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Governor Mike Dunleavy
STATE OF ALASKA

January 26, 2023

The Honorable Gary Stevens
Senate President
Alaska State Legislature
State Capitol, Room 111
Juneau, AK 99801-1182

Dear President Stevens:

Under the authority of Article III, Section 18, of the Alaska Constitution, I am transmitting a bill relating to carbon capture, utilization, and storage (CCUS) and providing for an effective date.

This bill is a key component of the state's efforts to monetize its immense carbon storage potential and maximize utilization of resources. CCUS projects capture carbon dioxide emitted from point sources or the atmosphere and inject it deep underground into geologic formations for utilization in industrial processes, such as enhanced oil recovery, or for permanent sequestration.

Industry interest in CCUS is growing around the country and the world, driven by regulatory requirements, corporate objectives, and government financing and tax incentives. Alaska's participation in the industry could bring new industrial activity into the state, provide new revenue through CCUS exploration licensing, leasing, and permitting programs, and burnish the state's credentials for environmentally responsible resource development. Alaska is uniquely positioned for success in the CCUS industry, having large, state-owned subsurface acreage positions with highly prospective geologic formations ideal for the underground storage of carbon dioxide.

This omnibus CCUS bill establishes a CCUS leasing and regulatory program for the state. The bill creates a framework for the Department of Natural Resources (DNR) and the Alaska Oil and Gas Conservation Commission (AOGCC) to permit and regulate carbon storage facilities on lands within the state. The bill establishes an exploration licensing and leasing program, along with a pathway for the conversion of enhanced oil recovery operations to sequestration operations. The bill also establishes a mechanism by which the state will assume title to sequestered carbon dioxide following storage facility closure, and an industry-funded trust fund to cover possible long-term liabilities.

The bill provides DNR with the authority to grant carbon storage exploration licenses, and then leases, for the underground storage of carbon dioxide on state land. Generally, a license would have a five-year term with mandatory work commitments including an annual fee of at least $20 per acre and annual reporting requirements. The bill contains minimum annual rent requirements,

a per-ton injection charge for stored carbon dioxide, and requirements for bonding or other financial security. Due to the mineral nature of pore space leased for carbon storage, twenty-five percent of lease payments would be deposited into the Alaska Permanent Fund. Carbon storage lessees would be required to file for approval of a plan of development with the commissioner of DNR in a process similar to current oil and gas lessees. The bill requires carbon storage licenses and leases to include covenants to prevent unreasonable interference with the rights of existing mineral lessees and to indemnify the state for any unreasonable interference.

The bill amends statutes for pipeline rights-of-way leasing on state land to include pipelines for the transportation of carbon dioxide. This allows the state to administer pipeline infrastructure for transportation of captured carbon dioxide to geological storage facilities.

The bill provides the AOGCC with the authority to seek primacy from the United States Environmental Protection Agency for permitting over Class VI underground injection wells. States with primacy over these wells are anticipated to enjoy a competitive advantage in this burgeoning industry due to quicker well permitting. The bill also grants AOGCC statewide regulatory authority over carbon storage facilities to maintain reservoir integrity, protect property rights, and ensure public health and safety. AOGCC would charge application fees to cover the anticipated costs of processing applications. Once carbon dioxide is being injected into a permitted carbon storage facility, the facility operator would pay AOGCC a fee for each ton of carbon dioxide injected to cover anticipated expenses during the operation of the carbon storage facility. Also, AOGCC would set a surcharge based on carbon dioxide injected to address the expenses the state will incur post-closure. The surcharge payments would be deposited into the carbon storage closure trust fund created in the bill. DNR would assume title and management of the facilities and stored carbon post-closure.

This bill has an immediate effective date to allow the state to capitalize on these new opportunities as soon as possible.

This bill is part of my long-term fiscal solution and plan to attract investment to Alaska. The public will benefit from new potential sources of revenue for the state and boroughs, which can be directed to funding programs to benefit Alaskans. The private sector will benefit from new opportunities for industries associated with the capture, transportation, use, and geological storage of carbon dioxide. The state will benefit from an inclusive carbon management strategy that can alleviate investor concerns over Arctic energy and infrastructure projects and strengthen Alaska's resource development opportunities.

I urge your prompt and favorable action on this measure.

Sincerely,

Mike Dunleavy
Governor

Enclosure

SENATE BILL NO. 49

IN THE LEGISLATURE OF THE STATE OF ALASKA

THIRTY-THIRD LEGISLATURE - FIRST SESSION

BY THE SENATE RULES COMMITTEE BY REQUEST OF THE GOVERNOR

Introduced: 1/27/23
Referred: Resources, Finance

A BILL

FOR AN ACT ENTITLED

"An Act relating to the geologic storage of carbon dioxide; and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

*** Section 1.** SHORT TITLE. This Act may be known as the Carbon Capture, Utilization, and Storage Act.

*** Sec. 2.** AS 31.05.027 is amended to read:

Sec. 31.05.027. Land subject to commission's authority. The authority of the commission applies to all land in the state lawfully subject to its police powers, including land of the United States and land subject to the jurisdiction of the United States. The authority of the commission further applies to all land included in a voluntary cooperative or unit plan of development or operation entered into in accordance with AS 38.05.180(p) **or 38.05.730**.

*** Sec. 3.** AS 31.05.030(h) is amended to read:

(h) The commission may take all actions necessary to allow the state to

acquire primary enforcement responsibility under 42 U.S.C. 300h-1 and 42 U.S.C. 300h-4 (Safe Drinking Water Act of 1974, as amended, 42 U.S.C. 300f - 300j-26), for the control of underground injection related to the recovery and production of oil and natural gas and the control of underground injection in Class I wells, as defined in 40 C.F.R. 144.6, as amended**, and the control of underground injection in Class VI wells, as defined in 40 C.F.R. 144.6, as amended**.

*** Sec. 4.** AS 37.14 is amended by adding a new section to read:

Article 11. Carbon Storage Closure Trust Fund.

Sec. 37.14.850. Carbon storage closure trust fund. (a) The carbon storage closure trust fund is established as a separate trust fund of the state. The principal and earnings of the fund shall be held by the state for the purpose of protecting the public interest in maintenance and closure of carbon storage facilities in the state. The fund is composed of the carbon storage closure trust fund income account and the carbon storage closure trust fund operating account.

(b) The carbon storage closure trust fund income account consists of payments received under (c) of this section, AS 41.06.180, and earnings on the income account. The carbon storage closure trust fund operating account consists of appropriations by the legislature of the annual balance of the carbon storage closure trust fund income account and any earnings on those appropriations while in the operating account.

(c) Before payments are accepted into the carbon storage closure trust fund income account for a particular carbon storage facility, the Alaska Oil and Gas Conservation Commission and the operator may execute a memorandum of understanding that outlines a schedule of expected payments into the fund and the relationship of the payments and accumulated earnings in the fund to the operator's obligations under AS 41.06.155 or 41.06.175. If the memorandum of understanding addresses investment of the fund with respect to payments made by the operator, the commissioner of revenue must also sign the memorandum.

(d) Nothing in this section creates a dedicated fund.

(e) In this section, unless the context requires otherwise,

(1) "fund" means the carbon storage closure trust fund;

(2) "storage facility" has the meaning given in AS 41.06.210.

*** Sec. 5.** AS 38.05.069(e) is amended to read:

(e) Nothing in (c) of this section affects the disposal of minerals under AS 38.05.135 - 38.05.183 **or carbon storage under AS 38.05.700 - 38.05.795**.

*** Sec. 6.** AS 38.05.070(a) is amended to read:

(a) Land, including tide, submerged, or shoreland, to which the state holds title or to which it may become entitled, may be leased, except for the extraction of natural resources **and carbon storage under AS 38.05.700 - 38.05.795**, in the manner provided in AS 38.05.070 - 38.05.105.

*** Sec. 7.** AS 38.05.130 is amended to read:

Sec. 38.05.130. Damages and posting of bond. Rights may not be exercised by the state, its lessees, successors, or assigns under the reservation as set out in AS 38.05.125 until the state, its lessees, successors, or assigns make provision to pay the owner of the land full payment for all damages sustained by the owner, by reason of entering upon the land. If the owner for any cause refuses or neglects to settle the damages, the state, its lessees, successors, assigns, or an applicant for a lease or contract from the state for the purpose of prospecting for valuable minerals, or option, contract, or lease for **carbon storage or** mining coal**,** or lease for extracting geothermal resources, petroleum, or natural gas, may enter upon the land in the exercise of the reserved rights after posting a surety bond determined by the director, after notice and an opportunity to be heard, to be sufficient as to form, amount, and security to secure to the owner payment for damages, and may institute legal proceedings in a court where the land is located, as may be necessary to determine the damages which the owner may suffer.

*** Sec. 8.** AS 38.05.135(a) is amended to read:

(a) Except as otherwise provided, valuable mineral deposits in land belonging to the state shall be open to exploration, development, and the extraction of minerals. All land, together with tide, submerged, or shoreland, to which the state holds title to or to which the state may become entitled, may be obtained by permit or lease for the purpose of exploration, development, and the extraction of minerals. Except as specifically limited by AS 38.05.131 - 38.05.181 **and 38.05.700 - 38.05.795**, land may be withheld from lease application on a first-come, first-served basis, and offered only

on a competitive bid basis when determined by the commissioner to be in the best interests of the state.

*** Sec. 9.** AS 38.05.135(c) is amended to read:

(c) Payment of a royalty or a net profit share payment to the state under a lease issued under AS 38.05.135 - 38.05.181 **or a payment of a rent or charge under AS 38.05.700 - 38.05.795** becomes due on the date and in the manner specified in the lease or in a regulation adopted by the commissioner.

*** Sec. 10.** AS 38.05.135(d) is amended to read:

(d) If a royalty or net profit share payment to which the state is entitled under AS 38.05.135 - 38.05.181 **or a payment of a rent or charge under AS 38.05.700 - 38.05.795** is not paid or is underpaid when it becomes due under (c) of this section, the unpaid amount of the **rent, charge,** royalty**,** or net profit share payment bears interest in a calendar quarter at the rate of five percentage points above the annual rate charged member banks for advances by the 12th Federal Reserve District as of the first day of that calendar quarter, or at the annual rate of 11 percent, whichever is greater, compounded quarterly as of the last day of that quarter.

*** Sec. 11.** AS 38.05.135(e) is amended to read:

(e) If a royalty or net profit share payment to which the state is entitled under AS 38.05.135 - 38.05.181 **or a payment of a rent or charge under AS 38.05.700 - 38.05.795** is overpaid, interest at the rate and compounded in the manner provided in (d) of this section shall be allowed and paid on the overpayment. The interest allowance is subject to the following:

(1) if the state grants a credit against future payments for the overpayment, the state shall pay interest on the overpayment

(A) from the date that is the later of the date the overpayment was

(i) due; or

(ii) received;

(B) to the date that is the earlier of the date

(i) of notice to the lessee of the credit; or

(ii) on which the lessee actually takes the credit;

(2) if the state refunds the overpayment, the state shall pay interest on the overpayment

(A) from the date that is the later of the date the overpayment was

(i) due; or

(ii) received;

(B) to the date the state issues the refund.

*** Sec. 12.** AS 38.05.140(a) is amended to read:

(a) A person may not take or hold coal leases or permits during the life of coal leases on state land exceeding an aggregate of 92,160 acres, except that a person may apply for coal leases or permits for acreage in addition to 92,160 acres, not exceeding a total of 5,120 additional acres of state land. The additional area applied for shall be in multiples of 40 acres, and the application shall contain a statement that the granting of a lease for additional land is necessary for the person to carry on business economically and is in the public interest. On the filing of the application, except as provided by AS 38.05.180(ff)(3) or 38.05.180(gg) **and 38.05.700 - 38.05.795**, the coal deposits in the land covered by the application shall be temporarily set aside and withdrawn from all other forms of disposal provided under AS 38.05.135 - 38.05.181.

*** Sec. 13.** AS 38.05.184(b) is amended to read:

(b) No **carbon storage licenses or leases or** additional oil or gas leases may be issued by the department or any other state agency for the exploration for or the development or production of oil and gas on state-owned land and waters seaward of the mean higher high water line, beginning at Anchor Point; then around the perimeter of Kachemak Bay, to Point Pogibshi; then west to the three mile limit of state land and waters; then north to a point three miles west of Anchor Point; then east to the mean higher high water line of Anchor Point, the point of beginning.

*** Sec. 14.** AS 38.05 is amended by adding new sections to read:

Article 15A. Carbon Storage Exploration Licenses; Leases.

Sec. 38.05.700. Policy on carbon dioxide storage. It is in the public interest to promote the geologic storage of carbon dioxide. The geologic storage of carbon dioxide benefits the citizens of the state and the environment by reducing greenhouse

gas emissions.

Sec. 38.05.705. Applicability; regulations. (a) The provisions of AS 38.05.700 - 38.05.795 apply to exploration licensing and the leasing of state land for carbon storage.

(b) The commissioner may adopt regulations necessary to implement AS 38.05.700 - 38.05.795.

Sec. 38.05.710. Carbon storage exploration licensing. (a) The commissioner may issue carbon storage exploration licenses on state land.

(b) A carbon storage exploration license gives the licensee

(1) the exclusive right to explore, for carbon storage purposes, the state land described in the license for a five-year term;

(2) the option to convert the license for all or part of the state land described in the license into a carbon storage lease after the licensee

(A) fulfills the work commitments set out in the license;

(B) demonstrates the ability to meet the commercial terms for the lease as set out in the license or in regulation;

(C) obtains a permit under AS 41.06.125; and

(D) complies with the lease conversion process of AS 38.05.720(b).

(c) A carbon storage exploration license must

(1) be conditioned on an obligation by the licensee to fulfill a specified work commitment as set out in the license; the work commitment must include mandatory provisions for

(A) an annual fee paid by the licensee to the department in an amount of at least $20 per acre subject to the license; and

(B) an annual report describing the licensee's exploration activities in the previous calendar year, which must be provided by the licensee to the department;

(2) include proposed commercial terms if the license is converted into a carbon storage lease, which must at a minimum provide for

(A) an annual rent of at least $20 per acre; and

(B) a per-ton injection charge on all injected volumes of carbon dioxide of at least $2.50;

(C) the posting of a bond or other security acceptable to the department and in favor of the state;

(3) be conditioned on the posting of a bond or other security acceptable to the department and in favor of the state; and

(4) be subject to revocation at the commissioner's discretion under (d) of this section.

(d) The commissioner may revoke a carbon storage exploration license before the termination of the license's five-year term if the licensee fails to comply with the requirements of (c) of this section or applicable regulations.

(e) The department shall renew a carbon storage exploration license if the licensee

(1) before the expiration of the license term, applies for a permit under AS 41.06.125;

(2) is in compliance with the conditions of the license;

(3) provides documentation acceptable to the department of the pending permit application; and

(4) submits an executed renewal form to the department affirming the original terms of the license for the renewed license term.

(f) In the commissioner's discretion, a carbon storage exploration license may be renewed for a term sufficient to determine whether the licensee's permit application will be accepted under AS 41.06.105 - 41.06.210.

(g) A carbon storage exploration license that has been renewed under (e) of this section terminates upon denial of the licensee's permit application by the Alaska Oil and Gas Conservation Commission under AS 41.06.105 - 41.06.210.

(h) The dollar amounts in (c) of this section shall change every five years according to changes in the Consumer Price Index for all urban consumers for the Anchorage Metropolitan Area compiled by the Bureau of Labor Statistics, United States Department of Labor. The index for January 2023 is the reference base index.

Sec. 38.05.715. License procedures. (a) The procedures in this section apply

to the issuance of a carbon storage exploration license under AS 38.05.710.

(b) To initiate the licensing procedure, an applicant shall submit to the commissioner a proposal that

(1) identifies a specific area to be subject to the license;

(2) proposes minimum work commitments;

(3) proposes commercial terms applicable to a carbon storage lease under AS 38.05.710(c)(2);

(4) demonstrates the applicant's ability to assume responsibility of a carbon storage lease;

(5) describes how the applicant meets the minimum qualifications for a licensee under applicable regulations; and

(6) includes an attestation of the applicant's ability to perform the requirements of (2) - (4) of this subsection.

(c) The commissioner shall publish notice of a proposal received under (b) of this section. The notice shall include a solicitation for competing proposals. A copy of the published notice shall be sent to any lessee under AS 38.05.135 - 38.05.181 in one-half mile of the area proposed for an exploration license. Any person in the area may submit a competing proposal under the process established by the commissioner in regulation. The regulations must require that a competing proposal be submitted not later than 90 days after the commissioner's written notice is published.

(d) After the deadline for submission of a competing proposal has passed, the commissioner shall issue a written finding determining whether the state's best interests are served through issuing a carbon storage exploration license. If the commissioner determines that issuance of a carbon storage exploration license is in the best interests of the state, the finding must

(1) describe the limitations, stipulations, conditions, or changes from the initiating proposal or competing proposals that are required to make the issuance of the exploration license conform to the best interests of the state;

(2) set out the commercial terms required for the eventual conversion of the exploration license into a carbon storage lease;

(3) if there are competing proposals from multiple applicants, identify

which applicants are qualified for the issuance of the exploration license and include information for the competitive bid process as set out in (f) of this section; and

(4) include a copy of the exploration license to be issued and the form of lease that will be used for any portion of the exploration license area subsequently converted to a lease under AS 38.05.720.

(e) If the commissioner concludes that issuance of a carbon storage exploration license is in the best interests of the state, and that only one applicant is qualified to be issued the license, the applicant may accept or reject the exploration license, as limited or conditioned by the terms of the finding and in the form attached to the finding, not later than 30 days after the finding's date of publication. The applicant shall accept or reject the issuance of the carbon storage exploration license in writing. The commissioner shall consider an applicant's failure to respond in the 30-day period as a rejection of the license.

(f) If the commissioner concludes that issuance of the carbon storage exploration license is in the best interests of the state, and that more than one applicant is qualified to be issued the license, the commissioner shall issue a request for competitive sealed bids, under procedures adopted by regulation, to determine which qualified applicants will be issued the license. If the commissioner determines that a competitive bid process is necessary, the best interest finding must include notice that the commissioner intends to request competitive bids.

(g) The commissioner shall establish in regulation the criteria for the assessment of competitive bids under (f) of this section and for the determination of a successful bidder.

(h) If a lessee under AS 38.05.135 - 38.05.181 in the area covered by a proposed carbon storage exploration license participates in a competitive bid process under (f) of this section and is not the successful bidder, before issuing the license, the commissioner shall provide the lessee an opportunity to match the successful bid. If the lessee matches the successful bid, the commissioner shall issue a carbon storage exploration license to the lessee.

(i) A carbon storage exploration license issued under this section and a carbon storage lease under AS 38.05.720 or 38.05.725 must include

(1) a covenant from the licensee not to unreasonably interfere with the rights of a lessee under AS 38.05.135 - 38.05.181; and

(2) a clause by which the licensee indemnifies the state for any unreasonable interference the licensee might cause to the rights of a lessee under AS 38.05.135 - 38.05.181.

(j) When notice is required under this section, the department shall follow the requirements for notice under AS 38.05.945(b) and (c).

Sec. 38.05.720. Conversion to lease by licensee. (a) The commissioner may convert a carbon storage exploration license to a carbon storage lease if the licensee satisfies the requirements of AS 38.05.710(b) and complies with (b) of this section.

(b) To convert a carbon storage exploration license to a carbon storage lease, a licensee shall provide a copy of the permit obtained under AS 41.06.105 - 41.06.210 to the commissioner. After receiving a copy of the permit, if the licensee is in compliance with AS 38.05.710(b), the commissioner shall issue a carbon storage lease for those areas of the exploration license approved for carbon storage by the permit. A lease issued under this section must include

(1) commercial terms for the lease as set out in the commissioner's finding under AS 38.05.715(d);

(2) the agreements required under AS 38.05.715(i); and

(3) any other condition or obligation deemed necessary by the commissioner or required by regulation.

Sec. 38.05.725. Concurrent carbon storage leasing. (a) A lessee under AS 38.05.180 injecting under a Class II well permit shall apply for a carbon storage lease from the department before engaging in injection operations that may require a Class VI injection permit from the United States Environmental Protection Agency or a storage facility permit under AS 41.06.125.

(b) The issuance of a carbon storage lease under (a) of this section is vested solely in the commissioner's discretion. The commissioner may consider the qualifications and abilities of the lessee to meet the commercial requirements of a carbon storage lease and whether issuance of the lease is in the best interests of the state.

(c) A carbon storage lease issued under this section must include

(1) the minimum commercial terms described in AS 38.05.710(c)(2);

(2) the agreements required under AS 38.05.715(i);

(3) if the carbon storage lessee is not the same entity as the responsible party under the existing lease, an assumption by the carbon storage lessee of any dismantlement, removal, and restoration obligations set out in the oil and gas lease; and

(4) any other conditions and obligations deemed necessary by the commissioner or required by regulation.

Sec. 38.05.730. Plan of development and operations; unitization. (a) The commissioner shall require the filing and approval of a plan of development and operation for a carbon storage lease.

(b) To prevent or assist in preventing waste, and to protect the correlative rights of persons owning interests in the tracts of lands affected, with the approval of the commissioner, lessees may validly integrate their interests to provide for the unitized management, development, and operation of the tracts of land as a unit. The commissioner may suspend or modify a development plan approved under (a) of this section in accordance with the unit agreement.

(c) A lease operated under a plan approved or prescribed by the commissioner is excepted from determining holdings or control under AS 38.05.140. The provisions of this section concerning cooperative or unit plans are in addition to and do not affect AS 31.05 and AS 41.06.

Sec. 38.05.735. Payments from carbon storage exploration licenses and carbon storage leases. Except as otherwise provided under art. IX, sec. 15, Constitution of the State of Alaska, the department shall deposit in the general fund the money it collects under AS 38.05.700 - 38.05.795.

Sec. 38.05.795. Definitions. In AS 38.05.700 - 38.05.795, unless the context requires otherwise,

(1) "carbon dioxide" means carbon dioxide of a quality that

(A) will not compromise the safety of geologic storage; and

(B) will not compromise the properties of a storage reservoir

that allow the reservoir to effectively enclose and contain a stored gas or stored supercritical fluid;

(2) "carbon storage" means the permanent or short-term underground storage of carbon dioxide in a geologic storage reservoir;

(3) "geologic storage" has the meaning given in AS 41.06.210;

(4) "pore space" means a geologic storage reservoir, cavity, or void in a subsurface sedimentary stratum;

(5) "reservoir" has the meaning given in AS 41.06.210;

(6) "supercritical fluid" means a substance at or above its critical temperature and critical pressure that is neither a liquid nor a gas but that has properties of both.

*** Sec. 15.** AS 38.35.020(a) is amended to read:

(a) Rights-of-way on state land including rights-of-way over, under, along, across, or upon the right-of-way of a public road or highway or the right-of-way of a railroad or other public utility, or across, upon, over, or under a river or other body of water or land belonging to or administered by the state may be granted by noncompetitive lease by the commissioner for pipeline purposes for the transportation of oil, products, **carbon dioxide,** or natural gas under those conditions prescribed by law or by administrative regulation. Except to the extent authorized by an oil and gas lease, a gas only lease, **carbon storage lease,** or an oil and gas or gas only **or carbon storage** unit agreement approved by the state, no person may engage in any construction or operation of any part of an oil, products, **carbon dioxide,** or natural gas pipeline, which in whole or in part is or is proposed to be on state land unless that person has obtained from the commissioner a right-of-way lease of the land under this chapter.

*** Sec. 16.** AS 38.35.020(b) is amended to read:

(b) The commissioner may by regulation exempt the construction or operation

(1) of field gathering lines or any reasonable classification of them from the requirement of a right-of-way lease under this chapter**; and**

(2) of a pipeline transporting carbon dioxide within a field for the purpose of an enhanced oil recovery project or field pressurization measures

within that same field from the requirement of a right-of-way lease under this chapter.

*** Sec. 17.** AS 38.35.122 is amended to read:

Sec. 38.35.122. Products pipeline and carbon dioxide transportation pipeline leases. The commissioner has discretion to include any or all of the terms set out in AS 38.35.120 in leases of state land for products pipeline right-of-way purposes **or carbon dioxide transportation pipeline right-of-way purposes**.

