

**Title 10—DEPARTMENT OF NATURAL RESOURCES  
Division 20—Clean Water Commission  
Chapter 6—Permits**

**10 CSR 20-6.090 Class III Mineral Resources Injection/Production  
Well Operating Permits**

**WORKING DOCUMENT**

**The Department presents these draft materials for  
stakeholder review and discussion only.  
Subject to the Red Tape Reduction review.**

The Missouri Department of Natural Resources has identified 10 CSR 20-6.090, Class III Mineral Resources Injection/Production Well Operating, as a potential rulemaking amendment. This workgroup has been convened for the purpose of informal and voluntary public participation and discussions regarding the development of this rule prior to initiating formal rulemaking.

Under Governor Greitens' leadership, all state agencies are working to reduce regulations and other government processes that unnecessarily burden individuals and businesses while doing little to protect or improve public health, safety, and our natural resources. The Missouri Department of Natural Resources is committed to limiting regulation to what is necessary to protect Missouri's environment, implementing statutory mandates, and maintaining state control of programs. Any further proposed changes to rules discussed on this page are being developed with these goals in mind. We welcome your comments to help ensure that our regulations provide required protections but do not add unnecessary costs.

## 10 CSR 20-6.090 Class III Mineral Resources Injection/Production Well Operating Permits

*PURPOSE: This regulation controls the construction and operations of mineral resources injection/production wells.*

### (1) Permits—General.

- (A) This rule **applies** [shall apply]<sup>2</sup> to Class III injection/production wells used for the extraction of minerals including:
1. Sulfur mining by the Frasch process;
  2. *In-situ* production of uranium or other metals. This category includes only *in-situ* production from ore bodies which have not been conventionally mined;
  3. *In-situ* combustion of fossil fuel; fossil fuels include coal, tar sands, oil shale and any other fossil fuel which can be mined by this process; and
  4. Solution mining of salts or potash.
- (B) This rule does not apply to wells used by generators of hazardous wastes or of radioactive wastes, by owners or operators of hazardous waste management facilities or by owners or operators of radioactive waste disposal sites to dispose of hazardous waste or radioactive waste into or above any underground formation. These types of wells are expressly forbidden under section 577.155, RSMo.
- (C) All persons who build, erect, alter, replace, operate, use or maintain existing or proposed Class III injection/production wells shall apply to the department for **applicable** permits [required by these regulations]<sup>2</sup> using application forms provided by the department. The department **will** [shall]<sup>4</sup> issue these permits in order to enforce the Missouri Clean Water Law and regulations.
- (D) Nothing in these regulations **will** [shall]<sup>4</sup> prevent the department from taking action where the department finds that any activity that places, or permits to be placed, a water contaminant where it is reasonably certain to cause pollution of any waters of the state, or the activity otherwise violates Chapter 644, RSMo, the Missouri Clean Water Law or these regulations.
- (E) Any information submitted to the department pursuant to these regulations may be claimed as confidential by the applicant. Any claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words confidential business information on each page containing the information. If no claim is made at the time of submission, the department may make the information available to the public without further notice. Claims of confidentiality for the following information will be denied:
1. The name and address of any permit applicant or permittee; and
  2. Information which deals with the existence, absence or level of contaminants in drinking water.
- (F) The permittee shall give advance notice to the director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- (G) Applicants shall keep records of all data used to complete permit applications and any supplemental information submitted under these regulations for a period extending from the date the application is signed to the date the permit expires **for at least three (3) years**. [The records shall be maintained at least three (3) years from the date the application is signed.]<sup>3</sup>

