APA-1

TRANSMITTAL SHEET FOR NOTICE OF INTENDED ACTION

Control: 400

Department or Agency: Oil & Gas Board / Geologic Storage of Carbon Dioxide

Rule No.: Chapter 400-8-1

Rule Title: General

Intended Action: New

Would the absence of the proposed rule significantly harm or endanger the public health, welfare, or safety?	Yes
Is there a reasonable relationship between the state's police power and the protection of the public health, safety, or welfare?	Yes
Is there another, less restrictive method of regulation available that could adequately protect the public?	No
Does the proposed rule have the effect of directly or indirectly increasing the costs of any goods or services involved?	No

To what degree?: N/A

Is the increase in cost more harmful to the public than the harm that might result from the absence of the proposed rule?	NA
Are all facets of the rule-making process designed solely for the purpose of, and so they have, as their primary effect, the protection of the public?	Yes
Does the proposed action relate to or affect in any manner any litigation which the agency is a party to concerning the subject matter of the proposed rule?	No

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Does the proposed rule have an economic impact? Yes

If the proposed rule has an economic impact, the proposed rule is required to be accompanied by a fiscal note prepared in accordance with subsection (f) of Section 41-22-23, Code of Alabama 1975.

Certification of Authorized Official

I certify that the attached proposed rule has been proposed in full compliance with the requirements of Chapter 22, Title 41, Code of Alabama 1975, and that it conforms to all applicable filing requirements of the Administrative Procedure Division of the Legislative Services Agency.

Signature of certifying officer: Janet Foster Overton

Janet Foster Overton

Date: Friday, August 23, 2024

REC'D & FILED

AUG 26, 2024

LEGISLATIVE SVC AGENCY

APA-2

OIL & GAS BOARD / GEOLOGIC STORAGE OF CARBON DIOXIDE

NOTICE OF INTENDED ACTION

AGENCY NAME: State Oil and Gas Board of Alabama

RULE NO. & TITLE: Chapter 400-8-1 General

INTENDED ACTION: New

SUBSTANCE OF PROPOSED ACTION:
Adopt Rules and Regulations Governing Geologic Storage of Carbon Dioxide

TIME, PLACE AND MANNER OF PRESENTING VIEWS:
November 5, 2024, 10:00 a.m., State Oil and Gas Board of Alabama, 420 Hackberry Lane, Tuscaloosa, AL 35401

FINAL DATE FOR COMMENT AND COMPLETION OF NOTICE:
Tuesday, November 5, 2024

CONTACT PERSON AT AGENCY:
Marvin Rogers will take comments
October 1st / November 5th through
email or phone contact.
mrogers@ogb.state.al.us
205-247-3680

Janet Foster Overton

Janet Foster Overton

(Signature of officer authorized
to promulgate and adopt
rules or his or her deputy)

OIL & GAS BOARD / GEOLOGIC STORAGE OF CARBON DIOXIDE ADMINISTRATIVE CODE

CHAPTER 400-8-1
GENERAL

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400-8-1-.01 Definitions.

1. **Abandoned well** shall mean, for purposes only of compliance with requirements herein, that a well is to be considered abandoned when it has not been used for twelve (12) consecutive months and cannot be operated, whether because it was drilled as a dry hole or has ceased to

be utilized, or operations have not been conducted thereon, or for some other reason.

2. **Activity** shall mean any activity related to the geologic storage of carbon dioxide subject to regulation under this chapter.
3. **Aquifer** shall mean a geological formation, group of formations, or part of a formation that is capable of yielding a significant amount of water to a well, spring, or other point of discharge.
4. **Area of review** shall mean the region adjoining and surrounding the geologic sequestration project or geologic storage area where underground sources of drinking water or other natural resources may be endangered by the storage operation and injection activity. The term "area of review" may be used synonymously with the term "buffer zone."
5. **Carbon dioxide plume** shall mean the extent underground, in three dimensions, of an injected carbon dioxide stream.
6. **Carbon dioxide stream** shall mean carbon dioxide that has been captured from an emission source (e.g., a coal-burning power plant), plus incidental associated substances derived from the source materials and the capture process, and any substances added to the stream to enable or improve the injection process. This does not apply to any carbon dioxide stream that meets the definition of a hazardous waste.
7. **Casing** shall mean a pipe or tubing of varying diameter and weight, which is installed into a well to maintain the structural integrity of that well.
8. **Closure period** shall mean that period from permanent cessation of carbon dioxide injection until the Board issues a certificate of project completion.
9. **Confining zone** shall mean a geologic formation, group of formations, or part of a formation stratigraphically overlying the injection zone that acts as a barrier to fluid movement.
10. **Contaminant** shall mean any physical, chemical, biological, or radiological substance or matter in water.
11. **Corrective action** shall mean the use of methods approved by the Board to ensure that wells within the area of review do not serve as conduits for the movement of fluids into underground sources of drinking water or damage natural resources.
12. **Fault** shall mean a zone of rock fracture along which there has been displacement.
13. **Flowlines** shall mean a pipeline that transports full well stream production from a well site to the production equipment where produced hydrocarbons are first separated, dehydrated, commingled with other production, or otherwise processed or to the point of custody transfer. Furthermore, pipelines transporting carbon dioxide from the carbon dioxide injection facilities to the wellhead.
14. **Fluid** shall mean any material or substance which flows or moves, whether in a semisolid, liquid, sludge, gaseous, or any other form or state.
15. **Formation** shall mean a body of rock characterized by a degree of lithologic homogeneity which is prevailingly, but not necessarily, tabular and is mappable on the earth's surface or traceable in the subsurface.

16. **Formation fluid** shall mean fluid present in a formation under natural conditions as opposed to introduced fluids.
17. **Formation fracture pressure** shall mean the pressure, measured in pounds per square inch, which, if applied to a subsurface formation, will cause that formation to fracture.
18. **Geologic storage or sequestration** shall mean the geologic storage of a gaseous, liquid, or supercritical carbon dioxide stream in a storage facility or reservoir. This term does not apply to carbon dioxide transportation. The terms “geologic storage” or “geologic sequestration” may be use synonymously.
19. **Ground water** shall mean water occurring beneath the surface of the ground that fills available openings in rock or soil materials such that they may be considered saturated.
20. **Injection well** shall mean a nonexperimental well used to inject carbon dioxide into or withdraw carbon dioxide from a reservoir.
21. **Injection zone** shall mean a geologic formation, group of formations, or part of a formation that is of sufficient areal extent, thickness, porosity, and permeability to receive carbon dioxide through a well or wells associated with a geologic sequestration project.
22. **Mechanical integrity** shall mean the absence of significant leakage within an injection well's tubing, casing, or packer (internal mechanical integrity), or outside of the casing (external mechanical integrity).
23. **Minerals** shall mean coal, oil, and natural gas.
24. **Model** shall mean a representation or simulation of a phenomenon or process that is difficult to observe directly or that occurs over long timeframes. Models that support geologic sequestration can predict the flow of carbon dioxide within the subsurface, accounting for the properties and fluid content of the subsurface formations and the effects of injection parameters.
25. **Operational period** shall mean the period during which injection occurs.
26. **Packer** shall mean a device lowered into a well, which can be expanded or compressed to produce a fluid-tight seal.
27. **Person** shall mean any natural person, firm, corporation, association, partnership, joint venture, receiver, trustee, guardian, executor, administrator, fiduciary, representative of any kind or any other group acting as a unit.
28. **Plug or plugging** shall mean the act or process of sealing the flow of fluid into or out of a formation through a borehole or "well" penetrating that formation.
29. **Pore space** shall mean the subsurface space that can be used for the geologic storage of sequestration of carbon dioxide and incidental substances that are part of the carbon dioxide capture, transportation, and storage process.
30. **Post-closure period** shall mean that period after the Board has issued a certificate of project completion.
31. **Post-injection site care** shall mean appropriate monitoring and other actions, including corrective action, needed following cessation of injection to ensure that underground sources of drinking water are not endangered. Post-injection site care may occur in the closure or post-closure periods.

32. **Pressure** shall mean the total load or force per unit area acting on a surface.
33. **Pressure front** shall mean the zone of elevated pressure and displaced fluids created by the injection of carbon dioxide into the subsurface. The pressure front of a carbon dioxide plume refers to a zone where there is a pressure differential sufficient to cause the movement of injected fluids or formation fluids into underground sources of drinking water.
34. **Project completion** shall mean the point in time, as determined by the Board at which the certificate of project completion is issued and the storage operator is released from all regulatory requirements associated with the storage facility.
35. **Storage facility** shall mean any underground reservoir used or to be used for the underground storage of carbon dioxide and all surface and subsurface rights and appurtenances necessary or useful in the operation of the facility for the underground storage of carbon dioxide, including any necessary or reasonable buffer zone as designated by the board for the purpose of ensuring the safe operation of the storage of carbon dioxide and to protect the storage facility against pollution, invasion, and escape or migration of carbon dioxide therefrom, together with any and all subsequent extensions thereof.
36. **Storage facility area** shall mean the area with designated boundaries on which the storage facility is located.
37. **Storage facility Operator** shall mean the person or entity designated by the Board to operate the storage facility.
38. **Storage facility plan** shall mean the detailed proposal addressing the operation of the storage facility.
39. **Stratigraphic test well** shall mean any hole or well drilled or bored into the subsurface for the purpose of obtaining cores or other geologic information and data.
40. **Stratum** shall mean a single sedimentary bed or layer, regardless of thickness, that consists of generally the same kind of rock material.
41. **Subsurface observation well** shall mean a well that is used to observe subsurface phenomena, including the presence of carbon dioxide, pressure fluctuations, fluid levels and flow, temperature, and in situ water chemistry.
42. **Transmissive fault or fracture** shall mean a fault or fracture that has sufficient permeability and vertical extent to allow fluids to move between formations.
43. **Trapping** shall mean the physical and geochemical processes by which injected carbon dioxide is sequestered in the subsurface. Physical trapping occurs when buoyant carbon dioxide rises in the formation until it reaches impermeable strata that inhibits further upward and lateral migration or is immobilized in pore spaces due to capillary forces. Geochemical trapping occurs when chemical reactions between the injected carbon dioxide and natural occurring minerals in the formation lead to the precipitation of solid carbonate minerals or dissolution in formation fluids.
44. **Underground source of drinking water** (USDW)
    a. Shall mean any aquifer or its portion:
        i. Which supplies any public water system; or

ii. Which contains a sufficient quantity of ground water to supply a public water system; and
   a. Currently supplies drinking water for human consumption; or
   b. Contains fewer than 10,000 mg/L total dissolved solids; and

b. Shall mean an aquifer or its portion which is not an exempted aquifer.

45. Well shall mean any oil or gas well, any well drilled or being drilled in search of oil and gas, any well defined as a class II injection well, any well defined as a class VI injection well, any well utilized for underground storage, or any well used for geologic storage.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.02 Scope of Chapter; Purpose.

This chapter governs the geologic storage or sequestration of carbon dioxide. This chapter does not apply to the utilization of carbon dioxide for an enhanced oil or gas recovery project. The purpose of this chapter and these rules adopted by the Board shall be to promote the underground storage or sequestration of carbon dioxide. Furthermore, the Board shall ensure the protection of the underground sources of drinking water and Alabama's natural resources. The obligation to protect Alabama's water is set forth in the original enabling law establishing the Alabama Oil and Gas Board, which provided inter alia that the Board would "prevent the pollution of fresh water supplies." Act No. 1, Acts of Alabama 1945.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.03 Protection of Freshwater Resources.

An operator shall conduct all operations in a manner so as to prevent the pollution of all freshwater resources. All fresh waters and waters of present or probable future value for domestic, municipal, commercial, stock, or agricultural purposes shall be confined to their respective strata and shall be adequately protected. Special precautions shall be taken to guard against any loss of artesian water and the contamination of fresh water.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.04 Injection into Underground Source of Drinking Water Prohibited.

Underground injection of carbon dioxide for geologic storage that causes or allows movement of fluid into an underground source of drinking water is prohibited.

No storage operator shall construct, operate, maintain, convert, plug, abandon, or conduct any injection activity in a manner that allows the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may endanger underground sources of drinking water, endanger natural resources, or may adversely affect the health of persons. Any operator of a geologic storage facility must prove that the objectives set out in Rule 400-8-1-.01, et seq., are fulfilled.