*** Sec. 18.** AS 38.35.230(3) is amended to read:

(3) "lease" means the instrument or extension of an instrument issued under this chapter granting a leasehold interest in state land for pipeline right-of-way purposes to a person and authorizing the construction or operation of, or transportation, service or sale by a pipeline for crude oil, natural gas, **carbon dioxide,** or products;

*** Sec. 19.** AS 38.35.230(7) is amended to read:

(7) "pipeline" or "pipeline facility" means all the facilities of a total system of pipe, whether owned or operated under a contract, agreement, or lease, used by a carrier for transportation of crude oil, natural gas, **carbon dioxide,** or products for delivery, for storage, or for further transportation, and including all pipe, pump or compressor stations, station equipment, tanks, valves, access roads, bridges, airfields, terminals and terminal facilities, including docks and tanker loading facilities, operations control center for both the upstream part of the pipeline and the terminal, tanker ballast treatment facilities, and fire protection system, communication system, and all other facilities used or necessary for an integral line of pipe, taken as a whole, to effectuate transportation, including an extension or enlargement of the line;

*** Sec. 20.** AS 38.35.230(10) is amended to read:

(10) "transportation" means the shipment or carriage by a pipeline of crude oil, natural gas, **carbon dioxide,** or products from an upstream terminus in one or more fields or points of production or supply of the minerals to a downstream terminus in one or more points for delivery of the minerals to a purchaser or consignee, for storage, or for further carriage or shipment, including shipment or carriage within the state that may be classified as interstate or foreign transportation to

the extent that the transportation may constitutionally be subjected to the provisions of this chapter, as well as all services necessary to effectuate shipment or carriage, including, among other things, the receipt, storage, processing, handling, transfer in transit, forwarding, and delivery of the minerals.

*** Sec. 21.** AS 38.35.230 is amended by adding a new paragraph to read:

(11) "carbon dioxide" has the meaning given in AS 38.05.795.

*** Sec. 22.** AS 41.06.005 is amended to read:

Sec. 41.06.005. Jurisdiction over geothermal resources. (a) The commission has jurisdiction under **AS 41.06.005 - 41.06.060** [THIS CHAPTER] over geothermal wells to prevent waste, to protect correlative rights, and to ensure public safety.

(b) The Department of Natural Resources has jurisdiction under **AS 41.06.005 - 41.06.060** [THIS CHAPTER] over management of geothermal leases and units in the public interest and to effect development.

*** Sec. 23.** AS 41.06.020 is amended to read:

Sec. 41.06.020. Authority of commission; application. (a) The commission has jurisdiction over all persons and property, public and private, necessary to carry out the purposes and intent of **AS 41.06.005 - 41.06.060** [THIS CHAPTER].

(b) The authority of the commission applies to all land in the state lawfully subject to the police power of the state, including private land, municipal land, state land, land of the United States, and land subject to the jurisdiction of the United States, and to all land included in a voluntary cooperative or unit plan of development or operation entered into in accordance with AS 38.05.181. When land that is subject to the commission's authority is committed to a unit agreement involving land subject to federal jurisdiction, the operation of **AS 41.06.005 - 41.06.060** [THIS CHAPTER] or a part of **AS 41.06.005 - 41.06.060** [THIS CHAPTER] may be suspended if

(1) the unit operations are regulated by the United States; and

(2) the conservation of geothermal resources is accomplished under the unit agreement.

(c) The provisions of **AS 41.06.005 - 41.06.060 apply** [THIS CHAPTER APPLIES]

(1) to wells drilled in search of, in support of, or for the recovery or

production of geothermal resources;

(2) when a person engaged in drilling activity not otherwise subject to the provisions of **AS 41.06.005 - 41.06.060** [THIS CHAPTER] encounters geothermal resources, fluid, or water of sufficient heat or pressure to constitute a threat to human life or health unless the drilling operation is subject to oil and gas drilling regulation under AS 31.05;

(3) in areas and under conditions in which the commission determines that drilling may encounter geothermal resources, fluid, or water of sufficient heat or pressure to constitute a threat to human life or health.

(d) To the extent the provisions of AS 31.05 do not conflict with the provisions of **AS 41.06.005 - 41.06.060** [THIS CHAPTER], the provisions of AS 31.05 are applicable to wells drilled in search of, in support of, or for the recovery or production of geothermal resources.

(e) Nothing in **AS 41.06.005 - 41.06.060** [THIS CHAPTER] limits the authority of the department

(1) over geothermal resources under AS 38.05.181; or

(2) to approve and manage geothermal units or operations that include state land.

*** Sec. 24.** AS 41.06.030(e) is amended to read:

(e) The commissioner may adopt regulations under AS 44.62 to carry out the purposes and intent of **AS 41.06.005 - 41.06.060** [THIS CHAPTER] for duties assigned to the department, including the promotion of maximum economic recovery.

*** Sec. 25.** AS 41.06.035(b) is amended to read:

(b) The commission may adopt regulations under AS 44.62 and issue orders appropriate to carry out the purposes and intent of **AS 41.06.005 - 41.06.060** [THIS CHAPTER] for duties assigned to the commission, including orders regarding the establishment of drilling units for pools as set out in AS 31.05.100 and orders regarding unitized operation and integration of interests as set out in AS 31.05.110.

*** Sec. 26.** AS 41.06.040(a) is amended to read:

(a) The commission shall adopt regulations under AS 44.62 (Administrative Procedure Act), issue orders, and take other appropriate action to carry out the

purposes and intent of **AS 41.06.005 - 41.06.060** [THIS CHAPTER], including adopting regulations to prevent

(1) geothermal resources, water or other fluids, and gases from escaping into strata other than that in which they are found, unless in accordance with an approved reinjection program;

(2) contamination of surface and groundwater;

(3) premature degradation of a geothermal system by water encroachment or otherwise;

(4) blowouts, cavings, and seepage; and

(5) unreasonable disturbance or injury to neighboring properties, prior water rights, prior oil or gas rights, human life, health, and the natural environment.

*** Sec. 27.** AS 41.06.050(e) is amended to read:

(e) In making the determination under (d) of this section, the commission shall consider whether the

(1) proposed well will significantly interfere with or substantially impair a prior water, oil, or gas right;

(2) proposed well is contrary to a provision of **AS 41.06.005 - 41.06.060** [THIS CHAPTER], a regulation adopted by the commission, another law, or an order, stipulation, or term of a permit issued by the commission; and

(3) applicant is in violation of a provision of **AS 41.06.005 - 41.06.060** [THIS CHAPTER], a regulation adopted by the commission, another law, or an order, stipulation, or term of a permit issued by the commission; the commission shall consider the magnitude of the violation.

*** Sec. 28.** AS 41.06.055(c) is amended to read:

(c) The commission shall determine the regulatory cost charges levied under this section so that the total amount to be collected approximately equals the appropriations made for the operating costs of the commission that have been incurred under **AS 41.06.005 - 41.06.060** [THIS CHAPTER] for the fiscal year.

*** Sec. 29.** AS 41.06.055(d) is amended to read:

(d) The commission shall collect the regulatory cost charges imposed under this section. The Department of Administration shall identify the amount of

appropriations made for the operating costs of the commission under **AS 41.06.005 - 41.06.060** [THIS CHAPTER] that lapse into the general fund each year. The legislature may appropriate an amount that is at least equal to the lapsed amount to the commission for its operating costs under **AS 41.06.005 - 41.06.060** [THIS CHAPTER] for the next fiscal year. If the legislature makes an appropriation to the commission under this subsection that is equal to or greater than the lapsed amount, the commission shall reduce the total regulatory cost charge collected for that fiscal year by a comparable amount.

*** Sec. 30.** AS 41.06.060 is amended to read:

Sec. 41.06.060. Definitions. In **AS 41.06.005 - 41.06.060** [THIS CHAPTER], unless the context otherwise requires,

(1) "commercial use" means the sale of heat or power to a third party;

(2) "commission" means the Alaska Oil and Gas Conservation Commission created under AS 31.05.005;

(3) "correlative rights" means the right of an owner of each property in a geothermal system to produce without waste the owner's just and equitable share of the geothermal resources in the geothermal system; a just and reasonable share is an amount, so far as can be practically determined and so far as can be practically produced without waste, that is substantially in proportion to the quantity of recoverable geothermal resources under the owner's property relative to the total recoverable geothermal resources in the geothermal system;

(4) "geothermal fluid" means liquids and steam at temperatures greater than 120 degrees Celsius or any commercial use of liquids and steam naturally present in a geothermal system at temperatures less than 120 degrees Celsius;

(5) "geothermal resources"

(A) means the natural heat of the earth at temperatures greater than 120 degrees Celsius, or any use of that heat for commercial purposes, measured at the point where the highest-temperature resources encountered enter or contact a well or other resource extraction device or any commercial use of the natural heat of the earth;

(B) includes

(i) the energy, including pressure, in whatever form present in, resulting from, created by, or that may be extracted from that natural heat;

(ii) the material medium, including steam and other gases, hot water, and hot brines constituting the geothermal fluid naturally present, as well as substances artificially introduced to serve as a heat transfer medium; and

(iii) all dissolved or entrained minerals and gases that may be obtained from the material medium, but excluding hydrocarbon substances and helium;

(6) "geothermal system" means a stratum, pool, reservoir, or other geologic formation containing geothermal resources;

(7) "operator" means a person drilling, maintaining, operating, producing, or in control of a well;

(8) "owner" means the person who has the right to drill into or produce from a geothermal system and to appropriate the geothermal resources produced from a geothermal system for that person and others;

(9) "waste" means, in addition to its ordinary meaning, physical waste, and includes an inefficient, excessive, or improper production, use, or dissipation of geothermal resources, including

(A) drilling, transporting, or storage methods that cause or tend to cause unnecessary surface loss of geothermal resources;

(B) locating, spacing, drilling, equipping, operating, producing, or venting of a well in a manner that results or tends to result in reducing the ultimate economic recovery of geothermal resources;

(10) "well" means a well drilled, converted, or reactivated for the discovery, testing, production, or subsurface injection of geothermal resources.

*** Sec. 31.** AS 41.06 is amended by adding new sections to read:

Article 2. Carbon Dioxide Injection and Storage.

Sec. 41.06.105. Policy on carbon dioxide storage. For the purposes of protecting health, safety, and property in the state, it is in the public interest that to the

extent economically and technologically feasible, carbon dioxide be injected into and stored in oil and gas reservoirs and other geologic formations in a manner protective of waters and reservoir integrity. The state recognizes that geologic storage of carbon dioxide may require the cooperation of mineral interest holders and that, when cooperation is not achieved, regulatory procedures that promote cooperative management for protection and maximization of resources are necessary.

Sec. 41.06.110. Jurisdiction over storage facilities. The commission has jurisdiction under AS 41.06.105 - 41.06.210 over storage facilities to prevent waste, protect correlative rights, and ensure public health and safety.

Sec. 41.06.115. Authority of the commission. (a) The authority of the commission applies to all land in the state lawfully subject to the police power of the state, including private land, municipal land, state land, federal land, and land subject to the jurisdiction of the United States, and to all land included in a voluntary cooperative or unit plan of development or operation entered into in accordance with AS 38.05.730.

(b) When land that is subject to the commission's authority is committed to a unit agreement involving land subject to federal jurisdiction, the operation of AS 41.06.105 - 41.06.210 may be suspended if

(1) the unit operations are regulated by the United States; and

(2) conservation of resources in the reservoir or pool is accomplished in the agreement.

(c) The commission has the authority to

(1) regulate activities related to a storage facility, including construction, operation, and closure;

(2) require that storage operators provide assurance, including bonds, that money is available to fulfill the storage operator's duties;

(3) enter, at a reasonable time and manner, a storage facility to

(A) inspect equipment and facilities;

(B) observe, monitor, and investigate operation; and

(C) inspect records required to be maintained at the facility;

(4) exercise continuing jurisdiction over storage operators and storage

facilities, including the authority, after notice and hearing, to amend provisions in a permit and to revoke a permit;

(5) dissolve or change the boundaries of any commission-established oil or gas field or unit that is within or near a storage reservoir's boundaries; and

(6) grant, for good cause, exceptions to the requirements and implementing rules of AS 41.06.105 - 41.06.210.

(d) To the extent AS 31.05 does not conflict with AS 41.06.105 - 41.06.210, the provisions of AS 31.05 are applicable to wells drilled in search of, in support of, and for carbon dioxide storage.

(e) Nothing in AS 41.06.105 - 41.06.210 limits the authority of the Department of Natural Resources under AS 38.05.700 - 38.05.795.

Sec. 41.06.120. Waste prohibited; investigation. Waste in a storage facility or reservoir in the state is prohibited. The commission may investigate to determine whether waste exists or is imminent, or whether other facts exist that justify or require action by the commission to prohibit waste. The injection of carbon dioxide and substances commonly associated with carbon dioxide injection is not considered waste.

Sec. 41.06.125. Storage facility permit. (a) A prospective storage operator is required to obtain a permit from the commission.

(b) A permit may not be transferred unless the commission consents.

(c) A person applying for a permit shall

(1) request a pre-application meeting with the commission staff;

(2) comply with application requirements;

(3) pay a fee in an amount determined by the commission; and

(4) pay the commission the cost the commission incurs in reviewing an application, publishing notices for hearings, and holding hearings on permit applications.

(d) A permit application must include sufficient information to enable the commission to determine whether the storage facility will interfere with or impair an existing water, oil, gas, or other mineral interest.

(e) The amount of the fee in (c)(3) of this section must be based on the

commission's anticipated cost of processing applications, including any preliminary work in advance of receipt of an application. The commission may enter into an agreement with a prospective applicant that requires the applicant to reimburse the commission for reasonable costs of work incurred in preparing for activities before receipt of an application.

(f) A fee the commission receives under this section must be deposited into the carbon dioxide storage facility administrative fund established in AS 41.06.165.

Sec. 41.06.130. Hearing on permit application. (a) Before issuing a permit for a storage facility, the commission shall hold a public hearing.

(b) The commission shall provide notice of a public hearing under this section. The notice must be provided in the same manner as a notice under AS 31.05.050(b) and be provided to

(1) each mineral lessee, mineral owner, and mineral right owner of record within the storage reservoir and within one-half mile of the storage reservoir's boundaries;

(2) each surface owner of land overlying the storage reservoir and within one-half mile of the reservoir's boundaries; and

(3) any additional persons that the commission requires.

(c) A hearing notice required by this section must comply with deadlines set by the commission.

Sec. 41.06.135. Permit requirements. (a) The commission shall consult with the Department of Environmental Conservation and the Department of Natural Resources before issuing a permit under AS 41.06.125.

(b) Before the commission may approve a permit applied for under AS 41.06.125, the commission shall find

(1) that the storage operator has complied with all requirements set by the commission;

(2) that the proposed storage facility is suitable and feasible for carbon dioxide injection and storage;

(3) that the carbon dioxide to be stored is of a quality that allows it to be safely and efficiently stored in the storage reservoir;

(4) that the storage operator has made a good-faith effort to get the consent of all persons with an ownership interest in the reservoir and surface owners of land overlying the proposed storage reservoir;

(5) if the proposed storage facility contains commercially valuable minerals, that the interests of the mineral owners or mineral lessees will not be adversely affected or have been addressed in an arrangement entered into by the mineral owners or mineral lessees and the storage operator;

(6) that the proposed storage facility will not adversely affect surface waters or formations containing fresh water;

(7) that carbon dioxide is not reasonably anticipated to escape from the storage reservoir;

(8) that substances that compromise the objectives of AS 41.06.105 - 41.06.210 or the integrity of a storage reservoir will not enter a storage reservoir;

(9) that the proposed storage facility will not endanger human health or unduly endanger the environment;

(10) that the proposed storage facility is in the public interest;

(11) that the horizontal and vertical boundaries of the proposed storage reservoir are defined and the boundaries include buffer areas to ensure that the storage facility is operated safely and as contemplated;

(12) that the storage operator will establish monitoring facilities and protocols to assess the location and migration of carbon dioxide injected for storage and to ensure compliance with all permit, statutory, and administrative requirements;

(13) that all nonconsenting land owners or holders of mineral rights are or will be equitably compensated; and

(14) that the storage operator is not in violation of a provision of AS 41.06.105 - 41.06.210 or regulations adopted by the commission.

Sec. 41.06.140. Permit provisions. The commission may include in a permit or order any parameters necessary to carry out the objectives of AS 41.06.105 - 41.06.210 and to protect and adjust the respective rights and obligations of persons affected by geologic storage.

Sec. 41.06.145. Amalgamating property interests. If a storage operator does

not obtain the consent of all persons with an ownership interest in the storage reservoir, the commission may order that the mineral rights of nonconsenting owners be included in a storage facility and subject to geologic storage. Before the commission may issue an order effectuating an amalgamation under this section, the commission must provide public notice and hold a hearing.

Sec. 41.06.150. Certificate. When the commission issues a permit under AS 41.06.125, the commission shall also issue a certificate that states the permit has been issued, describes the area covered, and contains information the commission deems appropriate. The storage operator may file a copy of the certificate with the office of the recorder in the district the facility is located.

Sec. 41.06.155. Environmental protection; reservoir integrity. (a) The commission shall take action to ensure that

(1) substances that compromise the integrity of a storage reservoir do not enter a storage reservoir; and

(2) carbon dioxide does not escape from a storage facility.

(b) For the purposes of this section and in the application of other laws, carbon dioxide that is stored and remains in storage under a permit is not a pollutant and does not constitute a nuisance.

(c) The commission's authority under (a) of this section does not limit the jurisdiction of the Department of Environmental Conservation.

Sec. 41.06.160. Preservation of rights. Nothing in AS 41.06.105 - 41.06.210

(1) prejudices the rights of those with property interests within a storage facility to exercise rights that have not been committed to a storage facility; or

(2) prevents a mineral owner or mineral lessee from drilling through or near a storage reservoir to explore for and develop minerals, provided the drilling, production, and related activities comply with commission requirements that preserve the storage facility's integrity and protect the objectives of AS 41.06.105 - 41.06.210.

Sec. 41.06.165. Fees; carbon dioxide storage facility administrative fund. (a) A storage operator shall pay the commission a fee on each ton of carbon dioxide injected for geologic storage. The fee must be in the amount set by the commission. The amount must be based on the anticipated expenses that the commission will incur

in regulating storage facilities during their construction, operational, and pre-closure phases. The fee shall be deposited in the carbon dioxide storage facility administrative fund established in (b) of this section.

(b) The carbon dioxide storage facility administrative fund is established in the general fund. The fund consists of

(1) fees received under (a) of this section;

(2) fees received under AS 41.06.125 and 41.06.200; and

(3) interest earned on the fund.

(c) Expenditure from the fund is subject to appropriation. The appropriation may be made by general appropriation of program receipts conditioned on compliance with the program review provisions of AS 37.07.080(h). The commission, however, through a cooperative agreement with another state agency, may use the fund to compensate the cooperating agency for expenses the cooperating agency incurs in carrying out regulatory responsibilities that the agency may have over a storage facility.

Sec. 41.06.170. Title to carbon dioxide. The storage operator has title to the carbon dioxide injected into and stored in a storage reservoir and holds title until the commission issues a certificate of completion under AS 41.06.175. While the storage operator holds title, the operator is liable for any damage the carbon dioxide may cause, including damage caused by carbon dioxide that escapes from the storage facility.

Sec. 41.06.175. Certificate of completion, release, and transfer of title and custody. (a) After carbon dioxide injections into a reservoir end and upon application by the storage operator, the commission shall consider issuing a certificate of completion. The certificate may only be issued after public notice and hearing. The commission shall establish notice requirements for the hearing. The certificate may only be issued after the commission has consulted with the Department of Environmental Conservation, the Department of Natural Resources, and all persons with an ownership interest in the storage reservoir. The certificate may not be issued until at least 10 years after carbon dioxide injections end.

(b) A certificate of completion may only be issued if the storage operator

(1) is in full compliance with all laws governing the storage facility;

(2) shows that the operator has addressed all pending claims regarding the storage facility's operation;

(3) shows that the underground place or pore space where the carbon dioxide was injected or stored is expected to no longer expand vertically or horizontally and is expected to pose no threat to human health, human safety, the environment, or underground sources of drinking water;

(4) shows that the stored or injected carbon dioxide is unlikely to cross any underground or pore space boundary and is not expected to endanger any underground source of drinking water or otherwise endanger human health, human safety, or the environment;

(5) shows that all wells, equipment, and facilities to be used in the post-closure period are in good condition and retain mechanical integrity;

(6) shows that the operator has plugged wells, removed equipment and facilities, and completed reclamation work as required by the commission;

(7) has paid all fees and surcharges for the facility; and

(8) meets any other regulatory requirements established by the state.

(c) Once a certificate of completion is issued, title to the storage facility and to the stored carbon dioxide transfers, without payment of any compensation, to the state under management of the Department of Natural Resources. Title acquired by the state includes all rights and interests in, and all responsibilities associated with, the stored carbon dioxide. The storage operator and all persons who generated any injected carbon dioxide are released from liability to the state associated with the storage facility, provided that the liability to the state shall not result in the payment of any damages in excess of the balance of the carbon storage closure trust fund established in AS 37.14.850. Any bonds posted by the storage operator must be released.

Sec. 41.06.180. Carbon storage facility injection surcharge. A storage operators shall pay the commission a surcharge on each ton of carbon dioxide injected for storage. The surcharge must be in the amount set by the commission. The amount must be based on anticipated expenses that the state will incur in regulating storage facilities during post-closure phases. The surcharge shall be deposited in the carbon

storage closure trust fund established in AS 37.14.850.

Sec. 41.06.185. Penalties. (a) In addition to the penalties in (b) - (d) of this section, a person who violates a provision of AS 41.06.105 - 41.06.210 or a commission regulation, order, or term of a permit issued under AS 41.06.105 - 41.06.210, is liable for a civil penalty of not more than $100,000 for the initial violation and not more than $10,000 for each day after that on which the violation continues.

(b) A person who knowingly commits an act specified in AS 11.46.630(a) for the purpose of evading a provision of this chapter, a regulation adopted under this chapter, or an order, stipulation, or term of a permit issued by the commission is guilty of a class A misdemeanor.

(c) A person who knowingly aids or abets another person in the violation of a provision of this chapter, a regulation adopted under this chapter, or an order, stipulation, or term of a permit issued by the commission is subject to the same penalty as that prescribed in this chapter for the violation by the other person.

(d) A person who knowingly violates a provision of this chapter, a regulation adopted under this chapter, or an order, stipulation, or term of a permit issued by the commission is guilty of a misdemeanor punishable by a fine of not more than $10,000 a day for each day of violation.

(e) The commission may assess the civil penalties provided in this section, and, if not paid, the penalties are recoverable by suit filed by the attorney general in the name and on behalf of the commission in the superior court. The payment of a penalty does not relieve a person on whom the penalty is imposed from liability to any other person for damages arising out of the violation.

(f) In determining the amount of a penalty assessed under (a) of this section, the commission shall consider

(1) the extent to which the person committing the violation was acting in good faith in attempting to comply;

(2) the extent to which the person committing the violation acted in a wilful or knowing manner;

(3) the extent and seriousness of the violation and the actual or

potential threat to public health or the environment;

(4) the economic or environmental harm, or injury to the public, caused by the violation;

(5) the economic value or other benefits derived by the person committing the violation from the violation;

(6) any history of previous violations by the person committing the violation;

(7) the need to deter similar behavior by the person committing the violation and others similarly situated at the time of the violation or in the future;

(8) the effort made by the person committing the violation to correct the violation and prevent future violations; and

(9) other matters justice requires.

Sec. 41.06.190. Enhanced oil recovery. (a) Except as provided in (b) of this section, the provisions of AS 41.06.105 - 41.06.210 do not apply to applications filed with the commission proposing to use carbon dioxide for enhanced oil or gas recovery.

(b) The commission may adopt regulations that allow enhanced oil or gas recovery and related well activities to be converted to a storage facility. If adopted, the regulations must require that in considering whether to approve a conversion, and upon conversion, AS 41.06.105 - 41.06.210 and its implementing rules apply. The regulations may impose additional requirements to, or waive the requirements of, AS 41.06.105 - 41.06.210 for good cause and to ensure that the objectives of AS 41.06.105 - 41.06.210 are met.

Sec. 41.06.195. Cooperative agreements and contracts. (a) The commission may enter into agreements with other governments, government entities, and state agencies for the purpose of carrying out the objectives of AS 41.06.105 - 41.06.210.

(b) The commission may enter into contracts with private persons to assist in carrying out the objectives of AS 41.06.105 - 41.06.210. If an emergency exists, the commission may enter into contracts without public notice and without competitive bidding.

Sec. 41.06.200. Determining storage amounts; carbon credits; fees. (a) The

commission, under procedures and criteria the commission may adopt, may determine the amount of carbon dioxide that may be injected and stored in a reservoir, including for enhanced oil or gas recovery.

(b) The purpose of determining storage amounts is to facilitate using the stored carbon dioxide for matters including carbon credits, allowances, trading, emissions allocations, and offsets. The commission may charge a reasonable fee to a person requesting a storage determination. The commission shall set the fee by regulation. A fee the commission receives for a storage determination must be deposited into the carbon dioxide storage facility administrative fund established in AS 41.06.165.

