



**WATER QUALITY DIVISION
UNDERGROUND INJECTION CONTROL**

**PERMIT APPLICATION
CLASS VI WELL**

Mail one (1) hard copy with original signatures and one (1) digital copy to:

Wyoming Dept. of Environmental Quality
Water Quality Division
ATTN: Groundwater Section Manager
200 West 17th Street, 2nd Floor
Cheyenne, WY 82002

Office Use Only

UIC Facility Number: _____

UIC Permit Number: _____

Date Received: _____

A complete application for a Class VI well shall include all information required under Wyoming Water Quality Rules and Regulations (WQRR), Chapter 24 and this application consisting of Part I and II.

All data used to complete the permit application shall be kept by the applicant for the life of the geologic sequestration project and for ten (10) years following site closure.

I. FORMS AND GENERAL INFORMATION AND SIGNATORY AUTHORITY

CLASS VI WELL DEFINITION: (WQRR CHAPTER 24, SEC 2)

“Class VI well” means a well injecting a carbon dioxide stream for geologic sequestration, beneath the lowermost formation containing an Underground Source of Drinking Water (USDW); or a well used for geologic sequestration of carbon dioxide that has been granted a waiver of the injection depth requirements pursuant to requirements of WQRR Chapter 24, Section 10; or, a well used for geologic sequestration of carbon dioxide that has received an expansion to the areal extent of an existing Class II enhanced oil recovery or enhanced gas recovery aquifer exemption pursuant to WQRR Chapter 24, Section 5.

1. Facility name _____
(This is the facility name that will appear on the permit.)
2. Type of application submittal

- Initial (new facility)
- Initial (conversion from other well type)
- Major Modification (current permit number) _____

3. Facility/Operator Name _____
Responsible Corporate Officer _____ Title _____
Street Address _____
City _____ County _____ State _____
Zip Code _____ E-mail Address _____ Phone No. _____

4. Operator's Ownership Status
- Private
 - Public
 - Federal Government
 - State Government
 - Other Entity (Specify) _____

5. Facility Address (if same as No. 3 enter SAA)
Street Address _____
City _____ County _____ State _____
Zip Code _____ Phone No. _____

6. Consultant Company Name (if applicable) _____
Consultant Contact Name _____
Street Address _____
City _____ State _____ Zip Code _____
E-mail Address _____ Telephone Number _____

7. Brief description of the business/activities to be conducted under this permit

8. Up to four SIC (Standard Industrial Classification) codes that best reflect the principal products or services provided by the facility

_____, _____, _____, _____

9. Major Permit modification. Describe major permit modification below. If necessary, contact the UIC Program staff to discuss if the modification is considered a major modification to the existing permit. If a new permit, skip and proceed to No. 9.

10. Well location(s). Complete the following table. Include additional sheet if necessary.

Table 1 Injection Well Location(s)

Well Name	County	Latitude*	Longitude*	Township	Range	Section	Qtr/Qtr

**Provide latitude and longitude in decimal degree format to four significant figures, using the North American Datum 83 geodetic reference system.*

Note: Please note which, if any, sections include Indian Lands.

11. Injection Well Information (referenced below ground surface in feet)

Table 2 Injection Well Information

Well Name	Injection Zone Formation Name(s)	Injection Well Total Depth	Injection Zone Depths

12. Mineral right ownership for injection zone at the facility (within Area of Review)

- | | |
|---|---|
| <input type="checkbox"/> Applicant | <input type="checkbox"/> State Government |
| <input type="checkbox"/> Surface Owner | <input type="checkbox"/> Indian Lands |
| <input type="checkbox"/> Federal Government | <input type="checkbox"/> Other (Specify) |

13. Surface ownership at facility location (within Area of Review)

- Applicant
- Private (Specify)
- Federal Government
- State Government
- Indian Lands (Contact USEPA Region 8)
- Other (Specify)

14. Proof of notice to surface owners, mineral claimants, mineral owners, lessees, and other owners of record of subsurface interests as to the contents of such notice. Notice requirements shall at a minimum require:

- a. The publishing of notice of the application in a newspaper of general circulation in each county of the proposed operation at weekly intervals for four (4) consecutive weeks; and
- b. A copy of the notice shall also be mailed to all surface owners, mineral claimants, mineral owners, lessees and other owners of record of subsurface interests that are located within one (1) mile of the proposed boundary of the geologic sequestration site as defined by W.S. § 35-11-103(c)(xxi).

