

Wyoming Department of Environmental Quality
Water Quality Division
Laramie County Permit for Land Application of Treated Produced Water

PERMIT NO. 20-184

This permit hereby authorizes the applicant to land apply uncontaminated produced water according to the procedures of the approved permit application and conditions of this permit. This permit shall be effective for a period of five (5) years from the date of issuance unless terminated by the Wyoming Department of Environmental Quality (WDEQ).

The issuance of this permit confirms that the Water Quality Division (WQD) has evaluated the application submitted by the permittee and determined that it meets minimum applicable WQD standards. Compliance with the standards and the operation of the permitted activity to meet the engineer's design are the responsibility of the permittee, owner, and operator.

Granting this permit does not imply that WQD guarantees or ensures that the permitted activity will meet applicable permit conditions or other effluent or operational requirements. Compliance with the standards remains the responsibility of the permittee.

Nothing in this permit constitutes an endorsement by WQD. This permit verifies only that the submitted application meets the standards imposed by Wyoming statutes, rules and regulations. The WDEQ assumes no liability for, and does not in any way guarantee or warrant the performance or operation of the permitted activity. The permittee, owner and operator are solely responsible for any liability arising from the permitted activity. By issuing this permit, the State of Wyoming does not waive its sovereign immunity.

The permittee shall allow WDEQ personnel and their invitees to enter the premises where the permitted activity is located, or where records are kept under the conditions of this permit, and collect resource data as defined by Wyoming Statute § 6-3-414, inspect and photograph the activity, collect samples for analysis, review records, and perform any other function authorized by law or regulation. The permittee shall secure and maintain such access for the duration of the permit.

If the activity is located on property not owned by the permittee, the permittee shall also secure and maintain from the landowner upon whose property the activity is located permission for WDEQ personnel and their invitees to enter the premises where a regulated activity is located, or where records are kept under the conditions of this permit, and collect resource data as defined by Wyoming Statute § 6-3-414, inspect and photograph the activity, collect samples for analysis, review records, and perform any other function authorized by law. The permittee shall secure and maintain such access for the duration of the permit.

If the activity location cannot be directly accessed using public roads, the permittee shall also secure and maintain permission for WDEQ personnel and their invitees to enter and cross all properties necessary to access the location. The permittee shall secure and maintain such access for the duration of the permit.

The permittee shall maintain in its records documentation that demonstrates that the permittee has secured permission for WDEQ personnel and their invitees to access the permitted activity location, including (i) permission to access the land where the activity is located, (ii) permission to collect resource data as defined by Wyoming Statute § 6-3-414, and (iii) permission to enter and cross all properties necessary to access the activity location if the location cannot be directly accessed from a public road. The permittee shall also maintain in its records a current map of the access route(s) to the activity location and contact information for the owners or agents of all properties that must be crossed to access the location. The permittee shall ensure that the documentation, map, and contact information are current at all times. The permittee shall provide the

documentation, map, and contact information to DEQ personnel upon request. Upon completion of the permitted activity, the permittee shall maintain such records for a period of five (5) years.

Nothing in this permit precludes the institution of any legal action or other proceeding to enforce any applicable provision of law or rules and regulations. It is the duty of the permittee, owner and operator to comply with all applicable federal, state and local laws or regulations in the exercise of its activities authorized by this permit.

The issuance of this permit does not convey any property rights in either real or personal property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

The permittee shall perform the permitted activity in accordance with the statements, representations, procedures, terms and conditions of the permit application, supporting documents and permit. This permit does not relieve the permittee from any duty to obtain any other permit or authorization that may be required by any provision of federal, state or local laws.

In carrying out its activities authorized by this permit, the permittee, owner and operator shall comply with all of the following permit conditions:

- 1 of 8 A permit application and written authorization from the Administrator is required in order to obtain coverage under this permit.
- 2 of 8 Only those lands authorized in the approved permit application are covered under this permit.
- 3 of 8 The permittee shall immediately notify WQD of any changes or modifications which are not consistent with the terms and conditions of this permit or the approved permit application.
 - a. Submit oral or written notice to CBM/Oil and Gas Group, 152 North Durbin Street, Suite 100, Casper, WY 82601, Phone 307-473-3465, FAX 307-473-3458, in accordance with the provisions of Section 11, Chapter 3, Wyoming Water Quality Rules and Regulations.
- 4 of 8 At a minimum of two (2) weeks prior to the start of land application the permittee shall file two copies of a **Notice of Intent (NOI)** to make a land application in accordance with the approved permit application and this permit.
 - a. A separate NOI is required for each separate land application site.
 - b. The NOI must be filed with the CBM/Oil and Gas Group, Water Quality Division, 152 North Durbin Street, Suite 100, Casper, WY 82601, Phone 307-473-3465, FAX 307-473-3458.
 - c. A copy of the NOI shall be provided to the local emergency management agency at least 48 hours prior to the land application.
- 5 of 8 The written **Notice of Intent** shall be titled "Notice of Intent" and include the following items:
 - a. Name, address, and telephone number of the applicant.
 - b. Name, address, and telephone number of the site supervisor for the land application.
 - c. Name, local address, and written permission to land apply from the property owner.
 - d. Signed landowner agreement providing the DEQ access to the property to inspect the permitted facility, take photos, collect samples, etc.

