

REMEDICATION INJECTION RULE AUTHORIZATION APPLICATION

**KERR-MCGEE GATHERING LLC
PLATTEVILLE COMPRESSOR STATION
NESE SEC 13-T3N-R66W
WELD COUNTY, COLORADO**

SEPTEMBER 2018

Prepared for:

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION 8
1595 Wynkoop Street
Denver, Colorado 80202-1129**

Prepared by:

**LT ENVIRONMENTAL, INC.
4600 West 60th Avenue
Arvada, Colorado 80003
(303) 433-9788**



REMEDIATION INJECTION RULE AUTHORIZATION APPLICATION

PLATTEVILLE COMPRESSOR STATION
NESE SEC 13-T3N-R66W
WELD COUNTY, COLORADO

1. Property owner of facility including a physical and mailing address; phone and fax numbers.

Kerr-McGee Gathering LLC
Attn: Travis Holland, APC Property Tax
P.O. Box 173779
Denver, Colorado 80217

2. Owner/operator of facility including a physical and mailing address; phone and fax numbers.

Kerr-McGee Gathering, LLC
1099 18th Street, Suite 1800
Denver, Colorado 80202
Contact: Mr. Charles Chase
Senior Staff HSE Representative
(720) 929-6000 phone
Charles.Chase@anadarko.com

3. Responsible party for the operation, maintenance, and closure of the injection system including a physical and mailing address and phone number.

LT Environmental, Inc. (LTE)
4600 West 60th Avenue
Arvada, Colorado 80003
(303) 433-9788 phone
(303) 962-5550 fax
bsulzberger@ltenv.com
Contact: Mr. Brian Sulzberger, P.G., P. E.

4. Contact persons representing any other regulatory agencies that have an interest in the site; including a physical and mailing address and phone number.

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



(303) 651-0949 phone
peter.gintautas@state.co.us
Reference: COGCC Remediation Project #9652

5. Briefly outline the type of contamination and when it occurred.

On May 1, 2013, the inlet slug catcher level sensor failed causing the slug catcher to fill up and allow liquids to flow to the low-pressure tank. The low-pressure tank overflowed releasing approximately 45 barrels (bbls) of condensate within the lined tank battery containment berm. A small amount of condensate (< 0.5 bbls) misted onto the surface soil outside of the tank battery berm and ran approximately 180 feet northeast due to melting snow.

The inlet slug catcher level sensor was flushed and cleaned. A vacuum truck was used to recover approximately 44.5 bbls of condensate from within the tank battery berm. The petroleum hydrocarbon impacted surface soil to the east of the tank battery was excavated.

Between May 6, 2013, and April 25, 2016, 24 excavation soil samples, 14 pothole soil samples, and 2 soil boring samples were collected to determine the extent of petroleum hydrocarbon impacts to soil. The soil samples were submitted for laboratory analysis of total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Laboratory results indicated that TPH and BTEX concentrations exceeded Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 allowable levels in 6 soil samples. However, based on depth to water measurements collected at a later date, these 6 soil samples were collected from the saturated zone. Therefore, TPH and BTEX concentrations were compliant with COGCC allowable levels at the extent of the excavation above the saturated zone.

6. Map of site location.

The topographic Water Well Location Map is attached as Figure 1. The site is located at a latitude/longitude of 40.222101 /-104.719881.

7. Analysis of groundwater from the receiving formation (up gradient from the contamination) and from the contaminated formation (near the source) include tabular data and a map of the contamination plume with the local groundwater flow direction shown.

Groundwater analytical results are provided in Table 1. The groundwater monitoring well locations, current areal extent of the contaminant plume, and most recent surveyed groundwater flow direction are presented on Figure 2.



8. Analysis of contaminants. Include BTEX and methyl tertiary-butyl ether (MTBE) if fuel spill related.

BTEX concentrations in site groundwater are presented in Table 1. MTBE is not a potential contaminant as this was an unrefined product release and did not contain any fuel additives.

9. Type of proposed injection well.

An air sparging (AS) pilot test will be conducted in the area with the highest benzene concentrations to help determine the feasibility of a full scale AS system. There are two proposed AS injection wells which will be installed to a depth of 27 feet each. Each AS well will be completed with two-inch polyvinyl chloride (PVC) pipe and will be screened from 25 to 27 feet below ground surface (bgs). The locations of the proposed AS wells are presented on Figure 2.

10. Analysis of the proposed injectate.

The AS system is designed to introduce ambient air into the subsurface water column to promote volatilization and aerobic microbial decomposition of dissolved-phase petroleum hydrocarbons.

11. Hydrogeologic description, location, depth, and current use (if any) of the receiving formations. Include hydrological studies if available.

The depth to the observed water table at the site ranges from approximately 8 feet to 20 feet bgs. The surveyed flow direction at the site is to the east northeast. Soil identified at the site generally consists of clayey sand (6 to 8 feet bgs) underlain by a lean clay. There is no known use of the groundwater in the receiving formation.

12. Location of existing monitoring wells (if any) and the location of proposed monitoring wells.

The areal extent of the dissolved-phase petroleum hydrocarbon plume has been defined by the existing network of 28 groundwater monitoring wells. No additional monitoring wells are proposed.

13. Explain how the proposed monitoring system will be able to track contaminant migration and how the proposed remediation system will minimize further migration.

The existing monitoring well network has established points of compliance (POC) and will be sampled on a quarterly basis to ensure a stable and decreasing contaminant plume. Quarterly groundwater monitoring will be conducted until site-wide BTEX concentrations are in compliance with COGCC Table 910-1 allowable levels for four consecutive quarters. The four



compliant sampling events used to close the site will occur with the system off to allow for static monitoring.

The AS pilot test is scheduled to be completed over one day, and influence will be monitored during the pilot test and pressures will be adjusted accordingly. It is not anticipated that further migration of the contaminant plume will occur as a result of the one-day pilot test event. Additionally, quarterly groundwater monitoring will continue on a quarterly basis to ensure no further plume migration is occurring.

14. If injection is into an alluvial aquifer, provide locations of surface water bodies, i.e. rivers, streams, and lakes, within one mile of injection site (may substitute topographic map).