Any underground storage of carbon dioxide shall be beneath the lowermost formation containing underground drinking water.

Notwithstanding any other rule, the Board may take emergency action upon receipt of information that a contaminant that is present in or likely to enter a public water system, endangers an underground source of drinking water or natural resources, or presents an imminent and substantial endangerment to the health of persons.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.05 Prohibition of Unauthorized Injection.

Any underground injection of carbon dioxide for the purpose of geologic storage, except into a storage facility approved by the Board, is prohibited. Furthermore, any underground injection of carbon dioxide for the purpose of geologic storage, except into a well authorized by well permit issued by the Board, is prohibited.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.06 Application of Other Rules to Geologic Storage of Carbon Dioxide.

The rules set forth in Rule 400-8-1.01 et seq. shall govern the geologic storage of carbon dioxide.

(1) In addition to the rules and regulations governing underground storage of carbon dioxide set forth in Rule 400-8-1-.01, et seq., the Rules and Regulations of the State Oil and Gas Board of Alabama Governing Practice and Procedure, Rule 400-7-1-.01, et seq. shall apply to underground storage of carbon dioxide.

(2) Unless otherwise specified by the Supervisor, Rules and Regulations of the State Oil and Gas Board of Alabama Governing Onshore Lands Operations, Rule 400-1-1-.01, et seq., or Rules and Regulations of the State Oil and Gas Board of Alabama Governing Submerged Offshore Lands Operations, Rule 400-2-1-.01, et seq., whichever is applicable, shall apply to underground storage of carbon dioxide, with the exception of the following:

(a) For Rules and Regulations of the State Oil and Gas Board of Alabama Governing Onshore Lands Operations, Rule 400-1-1-.01, et seq;

1. 400-1-1-.01 Applicability,
2. 400-1-1-.03 Repealed Rules, Special Field Rules, and Orders,
3. 400-1-1-.07 Determining and Naming Fields and Pools,
4. 400-1-2-.02 Spacing of Wells,
5. 400-1-5 Testing and Allowable,
6. 400-1-6-.01 General,
7. 400-1-6-.02 Protection of Oil and Gas,
8. 400-1-6-.03 Initial Bottom Hole Pressure Survey,
9. 400-1-6-.04 Pressure-Volume-Temperature Analysis,
10. 400-1-6-.05 Procedures for Multiple Completions,
11. 400-1-6-.06 Recompletion or Reworking,
12. 400-1-6-.07 Tanks or Tank Batteries,
13. 400-1-6-.12 Authorization for Permit to Clean Tanks
14. 400-1-7 Processing, and
15. 400-1-8 Transportation.

(b) For Rules and Regulations of the State Oil and Gas Board of Alabama Governing Submerged Offshore Lands Operations, Rule 400-2-1-.01, et seq;

1. 400-2-1-.01 Applicability,
2. 400-2-1-.03 Repealed Rules, Special Field Rules, and Orders,
3. 400-2-1-.07 Determining and Naming Fields and Pools,
4. 400-2-2-.02 Spacing of Wells,
5. 400-2-5 Testing and Allowable,
6. 400-2-6-.01 General,
7. 400-2-6-.02 Protection of Oil and Gas,
8. 400-2-6-.03 Initial Bottom Hole Pressure Survey,
9. 400-2-6-.04 Pressure-Volume-Temperature Analysis,
10. 400-2-6-.05 Procedures for Multiple Completions,
11. 400-2-6-.06 Recompletion or Reworking,
12. 400-2-6-.07 Subsurface Safety Devices,
13. 400-2-6-.08 Wellhead Equipment and Testing Procedures,

Author: S, Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.07 Conversion from Enhanced Oil or Gas Recovery to Geologic Storage.

An operator proposing to convert an enhanced recovery unit or project to geologic storage shall petition the Board for approval of such conversion to geologic storage. In considering the Petition, the Board shall ensure that the proposed geologic storage operation does not cause an increased risk to underground sources of drinking water or natural resources. In petitioning the Board for such conversion, these rules addressing geologic storage shall be applicable, and a petitioner requesting such conversion shall operate the conversion in accordance with these rules. In determining if there is an increased risk to underground sources of drinking water by the conversion of the enhanced recovery operation to geologic storage, the Board shall consider the following factors:

1. Increase in reservoir pressure within the injection zone;
2. Increase in carbon dioxide injection rates;
3. Decrease in reservoir production rates;
4. Distance between the injection zone and underground sources of drinking water;
5. Suitability of the enhanced oil or gas recovery area for the geologic storage of carbon dioxide;
6. Quality of abandoned well plugs within the unit area of the enhanced recovery project and the area of review of the geologic storage facility;
7. The source and properties of injected carbon dioxide; and
8. Any additional factors determined by the Board.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.08 Exempted Aquifers.

The Board may, on the petition by an operator or on the Board's own motion, after notice and hearing, approve a designated aquifer that otherwise is defined as an underground source of drinking water (an aquifer containing fewer than 10,000 milligrams per liter (mg/L) total dissolved solids under 40 C.F.R. 144.3) only with prior approval by the United States Environmental Protection Agency.
Author: S. Marvin Rogers

Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.09 Converting an Existing Well to a Geologic Storage Well.

An operator of a storage facility may apply to convert an existing oil and gas well to an injection well or other well to be utilized for the purpose of geologic storage of carbon dioxide. In such cases, the operator must demonstrate that the well is constructed in a manner that will ensure the protection of underground sources of drinking water and protection of natural resources. Furthermore, the conversion of an existing well into an injection well or other well to be utilized for the geologic storage of carbon dioxide shall comply with these rules related to geologic storage.
Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.10 Records to be Kept to Substantiate Reports.

All owners, operators, drilling contractors, drillers, service companies, or other persons engaged in drilling, completing, operating, or servicing geologic storage facilities shall keep appropriate records covering their operations in order to make and substantiate the reports required by these rules addressing carbon dioxide storage operations. The storage operator shall retain until project completion all records relating to the storage facility, the storage facility plan, the storage facility area, and the area of review. Upon project completion of a facility closure, the storage operator shall deliver the records to the Board.
Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.11 Access to Records.

The Board and the Board's authorized agents shall have access to all storage facility records. All owners, operators, drilling contractors, drillers, service companies, or other persons engaged in drilling, completing, operating, or servicing storage facilities shall allow the Board and the Board's authorized agents access to come upon and inspect any facility, property, well, drilling rig, or other equipment engaged in storage operations. Further, the Board and its authorized agents may conduct sampling and testing as necessary to enforce these rules relating to geologic storage. If requested, copies of storage facility records must be filed with the Board. As provided in these rules addressing geologic storage, numerous records and information are due to be filed with the Board.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.12 Consent of Owners of Storage Rights for Carbon Dioxide; Amalgamation and Pooling of Owners of Storage Rights.

Pursuant to Section 9-17-162 of the *Code of Alabama* (1975), as amended:

1. A storage operator shall make a good faith effort to obtain the consent of all persons that own a storage facility's pore space and storage rights for carbon dioxide.
2. A storage operator shall obtain the consent of persons that own not less than sixty-six and two-thirds (66 2/3) percent of a storage facility's pore space and storage rights for carbon dioxide.
3. Upon a storage operator obtaining the consent of persons that own not less than sixty-six and two-thirds (66 2/3) percent of a storage facility's pore space and storage rights for carbon dioxide, the Board, after providing notice and a public hearing, may enter an order to amalgamate and pool the pore space and storage rights for carbon dioxide owned by non-consenting owners into the storage facility on terms that are just and reasonable as determined by the Board.
4. All non-consenting owners of a storage facility's pore space and storage rights for carbon dioxide shall be fairly and equitably compensated.

Author: S. Marvin Rogers

Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.13 Limiting Surface Impact.
Pursuant to Section 9-17-162 (6) of the *Code of Alabama* (1975), as amended, a storage operator shall use commercially reasonable efforts to limit the adverse surface-use impact upon the lands of non-consenting owners of a storage facility's pore space and storage rights.
Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.14 Storage Operations Near Coal Mining Operations.
Pursuant to Section 9-17-162 (7) of the *Code of Alabama* (1975), as amended, a storage operator seeking approval to operate in the Blue Creek or Mary Lee coal seams in Jefferson, Tuscaloosa, or Walker Counties or within a 10-mile radius of any coal mine operation shall obtain the written consent of the coal mine operator and mineral owner with an operation or mineral interest in such seams or within such radius; provided, however, that such consent shall not be unreasonably withheld or delayed.
Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.15 Petition for Approval of a Storage Facility for the Storage of Carbon Dioxide.

1. Operators of a proposed geologic storage facility for the storage of carbon dioxide shall petition the Board for approval of the storage facility. Upon the filing of such petition, the Board shall conduct a hearing after appropriate notice has been provided to all interested persons, and such hearing shall provide an opportunity for all interested parties to address the Board.
2. A Petition for approval of a geologic storage facility for the storage of carbon dioxide shall include the following:
   a. A site map showing the boundaries of the storage facility showing the proposed storage facility area, the reservoir or reservoirs into which the carbon dioxide will be stored, the location of all proposed wells, proposed cathodic protection boreholes, and the surface facilities within the carbon dioxide storage facility area;
   b. A description of the storage facility area;

c. A description of the area of review;
d. A technical evaluation of the proposed storage facility, including the following:
    i. The name, description, and average depth of the storage reservoir;
    ii. A geologic and hydrogeologic evaluation of the proposed facility area, including an evaluation of all existing information on all geologic strata overlying the storage reservoir, including the immediate caprock containment characteristics and all subsurface zones to be used for monitoring. The evaluation must include any available geophysical data and assessments of any regional tectonic activity, local seismicity and regional or local fault zones, and a comprehensive description of local and regional structural or stratigraphic features. The evaluation must describe the storage reservoir's mechanisms of geologic confinement, including rock properties, regional pressure gradients, structural features, and adsorption characteristics with regard to the ability of that confinement to prevent migration of carbon dioxide beyond the proposed storage reservoir. The evaluation must also identify any productive existing or potential mineral zones occurring within the facility area and any underground sources of drinking water in the facility area and within one mile of the outside boundary. The evaluation must include exhibits showing the following:
        a. All wells, including water, oil, and natural gas exploration and development wells, and other manmade subsurface structures and activities, including coal mines, within the facility area and within one mile of its outside boundary;
        b. All manmade surface structures that are intended for temporary or permanent human occupancy within the facility area and within one mile of its outside boundary;
        c. Any regional or local faulting;
        d. An isopach map of the storage reservoirs;
        e. An isopach map of the primary and any secondary containment barrier for the storage reservoir;
        f. A structure map of the top and base of the storage reservoir or reservoirs;
        g. Identification of all structural spill points or stratigraphic discontinuities controlling the isolation of stored carbon dioxide and associated fluids within the storage reservoir;
        h. Evaluation of the pressure front and the potential impact on underground sources of drinking water, if any;
        i. Structural and stratigraphic cross sections that describe the geologic conditions at the storage reservoir;

j. The location, orientation, and properties of known or suspected faults and fractures that may transect the confining zone in the area of review, and a determination that they would not interfere with containment;

k. Data on the depth, areal extent, thickness, mineralogy, porosity, permeability, and capillary pressure of the injection and confining zone, including facies changes based on field data, which may include geologic cores, outcrop data, seismic surveys, well logs, and names and lithologic descriptions; geologic cores, outcrop data, seismic surveys, well logs, and names and lithologic descriptions;

l. Geomechanical information on fractures, stress, ductility, rock strength, and in situ fluid pressures within the confining zone. The confining zone must be free of transmissive faults or fractures and of sufficient areal extent and integrity to contain the injected carbon dioxide stream;

m. Information on the seismic history, including the presence and depth of seismic sources and a determination that the seismicity would not interfere with containment;

n. Geologic and topographic maps and cross sections illustrating regional geology, hydrogeology, and the geologic structure of the facility area;

o. Identification and characterization of additional strata overlying the storage reservoir that will prevent vertical fluid movement, are free of transmissive faults or fractures, allow for pressure dissipation, and provide additional opportunities for monitoring, mitigation, and remediation; and

p. Identification of any minerals in the storage facility area and within one mile of its outside boundary.