Sec. 41.06.210. Definitions. In AS 41.06.105 - 41.06.210, unless the context requires otherwise,

(1) "carbon dioxide" means carbon dioxide of a quality that

(A) will not compromise the safety of geologic storage; and

(B) will not compromise the properties of a storage reservoir that allow the reservoir to effectively enclose and contain a stored gas or stored supercritical fluid;

(2) "commission" means the Alaska Oil and Gas Conservation Commission created under AS 31.05.005;

(3) "geologic storage" means the permanent or short-term underground storage of carbon dioxide in a storage reservoir;

(4) "permit" means a permit issued by the commission allowing a person to operate a storage facility;

(5) "pore space" means a cavity or void in a subsurface sedimentary stratum;

(6) "reservoir" means a subsurface sedimentary stratum, formation, aquifer, cavity, or void, including pore space, oil and gas reservoirs, saline formations, and coal seams suitable for or capable of being made suitable for injecting and storing carbon dioxide;

(7) "storage facility" means the storage reservoir, underground equipment, well, and surface facilities and equipment used or proposed to be used in

accordance with a permit; "storage facility" does not include pipelines, compressors, surface facilities, and equipment used to transport carbon dioxide to the storage facility that are unrelated to well safety and metering;

(8) "storage operator" means a person holding or applying for a permit;

(9) "storage reservoir" means a reservoir proposed, authorized, or used for storing carbon dioxide;

(10) "supercritical fluid" means a substance at or above its critical temperature and critical pressure that is neither a liquid nor a gas but that has properties of both;

(11) "waste" means, in addition to its ordinary meaning, physical waste, and includes inefficient, excessive, or improper operation of a storage facility or well;

(12) "well" means a well that is drilled, converted, or reactivated for discovery, testing, or subsurface injection into a reservoir.

*** Sec. 32.** AS 41.21.167(a) is amended to read:

(a) The land and water areas described in AS 41.21.161 are not open to mineral entry under AS 38.05.135 - 38.05.275 **and 38.05.700 - 38.05.795**.

*** Sec. 33.** AS 41.21.491(d) is amended to read:

(d) Except for oil and gas leasing under AS 38.05.180 **and carbon storage licensing and leasing under AS 38.05.700 - 38.05.795**, the mineral estate in the state-owned land and water described in (a) of this section is closed to mineral entry under AS 38.05.181 - 38.05.275.

*** Sec. 34.** AS 41.21.502(c) is amended to read:

(c) The mineral estate in the state-owned land and water described in (a) of this section is open to oil and gas leasing under AS 38.05.180 **and carbon storage licensing and leasing under AS 38.05.700 - 38.05.795**. The mineral estate in the state-owned land and water described in (a) of this section is closed to mineral entry under AS 38.05.181 - 38.05.275.

*** Sec. 35.** AS 41.21.617 is amended to read:

Sec. 41.21.617. Other uses generally. The state land and water described in AS 41.21.611(b) is closed to mineral entry under AS 38.05.135 - 38.05.275 **and**

38.05.700 - 38.05.795, to commercial harvest of timber, and to sale under state land disposal laws. The commissioner may lease the land described in AS 41.21.611(b) under AS 38.05.070 - 38.05.105 for a purpose consistent with AS 41.21.610(a) and (b). A municipality may select land within the Alaska Chilkat Bald Eagle Preserve under law.

*** Sec. 36.** AS 44.37.020 is amended by adding a new subsection to read:

(d) The Department of Natural Resources shall administer storage facilities and stored carbon transferred to the state under AS 41.06.175.

*** Sec. 37.** The uncodified law of the State of Alaska is amended by adding a new section to read:

TRANSITION: REGULATIONS. The Department of Natural Resources and the Alaska Oil and Gas Conservation Commission may adopt regulations necessary to implement the changes made by this Act. The regulations take effect under AS 44.62 (Administrative Procedure Act), but not before the effective date of the law implemented by the regulation.

*** Sec. 38.** The uncodified law of the State of Alaska is amended by adding a new section to read:

REVISOR'S INSTRUCTION. The revisor of statutes is requested to change the chapter heading for AS 41.06 from "Geothermal Resources" to "Geothermal Resources and Carbon Storage."

*** Sec. 39.** Section 37 of this Act takes effect immediately under AS 01.10.070(c).

THE STATE of ALASKA
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Sectional Analysis

Senate Bill 49 – Carbon Storage (33-GS1567\A)

Sections 1 and 2 amend the Alaska Oil and Gas Conservation Act (AS 31.05)

Section 1: The short title for this act is the "Carbon Capture, Utilization, and Storage Act."

Section 2: Amends AS 31.05.027 to expand the regulatory authority of the Alaska Oil and Gas Conservation Commission (AOGCC) to include land included in a voluntary cooperative, unit plan of development, or operation entered into in accordance with proposed AS 38.05.730 (see Section 14).

Section 3: Amends AS 31.05.030(h) to expand AOGCC's existing power to take all actions necessary to obtain state primary enforcement responsibility over Class I wells to include all actions necessary to acquire state primary enforcement over Class VI wells. Class VI wells are used to inject carbon dioxide into deep rock formations for long-term underground storage.

Section 4 creates a carbon storage closure trust fund in AS 37.14

Section 4: Adds a new section AS 37.14.850 to create a "Carbon Storage Closure Trust Fund," which is not a dedicated fund, and will include two accounts: an income account and an operating account. The income account consists of payments received by AOGCC under new authorities granted under AS 41.06 by this bill. The income account is to be transferred annually to the operating account by legislative appropriation.

Sections 5 through 14 Amend the Alaska Land Act (AS 38.05)

Section 5: Amends AS 38.05.069(e), adding carbon storage under AS 38.05.700-38.05.795 (see Section 14) as an exception to the general rule that the DNR director of the division of lands cannot transfer state land classified as agriculture except for agricultural purposes, thereby allowing for agricultural lands to be transferred for mineral disposal for carbon storage.

Section 6: Amends AS 38.05.070(a) to exempt carbon storage leasing from application of AS 38.05.070–105 when state lands are leased for purposes other than extrication of natural resources.

Section 7: Amends AS 38.05.130 to include carbon storage in requirements for liability of lessees to pay damages to landowners, post bond for that purpose, and provision for lessees to access the state mineral estate if a surface owner refuses to engage in a surface use agreement. This is the same statutory process that exists for other mineral estate development.

Section 8: Amends AS 38.05.135(a) to include the "Alaska Carbon Underground Storage Act" (see Section 14) in requirements and limitations for the State's mineral estate leasing and development.

Section 9: Amends AS 38.05.135(c) to include provision for payments of rents or charges under the "Alaska Carbon Underground Storage Act" (see Section 14).

Section 10: Amends AS 38.05.135(d) to include provision for penalties on late payments of rents or charges under the "Alaska Carbon Underground Storage Act" (see Section 14).

Section 11: Amends AS 38.05.135(e) to include provision for interest on overpayments of rents or charges under the "Alaska Carbon Underground Storage Act" (see Section 14).

Section 12: Amends AS 38.05.140(a) to require carbon storage lessees under the "Alaska Carbon Underground Storage Act" (see Section 14) to be the same as the lessee of non-conventional gas under AS 38.05.180(ff)(3) or coal bed methane under AS 38.05.180(gg) where mineral leases are issued on the same land.

Section 13: Amends AS 38.05.184(b) to prohibit carbon storage licenses or leases from being issued in the Kachemak Bay oil and gas closure area.

Section 14: Adds new subsections AS 38.05.700–795 under the title "Alaska Carbon Underground Storage Act."

1. **AS 38.05.700:** Policy statement that it is in the public interest to promote geologic storage of carbon dioxide.
2. **AS 38.05.705:** Provision for applicability carbon storage statutes and authority for DNR to adopt regulations to implement these statutes.
3. **AS 38.05.710:** Allows the commissioner to issue carbon storage exploration licenses on state land and establishes work commitment obligations, minimum economic terms, the bonding is required, default provisions, renewal provisions, and the escalation of minimum economic terms.
4. **AS 38.05.715:** Procedures for issuance of a carbon storage exploration license. These are modeled after existing procedures for oil and gas exploration licensing under AS 38.05.133.

5. **AS 38.05.720:** Provision allowing conversion of an AS 38.05.715 carbon storage exploration license to a carbon storage lease.
6. **AS 38.05.725:** Provision for an oil and gas lessee who must convert a Class II injection well to a Class VI injection well to also apply for a carbon storage lease.
7. **AS 38.05.730:** Requirements for plans of development and operations, and provision for unitization, as with oil and gas leasing.
8. **AS 38.05.735:** Payments from carbon storage licenses and leases are to be deposited in the general fund except for the amount allocated to the Permanent Fund under art. IX, sec. 15, of the Alaska Constitution.
9. **AS 38.05.795:** Definitions for specific terms used in the "Alaska Carbon Underground Storage Act."

Sections 15 through 21 apply to the State Pipeline Coordinator's authority under the AS 38.35 Right of Way Leasing Act.

Section 15: Amends AS 38.35.020(a) to include carbon dioxide and carbon storage in the authority for right-of-way leasing.

Section 16: Amends AS 38.05.020(b), which allows the commissioner of DNR to exempt the construction or operation of field gathering lines from the requirement of a right-of-way lease under AS 38.35. The proposed amendment would allow the commissioner to exempt construction or operation of a pipeline transporting carbon dioxide within a field for the purpose of an enhanced oil recovery project or field pressurization measure within that same field from the requirement of a right-of-way lease under AS 38.35.

Section 17: Amends the title of AS 38.35.122 to read "Products pipeline *and carbon dioxide transportation pipeline* leases." It grants the commissioner of DNR the discretion to include any or all of the terms of AS 38.35.120 for carbon dioxide transportation pipeline right-of-way purposes. AS 38.35.120 contains covenants required to be included in a lease to a pipeline that is not a natural gas pipeline contract carrier.

Sections 18-21 amend or add definition to AS 38.35.230 which contain definitions applicable to AS 38.35.

Section 18: Amends the definition of "lease" in AS 38.35.230(3) to include a reference to a pipeline transporting carbon dioxide.

Section 19: Amends the definition of "pipeline" or "pipeline facility" in AS 38.35.230(7) to include the transportation of carbon dioxide.

Section 20: Amends the definition of "transportation" in AS 38.35.230(10) to include a pipeline carrying carbon dioxide.

Section 21: Adds as a new subsection to define "carbon dioxide" as the meaning given in AS 38.05.795 (see Section 14).

Sections 22 through 38 apply to AOGCC statutes under Title 41.
Sections 22-30 are conforming amendments to the geothermal resource statutes.

Section 22: Amends AS 41.06.005 regarding AOGCC and DNR's jurisdiction over management of geothermal resources to clarify applicability to geothermal statutes (AS 41.06.005–060).

Section 23: Amends AS 41.06.020 to clarify applicability to geothermal statutes (AS 41.06.005–060) regarding the authority of AOGCC over geothermal resources.

Section 24: Amends AS 41.06.030(b) to clarify applicability to geothermal statutes (AS 41.06.005–060) regarding the authority of AOGCC to adopt regulations regarding geothermal resources.

Section 25: Amends AS 41.06.035(b) to clarify applicability to geothermal statutes (AS 41.06.005–060) regarding the authority of AOGCC to adopt regulations and issue orders regarding the establishment of drilling units for pools and orders regarding unitized operation and integration of interests.

Section 26: Amends AS 41.06.040(a) to clarify applicability to geothermal statutes (AS 41.06.005–060) regarding directing the AOGCC to adopt regulations regarding geothermal statutes.

Section 27: Amends AS 41.06.050(e) to clarify applicability to geothermal statutes (AS 41.06.005–060) regarding AOGCC issuing permits to drill for geothermal resources.

Section 28: Amends AS 41.06.055(c) to clarify that the geothermal well regulatory cost charges only apply under geothermal statutes (AS 41.06.005–060).

Section 29: Amends AS 41.06.055(d) to specify revenue collected for operating costs under geothermal statutes (AS 41.06.005–060) are to be identified and lapse into the general fund each year.

Section 30: Amends AS 41.06.060 to include definitions for geothermal statutes (AS 41.06.005–060).

Section 31: Adds a new article to AS 41.06, titled "Article 2. Carbon Dioxide Injection and Storage," beginning at AS 41.06.105:

1. **AS 41.06.105:** Contains a policy statement providing that it is in the public interest to inject carbon dioxide into oil and gas reservoirs in a manner protective of waters and reservoir integrity. It also recognizes that in the event cooperation of mineral interest holders in an area cannot be obtained, regulatory procedures that enable cooperative management are required.
2. **AS 41.06.110:** Provides that the AOGCC has jurisdiction over carbon dioxide storage facilities to prevent waste, protect correlative rights, and ensure public health and safety. The term "waste" is defined in AS 41.06.210.
3. **AS 41.06.115:** Concerns AOGCC's authority to carry out the purposes and intent of AS 41.06.105 - 41.06.210. Subsection (a) contains an expansive statement of AOGCC's jurisdiction over persons and property necessary to carry out the purposes and intent of AS 41.06.105 - 41.06.210. Subsection (b) provides that the operation of AS 41.06.105 - 41.06.210 may be suspended pursuant to a unit agreement if unit operations are regulated by the United States and the agreement accomplishes "conservation of resources." The phrase "conservation of resources" is not specific to the CCUS permitting context and, if desired, could be amended to align with the purposes of AS 41.06.110 or to refer to the integrity of a geologic reservoir. Subsection (c) contains a list of specific regulatory authorities held by AOGCC. Subsection (d) provides that the provisions of AS 31.05 apply to wells drilled in search of, in support of, and for carbon dioxide storage, except in the event of a conflict with AS 41.06.105 - 41.06.210. Subsection (e) provides that nothing in AS 41.06.105 - AS 41.06.210 limits the authority of DNR over (1) carbon storage exploration licensing or leasing; or (2) approval and management of carbon storage units or operations that include state land.
4. **AS 41.06.120:** Provides that waste is prohibited in a carbon storage facility or reservoir. It also grants the AOGCC the authority to investigate whether waste exists or is imminent, or whether facts exist that justify action to prohibit waste. The section contains a statement that injection of carbon dioxide and "substances commonly associated with carbon dioxide injection" is not waste.
5. **AS 41.06.125:** Provides specifications for storage facility permitting.
6. **AS 41.06.130:** Creates a public hearing requirement for storage facility permits issued by AOGCC.
7. **AS 41.06.135:** Specifies the requirements for carbon storage facility permits.

8. **AS 41.06.140:** Allows the AOGCC to include parameters, limitations, or restrictions in a permit and to protect and adjust rights and obligations of persons affected by geologic storage.
9. **AS 41.06.145:** Concerns amalgamation of property interests and forced pooling for storage facilities.
10. **AS 41.06.150:** Creates specifications for a carbon storage facility certificate.
11. **AS 41.06.155:** Creates requirements for AOGCC to ensure environmental protection and reservoir integrity in storage facilities and reservoirs.
12. **AS 41.06.160:** Clarifies preservation of rights, including deconfliction of development of other minerals by drilling through or near a storage reservoir.
13. **AS 41.06.165:** Provides authority for AOGCC to collect fees and creation of a "carbon dioxide storage facility administrative fund" under the general fund.
14. **AS 41.06.170:** Specifies that storage operators hold title to injected carbon dioxide until a certificate is issued under AS 41.06.175, including liability for damage associated with injected carbon dioxide.
15. **AS 41.06.175:** Specifies criteria for certificate of completion a transfer of title of CO_2.
16. **AS 41.06.180:** Provides authority for AOGCC to collect a "carbon storage facility injection surcharge" for post-closure administration to be deposited in the "carbon storage closure trust fund" established in AS 37.14.850.
17. **AS 41.06.185:** Provision for AOGCC to impose civil penalties for violations of its carbon storage statutes.
18. **AS 41.06.190:** Exclusion of AOGCC's carbon storage statues from enhanced oil recovery (EOR), except for when an EOR-related reservoir is converted to a storage reservoir.
19. **AS 41.06.195:** Authority for AOGCC to enter into agreements with other government entities and agencies for carbon storage purposes.
20. **AS 41.06.200:** Authority for AOGCC to determine amounts for injection and storage, including EOR. Also provides for fees and applicability for credits and other carbon management goals.
21. **AS 41.06.210:** Definitions for terms used in AOGCC's carbon storage statutes.

Sections 32-35 are conforming amendments to parks and recreational facilities laws (AS 41.21)

Section 32: Amends AS 41.21.167(a) to add an exclusion for carbon storage under AS 38.05.700–799.

Section 33: Amends AS 41.21.491(d) to include carbon storage in the exception from the mineral estate closure described in AS 41.21.491(a).

Section 34: Amends AS 41.21.502(c) to include carbon storage leasing under AS 38.05.700–799, but prohibits mineral entry under AS 38.05.181–275.

Section 35: Amends AS 41.21.617 to close land described in AS 38.05.700–799 to commercial timber harvest and sale under state land disposal.

Section 36: Adds new subsection AS 44.37.020(d) for DNR to administer storage facilities and stored carbon under AS 41.06.175.

Section 37: Provides for DNR and AOGCC to adopt regulations to implement carbon storage under AS 44.62.

Section 38: Requests a title change for AS 41.06 from "Geothermal Resources" to "Geothermal and Carbon Storage."

Section 39: Section 37 takes effect immediately.

Stantec

PEER-STATE CARBON CAPTURE, UTILIZATION, AND SEQUESTRATION REGULATORY REGIMES

A review of carbon capture, utilization, and storage legislation, with applicability to Alaska

January 30, 2023

Prepared for:
Alaska Department of Natural Resources

Prepared by:
Stantec Consulting Services

Project Number:
185755566

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1	Response to Comments	LB	12/13/22	CHW	1/4/23	EKS	1/4/23
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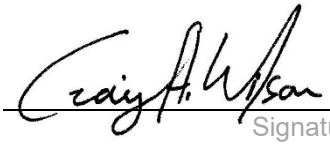
Reviewed by: 
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Executive Summary

The State of Alaska Department of Natural Resources has retained Stantec Consulting (Stantec) to undertake an overview and analysis of peer state regulatory frameworks governing carbon capture, utilization, and storage ("CCUS"). This report is designed to help inform decisions by the State of Alaska in considering seeking primacy from the U.S. Environmental Protection Agency (EPA) to permit Class VI underground injection wells for long-term storage of carbon dioxide (CO2) within Alaska and making public lands available for CCUS.

Carbon capture, utilization, and storage is the process of separating carbon dioxide from exhaust gas streams of industrial processes, collecting and transporting carbon dioxide for storage, with the intent that the carbon dioxide will be utilized for other activities (i.e., enhanced oil recovery) or stored in perpetuity (sequestration). CCUS has been occurring globally for over 40 years, first for use in enhanced oil recovery activities in the United States, and later for sequestration in the Sleipner project in Norway, which has been underway since 1996. Carbon storage – the long-term geological storage of carbon dioxide – is considered an important part of the global effort to reduce the emission of greenhouse gases ("GHGs") into the atmosphere.

This report describes common issues in CCUS legislation across other states (and a few countries) which should be considered in drafting of new state legislation. This report is meant to be one of many tools for the State to utilize when writing CCUS legislation and discussing state primacy over Class VI underground injection wells.

Most legislations reviewed were initially written around 2010 and were amended throughout the next decade. When amending legislations, states appeared to follow the lead of the two states with Class VI primacy: North Dakota and Wyoming. Slight variations occur with timelines and requirements, but most legislations are similar. Alaska will be able to take note of these similarities and apply it to its unique management of natural resources.

Acronyms / Abbreviations

ADNR	Alaska Department of Natural Resources
AOGCC	Alaska Oil & Gas Conservation Commission
CCUS	Carbon Capture, Utilization, and Sequestration
CO2	Carbon Dioxide
EOR	Enhanced Oil Recovery
EPA	Environmental Protection Agency
EU	European Union
GHG	Green House Gases
MMV	Measuring, Monitoring, and Verification
N/A	Not Applicable
NEPA	National Environmental Policy Act
UIC	Underground Injection Control
U.S.C.	United States Code

1 Introduction

This report was prepared by Stantec Consulting (Stantec) for the State of Alaska Department of Natural Resources under contract MA 230000011 CCUS Consulting Services. The purpose of this report is to provide an overview of carbon capture, utilization, and storage ("CCUS") legislation in other states, with an analysis of their applicability to Alaska.

1.1 Carbon Capture, Transportation, Utilization, and Storage Overview

Carbon capture, utilization, and storage is the process of separating carbon dioxide from exhaust gas streams of industrial processes, collecting and transporting carbon dioxide for utilization for enhanced oil recovery or storage, with the intent that the carbon dioxide will be stored in perpetuity (also known as sequestration). A conceptual diagram of the major activities associated with CCUS is shown in **Figure 1**. There are three main steps in the carbon capture and utilization/storage process:

- Carbon capture
- Carbon transportation
- Carbon storage and utilization

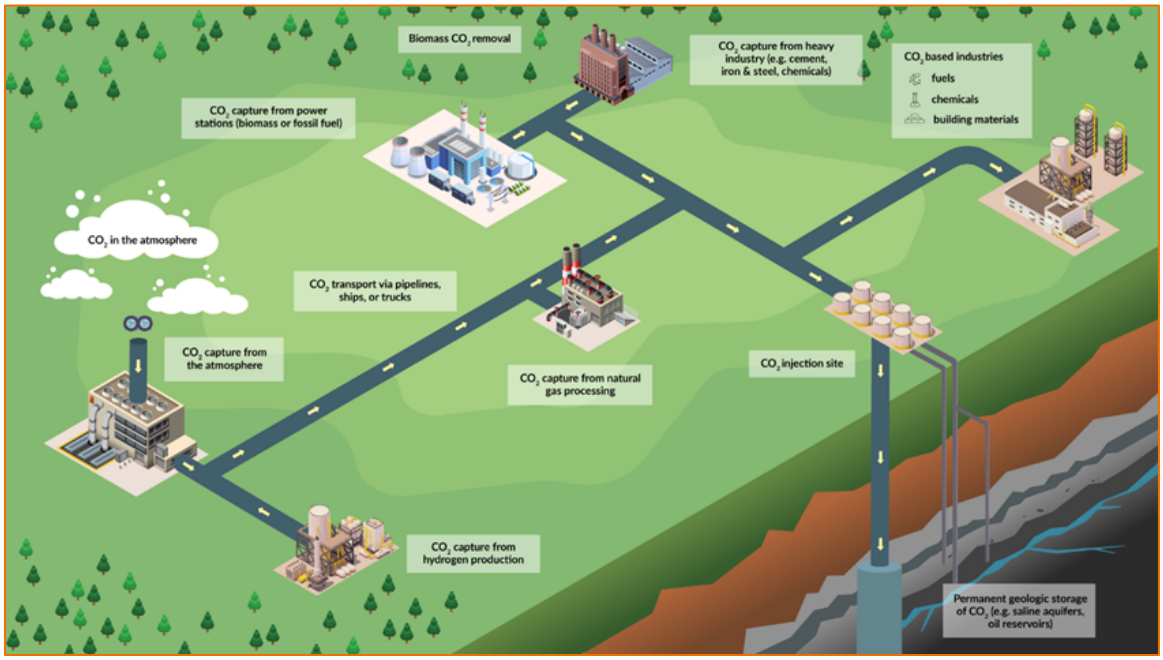

Figure 1 Conceptual Diagram of Carbon Capture and Storage Activities

(NRCan 2021)

1.2 Statement of Need

CCUS projects gives Alaska and the oil and gas industry the opportunity to engage in the growing market of decarbonization. It also gives Alaska another opportunity to lease State land and pore space.

The market of decarbonization and CCUS has gained new interest with the passing of the Infrastructure Investment and Jobs Act and the Inflation Reduction Act in recent years. Both acts have provisions designed to promote CCUS activity. The Infrastructure Investment and Jobs Act appropriated funds for permitting CCUS projects and Inflation Reduction Act increased the Section 45Q federal carbon capture tax credits. Now, there is growing momentum for CCUS, and states must prepare for a new market.

The main two objectives of this legislative effort are to authorize CCUS activity in Alaska and make public lands available for CCUS activities. This report serves as a discussion on legislation closely focused on CCUS from other states and countries.

1.3 History

Established in 1974, the Environmental Protection Agency's ("EPA") Underground Injection Control ("UIC") program regulates construction, operation, permitting, and closure of injection wells used to place fluids underground for storage or disposal. Before 2010, the UIC program covered five classes of injection wells; each well class is based on the type and depth of injection activity and the risk of endangering an underground source of drinking water. Class I, IV, and V wells are used for waste disposal while Class II and III wells are used for resource extraction. In December 2010, the EPA published the Carbon Dioxide (CO2) Geologic Sequestration Wells Final Rule, making Class VI wells the newest class of injection wells for CCUS.

Class VI wells were established in part due to the success of Class II wells used to store hydrocarbons. Class II wells are primarily permitted for enhanced oil and gas recovery, a process that involves the injection of fluids to retain or increase reservoir pressure and as a result, displace extractable oil and gas. A small number of Class II wells operate as injection wells for the storage of hydrocarbon in underground formations such as salt caverns, or porous geologic material.

Like Class II hydrocarbon storage wells, Class VI wells inject carbon products as a liquid (or as a supercritical fluid) into underground formations. But instead of storing the injected material for later use (as a reserve), Class VI wells are intended to keep the material permanently sequestered.

