

TITLE 267 – NEBRASKA OIL AND GAS CONSERVATION COMMISSION

CHAPTER 4 – UNDERGROUND INJECTION

001 **CLASSIFICATION OF UNDERGROUND INJECTION WELLS**

001.01 Enhanced recovery injection well is a well which injects fluids to increase the recovery of oil and/or gas.

A commercial enhanced recovery facility includes single or multiple wells that are specifically engaged in the business of underground injection of brine generated by third party producers for a fee or compensation. In addition, the produced brine must originate off-site as a result of oil and gas production operations only, and must be transported to the facility by tank truck.

001.02 Disposal well is a well which injects for purposes other than enhanced recovery those fluids brought to the surface in connection with the production of oil and/or gas.

A commercial disposal facility includes single or multiple wells that are specifically engaged in the business of underground injection of brine generated by third party producers for a fee or compensation. In addition, the produced brine must originate off-site as a result of oil and gas production operations only, and must be transported to the facility by tank truck.

002 **APPROVAL OF ENHANCED RECOVERY INJECTION WELLS OR DISPOSAL WELLS**

002.01 Commencement of waterflooding and other enhanced recovery operations involving the introduction of extraneous forms of energy into any reservoir, including cycling or recycling operations and the extraction and separation of liquid hydrocarbons from natural gas in connection therewith is permitted only upon order of the Commission.

002.02 Underground disposal of salt water, brackish water or other water unfit for domestic, livestock, irrigation or other general uses is permitted only upon order of the Commission.

002.03 All injection wells must have sufficient surface casing run to reach a depth below the base of all water sources that are less than three thousand (3,000) parts per million total dissolved solids or water sources that are or could be reasonably utilized as domestic fresh water unless those sources are exempted. Casing shall be sufficiently cemented to fill the annulus to the top of the hole.

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002.04 All injection wells shall be cased and the casing cemented in such a manner that damage will not be caused to oil and gas resources by any injection activity.

002.05 Authorization for injection may be conditioned upon the applicant taking action to protect fresh water as may be specified by the Commission in its order.

003 AUTHORIZATION FOR EXISTING ENHANCED RECOVERY INJECTION WELLS AND EXISTING DISPOSAL WELLS

003.01 Each enhanced recovery injection well authorized under order of the Commission prior to the effective date of this rule is an existing enhanced recovery well. Injection is prohibited in any existing enhanced recovery well unless the operator has included that well on an injection well inventory submitted to the Commission within one (1) year following the effective date of this rule. The inventory of authorized existing injection wells shall include each well name and number, location, Commission order number, date of order, maximum authorized injection rate and maximum authorized injection pressure.

003.02 Each disposal well being operated under order of the Commission prior to the effective date of this rule is an existing disposal well. Injection is prohibited into any existing disposal well unless the operator has included that well on an injection well inventory submitted to the Commission within one (1) year following the effective date of this rule. The inventory of authorized existing disposal wells shall include each well name and number, location, Commission order number or other authorization, date of order or authorization, maximum authorized injection rate and maximum authorized injection pressure.

003.03 Each commercial facility well being operated under order of the Commission prior to the effective date of this rule is an existing commercial facility well. Commercial injection is prohibited within six (6) months following the effective date of this rule, unless the operator files with the Commission a list of that commercial well and the well or wells meets or exceeds the requirements set forth in this chapter.

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004 APPLICATION FOR APPROVAL OF ENHANCED RECOVERY INJECTION AND DISPOSAL WELLS

004.01 Each application for the approval of a new enhanced recovery injection well or disposal well shall be filed and verified by a duly authorized representative of the operator. The original and six (6) copies of the application and one (1) complete set of attachments shall be furnished containing all the information required by these rules. More than one (1) well may be included on an application, provided, that such wells are associated with a single project or unit operation. An application for the approval of injection wells which are a part of a proposed enhanced recovery project or unit may be consolidated with the application for the approval of the enhanced recovery project or unit.

004.02 The application for the initial approval of an enhanced recovery injection or disposal well or wells shall be accompanied by:

004.02A A plat map showing all wells, including dry, abandoned or drilling wells shall be properly located and designated on said plat. In the case of an operation conducted subject to a unit agreement, the area affected shall be the area subject to such agreement, or that area within one-half (1/2) mile of each injection well, whichever is the greater distance.

004.02B The names and addresses of each person owning a fee, leasehold, mineral or royalty interest within one-half (1/2) mile of each injection well or within the area required to be shown on the plat, whichever is the greater.

004.02C A full description of the particular operation for which approval is sought.

004.02D The names and addresses of the operator or operators of the project.

004.02E If the wells have been drilled, a copy of each completion report and any available electric or radioactivity logs.

004.02F A schematic diagram of each well showing:

004.02F1 The total depth or plug-back of the well.