### (2) Application.

- (A) An application for an operating permit shall be made for each injection/production well **detailing the following information**. The application may be supplemented with copies of information submitted for other federal or state permits.
- (B) *Each application shall contain the following:*<sup>3</sup>
1. **All items listed in 40 CFR 144.31(e);** [Name and address of the companies, organization(s), owner(s) or operators of the proposed well, ownership status and status as a federal, state, private or other entity;  
The activities conducted by the applicant which require the applicant to obtain permits under the Resource Conservation and Recovery Act (RCRA), the Underground Injection Control (UIC) program under the Safe Drinking Water Act, the National Pollutant Discharge Elimination System (NPDES) program under the Clean Water Act or the Prevention of Significant Deterioration (PSD) program under the Clean Air Act;  
Name, mailing address and location of the facility for which the application is submitted;  
Up to four (4) standard industrial classification (SIC) codes which best reflect the principal products or services provided by the facility;  
A listing of all permits or construction approvals received or applied for under any of the following programs:  
A. Hazardous Waste Management program under RCRA;  
B. UIC program under the Safe Drinking Water Act;  
C. NPDES program under the Clean Water Act;  
D. PSD program under the Clean Air Act;  
E. Nonattainment program under the Clean Air Act;  
F. National Emission Standards for Hazardous Pollutants (NESHAPS) preconstruction approval under the Clean Air Act;  
G. Dredge and fill permits under Section 404 of the Clean Water Act; or  
H. Other relevant environmental permits, including state permits;]
  2. [6.] Description of the process that will be used for the mineral extractions, including injection/withdrawal procedures;
  3. [7.] Estimated depth of the well, casing lengths and weights, intervals to be cemented and related well construction data as recommended by the office of the state geologist;  
[8. Exact location of the well including a legal description to the nearest section line as determined by a registered surveyor, a narrative description using locally recognized features and an accompanying topographic or similar map extending one (1) mile beyond the boundary of the facility property depicting the facility and each of its intake and discharge structures, each of its treatment, storage or disposal facilities, each well where fluids from the facility are injected underground and those wells, springs, surface water bodies and drinking water wells listed in public records or otherwise known to the applicant within one-quarter (1/4) mile of the facility property boundary; ]  
[9. A brief description of the nature of the business; ]
  4. [10.] Maximum and average volume of injected fluids and injection pressure that will be used on a daily basis;