As of September 2022, there are only two active EPA permitted Class VI wells in the United States. The lack of Class VI permits issued across the United States is partly due to the catch-up time needed by states to develop CCUS legislation to support the UIC program. The delay is also due to a lack of primacy. Primary enforcement authority ("primacy") refers to State, territory, or tribal responsibilities associated with implementing EPA approved UIC programs within that state, territory, or tribe. Delegating Class VI primacy to states from the federal government helps alleviate the EPA's workload. States that do not have the authority to issue Class VI permits rely on the EPA's UIC program for permitting. North

Dakota and Wyoming are currently the only states with Class VI permitting primacy; North Dakota has issued two Class VI permits, with one already active.

Alaska has received primacy to issue Class II well permits within its borders under a Memorandum of Agreement with EPA but has not yet investigated Class VI primacy.

2 Review Methods

This section describes an evaluation of 11 states where CCUS legislation is currently in place: Kansas, Kentucky, Louisiana, Mississippi, Nebraska, North Dakota, Oklahoma, Texas, Utah, West Virginia, and Wyoming. Five applicable international CCUS legislations were also reviewed: Australia, Canada's province of Alberta, the European Union, Norway, and the United Kingdom. The review period lasted from August 2022 to October 2022. Each legislation was reviewed to answer the questions below:

- How does the legislation identify and describe the purpose of geologic sequestration? Does that purpose include references to greenhouse gas emissions?
- How does legislation define carbon sequestration?
- How could this legislation be applicable to Alaska?
- How does the legislation define pore space?
- Does the legislation determine pore space ownership?
- What is the timeline for certification of project completion and release of liability?
- Does the legislation describe penalties for breaking code? Negligence?
- Does the legislation describe carbon credits?
- What is the order of issues addressed? What does the legislation address first?
- Is there a logical flow to the order of issues?

As part of the review, key issues were thematically grouped into categories for easier comprehension. In general, states touched on similar issues but did not use the exact same language in reference to them.

3 Review Outcomes: Themes

The review identified several common regulatory themes, shown in **Table 1** and **Figure 2**. These have been grouped into the eight themes listed below and discussed in more detail in the report.

- Regulatory Purpose and Scope
- Establishment of Authority
- Resource Designation
- Fiscal Support
- Permitting Process
- Liability
- Storage Operations
- Environmental Considerations

The following report sections expand on how states differ in addressing each of the above themes in their CCUS legislations. The themes are described in **Table 1**. The themes were derived from finding similarities in states' CCUS legislation sections. **Table 2** shows a sample of that process; sections are color-coded to identify themes.

Table 1 Regulatory Themes

Regulatory Purpose and Scope	Refers to the introduction of the CCUS legislation. It describes how the CCUS legislation would benefit the state, therefore communicating what the State prioritizes. It also defines key words in the legislation.
Establishment of Authority	Refers to state's various responsibilities during the permit application process and operations of CCUS injection wells. It also defines which agency in the state will be the authority.
Fiscal Support	Encompasses issues around finances, such as proving financial responsibility, fees, and establishing administrative and trust funds.
Permitting Process	Encompasses all the requirements, provisions, and steps when applying for a CCUS injection well permit.
Resource Designation	Encompasses all the issues regarding ownership over natural resources, such as pore space, carbon dioxide, mineral rights, etc.
Liability	Outlines the liabilities of the CCUS applicant during the application process, operations, and post-operation (long-term).
Storage Operations	Encompasses all the processes involved with a CCUS well after a permit is approved. It covers issues of operation and closure.
Environmental Considerations	Refers to how each state regulates CCUS injection wells to protect the environment, public health and safety, and state resources.

Peer-State Carbon Capture, Utilization, and Sequestration Regulatory Regimes
Review Outcomes: Themes
February 1, 2023

Table 2 Sample of CCUS Peer-State Regulatory Themes

(In order of appearance and phrasing in legislation)

Wyoming	North Dakota	Texas	Louisiana	Mississippi	Nebraska	Utah	West Virginia
Purpose	Purpose	Purpose	Purpose	Purpose	Purpose	Purpose	Purpose
Definitions	Definitions	Definitions	Definitions	Definitions	Definitions	Definitions	Definitions
Authority Established	Authority Established	Jurisdiction (Authority Established)	Authority Established	Authority Established	Rights (ownership)	Authority Established	Permit Requirements
Regulatory	Permit Requirements	Applicability	Regulatory	Regulatory	Authority Established	Permit Requirement	Public Participation
Enforcement	Permit Hearings	Permitting	Enforcement	Enforcement	Permit Requirements	Hearings	Permit Provisions
Permit Requirements	Permit Consultations	Information required of applicant	Hearings, Rules, Emergency, Public Records	Approval of reservoir	Hearings	Findings to Issue Permit	Add Rule making authority
Permit Hearings	Permit Provisions	Fees	Underground Injection control	Protection of Correlative Rights	UIC Authority	Permit Provisions	Environmental Protection
Permit Consultations	Amalgamating Property Interests	Letter from executive director	Certificate of completion	Unit operation	Rights	Amalgamation of Interests	Other Activities
Permit Provisions	Certificate	Rules	Eminent domain	Permit provisions	Fee	carbon dioxide storage amalgamation unit establishment	Cooperative Agreements
Environmental Protection	Environmental Protection	Consistency with federal requirements	Liability release	Permit hearings	Completion	Requirement record	carbon dioxide ownership
Ownership & Rights	Preservation of rights	Memorandum of understanding		Compliance and enforcement	Penalties	Preservation of rights	Certification of Completion
Fees	Fees	Fiscal responsibility		Storage operations	Trusts	Title	Administration fund
Administration Fees	Administration Fees	Definitions		Fees	Authorization	Certification of Project Completion	Fees
carbon dioxide Trust fund	carbon dioxide Trust fund	Ownership of anthropogenic carbon dioxide		carbon dioxide storage fund		Cooperative Agreements / Contracts	Carbon Credits

Peer-State Carbon Capture, Utilization, and Sequestration Regulatory Regimes
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February 1, 2023

Wyoming	North Dakota	Texas	Louisiana	Mississippi	Nebraska	Utah	West Virginia
Title & Liability	Title to carbon dioxide	Anthropogenic carbon dioxide storage trust fund		Title / Liability		Public Interests	Pore/Container space
Certificate of Project Completion / Release	Certificate of Project Completion / Release	Extraction of carbon dioxide		Cessation of storage operation		Adoption of Procedure	Pore ownership
Oil and Gas conservation Commission	Penalties			Release bond/assurance / deposit		Fees	Funds
Enhanced Recovery	Enhanced Recovery					Trust	Judicial Review
Ownership of materials injected	Cooperative Agreements / Contracts						
Permit Requirements	Trusts/Monopolies						
Unitization of geologic sequestration sites	Participation of Public Interest						
Special revenue account (fees)	Storage Amount						
Administration fund							
Fund post-completion							
Authority							

Regulatory Theme Legend
Storage Regulatory Purpose & Scope
Establishment of Authority
Resource Designation
Fiscal Support
Permitting Process
Liability
Operations
Environmental Considerations

4 Regulatory Purpose

The regulatory purpose justifies the policy by explaining how it will benefit the state. There is an array of purpose statements, highlighting the differing state priorities. Many states have more robust sections than those provided as examples below. States may or may not factor in public health and safety, industrial and commercial interests, natural resources, and greenhouse gas emissions. A summary of regulatory purpose statements is provided in **Table 3**.

Table 3 Regulatory Purpose

State	Purpose Statement
Oklahoma S.B. 610 Section 1.B.1.	“Carbon dioxide is a valuable commodity to the citizens of the State, particularly for its value in enhancing the recovery of oil and gas and for its use in other industrial and commercial processes and applications."
Mississippi S.B 2723 Section 2. 53-11-3 (1)(f)-(g)	“(f) It is for the public benefit and in the public interest that the maximum amount of the State’s oil and gas reserves be produced to the extent that it is economically and technologically feasible. (g) It is for the public benefit and in the public interest that, to the extent that it is economically and technologically feasible, carbon dioxide be injected into and stored in oil and gas reservoirs and other geologic formations in a manner protective of waters of the State.”
Kansas HB 2419 New sec. 2.b.	“For the purposes of protecting the health, safety and property of the people of the State, and preventing escape of carbon dioxide into the atmosphere and pollution of soil and surface and subsurface water detrimental to public health or to plant, animal and aquatic life, the Commission, on or before July 1, 2008, shall adopt separate and specific rules and legislations establishing requirements, procedures and standards for the safe and secure injection of carbon dioxide and maintenance of underground storage of carbon dioxide.”
North Dakota S.B. 2095 38-22-01	“It is in the public interest to promote the geologic storage of carbon dioxide. Doing so will benefit the State and the global environment by reducing greenhouse gas emissions. Doing so will help ensure the viability of the State’s coal and power industries, to the economic benefit of North Dakota and its citizens. Further, geologic storage of carbon dioxide, a potentially valuable commodity, may allow for its ready availability if needed for commercial, industrial, or other uses, including enhanced recovery of oil, gas, and other minerals. Geologic storage, however, to be practical and effective requires cooperative use of surface and subsurface property interests and the collaboration of property owners. Obtaining consent from all owners may not be feasible, requiring procedures that promote, in a manner fair to all interests, cooperative management, thereby ensuring the maximum use of natural resources.”

4.1 Definitions

How states define key CCUS terms can be important in how legislation is regulated. Most states start by defining the following key words and phrases:

- Anthropogenic carbon dioxide
- Carbon capture, sequestration, and utilization
- Pore space

- Pore space ownership

The definition(s) of carbon dioxide have potential implications for how CCUS operations may be impacted by current, non CCUS legislations. Captured carbon dioxide could fall under the definition of hazardous, waste, a pollutant, or a commodity depending on the existing, non CCUS legislations in states. Therefore, carbon dioxide may be expanded to multiple definitions (such as carbon dioxide streams, captured carbon dioxide, anthropogenic carbon dioxide) or include many forms.

Several states include the term "anthropogenic" when defining carbon dioxide. Anthropogenic refers to originating in human activity, as opposed to naturally occurring carbon dioxide.

Table 4 Carbon Dioxide Definitions

State	Definition
Alabama 2022 AL S 36 Section 1	"(2) GAS. All natural gas, casinghead gas, carbon oxides, ammonia, hydrogen, nitrogen, noble gases, and occluded natural gas found in coal beds, and all other hydrocarbons not defined as oil in Section 9-17-1(3), except and not including liquid petroleum gas.
Kentucky H.B. 259 Section 1. A. (2)	"Carbon dioxide" means anthropogenic carbon dioxide of sufficient purity and quality as to not compromise the safety and efficiency of the reservoir to securely contain it."
West Virginia H.B. 4491 §22-11B-2 (1)	"Carbon dioxide" means carbon dioxide produced by anthropogenic sources which is of such purity and quality that it will not compromise the safety of geologic storage and will not compromise those properties of a storage reservoir which allow the reservoir to effectively enclose and contain a stored gas."
Mississippi S.B. 2723 53-11-5. (b)(i)	"Carbon dioxide" means: (i) naturally occurring carbon dioxide; (ii) geologically sourced carbon dioxide; (iii) anthropogenic carbon dioxide; or (iv) carbon dioxide stream. The term includes phases of carbon dioxide, whether fluid, liquid or gaseous, stripped, segregated, or divided from any other fluid stream thereof."
Nebraska NE L650	"(2) Carbon dioxide stream means carbon dioxide from anthropogenic sources, plus incidental associated substances derived from the source materials and the production or capture process, and any substances added to the stream to enable or improve the injection process if such substances will not compromise the safety of geologic storage and will not compromise those properties of a storage reservoir which allow the reservoir to effectively enclose and contain the stored carbon dioxide stream;"
Louisiana LAC Title 43, Part XVII §3601	"Carbon Dioxide—naturally occurring, geologically sourced, or anthropogenically sourced carbon dioxide including its derivatives and all mixtures, combinations, and phases, whether liquid or gaseous, stripped, segregated, or divided from any other fluid stream thereof. Carbon Dioxide Stream—the carbon dioxide that has been captured from an emission source (e.g., a 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 meaning does not apply to any carbon dioxide stream meeting the definition of a hazardous waste under Title 40, Code of Federal Regulations, Part 261."
Indiana IC 14-39-1-1	"As used in this chapter, "carbon dioxide" means a fluid consisting of more than ninety percent (90%) carbon dioxide molecules."

"Pore Space" is another key definition in CCUS legislations. There is a discrepancy between the definitions of pore space across states over the origins of pore space.

Table 5 Pore Space Definitions

State	Definition
West Virginia H.B.4491 §(22-11B-2) (9)	"A cavity or void, whether natural or artificially created, in a subsurface sedimentary stratum and is also known as container space or storage rights."
Utah H.B. 244 40-6-2.(23)(c)	"(a) "Pore space" means subsurface porous material possessing free space, naturally or artificially created, between the mineral grains. (b) "Pore space": (i) is expressed as a percentage; and (ii) depends on the size and sorting of the subsurface material's particles as a cubic or hexagonic package. (c) "Pore space" does not include void or cavern space created by the removal of minerals in the course of solution mining or other mining operations.."
Indiana IC 14-39-2-2(i)	"Pore space" means subsurface cavities or voids that can be used as a storage space for carbon dioxide.

"Pore Space Ownership" is equally as important as pore space. The majority of the states follow the "American rule" whereby the surface owner, not the mineral owner, owns the right to the pore space. Under this rule the mineral estate includes ownership of the underground minerals, but not of the geological formation, including the pore space. Several states have enacted pore space use and ownership statutes, including Montana, North Dakota, Oklahoma, and Wyoming. These states have all defined pore space as private property owned by the surface owner.

Only three of 11 states explicitly defined pore space ownership beyond "pore space owners." In Utah's definition, the scope of pore space is naturally occurring geologic formations, so the cavities created by mineral extraction are a separate entity and are under the jurisdiction of the mineral rights owner. Like most states, Utah also specified "title to pore space underlying the surface estate is vested in the owner of the surface estate."

Contradicting Utah's legislation definitions, the Supreme Court of North Dakota determined the use of the term "land" in the state's Damage and Disruption Code (§ 38-11.1-04) authorized surface owners to recover compensation for a mineral developer's use of the surface owners' pore space for the disposal of saltwater generated as a result of drilling operations.

Alaska is unique in that the Alaska Statehood Act vested the state with public ownership of the mineral estate and limited divestiture of that ownership. In effect, the Alaska Statehood Act prohibits private ownership of mineral rights on lands granted to the State from the Federal government. As well, the Supreme Court of Alaska in the case of *City of Kenai v. Cook Inlet Natural Gas Storage Alaska, LLC*. concluded that "the State reserved to itself the mineral estate, which includes the underground storage rights" of the pore space created from mineral extraction.

If the state assumes primacy for Class VI UIC well program, any state regulations regarding pore space use would also apply to federal lands in lieu of EPA regulations.

5 Authority Establishment

Statutory authority must be granted to a state agency for development and implementation of a CCUS program.

5.1 Duties of Authority

This can also be referred to as Jurisdiction, defining which state agency is vested authority to regulate CCUS. State commissions overseeing the oil and gas industry typically also serve as the regulatory authority over CCUS. Oil and gas commissions approve other surface-related facilities and equipment. For example, the Texas Railroad Commission regulates the oil and gas industry, pipeline transporters, and surface mining operations. North Dakota's Industrial Commission approves all oil and gas development, provides research grants, and assists in financing public infrastructure.

Table 6 Duties of Authority

State	Duties of Authority
Alabama 2022 AL S 36 §9-17-151.	"(2) The underground storage of carbon oxides, ammonia, hydrogen, nitrogen, and noble gases is in the public interest and welfare of this state and is for a public purpose.
North Dakota S.B. 2095 38-22-03 1-7	"1. Over all persons and property necessary to administer and enforce this chapter and its objectives. 2. To regulate activities relating to a storage facility, including construction, operation, and closure. 3. To enter, at a reasonable time and manner, a storage facility to inspect equipment and facilities; to observe, monitor, and investigate operations; and to inspect records required to be maintained at the facility. 4. To require that storage operators provide assurance, including bonds, that money is available to fulfill the storage operator's duties. 5. To exercise continuing jurisdiction over storage operators and storage facilities, including the authority, after notice and hearing, to amend provisions in a permit and to revoke a permit. 6. To dissolve or change the boundaries of any Commission-established oil or gas field or unit that is within or near a storage reservoir's boundaries. 7. To grant, for good cause, exceptions to this chapter's requirements and implementing rules."

State	Duties of Authority
Texas S.B. 1387 Section 2. Chapter 27. Subchapter C- 1. Sec. 27.041.	"(A) Except as provided by subsection (B), the Railroad Commission has Jurisdiction over the geologic storage of carbon dioxide in, and the injection of carbon dioxide into, a reservoir that is initially or may be productive of oil, gas, or geothermal resources or a saline formation directly above or below that reservoir. (B) The jurisdiction of the Railroad Commission over the geologic storage of carbon dioxide in, and the injection of carbon dioxide into, a saline formation described by subsection (A) is subject to the review of the Legislature based on the recommendations made in the preliminary report...Except as provided by subsection (B) , the Railroad Commission has Jurisdiction over a well used for the purpose provided by subsection (A) regardless of whether the well was initially completed for that purpose or was initially completed for another purpose and is converted to the purpose provided by subsection (A). Oklahoma appointed both the Corporation Commission and Department of Environmental Quality for CCUS legislation. A Memorandum of Understanding addressed areas in which implementation of the act would require interagency cooperation or interaction between the two agencies overseeing CCUS."

5.2 Cooperative Agreements and Contracts

The state's designated Authority is authorized to enter into legally binding agreements with other government agencies and private entities to facilitate CCUS legislations.

Table 7 Cooperative Agreements & Contracts

State	Cooperative Agreements and Contracts
West Virginia H.B. 2860 22-11A-9.	"The secretary is authorized to enter into cooperative agreements with other governments or government entities for the purpose of regulating carbon dioxide storage projects that extend beyond State regulatory authority under this article."
North Dakota S.B. 2095 38-22-20 1.-2.	"The Commission may enter into agreements with other governments, government entities, and State agencies for the purpose of carrying out this chapter's objectives. The Commission may enter into contracts with private persons to assist it in carrying out this chapter's objectives. Unless the circumstances require otherwise, the Commission shall, in entering such contracts, follow the process set out in section 38-08-04.4. If an emergency exists the Commission may enter contracts without public notice and without competitive bidding."

5.3 Public Participation

Support from the public and other industry is critical to the long-term viability of CCUS. Engagement events, open houses, and hearings are ways for the public to be involved in the CCUS process. Since citizens may not possess a lot of information about carbon sequestration, these events can educate them about what is happening in their community.

According to the CCUS State Workgroup Public Outreach, hosted by the American Petroleum Institute, the public are concerned about safety, possible impacts to fish, land use conversion, and unknown long-term risk. In Alaska, public concerns may also include tectonic stability, increased use of transportation infrastructure, and noise.

Table 8 Public Participation

State	Public Participation
Utah H.B. 244 40-11-19.	"The governing body of a controlling State interest or interest of a political subdivision is authorized to consent to and participate in a geologic carbon storage project."
North Dakota S.B. 2095 38-22-22	"Participation of public interests. The entity or official controlling State interests or the interests of political subdivisions is authorized to consent to and participate in a geologic storage project."

6 Fiscal Support

Alaska Oil & Gas Conservation Commission ("AOGCC") currently receives agency funding from fees on current oil and gas production. Implementing a Class VI permitting program under the current revenue model would result in several to many years wait between permitting a well and receipt of operational storage fees from the well. Some variety of bridge funding, such as federal grants, for the program may be needed to sustain the program until CCUS projects are operational. Bridge funding is a form of temporary, intermediate funding intended to cover AOGCC's short-term permitting expenses until long-term funding (i.e., royalties and taxes) is received.

6.1 Fees

States impose fees to cover the costs of permitting, monitoring, and inspecting CCUS injection wells, enforcing CCUS legislations, and conducting hearings. Fees are generally required at every stage of the CCUS injection well process (application, permitting, operation, and closure). No specific fee amounts are called out in any state legislation. Fees are typically split between two funds: administrative funds and long-term storage trust funds. Administrative fund fees generally cover processing permit applications and regulating storage facilities during construction, operation, and pre-closure phases. Long-term storage trust funds hold money for activities in the post-closure phase as described in Section 3.7.5. Many states also have a stipulation to reduce fees once a storage trust fund reaches or exceeds a certain amount. For example, Mississippi's Carbon Dioxide Storage Fund must reach or exceed $2,500,000 per geologic sequestration facility for fees to be reduced.

Table 9 Fees

State	Fees
West Virginia H.B. 2860 22-11A-5 (b)	"Upon filing an application, an applicant shall pay a reasonable fee, as established by the secretary in legislative rules, to the department for the costs of reviewing, evaluating and processing the permit, serving notice of an application and holding any hearings. The fee shall be credited to a separate account and shall be used by the department as required to complete the tasks necessary to process, publish and reach a decision on the permit application."

State	Fees
Texas S.B. 1387 Sec. 27.044	"The Railroad Commission may impose fees to cover the cost of permitting, monitoring, and inspecting anthropogenic carbon dioxide injection wells for geologic storage and geologic storage facilities; and enforcing and implementing this subchapter and rules adopted by the Railroad Commission under this subchapter. Fees collected by the Railroad Commission under this section shall be deposited to the credit of the Anthropogenic Carbon Dioxide Storage Trust."
North Dakota S.B. 2095 38-22-14 1.	"Storage operators shall pay the Commission a fee on each ton of carbon dioxide injected for storage. The fee must be in the amount set by Commission rule. The amount must be based on the Commission's anticipated expenses that it will incur in regulating storage facilities during their construction, operational, and pre-closure phases."

6.2 Financial Responsibility and Assurance

A storage operator needs to prove they can pay all required fees, operate the CCUS project, and support the state in monitoring the site after the cessation of injections. Financial assurance is essential for short-term fiscal support needs and long-term fiscal support. Short-term fiscal support needs refer to the cost of permitting, constructing, and operating CCUS projects. Long-term fiscal support needs refer to a long-term storage trust fund. Long-term trust funds are meant to hold money for activities in the post-closure phase and are described in more detail in Section 9.5.

To demonstrate financial assurance for short-term needs, a storage operator can fund administrative funds, bonds, credit lines, insurance, and/or self-insurance.

6.3 Tax Incentives

CCUS projects are not traditional income producers and are expensive to construct and operate, so tax credits and/or incentives are the revenue and thus, essential to help grow the industry. Other states with CCUS legislation have adopted property tax exemptions to help incentivize CCUS projects within the state. Tax incentives like property tax exemptions could reduce the significant start-up costs for CCUS projects.

North Dakota's legislation exempts carbon dioxide pipelines from property tax during construction and first 10 years of operation. The state will also reimburse local government for foregone property tax revenue from the carbon dioxide pipeline exemption. Montana's legislation allows for 50% of the assessed value of certain "clean energy" projects up to first $1 million in value to be exempted from property tax. The simplest tax incentive is Kansas, which exempted all CCUS property from property tax entirely.

Table 10 Tax Incentives

State	Tax Incentive
Kansas §79-233(a)	"Property exempt from taxation; carbon dioxide capture, sequestration or utilization property. (a) The following described property, to the extent herein specified, shall be exempt from all property taxes levied under the laws of the state of Kansas: Any carbon dioxide capture, sequestration or utilization property; and any electric generation unit which captures and sequesters all carbon dioxide and other emissions."
Montana §15-24-3111	"(1) A facility listed in subsection (3), clean advanced coal research and development equipment, and renewable energy research and development equipment may qualify for an abatement of property tax liability pursuant to this part. (2)(a) If the abatement is granted for a facility listed in subsection (3), the qualifying facility must be assessed at 50% of its taxable value for the qualifying period. (b) If the abatement is granted for clean advanced coal research and development equipment or renewable energy research and development equipment, the qualifying equipment, up to the first $1 million of the value of equipment at a facility, must be assessed at 50% of its taxable value for the qualifying period. There is no abatement for any portion of the value of equipment at a facility in excess of $1 million."
North Dakota § 57-06-17.1	"Property, not including land, is exempt from taxation during construction and for the first ten full taxable years following initial operation if it consists of a pipeline, constructed after 1996, and necessary associated equipment for the transportation or storage of carbon dioxide for secure geologic storage or use in enhanced recovery of oil or natural gas."

6.4 Federal 45Q and Other Tax Credits and Incentives

The federal 45Q tax credit is a performance-based tax credit designed to incentivize CCUS projects through a tax liability offset per every captured metric ton of carbon dioxide that is geologically sequestered. The original Section 45Q tax credit was enacted by the Energy Improvement and Extension Act of 2008. The Inflation Reduction Act of 2022 raised the 45Q tax credit from $50 per metric ton to $85 per metric ton. The Act also gives CCUS operators a "Direct Pay Election" for five years, allowing them to claim 45Q credits as cash refunds instead of as offsets against other taxes. The Inflation Reduction Act also allows taxpayers to sell 45Q tax credits tax-free by transferring the 45Q tax credits to other taxpayers in exchange for cash. As stated before, tax credits (and now cash refunds) are the desired revenue for a CCUS project and are essential for the market.