- e. Well name, location (latitude/longitude), API Number, Operator's name, address and telephone number from which produced water has been obtained for land application.
- f. Description of all containers used to store treated and untreated produced water and treatment by-products.
- g. Description of the land application site, including:
 - (1) Legal description of area where land application is to occur.
 - (2) USGS topographic map illustrating the area(s) where land application is to occur.
 - (3) A narrative description of the site, to include a discussion of the average slopes, maximum slopes, soil types as described in the approved permit application, and crop or vegetation types.
 - (4) Method and rate of application.
- h. The date(s) land application(s) will begin, and the estimated completion date(s).
 - (1) For multiple applications during the season, provide the estimated dates and durations for each individual application.
- i. Baseline soil test results, unless already provided.

6 of 8 For each land application site, within sixty (60) days of completion of a one-time or of a series of land applications during the growing season, the permittee shall submit to the WQD on the form provided **(CERTIFICATE OF COMPLETION)** the following information:

- a. Date(s) that the land application was performed and the volume(s) applied, and;
- b. Certification by the permittee that all land applications were made in accordance with the approved permit application and the conditions of this permit.

7 of 8 **Conditions to be met to allow use of the County-wide Permit**

- a. Application of treated wastewater shall be terminated within 300 feet of the definable high water mark of perennial and intermittent drainages, irrigation canals, lakes, ponds, reservoirs or other bodies of water. Land application that results in treated wastewater reaching waters of the state including, perennial, intermittent and ephemeral waters is a violation of the permit and the Environmental Quality Act.
- b. The addition of any chemical additives to treated wastewater to be land applied is a violation of the permit unless authorized in writing by the Administrator prior to land application.
- c. The treated water shall be applied uniformly and at the agronomic rate established in a Nutrient Management Plan.
- d. The land application shall not result in pooling or runoff from the land.

- e. The treated water shall not be land applied to the ground when it is saturated, frozen, or covered by snow.
- f. The application site slope shall not exceed eight per cent (8%) for vehicular application.
- g. All treated water to be land applied shall not exceed the water quality criteria listed in the attachment to this permit.
- h. Storage of treated water to be used for land application shall only occur in containers that are contaminant-free and pre-approved by DEQ. Prior to storage of treated water, the permittee shall provide documentation that demonstrates that the container(s) are clean and free from all solids, liquids, and residual contamination. Storage of material other than treated water in these containers is a violation of this permit.
- i. When the source of produced water to be treated changes, (i.e. is from a source of produced water other than that identified in the approved permit application), land application is prohibited until the permittee:
 - (1) Provides documentation from the well owner and the OGCC of all chemical compounds and other materials, together with the amounts for each well from which produced water is obtained for land application. This includes all chemical compounds and other materials introduced to the well during completion, maintenance, workover, hydraulic fracturing, and other types of well stimulation, and;
 - (2) Provides test results from collection of a minimum of three consecutive compliant batch water test samples (see below) that demonstrates that treatment is capable of achieving the screening criteria limits in the attached table, as amended to include additional constituents of concern identified in (1), above.
 - a. A compliant batch water is defined as a maximum of 1000 barrels of continuously treated water from the same source that meets the screening criteria limits for all constituents identified in the attached table, including any additional constituents of concern and their respective screening criteria limits as established by the Administrator.
 - b. A water test sample is a composite sample consisting of three separate samples that are representative of the beginning, middle and end of an uninterrupted batch run not exceeding 1000 barrels of treated water.
 - (3) Receives written authorization to land apply from the Administrator.
- j. Testing for all constituents identified in the attached table, including any additional constituents of concern and their respective screening criteria limits as established by the Administrator, is required for every increment of 5,000 barrels of treated produced water to be land applied.
 - (1) Constituents that are not present in concentrations above the detection limit for all three consecutive compliant batch tests may be removed from the screening criteria list upon review and approval by DEQ.
 - (2) Test results are to be provided to the Water Quality Division upon receipt.