The injection zone is not in an alluvial aquifer. A topographic Water Well Location Map depicting the geographical setting of the site is provided as Figure 1. There is one unnamed stream located 0.2 miles east (downgradient) of the site, the Speer Canal located 0.35 miles northwest (upgradient) of the site, and one unnamed stream located 0.9 miles south (upgradient) of the site.

15. Provide location and description of any drinking water wells within ¼ mile that may be impacted by the proposed injection.

According to the Colorado Division of Water Resources (DWR) water well database, two domestic water wells (receipt numbers 216442 and 468284) are located within ¼-mile of the site. Receipt number 468284 is located cross gradient of the site and receipt number 216442 is located slightly downgradient of the site. Due to the depth of the downgradient well, the two wells are not likely to be impacted by the injection event. The other wells within ¼-mile search radius are stock, monitoring, or irrigation wells. The ¼-mile search radius overlain on the topographic site location map is presented in Figure 1.

16. Description of the remediation system including operational procedures.

16.1 Injection Design

The AS system is designed to introduce ambient air into the subsurface water column to promote volatilization and aerobic microbial decomposition of dissolved-phase petroleum hydrocarbons.

LTE has installed and operated numerous AS systems in the region and within similar geology. Data from the operation of these systems indicates that a conservative, but reliable, radius of influence (ROI) of 20 feet for the AS wells.

The AS system is proposed to operate through 2 AS wells which will be connected to a tow behind air compressor and will be controlled using a manifold at the well head.



Based on the effectiveness of the pilot test, a full scale AS system will be designed to address groundwater impacts at this site. An amended Underground Injection Control (UIC) application will be submitted to the Environmental Protection Agency (EPA) if AS is feasible and a full-scale remediation system is planned.

17. If injectate is treated water, is it expected to meet current drinking water standards? If not, what exceedances are expected?

The injectate is ambient air.

18. Describe effect of injectate on groundwater: reaction products or by-products that are anticipated.

The AS system is designed to introduce ambient air into the subsurface water column to volatilize and promote aerobic microbial decomposition of dissolved-phase petroleum hydrocarbons. The injection of ambient air is expected to increase groundwater DO concentrations.

19. Bench scale-testing results if available.

A bench scale-test will not be performed.

20. A specific closure plan for the removal, closure, or plugging of the injections system, including an estimate of closing costs.

All monitoring wells and injection wells will be abandoned following Colorado DWR guidelines.

21. An executive summary of the approved Corrective Action Plan.

A site assessment was conducted to determine the extent of the dissolved-phase groundwater impact. Per the COGCC, petroleum hydrocarbon impacts in groundwater must be remediated to meet the current Maximum Contaminant Levels (MCLs). Thus, LTE is initiating a remediation program to achieve this cleanup goal. Remediation at the site will consist of using AS technology to promote dissolved-phase petroleum hydrocarbon volatilization and aerobic microbial decomposition.

22. Estimate the time required to complete the task covered in this Rule authorization request.

It is estimated that the pilot test and data evaluation will be completed within one year following approval of the Rule Authorization by the EPA.



FIGURES

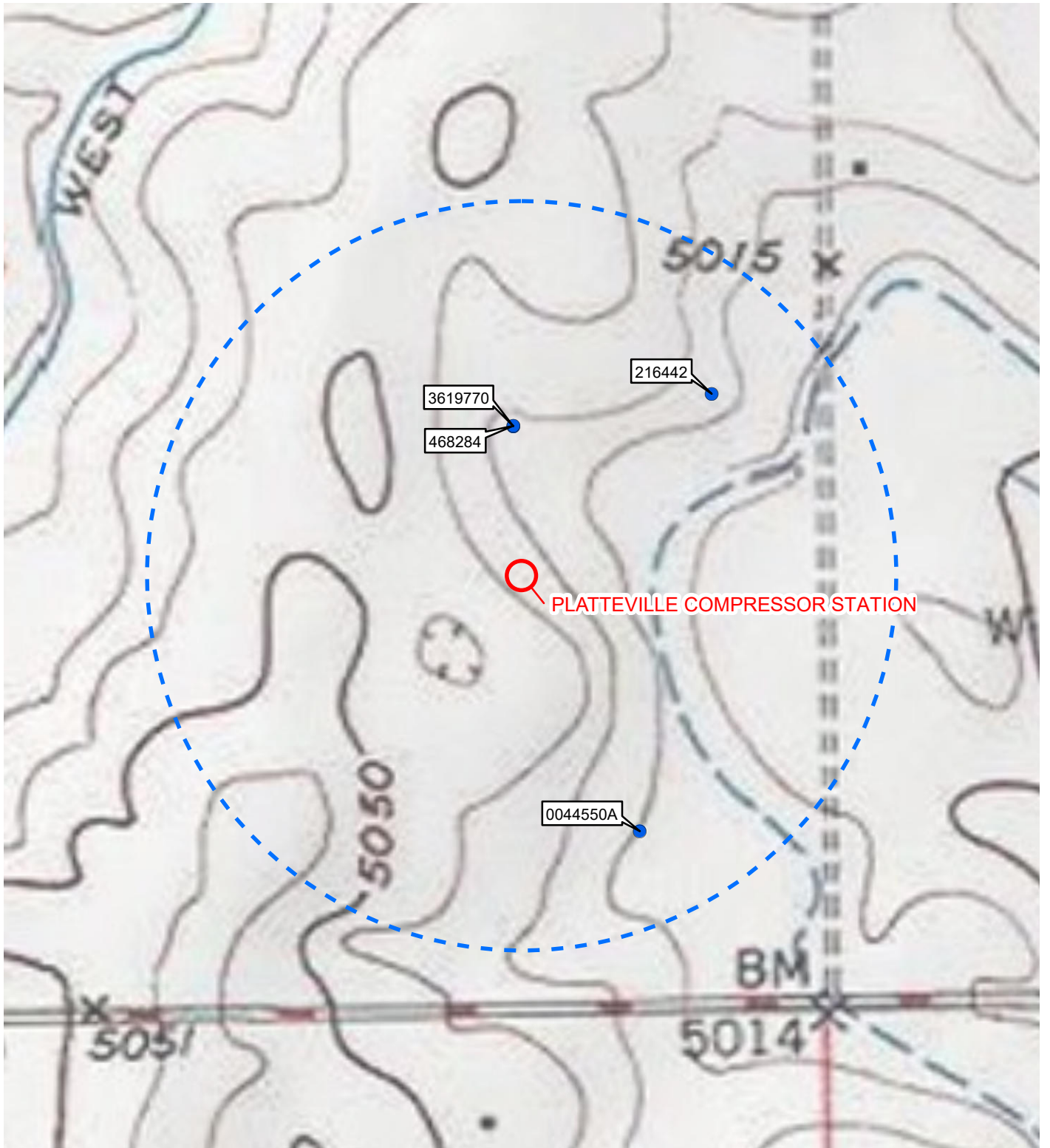





IMAGE COURTESY OF ESRI/USGS

LEGEND

-  SITE LOCATION
-  WATER WELL
-  QUARTER MILE RADIUS

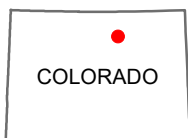
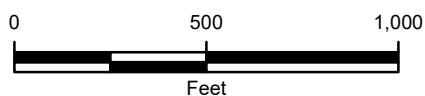