iii. A review of public records, conducted by a geologist or engineer, for all wells within the proposed storage facility area, which penetrate the storage reservoir or primary or secondary seals overlying the reservoir, and all wells within the proposed storage facility area and within one mile, or any other distance as deemed necessary by the Board of the facility area boundary. The review must include the following:

a. A determination that all abandoned wells have been plugged and all operating wells have been constructed in a manner that prevents the carbon dioxide or associated fluids from escaping from the storage reservoir;

b. A description of each well's type, construction, date drilled, location, depth, record of plugging, and completion;

c. Maps and stratigraphic cross sections indicating the general vertical and lateral limits of all underground sources of drinking water, water wells, and springs within the area of review; their positions relative to the injection zone; and the direction of water movement, where known;

d. Maps delineating the area of review and cross sections of the proposed area of review, including the model used, assumptions made, and the site character data on which the model is based;

e. A map of the proposed area of review adjoining and surrounding the proposed storage facility area showing the number or name and location of all injection wells, producing wells, abandoned wells, plugged wells or dry holes, deep stratigraphic boreholes, subsurface cleanup sites approved by an agency of the State of Alabama or the USEPA , surface bodies of water, springs, mines (surface and subsurface), quarries, water wells, other pertinent surface features, including structures intended for human occupancy, state, or county boundary lines, and roads;

f. A list of contacts, submitted to the Board when the proposed area of review extends across state boundary lines;

g. Baseline geochemical data on subsurface formations, including all underground sources of drinking water in the proposed area of review;

h. Proposed special storage facilities rules, which include, inter alia, conditions placed on well permits; and

i. Any additional information that the Board may require.

iv. The proposed calculated average and maximum daily injection rates, daily volume, and the total anticipated volume of the carbon dioxide stream using a method acceptable to and filed with the Board;

v. The proposed average and maximum bottom hole injection pressure to be utilized at the reservoir. The maximum allowed injection pressure, measured in pounds per square inch gauge, shall be approved by the Board and specified in the permit. In approving a maximum injection pressure limit, the Board shall consider the results of well tests and other studies that assess the risks of tensile failure and shear failure. The Board shall approve limits that, with a reasonable degree of certainty, will avoid initiating a new fracture or propagating an existing fracture in the confining zone or cause the movement of injection or formation fluids into an underground source of drinking water;

vi. The proposed preoperational formation testing program to obtain an analysis of the chemical and physical characteristics of the injection zone and confining zone.

vii. The proposed stimulation program, a description of stimulation fluids to be used, and a determination that stimulation will not interfere with containment; and

viii. The proposed procedure outlining steps necessary to conduct injection operations.

e. The extent of the pore space that will be occupied by carbon dioxide as determined by utilizing all appropriate geologic and reservoir engineering information and reservoir analysis, which must include various computational models for reservoir characterization, and the projected response of the carbon dioxide plume and storage capacity of the storage reservoir. The computational model must be based on detailed geologic data collected to characterize the injection zones, confining zones, and any additional zones;

f. An emergency and remedial response plan.

g. A detailed worker safety plan that addresses carbon dioxide safety training and safe working procedures at the storage facility.

h. A corrosion monitoring and prevention plan for all wells and surface facilities.

i. A leak detection and monitoring plan for all wells and surface facilities. The plan must:

   i. Identify the potential for release to the atmosphere;

   ii. Identify potential degradation of ground water resources with particular emphasis on underground sources of drinking water; and

   iii. Identify potential migration of carbon dioxide into any mineral zone in the facility area.

j. A leak detection and monitoring plan to monitor any movement of the carbon dioxide outside of the storage reservoir. This may include the collection of baseline information of carbon dioxide background concentrations in ground water, surface soils, and chemical composition of in situ waters within the facility area and the storage reservoir and within one mile of the facility area's outside boundary. Provisions in the plan will be dictated by the site characteristics as documented by materials submitted in support of the permit application but must:

   i. Identify the potential for release to the atmosphere;

   ii. Identify potential degradation of ground water resources with particular emphasis on underground sources of drinking water; and

   iii. Identify potential migration of carbon dioxide into any mineral zone in the facility area.

k. The proposed well casing and cementing program.

l. A corrective action plan.

m. A proposed financial responsibility plan.

n. A testing and monitoring plan.

o. A plugging plan that meets the Board’s requirements.

p. A post-injection site care and facility closure plan.

q. A sworn statement that petitioner has obtained the requisite percentage of rights of the owners of the storage facility area to store carbon dioxide within the storage facility area pursuant to Section 9-17-150 et seq. of the *Code of Alabama* (1975), as amended.

r. A storage facility plan to be implemented and followed after approval of the Board during the operation of the storage facility.
s. Proposed special storage facility rules.
t. Any other information that the Board may require.

3. Any operator petitioning the Board to establish a storage facility for carbon dioxide shall pay a fee of One Hundred Thousand Dollars ($100,000.00). The petitioner must pay the fee regardless of whether the petition is withdrawn.
4. The Board shall have three (3) months from the date the hearing concludes to issue an order addressing the petition.
5. Approval of a petition to establish a storage facility does not convey any property rights or exclusive privilege to a storage facility operator.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.16 Petitions, Notice.

The Board shall hold a public hearing before approving a storage facility.

1. At least fifty days prior to the hearing, the petitioner shall give notice of the hearing to the following:
   a. Each operator of mineral extraction activities within the facility area and within one-half mile of the outside boundary;
   b. All mineral owners of record within the facility area, the area of review, and within one-half mile of the outside boundary of the area of review;
   c. All surface owners of record within the facility area, the area of review, and one-half mile of the outside boundary of the area of review;
   d. Each owner of record of the storage rights within the storage reservoir and within one-half mile of the reservoir's boundary; and
   e. Any other persons as determined by the State Oil and Gas Supervisor of the State Oil and Gas Board of Alabama.
2. The notice given by the petitioner must contain:
   a. A description of the land within the proposed storage facility area.
   b. The date, time, and place that the Board will hold a hearing on the petition.
   c. A statement that a copy of the petition and exhibits may be obtained from the Board or petitioner. When the Board receives a request for a copy of the petition or exhibits from an interested party, the Board may direct Petitioner to deliver the Petition or exhibits to the interested party.
   d. A statement that all comments regarding the storage facility petition must be in writing and submitted to the Board prior to the hearing or presented at the hearing.

e. A statement that if the Board approves the proposed storage facility, the storage facility operator may acquire storage rights from nonconsenting owners through amalgamtion.

3. Public notice of a petition for the storage facility shall be published at least fifty (50) days prior to a hearing. The notice shall be published in the county newspaper with the highest circulation, except in an emergency, including notice of the time and place of hearing thereon. The notice shall be issued in the name of the Board. The public notice must state that a petition has been filed with the Board for approval to store carbon dioxide and describe the location of the proposed storage facility area and the date, time, and place of the hearing before the Board at which time the merits of the petition will be considered.
4. The public notice given by the Board must contain the following:
   a. Name and address of the Board;
   b. Name and address of the petitioner;
   c. A brief description of the nature and purpose of the hearing, including the applicable rules and procedures;
   d. A brief description of the activity described in the storage facility petition;
   e. Name, address, and telephone number of a person from whom interested persons may obtain further information, including copies of the petition and exhibits; and
   f. Any additional information that the Board requires.
5. Public notice shall be given by the following methods:
   a. By mailing and e-mailing a copy of the notice of the petition to the following:
      i. The Alabama Department of Environmental Management;
      ii. The United States Environmental Protection Agency;
      iii. To any local government having jurisdiction over the area where the storage facility is proposed to be located.
6. At or prior to the hearing, any interested person may address the Board on the petition to establish the storage facility.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.17 Operations Prior to Approval to Inject.
Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.18 Petition for Approval to Inject.
Prior to commencing injection, the operator shall petition the Board to request approval to inject. The storage operator shall pay a filing fee of Fifteen Thousand Dollars ($15,000.00) for a petition for approval to

inject. The requirements for notice of the petition shall be the same as the notice requirements for the petition to approve the storage facility. The Board shall conduct a hearing on the petition for approval to inject and thereafter issue an order addressing the petition.

Author: S. Marvin Rogers

Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)

History: New Rule: Published _____; effective _____.

400-8-1-.19 Approval to Inject.

The storage facility operator shall present and the Board shall review all new data obtained during the construction, drilling, and testing of wells drilled in considering the petition for approval to inject. The storage facility operator shall submit the following information to the Board at the hearing of the petition for approval to inject:

1. Updated geologic modeling and site characterization;
2. Final storage facility area, area of review, and the corrective action plan;
3. Compatibility of carbon dioxide injections stream with the fluids and minerals in the injection zone;
4. Final injection well construction;
5. Demonstration of internal and external mechanical integrity;
6. Maximum operating injection pressures;
7. Any updates to the storage facility plan including but not limited to:
   a. Storage facility area and area of review;
   b. Corrective action plan;
   c. Testing and monitoring plan;
   d. Well plugging plan;
   e. Post-injection site care and facility closure plan;
   f. Emergency and remedial response plan;
8. A sworn statement that petitioner has obtained one hundred percent (100%) of the rights to store carbon dioxide within the storage facility area.
9. Other information that the Board may require.

Author: S. Marvin Rogers

Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)

History: New Rule: Published _____; effective _____.

400-8-1-.20 Competing Mineral Rights.

In accordance with Section 9-17-161 (g) of the *Code of Alabama* (1975), as amended, in considering approving a storage facility to be used for the storage and sequestration of carbon dioxide pursuant to this division, the Board shall consider both of the following:

1. Any competing rights of all separately owned estates in lands potentially affected by the storage facility, giving due consideration of competing

rights as to existing or future uses by pore space, surface, and mineral owners that may be affected.

2. The distance of the storage facility from any current or future underground mining operation or other underground operation designed and operated for the extraction of minerals and the potential impact on the safety of these operations.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.21 Implementation of the Storage Facility Plan.
After the Board has approved a petition or approved the storage facility plan, and the petition for approval to inject, the storage operator shall implement the plan for the storage facility and commence injection.
Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.22 Delineation of Storage Facility Area and Area of Review.
In connection with the boundaries of the storage facility area and area of review, the storage operator shall perform the following actions:

1. Predict, using existing site characterization, monitoring and operational data, and computational modeling, the projected lateral and vertical migration of the carbon dioxide plume and its associated pressure front in the subsurface from the commencement of injection activities until the plume movement ceases, or until the end of a fixed time period as determined by the Board. The model must:
   a. Be based on detailed geologic data collected to characterize the 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;
   b. Take into account any geologic heterogeneities, other discontinuities, data quality, and their possible impact on model predictions; and
   c. Consider potential migration through faults, fractures, and artificial penetrations.
2. Using methods approved by the Board, identify all penetrations, including active and abandoned wells and underground mines, in the storage facility and the area of review that may penetrate the confining zone. Provide a description of each well's type, construction, date drilled, location, depth, record of plugging

and completion, and any additional information the Board may require.

3. Determine which abandoned wells have been plugged or operating wells have been constructed in the storage facility area and the area of review in a manner that prevents the movement of the injected carbon dioxide or other fluids that may endanger underground sources of drinking water, including use of materials compatible with the carbon dioxide stream.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.23 Corrective Action.

1. The storage operator shall perform corrective action on all wells in the storage facility and in the area of review that are determined to need corrective action, using methods designed to prevent the movement of fluid into or between underground sources of drinking water, including use of materials compatible with the carbon dioxide stream, where appropriate.
2. With respect to corrective action, the storage operator shall address, among other things:
   a. The corrective action to be performed prior to injection and what, if any, corrective action will be on a phased basis and how the phasing will be determined;
   b. How corrective action will be adjusted if there are changes in the boundaries of the storage facility area or to the area of review; and
   c. How site access will be assured for future corrective action.
3. Furthermore, the storage operator shall identify all wells that require corrective action and take appropriate corrective action.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.24 Reevaluation of Storage Facility.