15. A list of contacts, submitted to the Administrator, for those Tribes identified to be within the area of review of the geologic sequestration project.
16. The Administrator may consider a request from owners and/or operators of permitted Class II injection well(s) that are seeking to convert their well(s) to a Class VI well and are seeking an expansion to the areal extent of an existing Class II enhanced oil recovery or enhanced gas recovery aquifer exemption for the exclusive purpose of Class VI injection for geologic sequestration if the existing aquifer exemption and the affected wells meet the conditions identified in WQRR Chapter 24, Section 5(c)(i)(A-C).
 - a. Such request will not be final until the Administrator submits the request as a revision to the applicable Federal UIC program under 40 CFR Part 147 or as a substantial program revision to an approved State UIC Program under 40 CFR §145.32 and EPA approves the request.
 - b. The owner or operator of a Class II enhanced oil recovery or enhanced gas recovery well that requests an expansion of the areal extent of an existing aquifer exemption for the exclusive purpose of Class VI injection for geologic sequestration must define (by narrative description, illustrations, maps, or other means) and describe in geographic and/or geometric terms (such as vertical and lateral limits and gradient) that are clear and definite, all aquifers or parts thereof that are requested to be designated as exempted using the criteria identified in WQRR Chapter 24, Section 5(d)(i)(A-C).
17. Owners or operator seeking a waiver of the requirement to inject below the lowermost USDW must refer to WQRR Chapter 24, Section 10 and submit a supplemental report, as required in WQRR Chapter 24, Section 10(a). The supplemental report is not part of the permit application and may be submitted under separate cover once a determination is made that a waiver is warranted.
18. Pursuant to WQRR, Chapter 8, Section 6(c)(ii), the discharge will not degrade or decrease the availability of mineral resources, including oil and gas. Therefore, prior to submitting an application to construct a UIC Class VI injection well, the WDEQ strongly encourages applicants to collaborate with nearby leasees and mineral ownership owners to demonstrate that the proposed injection activities to be permitted will present no damage to existing or future recovery of sub-surface minerals. Any permit challenge that is upheld by the WOGCC is grounds for the WDEQ to deny issuance of the Class VI UIC permit.
19. An applicant applying for a Class VI well permit must obtain public liability insurance to cover the geologic sequestration activities for which a permit is sought.
 - a. The public liability insurance shall be in addition to the financial assurance required in WQRR Chapter 24, Section 19.
 - b. A certificate shall be provided with the application or evidence that the applicant has satisfied other state or federal self insurance requirements.

- c. The minimum insurance coverage shall be five hundred thousand dollars (\$500,000) for each occurrence of bodily injury or property damage, and one million dollars (\$1,000,000) aggregate.
- d. The public liability insurance shall include a rider requiring that the insurer notify the Administrator whenever substantive changes are made to the policy, including any termination or failure to renew.

20. Sage grouse mitigation

Pursuant to the requirements of the Governor’s Executive Order 2011-5 (SGEO), applicants for new UIC permits must determine if any part of the project falls within a Greater Sage-Grouse Core Area (SGCA) before applying. If any part of the project falls within an SGCA, the first point of contact for addressing sage-grouse issues is the Wyoming Game and Fish Department (WGFD). Please coordinate with the WGFD and obtain written confirmation of consistency with the Executive Order prior to applying for a UIC permit and submit this documentation as part of the application package. Note that the application shall be returned without processing until a letter confirming consistency with the Executive Order has been obtained. Additional information and maps of SGCAs are available at <https://wgfd.wyo.gov/Habitat/Sage-Grouse-Management>.

Check one of the following, as applicable to the project:

- Some part of my project does fall within an SGCA and I have contacted the WGFD for an SGEO review. A letter from the WGFD confirming consistency with the Executive Order is attached.
- My project does fall within an SGCA. I have contacted the WGFD for an SGEO review. It does not comply with the SGEO. I have valid and existing rights related to this permit. I have committed to the following recommendations that will minimize the impact on the sage grouse.
- No part of my project falls within an SGCA. There are no additional requirements.