- k. For land application sites where land application is more frequent than a one-time application:
 - (1) Soils shall be sampled annually in accordance with the approved permit application and the sample results and locations submitted to the DEQ upon receipt.
 - a. A written evaluation of soil test sample results shall be completed by a soil scientist or agronomist and shall specify whether the soil can accept additional treated water and/or require soil amendments. The written evaluation shall be submitted to the DEQ together with the soil test sample results and locations.

8 of 8 DEQ's review and approval of this permit is based upon the items identified in the attached "Statement of Basis".

AUTHORIZED BY:



Kevin Frederick, Administrator
Water Quality Division

June 9, 2020
Date of Issuance

TP/KF/RRC/CF



Todd Parfitt, Director
Department of Environmental Quality

STATEMENT OF BASIS

1. Permit Number: **20-184**
2. Application reviewed for compliance with the following regulations:
Chapters 3 and 11 of the Wyoming Water Quality Rules and Regulations.
3. Does the permit comply with all the applicable regulations identified above?
Yes.

CERTIFICATION

WDEQ issued this permit in accordance with the requirements of Chapter 3, Section 6 and Chapter 11, Sections 50, 51, 55 and 56, Wyoming Water Quality Rules and Regulations. Richard Cripe, P.E., rich.cripe@wyo.gov, Water/Wastewater Section Manager completed this review on June 3, 2020.

XC: Dennis Lamb, WQD, Casper

Screening Criteria Limits

General Water Chemistry

pH	4.5 - 9.0 s.u.
TDS	480.0 mg/L
Electrical Conductivity	(EC) 750 micromhos/cm@25°C
Sodium Adsorption Ratio (SAR)	8 - 10
Chloride (Cl)	100 mg/L
Sulfates (SO4 2-)	192 mg/L
Bicarbonates (HO3-)	Not greater than 50 percent of the total anion concentration in meq/L
Aluminum (Al)	5 mg/L
Ammonia (NH3-N)	30 mg/L
Antimony	0.006 mg/L
Arsenic (As)	0.01 mg/L
Barium (Ba)	2 mg/L
Beryllium (Be)	0.1 mg/L
Boron (B)	0.6 mg/L
Cadmium (Cd)	0.01 mg/L
Chromium (Cr)	0.1 mg/L
Cobalt (Co)	0.05 mg/L
Copper (Cu)	0.2 mg/L
Cyanide (CN)	0.2 mg/L
Fluoride (F)	4 mg/L
Hydrogen Sulfide(H2S)	4.2 ug/L
Iron (Fe)	5 mg/L
Lead (Pb)	5 mg/L
Lithium (Li)	0.1 mg/L
Manganese (Mn)	0.2 mg/L
Mercury (Hg)	2 ug/L
Molybdenum	0.2 mg/L
Nickel (Ni)	0.2 mg/L
Nitrate (NO3-N)	10 mg/L
Nitrite (NO2-N)	1 mg/L
(NO3+NO2)-N	10 mg/L
Oil & Grease	10 mg/L
Phenol	11 mg/L
Selenium (Se)	0.02 mg/L
Silver (Ag)	0.2 mg/L
Strontium	20 mg/L
Thallium	0.002 mg/L
Uranium	30 µg/L
Vanadium (V)	0.1 mg/L
Zinc (Zn)	2 mg/L
RSC	1.25 meq/L
Combined Total Radium 226 and Radium 228	5 pCi/L
Gross alpha particle radioactivity (including Radium 226 and Radium 228)	15 pCi/L

VOCs, SVOCs and PAHs

acrolein	17 ug/L
acrylonitrile	0.17 ug/L
benzene	5 µg/L
bromoform	80 ug/L
carbon tetrachloride	5 ug/L
chlorobenzene	100 ug/L
chlorodibromomethane	80 ug/L
chloroethane	21 mg/L
chloroethylvinyl ether	ND
chloroform	80 ug/L
dichlorobromomethane	ND