FIGURE 1
WATER WELL LOCATION MAP
PLATTEVILLE COMPRESSOR STATION
NESE SEC 13-T3N-R66W
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP



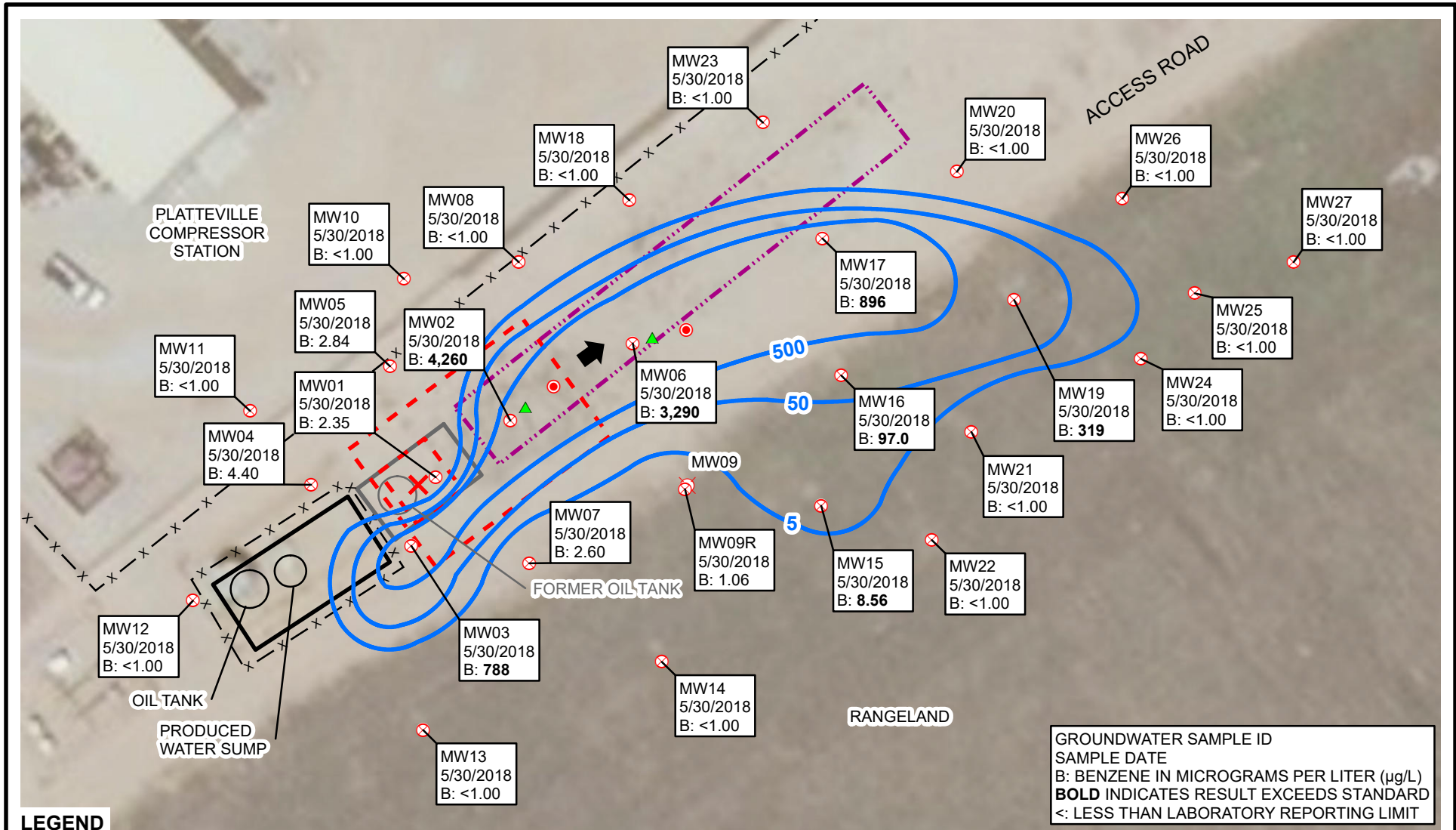


FIGURE 2
AS PILOT TEST MAP
PLATTEVILLE COMPRESSOR STATION
NESE SEC 13-T3N-R66W
WELD COUNTY, COLORADO
KERR-MCGEE GATHERING LLC





TABLES

TABLE 1
GROUNDWATER ANALYTICAL AND FIELD RESULTS
PLATTEVILLE COMPRESSOR STATION
WELD COUNTY, COLORADO
KERR-MCGEE GATHERING, LLC

