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

**R644-8. Siting Criteria, Area of Review, and Corrective Action.**

**R644-8-1. Minimum Criteria for Siting for a Class VI Well.**

(1) Operators of a Class VI well must demonstrate to the satisfaction of the division that the well will be sited in areas with a suitable geologic system. The demonstration must show that the geologic system comprises:

(a) An injection zone of sufficient areal extent, thickness, porosity, and permeability to receive the total anticipated volume of the carbon dioxide stream;

(b) A confining zone free of transmissive faults or fractures and of sufficient areal extent and integrity to contain the injected carbon dioxide stream and displaced formation fluids and allow injection at proposed maximum pressures and volumes without initiating or propagating fractures in the confining zone.

(i) The division may require an operator of a Class VI well to identify and characterize additional zones that will impede vertical fluid movement, are free of faults and fractures that may interfere with containment, allow for pressure dissipation, and provide additional opportunities for monitoring, mitigation, and remediation.

**R644-8-2. Area of Review.**

(1) The area of review is the region surrounding the geologic sequestration project where USDWs may be endangered by the injection activity. The area of review is delineated using computational modeling that accounts for the physical and chemical properties of each phase of the injected carbon dioxide stream and is based on available site characterization, monitoring, and operational data.

(2) The operator of a Class VI well must prepare, maintain, and comply with a plan to delineate the area of review for the proposed geologic sequestration project, periodically reevaluate the delineation, and perform corrective action that meets the requirements of this section and is acceptable to the division. The requirement to maintain and implement an approved plan is directly enforceable regardless of whether the requirement is a condition of the permit. As a part of the permit application, the operator must submit an area of review and corrective action plan that includes the following information:

(a) The method for delineating the area of review that meets the requirements of Subsection (3), including the model to be used, assumptions that will be made, and the site characterization data that the model will be based;

(b) A description of:

(i) The minimum fixed frequency, not to exceed five years, that the operator proposes to reevaluate the area of review;

(ii) The monitoring and operational conditions that would warrant a reevaluation of the area of review prior to the next scheduled reevaluation as determined by the minimum fixed frequency established in Subsection (2)(b)(i).

(iii) How monitoring and operational data, such as injection rate and pressure, will be used to inform an area of review reevaluation; and

(iv) How corrective action will be conducted to meet the requirements of Subsection R644-8-3(1), including what corrective action will be performed prior to injection and what, if any, portions of the area of review the operator proposes to have corrective action addressed on a phased basis and how the phasing will be determined, how corrective action will be adjusted if there are changes in the area of review, and how site access will be guaranteed for future corrective action.

(3) An operator of a Class VI well must perform the following actions to delineate the area of review and identify each well that requires corrective action:

(a) Predict, using existing site characterization, monitoring and operational data, and computational modeling, the projected lateral and vertical migration of the carbon dioxide plume and formation fluids in the subsurface from the commencement of injection activities until the plume movement ceases, until pressure differentials sufficient to cause the movement of injected fluids or formation fluids into a USDW are no longer present, or until the end of a fixed time period as determined by the division. The model must:

(i) Be based on detailed geologic data collected to characterize each injection zone, confining zone and any additional zones; and anticipated operating data, including injection pressures, rates, and total volumes over the proposed life of the geologic sequestration project;

(ii) Take into account any geologic heterogeneities, other discontinuities, and data quality, and their possible impact on model predictions; and

(iii) Consider potential migration through faults, fractures, and artificial penetrations.

(b) Using methods approved by the division, the operator shall at a minimum, identify each artificial penetration, including active wells, inactive wells, shut-in wells, abandoned wells and underground mines, in the area of review that penetrate each confining and injection zone. Provide a description of each well's type, construction, date drilled, location, depth, record of plugging, record of completion, and any additional information the division may require; and

(c) Determine which abandoned wells in the area of review have, or have not, been plugged in a manner that prevents the movement of carbon dioxide or other fluids that may endanger USDWs, including the use of materials compatible with the carbon dioxide stream.

**R644-8-3. Corrective Action.**

(1) An operator of a Class VI well must perform corrective action on each well in the area of review that is determined to need corrective action, using methods designed to prevent the movement of fluid into or between USDWs, including use of materials compatible with the carbon dioxide stream, where appropriate.

(2) At the minimum fixed frequency, not to exceed five years, as specified in the area of review and corrective action plan, or when monitoring and operational conditions warrant, an operator must:

(a) Reevaluate the area of review in the same manner specified in Subsection R644-8-2(3)(a);

(b) Identify each well in the reevaluated area of review that requires corrective action in the same manner specified in Subsection R644-8-2(3);

(c) Perform corrective action on each well requiring corrective action in the reevaluated area of review in the same manner specified in this section; and

(d) Submit an amended area of review and corrective action plan or demonstrate to the division through monitoring data and modeling results that no amendment to the area of review and corrective action plan is needed. Any amendment to the area of review and corrective action plan must be approved by the division, must be incorporated into the permit, and is subject to the permit modification requirements listed in Rule R644-7, as appropriate.

(3) The emergency and remedial response plan, required by Rule R644-12, and the demonstration of financial responsibility, as described Section R644-5-3, must account for the area of review delineated as specified in Subsection R644-8-2(3) or the most recently evaluated area of review delineated under Subsection R644-8-2(2)(b)(i), regardless of whether or not corrective action in the area of review is phased.

(4) All modeling inputs and data used to support the area of review reevaluations under Subsections R644-8-2(2)(b)(i) and R644-8-3(2) shall be retained for at least 10 years.

**KEY: oil and gas law**

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