1. The storage operator shall petition the Board within five years of the initial injection of the storage facility to reevaluate the storage facility initially approved by the Board. The storage operator shall pay a filing fee of Fifteen Thousand Dollars ($15,000.00) for a petition for reevaluation. At the hearing on the petition to reevaluate the storage facility, the storage operator shall:
   a. Present evidence at the reevaluation hearing addressing the operations of the storage facility, the storage facility plan, the storage facility area, and the area of review and identifying all wells that require corrective action.

b. Describe corrective action performed on wells requiring corrective action in the reevaluated storage facility area and the area of review.
c. Submit exhibits showing any amended boundaries of the storage facility affecting the storage facility area, and the area of review and corrective action plan or demonstrate to the Board through monitoring data and modeling results that no amendment to the storage facility, the storage facility area, and to the area of review is needed.
d. Submit exhibits addressing the emergency and remedial response plan.
e. Submit exhibits addressing the financial responsibility of the storage operator at the time of this petition for reevaluation.
f. Submit all modeling inputs and data used to support delineations of the boundaries of the storage facility, the storage facility area, and the area of review.
g. The Board shall consider the evidence on the petition for reevaluation and issue an order addressing the storage facility, the storage facility area, the storage facility plan, and the area of review.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.25 Storage Facility Change of Operator.

1. All proposals for Change of Operator of a storage facility shall be approved only after the filing of a petition for change of operator and subsequent notice and hearing. A storage operator shall pay a filing fee of Fifteen Thousand Dollars ($15,000.00) for a Change of Operator proposal. The petition for Change of Operator of a storage facility must contain the following:
   a. The name and address of the person proposed new storage operator.
   b. The date that the storage operator desires the proposed transfer to occur.
   c. A demonstration of financial assurance by the proposed new storage operator.
   d. The consent of the proposed Change of Operator by the current operator.
2. The Board shall conduct a hearing on the petition for Change of Operator to ensure that the purposes of the Alabama Oil and Gas Conservation Laws are promoted. For good cause, the Board may deny a petition for Change of Operator of a storage facility or take other action that the Board deems appropriate.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.26 Obligations of an Operator of a Storage Facility for Carbon Dioxide.

A storage operator shall comply with the obligations set forth hereinbelow. These obligations are, however, not exhaustive, and the storage operator is responsible for other obligations required or implied by these regulations governing geologic storage of carbon dioxide.

1. The storage operator shall comply with all conditions of the plan for storage operations approved by the Board. Further the storage operator shall comply with any well permits approved by the Board. Any noncompliance constitutes a violation and is grounds for enforcement action, including termination of the plan and termination of the storage facility.
2. The storage operator shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with the storage facility plan approved by the Board.
3. The storage operator shall be prepared at all times to implement the emergency and remedial response plan.
4. The storage operator shall at all times properly operate and maintain all storage facilities which are installed or used by the storage operator in its storage operations. Proper operation and maintenance includes effective performance, adequate funding, adequate staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures.
5. The storage operator shall furnish to the Board, within a time specified by the Board, any information which the Board may request to determine whether cause exists for modifying, revoking and reissuing, or terminating the approval of the storage facility.
6. The storage operator shall allow the Board or an authorized representative to:
   a. Enter upon the storage facility premises where records must be kept under the conditions of the permit;
   b. At reasonable times, have access to and copy any records related to storage operations;
   c. At reasonable times, inspect any facilities, equipment, including monitoring and control equipment, practices, or operations.
7. The storage operator shall prepare, maintain, and comply with a testing and monitoring plan.
8. The storage operator shall comply with all reporting requirements.
9. The storage operator must obtain an injection well permit, and injection wells must meet the construction and completion requirements.
10. The storage operator shall prepare, maintain, and comply with a plugging plan.
11. The storage operator shall establish mechanical integrity prior to commencing injection and maintain mechanical integrity.

12. The storage operator shall implement an approved worker safety plan.
13. The storage operator shall comply with leak detection and reporting requirements.
14. The storage operator shall conduct a corrosion monitoring and prevention plan.
15. The storage operator shall prepare, maintain, and comply with the corrective action plan.
16. The storage operator shall maintain financial responsibility.
17. The storage operator shall maintain and comply with the post-injection site care and facility closure plan.
18. The storage operator shall at the end of each calendar year provide the Board with a list of third-party contractors having the knowledge and expertise to perform operations in the event of default by the storage operator.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.27 Establishing Permit Conditions.

1. The Board may establish conditions, as required on a case-by-case basis on each well permit. The operator shall comply with any conditions placed on the storage operator by the Board in the order approving the storage facility. Such additional conditions may be necessary to prevent the endangerment of underground sources of drinking water and natural resources.
2. The Board shall establish conditions of any permit as required on a case-by-case basis, to provide for and assure compliance with all statutory or regulatory requirements which take effect prior to final administrative disposition of the permit.
3. New permits may be modified or revoked as the Board determines.
4. All permit conditions shall be stated expressly. All Alabama laws, statutes, regulations, and rules are incorporated by reference into each permit approved by the Board.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.28 Well Permit for Wells Within the Storage Facility.

1. **Activities requiring Permits.** Individual well permits shall be issued by the Supervisor for all wells within a storage facility for the storage of carbon dioxide as approved by the Board.
2. **Stratigraphic Test Well Requirements.** Application for permits for Stratigraphic test wells to obtain geologic information for the purpose of carbon dioxide storage shall be submitted as set forth in Rules 400-1-2-.01 or 400-2-2-.01, whichever is applicable. The

applicant for a stratigraphic test well permit shall pay a fee of One Thousand Dollars ($1,000.00).

3. **Subsurface Observation Well Permit Requirements.** Application for permits for subsurface observation wells for underground storage purposes shall be submitted as set forth in Rules 400-1-2-.01 or 400-2-2-.01, whichever is applicable. The storage operator shall pay a fee of One Thousand Dollars ($1,000.00) for each permit to drill a subsurface observation well.
4. **Injection Well Permit Requirements.** Application for permits for underground storage injection wells shall be considered as a two-step process. All wells drilled or recompleted for the purpose of underground storage shall comply with the following permitting requirements:
    a. **Step 1.**
        i. Well permit requirements as set forth in Rules 400-1-2-.01 or 400-2-2-.01, whichever is applicable for the drilling, conversion, or reentry of a plugged and abandoned well. The storage operator shall pay a fee of Three Thousand Dollars ($3,000.00) for each permit to drill an injection well.
        ii. A plat, in triplicate, prepared by a licensed land surveyor showing the location of the proposed underground storage well. The plat shall be drawn to the scale of one (1) inch equals one thousand (1,000) feet, unless otherwise stipulated by the Supervisor and shall show distances from the proposed well to the nearest governmental section lines. The plat shall show the direction of north, and the latitude and longitude in decimal degrees to five (5) significant digits and state plane coordinates of the proposed well.
        iii. A prognosis specifying the drilling, completion, or conversion procedures for the proposed underground storage well;
        iv. A well bore sketch showing the name, description, and depth of the proposed underground reservoir and the depth of the deepest underground source of drinking water (USDW); a description of the casing in the underground storage well, or the proposed casing program, including a full description of cement already in place or as proposed; and the proposed method of testing casing before use of the underground storage well;
        v. A complete log through the underground reservoir of the storage well or if an underground storage well is to be drilled, a complete log through the underground reservoir from a nearby well. Such log shall be annotated to identify the estimated location of the base of the deepest USDW, significant aquicludes, and the underground reservoir; and
        vi. The known or calculated fracturing pressure of the underground reservoir. All determinations included in

this application shall be supported by basic data and calculations.

b. **Step 2.**

i. Permit application, Form OGB-1 CO2, Application for Permit to Inject Carbon Dioxide;

ii. A schematic diagram of the surface injection system and its appurtenances;

iii. An as-built wellbore sketch showing the name, description, and depths of the underground reservoir and the base of the deepest USDW; a description of the casing, cementing, perforation, tubing, and plug and packer records associated with the construction of the underground storage well; and the method and results of casing tests reported on Form OGB-7, Well Record and Completion or Recompletion Report;

iv. A complete dual induction or equivalent log through the underground reservoir of the underground storage well. Such log for wells drilled for underground storage operations shall be run prior to the setting of casing through the underground reservoir. Logs shall be annotated to identify the estimated location of the base of the deepest USDW, significant aquicludes, and the underground reservoir unless previously submitted in Step 1.

v. An affidavit specifying the source of injected fluids; an analysis of the fluids to be injected and the fluids in the injection zone; and a statement specifying any proposed treatment of the injected fluids;

vi. Proof that the long string of casing of the underground storage well is cemented adequately so that injected gas cannot migrate along the annular space to any USDW. Such proof shall be provided in the form of a cement bond log or the results of a fluid movement study or such other method specified by the Supervisor;

vii. Demonstration of internal and external mechanical integrity;

viii. Forms OGB-6 (if applicable), OGB-7, and OGB-8;

ix. Two (2) copies of all electrical, mechanical, radioactive, and dip-meter logs or such other surveys performed as a part of drilling, completing, or converting the underground storage well unless previously submitted to the Board; and

x. The calculated maximum operating wellhead injection pressure (MOWHIP) necessary to ensure that fractures are not initiated in the confining zone, that injected fluids do not migrate into any USDW, and that formation fluids are not displaced into any USDW.

5. **Permit Approval Procedures**. Applications for underground storage well permits shall be submitted in writing to the Supervisor in accordance with sections 2, 3, and 4 of this rule. Approval to inject gas may be granted by the Supervisor after submittal and consideration of the information required under section (4)(b) of this rule, but not before “Approval to Inject” has been granted by the Board pursuant to Rule 400-8-1-.19;

6. **Expiration of a Permit.** A permit shall expire twelve (12) months from the date of issuance if the permitted well has not been spudded.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.29 Financial Responsibility.

The Board shall ensure that the storage operator submits to the Board a surety bond or bonds sufficient to cover the costs and expenses of the closure of the storage facility. The proceeds of a bond shall be payable to the board by the surety upon order of the Board. The storage operator shall address in its petition to approve the proposed storage operation the sufficiency of the bond or bonds to cover the costs and expenses of the closure of the storage facility.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.30 Injection Well Construction and Completion Standards.

1. The storage operator shall ensure that all injection wells are constructed and completed to prevent movement of the carbon dioxide stream or fluids into underground sources of drinking water or outside the authorized storage reservoir. Further, the storage operator shall ensure that all injection wells are constructed and completed to protect Alabama's natural resources. The injection wells must be constructed and completed in a way that allows the use of appropriate testing devices and workover tools. The casing and cement or other materials used in the construction of each new injection well must be designed for the well's life expectancy. In determining and specifying casing and cementing requirement , all of the following factors must be considered:
   a. Depth to the injection zone;
   b. Injection pressure, external pressure, internal pressure, and axial loading;
   c. Hole size;
   d. Size and grade of all casing strings (wall thickness, external diameter, nominal weight, length, joint specification, and construction material);
   e. Corrosiveness of the carbon dioxide stream and formation fluids;
   f. Down-hole temperatures;
   g. Lithology of injection and confining zone;
   h. Type or grade of cement and cement additives; and

i. Quantity, chemical composition, and temperature of the carbon dioxide stream.

2. Surface casing in all newly drilled carbon dioxide injection and subsurface observation wells drilled below the underground source of drinking water must be set fifty (50) feet below the base of the lowermost underground source of drinking water and cemented.
3. The long string casing in all injection and subsurface observation wells must be cemented. Sufficient cement must be used on the long string casing to fill the annular space behind the casing to the surface and a sufficient number of centralizers shall be used to assure a good cement job. The long string casing must extend to the injection zone.
4. Any liner set in the well bore must be cemented with a sufficient volume of cement to fill the annular space.
5. All cements used in the cementing of casings in injection and subsurface observation well must be of sufficient quality to maintain well integrity in the carbon dioxide injection environment. Circulation of cement may be accomplished by staging. The Board may approve an alternative method of cementing in cases where the cement cannot he recirculated to the surface, provided the storage operator can demonstrate by using logs that the cement does not allow fluid movement behind the well bore.
6. All casings must meet the standards specified in any of the following publications, which are hereby adopted by reference:
   a. The most recent American Petroleum Institute publication on performance properties of casing, tubing and drill pipe;
   b. Specifications for casing and tubing as published by the American Petroleum Institute; or
   c. Other equivalent casing as approved by the Board.
7. All casings used in new wells must be new casing or reconditioned casing of a quality equivalent to new casing and that has been pressure-tested.
8. The location and amount of cement behind casings must be verified by an evaluation method approved by the Board. The evaluation method must be capable of evaluating cement quality radially and identifying the location of channels to ensure that underground sources of drinking water are not endangered.
9. All injection wells must be completed with and injection must be through tubing and packer. In order for the Board to determine and specify requirements for tubing and packer, the storage operator shall submit the following information:
   a. Depth of setting;
   b. Characteristics of the carbon dioxide stream (chemical content, corrosiveness, temperature, and density) and formation fluids;
   c. Maximum proposed injection pressure;
   d. Maximum proposed annular pressure;
   e. Proposed injection rate (intermittent or continuous) and volume and mass of the carbon dioxide stream;
   f. Size of tubing and casing;
   g. Tubing tensile, burst, and collapse strengths; and
   h. Any other information or tests that the Board may require.