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
MW01	8/21/2015	9,600	8,780	610	8,760	NM	NA
	5/3/2016	258	16.1	15.2	133	NM	NA
	8/26/2016	144	<4.00	<4.00	9.64	13.11	NA
	11/28/2016	166	<4.00	<4.00	23.3	14.49	85.99
	2/27/2017	54.6	<1.00	<1.00	<1.00	15.59	84.89
	5/22/2017	35.8	<1.00	<1.00	<1.00	16.15	84.33
	8/22/2017	52.4	<1.00	<1.00	<1.00	14.80	85.68
	11/16/2017	11.7	<1.00	<1.00	<1.00	15.33	85.15
	2/6/2018	5.34	<1.00	<1.00	<1.00	16.16	84.32
5/30/2018	2.35	<1.00	<1.00	<1.00	17.03	83.45	
MW02	5/3/2016	19,900	4,570	340	6,430	NM	NA
	8/26/2016	17,000	2,090	625	6,680	12.72	NA
	11/28/2016	9,490	145	380	3,790	13.90	84.81
	2/27/2017	7,350	192	408	4,220	14.94	83.77
	5/22/2017	5,370	<100	404	3,650	15.33	83.38
	8/22/2017	4,210	<50.0	392	3,300	14.31	84.40
	11/16/2017	49.9	<1.00	6.62	48.7	14.92	83.79
	2/6/2018	1,490	1.23	510	4,450	15.50	83.21
5/30/2018	4,260	<10.0	283	1,750	16.40	82.31	
MW03	5/3/2016	4,500	3,970	260	1,820	NM	NA
	8/26/2016	1,590	931	105	920	14.10	NA
	11/28/2016	665	342	54.9	460	15.21	86.31
	2/27/2017	302	99.0	37.8	290	17.05	84.47
	5/22/2017	1,150	4.48	17.0	65.4	17.04	84.48
	8/22/2017	1,670	44.8	21.0	75.0	15.64	85.88
	11/16/2017	50.1	1.06	2.15	9.64	16.23	85.29
	2/6/2018	513	29.5	10.4	47.4	16.98	84.54
	5/30/2018	788	<4.00	22.5	31.2	17.83	83.69
MW04	5/3/2016	1,050	<1.0	177	544	NM	NA
	8/26/2016	308	<10.0	74.5	151	14.02	NA
	11/28/2016	220	<1.00	91.1	95.1	16.00	85.93
	2/27/2017	201	<4.00	70.3	120	16.46	85.47
	5/22/2017	139	<4.00	59.4	74.5	17.00	84.93
	8/22/2017	21.3	<4.00	17.5	15.5	15.58	86.35



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	11/16/2017	117	<1.00	107	167	16.17	85.76
	2/6/2018	33.5	<1.00	49.9	62.5	17.11	84.82
	5/30/2018	4.40	<1.00	10.1	10.6	18.03	83.90
MW05	5/3/2016	142	82.7	1.4	79.9	NM	NA
	8/26/2016	1,070	14.9	59.9	294	13.71	NA
	11/28/2016	331	28.9	10.0	53.6	15.62	84.78
	2/27/2017	438	120	34.8	189	16.41	83.99
	5/22/2017	593	222	75.4	381	16.37	84.03
	8/22/2017	261	116	56.2	239	15.40	85.00
	11/16/2017	8.18	<1.00	2.78	6.57	16.13	84.27
	2/6/2018	10.3	10.5	6.95	30.8	16.99	83.41
	5/30/2018	2.84	1.52	3.93	17.4	17.91	82.49
MW06	5/3/2016	8,170	3,720	399	5,250	NM	NA
	8/26/2016	6,410	784	470	5,720	10.71	NA
	11/28/2016	7,020	2,260	304	3,100	11.74	84.05
	2/27/2017	3,130	1,910	315	3,580	12.70	83.09
	5/22/2017	2,070	1,030	351	3,750	12.97	82.82
	8/22/2017	3,830	1,160	347	3,920	12.01	83.78
	11/16/2017	48.5	18.6	5.19	46.6	12.63	83.16
	2/6/2018	2,830	472	426	4,820	13.31	82.48
	5/30/2018	3,290	503	230	2,710	14.25	81.54
MW07	5/3/2016	83.3	94.3	7.0	64.3	NM	NA
	8/26/2016	48.9	<1.00	<1.00	<1.00	13.07	NA
	11/28/2016	17.2	<1.00	<1.00	<1.00	14.27	85.64
	2/27/2017	54.3	<1.00	<1.00	<1.00	15.39	84.52
	5/22/2017	166	<1.00	<1.00	<1.00	15.97	83.94
	8/22/2017	1.31	<1.00	<1.00	<1.00	14.66	85.25
	11/16/2017	2.21	<1.00	<1.00	<1.00	15.06	84.85
	2/6/2018	11.5	<1.00	<1.00	5.28	15.93	83.98
	5/30/2018	2.60	<1.00	<1.00	<1.00	16.82	83.09
MW08	5/3/2016	<1.0	<1.0	36.9	146	NM	NA
	8/26/2016	<1.00	<1.00	2.64	5.36	12.04	NA
	11/28/2016	<1.00	<1.00	<1.00	<1.00	13.41	84.22



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	2/27/2017	<1.00	<1.00	<1.00	<1.00	14.27	83.36	
	5/22/2017	<1.00	<1.00	<1.00	<1.00	13.81	83.82	
	8/22/2017	<1.00	<1.00	<1.00	<1.00	13.42	84.21	
	11/16/2017	<1.00	<1.00	<1.00	<1.00	14.10	83.53	
	2/6/2018	<1.00	<1.00	<1.00	<1.00	15.00	82.63	
	5/30/2018	<1.00	<1.00	<1.00	<1.00	15.82	81.81	
MW09	5/3/2016	62.3	<1.0	1.8	51.7	NM	NA	
	8/26/2016	48.6	<1.00	<1.00	<1.00	12.01	NA	
	11/28/2016	10.4	<1.00	<1.00	<1.00	13.18	84.05	
	2/27/2017	21.9	<1.00	<1.00	<1.00	14.11	83.12	
	5/22/2017	73.0	<1.00	<1.00	2.03	14.69	82.54	
	MW09 destroyed as of 8/22/2017							
MW09R	10/13/2017	3.86	<1.00	1.75	22.8	11.38	85.59	
	11/16/2017	<1.00	<1.00	<1.00	<1.00	13.67	83.28	
	2/6/2018	<1.00	<1.00	<1.00	<1.00	14.45	82.50	
MW09R	5/30/2018	1.06	<1.00	<1.00	<1.00	15.32	81.63	
MW10	11/28/2016	<4.00	<4.00	<4.00	<4.00	14.96	84.91	
	2/27/2017	<1.00	<1.00	<1.00	<1.00	16.15	83.72	
	5/22/2017	<1.00	<1.00	<1.00	<1.00	15.77	84.10	
	8/22/2017	<1.00	<1.00	<1.00	<1.00	15.39	84.48	
	11/16/2017	<1.00	<1.00	<1.00	<1.00	15.83	84.04	
	2/6/2018	<1.00	<1.00	<1.00	<1.00	16.74	83.13	
	5/30/2018	<1.00	<1.00	<1.00	<1.00	17.58	82.29	
MW11	11/28/2016	<1.00	<1.00	<1.00	<1.00	16.00	86.48	
	2/27/2017	<1.00	<1.00	<1.00	<1.00	17.25	85.23	
	5/22/2017	<1.00	<1.00	<1.00	<1.00	17.71	84.77	
	8/22/2017	Not Found - Not Sampled					NM	NA
	11/16/2017	<1.00	<1.00	<1.00	<1.00	16.88	85.60	
	2/6/2018	<1.00	<1.00	<1.00	<1.00	17.76	84.72	
	5/30/2018	<1.00	<1.00	<1.00	<1.00	18.68	83.80	
MW12	11/28/2016	<1.00	<1.00	<1.00	<1.00	17.57	87.8	
	2/27/2017	<1.00	<1.00	<1.00	<1.00	18.80	86.57	