In addition to the 45Q credit, several states offer tax credits or incentives for CCUS projects. These vary widely in scope and scale, ranging from credits, exemption or reduction of property tax, severance tax, gross receipt tax, and sales tax. Texas has the greatest variety of carbon sequestration incentives, including sales tax exemptions, franchise tax credits, and severance tax reductions, mostly associated with EOR.

California and Oregon grant credits to fuel suppliers that have reduced their carbon footprint through CCUS activities.

Table 11 State Tax Credits and Incentives

State	Tax Incentives	Non-tax Incentives
California	EOR Credit	The Low Carbon Fuel Standard (with CCS protocol) provides suppliers of low-carbon fuels with credits that can be sold to suppliers of higher-carbon fuels. California's economy-wide cap-and-trade program covers 80 percent of the state's economy. Operators of low carbon power resources, such as power facilities with CCUS, can mostly avoid carbon allowance costs, providing a competitive advantage in the California electricity market.
Illinois	N/A	Illinois utilities are required to source electricity from "clean coal facilities" as part of the goal for at least 25 percent of electricity in Illinois to come from coal plants that capture and sequester CO2 emissions by 2025.
Kansas	Accelerated Depreciation Property Tax Exemption Carbon Farming Tax Credit	N/A
Kentucky	Sales and Use Tax Exemption Severance Tax Credit Credit on Corporate Income Taxes Credit on Personal Income Taxes	N/A
Louisiana	Sales and Use Tax Exemption Severance Tax Reduction	N/A
Michigan	Severance Tax Reduction	Integrated Renewable Portfolio Standard includes, to a limited extent, carbon capture and sequestration technology installed on a coal plant towards the renewable target.
Mississippi	Ad Valorem Tax Exemption Severance Tax Reduction Gross Income Tax Reduction	N/A
Montana	Reduced Property Tax	New electric generation capacity fueled by coal constructed after January 1, 2007, is required to capture and sequester at least 50 percent of CO2 emissions.
New Mexico	Alternative Energy Product Manufacturers Tax Credit Act	Public utilities may recover costs related to clean energy projects.
North Dakota	Sales and Use Tax Exemption Property Taxes Exemption Gross Receipts Tax Reduction	Includes CO2 pipelines as common carriers.
Oklahoma	Gross Production Tax Exemption	N/A
Oregon	N/A	Clean Fuels Program
Pennsylvania	N/A	The use of non-sulfur diesel fuel derived from coal is permitted as long as the fuel's carbon emissions are offset through geologic carbon sequestration or by participation in a carbon offset program.
Texas	Franchise Tax Credit Severance Tax Reductions Sales and Use Tax Exemption Gross Receipts Tax Exemption and Other Tax Incentives	Includes CO2 pipelines as common carriers if certain conditions are met.
Wyoming	Sales Tax Exemption Severance Tax Credit	N/A

Note: Adapted from Conners et al. (2020)

7 Permitting Process

The permitting process may involve separate permits for carbon dioxide sequestration, such as transportation. Each state lists what conditions an applicant shall follow to receive a CCUS permit. Permit conditions usually include complying with application requirements, paying a fee for the cost of processing the application, and paying a cost that assists in public notice and participation.

7.1 Pre-Application

States without primacy do not have pre-application steps or requirements, such as a pre-application meeting, prior to submitting a Class VI application with the EPA. One state with primacy, Wyoming, has requirements prior to submitting a Class VI application. The state has clear steps for screening a site, determining feasibility, and multiple pre-application meetings (**Figure 2**).

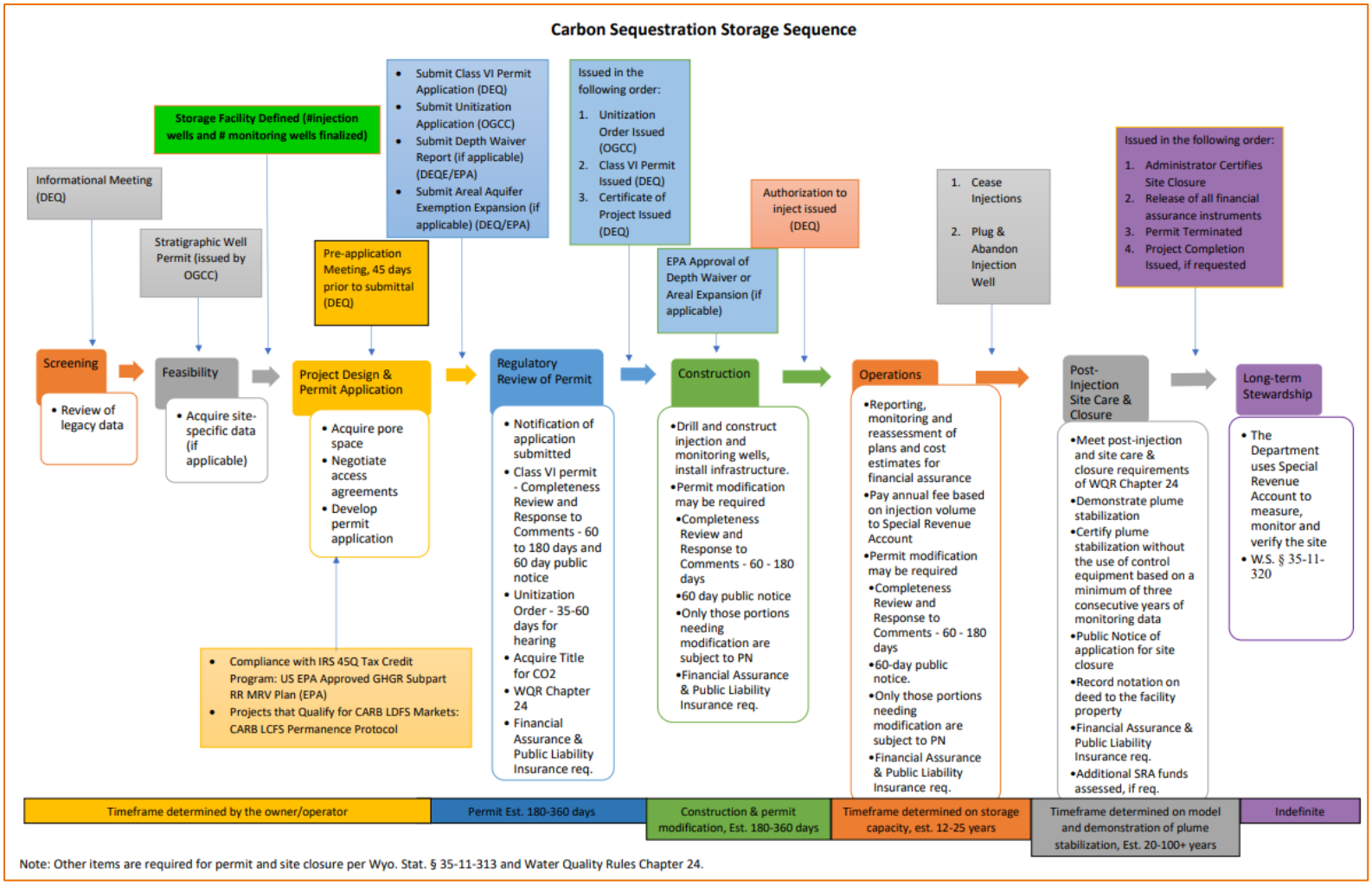

Figure 2 Carbon Sequestration Storage Sequence

(Wyoming Department of Environmental Quality, n.d.)

7.2 Permit Hearings

Hearings are held to hear evidence and accept public comment concerning an active permit application with potential environmental impacts. Hearings also inform all stakeholders (mineral rights owners, pore space owners, surface owners) of project updates. Some states give exact timelines of the hearing process while others leave it up to the designated authority.

Table 12 Public Participation

State	Permit Hearings
North Dakota S.B. 2095 38-22-06	"1. The Commission shall hold a public hearing before issuing a permit. 2. Notice of the hearing must be published for two consecutive weeks in the official newspaper of the county or counties where the storage reservoir is proposed to be located and in any other newspaper the Commission requires. Publication deadlines must comply with Commission requirements. 3. Notice of the hearing must be given to each mineral lessee, mineral owner, and pore space owner within the storage reservoir and within one-half mile of the storage reservoir's boundaries. 4. Notice of the hearing must be given to each surface owner of land overlying the storage reservoir and within one-half mile of the reservoir's boundaries. 5. Notice of the hearing must be given to any additional persons that the Commission requires. 6. Service of hearing notices required by this section must conform to personal service provisions in rule 4 of the North Dakota rules of civil procedure. 7. Hearing notices required by this section must comply with deadlines set by the Commission. 8. Hearing notices required by this section must contain the information the Commission requires."
Utah H.B. 244 40-11-7. (1)-(4)	"(1) The board shall hold a public hearing before authorizing the division to issue a permit. (2) The board shall conduct the hearing in accordance with Title 63G, Chapter 4, 474 Administrative Procedures Act. (3) The board shall give notice no fewer than 30 days prior to the hearing by: (a) one publication in a daily newspaper of general circulation in Salt Lake City, Utah; (b) in all newspapers of general circulation published in the county or counties in 478 which the land affected is situated; and(c) by publication in accordance with Section 45-1-101. (4) In addition to the notice required in Subsection (3), an applicant shall provide notice of the hearing and a copy of the permit application, no fewer than 30 days before the hearing to (a) each mineral lessee within one-half mile of the storage reservoir's boundaries; (b) each mineral owner within one-half mile of the storage reservoir's boundaries; (c) each pore space owner within one-half mile of the storage reservoir's boundaries; (d) each surface owner of land within one-half mile of the storage reservoir's boundaries."

7.3 Permit Consultation

The permitting authority may want to consult with other departments before issuing a permit. These may include the state's department of public health or environment. In Alaska permit consultation and coordination would be required between several agencies, including the Department of Natural Resources, Alaska Oil and Gas Conservation Commission, Department of Environmental Conservation, and potentially others.

Table 13 Permit Consultation

State	Permit Consultation
Wyoming H.B. 90. 35-11-313 (f)	The administrator of the water quality division of the department of environmental quality, after receiving public comment and after consultation with the State geologist, the Wyoming oil and gas conservation Commission and the advisory board created under this act, shall recommend to the director rules, legislations and standards."

7.4 Permit Requirements

Permit requirements necessitate an applicant to demonstrate a thorough review of the CCUS project site and its potential impacts on ground water, human health, and the environment. UIC programs are authorized through the Safe Drinking Water Act 42 U.S.C. 300f *et seq.* UIC programs are also exempt from the National Environmental Policy Act ("NEPA") environmental assessment under Section 511(c) of the Clean Water Act because the UIC program itself requires sufficient environmental assessment. Although CCUS permits do not need to go through the NEPA permitting process, the project must still comply with all applicable federal and state environmental laws and follow the UIC and state permit requirements.

Table 14 Permit Requirements

State	Permit Requirements
North Dakota S.B. 2095 38-22-08	"1. That the storage operator has complied with all requirements set by the Commission. 2. That the storage facility is suitable and feasible for carbon dioxide injection and storage. 3. That the carbon dioxide to be stored is of a quality that allows it to be safely and efficiently stored in the storage reservoir. 4. That the storage operator has made a good-faith effort to get the consent of all persons who own the storage reservoir's pore space. 5. That the storage operator has obtained the consent of persons who own at least sixty percent of the storage reservoir's pore space. 6. Whether the storage facility contains commercially valuable minerals and, if it does, a permit may be issued only if the Commission is satisfied that the interests of the mineral owners or mineral lessees will not be adversely affected or have been addressed in an arrangement entered into by the mineral owners or mineral lessees and the storage operator. 7. That the proposed storage facility will not adversely affect surface waters or formations containing fresh water. 8. That carbon dioxide will not escape from the storage reservoir. 9. That substances that compromise the objectives of this chapter or the integrity of a storage reservoir will not enter a storage reservoir. 10. That the storage facility will not endanger human health nor unduly endanger the environment. 11. That the storage facility is in the public interest. 12. That the horizontal and vertical boundaries of the storage reservoir are defined. These boundaries must include buffer areas to ensure that the storage facility is operated safely and as contemplated. 13. That the storage operator will establish monitoring facilities and protocols to assess the location and migration of carbon dioxide injected for storage and to ensure compliance with all permit, statutory, and administrative requirements. 14. That all nonconsenting pore space owners are or will be equitably compensated."

Nebraska follows similar requirements, but also calls for a geologic study that includes seismic assessment. The state also specifies how carbon dioxide will not escape from the reservoir through the atmosphere nor water.

> "In accordance with the United States Environmental Protection Agency Underground Injection Control program, that the storage operator has completed a comprehensive geologic study which includes a seismic risk assessment."

Utah also follows similar requirements, but also requires plans for ensuring compliance, requires 70% of pore space owners to consent to CCUS, and explicitly limits carbon dioxide escapement.

> "Carbon dioxide will not escape from the storage reservoir at a rate exceeding the lower of 1% or the standard recommended by the Environmental Protection Agency."

7.5 Permit Provisions

Permit provisions refer to extra requirements or conditions in the state CCUS legislation. West Virginia added a provision about agents and Mississippi included many provisions regarding oil and gas production in connection with a CCUS project.

Table 15 Permit Provisions

State	Permit Provisions
West Virginia H.B. 4491 §22-11B-6 (a)-(b)	"The secretary may include in any permit or order all things necessary to carry out this article's objectives and to protect and adjust the respective rights and obligations of persons affected by a carbon dioxide sequestration facility. Every well operator required to designate an agent under this article shall, within five days after the termination of the designation, notify the secretary of the termination and designate a new agent."
Mississippi S.B. 2723 53-11-15 (1)(c)(i)	"A provision for: (i) access to and use of a reasonable amount of the surface area within the unit area by the storage operator and his agents in connection with constructing, equipping, operating, maintaining and terminating operations of the geologic sequestration facility; and (ii) payment of the reasonable costs of compensable damages to the surface and reasonable consideration for use of the surface area."

7.6 Amalgamating Property Interests

Amalgamating property interests means combining many properties from one single large property, usually facilitated by multiple property owners.

Amalgamating property can also be facilitated by a state government, like eminent domain. While eminent domain refers to the right of a government to expropriate private property to public use in return for payment of compensation, amalgamating property interests refers to the government's right to order the pooling of the desired pore space licensing for a CCUS project in return for payment of compensation. The pore space owners still own their pore space, but the state may allow the pore space to be licensed to the project, with compensation, regardless of if all the pore space owner consented to the licensing.

Naturally, some owners may want to license pore space to a CCUS project while others may not. Since subsurface property is harder to delineate than surface property lines, a nonconsenting owner's pore space may not be separatable from the desired pore space reservoir. Therefore, amalgamating can be necessary.

Before ordering an amalgamation of property, the state needs to see the applicant/storage operator make "good faith" attempts to acquire the license to use the desired pore space. A "good faith" attempt refers to a diligent and honest effort to contact the pore space owners to secure licensing.

In addition to good faith efforts, an applicant/storage operator needs to secure a certain percentage of the interest in pore space. The minimum percentage of the interest in pore space (licensing) required varies

among states. At the very least, an applicant/storage operator needs a majority approval, 51%. Some states, such as Utah, set the minimum percent required at 70%.

States vary in how they amalgamate properties of consenting and nonconsenting owners for a CCUS permit.

Table 16 Amalgamation of Property Interests

State	Amalgamation of Property Interests
Utah H.B. 244 40-11-11. (1) & 40-11-6.(3)(c)	"The board may hold a hearing to consider the need for the amalgamation of a tract of land for geologic carbon storage.: (c) that owners who own no less than 70% of the reservoir's pore space have provided written consent to the use of the owners' pore space for a storage facility;
North Dakota S.B. 2095 38-22-10	"If a storage operator does not obtain the consent of all persons who own the storage reservoir's pore space, the Commission may require that the pore space owned by nonconsenting owners be included in a storage facility and subject to geologic storage. When the Commission issues a permit it shall also issue a certificate stating that the permit has been issued, describing the area covered, and containing other information the Commission deems appropriate. The Commission shall file a copy of the certificate with the county recorder in the county or counties where the storage facility is located."

8 Resource Designation

Title to resources should be addressed early in the CCUS legislation to assist in creating a regulatory scope. Resources to identify ownership and title includes pore space, carbon throughout the CCUS process, minerals, and property. The rights of owners are also addressed in other state CCUS legislation.

8.1 Pore Space Licensing

Pore space ownership is not a clear and settled area of property rights law in all states. However, most states are leaning towards the American rule, designating ownership of pore space (any geological formations below the surface) to the surface estate owners. These owners have the choice to license their pore space for a CCUS project.

The federal government is also leaning towards the American rule, but the federal government has not explicitly defined pore space ownership. The United States Supreme Court has not ruled on pore space ownership, nor has the Legislative branch enacted any laws. However, the Bureau of Land Management recently issued an Instruction Memorandum (No. 2022-041) as the national policy for right-of-way authorizations for carbon sequestration projects. The Memorandum stated the following regarding pore space ownership:

> "Typically, pore space is owned by the surface owner, although it may be separately conveyed. In determining pore-space ownership, title documents should be reviewed. Questions about pore-space ownership should be resolved in coordination with the Solicitor's Office."

Governments outside of the United States typically follow the "English rule" and designate pore space ownership to the government itself. Governments of Australia, Norway, and Canada all claim ownership of all underground geologic formations (including minerals and pore space) below the surface. These countries may enter into an agreement with a person that grants them leases and/or licenses to the geologic formations. Alaska more closely follows the English rule than the American rule. In certain cases the federal government may own the surface estate while an Alaska Native Corporation has been granted the mineral rights (subsurface estate).

Table 17 Pore Space Licensing

State	Pore Space Licensing
Wyoming H.B. 89 34-1-152 (b)	"The ownership of pore space in strata may be conveyed in the manner provided by law for the transfer of mineral interests in real property. No agreement conveying mineral or other interests underlying the surface shall act to convey ownership of any pore space in the stratum unless the agreement explicitly conveys that ownership Interest."
Alberta, Canada Mines and Minerals Act RSA 2000, c M-17 15.1(1)	"(a) no grant from the Crown of any land in Alberta, or mines or minerals in any land in Alberta, has operated or will operate as a conveyance of the title to the pore space contained in, occupied by or formerly occupied by minerals or water below the surface of that land, (b) the pore space below the surface of all land in Alberta is vested in and is the property of the Crown in right of Alberta and remains the property of the Crown in right of Alberta whether or not (i) this Act, or an agreement issued under this Act, grants rights in respect of the subsurface reservoir or in respect of minerals occupying the subsurface reservoir, or (ii) minerals or water is produced, recovered or extracted from the subsurface reservoir, and... (3) The Minister may enter into agreements with respect to the use of pore space."
Country of Norway Legislation for carbon dioxide Section 1-2.	"The Norwegian State has the proprietary right to subsea reservoirs on the continental shelf for exploitation of said reservoirs for storage of CO_2 and has an exclusive right to management of said reservoirs."
Victoria, Australia Greenhouse Gas Geological Sequestration Act Part 2 14(1)-(4)	"(1) The Crown owns all underground geological storage formations below the surface of any land in Victoria. (2) Subsection (1) does not apply in relation to any land (other than Crown land) to the extent that the underground geological storage formation is within 15.24 metres of the surface of the land. (3) Subsection (1) applies despite any prior alienation of Crown land. (4) The Crown is not liable to pay any compensation in respect of a loss caused by the operation of this section."

8.2 Mineral Ownership

Mineral rights are the ownership rights to underground resources, including fossil fuels, ore, and mineable rocks. Mineral rights are separate from surface rights and can be considered a type of subsurface right, but not completely interchangeable. The ability to mine for minerals may be affected by a CCUS injection well, creating a rivalrous use between subsurface and surface right owners. Therefore, states address

how the state will maintain the rights of mineral rights owners and pore space owners to be non-exclusionary.

Table 18 Mineral Ownership

State	Mineral Ownership
Nebraska NE L650 Section 4	"(1) Title to any reservoir estate underlying the surface of lands and waters is vested in the owner of the overlying surface estate unless it has been severed and separately conveyed."
Wyoming H.B. 89 34-1-202 (c)	"This act shall not alter the law of Wyoming regarding the primacy of the mineral estate and any easement created hereunder shall not limit the right of a mineral owner or his lessee to reasonable use of the surface for the purpose of mineral exploration and production unless the owners and lessees of the entire mineral estate...."
North Dakota S.B 2095 38-22-08 6.	'Whether the storage facility contains commercially valuable minerals and, if it does, a permit may be issued only if the Commission is satisfied that the interests of the mineral owners or mineral lessees will not be adversely affected or have been addressed in an arrangement entered into by the mineral owners or mineral lessees and the storage operator."

8.3 Preservation of Rights

Preservation of rights means the rights acquired in the past are still considered a valid contract, even if the rights were acquired through antiquated rules. Many CCUS legislations explicitly address preserving mineral owners' rights.

Additionally, many states require the location of the CCUS project to be a site with no valuable minerals, to protect the interests of mineral owners or lessees. The European Union ("EU") continues this priority of mineral interests. The EU member states legislations allow the states to prioritize other uses of the underground geologic formations and are encouraged to consider other energy-related projects in the same space.

Although resource extraction is prioritized, drilling through an active carbon dioxide storage reservoir for oil and gas production at a greater depth is technically feasible, provided appropriate geologic formations and safety measures are in place.

Table 19 Preservation of Rights

State	Preservation of Rights
Indiana IC 14-39-2 Chapter 2 Section 1	(c) Except as otherwise provided in this chapter, this chapter applies to the underground storage of carbon dioxide. (d) The rights and requirements of this chapter: (1) are subordinate to the rights pertaining to oil, gas, and coal resources; and (2) may not adversely affect oil, gas, and coal resources, except as is strictly necessary to construct and maintain a carbon sequestration project that will provide for the permanent storage of carbon dioxide.
Oklahoma S.B. 610 Section 6. B.	"Nothing in this act shall alter the incidents of ownership, or other rights, of the owners of the mineral estate or adversely affect enhanced oil or gas recovery efforts in the state."

State	Preservation of Rights
West Virginia H.B. 2860 22-11A-8. (b)	"Nothing in this article is intended to impede or impair the ability of an oil, natural gas, or coalbed methane operator to inject carbon dioxide through an approved enhanced oil, natural gas, or coalbed methane recovery project and to establish, verify, register, and sell emission reduction credits associated with the project."
North Dakota S.B. 2095 38-22-13	"Nothing in this chapter nor the issuing of a permit: 1. Prejudices the rights of property owners within a storage facility to exercise rights that have not been committed to a storage facility. 2. Prevents a mineral owner or mineral lessee from drilling through or near a storage reservoir to explore for and develop minerals, provided the drilling, production, and related activities comply with commission requirements that preserve the storage facility's integrity and protect this chapter's objectives."
Kentucky H.B. 259 Section 3. (2)	"To be approved, a project shall inject carbon dioxide into pore space that contains no economically recoverable minerals at the time of the injection."
Mississippi S.B. 2723 53-11-9. (1)(c)(ii)	"The reservoir has a greater value or utility as a reservoir for carbon dioxide storage than for the production of the remaining volumes of reservoir oil, gas, condensate or other commercial mineral, if any, and the requirements of Sections 53-11-11 and 53-11-13 have been satisfied. Approval of a geologic sequestration facility by the board shall provide full and complete authority for the construction, equipping and operation of the geologic sequestration facility without need of further action or grant by any person."
European Union Directive 2009/31/EC Introduction (19)	"Member States should retain the right to determine the areas within their territory from which storage sites may be selected. This includes the right of Member States not to allow any storage in parts or on the whole of their territory, or to give priority to any other use of the underground, such as exploration, production and storage of hydrocarbons or geothermal use of aquifers. In this context, Member States should in particular give due consideration to other energy-related options for the use of a potential storage site, including options which are strategic for the security of the Member State's energy supply or for the development of renewable sources of energy."

9 Liability

Liability is the state of being responsible for something, especially by law. All active CCUS projects are still in the beginning stages since the CCUS industry itself is relatively new. No projects have reached the closure or post-closure phase. Post-closure risks, such as carbon dioxide plume migration, have not been fully actualized. To mitigate this limited understanding of sequestered carbon dioxide, the EPA set a minimum monitoring period of 50 years after cessation of injection. During the 50-year period, the carbon dioxide will be monitored to track if it is escaping from the storage reservoir. Although the EPA designates a 50-year monitoring period, it is not clear who is liable for the carbon dioxide itself during or after the monitoring period.

In addition to the lack of experience with sequestered carbon dioxide, a possible change in carbon dioxide ownership and transfer of liability during the post-closure phase adds more uncertainty. Other states and government agencies are preparing for the state to have a role in post-closure site management and take on long-term liability.

9.1 Pore Space Liability

In most states, pore space owners do not hold liability for the injected carbon dioxide when licensing their pore space.