10. All tubing strings must meet industry standards. All tubing must be new tubing or reconditioned tubing of a quality equivalent to new tubing and that has been pressure-tested.
11. All wellhead components, including the casinghead and tubing head, valves, and fittings, must be made of steel having operating pressure ratings sufficient to exceed the maximum injection pressures computed at the wellhead and to withstand the corrosive nature of carbon dioxide. Each flow line connected to the wellhead must be equipped with a manually operated positive shutoff valve located on or near the wellhead.
12. All packers, packer elements, or similar equipment critical to the containment of carbon dioxide must be of a quality sufficient to withstand exposure to carbon dioxide.
13. All injection wells must have at all times an accurate, operating pressure gauge or pressure recording device. Gauges must be calibrated as required by the Board and evidence of such calibration must be available to the Board upon request.
14. All newly drilled wells must establish internal and external mechanical integrity and continued mechanical integrity through periodic testing. All other wells to be used as injection wells must demonstrate mechanical integrity prior to use for injection and be tested on an ongoing basis.
    a. Pressure tests. Injection wells, equipped with tubing and packer as required, must be pressure-tested. A testing plan must be submitted to the Board for prior approval. At a minimum, the pressure must be applied to the tubing casing annulus at the surface for a period of thirty minutes and must have no decrease in pressure greater than ten percent of the required minimum test pressure. The packer must be set at a depth at which the packer will be opposite a cemented interval of the long string casing and must be set no more than fifty (50) feet above the uppermost perforation or open hole for the storage reservoirs; and
    b. The Board may require additional testing, such as a bottom hole temperature and pressure measurements, tracer survey, temperature survey, gamma ray log, neutron log, noise log, casing inspection log, or a combination of two or more of these surveys and logs, to demonstrate mechanical integrity.
15. The Board has the authority to witness all mechanical integrity tests conducted by the storage operator.
16. If an injection well fails to demonstrate mechanical integrity by an approved method, the storage operator shall immediately shut in the well, report the failure to the Board, and commence isolation and repair of the leak. The operator shall, within ninety days or as otherwise directed by the Board, perform one of the following:
    a. Repair and retest the well to demonstrate mechanical integrity; or
    b. Properly plug the well.
17. All injection wells must be equipped with shutoff systems designed to alert the operator and shut in wells when necessary.
18. Additional requirements may be required by the Board to address specific circumstances and types of projects.

Author: S. Marvin Rogers

Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.31 Injection Well Mechanical Integrity.

1. An injection well has mechanical integrity if:
   a. There is no significant leak in the casing, tubing, or packer; and
   b. There is no significant fluid movement into an underground source of drinking water through channels adjacent to the well bore.
2. To evaluate the absence of significant leaks, the storage operator shall, following an initial annulus pressure test, continuously monitor injection pressure, rate, injected volumes, pressure on the annulus between tubing and long string casing, and volume.
3. On a schedule determined by the Board, but at least annually, the storage operator shall use one of the following methods to determine the absence of significant fluid movement:
   a. An approved tracer survey; or
   b. A temperature or noise log.
4. If required by the Board, at a frequency specified in the testing and monitoring plan, the storage operator shall run a casing inspection log to determine the presence or absence of corrosion in the long string casing.
5. The Board may require alternative and additional methods to evaluate mechanical integrity. Also, the Board may allow the use of an alternative method to demonstrate mechanical integrity other than those listed above with the written approval of the Board.
6. To conduct and evaluate mechanical integrity, the storage operator shall apply methods and standards generally accepted in the industry. When the storage operator reports the results of mechanical integrity tests to the Board, the storage operator shall include a description of the test and the method used.
7. The Board may require additional or alternative tests if the results presented by the storage operator are not satisfactory to the Board to demonstrate mechanical integrity.
8. If the Board determines that an injection well lacks mechanical integrity pursuant to this section, the Board shall give written notice of its determination to the storage operator. Unless the Board requires immediate cessation of injection, the storage operator shall cease injection into the well within forty-eight hours of receipt of the Board's determination. The Board may allow plugging of the well or require the storage operator to perform such additional construction, operation, monitoring, reporting, and corrective action as is necessary to prevent the movement of fluid into or between underground sources of drinking water caused by the lack of mechanical integrity. The storage operator may resume injection upon written notification from the Board that the storage operator has demonstrated mechanical integrity pursuant to this section.

9. The Board may allow the storage operator of an injection well that lacks mechanical integrity pursuant to this section to continue or resume injection, if the storage operator has made a satisfactory demonstration that there is no movement of fluid into or between underground sources of drinking water.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.32 Injection Well Logging, Sampling, and Testing.

1. During the drilling and construction of an injection well, the storage operator shall run appropriate logs, surveys, and tests to determine or verify the depth, thickness, porosity, permeability, lithology, and salinity of any formation fluids in all relevant geologic formations to ensure conformance with the injection well construction requirements, and to establish accurate baseline data against which future measurements may be compared. The storage operator shall submit to the Board a descriptive report prepared by a log analyst that includes an interpretation of the results of such logs and tests. At a minimum, such Logs and tests must include:
   a. Deviation surveys.
   b. Before and upon installing the surface casing:
      i. Resistivity, spontaneous potential, and caliper logs before the casing is installed; and
      ii. A cement bond and variable density log to evaluate cement quality radially and a temperature log after the casing is set and cemented.
   c. Before and upon installation of the long string casing:
      i. Resistivity, spontaneous potential, porosity, caliper, gamma ray, fracture finder logs, and any other logs the Board requires for the given geology before the casing is installed; and
      ii. A cement bond and variable density log, and a temperature log after the casing is set and cemented.
   d. A series of tests designed to demonstrate the internal and external mechanical integrity of injection wells, which may include:
      i. A pressure test with liquid or gas;
      ii. A tracer survey;
      iii. A temperature or noise Log;
      iv. A casing inspection log; and
   e. Any alternative methods that provide equivalent or better information and that the Board requires or approves.
2. The storage operator shall take whole cores or sidewall cores of the injection zone and confining zone and formation fluid samples from the injection zone, and shall submit to the Board a detailed report prepared by a log analyst that includes well log analyses (including well logs), core analyses, and formation fluid sample information. The Board may accept information on cores from nearby

wells if the storage operator can demonstrate that core retrieval is not possible and that such cores are representative of conditions at the well. The Board may require the storage operator to core other formations in the borehole.

3. The storage operator shall record the fluid temperature, pH, conductivity, reservoir pressure, and static fluid level of the injection zone.
4. At a minimum, the storage operator shall determine or calculate the following information concerning the injection and confining zone:
   a. Fracture pressure;
   b. Other physical and chemical characteristics of the injection and confining zone; and
   c. Physical and chemical characteristics of the formation fluids in the injection zone.
5. Upon completion, but prior to operation, the storage operator shall conduct the following tests to verify hydrogeologic characteristics of the injection zone:
   a. Pressure fall-off test; and
   b. Pump test; or
   c. lnjectivity test.
6. The storage operator shall provide the Board with the opportunity to witness all logging and testing carried out under this section. The storage operator shall submit a schedule of such activities to the Board thirty days prior to conducting the first test and submit any changes to the schedule thirty days prior to the next scheduled test.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.33 Injection Well Operating Requirements.

1. Except during stimulation, the storage operator shall ensure that injection pressure does not exceed ninety percent of the fracture pressure of the injection zone so as to ensure that the injection does not initiate new fractures or propagate existing fractures in the injection zone. Injection pressure must never initiate fractures in the confining zone or cause the movement of injection or formation fluids that endanger an underground source of drinking water. All stimulation programs are subject to the Board 's approval as part of the approval of the storage facility.
2. Injection between the outermost casing protecting underground sources of drinking water and the well bore is prohibited.
3. The storage operator shall fill the annulus between the tubing and the long string casing with a noncorrosive fluid approved by the Board. The storage operator shall maintain on the annulus a pressure that exceeds the operating injection pressure, unless the Board determines that such requirement might harm the integrity of the well or endanger underground sources of drinking water.

4. Other than during periods approved by the Board in which the sealed tubing-casing annulus is disassembled for maintenance or corrective procedures, the storage operator shall maintain mechanical integrity of the injection well at all times.
5. The storage operator shall install and use the following monitoring equipment:
   a. Continuous recording devices to monitor the injection pressure; the rate, volume or mass, and temperature of the carbon dioxide stream; and the pressure on the annulus between the tubing and the long string casing and annulus fluid volume; and
   b. Alarms and automatic surface shutoff systems or, at the discretion of the Board, down-hole shutoff systems (e.g., automatic shutoff, check valves) or other mechanical devices that provide equivalent protection that are designed to alert the operator and shut-in the well when operating parameters diverge beyond permitted ranges or gradients specified in the permit.
6. If a shutdown (down-hole or at the surface) is triggered or a loss of mechanical integrity is discovered, the storage operator shall immediately investigate and identify the cause as expeditiously as possible. If, upon such investigation, the well appears to be lacking mechanical integrity, or if monitoring required under section 5 of this rule indicates that the well may lack mechanical integrity, the storage operator shall:
   a. Immediately cease injection;
   b. 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;
   c. Notify the Board within twenty-four hours;
   d. Restore and demonstrate mechanical integrity to the satisfaction of the Board prior to resuming injection; and
   e. Notify the Board when injection can be expected to resume.
7. If any monitoring indicates the movement of injection or formation fluids into underground sources of drinking water, the Board shall prescribe such additional requirements for construction, corrective action, operation, monitoring, or reporting as are necessary to prevent such movement. These additional requirements must be imposed by modifying or terminating the approval of the storage facility if the Board determines that cause exists, or appropriate enforcement action may be taken if the storage facility plan has been violated.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.34 Injection Well Testing and Monitoring Requirements.

The storage operator shall prepare, maintain, and comply with a testing and monitoring plan to verify that the geologic sequestration project is operating as approved and is not endangering underground sources of

drinking water or natural resources. The plan must be submitted with the petition to approve the storage facility and must include a description of how the storage operator will meet the requirements of this section, including accessing sites for all necessary monitoring and testing during the life of the project.