004.02F2 The depth of the injection or disposal interval.

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- 004.02F3 The geological name of the injection or disposal zone.
- 004.02F4 A geologic description of the injection or disposal zone including the location and extent of any known faults or fracture systems.
- 004.02F5 The depths of the tops and bottoms of the casing and cement to be used in the well.
- 004.02F6 The size and specifications of the casing and tubing, and the setting depth and type of packer, if used.
- 004.02G Information showing that injection into the proposed zone will not initiate vertical fractures into or through the overlying strata which could enable the injected fluids or formation fluids to enter any fresh water strata.
- 004.02H Information that no unplugged wells exist which will allow the migration of the injected fluids or formation fluids to enter any fresh water strata.
- 004.02I Information regarding the fracture pressures of the injection zone and the overlying strata, including the source of such information.
- 004.02J Proposed operating data:

 - 004.02J1 Maximum designed or proposed daily injection rates and injection pressures.
 - 004.02J2 The source of any fluids to be injected.
 - 004.02J3 Analysis of a representative sample of the fluids to be injected.
 - 004.02J4 Analysis of fresh water from two or more freshwater wells within one mile of the proposed injection well showing the location of the wells and the dates the samples were collected, or a statement why samples were not submitted.
 - 004.02J5 Geological name of the lowest freshwater zone, if known, and the depth to the base of the freshwater zone.

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004.02J6 The vertical distance separating top of the injection zone and the base of the lowest freshwater strata.

004.03 For previously authorized units or projects, the names and addresses of each person owning a fee, leasehold, mineral or royalty interest within one-half (1/2) mile of each new injection well shall be shown on the plat.

005 NOTICE OF HEARING

005.01 Upon filing of an application, the Commission shall issue notice thereof, as provided by the Act and these regulations. Said application shall be set for public hearing at such time and place as the Commission may fix.

005.02 In addition to the notice required by law, notice of the application and the time and place of hearing shall be given by the applicant by certified mail or by delivering a copy of the notice to each person owning a fee, leasehold, mineral or royalty interest within the secondary recovery project area or within one-half (1/2) mile of the injection well, whichever is the greater. For previously authorized units or projects, the operator(s) of record owning adjacent secondary recovery unit or project within one-half (1/2) mile of each new injection well shall be noticed. A copy of such notice shall be filed with the Commission, and the applicant shall certify that notice by certified mail or by delivery to each person has been accomplished at least fifteen (15) calendar days prior to the hearing.

005.03 In the event no person required to be notified, or the Commission itself files a written objection to the application within ten (10) days of the date of the notice, the application shall be granted; but if any person or the Commission itself files written objection within ten (10) calendar days of the notice, then a hearing shall be held.

005.04 No notice is necessary to any person who has consented to the proposed installation in writing.

005.05 An order authorizing an injection well will expire and become null and void if the authorized well or wells are not completed or converted to injection within one (1) year from the date of the order.

006 OPERATING REQUIREMENTS FOR ENHANCED RECOVERY INJECTION AND DISPOSAL WELLS

006.01 Initial Requirements:

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006.01A Each enhanced recovery injection well or disposal well shall be completed, equipped, operated and maintained in a manner that will prevent pollution of fresh water or damage to sources of oil and/or gas and will confine injected fluids to the formation or zones approved.

006.01B Injection of any substance shall be through adequate casing or casing and tubing. Annular injection is prohibited. Above ground extensions shall be installed in each annulus in the well and each injection tubing or casing. Such extensions shall be fitted with a cut-off valve and a one-fourth (1/4) inch female fitting to provide for pressure monitoring by attaching a gauge having a one-fourth (1/4) inch male fitting.

006.01B1 Each commercial facility well must be equipped with tubing and packer.

006.01C Before operating a new well drilled or converted for enhanced recovery injection or disposal, the casing shall be tested under the supervision of the Director.

006.01D For all Salt Water Disposal (SWD) wells, the operator shall monitor and record actual injection pressure and each annulus pressure at least once each week and report such monitoring monthly.

006.01E For all Enhanced Oil Recovery (EOR) wells, the operator shall monitor and record actual injection pressure and each annulus pressure at least once each month and report such monitoring monthly.

006.01F Each well or group of wells which inject fluids under pressure utilizing a positive displacement pump shall have installed both high pressure and low pressure safety switches which will shut down the pump in case of pressure increase over the authorized pressure or sudden pressure loss.

006.01G All commercial facility sites must be physically secured at all times. The Director will determine if a site is secure. The Commission recommends that sites be secured by either of the following:

- Complete enclosure of all wells, tanks/pits and wellhead assemblies within suitable fencing; and/or

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- All gates and other entry points shall be locked when the facility is unattended; and/or
- Provide tamper-proof seals or locks for the "master" valve on each well; and/or
- Install locking caps on all valves and connections on holding tanks and headers.