5. [11.] **Appropriate application fee as listed in section 6.011 of this rule;** [Application fee of seventy-five dollars (\$75). When a check used for an application is returned to the department as nonnegotiable, review of the application shall cease and the applicant shall be notified. No further action shall be taken on the application until the fees have been resubmitted in the form of a cashier's check or money order payable to the state of Missouri;]<sup>3</sup>
6. [12.] Recommendation and justification on the number and location of sampling wells by a registered professional engineer or a qualified geologist as defined by sections 256.501 and 256.503, RSMo;
7. [13.] Where injection is into a formation which contains water with less than ten thousand milligrams per liter (10,000 mg/l) total dissolved solids (TDS), monitoring wells shall be: [completed into the injection zone and into any underground sources of drinking water above the injection zone which could be affected by the mining operation. These wells shall be located in a fashion as to detect any excursion of injection fluids, process by-products or formation fluids outside the mining area or zone. If the operation may be affected by a subsidence or catastrophic collapse, the monitoring wells shall be located so that they will not be physically affected];<sup>3</sup>
  - A. **Completed into the injection zone and into any underground sources of drinking water above the injection zone which could be affected by the mining operation;**
  - B. **Located in a fashion as to detect any excursions of injection fluids, process by-products or formation fluids outside the mining area or zone; and**
  - C. **Located so they will not be physically affected by a subsidence or catastrophic collapse;**
8. [14.] Where injection is into a formation which does not contain water with less than ten thousand (10,000) mg/l TDS, no monitoring wells are necessary in the injection zone;
9. [15.] Where the injection wells penetrate an underground source of drinking water (USDW) in an area subject to subsidence or catastrophic collapse, an adequate number of monitoring wells shall be: [completed into the USDW to detect any movement of injected fluids, process by-products or formation fluids into a USDW. The monitoring wells shall be located outside the physical influence of the subsidence or catastrophic collapse];<sup>3</sup>
  - A. **Completed into the USDW to detect any movement of injected fluids, process by-products, or formation fluids into a USDW; and**
  - B. **Located so they will not be physically affected by a subsidence or catastrophic collapse;**
10. [16.] In determining the number, location, construction and frequency of sampling of the monitoring wells, **consider** the following criteria [shall be considered]<sup>1</sup>:
  - A. Population relying on the USDW affected or potentially affected by the injection operation;
  - B. Proximity of the injection operation to points of withdrawal of drinking water;
  - C. Local geology and hydrology;
  - D. Operating pressures and whether a negative pressure is being maintained;
  - E. Nature and volume of the injected fluid, the formation water and the process by-products; and
  - F. Injection well density;
11. [17.] Map(s) describing an area of review for each Class III injection/production well or group of wells, **as**[. The area of review shall be]<sup>2</sup> determined by a registered professional engineer or a qualified geologist as defined by sections 256.501 and 256.503, RSMo. The area of review [shall be]<sup>2</sup> is defined as that area the radius of which is determined by the lateral distance from a Class III injection/production well or perimeter of a group of wells in which the pressure in the injection zone may cause the migration of injection or formation, or both, fluid into an USDW or into an improperly constructed, plugged or abandoned well or test hole.
  - A. The radius of the area of review may be calculated using a mathematical model (for example, modified Thesis equation) [and shall be calculated]<sup>2</sup> for an injection time period at least equal to the expected life of the well(s). The owner or operator must demonstrate to the director that the mathematical model used and the calculated area of review are appropriate for the known hydrologic properties of the underlying formations.
  - B. A fixed radius around the well or the perimeter of a group of wells of not less than one-half (1/2) mile may be used. In determining the fixed radius, the following factors shall be taken into consideration: chemistry of injected and formation fluids, hydrogeology, population and groundwater use and dependence, and historical practices in the area.
  - C. If the area of review is determined by a mathematical model pursuant to subparagraph (2)(B)8.A., the permissible radius is the result of the calculation even if it is less than one-half (1/2) mile.
  - D. Nothing in this section **will** [shall]<sup>4</sup> prevent the director from imposing alternate areas of review when geologic or hydrologic conditions render a calculated or fixed area a potential threat to an underground source of drinking water;
12. [18.] **Submit with the application a** [A] mapped and tabulated inventory of all known water supply, injection/production, abandoned and test wells, including field names or numbers and locations of the wells, public water systems, within the area of review and a separate tabulation of all the wells, which penetrate the injection zone listing each well's type, construction method, date drilled, location, depth and record of plugging or completion, or both, [shall be submitted with the applications and shall include]<sup>3</sup> **including** a description of all corrective action(s) proposed to be performed to render wells penetrating the injection zone sealed, plugged or otherwise impervious to the migration of fluids into or between well bores, USDWs or different aquifers. The applicant is responsible for the inventory and corrective action requirements of this section and shall extend every reasonable effort to locate all wells within the area of review of the applicant well(s);
13. [19.] A plan for plugging and abandonment. Where the plan meets the requirements of this paragraph, the director **will** [shall]<sup>4</sup> incorporate it into the permit as a condition. Where the director's review of an application indicates that the permittee's plan is inadequate, the director **will** [shall]<sup>4</sup> require the applicant to revise the plan, prescribe conditions meeting the requirements of this paragraph or deny the application. For purposes of this paragraph, temporary intermittent cessation of injection operations is not abandonment;
14. [20.] Prior to granting approval for the plugging and abandonment of a Class III well, the director **will** [shall]<sup>4</sup> consider the following information:
  - A. The type and number of plugs to be used;
  - B. The placement of each plug including the elevation of the top and bottom;