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Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
	5/22/2017	<1.00	<1.00	<1.00	<1.00	19.42	85.95
	8/22/2017	<1.00	<1.00	<1.00	<1.00	17.81	87.56
	11/16/2017	<1.00	<1.00	<1.00	<1.00	18.39	86.98
	2/6/2018	<1.00	<1.00	<1.00	<1.00	19.28	86.09
	5/30/2018	<1.00	<1.00	<1.00	<1.00	20.18	85.19
MW13	11/28/2016	<4.00	<4.00	<4.00	8.80	15.44	87.25
	2/27/2017	<1.00	<1.00	<1.00	<1.00	16.59	86.1
	5/22/2017	<1.00	<1.00	1.47	2.41	17.44	85.25
	8/22/2017	<1.00	<1.00	5.60	9.94	15.88	86.81
	11/16/2017	<1.00	<1.00	3.00	4.98	16.52	86.17
	2/6/2018	<1.00	<1.00	4.03	8.30	17.17	85.52
	5/30/2018	<1.00	<1.00	2.65	5.50	19.17	83.52
MW14	11/28/2016	<1.00	<1.00	<1.00	<1.00	12.70	85.32
	2/27/2017	<1.00	<1.00	<1.00	<1.00	13.69	84.33
	5/22/2017	<1.00	<1.00	<1.00	<1.00	14.52	83.50
	8/22/2017	<1.00	<1.00	<1.00	<1.00	13.19	84.83
	11/16/2017	<1.00	<1.00	<1.00	<1.00	13.66	84.36
	2/6/2018	<1.00	<1.00	<1.00	<1.00	14.42	83.60
	5/30/2018	<1.00	<1.00	<1.00	<1.00	15.25	82.77
MW15	11/28/2016	3.25	<1.00	<1.00	13.9	10.87	83.33
	2/27/2017	13.7	<1.00	7.11	43.2	11.81	82.39
	5/22/2017	38.9	<1.00	23.2	94.7	12.53	81.67
	8/22/2017	11.4	<1.00	8.37	4.47	11.24	82.96
	11/16/2017	2.47	<1.00	2.22	<1.00	11.73	82.47
	2/6/2018	4.03	<1.00	4.55	2.71	12.49	81.71
	5/30/2018	8.56	<1.00	9.07	<1.00	13.27	80.93
MW16	11/28/2016	613	89.3	198	1,900	11.03	82.65
	2/27/2017	76.8	<20.0	<20.0	98.0	11.81	81.87
	5/22/2017	80.2	1.62	14.0	107	12.33	81.35
	8/22/2017	469	1.89	40.4	323	11.28	82.40
	11/16/2017	29.5	<1.00	3.22	25.6	11.95	81.73
	2/6/2018	303	<1.00	20.4	80.5	12.42	81.26
	5/30/2018	97.0	<4.00	10.4	27.0	13.35	80.33



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MW17	11/28/2016	320	6,360	388	5,170	10.09	82.22	
	2/27/2017	524	6,300	359	4,410	10.50	81.81	
	5/22/2017	750	8,060	481	5,650	10.64	81.67	
	8/22/2017	426	7,350	476	5,820	9.89	82.42	
	11/16/2017	5.96	86.9	6.91	77.7	10.45	81.86	
	2/6/2018	275	2,130	424	4,820	11.09	81.22	
	5/30/2018	896	998	412	5,160	11.91	80.40	
MW18	11/28/2016	<4.00	<4.00	92.0	108	11.21	83.65	
	2/27/2017	<1.00	<1.00	29.3	35.5	12.20	82.66	
	5/22/2017	<1.00	<1.00	13.4	4.95	11.96	82.90	
	8/22/2017	<1.00	<1.00	16.0	4.56	11.44	83.42	
	11/16/2017	<1.00	<1.00	10.4	2.50	12.17	82.69	
	2/6/2018	<1.00	<1.00	7.36	<1.00	12.81	82.05	
	5/30/2018	<1.00	<1.00	4.29	<1.00	13.64	81.22	
MW19	3/22/2017	587	<4.00	96.2	3,030	9.83	81.4	
	3/23/2017	Surveyed - Not Sampled					9.86	81.37
	5/22/2017	479	<10.0	87.6	739	9.90	81.33	
	8/22/2017	1,320	<4.00	248	2,340	9.18	82.05	
	11/16/2017	66.1	<1.00	16.0	122	10.73	80.50	
	2/6/2018	737	<1.00	274	1,990	10.51	80.72	
	5/30/2018	319	<10.0	199	1,340	11.14	80.09	
MW20	3/22/2017	43.9	<1.00	9.80	171	9.70	81.85	
	3/23/2017	Surveyed - Not Sampled					9.71	81.84
	5/22/2017	<1.00	<1.00	<1.00	<1.00	9.59	81.96	
	8/22/2017	<1.00	<1.00	<1.00	<1.00	8.97	82.58	
	11/16/2017	<1.00	<1.00	<1.00	<1.00	9.60	81.95	
	2/6/2018	<1.00	<1.00	<1.00	<1.00	10.16	81.39	
	5/30/2018	<1.00	<1.00	<1.00	<1.00	10.94	80.61	
MW21	3/22/2017	<1.00	1.12	2.68	59.6	11.08	80.96	
	3/23/2017	Surveyed - Not Sampled					11.10	80.94
	5/22/2017	1.05	<1.00	<1.00	<1.00	10.33	81.71	
	8/22/2017	<1.00	<1.00	<1.00	<1.00	9.41	82.63	