1. The testing and monitoring plan must include:
    a. Analysis of the carbon dioxide stream in compliance with applicable analytical methods and standards generally accepted by industry and with sufficient frequency to yield data representative of its chemical and physical characteristics;
    b. Installation and use, except during well workovers, of continuous recording devices to monitor injection pressure, rate, and volume; the pressure on the annulus between the tubing and the long string casing; and the annulus fluid volume added;
    c. Corrosion monitoring of the well materials for loss of mass, thickness, cracking, pitting, and other signs of corrosion, which must be performed on a quarterly basis to ensure that the well components meet the minimum standards for material strength and performance by:
        i. Analyzing coupons of the well construction materials placed in contact with the carbon dioxide stream;
        ii. Routing the carbon dioxide stream through a loop constructed with the material used in the well and inspecting the materials in the loop; or
        iii. Using an alternative method approved by the Board;
    d. Periodic monitoring of the ground water quality and geochemical changes above the confining zone that may be a result of carbon dioxide movement through the confining zone or additional identified zones, including:
        i. The location and number of subsurface observation wells based on specific information about the geologic sequestration project, including injection rate and volume, geology, the presence of artificial penetrations, and other factors; and
        ii. The monitoring frequency and spatial distribution of subsurface observation wells based on baseline geochemical data and on any modeling results in the area of review evaluation.
    e. A demonstration of external mechanical integrity at least once per year until the injection well is plugged; and, if required by the Board, a casing inspection log at a frequency established in the testing and monitoring plan;
    f. A pressure fall-off test at least once every five years unless more frequent testing is required by the Board based on site-specific information;
    g. Testing and monitoring to track the extent of the carbon dioxide plume and the presence or absence of elevated pressure (e.g., the pressure front) by using:
        i. Direct methods in the injection zone; and
        ii. Indirect methods (e.g., seismic, electrical, gravity, interferometric synthetic aperture radar or electromagnetic surveys and down-hole carbon dioxide detection tools), unless the Board determines, based on

site specific geology, that such methods are not appropriate;

h. The Board may require surface air monitoring and soil gas monitoring to detect movement of carbon dioxide that could endanger an underground source of drinking water. Regarding these requirements:
    i. Design of surface air and soil gas monitoring must be based on potential risks to underground sources of drinking water within the area of review;
    ii. The monitoring frequency and spatial distribution of surface air monitoring and soil gas monitoring must be based on using baseline data, and the monitoring plan must describe how the proposed monitoring will yield useful information on the area of review; and
    iii. Surface air monitoring and soil gas monitoring methods are subject to the Board's approval;
i. Any additional monitoring, as required by the Board, necessary to support, upgrade, and improve computational modeling of the area of review evaluation;
j. Periodic reviews of the testing and monitoring plan by the storage operator to incorporate monitoring data collected, operational data collected, and the most recent area of review reevaluation performed. The storage operator shall review the testing and monitoring plan at least once every five years. Based on this review, the storage operator shall submit an amended testing and monitoring plan or demonstrate to the Board that no amendment to the testing and monitoring plan is needed. Any amendments to the testing and monitoring plan are subject to the Board's approval, must be incorporated into the permit, and are subject to the permit modification requirements. Amended plans or demonstrations must be submitted to the Board as follows:
    i. Within one (1) year of the reevaluation;
    ii. Following any significant changes to the facility, such as addition of subsurface observation wells or newly permitted injection wells within the storage facility area or the area of review, on a schedule determined by the Board; or
    iii. When required by the Board; and
k. A quality assurance and surveillance plan for all testing and monitoring requirements.

2. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
3. Records of monitoring information shall include:
    a. The date, exact place, and time of sampling or measurements;
    b. The individual who performed the sampling or measurements;
    c. The date analyses were performed;
    d. The individual who performed the analyses;
    e. The analytical techniques or methods used; and
    f. The results of such analyses.
4. All well permits issued by the Board shall specify:
    a. Requirements concerning the proper use, maintenance, and installation, when appropriate, of monitoring equipment or

methods, including biological monitoring methods when appropriate;
   b. Required monitoring, including type, intervals, and frequency sufficient to yield data, which are representative of the monitored activity, including when appropriate, continuous monitoring; and
   c. Applicable reporting requirements based upon the impact of the regulated activity and as specified throughout this chapter. .

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.35 Monitoring of Seismicity.
The storage operator shall prepare, maintain, and comply with a monitoring plan to monitor the seismicity throughout the storage facility area. The seismicity plan shall be submitted with the petition to approve the storage facility.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.36 Injection Well Plugging.
1. Prior to the well plugging, the storage operator shall flush each injection well with a buffer fluid, determine bottom hole reservoir pressure, and perform a final external mechanical integrity test.
2. The storage operator shall prepare, maintain, and comply with a plugging plan that is approved by the Board. The well plugging plan shall be submitted as part of the petition for approval of the storage facility and shall include the following:
   a. Appropriate tests or measures for determining bottom hole reservoir pressure;
   b. Appropriate testing methods to ensure external mechanical integrity;
   c. The type and number of plugs to be used;
   d. The placement of each plug, including the elevation of the top and bottom of each plug;
   e. The type, grade, and quantity of material to be used in plugging. The material must be compatible with the carbon dioxide stream; and
   f. The method of placement of the plugs.
3. The storage operator shall notify the Board in writing, at least sixty days before plugging a well. Any proposed amendments to the plugging plan are subject to the Board's approval after notice and hearing.

4. Within thirty days after plugging, the storage operator shall submit a plugging report to the Board. The report must be certified as accurate by the storage operator.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.37 Modification, Revocation, and Reissuance or Termination of Orders Approving a Storage Facility.

Orders by the Board approving a storage facility are subject to review by the Board. Any interested person (e.g., the storage operator, local governments having jurisdiction over land within the area of review, and any person who has suffered or will suffer actual injury or economic damage) may petition the Board to review the storage facility approved by the Board for one of the reasons set forth below. All requests must be in writing and must contain facts or reasons supporting the request. If the Board determines that the request may have merit, the Board may, after notice and hearing, review the approval of the storage facility, the storage facility area. The Board may modify the storage facility, the plan for the storage facility, the area of review, or make such orders as the Board deems appropriate, including revoking the approval of the storage facility. The Board may at any time, particularly in considering a petition for reevaluation, enact the following:

1. Changes to the storage facility area.
2. Changes to the area of review.
3. Injecting into a reservoir not specified in the Board order.
4. Any increase greater than the permitted carbon dioxide storage volume.
5. Changes in the chemical composition of the carbon dioxide stream;
6. Amendment to the testing and monitoring plan.
7. Amendment to the injection well plugging plan.
8. Amendment to the post-injection site care and facility closure plan.
9. Amendment to the emergency and remedial response plan.
10. Review of monitoring and testing results conducted m accordance with injection well permit requirements;

If the Board at any time receives information that was not available at the time of the hearing on the petition for the storage facility, the Board may modify orders of the Board.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.38 Minor Modifications to the Plan of Storage Operations.

With approval of the Supervisor, upon the written request by the storage operator, the Supervisor may modify a plan for storage operations to make the corrections of minor modifications. Minor modifications may include:

1. Correct typographical errors;
2. Require more frequent monitoring or reporting by the storage operator;
3. Change an interim compliance date in a schedule of compliance; or
4. Change quantities or types of fluids injected which are within the capacity of the storage facility and, in the judgment of the Board, would not interfere with the operation of the facility.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.39 Emergency and Remedial Response Plan; Worker Safety Plan.

The storage operator shall include in its petition for approval of the storage facility an emergency and remedial response plan and a plan for worker safety. The plan must include, among other things, a list of contractors and vendors capable of addressing remedial work at the storage facility. Upon approval of the petition, the storage operator shall implement the emergency and remedial response plan and the plan for worker safety plan. This emergency and remedial response plan must include adequate emergency response and security procedures. The plan, including any revisions of the list of contractors and vendors, must be updated as necessary or as the Board requires. Copies of the plans must be available at the storage facility and at the storage operator's nearest operational office.

1. The emergency and remedial response plan requires a description of the actions the storage operator shall take to address movement of the injection or formation fluids that may endanger an underground source of drinking water or natural resources during construction, operation, and post-injection site care periods. The plan must also include:
   a. The safety procedures concerning the facility and residential, commercial, and public land use within one mile, or any other distance set by the Board, of the outside boundary of the facility area;
   b. Contingency plans for addressing carbon dioxide leaks from any well, flow lines, or other facility, and loss of containment from the storage reservoir, and identify specific contractors and equipment vendors capable of providing necessary services and equipment to respond to such leaks or loss of containment; and

c. A list of contractors and vendors capable of addressing remedial work at the storage facility.

2. If the storage operator obtains evidence that the injected carbon dioxide stream and associated pressure front may endanger an underground source of drinking water or natural resources, the storage operator shall:
   a. Immediately cease injection;
   b. Take all steps reasonably necessary to identify and characterize any release;
   c. Notify the Board within twenty-four hours; and
   d. Implement the emergency and remedial response plan approved by the Board.
3. The Board may allow the operator to resume injection prior to remediation if the storage operator demonstrates that the injection operation will not endanger underground sources of drinking water or natural resources.
4. The storage operator shall review annually the emergency and remedial response plan developed under section 1 of this rule. Further, the storage operator shall submit to the Board by the end of each calendar year a written review of the status of the emergency and remedial response plan and the plan for worker safety. In this review, the storage operator shall include amended plans, if necessary, or a statement to the Board that no amendment to the plans are needed. Any amendments to the plans are subject to the Board 's approval, must be incorporated into the storage facility order of approval. The written review of the status of the plans shall be submitted to the Board as follows:
   a. Annually by the end of the calendar year;
   b. With any petition for reevaluation;
   c. Following any significant changes to the facility, such as addition of injection or subsurface observation wells, on a schedule determined by the Board; or
   d. As required by the Board.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.40 Leak Detection and Reporting.

1. Leak detectors or other approved leak detection equipment must be placed at the wellhead of all injection wells. Leak detectors must be integrated, where applicable, with automated warning systems and must be inspected and tested on a semiannual basis and, if defective, shall be repaired or replaced within ten days. Each repaired or replaced detector must be retested as required by the Board. An extension of time for repair or replacement of a leak detector may be granted upon a showing of good cause by the storage operator. A record of each inspection must be maintained by the operator for at least ten years, and must be made available to the Board.

2. The storage operator shall immediately report to the Board any leak detected at any well or surface facility.
3. The storage operator shall immediately report to the Board any pressure changes or other monitoring data from subsurface observation wells that indicate the presence of leaks in the storage reservoir.
4. The storage operator shall immediately report to the Board any other indication that the storage facility is not containing carbon dioxide, whether the lack of containment concerns the storage reservoir, surface equipment, or any other aspect of the storage facility.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.41 Storage Facility Corrosion Monitoring and Prevention.

The storage operator shall conduct a corrosion monitoring and prevention program approved by the Board.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.42 Storage Facility Identification Requirements.

Identification signs shall be placed at each storage facility in a centralized location and at each well site. The signs identifying the storage facility shall show the name of the operator, the facility name, the emergency response number to contact the operator and contact information for the Board. Identification signs shall also be placed at each well in the storage facility. The well signs shall be posted and maintained in a legible state in a conspicuous place near the well. Such well signs shall be posted before spudding or reentry and shall remain posted until the well is plugged and abandoned and the location restored. Each well sign shall include the name of the operator, the permit number, the well name and number, and the section, township, range, and county in which the well is located.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.43 Stratigraphic Test Well.

1. Any company or individual proposing to drill a stratigraphic test well to obtain cores or other geologic information and data related to a proposed or current carbon dioxide storage operation shall obtain a well permit from the Board prior to commencing drilling operations.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.44 Storage Facility Fees.

1. The storage operator shall pay the Board a fee of Three Cents ($0.03) on each ton of carbon dioxide injected for storage, which shall be deposited into the State Oil and Gas Board Geologic Storage of Carbon Dioxide Administrative Fund, authorized by Section 9-17-163 of the *Code of Alabama* (1975), as amended, to be utilized by the Board for the Board's administrative services and regulatory duties for storage of carbon dioxide. The storage operator shall pay this fee to the State Oil and Gas Board of

Alabama quarterly by the 15th of the month following end of quarter.