- C. The type, grade and quantity of cement to be used; and
  - D. The method of placement of the plugs;
  - 15. [21.] The permittee is required to maintain financial responsibility and resources to close, plug and abandon the underground injection operation in a manner prescribed by the director. The permittee must show evidence of financial responsibility to the director by the submission surety bond or other adequate assurance such as financial statements or other materials acceptable to the director;
  - 16. [22.] Maps and cross sections indicating the vertical limits of all USDWs within the area of review, 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;
  - 17. [23.] Maps and cross sections detailing the geologic structure of the local area;
  - 18. [24.] Generalized map and cross sections illustrating the regional geologic setting;
  - 19. [25.] Qualitative analysis and ranges in concentrations of all constituents of injected fluids. The applicant may request confidentiality as specified in subsection (1)(E). If the information is proprietary, an applicant, in lieu of the ranges in concentrations, may choose to submit maximum concentrations which shall not be exceeded. In this case the applicant shall retain records of the undisclosed concentrations and provide them upon request to the director as part of any enforcement investigation;
  - 20. [26.] Proposed formation testing program to obtain the information required by paragraph (2)(I)4.;
  - 21. [27.] Proposed stimulation program;
  - 22. [28.] Schematic or other appropriate drawings of the surface and subsurface construction details of the well;
  - 23. [29.] Plans, including maps, for meeting the monitoring requirements of subsection (4)(D);
  - 24. [30.] Expected changes in pressure, native fluid displacement and direction of movement of injection fluid;
  - 25. [31.] Contingency plans to cope with all shut-ins or well failures so as to prevent the migration of contaminating fluids into the USDW;
  - 26. [32.] A certificate that the applicant has assured, through a performance bond or other appropriate means, the resources necessary to close, plug or abandon the well as required by paragraph (2)(B)19.;
  - 27. [33.] The corrective action proposed to be taken under paragraph (2)(B)18.;
  - 28. [34.] Where the injection zone is a formation which is naturally water-bearing, the following information concerning the injection zone shall be determined or calculated for new Class III wells or projects:
    - A. Fluid pressure;
    - B. Fracture pressure; and
    - C. Physical and chemical characteristics of the formation fluids;
  - 29. [35.] Where the injection formation is not a water-bearing formation, only the information in subparagraph (2)(B)34.B. must be submitted;
  - 30. [36.] Where the permittee becomes aware that s/he failed to submit any relevant facts in a permit application, or has submitted incorrect information in a permit application or in any report to the director, the permittee shall promptly submit the facts or information; and
  - 31. [37.] Data sufficient to allow the department to carry out aquifer exemption procedures under the Safe Drinking Water Act, UIC program. The information shall be sufficient to demonstrate that the aquifer is expected to be mineral or hydrocarbon producing. Information for the proposed project, such as a map and general description of the mining zone, general information on the mineralogy and geochemistry of the mining zone, analysis for the amenability of the mining zone to the proposed mining method and a timetable of planned development of the mining zone shall be considered by the director.
- (B) **Sign** [C]all applications [*must be signed*]<sup>3</sup> as follows:
- 1. For a corporation—by an officer of at least the level of plant manager;
  - 2. For a partnership or sole proprietorship—by a general partner or the proprietor; or
  - 3. For a municipal, state, federal or other public facility—by either a principal executive officer or ranking public official or his/her designee.
- (C) [(D)] All other reports required by the department shall be signed by a person designated in subsection (2)(B)[C] of this rule or a duly authorized representative, where—
- 1. The representative so authorized is responsible for the overall operation of the facility from which the injection/withdrawal occurs; and
  - 2. The authorization is made in writing by a person designated in subsection (2)(B)[C] of this rule and is submitted to the director.
- (D) [(E)] Any changes in the written authorization which occur after the issuance of a permit shall be reported to the department by submitting a new written authorization which meets the requirements of subsection (2)(C)[D] of this rule.
- (E) [(F)] If an application is incomplete or otherwise deficient, the applicant [*shall*]<sup>3</sup> **will** be notified of the deficiency and processing of the application may be discontinued until the applicant has corrected all deficiencies.
- (F) [(G)] Any person signing a document under subsection (2)(C) or (D) shall make the following certification:  
I certify under 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.
- (G) [(H) *Applications shall be mailed*]<sup>3</sup> **Mail applications** to Water Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102.
- (H) [(I)] Prior to granting approval for the operation of a Class III well, the director **will** [*shall*]<sup>4</sup> consider the following information:
- 1. All available logging and testing data on the well;
  - 2. A satisfactory demonstration of mechanical integrity;
  - 3. The anticipated maximum pressure and flow rate at which the permittee will operate;
  - 4. The results of the formation testing program;
  - 5. The actual injection procedures; and
  - 6. The status of corrective action on defective wells in the area of review.

(3) Operating Permits.