1,1-dichloroethane	ND
1,2-dichloroethane	5 ug/L
1,1-dichloroethylene	0.7 ug/L
1,2-dichloropropane	5 ug/L
1,3-dichloropropylene (1,3-dichloroprope	1 mg/L
1,4-dioxane	1 mg/L
ethylbenzene	700 ug/L
ethylene glycol	70 mg/L
2-ethyl 1-hexanol	0.83 ug/L
MBAS (Surfactants)	0.5 mg/L
methyl bromide	47 ug/L
methyl chloride	ND
methylene chloride	5 ug/L
nitrobenzene	0.7 mg/L
1,1,1,2-tetrachloroethane	0.5 ug/L
tetrachloroethylene	5 ug/L
toluene	1 mg/L
1,2-trans-dichloroethylene	1 ug/L
1,1,1-trichloroethane	0.2 mg/L
1,1,2-trichloroethane	5 ug/L
trichloroethylene	5 ug/L
vinyl chloride	2 ug/L
2-chlorophenol	0.2 mg/L
2,4-dichlorophenol	0.1 mg/L
2,4-dimethylphenol	667 ug/L
4,6-dinitro-o-cresol	1.5 ug/L
2,4-dinitrophenol	39 ug/L
2-nitrophenol	ND
4-nitrophenol	300 ug/L
p-chloro-m-cresol	1.4 mg/L
pentachlorophenol	1 ug/L
phenol	11 mg/L
2,4,6-trichlorophenol	4.1 ug/L
acenaphthene	2 mg/L
acenaphthylene	1 mg/L
anthracene	10 mg/L
benzidine	0.00039 ug/L
benzo(a)anthracene	ND
benzo(a)pyrene	0.2 ug/L
3,4-benzofluoranthene	ND
benzo(g,h,i)perylene	ND
benzo(k)fluoranthene	2.5 ug/L
bis(2-chloroethoxy)methane	59 ug/L
bis(2-chloroethyl)ether	0.0816 ug/L
bis(2-chloroisopropyl)ether	ND
bis (2-ethylhexyl)phthalate	6 ug/L
4-bromophenyl phenyl ether	ND
butylbenzyl phthalate	16 ug/L
2-chloronaphthalene	ND
4-chlorophenyl phenyl ether	ND
chrysene	89.7 ug/L
dibenzo(a,h)anthracene	0.012 ug/L
1,2-dichlorobenzene	600 ug/L
1,3-dichlorobenzene	3 mg/L
1,4-dichlorobenzene	75 ug/L
3,3'-dichlorobenzidine	0.13 ug/L
diethyl phthalate	30 mg/L

dimethyl phthalate	ND
di-n-butyl phthalate	ND
2,4-dinitrotoluene	67 ug/L
2,6-dinitrotoluene	33 ug/L
di-n-octyl phthalate	200 ug/L
1,2-diphenylhydrazine (as azobenzene)	0.078 ug/L
fluroanthene	ND
fluorene	1.33 mg/L
hexachlorobenzene	1 ug/L
hexachlorobutadiene	10 ug/L
hexachlorocyclopentadiene	50 ug/L
hexachloroethane	40 ug/L
indeno(1,2,3-cd)pyrene	897 ug/L
isophorone	7 mg/L
N-nitrosodimethylamine	0.11 ug/L
N-nitrosodi-n-propylamine	0.00128 ug/L
N-nitrosodiphenylamine	18.3 ug/L
naphthalene	700 ug/L
phenanthrene	1 mg/L
pyrene	1 mg/L
toluene	1 mg/L
1,2,4-trichlorobenzene	70 ug/L
tetrachloroethylene	5 ug/L

Pesticides

aldrin	1 ug/L
alpha-BHC	2 ug/L
beta-BHC	0.050 ug/L
gamma-BHC	0.2 ug/L
delta-BHC	0.2 ug/L
chlordan	2 ug/L
4,4'-DDT	0.264 ug/L
4,4'-DDE	0.264 ug/L
4,4'-DDD	0.374ug/L
dieldrin	2 ug/L
alpha-endosulfan	ND
beta-endosulfan	ND
endosulfan sulfate	110 ug/L
endrin	2 ug/L
endrin aldehyde	2 ug/L
heptachlor	2 ug/L
heptachlor epoxide	0.2 ug/L
PCB-1242	0.5 ug/L
PCB-1254	0.5 ug/L
PCB-1221	0.5 ug/L
PCB-1232	0.5 ug/L
PCB-1248	0.5 ug/L
PCB-1260	0.5 ug/L
PCB-1016	0.5 ug/L
toxaphene	3 ug/L

NOTES:

1. Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in the Permit.
2. Laboratory results for cations, anions and metals are to be reported as Total Recoverable.
3. Where laboratory methods are not capable of achieving detection at, or below the permissible limit, a result of non-detectable will be accepted provided that the method used is capable of achieving the lowest detection limit.
4. Pesticide analyses are required unless it is documented that one or more have not been used.
5. The permittee shall provide documentation of all chemical compounds used during well completions, workovers, or hydraulic fracturing. Additional analytes may be added to this list, accordingly.