**R644. Natural Resources, Oil, Gas and Mining; Carbon Sequestration.**

**R644-11. Operations.**

**R644-11-1. Injection Well Operating Requirements.**

(1) Except during stimulation, the injection well shall be operated so that the injection-induced pressure in each injection zone does not exceed 90% of the fracture pressure of that injection zone so as to ensure that the injection does not initiate new fractures or propagate existing fractures in the injection zone. In no case may injection pressure initiate fractures in the confining zone or cause the movement of injection or formation fluids that endangers a USDW. Pursuant to requirements in Subsection R644-4-3(1)(q), each stimulation program must be approved by the division as part of the permit application and incorporated into the permit.

(2) Injection between the outermost casing protecting USDWs and the wellbore is prohibited.

(3) The operator must fill the annulus between the tubing and the long string casing with a non-corrosive fluid approved by the division. The operator must maintain on the annulus a pressure that exceeds the operating injection pressure, unless the division determines that such a requirement might harm the integrity of the well or endanger USDWs. A request to operate the well at a reduced annulus pressure must be in writing and approved by the division.

(4) Other than during periods of well workover maintenance approved by the division where the sealed tubing-casing annulus is disassembled for maintenance or corrective procedures, the operator must maintain mechanical integrity of the injection well at all times.

(5) Continuous recording devices shall be installed, used, and maintained in proper working order for each well.

(a) Continuous recording devices shall monitor:

(i) Surface injection and bottomhole pressure;

(ii) Flow rate, volume, mass, and temperature of the carbon dioxide stream;

(iii) Tubing-casing annulus pressure and annulus fluid volume; and

(iv) Any other data specified by the division.

(b) Continuous recordings shall consist of digital recordings. Instruments shall be weatherproof or housed in weatherproof enclosures when located in areas exposed to climatic conditions.

(6) Alarms and Automatic Shutdown Systems

(a) Alarms and automatic shut-off systems designed to actuate on exceedance of a predetermined monitored condition shall be installed and maintained in proper working order as follows:

(i) Alarms and automatic surface shut-off valves or, at the discretion of the division, down-hole shut-off systems, such as automatic shut-off, check valves, or other mechanical devices, that provide equivalent protection; and

(ii) Each alarm must be integrated with any automatic shut-off system. If a shut-off is triggered or a loss of mechanical integrity is discovered, the operator must immediately investigate and identify as expeditiously as possible the cause of the shut-off. If, upon such investigation, the well is lacking mechanical integrity, or if monitored well parameters indicate that the well may be lacking mechanical integrity, the operator must:

(iii) Immediately cease injection;

(iv) Take all steps reasonably necessary to determine whether there may have been a release of the injected carbon dioxide stream or formation fluids into any unauthorized zone;

(v) Notify the division within 24 hours;

(vi) Restore and demonstrate mechanical integrity to the satisfaction of the division prior to resuming injection; and

(vii) Notify the division when injection can be expected to resume.

(7) Wellhead Identification

(a) An identifying sign shall be placed at the wellhead of each injection well and shall include, at a minimum, the operator's name, well name and number, well API number, section-township-range, and any other information required by the division. The sign shall be of durable construction with all lettering kept in a legible condition.

(8) Well Workovers. No well remedial work, well maintenance or repair, well or injection formation stimulation, well plug and abandonment or temporary abandonment, any other test of the injection well conducted by the operator, or well work of any kind, shall be done without prior written authorization from the division. The operator shall submit a work permit request form through sundry notification to seek well workover authorization.

(9) Pressure gauges that show surface and downhole pressure on the injection tubing and surface pressure on the tubing-casing annulus shall be installed at each wellhead. Each gauge shall be properly calibrated, maintained in good working order, and readable upon inspection.

**KEY: oil and gas law**

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