Table 20 Pore Space Liability

State	Pore Space Liability
Utah H.B. 244 40-11-15 (3).	"An owner of pore space does not incur liability for geologic carbon storage activity by virtue of ownership of or of leasing out the pore space."
Wyoming S.F. 47 34-1-15"3	(a) All carbon dioxide, and other substances injected incidental to the injection of carbon dioxide, injected into any geologic sequestration site for the purpose of geologic sequestration shall be presumed to be owned by the injector of such material subject to W.S. 35-11-318 and 35-11-319 and all rights, benefits, burdens and liabilities of such ownership shall belong to the injector. This presumption may be rebutted by a person claiming contrary ownership by a preponderance of the evidence in an action to establish ownership. (b) Except as provided in W.S. 35-11-318 and 35-11-319, no owner of pore space, other person holding any right to control pore space or other surface or subsurface interest holder, shall be liable for the effects of injecting carbon dioxide for geologic sequestration purposes, or for the effects of injecting other substances for the purpose of geologic sequestration which substances are injected incidental to the injection of carbon dioxide, solely by virtue of their interest or by their having given consent to the injection."

9.2 Operating Liability

The storage operator has title, or actual ownership of property, of the carbon dioxide associated with the CCUS project, and thus holds all rights, responsibilities, and liability. No states hold liability for the CCUS project during the operating life of the project.

Table 21 Title and Liability

State	Title and Liability
North Dakota S.B. 2095 38-22-16	"The storage operator has title to the carbon dioxide injected into and stored in a storage reservoir and holds title until the Commission issues a certificate of project completion. While the storage operator holds title, the operator is liable for any damage the carbon dioxide may cause, including damage caused by carbon dioxide that escapes from the storage facility."
Nebraska L.B. 650 Sec. 18	"The storage operator has title to the carbon dioxide injected into and stored in a storage reservoir and holds title until the commission issues a certificate of project completion under Section 19 of this act. While the storage operator holds title, the operator is liable for any damage the carbon dioxide may cause, including damage caused by carbon dioxide that escapes from the storage facility."
Wyoming S.F. 47 35-11-318. (b)	"An injector shall: have title to any carbon dioxide the injector injects into and stores underground or within a unit area; hold title for any injected or stored carbon dioxide until the department issues a certificate of project completion. During any time, the injector holds title to carbon dioxide under this section, the injector shall be liable for any damage the injected or stored carbon dioxide may cause, including damage caused by carbon dioxide that escapes or is released from where it is being stored underground."

State	Title and Liability
Kansas H.B. 2418 55-1637 (H)	"(H) No rule or regulation adopted under the provisions of this section shall create or impose upon the Commission, any agent or employee thereof or the state of Kansas any liability for the underground storage of carbon dioxide or the maintenance of any carbon dioxide injection well or underground storage of carbon dioxide except as permitted by the Kansas tort claims act. From and after July 1, 2010, any requirement in any rule and regulation adopted by the Commission which conflicts with the prohibition prescribed in this section shall be null and void."
Utah	"(1) The storage operator has title to the carbon dioxide injected into and stored in a storage reservoir and holds title until the board issues a certificate of project completion. (2) The storage operator is liable for any damage the stored carbon dioxide may cause, including damage caused by escaping stored carbon dioxide until the board issues a certificate of completion."

Operational liabilities can be incurred by violation of CCUS statutes or by violations of common law (i.e., negligent operation, trespass, nuisance, or injury to neighboring property owners). The risks associated with operational liabilities is usually addressed through financial assurance requirements (in Section 3.4.1). Alaska has well established financial assurance requirements for the oil and gas industry that can be utilized as models for CCUS projects.

9.3 Long-term Liability

Long-term liability refers to Phase V, from the figure below. The storage operator has liability of carbon dioxide from Phase II to Phase IV, highlighted in yellow.

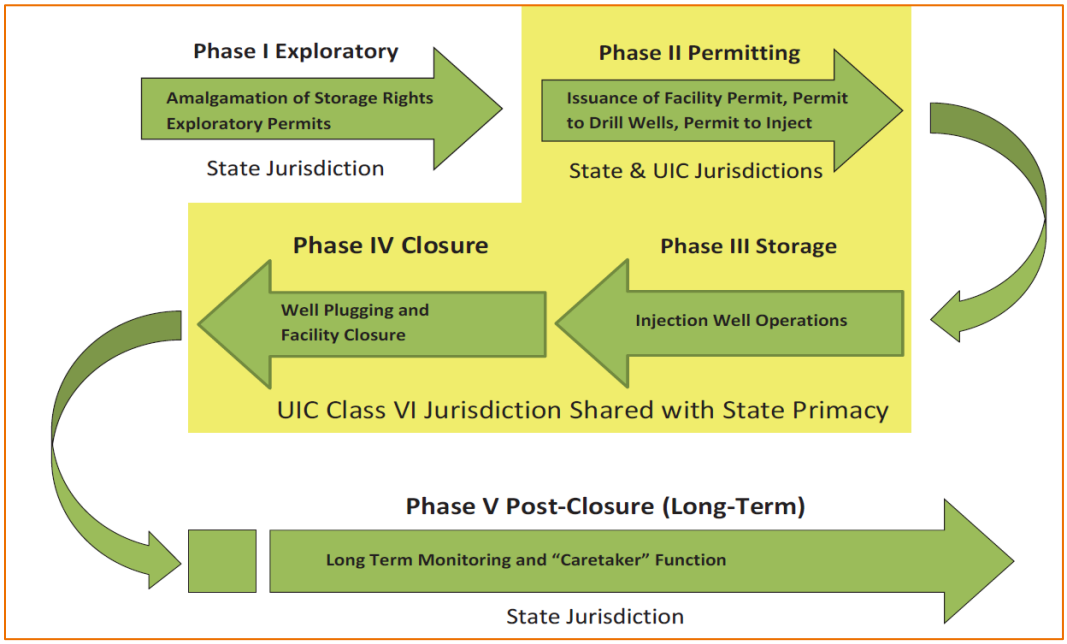

Figure 3 CCUS Project Flow Diagram

(IOGCC 2014)

Liability is not guaranteed to be transferred after a project is completed. A state can take on different degrees of long-term liability for Phase V, Post-Closure:

- **Full Liability**: State becomes solely responsible for carbon dioxide in storage reservoir and CCUS project, the storage operator is released from all liability.
    - North Dakota, West Virginia, Wyoming, Alberta, Utah
- **Partial Liability**: State is partially responsible for carbon dioxide in storage reservoir and CCUS project, the storage operator shares liability.
    - Texas, Mississippi, Louisiana
- **No Liability:** State is not responsible for carbon dioxide in storage reservoir and CCUS project, the storage operator has full liability.
    - Federal (BLM)

There is a general trend of the state assuming full liability after the Certificate of Project Completion is issued. States identified with assuming partial liability made caveats for the storage operator being liable for carbon dioxide operations prior to injection, any omission of information, and restoration of facilities. In Louisiana, transfer of ownership does not assume transfer of liability; the state can take ownership but not liability if a CCUS project cannot show mechanical integrity. In all jurisdictions reviewed apart from West Virginia, the title of the storage facility and stored carbon dioxide is transferred to the state. West Virginia transfers the title of the stored carbon dioxide back to the pore space owners, but the liability of that stored carbon dioxide is transferred to the state.

Table 22 Long-Term Liability

State	Long-Term Liability
North Dakota SB 2095 38-22-17.6.	"Once a certificate is issued: A. Title to the storage facility and to the stored carbon dioxide transfers, without payment of any compensation, to the state. B. Title acquired by the state includes all rights and interests in, and all responsibilities associated with, the stored carbon dioxide. C. The storage operator and all persons who generated any injected carbon dioxide are released from all regulatory requirements associated with the storage facility. D. Any bonds posted by the storage operator must be released. E. Monitoring and managing the storage facility is the state's responsibility to be overseen by the commission until such time as the federal government assumes responsibility for the long-term monitoring and management of storage facilities."
Texas EC. 382.507. (a)-(b)	"(a) The board shall acquire title to carbon dioxide stored in the carbon dioxide repository on a determination by the board that permanent storage has been verified and that the storage location has met all applicable state and federal requirements for closure of carbon dioxide storage sites. (b) The right, title, and interest in carbon dioxide acquired under this section are the property of the permanent school fund and shall be administered and controlled by the board."

State	Long-Term Liability
Texas ec. 382.508. (a)-(b)	"(a) The transfer of title to the state under section 382.507 does not relieve a producer of carbon dioxide of liability for any act or omission regarding the generation of stored carbon dioxide performed before the carbon dioxide was stored. (b) On the date the permanent school fund, under section 382.507, acquires the right, title, and interest in carbon dioxide, the producer of the carbon dioxide is relieved of liability for any act or omission regarding the carbon dioxide in the carbon dioxide repository. (c) this section does not relieve a person who contracts with the board under section 382.504(b) of liability for any act or omission regarding the construction or operation, as applicable, of the carbon dioxide repository."
West Virginia H.B 4491 §22-11B-12. (c) (1)-(3)	"(c) As of the effective date of a completion certificate: (1) Ownership of the stored carbon dioxide transfers, without payment of any compensation, to the owners of the pore space as established in §22-11B-18 of this code; (2) Ownership acquired by the pore space owners under subdivision (c)(1) of this section includes all rights and interests in the stored carbon dioxide and any associated leasing rights; Provided, That all liability and regulatory requirements associated with the stored carbon dioxide shall become the responsibility of the state and the state shall defend, indemnify, and hold harmless the pore space and surface owners against all claims using only funds from the Carbon Dioxide Storage Facility Trust Fund; (3) The storage operator and all persons who transported and/or generated any stored carbon dioxide are released from all liability and regulatory requirements associated with the storage facility;"
Wyoming S.F. 47 35-11-319 (d) (iv)-(vi)	"(iv) The injector and all persons who generated any injected or stored carbon dioxide shall be forever released from all regulatory requirements associated with the continued storage and maintenance of the injected carbon dioxide; (v) Any bond or financial assurance submitted to the department under W.S. 35-11-313 through 35-11- 317 shall be released; (vi) The state, through the department, shall assume responsibility to manage and monitor the stored carbon dioxide until such time when the federal government assumes responsibility for the long term monitoring and management of stored carbon dioxide."
Mississippi S.B. 2723 53-11-25 (2)	"2) Nothing in this chapter shall establish or create any liability or responsibility on the part of the board or the state to pay any costs associated with facility restoration from any source other than the performance bond, deposit, other assurance of performance, or financial assurances posted or required pursuant to this chapter, nor shall the board or the state have any liability or responsibility to make any payments for costs associated with facility restoration."
Louisiana H.B. 661 Section 1109 (4)	"It is the intent of this section that the state shall not assume or have any liability by the mere act of assuming ownership of a storage facility after issuance of a certificate of completion of injection operations."
Alberta, Canada Mines and Minerals Act RSA 2000, c M-17 121(1)(b)	"The Minister...assumes all obligations of the lessee as owner and licensee under the Oil and Gas Conservation Act of the wells and facilities covered by that agreement, (ii) as the person responsible for the injected captured carbon dioxide under the Environmental Protection and Enhancement Act, (iii) as the operator under Part 6 of the Environmental Protection and Enhancement Act in respect of the land within the location of the agreement used by the lessee in relation to the injection of captured carbon dioxide, and (iv) under the Surface Rights Act,"

9.4 Federal Liability

For states without primacy, the EPA requires a post-closure plan that includes monitoring for 50 years (40CFR146.93(b)(2)) before the EPA will review potential site closure. The wording of the regulation, and the prefatory text in the Federal Register (FR Vol.75, No. 237, Dec. 10, 2010) implies that the owner or operator of the CCUS facility is directly liable until site closure and may be liable for violations of federal regulations indefinitely. As noted in the Federal Register,

> "EPA acknowledges stakeholder interest in liability and long-term stewardship in the context of development and deployment of GS technology, however, under current SDWA provisions EPA does not have authority to transfer liability from one entity (i.e., owner or operator) to another." (page 77272)

Wyoming, North Dakota, Kansas, and West Virginia's legislations referred to the federal government assuming liability from the storage operator and/or state in the future.

Table 23 Federal Liability

State	Federal Liability
Wyoming S.F. 47 35-11-319 (d) (vi)	"(vi) The state, through the department, shall assume responsibility to manage and monitor the stored carbon dioxide until such time when the federal government assumes responsibility for the long term monitoring and management of stored carbon dioxide."
North Dakota SB 2095 38-22-17.6. E.	"Monitoring and managing the storage facility is the state's responsibility to be overseen by the commission until such time as the federal government assumes responsibility for the long-term monitoring and management of storage facilities."
West Virginia H.B 4491 §22-11B-12. (c) (5)	"Notwithstanding ownership of the stored carbon dioxide in the pore space owners as provided herein, monitoring, and managing the storage facility shall become the state's responsibility to be overseen by the secretary utilizing only money from the Carbon Dioxide Storage Facility Trust Fund until such time as the federal government assumes responsibility for the long-term monitoring and management of storage facilities."
Kansas H.B. 259 353 Section 6. (3) – (4)	"(3) The ownership and liability for a storage facility may be transferred to: (a) The federal government if a federal program exists; or (b) The Finance and Administration Cabinet pursuant to subsections (4) to (6) of this section if a federal program does not exist. (4) If no federal program exists, and the storage operator seeks to transfer the ownership and liability of a storage facility to the Finance and Administration Cabinet, after completion of the required period of monitoring following completion and plugging, the storage operator shall notify the division of its intent to transfer ownership of the stored carbon dioxide and associated liability to the Finance and Administration Cabinet. The storage operator shall provide evidence to the division of the satisfactory completion of all permit conditions pertaining to the demonstration carbon injection well. Upon receipt and evaluation of satisfactory evidence, the division shall forward the evidence to the Finance and Administration Cabinet with a recommendation for the transfer of ownership of the stored carbon dioxide and liability. The storage operator may then apply to the Finance and Administration Cabinet for the transfer of ownership and liability for the stored carbon dioxide."

9.5 Funding Long-term Liability

A long-term storage trust fund is meant to hold money for activities in the post-closure phase. Often, liability may only be released if there are sufficient trust funds to address or remediate any duty, obligation, or liability that may arise after a verification of completion is issued, such as long-term monitoring and management of the storage facility. Sufficient storage trust funds assure liability will not be the burden of the state and people. Many states reviewed will not release liability from the storage operators if there are insufficient funds in a long-term trust fund.

Table 24 Long-Term Liability Funding Requirements

State	Long-Term Liability Funding Requirements
Louisiana H.B. 661 Section 1109 (2)	"Provided the provisions pertaining to site-specific trust accounts are not applicable, such release from liability will not apply to the owner or last operator of record of a storage facility if the carbon dioxide geologic storage trust fund has been depleted of funds such that it contains inadequate funds to address or remediate any duty, obligation, or liability that may arise after issuance of the certificate of completion of injection operations."

States have many options to fund these long-term liability trust funds:

- Per-ton injection fees
- Lump sum closure fees
- Rent of pore space and surface land
- Royalties or portions on 45Q Tax Credits

CCUS legislations require permitting fees (as described in Section 6.1 Fees) to be deposited in designated administrative and trust funds to facilitate CCUS injection wells. CCUS legislation generally includes a per-ton injection fee during CCUS operations for funding long-term liability trust funds.

Table 25 Funding Long-Term Liability

State	Funding Long-Term Liability
North Dakota S.B. 2095 38-22-15 1	"Storage operators shall pay the Commission a fee on each ton of carbon dioxide injected for storage. The fee must be in the amount set by Commission rule. The amount must be based on the Commission's anticipated expenses associated with the long-term monitoring and management of a closed storage facility."
Nebraska L.B 650 Sec. 7. (1)	"(1) A Person applying for a permit shall: (a) comply with application requirements set by the Commission; (b) pay a fee in an amount set by the Commission. The amount of the fee shall be set by rule and legislation and shall be based on the Commission's anticipated cost of processing the application. The fee shall be deposited in the carbon dioxide storage facility administrative fund; and (c) pay to the Commission the costs the Commission incurs in publishing notices for hearings and holding hearings on permit applications."

State	Funding Long-Term Liability
Mississippi § 53-11-23. (1)(c)	"Any per-ton fee shall first be applied to the administration and enforcement costs of the board's activities required or authorized by this chapter, and any amount exceeding those costs shall be transferred to a separate special fund of the State Oil and Gas Board which is hereby created and is to be known as the Carbon Dioxide Storage Fund."
Indiana IC 14-39-2-9	(a) A storage operator shall pay the department a fee for every ton of carbon dioxide injected for storage. (b) The storage operator shall provide the department with an estimate of the amount of carbon dioxide to be injected into a storage facility for the period of the permit at the time of application for a carbon sequestration project permit. (c) A storage operator shall pay annually to the department a fee of eight cents ($0.08) per ton of carbon dioxide estimated to be injected into a storage facility. (d) A storage operator shall reconcile the previous calendar year's payment with the volume of carbon dioxide actually injected into the storage facility the previous calendar year. The storage operator shall submit payment for the amount of carbon dioxide injected into a storage facility less the amount paid the previous calendar year. (e) The department shall refund a storage operator any overpayment in the current year from the previous calendar year.

10 Operations

CCUS operations requirements typically include measuring, monitoring, and verification plans, verification of storage amounts, and penalties for non-compliance.

10.1 Measuring, Monitoring, and Verification Plan

CCUS projects can be strictly sequestration, or they can be used for enhanced oil recovery. For both types of projects, measurement and monitoring of carbon dioxide to confirm conformance and containment is a critical activity. Commitment to undertake measurement and monitoring and to report this data is done through a measurement, monitoring, and verification ("MMV") plan and in many jurisdictions is a condition of project approval.

10.2 Storage Amount

Carbon dioxide injection and storage volumes are measured as part of the project's MMV plan. This data can be applied to carbon credits, allowances, emissions allocations, and offsets, as well as for public reporting requirements.

Table 26 Storage Amount

State	Storage Amount
North Dakota S.B 2095 38-22-23	"1. The Commission, under procedures and criteria it may adopt, 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. The Commission may also make such a determination for carbon dioxide stored under this chapter. 2. The purpose for determining storage amounts is to facilitate using the stored carbon dioxide for such matters as carbon credits, allowances, trading, emissions allocations, and offsets, and for other similar purposes. 3. The Commission may charge a reasonable fee to the person requesting a storage determination. The fee must be set by rule. 4. Fees the Commission receives for storage determinations must be deposited into the carbon dioxide storage facility administrative fund."

10.3 Enhanced Recovery Projects

Enhanced oil and gas recovery ("EOR") is the process that involves the injection of fluids to retain or increase reservoir pressure and as a result, displace extractable oil and gas, the fluid is often naturally occurring or anthropogenetic carbon dioxide. EOR is regulated through the EPA's Class II Underground Injection Control Program. According to an EPA memorandum from 2015, Class II EOR injection wells have the potential to transition into Class VI injection wells because both wells inject carbon products as liquid into underground formations. The memorandum outlines the key principles for transitioning Class II wells. However, the absence of finalized technical guidance from the EPA creates a lack of clarity and consistency for state legislation. EOR injection wells are sometimes included in a CCUS program or regulated separately. Some states, such as Oklahoma, include EOR as a part of CCUS, others do not, such as North Dakota.

Table 27 Enhanced Recovery

State	Enhanced Recovery Projects
Oklahoma S.B. 610 Section 3. A.	"The Commission shall have such jurisdiction regardless of whether such carbon dioxide sequestration facility or other injection of carbon dioxide involves enhanced oil or gas recovery."
North Dakota S.B. 2095 38-22-19	"This chapter does not apply to applications filed with the Commission proposing to use carbon dioxide for an enhanced oil or gas recovery project, rather such applications will be processed under chapter 38-08. 2. The Commission may allow an enhanced oil or gas recovery project to be converted to a storage facility. In considering whether to approve a conversion, and upon conversion, the provisions of this chapter and its implementing rules apply, but if during the conversion process unique circumstances arise, the Commission, to better ensure that the chapter's objectives are fulfilled, may waive such provisions and may impose additional ones."

10.4 Penalties

Penalties are also referred to as compliance and enforcement. A person or entity who violates any provisions or rules in a CCUS legislation is subject to civil penalty until the person corrects to the provision or rule. The amount of a penalty is determined by the nature of the violation, circumstances and gravity, and hazard or potential hazards to others. Economic or environmental harm, history of previous violations, efforts to correct the violation, and the amount necessary to deter future violations are also factors in the penalty amount. There is a significant discrepancy between states on the maximum civil penalty amount per day per violation. Many states leave penalties up to the discretion of the authority, and a few states have explicit caps on penalties. The table below shows a sample of maximum civil penalties, ascending in amount.

Table 28 Civil Penalty Amounts

State	Civil Penalty Amounts
Nebraska	Class II Misdemeanor ($1,000) or 6 months imprisonment
Mississippi	$5,000
Louisiana	$5,000
Utah	$10,000
Kansas	$10,000
North Dakota	$12,500
West Virginia	$25,000

The language of declaring penalties communicates that the civil penalty cost is cumulative. Kansas law stipulates “every day such violation continues shall be deemed a separate violation.”

Table 29 Penalty Language

State	Language of Penalties
Kansas HB 2419 New Sec. 4. a.	“The Commission, upon a finding that a person has violated any provision of section 2, and amendments thereto, or rules and legislations adopted thereunder, may impose a penalty not to exceed $ 10,000 per violation which shall constitute an economic deterrent to the violation for which it is assessed and, in the case of a continuing violation, every day such violation continues shall be deemed a separate violation.”
West Virginia H.B.2860 22-11-22. (a)	“Any person who violates any provision of any permit issued under or subject to the provisions of this article or article eleven-a of this chapter is subject to a civil penalty not to exceed $ 25,000 per day of such violation and any person who violates any provision of this article or of any rule or who violates any standard or order promulgated or made and entered under the provisions of this article, article eleven-a of this chapter or article one, chapter twenty-two-b of this code is subject to a civil penalty not to exceed $ 25,000 per day of such violation.”

10.5 Certificate of Project Completion

There are multiple phases of the project completion process, with the first step typically as termination of carbon dioxide injection. Next, the storage operator must apply for project completion by proving the reservoir can maintain integrity, often referred to as the cessation of storage operations. The application for project completion may also include hearings, public notices, and consolations with other state departments (such as a department of health). Finally, once integrity is established and the state issues a Certificate of Project Completion, the storage operator can transfer ownership to the state.

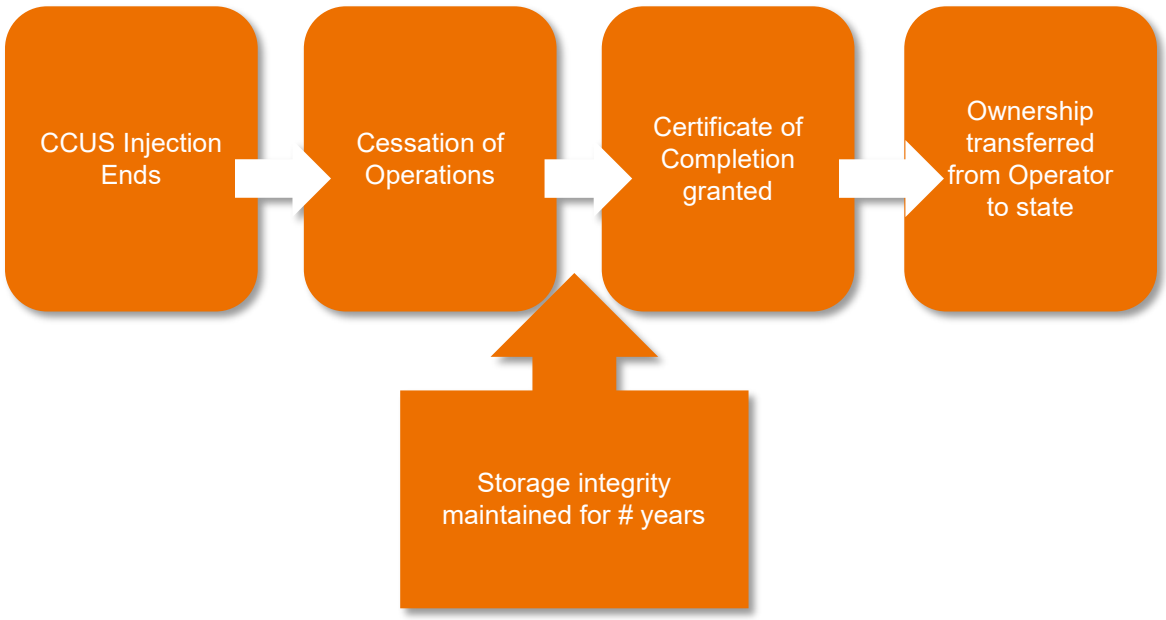

Figure 4 Certificate of Completion Flowchart

For each state, there is a range of minimum years required before the state issues a Certificate of Project Completion. The table below includes which States had explicit year requirements. A longer period between cessation and certification may reduce the chance of an accident while the state holds liability but may deter potential applicants, thus reducing the amount of CCUS injection well applications and its economic and environmental benefits. Regardless of the timeline for getting a Certificate of Project Completion, the EPA's Class VI UIC program requires monitoring of the storage site for 50 years after injection is complete before being considered complete for ownership transfer.