TABLE 1
GROUNDWATER ANALYTICAL AND FIELD RESULTS
PLATTEVILLE COMPRESSOR STATION
WELD COUNTY, COLORADO
KERR-MCGEE GATHERING, LLC

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)	
	11/16/2017	<1.00	<1.00	<1.00	<1.00	9.98	82.06	
	2/6/2018	<1.00	<1.00	<1.00	<1.00	10.60	81.44	
	5/30/2018	<1.00	<1.00	<1.00	<1.00	11.38	80.66	
MW22	3/22/2017	<1.00	<1.00	<1.00	2.84	10.91	82.51	
	3/23/2017	Surveyed - Not Sampled					10.93	82.49
	5/22/2017	1.18	<1.00	5.79	12.3	11.41	82.01	
	8/22/2017	1.28	<1.00	1.09	<1.00	10.28	83.14	
	11/16/2017	3.33	<1.00	3.76	<1.00	10.85	82.57	
	2/6/2018	<1.00	<1.00	<1.00	<1.00	11.50	81.92	
	5/30/2018	<1.00	<1.00	<1.00	<1.00	12.24	81.18	
MW23	3/22/2017	<1.00	<1.00	<1.00	<1.00	10.25	82.75	
	3/23/2017	Surveyed - Not Sampled					10.27	82.73
	5/22/2017	<1.00	<1.00	<1.00	<1.00	9.81	83.19	
	8/22/2017	<1.00	<1.00	<1.00	<1.00	9.29	83.71	
	11/16/2017	<1.00	<1.00	<1.00	<1.00	9.86	83.14	
	2/6/2018	<1.00	<1.00	<1.00	<1.00	10.56	82.44	
	5/30/2018	<1.00	<1.00	<1.00	<1.00	11.41	81.59	
MW24	10/13/2017	<1.00	<1.00	<1.00	2.00	11.39	84.48	
	11/16/2017	<1.00	<1.00	<1.00	<1.00	8.79	84.31	
	2/6/2018	<1.00	<1.00	<1.00	<1.00	9.48	83.62	
MW24	5/30/2018	<1.00	<1.00	<1.00	<1.00	10.20	82.90	
MW25	10/13/2017	25.8	<1.00	110	581	8.16	84.13	
	11/16/2017	<1.00	<1.00	<1.00	1.68	8.35	83.94	
	2/6/2018	<1.00	<1.00	<1.00	<1.00	9.07	83.22	
MW25	5/30/2018	<1.00	<1.00	<1.00	<1.00	9.77	82.52	
MW26	10/13/2017	<1.00	<1.00	<1.00	<1.00	5.88	84.53	
	11/16/2017	<1.00	<1.00	<1.00	<1.00	9.06	84.12	
	2/6/2018	<1.00	<1.00	<1.00	<1.00	9.54	83.64	
MW26	5/30/2018	<1.00	<1.00	<1.00	<1.00	10.36	82.82	
MW27	2/6/2018	<1.00	<1.00	<1.00	<1.00	8.42	82.81	
MW27	5/30/2018	<1.00	<1.00	<1.00	<1.00	9.26	81.97	




TABLE 1
GROUNDWATER ANALYTICAL AND FIELD RESULTS
PLATTEVILLE COMPRESSOR STATION
WELD COUNTY, COLORADO
KERR-MCGEE GATHERING, LLC

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
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COGCC Allowable Levels	5	1,000	700	1,400			
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Notes: COGCC - Colorado Oil and Gas Conservation Commission µg/L - micrograms per liter
ft bgs - feet below ground surface < - less than laboratory reporting limit
NA - not analyzed/not available Bold indicates result exceeds allowable level
NM - not measured Excavation groundwater depth is approximate



 United States Environmental Protection Agency Underground Injection Control Permit Application <i>(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)</i>										I. EPA ID Number <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 80%;"></td> <td style="width: 10%; text-align: center;">T/A</td> <td style="width: 10%; text-align: center;">C</td> </tr> <tr> <td style="text-align: center;">U</td> <td></td> <td></td> </tr> </table>					T/A	C	U		
	T/A	C																	
U																			
Read Attached Instructions Before Starting For Official Use Only																			
Application approved mo day year			Date received mo day year			Permit Number			Well ID			FINDS Number							
II. Owner Name and Address							III. Operator Name and Address												
Owner Name Kerr-McGee Gathering, LLC							Owner Name Kerr-McGee Gathering, LLC												
Street Address 1099 18th Street, Suite 1800					Phone Number (720) 929-6726		Street Address 1099 18th Street, Suite 1800					Phone Number (720) 929-6726							
City Denver		State CO	ZIP CODE 80202			City Denver		State CO	ZIP CODE 80202										
IV. Commercial Facility				V. Ownership				VI. Legal Contact				VII. SIC Codes							
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				<input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other				<input checked="" type="checkbox"/> Owner <input type="checkbox"/> Operator											
VIII. Well Status (Mark "x")																			
<input type="checkbox"/> A Operating		Date Started mo day year			<input type="checkbox"/> B. Modification/Conversion				<input checked="" type="checkbox"/> C. Proposed										
IX. Type of Permit Requested (Mark "x" and specify if required)																			
<input type="checkbox"/> A. Individual		<input checked="" type="checkbox"/> B. Area		Number of Existing Wells 0			Number of Proposed Wells 2			Name(s) of field(s) or project(s) Platteville Compressor Station									
X. Class and Type of Well (see reverse)																			
A. Class(es) (enter code(s)) Class V			B. Type(s) (enter code(s)) NA			C. If class is "other" or type is code 'x,' explain Aquifer remediation - temporary air sparging injection points						D. Number of wells per type (if area permit)							
XI. Location of Well(s) or Approximate Center of Field or Project											XII. Indian Lands (Mark 'x')								
Latitude			Longitude			Township and Range									<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Deg	Min	Sec	Deg	Min	Sec	Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line						
40	13	20	104	43	10	13	3N	66W	SE	1021	E	1555	S						
XIII. Attachments																			
(Complete the following questions on a separate sheet(s) and number accordingly; see instructions) For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.																			
XIV. Certification																			
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)																			
A. Name and Title (Type or Print) Charles Chase, Senior Staff HSE Representative											B. Phone No. (Area Code and No.) (720) 929-6000								
C. Signature											D. Date Signed								

Well Class and Type Codes

Class I Wells used to inject waste below the deepest underground source of drinking water.