- (A) **In order to obtain an operating permit for Class III injection/production wells, application for an operating permit shall be submitted to the department in accordance with the timeframes listed in section 644.051, RSMo and section 6.010 of this rule.** *[Persons who build, erect, alter, replace, operate, use or maintain Class III injection/production wells shall obtain an operating permit from the department.*
- (B) *Applications for an original operating permit must be received by the department at least sixty (60) days before construction of the well begins. Applications shall include the earliest date on which injection/production is to begin. The department will issue or deny the permit within sixty (60) days of receipt of the complete application as specified in section (2). No person shall operate an injection/production well without a valid operating permit. If the department fails to issue or deny the permit within the allotted time, the applicant may request a hearing before the Missouri Clean Water Commission. The commission may either require the department to issue or deny the permit at, or within, a specified time following the hearing or extend the permit review period another sixty (60) days following the hearing.*
- (C) *Applications for the renewal of operating permits must be received at least sixty (60) days before the expiration date of the present operating permit. The department will issue or deny the permit within sixty (60) days of receipt of the application.]*<sup>3</sup>
- (B) [(D)] The director may issue a permit on an area basis, rather than for each well individually, provided that the permit is for injection wells—
1. Described and identified by location in permit application(s) if they are existing wells, except that the director may accept a single description of wells with substantially the same characteristics;
  2. Located within the same well field, facility site, reservoir, project or similar unit in the same state; [and]
  3. Operated by a single owner or operator;[.]
  4. [(E)] Area permits [shall]<sup>4</sup> specify—
    - I. [(1)] The area within which underground injections are authorized; and
    - II. [(2)] The requirements for construction, monitoring, reporting, operation and abandonment for all wells authorized by the permit.
  5. [(F) The a]Area permits may authorize the permittee to construct and operate, convert or plug and abandon wells within the permit area provided—
    - I. [(1)] The permittee notifies the director at a time as the permit requires;
    - II. [(2)] The additional well satisfies the criteria in subsection (3)(D) and meets the requirements specified in the permit under subsection (3)(E); and
    - III. [(3)] The cumulative effects of drilling and operation of additional injection wells are considered by the director during evaluation of the area permit application and are acceptable to the director.
- (C) [(G)] If the director determines that any well constructed pursuant to subsection (3)(F) does not satisfy any of the requirements of paragraphs (3)(F)1. and 2., the director may modify or terminate the permit or take enforcement action. If the director determines that cumulative effects are unacceptable, the permit may be modified or terminated.

(4) Terms and Conditions of Permits.

- (A) The following shall be incorporated as terms and conditions of all permits:
1. All operations shall be consistent with the terms and conditions of the permit [*and shall comply with the Clean Water Law; corresponding regulations and applicable permit conditions*]<sup>3</sup>;
  2. The permit may be modified or revoked after reasonable notice for causes including, but not limited to:
    - A. Material and substantial alterations or additions to the permitted facility or activity which occurred after permit issuance, which justify the application of permit conditions that are different or absent in the existing permit;
    - B. New information received by the director, including information indicating that cumulative effects on the environment are unacceptable;
    - C. The standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued;
    - D. Good cause, as determined by the director, exists for modification of a compliance schedule, such as an act of God, strike, flood or materials shortage or other events over which the permittee has little or no control and for which there is no reasonably available remedy; and
    - E. Notification of a proposed transfer of the permit has been received by the director;
  3. Suitability of the facility will not be considered at the time of permit modification or revocation and reissuance unless new information or standards indicate that a threat to human health or the environment exists which was unknown at the time of permit issuance;
  4. The permit may be issued for a period of up to five (5) years **in accordance with section 644.051, RSMo and section 6.010 of this rule.** [*The permit may not be modified so as to extend the term of the permit beyond five (5) years after its issuance.*]<sup>3</sup> If the permittee wishes to continue an activity regulated by the permit after the expiration date of the permit, the permittee must apply for and obtain a new permit prior to the expiration date of the permit in effect;
  5. The director may terminate a permit during its term or deny a permit renewal application for the following causes:
    - A. Noncompliance by the permittee with any condition of the permit;
    - B. The permittee's failure in the application or during the permit issuance process to disclose fully all relevant facts or the permittee's misrepresentation of any relevant facts at any time; or
    - C. A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination;
  6. For the purpose of inspecting for compliance with the Clean Water Law and these regulations, authorized representatives of the department shall be allowed by the permittee, upon presentation of credentials and at reasonable times, to—
    - A. Enter upon permittee's premises in which Class III injection/production well is located or in which any records are [required