006.02 Mechanical Integrity Pressure or Monitoring Test Requirements:

The following pressure or monitoring test must be performed on all new and existing enhanced recovery injection wells and disposal wells to periodically establish the mechanical integrity of the casing, and tubing and packer, if used.

006.02A Pressure Test: All new enhanced recovery injection wells and disposal wells authorized by the Commission after February 3, 1983, shall have the casing pressure tested prior to use and thereafter no less than once each five (5) years. Wells with tubing and packer installed shall have the tubing-casing annulus pressure tested to a pressure of three hundred (300) pounds per square inch. Wells without tubing and packer installed shall be tested to a pressure equal to one hundred twenty-five (125) percent of the maximum authorized injection pressure or at a pressure of three hundred (300) pounds per square inch, whichever is greater. Existing injection wells shall be tested not less than once each five (5) years. Casing pressure tests shall be conducted under the supervision of the Director.

006.02B On existing injection wells without tubing and packer, the operator shall demonstrate the absence of fluid movement in vertical channels adjacent to the injection well bore by the use of tracer surveys, noise logs, temperature surveys or other tests or combination of tests approved by the Director, at least once each three (3) years. Such tests shall be run under the supervision of the Director.

006.02C All commercial wells must have annual pressure tests to establish the mechanical integrity of the casing, tubing and packer. Casing pressure tests shall be conducted under the supervision of the Director.

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007 MONITORING AND REPORTING REQUIREMENTS FOR ENHANCED RECOVERY INJECTION AND DISPOSAL WELLS

- 007.01 Immediately upon the commencement of injection operations, the operator shall notify the Commission of the date on which injection was commenced.
- 007.02 Within ten (10) days after the discontinuances of injection operations, the operator shall notify the Commission of the date of such discontinuance and the reasons therefore.
- 007.03 Except as may otherwise be required, the operator shall monitor injection pressure and injection rate of each injection well on a monthly basis and report the results on Form 11. Units or projects with more than one injection well may utilize manifold monitoring.
- 007.04 Mechanical failures or downhole problems which indicate an enhanced recovery injection well or disposal well is not, or may not be, directing or containing the injected fluid into the permitted or authorized injection zone is cause to shut-in the well. If said condition may endanger fresh water sources, the operator shall orally notify the Director within twenty-four (24) hours. Written notice of the failure shall be submitted to the Director within five (5) days of the occurrence together with a plan for repairing and testing the well. Results of the repair and testing shall be reported to the Director and approved before further injection is commenced.
- 007.04A If a well poses a substantial risk to a protected aquifer, then repairs or plugging and abandonment shall be initiated within ninety (90) days of the failure date. However, under certain conditions, that date may be extended by the Director.
- 007.04B Wells which lack mechanical integrity but do not pose a substantial risk shall be repaired or plugged and abandoned within two hundred seventy (270) days of the failure date. However, if the operator has the ability to monitor the well, then the Director may allow the well to be shut-in.
- 007.05 Enhanced recovery injection wells and disposal wells shall be plugged and abandoned in accordance with the provisions of Rule 3-028.

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008 **DURATION OF UNDERGROUND INJECTION WELL ORDERS**

- 008.01 Orders authorizing injection into enhanced recovery injection wells and disposal wells shall remain valid for the life of the well, unless revoked by the Commission for cause.
- 008.02 An order granting underground injection may be modified, revoked and reissued, or terminated during its term for cause, after notice and hearing, upon the request of any interested person or at the Commission's initiative. All requests filed requesting review of any order authorizing underground injection shall be in writing and shall contain facts or reasons supporting such request.
- 008.03 Upon receipt of a request to modify or revoke an order authorizing underground injection, the Commission shall promptly set the matter for hearing and may revoke, modify and reissue said order if:
- 008.03A There is a substantial change of conditions in the enhanced recovery injection well or the disposal well operation, or there are substantial changes in the information originally furnished.
- 008.03B Information shows that the permitted operation will have adverse cumulative effects on the environment.
- 008.03C Information shows that the operation is not in accordance with the order authorizing the injection.

009 **TRANSFER OF AUTHORITY TO INJECT**

An order authorizing an enhanced recovery injection well or disposal well shall not be transferred from one operator to another without the approval of the Director. Prior to transfer of ownership of any injection well or change of operator, the new operator shall file written notice of such change with the Commission on Form 4 showing the proposed date of transfer along with proof of compliance with the bonding provisions of Rule 3-004.

- 009.01 The class II permits are considered expired once an applicant applies for a transition from Class II to Class VI injection wells. The operator must apply for and obtain a Class VI geologic sequestration permit.

Statute: 57-905; 57-910; 57-911