Under the Mines and Minerals Act of Alberta (Canada), the province requires the captured carbon dioxide to behave "in a stable and predictable manner, with no significant risk of future leakage" before assuming liability.

Table 30 Timeline for Certificates of Completion

State	Timeline for Certificate of Completion
Mississippi	3 years
North Dakota	10 years
Utah	10 years
Louisiana	10 years
Wyoming	20 years
Norway	20 years

Table 31 Certificates of Completion

State	Certificate of Completion
Wyoming SF 47 35-11-319 (a)-(b)	"(a) After all carbon dioxide injections underground or into pore space are completed as provided by a permit issued under W.S. 35-11-313 and upon application by the injector holding title to the carbon dioxide under W.S. 35-11-318, the department may issue a certificate of project completion. The department shall only issue a certificate upon satisfaction of the conditions imposed under subsections (b), (c) and (d) of this section and after providing public notice of the application, an opportunity for public comment and a public hearing on the application. (b) A certificate of project completion shall not be issued until at least twenty (20) years after carbon dioxide injections end."
Louisiana H.B. 661 Section 1109. A. (1)	"Ten years, or any other time frame established by rule, after cessation of injection into a storage facility, the Commissioner shall issue a certificate of completion of injection operations, upon a showing by the storage operator that the reservoir is reasonably expected to retain mechanical integrity and the carbon dioxide will reasonably remain emplaced, at which time ownership to the remaining project including the stored carbon dioxide transfers to the State. Upon the issuance of the certificate of completion of injection operations, the storage operator, all generators of any injected carbon dioxide, all owners of carbon dioxide stored in the storage facility, and all owners otherwise having any interest in the storage facility, shall be released from any and all duties or obligations under this chapter and any and all liability associated with or related to that storage facility which arises after the issuance of the certificate of completion of injection operations."

11 Environmental Protection Considerations

The Class VI rule for the UIC program was designed to protect underground sources of drinking water from long-term carbon sequestration, following the Safe Drinking Water Act. Since the UIC program is a federal program that includes environmental assessment, going through the NEPA process would be redundant. The Class VI permit application itself expands on those requirements to protect the environment around the project site through developing leading practices for siting, operation, testing, monitoring, and closure. For example, siting wells requires extensive site characterization of the affected environments.

States can choose to expand on the UIC requirements (which are already expanded from NEPA). In general, most jurisdictions rely on existing legislation, and adapt as needed, to regulate CCUS. For

instance, in Alberta, Canada, many of the components of CCUS, including injection wells are permitted under the existing Oil and Gas Conservation Act and the Mines and Minerals Act. Environmental protection is also managed through the Environmental Protection and Enhancement Act, as well as numerous other acts and legislation that are already in place primarily to manage oil and gas and other resource developments. In addition, proponents are required to develop an MMV plan for the project that is subject to review by the Alberta Energy Regulator prior to its implementation.

Additional environmental considerations and protection efforts may include categorizing stored carbon dioxide, rehabilitating the land where a CCUS project took place, and refusing any level of risk to public health.

Table 32 Environmental Considerations

State	Environmental Considerations
North Dakota S.B. 2095 38-22-12	“The commission shall take action to ensure that a storage facility does not cause pollution or create a nuisance. for the purposes of this provision and in applying other laws, carbon dioxide stored, and which remains in storage under a commission permit, is not a pollutant nor does it constitute a nuisance. 2. the commission’s authority in subsection 1 does not limit the jurisdiction held by the state department of health. nothing else in this chapter limits the jurisdiction held by the state department of health. 3. the commission shall take action to ensure that substances that compromise the objectives of this chapter or the integrity of a storage reservoir do not enter a storage reservoir. 4. the commission shall take action to ensure that carbon dioxide does not escape from a storage facility.”
West Virginia H.B. 4491 §22-11B-8. (a)-(b)	“For the purposes of this article and in all other respects, any carbon dioxide injected and sequestered in accordance with an underground injection control permit issued by the secretary shall not be considered a pollutant and the operation and existence of such a carbon dioxide sequestration facility shall not be considered a public nuisance. (b) The secretary’s and the commission’s authority as set forth in this article shall not otherwise limit the authority or jurisdiction of the secretary and the commission in any manner.”
Victoria, Australia Greenhouse Gas Geological Sequestration Act Division 2. 7	"The objectives of this Act are to encourage and promote greenhouse gas sequestration operations for the benefit of all Victorians by...establishing a legal framework for the legislation of greenhouse gas sequestration operations aimed at ensuring that... (i) greenhouse gas sequestration operations are carried out in ways that minimise impacts on public health and the environment; and (ii) consultation mechanisms are effective and appropriate access to information regarding greenhouse gas sequestration operations is provided; and (iii) land affected by greenhouse gas sequestration operations is rehabilitated."
Country of Norway Legislation of carbon dioxide Section 1-10	"A subsea reservoir shall only be selected as a storage location if there, under the conditions proposed for such use, is not a significant risk of leakage, and there is also not considered to be any risk of health or environmental damage of significance."

12 Review Outcome: Primacy

Primary enforcement authority ("primacy") refers to State, territory, or tribal responsibilities associated with implementing EPA approved UIC programs within that state, territory, or tribe. Delegating Class VI primacy to states helps alleviate the EPA's workload. Self-regulating via primacy also gives power— although granted — back to the states. States seeking primacy must demonstrate the state has authority over underground injection, the state's legislation meets the Safe Drinking Water Act Section 1422 requirements and have the capacity to fulfill administrative and enforcement duties. Writing robust legislation that follow the UIC program is one of many steps to program primacy.

Any state legislation implemented by Alaska would need to meet or exceed the EPA criteria for Class VI wells, including:

- Extensive site characterization requirements,
- Injection well construction requirements for materials that are compatible with and can withstand contact with carbon dioxide over the life of the project,
- CCUS injection well operation requirements,
- Comprehensive monitoring requirements addressing well integrity, carbon dioxide injection and storage, and ground water quality during the injection operation and the post-injection site care period,
- Financial responsibility requirements assuring the availability of funds for the life of the project (including post-injection site care and emergency response), and
- Reporting and recordkeeping requirements that provide project-specific information to continually evaluate Class VI operations and confirm protection of underground drinking water sources.

There are four phases of the Primacy application process.

- Phase I: pre-application activities (writing legislation reviewed in this document)
- Phase II: completeness review and determination
- Phase III: application evaluation
- Phase IV: rulemaking and codification

12.1 States with Primacy

North Dakota and Wyoming are the only states with Class VI primacy. A significant portion of the language used as examples in the previous section were from the two state's legislations because they were the most robust out of all 11 states sampled. Louisiana, Texas, and West Virginia's legislations closely followed the legislations of the primacy states and now those states are in the process of applying for primacy.

Arizona is in the Pre-Application Activities phase of applying for Primacy. West Virginia and Texas are in Pre-Application Activities phase of Program Revision Applications. Louisiana's Program Revision Application (for Class VI Primacy) is currently being evaluated.

12.2 Steps to Primacy and Timeline

The timeline to primacy is not consistent between states. The EPA originally estimated it would take 270 days for a state to apply and obtain Class VI primacy. While it took less than 3 months for the EPA to accept North Dakota and Wyoming's completed Class VI primacy applications, the evaluation process timeline varied. North Dakota's application took five years to be approved while Wyoming's application took six months to be approved (more aligned with the original estimation).

Louisiana submitted a completed Class VI primacy application in September 2021 and is still in the evaluation process (almost 400 days later). Arizona's timeline also lags the EPA's estimation and has been in the pre-application activity stage for four years (since 2018).

While creating state legislation may only take less than a year to write and pass, primacy has a longer, inconsistent timeline.

13 Summary of Major Issues

As noted in this report, there are several major issues to be addressed in developing CCUS legislation.

13.1 Pore space licensing

As previously stated, pore space ownership is not a clear and settled area of property rights law. Therefore, protocols for licensing pore space are also not clear or settled. Most states are primarily following the American rule, designating ownership of pore space (any geological formations below the surface) to the surface estate owners. However, there are two exceptions to the American rule. First, the surface owner does not have title to pore space if there has previously been a severance in the surface and subsurface estate (primarily for mineral extraction). And second, the surface owner may not own all the pore space if pore space is defined to exclude pore space created from mineral extraction activities. Utah follows this exception; all other states appear to assign all pore space to surface owners.

Pore space licensing in Alaska is already unique compared to the lower 48 states. According to the Alaska Constitution and the Alaska Statehood Act, natural and subsurface resources belong to Alaska. Oil and gas companies pay royalties on oil and gas production to ADNR and taxes to the Department of Revenue. Alaska's subsurface ownership is more like Norway and Canada than other American states. Since surface owners do not automatically own all geological formations below the surface, Alaska does not exclusively follow the American rule. If Alaska owns the subsurface estate, Alaska theoretically owns the pore space as well. Alaska may be able to lease the right to use pore space, just as the state leases the right to extract oil, gas, and minerals.

13.2 Amalgamation of Property Interests

As previously described, not every property owner needs to consent for a permit to be issued. The desired storage reservoir (comprised of pore space) for a CCUS project may be owned by multiple owners. Some owners may want to license pore space to a CCUS project while others may not. Since subsurface property is harder to delineate than surface property lines, a nonconsenting owner's pore space may not be separatable from the desired pore space reservoir. Therefore, states can amalgamate property, like they have the power of eminent domain. Amalgamating property interests refers to the government's right to order the pooling of the desired pore space licensing for a CCUS project in return for payment of compensation. The pore space owners still own their pore space, but the state may allow the pore space to be licensed to the project, with compensation. Alaska will need to determine its process for amalgamation and its minimum percentage of consenting pore space and surface owners. If it is determined that Alaska owns the pore space, this process may still focus on getting consent from the surface owners.

13.3 Class VI Primacy

Primary enforcement authority ("primacy") refers to state, territory, or tribal responsibilities associated with implementing EPA approved UIC programs within that state, territory, or tribe. The majority of the states do not have the authority to issue Class VI permits, leaving permitting responsibility with the EPA. Delegating Class VI primacy to states would help alleviate the EPA's workload and may speed up the permitting process back to the estimated 270-day timeline. To do so, states seeking primacy must demonstrate the state has authority over underground injection, the state's legislation meet the Safe Drinking Water Act Section 1422 requirements and have the capacity to fulfill administrative and enforcement duties. Earning primacy will likely take Alaska many years, based on how other states are moving slowly through the process.

13.4 Measurement, Monitoring, and Verification

Because of the propensity of sequestered carbon dioxide to migrate offsite the EPA's Class VI UIC program requires applicants to provide a site-specific "Testing and Monitoring Plan" to cover measurement, monitoring, and verification. These plans require narrative descriptions of a variety of techniques. Measurement, monitoring and verification of permit compliance is an important step to completing a project and ensuring environmental and human health.

Many states do not include detailed, explicit MMV requirements in state policy aside from including the act of "monitoring" in the duties of that state's authority. Monitoring is often referred to in legislation but does not have its own section or extra requirements from the state. This deference to state regulatory agencies could become a source of confusion when applying for CCUS permits.

13.5 Long Term Liability

Long term liability is a major regulatory challenge because of the novelty of geologic sequestration and the uncertainty about its long-term effects on human health and the environment. Even though many states have financial, temporal, and technical conditions a storage operator needs to meet before transferring liability of the CCUS site to the state government, there is still uncertainty if the conditions are enough to determine negligible risk. Therefore, liability is not guaranteed to be transferred after a project is completed. Some states require significantly endowed trust funds to address or remediate any duty, obligation, or liability that may arise after ownership is transferred to the state. These trust funds are industry's current best attempt to ensure liability will not be the burden of the state and people.

13.6 Mineral Interests

Mineral rights are the ownership rights to underground resources, including fossil fuels, ore, and mineable rocks. Mineral rights are a type of subsurface right, but it does not mean a holder of a mineral right has the right to the entirety of a subsurface property. A CCUS injection well and mineral extraction operation within the same property could be mutually exclusive. Therefore, states must address how the state will maintain the rights of both mineral rights owners and pore space owners. A mineral right is a much older and solidified legal concept than pore space, so it is imperative that Alaska prioritizes the holders of oil, gas, and mineral rights.

13.7 Fiscal Issues

States plan to impose fees at every stage of the CCUS injection well process to cover the costs of implementing a Class VI permitting program. Unique to other states, Alaska, specifically the AOGCC, receives funding from revenue of oil and gas production. If this revenue modeled was followed for the Class VI permitting program, it would take many years to receive those fees. Therefore, temporary funding may be needed to cover the initial expenses of implementing the program until those revenue fees can be taken. These fees are intended to be deposited in designated administrative and trust funds to facilitate CCUS injection wells and the program. To address concerns about uncertainty of long-term liability, trust funds hold money for long-term monitoring and management of a closed facility. Alaska will need to structure funding for this program to work.

Alaska's Corporate Income Tax adopts the Federal Income Tax Code without modifications or exceptions, so any Alaska-based taxpayer is eligible to earn the Federal 45Q Tax Credit. Alaska could continue to recognize the Federal 45Q Tax Credit or de-couple from it and adopt an alternative system.

If Alaska treats 45Q tax credits (or cash refunds) as other federal tax credits, the State could increase its corporate income tax revenue.

14 Conclusion

Most legislation reviewed for this report were initially written circa 2010 and amended throughout the next decade. When amending legislation, states appear to follow the lead of the two states with Class VI primacy: North Dakota and Wyoming. Slight variations occur with timelines and requirements, but most legislations are similar. Alaska will be able to take note of these similarities and apply it to its unique management of natural resources.

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APPENDIX

Appendix A Recommendations

Successful development of CCUS projects in Alaska will require state primacy of Class VI underground injection well permitting, since the EPA is unlikely to permit Class VI wells in Alaska in a timely manner and in sufficient quantity to support a nascent industry within the state. The implementation of some form of bridge funding to subsidize program development and initial operation will also be needed to cover program costs until there is sufficient funding from industry to support the state's Class VI well program.

CCUS is a relatively new and rising industry and the slow permitting of Class VI injection wells by the EPA compared to states that have primacy means that states that do not have primacy will be at a disadvantage in attracting CCUS projects. Recent decisions at the federal level, such as the 45Q tax breaks and the administration's plan to reduce GHG, will spur relatively rapid growth of CCUS projects.

A recommended first step would be a legislative bill package authorizing a state agency, preferably AOGCC, to investigate Class VI primacy. This bill package would need to include statutory language defining pore space and other CCUS concepts addressed in this report, establish state authority over pore space on state and private lands and vest AOGCC with that authority, address preservation of existing rights, and provide agency funding to investigate primacy. There may be additional federal funding available for this effort, and coordination with Alaska's Congressional delegation would be needed. Title III of the Infrastructure Investment and Jobs Act (H.R. 3684) provided some funding for this effort, and there are several bills currently in committee that address CCUS (e.g., H.R. 8337 and H.R. 3039).

The state received primacy over Class II injection wells in 1991, but that process has little relevancy to a future Class VI primacy project. A better model might be ADEC's program to gain primacy over National Pollutant Discharge Elimination System (NPDES) permitting in Alaska. A review of other states' experiences in achieving primacy would also be useful. EPA has indicated that the pathway to state primacy takes approximately 270 days, but the experiences of the states with primacy vary widely.

Development of legislations to support the state's application for primacy would also be needed. This report can serve as a compendium of state legislations to support development of Alaska legislations, identifying the relevant issues and providing example language. There is a significant corpus of model and existing legislations that can be utilized in legislations development.

In the interim, carbon dioxide injection for EOR under the Class II UIC well program can be currently permitted by the state. The EPA has ruled that carbon dioxide injection for EOR, whether using anthropogenic or non-anthropogenic sources of carbon dioxide, can be covered under the Class II permit system and that Class II wells can be transitioned to Class VI wells if EOR ends and the quantities of carbon dioxide being sequestered increases the risk to underground drinking water reservoirs. This should only be considered as an interim measure as the requirements for Class VI wells, particularly in siting and construction, are significantly different from Class II wells.

Issue and Policy Review for Carbon Capture, Utilization, and Storage (CCUS) in the State of Alaska

November 1, 2022

Prepared by the Division of Oil & Gas, Department of Natural Resources, State of Alaska

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PCO2R Partnership

Introduction

This paper summarizes five meetings regarding carbon capture, utilization, and storage (CCUS) organized by the University of Alaska with the assistance of the PCOR partnership and the Alaska Department of Natural Resources (DNR). At these meetings, stakeholders from several State of Alaska agencies, the University of Alaska, the energy and carbon storage industry, and public/non-government organizations came together to discuss a potential CCUS program in the State of Alaska. Many of these stakeholders also collectively contributed to a response to a Request for Information (RFI) from the U.S. Department of Energy (USDOE) highlighting the potential for CCUS in Alaska after passage of the Infrastructure Investment and Jobs Act (IIJA) in 2021. While part of the impetus for investigating legislation and policy options for CCUS is to take advantage of funding available through the USDOE under the IIJA, positioning Alaska to participate in this growing sector is in the long-term interest of the state and could significantly increase investment opportunities, welcome new industry, be an opportunity for existing industry, and create more jobs.

The kickoff meeting in July laid out a plan to review regulatory framework options. A series of background informational meetings were held, and the group convened during a one-day symposium to gather feedback on points of consensus, areas of concern, and lingering questions requiring further investigation. The background informational meetings covered:

1. State property rights and the licensing of State pore space;
2. The amalgamation of property rights and the potential conflicts between existing uses and future CCUS uses;
3. Long-term liability for the CO_2 plume;
4. Fiscal levers available to industry or the state to encourage development; and
5. Class VI underground injection wells.

Participants were provided background briefings on the topics and the groups were then polled on several prompts for each topic. The summary results of these polls are discussed below.

This paper does not represent a final decision by the State of Alaska or any other entity – rather it is informational about the discussions that occurred in these meetings. The ideas generated by these sessions and memorialized in this paper are the result of research and brainstorming exercises, which are still ongoing. More work must be done to review legal implications and ultimately select options for legislation and policy, which will then be subject to the political and legislative process. This paper is organized with a brief introduction to each topic of potential legislative/regulatory concern, a summary of the issues as presented to the small symposium groups, and a summary of the feedback provided by the small symposium groups – to be a resource during these future, formal processes. The conclusion captures the most important points requiring evaluation for legislation and executive policy decisions.

1. State property rights & licensing

Status of State and Private Pore Space Ownership

Codification of pore space rights ownership would be a necessary preliminary step to a CCUS program. Alaska received all mineral rights underlying the land entitlement granted at statehood, and, uniquely among the states, is required to retain those mineral rights for any land it has sold or otherwise disposed. The Alaska Supreme Court held the mineral estate reserved by the State in this compulsory reservation includes the pore space used for storage of injected gases, including CO_2. As a result, the State owns the pore space both beneath entitlement lands that it holds today and beneath entitlement lands it has sold to others, including private individuals—meaning that the state owns an even broader scope of pore space than its currently-owned surface lands.

The full fee estate held by Regional Alaska Native Corporations includes the pore space. Additionally, various other private mineral rights exist in Alaska. It is unclear, especially where granting documents include only some features of the mineral estate, to whom pore space title belongs in these cases. Ultimately, in the significant acreage where the State has the full mineral estate, the matter is clear, presenting an opportunity to maximize the value of the State's natural resources in partnership with prospective CCUS operators.

Possible Leasing/Licensing Regimes

To enable a CCUS industry, the State must be empowered to offer its pore space to potential operators consistent with its constitutional mandates, limitations, and processes imposed by the legislature (akin to those in the Alaska Land Act, for example). In general, sovereigns in the CCUS space offer acreage through three general methods:

Competitive – Blocks of tracts offered to the highest bidder. This would likely occur in much the same format as the regular lease sales held by the Division of Oil & Gas (DOG).

Negotiated – An operator brings a proposal to the sovereign. In this approach, the prospective operator would identify a project area and apply to DOG for a license to carry the project out.

Nomination/Request for Proposal – Operators Nominate blocks and there is an opportunity for competing proposals for those blocks. This adds an element of competition to the negotiated approach. This is how DOG's exploration licensing program for oil and gas, and prospecting permits for geothermal, are presently conducted.

Feedback Summary

Symposium members were asked generally how they might design a leasing/licensing program for the State to offer its pore space, what factors led to their recommendation of this methodology and, finally, what factors the State should consider when evaluating proposals offered by operators to utilize State pore space rights for carbon storage.

Participants generally agreed the CCUS industry is in emerging status, so the land managers should be accorded flexibility within any statutory authority granted in how a leasing or licensing program is rolled out and implemented. Suggestions ranged from adapting the existing Exploration License program for greenfield storage projects to providing area-specific or areawide storage competitive lease sales for brownfield areas or other areas where there is established knowledge of subsurface conditions. There was specific enthusiasm for the State to provide for conversion of existing oil and gas leases to CO_2 storage leases by transitioning current oil and gas fields from production operations/enhanced oil recovery injection operations to pure storage/sequestration operations. It was also suggested to provide some form of carbon capture right of first refusal to existing oil and gas field operators for storage projects proposed at producing oil and gas fields to fairly incentivize an operator who has heavily invested and acquired subsurface knowledge. Such a right could also induce an operator to begin CO_2 storage at the end of a field's economic life. There was broad support by participants for a multi-pronged leasing/licensing approach appropriate for the level of subsurface knowledge, risk, and industry interest with maximum flexibility of the land management agency to evolve a leasing/licensing program as experience advances.

Key considerations in specifying this approach to leasing included: provisions to allow or promote, including appropriate compensation, reusing existing oil and gas infrastructure (*e.g.,* pipelines, platforms, or well pads), addressing DR&R liability transferal, and giving flexibility to the land management agency to design a leasing program to minimize regulatory complexity and avoid or mitigate impacts on existing uses. A long lease term for project build-out and avoiding conflict with existing uses were also highlighted. The end goal was to ultimately make Alaska an attractive environment for industry investment.

The goal of a CCUS leasing or licensing regime is the establishment of *operating* injection facilities and not warehousing of acreage and property rights speculation. To that end, symposium participants wanted to ensure operators and proposed projects be evaluated on several factors and not just awarded to the "highest bidder." Participants believed the State should consider an operator's existing leasehold, experience in the lease area, executing CCUS projects, how the CO_2 source pairs with the sink, whether the project might interfere with another project or lease and clearly establish the dominant subsurface mineral estate function based on economic considerations. Long-term financial surety, contractual agreements between extraction and injection operations to ensure avoidance of conflict, work commitments on projects to ensure they progress, and measures to ensure acreage is not "warehoused" were important factors. Methods to transparently and fairly deconflict the use of existing remote infrastructure such as a formulaic method for compensating the developer/owner of the infrastructure for its use by others (and even competitors) and a unified and simplified leasing and permitting regime, especially for transportation infrastructure (pipelines) was also highlighted as being important.

Symposium members were aware of the pivotal role the State will play in establishing (from a property rights perspective) the CCUS industry, and feedback endorsed flexibility in the program, priority for

extractive processes, and for substantive analysis of projects and project operators (*i.e.,* robust qualifications to be awarded a license) to ensure development proceeds. Finally, further work could be done by the State to address geologic uncertainty, which could include geologic investigations by the State or different leasing regimes for areas of known geology versus those that might be considered frontier basins.

2. Amalgamation of Property Rights & Mineral Interest Conflicts

Amalgamation of Property Rights

Given the potential subsurface extent of an injected CO_2 plume, it is possible a storage project will require several parcels of land, potentially with different ownership or lease terms. For example, there could be a mix of Federal, State, Alaska Native Corporation, and private mineral interests overlying an area proposed for CO_2 injection operations. An operator must have a mechanism to amalgamate those parcels and their commensurate rights and interests. Those familiar with oil and gas will recognize the traditional practice of *unitization.* This highly effective legal tool brings together different oil and gas rights, which may have varied lessees, lessors, and ownership interests, under a unit based on the assumed subsurface picture for simple and fair management and protection of respective interests. This amalgamation often occurs by private agreement among the owners and operators, but in instances where consensus cannot be achieved many states provide for compulsory unitization and, indeed, in the oil and gas context, the Alaska Oil and Gas Conservation Commission currently provides processes to settle unitization disputes under the authority granted in AS 31.05.100 and implemented by 11 AAC 25.055 and 25.520. A similar framework of statutes and regulations will provide a stable, predictable environment for CCUS projects, while protecting the correlative rights of property owners, as it has for Alaskan oil and gas since the 1960s.

Addressing Mineral Interest Conflicts

In addition to the power to amalgamate, it may also be in the State's interest to craft legislation to pre-emptively settle conflicts between oil and gas extraction and carbon sequestration (meaning which use is dominant or prioritized), how to implement co-location of CCUS and existing oil and gas facilities, and finally, how best to transition a producing oil and gas field (perhaps one using CO_2 for enhanced oil recovery (EOR) to a project permanently sequestering CO_2 and specifically how to transfer end of field life responsibilities for facilities persisting beyond the current oil and gas operator.