- to be*]<sup>3</sup> kept under terms and conditions of the permit;
  - B. Have access to or copy, any records [*required to be*]<sup>3</sup> to be kept under terms and conditions of the permit;
  - C. Inspect any sampling wells, monitoring equipment or method [*required*]<sup>3</sup> **listed** in the permit; and
  - D. Sample for permit compliance;
7. Facility expansions, production increases or process modifications which will result in a new substantially different operation must be reported sixty (60) days before the facility or process modification begins. Notification may be accomplished by application for a new permit or by submission of notice to the department;
  8. Copies of well location, driller's logs, sample logs, casing schedule, volume of water, temperature, water quality, cement records and other information developed or determined for the completed installation shall be sent to the Missouri Department of Natural Resources, Water Pollution Control Program and to the Missouri Department of Natural Resources, Division of Geology and Land Survey;
  9. **Measure and record** [*M*]maximum and average injection/withdrawal volumes and pressures [*shall be measured and recorded*]<sup>3</sup> semi-monthly;
  10. **Measure and record** [*T*]total dissolved solids [*shall be measured and recorded*]<sup>3</sup> semi-monthly for each injection/production well and each monitoring well;
  11. **Submit** [*A*] a quarterly report [*shall be submitted*]<sup>3</sup> to the agencies listed in paragraph (4)(A)8. which contains the following information:
    - A. Volume and pressure of fluids injected and withdrawn; and
    - B. Copies of water quality analyses performed; and
  12. Information on compliance and noncompliance shall be submitted as follows:
    - A. **No later than thirty (30) days following each schedule data – report** [*Reports of*] compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule pertaining to this permit [*shall be submitted no later than thirty (30) days following each schedule date. The permittee shall report any noncompliance which may endanger health or the environment, including information which indicates that any contaminant may cause an endangerment to a USDW, or noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between USDWs. This information shall be provided orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances. A written submission also shall be provided within five (5) days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times and if the noncompliance has not been corrected, the anticipated time it is expected to continue, and steps taken or planned to reduce, eliminate and prevent reoccurrence of the noncompliance; and*]<sup>3</sup>
    - B. **Within twenty-four (24) hours of the time the permittee becomes aware of the circumstances – report orally any noncompliance which may endanger health or the environment, including information which indicates that any contaminant may cause an endangerment to a USDW, or noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between USDWs.**
    - C. **Within five (5) days of the time the permittee becomes aware of the circumstances – report in writing a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times and if the noncompliance has not been corrected, the anticipated time it is expected to continue, and steps taken or planned to reduce, eliminate and prevent reoccurrence of the noncompliance; and**
    - D. [*B*] **With submission of next closest scheduled monitoring report – report** [*The permittee shall report*]<sup>3</sup> all instances of noncompliance not reported under other sections of this rule [*at the time monitoring reports are submitted. The reports shall contain*]<sup>3</sup> **containing** the information listed in subparagraph (4)(A)12.A.
- (B) No owner or operator shall construct, operate, maintain, convert, plug or abandon any Class III injection/production well or conduct any other activity in a manner that allows the movement of fluid containing any contaminant into USDWs. The applicant for a permit shall have the burden of showing that the requirements of this section are met through a demonstration of mechanical integrity **by completing the following:** [*Demonstration of the absence of significant leaks shall utilize at least one (1) of the following procedures: a pressure test with liquid or gas; monitoring of annulus pressure in wells injecting at a positive pressure following an initial pressure test; or any other test(s) that the state geologist considers effective. Demonstration of the absence of significant migration of fluids in channels adjacent to the well bore shall utilize at least two (2) of the following procedures: noise logs, temperature surveys, cement records demonstrating the presence of adequate cement to prevent migration (used only if the nature of casing precludes the use of noise logs or temperature surveys); or any other test(s) approved by Environmental Protection Agency (EPA) and that the state geologist considers effective. Mechanical integrity must be demonstrated before operations may begin. Documentation of successful demonstration of mechanical integrity shall be submitted to the department or the department may witness the demonstrations. Scheduling of witnessed demonstrations of mechanical integrity shall be at the reasonable convenience of the applicant. Nothing in this rule shall prevent the director from rescheduling a test at a reasonable time convenient to the applicant when necessary to allow department personnel to witness the test(s).*]<sup>3</sup>
1. **Demonstrate the absence of significant leaks utilizing at least one (1) of the following procedures: a pressure test with liquid or gas; monitoring of annulus pressure in wells injecting at a positive pressure following an initial pressure test; or any other test(s) that the state geologist considers effective.**
  2. **Demonstrate the absence of significant migration of fluids in channels adjacent to the well bore utilizing at least two (2) of the following procedures: noise logs, temperature surveys, cement records demonstrating the presence of adequate cement to prevent migration (used only if the nature of casing precludes the use of noise logs or temperature surveys); or any other test(s) approved by Environmental Protection Agency (EPA) and that the state geologist considers effective.**
  3. **Demonstrate mechanical integrity before operations may begin by submitting documentation of successful demonstrations of mechanical integrity or by allowing department personnel to witness the demonstrations. Scheduling of witnessed demonstrations of mechanical integrity may be at the reasonable convenience of the applicant. Nothing in this rule will prevent the director from rescheduling a test at a reasonable time convenient to the applicant when necessary to**