Type “I” Nonhazardous industrial disposal well
 “M” Nonhazardous municipal disposal well
 “W” Hazardous waste disposal well injecting below USDWs
 “X” Other Class I wells (not included in Type “I,” “M,” or “W”)

Class II Oil and gas production and storage related injection wells.

Type “D” Produced fluid disposal well
 “R” Enhanced recovery well
 “H” Hydrocarbon storage well (excluding natural gas)
 “X” Other Class II wells (not included in Type “D,” “R,” or “H”)

Class III Special process injection wells.

Type “G” Solution mining well
 “S” Sulfur mining well by Frasch process
 “U” Uranium mining well (excluding solution mining of conventional mines)
 “X” Other Class III wells (not included in Type “G,” “S,” or “U”)

Other Classes Wells not included in classes above.
 Class V wells which may be permitted under §144.12.
 Wells not currently classified as Class I, II, III, or V.

Attachments to Permit Application

Class	Attachments
I new well	A, B, C, D, F, H – S, U
existing	A, B, C, D, F, H – U
II new well	A, B, C, E, G, H, M, Q, R; optional – I, J, K, O, P, U
existing	A, E, G, H, M, Q, R, – U; optional – J, K, O, P, Q
III new well	A, B, C, D, F, H, I, J, K, M – S, U
existing	A, B, C, D, F, H, J, K, M – U
Other Classes	To be specified by the permitting authority

INSTRUCTIONS - Underground Injection Control (UIC) Permit Application

Paperwork Reduction Act: The public reporting and record keeping burden for this collection of information is estimated to average 224 hours for a Class I hazardous well application, 110 hours for a Class I non-hazardous well application, 67 hours for a Class II well application, and 132 hours for a Class III well application. Burden means the total time, effort, or financial resource expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal Agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to the collection of information; search data sources; complete and review the collection of information; and, transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including the use of automated collection techniques to Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822), 1200 Pennsylvania Ave., NW, Washington, DC 20460. Include the OMB control number in any correspondence. Do not send the completed forms to this address.

This form must be completed by all owners or operators of Class I, II, and III injection wells and others who may be directed to apply for permit by the Director.

- I. **EPA I.D. NUMBER** - Fill in your EPA Identification Number. If you do not have a number, leave blank.
- II. **OWNER NAME AND ADDRESS** - Name of well, well field or company and address.
- III. **OPERATOR NAME AND ADDRESS** - Name and address of operator of well or well field.
- IV. **COMMERCIAL FACILITY** - Mark the appropriate box to indicate the type of facility.
- V. **OWNERSHIP** - Mark the appropriate box to indicate the type of ownership.
- VI. **LEGAL CONTACT** - Mark the appropriate box.
- VII. **SIC CODES** - List at least one and no more than four Standard Industrial Classification (SIC) Codes that best describe the nature of the business in order of priority.
- VIII. **WELL STATUS** - Mark Box A if the well(s) were operating as injection wells on the effective date of the UIC Program for the State. Mark Box B if wells(s) existed on the effective date of the UIC Program for the State but were not utilized for injection. Box C should be marked if the application is for an underground injection project not constructed or not completed by the effective date of the UIC Program for the State.
- IX. **TYPE OF PERMIT** - Mark "Individual" or "Area" to indicate the type of permit desired. Note that area permits are at the discretion of the Director and that wells covered by an area permit must be at one site, under the control of one person and do not inject hazardous waste. If an area permit is requested the number of wells to be included in the permit must be specified and the wells described and identified by location. If the area has a commonly used name, such as the "Jay Field," submit the name in the space provided. In the case of a project or field which crosses State lines, it may be possible to consider an area permit if EPA has jurisdiction in both States. Each such case will be considered individually, if the owner/operator elects to seek an area permit.
- X. **CLASS AND TYPE OF WELL** - Enter in these two positions the Class and type of injection well for which a permit is requested. Use the most pertinent code selected from the list on the reverse side of the application. When selecting type X please explain in the space provided.
- XI. **LOCATION OF WELL** - Enter the latitude and longitude of the existing or proposed well expressed in degrees, minutes, and seconds or the location by township, and range, and section, as required by 40 CFR Part 146. If an area permit is being requested, give the latitude and longitude of the approximate center of the area.
- XII. **INDIAN LANDS** - Place an "X" in the box if any part of the facility is located on Indian lands.
- XIII. **ATTACHMENTS** - Note that information requirements vary depending on the injection well class and status. Attachments for Class I, II, III are described on pages 4 and 5 of this document and listed by Class on page 2. Place EPA ID number in the upper right hand corner of each page of the Attachments.
- XIV. **CERTIFICATION** - All permit applications (except Class II) must be signed by a responsible corporate officer for a corporation, by a general partner for a partnership, by the proprietor of a sole proprietorship, and by a principal executive or ranking elected official for a public agency. For Class II, the person described above should sign, or a representative duly authorized in writing.

INSTRUCTIONS - Attachments

Attachments to be submitted with permit application for Class I, II, III and other wells.

A. AREA OF REVIEW METHODS - Give the methods and, if appropriate, the calculations used to determine the size of the area of review (fixed radius or equation). The area of review shall be a fixed radius of 1/4 mile from the well bore unless the use of an equation is approved in advance by the Director.

B. MAPS OF WELL/AREA AND AREA OF REVIEW - Submit a topographic map, extending one mile beyond the property boundaries, showing the injection well(s) or project area for which a permit is sought and the applicable area of review. The map must show all intake and discharge structures and all hazardous waste treatment, storage, or disposal facilities. If the application is for an area permit, the map should show the distribution manifold (if applicable) applying injection fluid to all wells in the area, including all system monitoring points. Within the area of review, the map must show the following:

Class I

The number, or name, and location of all producing wells, injection wells, abandoned wells, dryholes, surface bodies of water, springs, mines (surface and subsurface), quarries, and other pertinent surface features, including residences and roads, and faults, if known or suspected. In addition, the map must identify those wells, springs, other surface water bodies, and drinking water wells located within one quarter mile of the facility property boundary. Only information of public record is required to be included in this map;

Class II

In addition to requirements for Class I, include pertinent information known to the applicant. This requirement does not apply to existing Class II wells;

Class III

In addition to requirements for Class I, include public water systems and pertinent information known to the applicant.