21. Access for Inspections

Wyoming Statute (W.S.) § 35-11-303 (a) states: “the administrator of the water quality division at the direction of the director: (i) may conduct on-site compliance inspections of all facilities and work during or following the completion of any construction, installation or modification for which a permit is issued under W.S. § 35-11-301 (a)(ii).”

As part of its application, the applicant shall certify under penalty of perjury that the applicant has secured and shall maintain permission for WDEQ personnel and their invitees to access the permitted facility, including (i) permission to access the land where the facility is located, (ii) permission to collect resource data as defined by W.S § 6-3-414, and (iii) permission to enter and cross all properties necessary to access the facility if the facility

cannot be directly accessed from a public road. A map of the access route(s) to the facility shall accompany the application.

I, _____, certify under penalty of perjury that applicant has secured and shall maintain permission for WDEQ personnel and their invitees to access the permitted facility, including (i) permission to access the land where the facility 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 facility if the facility cannot be directly accessed from a public road.

CERTIFICATION OF THE OPERATOR OF THE FACILITY:

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

Printed name of Applicant

Title

Signature of Applicant

Date signed

II. TECHNICAL INFORMATION

CERTIFICATION OF PROFESSIONAL GEOLOGIST:

The geologic interpretations, cross sections, maps and hydrologic studies that are included in this application were all completed under the responsible charge or direct supervision of the licensee, who has reviewed this work and certifies that it is prepared according to the highest standards of Professional Geology.

Printed Name of Professional Geologist

P.G. Number (SEAL)

Signature of Professional Geologist

Date Signed

CERTIFICATION OF PROFESSIONAL ENGINEER:

The Engineering Designs, Plans, and Specifications that are included in this application were all completed under the responsible charge or direct supervision of the licensee who has reviewed this work and certifies that it is prepared according to the highest standards of Professional Engineering.

Printed Name of Professional Engineer

P.E. Number (SEAL)

Signature of Professional Engineer

Date Signed

A. AREA OF REVIEW

- i. “Area of review” means the subsurface three-dimensional extent of the carbon dioxide plume, associated pressure front, and displaced fluids, as well as the overlying formations, and surface area above that delineated region. The area of review is based on available site characterization, monitoring, and operational data as set forth in WQRR Chapter 24, Section 8.
- ii. Within the area of review, a listing and status of all permits or construction approvals associated with the geologic sequestration project received or applied for by the applicant as identified in WQRR Chapter 24, Section 5(b)(v)(A - G).
- iii. Within the area of review, a list of other relevant permits, whether federal or state, associated with the geologic sequestration project that the applicant has been required to obtain, such as construction permits. This includes a statement as to whether or not the facility is within a state-approved water quality management plan area, a state-approved wellhead protection area or a state-approved source water protection area.
- iv. A map showing the injection well(s) for which a permit is sought and the applicable area of review, consistent with WQRR Chapter 24, Section 8 and:
 - (a) Within the area of review, the map must show the number, or name and location of all known injection wells, producing wells, abandoned wells, plugged wells or dry holes, deep stratigraphic boreholes, state or US Environmental Protection Agency (EPA) approved subsurface cleanup sites, public drinking water supply wellhead or source water protection areas, surface bodies of water, springs, mines (surface and subsurface), quarries, water wells and other pertinent surface features including structures intended for human occupancy, state, tribal, and territory boundaries, and roads.
 - (b) Only information of public record is required to be included on the map.
 - (c) The map should also show faults, if known or suspected.
- v. A map delineating the area of review based upon modeling, using all available data including data available from any logging and testing of wells within and adjacent (within one (1) mile) to the area of review;
 - (a) A Class VI area of review shall never be less than the area of potentially affected groundwater.
 - (b) All areas of review shall be legally described by township, range, and section to the nearest ten (10) acres as described under the general land survey system.
- vi. The permit application shall include a description of the general geology of the area to be affected by the injection of carbon dioxide including geochemistry, structure and faulting, fracturing and seals, and stratigraphy and lithology including petrophysical attributes. The description shall also include sufficient information on the geologic structure and reservoir

properties of the proposed storage site and overlying formations, including information as required in WQRR Chapter 24, Section 5(b)(ix)(A - F).