2. The storage operator shall pay the Board a fee of Four Cents ($0.04) on each ton of carbon dioxide injected for storage which shall be deposited into the State Oil and Gas Board Geologic Storage of Carbon Dioxide Trust Fund, authorized by Section 9-17-163 of the *Code of Alabama* (1975), as amended, to be used by the Board for certain costs associated with geologic sequestration sites within this state pursuant to Rule 400-8-1-.56. The storage operator shall pay this fee to the State Oil and Gas Board of Alabama quarterly by the 15th of the month following end of quarter.
3. The storage operator shall pay the Board a filing fee for a petition to approve a storage facility in the amount of One Hundred Thousand Dollars ($100,000.00), pursuant to Rule 400-8-1-.15.
4. The storage operator shall pay a filing fee of Fifteen Thousand Dollars ($15,000.00) for a petition to reevaluate the storage facility, pursuant to Rule 400-8-1-.24.
5. A storage operator shall pay a filing fee of Fifteen Thousand Dollars ($15,000.00) for a request for Change of Operator, pursuant to Rule 400-8-1-.25.
6. The storage operator shall pay a filing fee of Fifteen Thousand Dollars ($15,000.00) for a petition for approval to inject, pursuant to Rule 400-8-1-.18.
7. The storage operator shall pay a fee of Three Thousand Dollars ($3,000.00) for each permit to drill an injection well, pursuant to Rule 400-8-1-.28. The storage operator shall pay a fee of One Thousand Dollars ($1,000.00) for each permit to drill a subsurface observation well, pursuant to Rule 400-8-1-.28. The applicant for a stratigraphic test well permit shall pay a fee of One Thousand Dollars ($1,000.00), pursuant to Rule 400-8-1-.28.
8. The storage operator shall pay a fee of One Thousand Dollars ($1,000.00) for each petition for temporary abandoned status, pursuant to Rule 400-8-1-.53.
9. A storage operator shall pay a filing fee of Fifteen Thousand Dollars ($15,000.00) for a petition to approve a Post-Injection Site Care and Facility Closure Plan, pursuant to Rule 400-8-1-.54.
10. A storage operator shall pay a filing fee of Fifteen Thousand Dollars ($15,000.00) for a petition for approval of the facility closure and final assessment, pursuant to Rule 400-8-1-.55.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.45 Reporting Requirements.

1. The storage operator shall file with the Board all reports, submittals, notifications, and any other information that the Board requires.

2. The storage operator shall give notice to the Board as soon as possible of any planned physical alterations or additions to the permitted storage facility or any other planned changes in the permitted storage facility or activity which may result in noncompliance with permit requirements.
3. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than thirty days following each schedule date.
4. The storage operator shall file with the Board quarterly, or more frequently if the Board requires, a report on the volume of carbon dioxide injected into or withdrawn since the last report, the average injection rate, average composition of the carbon dioxide stream, wellhead and down-hole temperature and pressure data or calculations, or other pertinent operational parameters as required by the Board.
5. The storage operator shall submit copies of all required report, submittals, and notifications sent to the United States Environmental Protection Agency to the Board.
6. The quarterly report is due thirty days after the end of the quarter. The report must:
    a. Describe any changes to the physical, chemical, and other relevant characteristics of the carbon dioxide stream from the proposed operating data;
    b. State the monthly average, maximum, and minimum values for injection pressure, flow rate and volume, and annular pressure;
    c. Describe any event that exceeds operating parameters for annulus pressure or injection pressure specified in the permit;
    d. Describe any event which triggers a shutoff device and the response by the storage operator.
    e. State the monthly volume and mass of the carbon dioxide stream injected over the reporting period and the volume injected cumulatively over the life of the project to date;
    f. State the monthly annulus fluid volume added; and
    g. State the results of monitoring.
7. The storage operator shall file with the Board an annual report that summarizes the quarterly reports and that provides updated projections of the response and storage capacity of the storage reservoir. The projections must be based on actual reservoir operational experience, including all new geologic data and information. All anomalies in predicted behavior as indicated in permit conditions or in the assumptions upon which the permit was issued must be explained. The annual report is due forty-five days after the end of the year.
8. The storage operator shall report, within thirty days, the results of:
    a. Periodic tests of mechanical integrity;
    b. Any well workover; and
    c. Any other test of the injection well conducted by the storage operator if required by the Board.

9. The storage operator shall report the following, within twenty-four hours:
    a. Any evidence that the injected carbon dioxide stream or associated pressure front may cause an endangerment to an underground source of drinking water;
    b. Any noncompliance which may endanger health and safety of persons or cause pollution of the environment, including:
        i. Any monitoring or other information which indicates that any contaminant may cause an endangerment to underground sources of drinking water; or
        ii. Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between underground sources of drinking water shall be provided verbally within twenty-four hours from the time the storage operator becomes aware of the circumstances. A written submission shall also be provided within five days of the time the storage operator 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.
    c. Any triggering of a shutoff system (e.g., down-hole or at the surface);
    d. Any failure to maintain mechanical integrity; or
    e. Any release of carbon dioxide to the atmosphere.
10. The storage operator shall notify the Board in writing thirty days in advance of:
    a. Any planned well workover;
    b. Any planned stimulation activities, other than stimulation for formation testing conducted;
    c. Any other planned test of the injection well conducted by the storage operator; and
    d. The conversion or abandonment of any well used or proposed to be used in a geologic storage operation.
11. The storage operator shall retain the following records until project completion:
    a. All data collected for the applications of the storage facility permit, injection well permit, and operation of injection well permit;
    b. Data on the nature and composition of all injected fluids collected. and
    c. All records from the closure period, including well plugging reports, post-injection site care data, and the final assessment.
    d. Upon project completion, the storage operator shall deliver any records required to the Board.
12. The storage operator shall retain the following records for a period of at least ten years from the date of the sample, measurement, or report:
    a. Monitoring data collected, and

b. Calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, and copies of all reports required by the storage facility permit.
c. This period may be extended by request of the Board at any time.

13. The storage operator shall report all instances of noncompliance under this section relating to reporting.
14. The storage operator shall report all releases of carbon dioxide.
15. When the storage operator becomes aware that it failed to submit any relevant facts or submitted incorrect information in a permit application or in any report to the Board, such facts or information shall be promptly submitted to the Board. Failure to do so may result in revocation of the approval of the storage facility, depending on the nature of the information withheld.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.46 Determining Storage Amounts.
The storage operator shall determine the amount of injected carbon dioxide stored in a reservoir that has been or is being used for an enhanced oil or gas recovery project or in a storage reservoir that has been or is being used for storage under order of the Board.
Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.47 Well Status Report.
A status or progress report of operations being performed in association with well activities shall be reported orally or in writing to the appropriate Board office by 10:00 a.m. on the first working day of each week.
Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.48 Notification of Activities.

1. Notification Prior to Performance of Activity. A storage operator shall notify the Supervisor prior to performing any of the following activities:
   a. Setting surface casing;
   b. Running intermediate or production casing;

c. Perforating;
d. Drillstem testing;
e. Wireline logging or surveying;
f. Coring;
g. Pressure testing;
h. Cleaning tanks; and
i. Initiating a gathering line construction operation.

2. Witness of Activities. The Supervisor may send a duly authorized representative to the location to witness activities in section 1 of this rule.

3. Notification Subsequent to Occurrence of Activity. An operator shall notify the Supervisor when the following occurs:
a. Loss of a radioactive logging source;
b. Encountering unexpected wellbore conditions during recompletion or reworking;
c. Repairing or replacing damaged gathering lines; and
d. Fire, spill, leak, or blow out.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.49 Approval of Activities.

1. A storage operator shall obtain approval of the Supervisor for:
a. Initiating drilling, converting, or reentering a well;
b. Deepening;
c. Directionally drilling or sidetracking;
d. Plan of abandonment of a radioactive logging source;
e. Plan of operation for reentering, converting, recompleting, or reworking a well containing a radioactive logging source;
f. Radioactive surveys;
g. Chemical treatment or fracturing;
h. Construction of any pit;
i. Disposal of pit fluids;
j. Plugging and abandonment;
k. Restoration of location;
l. Recompletion or reworking;
m. Construction and operation of gathering lines;
n. Modifications to gathering lines;
o. Repairing or replacing damaged sour flowlines or sour gathering lines;
p. Transportation of wastes; and
q. Modification of transportation of wastes procedures.

2. Witness of Activities. The Supervisor may send a duly authorized representative to the location to witness activities in item 1 above.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.50 Well Record.

1. During drilling, completing, and workover operations on every permitted well, the owner, operator, contractor, driller, or other person responsible for the conduct of drilling operations, shall notify the Supervisor prior to performing the following activities: setting surface casing, running intermediate or production casing, perforating, drillstem testing, wireline logging or surveying, and coring. Such persons shall keep a detailed and accurate record of the well, reduced to writing from day to day, which shall be accessible to the Board and its agents at all times. Pertinent information from such records shall be furnished to the Board within thirty (30) days after completion, or at such time as prescribed by the Supervisor. Said information shall include, but not be limited to: drilling contractor; spud date; ground level, derrick floor, and kelly bushing elevations surveyed by a licensed land surveyor; total depth; kick-off point depths and directions of any sidetracks; bottom-hole location; casing and liner record; cement record; squeeze cement record; perforation record; tubing record; the depth and type of any plugs or packers set; well stimulation and treatment record; drillstem test record; and a record of all wireline logging, sampling, and coring operations for said well. This information shall be submitted on the appropriate **Forms OGB-6, OGB-7, and OGB-8.**
2. One (1) copy of all electrical, mechanical, radioactive, and dipmeter logs or such other surveys performed as a part of drilling, completing, or workover operations shall be submitted to the Board within thirty (30) days after completion. In addition to filing either blue or black line log copies, all available digital log data in a Log ASCII Standard (LAS) format shall be filed with the Board. One (1) copy of all drillstem test results shall be submitted along with **Form OGB-7** within thirty (30) days after completion. A complete set of washed (mud-logger) cuttings, if available, correctly labeled and identified as to depth, shall be filed with the Board within thirty (30) days from the time of completion of any well unless otherwise approved by the Supervisor. If cores are taken, a complete set of cores, either whole or at least quarter slabs, correctly labeled and identified as to depth, shall be filed with the Board within three (3) months from the time of completion of any well unless otherwise approved by the Supervisor.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.51 Forms.

In addition to **Form OGB-1 CO2**, Application for Permit to Inject Storage Gas, required pursuant to Rule 400-8-1-28, the Supervisor may prepare and utilize such forms as the Supervisor deems appropriate for the proper administration of these rules and regulations.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.52 Directional Surveys.

If required by this rule, a directional survey, which may include logging while drilling (LWD) or measurement while drilling (MWD) logs, shall be run and one (1) copy thereof filed by the operator with the Supervisor within thirty (30) days after completion of a well. Directional surveys shall be run from total depth to base of surface casing or the kickoff point, whichever is shallowest, unless otherwise approved by the Supervisor. However, directional surveys to total depth shall be unnecessary in cases where the interval below the survey is less than five hundred (500) feet. In such an instance, a projection of the latest survey shall satisfy Board requirements. Directional surveys shall be run when:

1. The well is directionally controlled and is thereby intentionally deflected from the vertical; or
2. The well is drilled to a measured depth of six thousand (6,000) feet or greater; or
3. A well is expected to penetrate pore pressure gradients greater than sixty-seven (67) pounds per square inch (psi) per one hundred (100) feet (ft) in depth or 0.67 psi/ft; or
4. A well penetrates or is expected to penetrate intervals containing hydrogen sulfide, such surveys to be run within five hundred (500) feet of entering such hydrogen sulfide bearing formation; or
5. The well is drilled as an exceptional location and such directional survey is ordered by the Board.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.53 Abandonment of Wells.

1. Notwithstanding the definition of abandoned well, the removal of injection equipment or the failure to operate an injection well

for one year constitutes abandonment of the well. An abandoned well must be plugged in accordance with the plugging plan and the well site must be restored and reclaimed.

2. On written request by the storage facility operator, the Board may grant a one-year temporarily abandoned status. This status may only be given to wells that are to be used for purposes related to the geologic storage of carbon dioxide. In order for temporarily abandoned status to be approved, the Board may require that the well's perforations have been isolated, the well's casing has integrity, and the casing is sealed at the surface, all in a manner approved by the Board. The Board may extend a well's temporarily abandoned status beyond one year only after notice and hearing on a petition. The storage operator shall pay a filing fee of One Thousand Dollars ($1,000.00) for each request or petition for temporarily abandoned status.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.54 Post-Injection Site Care and Facility Closure Plan.

The Board may at any time by a motion by the Board during the operation of the facility require the operator at a hearing to present, discuss or review the post-injection site care and facility closure plan. Prior to the actual closure of the facility, the storage operator shall file a post-injection site care and facility closure plan. The storage operator shall pay a fee to the Board in the amount of Fifteen Thousand Dollars ($15,000.00) for a petition to approve a post-injection site care and facility closure plan.