C. CORRECTIVE ACTION PLAN AND WELL DATA - Submit a tabulation of data reasonably available from public records or otherwise known to the applicant on all wells within the area of review, including those on the map required in B, which penetrate the proposed injection zone. Such data shall include the following:

Class I

A description of each well's types, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Director may require. In the case of new injection wells, include the corrective action proposed to be taken by the applicant under 40 CFR 144.55.

Class II

In addition to requirement for Class I, in the case of Class II wells operating over the fracture pressure of the injection formation, all known wells within the area of review which penetrate formations affected by the increase in pressure. This requirement does not apply to existing Class II wells.

Class III

In addition to requirements for Class I, the corrective action proposed under 40 CFR 144.55 for all Class III wells.

D. MAPS AND CROSS SECTION OF USDWs - Submit maps and cross sections indicating the vertical limits of all underground sources of drinking water within the area of review (both vertical and lateral limits for Class I), their position relative to the injection formation and the direction of water movement, where known, in every underground source of drinking water which may be affected by the proposed injection. (Does not apply to Class II wells.)

- E. NAME AND DEPTH OF USDWs (CLASS II)** - For Class II wells, submit geologic name, and depth to bottom of all underground sources of drinking water which may be affected by the injection.
- F. MAPS AND CROSS SECTIONS OF GEOLOGIC STRUCTURE OF AREA** - Submit maps and cross sections detailing the geologic structure of the local area (including the lithology of injection and confining intervals) and generalized maps and cross sections illustrating the regional geologic setting. (Does not apply to Class II wells.)
- G. GEOLOGICAL DATA ON INJECTION AND CONFINING ZONES (Class II)** - For Class II wells, submit appropriate geological data on the injection zone and confining zones including lithologic description, geological name, thickness, depth and fracture pressure.
- H. OPERATING DATA** - Submit the following proposed operating data for each well (including all those to be covered by area permits): (1) average and maximum daily rate and volume of the fluids to be injected; (2) average and maximum injection pressure; (3) nature of annulus fluid; (4) for Class I wells, source and analysis of the chemical, physical, radiological and biological characteristics, including density and corrosiveness, of injection fluids; (5) for Class II wells, source and analysis of the physical and chemical characteristics of the injection fluid; (6) for Class III wells, a qualitative analysis and ranges in concentrations of all constituents of injected fluids. If the information is proprietary, maximum concentrations only may be submitted, but all records must be retained.
- I. FORMATION TESTING PROGRAM** - Describe the proposed formation testing program. For Class I wells the program must be designed to obtain data on fluid pressure, temperature, fracture pressure, other physical, chemical, and radiological characteristics of the injection matrix and physical and chemical characteristics of the formation fluids.
- For Class II wells the testing program must be designed to obtain data on fluid pressure, estimated fracture pressure, physical and chemical characteristics of the injection zone. (Does not apply to existing Class II wells or projects.)
- For Class III wells the testing must be designed to obtain data on fluid pressure, fracture pressure, and physical and chemical characteristics of the formation fluids if the formation is naturally water bearing. Only fracture pressure is required if the program formation is not water bearing. (Does not apply to existing Class III wells or projects.)
- J. STIMULATION PROGRAM** - Outline any proposed stimulation program.
- K. INJECTION PROCEDURES** - Describe the proposed injection procedures including pump, surge, tank, etc.
- L. CONSTRUCTION PROCEDURES** - Discuss the construction procedures (according to §146.12 for Class I, §146.22 for Class II, and §146.32 for Class III) to be utilized. This should include details of the casing and cementing program, logging procedures, deviation checks, and the drilling, testing and coring program, and proposed annulus fluid. (Request and submission of justifying data must be made to use an alternative to packer for Class I.)
- M. CONSTRUCTION DETAILS** - Submit schematic or other appropriate drawings of the surface and subsurface construction details of the well.
- N. CHANGES IN INJECTED FLUID** - Discuss expected changes in pressure, native fluid displacement, and direction of movement of injection fluid. (Class III wells only.)
- O. PLANS FOR WELL FAILURES** - Outline contingency plans (proposed plans, if any, for Class II) to cope with all shut-ins or wells failures, so as to prevent migration of fluids into any USDW.
- P. MONITORING PROGRAM** - Discuss the planned monitoring program. This should be thorough, including maps showing the number and location of monitoring wells as appropriate and discussion of monitoring devices, sampling frequency, and parameters measured. If a manifold monitoring program is utilized, pursuant to §146.23(b)(5), describe the program and compare it to individual well monitoring.
- Q. PLUGGING AND ABANDONMENT PLAN** - Submit a plan for plugging and abandonment of the well including: (1) describe the type, number, and placement (including the elevation of the top and bottom) of plugs to be used; (2) describe the type, grade, and quantity of cement to be used; and (3) describe the method to be used to place plugs, including the method used to place the well in a state of static equilibrium prior to placement of the plugs. Also for a Class III well that underlies or is in an exempted aquifer, demonstrate adequate protection of USDWs. Submit this information on EPA Form 7520-14, Plugging and Abandonment Plan.

- R. **NECESSARY RESOURCES** - Submit evidence such as a surety bond or financial statement to verify that the resources necessary to close, plug or abandon the well are available.
- S. **AQUIFER EXEMPTIONS** - If an aquifer exemption is requested, submit data necessary to demonstrate that the aquifer meets the following criteria: (1) does not serve as a source of drinking water; (2) cannot now and will not in the future serve as a source of drinking water; and (3) the TDS content of the ground water is more than 3,000 and less than 10,000 mg/l and is not reasonably expected to supply a public water system. Data to demonstrate that the aquifer is expected to be mineral or hydrocarbon production, such as general description of the mining zone, analysis of the amenability of the mining zone to the proposed method, and time table for proposed development must also be included. For additional information on aquifer exemptions, see 40 CFR Sections 144.7 and 146.04.
- T. **EXISTING EPA PERMITS** - List program and permit number of any existing EPA permits, for example, NPDES, PSD, RCRA, etc.
- U. **DESCRIPTION OF BUSINESS** - Give a brief description of the nature of the business.