- vii. A compilation of all wells and other drill holes within, and adjacent (within 1 mile) to the area of review. Such data must include a description of each well and drill hole type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Water Quality Division (WQD) Administrator may require.
 - (a) The location of all known wells within, and adjacent (within 1 mile) to the area of review that penetrate the confining or injection zone.
 - (b) Mapping with sufficient resolution as to make a comprehensive effort to identify wells that are not in the public record using aerial photography, aerial survey, physical traverse, or other methods acceptable to the WQD Administrator.
 - (c) Perform corrective action as specified in WQRR Chapter 24, Section 8.
- viii. Maps and stratigraphic cross-sections indicating the general vertical and lateral limits of all USDWs, the location of water wells and springs within the area of review, their positions relative to the injection zone(s), and the direction of water movement, where known.

B. Groundwater/Aquifer Characterization

- i. A characterization of the injection zone and aquifers above and below the injection zone that may be affected, including applicable pressure and fluid chemistry data to describe the projected effects of injection activities, and background water quality data that will facilitate the classification of any groundwaters which may be affected by the proposed discharge. This must include information necessary for WQD to classify the receiver and any secondarily affected aquifers under WQRR, Chapter 8;
- ii. Provide baseline geochemical data on subsurface formations, including all USDWs in the area of review. "USDW" or "Underground source of drinking water" means those aquifers or portions thereof meet the definition at 40 CFR § 144.3 as of November 15, 1984.
 - (a) For all Class VI Underground Injection Control (UIC) wells, the proposed injection zone shall be situated such that injection takes place into a formation that is beneath the lowermost USDW, or has been granted a waiver of the injection depth requirements in accordance with WQRR Chapter 24, Section 10 or an expansion of an aquifer exemption of an enhanced oil or gas operation.
 - a. Determination of USDWs:
 - 1. For each aquifer from the ground surface to the Precambrian basement, including the target injection formation, Total Dissolved Solids concentrations, aquifer yield, and all supporting materials, including references, shall be presented to determine if each aquifer is a potential USDW.
 - b. Submit all available groundwater quality data for the formations determined to be aquifers in the region including, but not limited to data from:
 - 1. Wyoming Oil and Gas Conservation Commission (WOGCC);

2. United States Geological Survey (USGS) produced water database: (<http://energy.cr.usgs.gov/prov/prodwat>)
3. USGS/ National Water Information System: (<http://waterdata.usgs.gov>)
4. Wyoming State Engineer's (WSEO) Office database: (<http://seo.state.wy.us>)
5. Wyoming Water Development Commission (WWDC) (<http://wwdc.state.wy.us/>)
6. Any additional available information.

C. Well Construction

For proposed new injection wells, and wells to be converted for injection, the applicant shall provide the following construction and operational details. Attach complete well diagrams for each well, including depth information, identified USDWs, confining zones, injection zones, tubing sizes, packers, perforated zones, casing sizes, cement types, and location of cement on each diagram. For existing production wells (being converted) provide hydrocarbon production history. The following tables shall be included in the permit application. Expand tables or provide additional tables as necessary. Provide a numbering scheme for all tables.

Table _____ [Insert Injection Well Name]: General Information

Well Name	Planned Injection Start Date (mo/year)	Surface Elevation (feet)	Total Well Depth (feet)	Max Proposed Injection Rate (bbl/day)	Ave Proposed Injection Rate (bbl/day)	Proposed Well Life (years)

Table _____ [Insert Injection Well Name]: History (If applicable)

Well Name	API Number	Date Constructed	Date Production Began	Date Production Ended	Total Volume of fluids produced	Date Injection Began	Date Injection Ended	Total Volume Injected

Table ____ [Insert Injection Well Name]: Construction Details

	Conductor Casing	Surface Casing	Long String Casing	Liner (if applicable)	Tubing
Perforated Intervals (feet)					
Hole Diameter (inches)					
Grade					
Diameter (inches)					
Wall thickness					
Nominal Weight (pounds)					
Joint Specifications					
Construction Material					
Tensile, Burst, Collapse Strengths					
Type or Grade of Cement					
Top of Cement					
Packer Depth (feet)					
Packer Type					