1. In support of the petition, the storage operator shall submit the following information:
   a. The pressure differential between pre-injection and predicted post-injection pressures in the injection zone;
   b. The predicted position of the carbon dioxide plume and associated pressure front at cessation of injection;
   c. A description of post-injection monitoring location, methods, and proposed frequency;
   d. A schedule for submitting post-injection site care monitoring results to the Board; and
   e. The duration of the post-injection site care monitoring timeframe that ensures nonendangerment of underground sources of drinking water.
2. The storage operator shall specify in the post-injection site care and facility closure plan the wells that will be plugged and the wells that will remain unplugged to be used as subsurface observation wells. Subsurface observation and ground water subsurface observation wells as approved in the plan must remain in place for continued monitoring during the closure and post-closure periods.

3. Upon cessation of injection, the storage operator shall either submit an amended post-injection site care and facility closure plan or demonstrate to the Board through monitoring data and modeling results that no amendment to the plan is needed. Any amendments to the post-injection site care and facility closure plan are subject to the Board 's approval.
4. Upon cessation of injection, all wells not associated with monitoring must be properly plugged and abandoned in a manner which will not allow movement of injection or formation fluids that endanger underground sources of drinking water or natural resources. All storage facility equipment, appurtenances, and structures not associated with monitoring must be removed. Following well plugging and removal of all surface equipment, the surface must be reclaimed to the Board's specifications that will, in general, return the land as closely as practicable to original condition.
5. The well casing must be cut off at a depth of five (5) feet below the surface and a steel plate welded on top identifying the well name and stating that it was used for carbon dioxide storage.
6. The Board shall develop in conjunction with the storage operator a continuing monitoring plan for the post-closure period, including a review and final approval of wells to be plugged.
7. The storage operator shall continue to conduct monitoring during the closure period as specified in the post-injection site care and facility closure plan.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: New Rule: Published _____; effective _____.

400-8-1-.55 Petition for Approval of the Facility Closure Final Assessment.

Within ninety days of completing all post-injection site care and facility closure requirements, the storage operator shall petition the Board for approval of the closure of the storage facility and shall submit a final assessment to the Board. The storage operator shall pay a fee to the Board in the amount of Fifteen Thousand Dollars ($15,000.00) for the petition.

1. In support of the petition, the storage operator must submit:
    a. The results of computational modeling performed pursuant to delineation of the area of review;
    b. The predicted timeframe for pressure decline within the injection zone, and any other zones, such that formation fluids may not be forced into any underground sources of drinking water or the timeframe for pressure decline to pre-injection pressures;
    c. The predicted rate of carbon dioxide plume migration within the injection zone and the predicted timeframe for the cessation of migration;
    d. A description of the site-specific processes that will result in carbon dioxide trapping, including immobilization by

capillary trapping, dissolution, and mineralization at the site;

e. The predicted rate of carbon dioxide trapping in the immobile capillary phase, dissolved phase, or mineral phase;
f. The results of relevant laboratory analyses, research studies, or field or site-specific studies.
g. A characterization of the confining zone, including a demonstration that it is free of transmissive faults, fractures, and microfractures, and an evaluation of thickness, permeability, and integrity to impede fluid (e.g., carbon dioxide, formation fluids) movement;
h. The presence of potential conduits for fluid movement, including planned injection wells and project subsurface observation wells associated with the proposed geologic sequestration project;
i. A description of the well construction and an assessment of the quality of plugs of all abandoned wells within the storage facility area and the area of review;
j. The distance between the injection zone and the nearest underground source of drinking water above and below the injection zone; and
k. An assessment of the operations conducted during the operational period, including the volumes injected, volumes extracted, all chemical analyses conducted, and a summary of all monitoring efforts.
l. The report must also document the stored carbon dioxide's location and characteristics and predict how it might move during the post-closure period;
m. Any additional factors specific to the particular site that the Board may require.

2. Information submitted to support the petition shall comply with the following criteria:
    a. All analyses and tests for the final assessment must be accurate, reproducible, and performed in accordance with the established quality assurance standards. An approved quality assurance and quality control plan must address all aspects of the final assessment;
    b. Estimation techniques must be appropriate and test protocols certified by the United States Environmental Protection Agency must be used where available;
    c. Predictive models must be appropriate and tailored to the site conditions, composition of the carbon dioxide stream, and injection and site conditions over the life of the geologic sequestration project;
    d. Predictive models must be calibrated using existing information when sufficient data are available;
    e. Reasonably conservative values and modeling assumptions must be used and disclosed to the Board whenever values are estimated on the basis of known, historical information instead of site-specific measurements;
    f. An analysis must be performed to identify and assess aspects of the post-injection monitoring timeframe demonstration that contribute significantly to uncertainty. The storage operator shall conduct

sensitivity analyses to determine the effect that significant uncertainty may contribute to the modeling demonstration; and

g. Any additional criteria required by the Board.

3. At the time of the closing, the storage operator shall record a plat of the storage facility certified by a registered surveyor in the Office of the Judge of Probate in the county where the storage facility lies. The storage operator shall also submit a copy of the plat to the United States Environmental Protection Agency regional administrator office.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.56 Certificate of Project Closing and Completion.
Once it is demonstrated that underground sources of drinking water and natural resources are no longer endangered, pursuant to Section 9-17-164 of the *Code of Alabama* (1975), as amended, the storage operator may petition the Board for a certificate of project completion for the storage facility.

1. Upon all carbon dioxide injections into a storage facility ending and upon the filing of a petition by a storage facility operator, the Board may issue a certificate of project closure and completion for the storage facility.
2. A certificate of project closure and completion shall only be issued after all of the following have been satisfied:
   a. Notice and a public hearing on the issuance of the certificate are provided.
   b. The Board has consulted with the Alabama Department of Environmental Management regarding issuing the certificate.
   c. Ten or more years have passed from the date carbon dioxide injection into the storage facility ended.
   d. The storage operator has demonstrated all of the following to the satisfaction of the Board:
      i. The storage facility is in full compliance with all governing laws and rules.
      ii. The storage facility is reasonably expected to retain the carbon dioxide.
      iii. The carbon dioxide in the storage facility is stable. For purposes of this paragraph, carbon dioxide is stable if it is essentially stationary or, if it is migrating or may migrate, migration is unlikely to cross the underground reservoir boundary and is not expected to endanger any underground source of drinking water.
      iv. All wells, equipment, and facilities to be used in the post-closure period are in good condition and retain mechanical integrity.
      v. All injection wells have been plugged, all related equipment and facilities used during the pre-closure period not necessary for long-term monitoring have been

removed, and all reclamation work required by the Board has been completed.

3. Upon the issuance of a certificate of project closure and completion, all of the following shall occur:
   a. Title to equipment and facilities necessary for long-term monitoring and all carbon dioxide injected into the storage facility, without payment of any compensation, shall transfer to the state. Title acquired by the state includes all rights and interests in, and all responsibilities and liabilities associated with, all equipment and facilities used for long-term monitoring and the stored carbon dioxide within the storage facility. A storage operator may not transfer to the state, and the state may not accept, any property interests or rights that the storage operator does not own or have the authority to transfer.
   b. The storage operator and all persons that generated any injected carbon dioxide shall be released from all regulatory requirements associated with the storage facility.
   c. The storage operator shall be released from all bonds and other security posted by the storage operator.
   d. Monitoring and managing the storage facility shall become the responsibility of the state and be administered by the Board unless an agency of the federal government assumes responsibility for the long-term monitoring and management of the storage facility.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

400-8-1-.57 Liability and Responsibility to Close, Clean up, and Restore Storage Facility and Site.

If at the closure of the storage facility, the funds from the surety or other financial protections are insufficient to close, clean up, and restore the site of the facility, then the storage operator shall be responsible to the Board to pay the cost of the closure and clean up.

Author: S. Marvin Rogers
Statutory Authority: 9-17-150 et seq. of the Code of Alabama (1975)
History: **New Rule:** Published _____; effective _____.

APA-6

ECONOMIC IMPACT STATEMENT
FOR APA RULE
(Section 41-22-23(f))

Control No:	400
Department or Agency:	Oil & Gas Board / Geologic Storage of Carbon Dioxide
Rule No:	Chapter 400-8-1
Rule Title:	General
Intended Action:	New

_____ This rule has no economic impact.

Yes This rule has an economic impact, as explained below:

1. **NEED/EXPECTED BENEFIT OF RULE:**

The implementation of the rule will provide for a new industry for our State and regulate that industry in a manner that insures the protection of the health and safety of Alabama's citizens and of the environment. Presently no businesses operate a carbon dioxide storage facility. We expect several businesses to engage in the business of underground storage of carbon dioxide after this rule becomes effective. Only businesses that choose to engage voluntarily in the business of underground storage of carbon dioxide will participate in this new industry. The rule will benefit the environment by reducing the carbon dioxide emissions in Alabama. The rule will also benefit citizens of the state through industry payment for leases, royalties, goods and services, etc., as well as providing well-paying jobs.

2. **COSTS/BENEFITS OF RULE AND WHY RULES IS THE MOST EFFECTIVE, EFFICIENT, AND FEASIBLE MEANS FOR ALLOCATING RESOURCES AND ACHIEVING THE STATED PURPOSE:**

The implementation of the rule will provide for the safe and effective storage of carbon dioxide. The rule provides for a reasonable, logical, and rational means to protect Alabama citizens, the environment, and Alabama's natural resources. The rule was drafted by trained and experienced engineers, geologists, and lawyers familiar with this type of business enterprise.

3. **EFFECT OF THIS RULE ON COMPETITION:**

The implementation of the rule will provide for a new industry for our State. We expect several businesses to engage competitively in the underground storage of carbon dioxide. No one business is put at a competitive advantage over another.

4. **EFFECT OF THIS RULE ON COST-OF-LIVING AND DOING BUSINESS IN THE GEOGRAPHICAL AREA WHERE THE RULE IS TO BE IMPLEMENTED:**

The business of underground storage of carbon dioxide will have no effect on the cost-of-living. This will be a new business in any area where the business is operated.

5. **EFFECT OF THIS RULE ON EMPLOYMENT IN THE GEOGRAPHICAL AREA WHERE THE RULE IS TO BE IMPLEMENTED:**

This rule will provide for some additional employment in the area where businesses engage in the underground storage of carbon dioxide.

6. **SOURCE OF REVENUE TO BE USED FOR IMPLEMENTING AND ENFORCING THIS RULE:**

The Legislature provides general fund revenue to the State Oil and Gas Board of Alabama, which will implement the rule. Furthermore, the rule requires certain filing fees and permit fees for the businesses that engage in the underground storage of carbon dioxide.

7. **THE SHORT-TERM/LONG-TERM ECONOMIC IMPACT OF THIS RULE ON EFFECTED PERSONS, INCLUDING ANALYSIS OF PERSONS WHO WILL BEAR THE COSTS AND THOSE WHO WILL BENEFIT FROM THE RULE:**

Since this is a new business in Alabama, the implementation of the rule will have no effect on the State's citizens. The businesses that participate in this economic enterprise bear only reasonable and necessary costs in complying with the rule. Those businesses will benefit from the compliance with the rule because compliance with the rule will ensure safe operations that protect the environment, protect Alabama's natural resources, and protect Alabama citizens.

8. **UNCERTAINTIES ASSOCIATED WITH THE ESTIMATED BENEFITS AND BURDENS OF THE RULE, INCLUDING QUALITATIVE/QUANTITATIVE BENEFITS AND BURDEN COMPARISON:**

The principal benefit to the businesses of a successful operation will be business profits. Any burden of compliance with the rule will be offset because compliance will ensure safe operations that protect the environment, protect Alabama's natural resources, and protect Alabama citizens.

9. **THE EFFECT OF THIS RULE ON THE ENVIRONMENT AND PUBLIC HEALTH:**

This rule clearly benefits the environment and public health by limiting carbon dioxide emissions and requiring that geologic storage of carbon dioxide in storage facilities is carried in a safe and effective manner.

10. **DETRIMENTAL EFFECT ON THE ENVIRONMENT AND PUBLIC HEALTH IF THE RULE IS NOT IMPLEMENTED:**

The failure to implement the rule will cause higher emissions of carbon dioxide, as well as open the possibility for unsafe and ineffective operations that have the potential impact the health and safety of Alabama citizens and our environment, particularly underground sources of drinking water.

Signature of certifying officer Janet Foster Overton

Janet Foster Overton

Date Friday, August 23, 2024