**allow department personnel to witness the test(s).**

- (C) For Class III injection/production wells—if any water quality monitoring of any USDW indicates the movement of any contaminant into the USDW, the director shall prescribe the additional requirements for construction, corrective action, operation, monitoring or reporting (including closure of the injection/production well) as are necessary to prevent this movement. These additional requirements shall be imposed by modifying the permit in accordance with this regulation or the permit may be terminated.
- (D) Monitoring requirements, at a minimum, shall specify—
1. Monitoring of the nature of injected fluids with sufficient frequency to yield representative data on its characteristics. Whenever the injection fluid is modified to the extent that the analysis **completed in accordance with** [required by]<sup>3</sup> paragraph (2)(B)25. is incorrect or incomplete, a new analysis **in accordance with** [as required by]<sup>3</sup> paragraph (2)(B)25. shall be provided to the director;
  2. Monitoring of injection pressure and either flow rate or volume semi-monthly, or metering and daily recording of injected and produced fluid volumes as appropriate;
  3. Monitoring of the fluid level in the injection zone semi-monthly where appropriate and monitoring of the parameters chosen to measure water quality in the monitoring wells **in accordance with** [as required by]<sup>3</sup> paragraph (2)(B)13. semimonthly; and
  4. Quarterly monitoring of wells **in accordance with** [as required by]<sup>3</sup> by paragraph (2)(B)15.
- (E) Reporting requirements, at a minimum, shall include:
1. Quarterly reporting to the director on required monitoring;
  2. Results of mechanical integrity tests and any other periodic test required by the department reported with the first regular quarterly report after the completion of the test; and
  3. Monitoring may be reported on a project or field basis rather than individual well basis where manifold monitoring is used.

(5) Prohibitions.

(A) No permit shall be issued: [where the terms and conditions of the permit do not comply with applicable guidelines or requirements of the Clean Water Law and corresponding regulations or relevant federal laws.]

**1. Where the terms and conditions of the permit do not comply with applicable guidelines or requirements of the Clean Water Law and corresponding regulations or relevant federal laws**

[(B) No permit shall be issued]<sup>3</sup> **2. W**[w]here the permit conditions do not ensure compliance with the applicable water quality requirements of any other affected states.

[(C) No permit shall be issued]<sup>3</sup> **3. F**[f]or the discharge of any pollutant not necessary to the extraction process, except thermal discharges; those produced pollutants contained in the formation water may be reinjected into a formation of the same TDS concentration.

[(D) No permit shall be issued]<sup>3</sup> **4. F**[f]or the discharge of any radiological, chemical or biological warfare agent or radioactive waste.

[(E) No permit shall be issued]<sup>3</sup> **5. F**[f]or the construction or operation of a new injection/production well which would degrade the usefulness of water withdrawn from earlier permitted wells.

[(F) No permit shall be issued]<sup>3</sup> **6. F**[f]or a well utilizing annular injection or production.

(B) [(G)] No well shall be operated so that fluid pressures in the injection zone exceed the fracture pressure calculated or known for that formation.