D. Operational Data

- i. Submit proposed Operational Data that shall include:
 - (a) Average and maximum daily rate and volume and/or mass and total anticipated volume and/or mass of the carbon dioxide stream;
 - (b) Average and maximum surface injection pressure;
 - (c) The source of the carbon dioxide stream; and
 - (d) An analysis of the chemical and physical characteristics of the carbon dioxide stream and any other substance(s) proposed for inclusion in the injectate stream;
 - (e) Anticipated duration of the proposed injection period(s);
- ii. Submit information regarding the compatibility of the carbon dioxide stream with fluids in the injection zone and minerals in both the injection and the confining zone(s), based on the results of the formation testing program, and with the materials used to construct the well;

- iii. Submit an assessment of the impact to fluid resources, on subsurface structures and the surface of lands that may reasonably be expected to be impacted, and the measures required to mitigate such impacts;
- iv. Submit a proposed formation testing program to obtain an analysis of the chemical and physical characteristics of the injection zone and confining zone and that meets the requirements of WQRR Chapter 24, Section 11;
- v. Submit a proposed stimulation program, a description of stimulation fluids to be used and a determination that stimulation will not compromise containment. All stimulation programs must be approved by the WQD Administrator as part of the permit application and incorporated into the permit;
- xix. Submit a proposed procedure that outlines steps to conduct injection operation;
- xx. Submit a wellbore schematic of the subsurface construction details and surface wellhead construction of the injection and monitoring wells.
- xxi. Submit an injection well design and construction procedures that meet the requirements of WQRR Chapter 24, Section 9;
- xxii. Submit a proposed area of review and corrective action plan that meets the requirements under WQRR Chapter 24, Section 8 and as prescribed in Section vi.c above;
- xxiii. Provide the status of corrective action on wells in the area of review;
- xxiv. Provide all available logging and testing program data on the well(s) required by WQRR Chapter 24, Section 11;
- xxv. Submit a demonstration of mechanical integrity pursuant to WQRR Chapter 24, Section 13;

E. FINANCIAL ASSURANCE

- i. Submit a demonstration, satisfactory to the WQD Administrator, that the applicant has met the financial responsibility requirements under WQRR Chapter 24, Section 19;
- ii. The owner or operator must submit a detailed written estimate, at the time of permit application and updated annually in accordance with paragraph WQRR Chapter 24, Section 19(j)(iii), in current dollars, that includes the cost of performing corrective action on wells in the area of review that meets the requirements of WQRR Chapter 24, Section 8; plugging the injection well(s) that meets the requirements of WQRR Chapter 24, Section 16; post-injection site care and site closure; that meets the requirements of WQRR Chapter 24, Section 17; monitoring activities that meets the requirements of WQRR Chapter 24, Section 14; and emergency and remedial response that meets the requirements of WQRR Chapter 24, Section 18.

F. TESTING AND MONITORING REQUIREMENTS

- i. The owner or operator of a Class VI well must prepare, maintain, and comply with a testing and monitoring plan to verify that the geologic sequestration project is operating as permitted and is not endangering USDWs. The testing and monitoring plan must be submitted with the permit application, for Administrator approval, and must include a description of how the owner or operator will meet the requirements of WQRR Chapter

24, Section 14, including accessing sites for all necessary monitoring and testing during the life of the project

G. PLUGGING AND ABANDONMENT AND POST CLOSURE CARE

- i. Submit proposed injection and monitoring well(s) plugging plan required by WQRR Chapter 24, Section 16(b); where the plan meets the requirements of Section 16(b), the Administrator shall incorporate it into the permit as a permit condition.
- ii. The owner or operator of a Class VI well must prepare, maintain, update on the same schedule as the update to the area of review delineation, and comply with a plan for post-injection site care and site closure that meets the requirements of WQRR Chapter 24, Section 17(a)(ii) and is acceptable to the WQD Administrator.

H. EMERGENCY AND REMEDIAL RESPONSE PLAN

- i. The owner or operator must provide the WQD Administrator with an emergency and remedial response plan that describes actions to be taken to address movement of the injectate or formation fluids that may cause an endangerment to a USDW or threaten human health, safety, or the environment during construction, operation, closure, and post-closure periods as required by WQRR Chapter 24, Section 18.