(C) [(H)] New injection wells may not commence injection until construction is complete and—

1. The permittee has submitted notice of completion of construction to the director and—
  - A. The director has inspected or otherwise reviewed the new injection well and finds it is in compliance with the conditions of the permit; or
  - B. The permittee has not received notice from the director of the intent to inspect or otherwise review the new injection well within thirteen (13) days of the date of the notice in paragraph (5)(H)1. of this rule, in which case prior inspection or review is waived and the permittee may commence injection.
- (I) No operation shall commence until corrective actions outlined in paragraph (2)(B)18. and those required by the department have been completed.

(6) Class III Injection/Production Well Construction Requirements.

(A) All new injection/production wells shall **meet the following conditions:** [be cased and cemented to prevent the migration of fluids into or between USDWs or potential sources of drinking water. The casing and cement used in construction of each newly drilled well shall be designed for the life of the well. In determining and specifying casing and cementing requirements, the following factors shall be considered:

1. Depth to the injection/production zone;
2. Injection pressure, external pressure, internal pressure, axial loading;
3. Borehole size;
4. Size and grade of all casing strings including wall thickness, diameter, nominal weight, length, joint specification and construction material;
5. Corrosiveness of injection/production and formation fluids or combinations;
6. Lithology of injection/production and confining zones; and
7. Type and grade of cement.]<sup>3</sup>
1. **Wells are cased and cemented to prevent the migration of fluids into or between USDWs or potential sources of drinking water; and**
2. **The casing and cement used in construction of each newly drilled well is designed for the life of the well.**
3. **Casing and cementing design considered the following factors:**
  - A. **Depth to the injection/production zone;**
  - B. **Injection pressure, external pressure, internal pressure, axial loading;**
  - C. **Borehole size;**
  - D. **Size and grade of all casing strings including wall thickness, diameter, nominal weight, length, joint specification and**

**construction material;**

**E. Corrosiveness of injection/production and formation fluids or combinations;**

**F. Lithology of injection/production and confining zones; and**

**G. Type and grade of cement.**

- (B) Each well or group of wells utilizing a positive displacement pump shall be equipped with both high and low safety switches which will shut down the pump in case of pressure increase over the authorized pressure or sudden pressure loss.
- (C) Appropriate logs and other tests shall be conducted during the drilling and construction of new injection/production wells. A descriptive report shall be prepared by a qualified log analyst and submitted to the director. The logs and test appropriate to each type of well shall be determined on the intended function, depth, construction and other characteristics of the well, availability of similar data in the area of the drilling site and the need for additional information that may arise from time-to-time as the construction of the well progresses. At a minimum, the logs and test shall include deviation checks conducted on all holes where pilot holes and reaming are used at sufficiently frequent intervals to assure that vertical avenues for fluid migration in the form of diverging holes are not created during drilling.

(7) Permits Transferable.

- (A) Subject to section (3), an opening permit may be transferred upon submission to the department of an application to transfer signed by a new owner. Until that time as the permit is officially transferred, the original permittee remains responsible for complying with the terms and conditions of the existing permit.
- (B) Within thirty (30) days of receipt of the application the department, shall notify the new applicant of the intent to revoke and reissue or transfer the permit.

(8) Plugging and Abandonment.

- (A) Prior to abandoning Class III wells the well shall be plugged with cement in a manner which will not allow the movement of fluids between one (1) aquifer or formation and another. The director may allow Class III wells to use other plugging materials if s/he is satisfied that the materials will prevent movement of fluids into or between USDWs.
- (B) Placement of the cement plugs shall be accomplished by one (1) of the following:
  - 1. The balance method;
  - 2. The dump method;
  - 3. The two (2)-plug method; or
  - 4. An alternative method approved by the director which will reliably provide a comparable level of protection.
- (C) The well to be abandoned shall be in a state of static equilibrium with the mud weight equalized top to bottom, either by circulating the mud in the well at least once or by a comparable method prescribed by the director prior to the placement of the cement plug(s).
- (D) The director [*shall*]<sup>4</sup> **will** prescribe aquifer cleanup and monitoring where s/he deems it necessary and feasible to insure adequate protection of USDWs.
- (E) The permittee shall notify the director at the times as the permit requires before conversion or abandonment of the well or in the case of area permits before closure of the project.

*AUTHORITY: section 644.026, RSMo Supp. 1987. \* Original rule filed Nov. 9, 1983, effective June 1, 1984.*

*\*Original authority: 644.026, RSMo 1972, amended 1973, 1987.*