Feedback Summary

Symposium members were asked what geologic or correlative rights factors the AOGCC, the pooling agency in Alaska, should consider when determining whether to amalgamate property rights, how to ensure collocation of CCUS and oil and gas operations occur safely and with minimized use conflicts while still ensuring the State is maximizing the utilization of its resources consistent with its constitutional mandate and, finally, what role the parties to a CCUS project have in negotiating dismantlement agreements for the re-use of existing infrastructure being transferred to a CCUS operator.

Since the AOGCC already has a functioning model for managing these kinds of issues, with a record of success spanning decades, there was consensus they should continue to fulfill this role for CCUS matters and be empowered to weigh factors in much the same way as is permitted for oil and gas matters. Participant feedback indicated statutes and regulations will need to clarify the authority for AOGCC as arbiter for

correlative rights on CCUS resource ownership matters, as a corollary to how codification of pore space ownership in statute would also provide certainty with these authorities and for owners and applicants. As is already the case with oil and gas, public notice and opportunity for public input should be integral to the CCUS process. Generally, the group agreed that, where possible, the successful framework established by AOGCC for oil and gas should be adopted for CCUS.

One group advocated initiating a CCUS program in areas of the State where property rights ownership is clear and the need for amalgamation and chances for conflicts are low, especially in areas where the risk of contaminating subsurface drinking water is low. This will set up initial CCUS projects for success.

Other areas of rights for State agencies to consider will include how to address the interface between federal and state rights and whether there should be a minimum threshold of voluntary participation for compelling pooling. It will also be necessary to address conflicts with adjacent oil and gas or mineral extraction operations. One important area of concern is balancing the primacy of some resources over others. This could be done by establishing a hierarchy in statute of dominant resources so there is transparency and stability about what collocated operations can expect before investment. It may also be wise to not allow CO_2 storage to condemn future mineral extraction. Complete segregation from oil and gas operations and continuous plume monitoring were also suggested. However, this concept may shift over time as the relative value of carbon sequestration increases vis-à-vis oil and gas extraction.

Group members were particularly concerned about how a pooling agency might segregate liability between legacy infrastructure and new operations (*e.g.,* if a plume contacted an old wellbore, would the former well owner be liable if the plume degraded its integrity?). There were also questions about liability or compensation if a plume unexpectedly migrates to pore space not part of the initial CCUS project. Thus, certainty regarding liability at different stages of the CCUS project lifecycle was an important theme among group participants. An emerging CCUS issue is pressure interference across leases; although the plume itself may not extend, the pressure wave that advances ahead of the plume may affect offset acreage.

Infrastructure in Alaska's oil and gas provinces is aging, and the necessity of dismantlement, removal, and restoration (DR&R) is becoming apparent for some assets. However, use of existing well bores, well pads, pipelines, roads, and other facilities may be an efficiency opportunity for the CCUS industry.

When CCUS projects reuse existing infrastructure, the group identified the following concepts to be considered by the State in negotiating DR&R liabilities:

- the laws and regulations should provide a framework to responsibly maximize resource development (including CO_2 storage) benefits to the State;
- the State should *facilitate* negotiations among pore space owners, resource owners, and surface owners, especially in cases where private agreements are not reached;
- the State should establish performance standards for storage operators;
- the State should provide guidance on what types of equipment can be repurposed for CCUS, recognizing facilities with long-term value and defer DR&R appropriately;
- the State could have final approval of private entity DR&R agreements.; and
- the State should maintain the practice of liability for legacy oilfield infrastructure on the oil and gas party when not used in a CCUS project.

3. Long term liability

The CCUS industry is rapidly evolving with many sequestration projects still in very early stages. Post-closure risks, while understood to be technically manageable, are not yet sufficiently characterized for the commercial risk market to have fully emerged. Specifically, a CO_2 plume may continue to migrate in the subsurface following the cessation of injection activities. The EPA sets a default post-injection monitoring period of 50 years. This monitoring may include monitoring wells and other surface remote devices to track whether CO_2 is migrating or escaping.

Given the protracted caretaking timeline of a facility, well beyond its profitable activities, other sovereigns are envisioning a role for the jurisdiction to play in post-closure site management and in determining who will hold title to the injected CO_2. Simply stated, states endure while corporations do not. Carbon Storage Trust Funds are a ubiquitous tool adopted in other jurisdictions for dealing with the costs of long-term management. There are multiple policy choices imbedded in how trust funds are established and managed. We asked the work group to provide feedback on a few challenging aspects of post-closure liability.

Feedback Summary

Symposium groups were asked which of the three post-closure liability options—ranging from no liability assumed by the sovereign, limited liability to the sovereign under certain terms or circumstances, or the sovereign assuming all liability—would be most prudent for developing CCUS and what major concerns must be addressed to make the preferred option viable. All groups recommended the State play a role in post-closure site maintenance and liability. There was variation in the degree of liability the State should assume, but consensus was supportive of a discretionary transfer to the State after an appropriate period and satisfaction of requirements, subject to a public notice and comment process. Any transfer would need to clearly enumerate the specific liabilities assumed, secured with funding commensurate to meeting these obligations. The State may also wish to consider adopting a limited liability role initially and potentially scaling up as the post-closure period matures.

When asked if the State's role would differ if it were not the pore space or surface estate owner, several points of agreement were identified. Most participants agreed the State has the most enduring long-term responsibility post closure, regardless of pore space ownership. It was noted there is already established spill response and mining reclamation programs with the State covering non-State lands (*i.e.,* private lands, including those belonging to Alaska Native corporations, and federal lands). These models could provide helpful insight in defining post-closure roles.

Questions remain about the relationship between the State and projects on federal or private lands. Some recommended against assuming any liability for projects on federal lands. There may also be conflicts about post-closure roles on lands belonging to Alaska Native Corporations. Where liability may be transferred to the State from another surface or pore space owner, surface facility DR&R should be completed before transferring liability. Signed agreements should be in place regarding liability and title to injected CO_2 for projects on non-State lands. It may be best to tie the matters of long-term monitoring, long-term liability, and title to injected CO_2 together as mutually inclusive rights and responsibilities.

Options and concerns were solicited for how to construct a "carbon storage trust fund," which could take several forms and would be part of an overall framework of financial assurance for liability of a carbon

storage project. Overwhelming support was expressed for pooling trust funds, rather than allocating storage fees to discrete project accounts. Some noted pooling funds could incentivize individual project operators to reduce financial liability. In addition to the regular pooled fund contribution, additional allocations could be required if the size or risk associated with a project is sufficient. Some also recommended indexing rates to inflation to protect the value of the fund, given the extended timeframe expected for CCS project operations and post-closure monitoring. In the Alaska legal context, implementation of a "trust fund" will require further review by legal counsel of the implications of a dedicated fund and identifying a mechanism to ensure trust funds remain available for their intended purpose year-to-year.

4. Fiscal/incentives issues

The development of a CCUS industrial sector in Alaska has the potential to impact the State fiscal system in several positive ways. Increased industrial activity can lead to higher State corporate income tax receipts, as well as potentially increasing local sales and property tax receipts, and CO_2 injection for enhanced oil recovery may increase oil production tax receipts. However, some aspects of CCUS may interface with the State's existing fiscal system in unexpected ways. Care should be taken to understand and address these issues in a way that encourages CCUS activities in Alaska without unanticipated or unconsidered impacts to state revenue.

The Alaska Corporate Income Tax adopts the Federal Income Tax Code, including the 45Q Tax Credit (which is scaled/apportioned based on Alaska tax code and taxpayer apportionment) for corporate taxpayers, including (for multi-state taxpayers) for CCUS projects located outside of Alaska. Alaska could choose to de-couple from the Federal 45Q tax credit or adopt an alternative system.

Alaska has a statewide oil & gas property tax (2%) and local property taxes (ranging up to 1.8%). Other states with comprehensive CCUS legislation have adopted property tax measures ranging from regular taxation through partial and general exemptions for CCUS. CCUS property could be bifurcated between statewide and local tax rolls, and the State may wish to consolidate CCUS property into one or the other systems. Additionally, the State will want to ensure its other fiscal statutes are updated and conformed with any changes made regarding CCUS fiscal incentives.

Feedback Summary

When asked if the State should financially incentivize CCUS projects, the group recommended keeping the tax structure as simple as possible and not create incentives beyond those provided at the federal level. Some also advised avoiding duplicative taxes for storage operations collocated with existing resource extraction operations. Others added the State should minimize access costs, such as for leasing and permitting, instead of offering tax-oriented incentives.

Some participants supported offering tax exemptions, such as property tax relief during the capital recovery phase of a project but avoiding credits that create fiscal obligations. Clarity was also requested as to whether the value of injected CO_2 is subject to property taxes. Another option for incentivizing projects could be to direct the Alaska Industrial Development and Export Authority (AIDEA) to offer low-interest infrastructure development loans to CCUS developers. It was also cautioned Alaska should only make 45Q credits that flow through the state tax system applicable to Alaska-based projects. Another concept could be to connect incentives to a future return in revenue, such as for EOR projects resulting in greater royalties, or in the case

of industrial usage of the CO_2. An example of industrial CO_2 use provided would be to ship it to local greenhouses to amplify domestic fruit and vegetable production.

5. Class VI primacy

The US Environmental Protection Agency (EPA) classifies types of injection wells and sets regulatory standards for safety pursuant to the Safe Drinking Water Act. The advent of CO_2 injection prompted EPA to develop a new classification of injection well – Class VI – to address the unique risks, such as pressure and corrosion, posed by concentrations of injected CO_2.

States are encouraged to seek primacy for some or all categories of injection wells to localize permitting and oversight. The oil industry generally prefers working with state agencies because they are typically more responsive, possess greater regional expertise, and—perhaps most importantly—can usually process permits faster. If Alaska were to seek primacy and identify milestone timelines and expected schedules for permit issuance, this clear regulatory process would likely encourage CCUS projects.

Alaska already has primacy for Class II wells, with about 1,500 permitted for enhanced oil recovery (EOR) injection, but it does not have Class VI primacy. Few states do. North Dakota and Wyoming have received primacy, and four other states are seeking it. For AOGCC, Alaska's regulatory body for permitting wells for oil, gas, and geothermal operations, to seek Class VI primacy, it would require new statutory and regulatory authority, inspector certification and training, funding in the approximate range of $300,000 to $1,000,000 annually to support new personnel and software, and a three-to-five-year timeline to pursue the authorization with the EPA.

Operationally, class VI wells are a central component to CCUS projects and CO_2 storage injection. Seeking Class VI primacy would send the clearest signal to prospective CCUS storage operators that Alaska is pursuing a CCUS program and attracting investment in the state. Some funding is available through the IIJA to stand up the program, but it first requires budgetary commitment from the legislature, including receipting authority for any potential federal funding. Once running, permit and injections fees would likely cover ongoing operating costs as the number and type of CCUS projects expands.

Feedback Summary

Overall, the group recommended the State commit resources to seek Class VI well primacy with a goal toward having shorter permitting and approval timeframes. The benefits of local expertise, combined with a more expeditious review process than the EPA, were noted to potentially accelerate project timelines and thus increase commercial viability, Additionally, having primacy over both Class II and Class VI wells would allow for a single regulating agency to provide clarity on when Class II wells may have to transition to Class VI, ensuring the appropriate well closure standards are implemented. Hosting both within AOGCC would avoid agency regulatory conflict between AOGCC & EPA over injection well regulation.

There was some discussion as to whether there is sufficiently understood industry demand to justify the cost of a Class VI well program. Others noted broadcasting intent for primacy could attract potential developers to choose Alaska for projects. The legislature, at the least, could authorize AOGCC to seek primacy (utilizing "may," not "shall" statutory language) so it may initiate the process when it has developed the capacity to do so successfully. Sooner rather than later may be necessary to take advantage of federal funding opportunities included in the IIJA. Further, the AOGCC, as the subsurface regulator for oil and gas activities and likely

regulator of CCUS subsurface activities, can ensure operational plans for both types of activities do not interfere with one another.

Conclusion

From this feedback, the following recommendations are highlighted for potential legislation and policy development:

State property rights & licensing

- Adapt existing oil and gas leasing methods for use of pore space for CO_2 storage, including expansion of current oil/gas leases to cover CCUS; holding competitive lease sales and areawide programs; and exploration licensing in frontier areas.
- Establish a mechanism to convert existing oil and gas leases into CO_2 storage leases to extend the value of legacy fields and infrastructure, making depleted oil and gas reservoirs more readily available for CCUS projects.
- Consider a right of first refusal for existing oil and gas operators where storage projects are proposed.
- Establish requirements for leasing or licensing projects to consider the operator's capability to safely, effectively, timely build and operate a project, and provide an identified CO_2 source for injection, rather than simply lease to the highest bidder.
- Establish a mechanism to encourage CCUS projects to move forward and not allow pore space to simply be locked up or warehoused for speculative future use.

Amalgamation of property rights & mineral interest conflicts

- Grant authority to AOGCC for injection, pooling, and correlative rights adjudication related to CO_2 storage in the same way it has for oil, gas, and geothermal resources.
- Specify the appropriate threshold, if any, for compelled pooling.
- Establish a process or processes for resolution of conflicts and liabilities between CO_2 storage facilities and existing oil and gas infrastructure, and provide for clarity on DR&R responsibility where legacy infrastructure is repurposed for CO_2 storage operations.
- Establish the State as the arbiter of agreements among pore space owners, resource owners, and surface owners.
- Address the liability, both financial and legal, of a force-pooled owner.

Long-term liability

- After closure, State should assume some degree of long-term liability whenever legally possible.
- Develop framework for the State to accept transfer of liability and title to CO_2 when assuming monitoring and management responsibility, regardless of land ownership but subject to financial protections and agreements, as necessary.
- Implement a pooled trust fund for long-term monitoring and management after storage closure.
- Investigate the legal mechanism to constitutionally protect such trust funds.

Fiscal/incentives

- Keep the tax structure simple, avoiding duplicative taxes.
- Consider minimizing permitting costs and providing tax exemptions to encourage CCUS projects (rather than direct fiscal incentives) and clarify what aspects of CO_2 injection operations and infrastructure, such as the value of injected CO_2, are subject to taxation.
- Consider, as other states do, a tax holiday or deferred "start-up" period for CCUS property.

Class VI well primacy

- Authorize AOGCC to seek primacy (utilizing "may" not "shall" statutory language).
- Appropriate funds commensurate with the costs seen by other states for starting the primacy process with U.S. EPA and enable the State to receipt available funds for investigating Class VI primacy.

As stated above, this summary is intended to be a resource for policy makers, industry, and the public as CCUS opportunities in Alaska are evaluated. These highlights are not intended to ignore the breadth of recommendations provided by the stakeholders. In addition to the broader summaries provided for each topic in this paper, submitted written materials from the meetings are also available for review.

Carbon Capture, Utilization & Storage Act (CCUS)

SB 49
HB 50

Diversify Alaska's revenue portfolio

- New revenue from carbon storage companies.
- Enhance recovery from oil and gas fields.
- Synergies with new oil production projects and LNG export business models.
- Bring new industries to Alaska to capitalize on carbon capture streams.
- Promote clean energy industry job creation.

Bring decades-long success of oil and gas regulatory framework to CCUS

- Alaskan agencies have expertise with related technologies and regulatory frameworks.
- While the carbon storage industry is relatively new, it is already more than two decades old and depends on mature technologies.

Why carbon storage is important?

Carbon emissions (CO and CO_2) can act as "greenhouse gases" to warm the atmosphere. Many national and state governments incentivize or require businesses to compensate for their greenhouse gas emissions. One way to do this is through capture and underground storage.

Where the carbon comes from and where it goes?

Carbon oxides can be captured in exhaust streams at power plants, industrial process facilities, oil and gas treatment plants, or through direct air capture. They are transported to injection sites by pipeline, truck, or ship and used in enhanced oil recovery or stored. CO_2 can also be used for production of commodities such as fuels, chemicals, construction materials, fertilizers, food and beverages, or for use in medical applications.

How this affects the oil and gas industry and state revenue?

Many companies want or are required to account for carbon oxide emissions in development projects. This legislation could help foster new investment and development in Alaska. Streams of captured CO_2 could also enhance oil and gas recovery and attract new industries to Alaska, creating jobs and revenues.

If private landowners are affected by carbon storage projects?

Private landowners retain their rights as surface owners. These situations are usually handled by a private surface use agreement between the landowner and developer. Where **AS 38.05.125** creates a split estate and landowners and developers are unable to agree on surface use terms, DNR can resolve disputes under **AS 38.05.130** and **11 AAC 86.145**.

Revenue and Costs

- Division of Oil & Gas will charge fees for applications and licenses, and annual rentals for leases.
- Once operations begin, injection fees similar to royalties at a rate of at least $2.50 per ton will be charged. Fees will be collected to fund program oversight and monitoring after closure of injection facilities.
- AOGCC will assess fees to fund oversight of wells and facilities during drilling, operations, and closure.

Costs: DNR Division of Oil & Gas

2 new positions. Some regulatory functions, such as licensing and leasing, follow existing oil, gas, and geothermal models and can be managed by existing staff. Additional staff for commercial and technical oversight are required. Additional capital funding is needed for consultants.

Costs: DCCED Alaska Oil & Gas Conservation Commission

2 new positions. Additional expertise in carbon oxide injection is required. Program setup and Class VI primacy requires general fund appropriations for legal support and contractual services. Permitting and oversight fees will eventually cover staffing and operations costs like with oil and gas, managed through the Carbon Dioxide Storage Facility Administrative Fund. Post-injection monitoring is funded from the Carbon Storage Closure Trust Fund.

THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Natural Resources
OFFICE OF THE COMMISSIONER

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March 29, 2023

The Honorable Click Bishop, Co-Chair
The Honorable Cathy Giessel, Co-Chair
Senate Resources Committee
Alaska State Capitol
Juneau, Alaska 99801

Re: Senate Bill 49 Carbon Storage

Dear Senator Bishop and Senator Giessel:

Thank you for the opportunity to present SB 49 to your committee. Below are answers in response to the questions asked during the March 13 hearing.

Mineral revenue split to the Permanent Fund

What portion of mineral revenue is allocated to the Permanent Fund?

Article 9, Section 15 of the Alaska Constitution requires "at least twenty-five per cent of all mineral lease rentals, royalties, royalty sale proceeds, federal mineral revenue sharing payments and bonuses received by the State shall be placed in a permanent fund."

The Alaska Supreme Court has held "pore space is mineral"[1] and DNR interprets this holding necessarily requires revenues from pore space leasing and development be deposited into the Alaska Permanent Fund consistent with the Alaska Constitution. As newer leases, the leases would fit into the description of leases in AS 37.13.010(2) such that 50 percent of the rentals, payments, and bonuses could be deposited into the Alaska Permanent fund subject to appropriation.

Section 16 Right-of-Way leasing exemptions

Are the Section 16 ROW leasing exemptions limited to oil and gas fields? Could it affect someone's private property rights?

Yes, the exemption is limited to pipelines within a producing oil or gas field. The text of the subsection is below with emphasis added:

> a pipeline transporting carbon dioxide **within a field** *for the purpose of* an **enhanced oil recovery** project *or* **field pressurization** measures **within that same field** from the requirement of a right-of-way lease under this chapter.

[1] City of Kenai v. Cook Inlet Nat. Gas Storage Alaska, LLC, 373 P.3d 473, 480 (Alaska 2016). (link)

While it is possible this could occur on surface lands that include private landowners, this is explicitly within the context of the larger surface-use permitting process for an oil or gas development, with all the rights and public processes that implies.

Carbon dioxide definition

How is carbon dioxide defined in other states?

Examples of other state definitions for "carbon dioxide" are provided in the Stantec peer-state review report in Table 4 on page 8. Since the question was asked in the context of Section 31 of the bill, please note the definition for carbon dioxide proposed under the AOGCC statute is oriented toward reservoir integrity. It is not intended to replace the common, scientific definition of carbon dioxide, but to define it in terms of AOGCC regulatory authority over storage reservoirs. The unique characteristics of a reservoir may dictate specifications on the allowable concentration of carbon dioxide or other gases and particulates that may be captured along with it at the source.

Volume of produced natural gas vs carbon dioxide injection potential

What is the ratio of the amount of natural gas that can be withdrawn from a reservoir to the amount of carbon dioxide that can be injected into a reservoir?

The amount of carbon dioxide that can be injected into a depleted hydrocarbon reservoir will be highly dependent on a combination of natural, mechanical, and self-imposed factors including, but not limited to:

1. The amount of production withdrawal and pressure depletion that has occurred in the reservoir.
2. The original hydrocarbon type and compositional makeup—dry gas, wet gas, light oil, viscous or heavy oil.
3. The reservoir's permeability, porosity, and connate water saturation.
4. The overall volume of water that has in-fluxed (if any) into the hydrocarbon "area" through the reservoir matrix (Aquifer Influx).
5. The level of re-pressurization that can be achieved through injection of CO_2 given certain mechanical limitations of surface equipment or injection wells or self-imposed limitations such as not exceeding fracture pressure.
6. The injectivity impacts resulting from chemical reactions of CO_2 and associated impurities in the injection stream with the in-situ water, remaining hydrocarbons, and formation minerals.

An example calculation for a ***depleted natural gas reservoir*** that originally contained predominantly methane can be found in the following article: Estimation of Carbon Dioxide Storage Capacity for Depleted Gas Reservoirs - ScienceDirect. This theoretical example demonstrates that

98 billion standard cubic feet (bscf)[2] of pure CO_2 (5.2 million tonnes) could be injected into a low pressure, dry gas reservoir that produced nearly 70 bscf and had undergone pressure depletion from 3000 psi to 800 psi during its "production" period.

The example inherently assumes the reservoir could safely be re-pressured to the original pressure of 3000 psi without exceeding other limitations such as "near wellbore" injection pressures above the formation's fracture pressure. Imposition of such limitations could substantially reduce the volume of CO_2 that can be injected relative to the overall volume of gas produced.

Certain "rules of thumb" indicate the ratio of CO_2 injection to gas produced may be on the order of two-thirds. In other words, 47 Bscf of CO_2 (2.5 million tonnes) could be injected into the same reservoir after producing 70 Bscf. This "rule of thumb" ratio does not seem to be verified through any known scientific research and may inherently incorporate many of the limiting factors previously mentioned.

Please let me know if we can be of further help in providing information to the committee.

Sincerely,

Joe Byrnes
Legislative Liaison
Department of Natural Resources

cc: Laura Stidolph, Legislative Director, Office of the Governor

[2] A standard cubic foot of natural gas is the volume that the gas occupies at standardized pressure and temperature conditions which is typically 1 atmosphere (14.7 psi) and 60 degrees Fahrenheit. From the example, 98 billion standard cubic feet of CO2 would occupy approximately 343 million cubic feet at **subsurface** conditions (Pressure = 3000 psi and Temperature = 220 deg Fahrenheit). 70 billion standard cubic feet of natural gas would occupy 424 million cubic feet at the same **subsurface** conditions. Thus, the reservoir volume occupied by the injected CO2 would be approximately 80% of the reservoir volume originally occupied by the produced natural gas.

Fiscal Note

State of Alaska
2024 Legislative Session

Bill Version: SB 49
Fiscal Note Number:
() Publish Date:

Identifier: SB049-DCCED-AOGCC-01-19-24
Title: CARBON STORAGE
Sponsor: RLS BY REQUEST OF THE GOVERNOR
Requester: (S) Resources

Department: Department of Commerce, Community and Economic Development
Appropriation: Alaska Oil and Gas Conservation Commission
Allocation: Alaska Oil and Gas Conservation Commission
OMB Component Number: 3269

Expenditures/Revenues

Note: Amounts do not include inflation unless otherwise noted below. (Thousands of Dollars)

	FY2025 Appropriation Requested	Included in Governor's FY2025 Request	Out-Year Cost Estimates				
OPERATING EXPENDITURES	**FY 2025**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**FY 2030**
Personal Services		388.0	388.0	388.0	388.0	388.0	388.0
Travel							
Services		500.0	350.0	350.0	350.0	350.0	350.0
Commodities							
Capital Outlay							
Grants & Benefits							
Miscellaneous							
Total Operating	**0.0**	**888.0**	**738.0**	**738.0**	**738.0**	**738.0**	**738.0**
Fund Source (Operating Only)							
1004 Gen Fund (UGF)		888.0					
1252 DGF Temp (DGF)			738.0	738.0	738.0	738.0	738.0
Total	**0.0**	**888.0**	**738.0**	**738.0**	**738.0**	**738.0**	**738.0**
Positions							
Full-time		2.0	2.0	2.0	2.0	2.0	2.0
Part-time							
Temporary							
Change in Revenues							
1252 DGF Temp (DGF)			738.0	738.0	738.0	738.0	738.0
Total	**0.0**	**0.0**	**738.0**	**738.0**	**738.0**	**738.0**	**738.0**

Estimated SUPPLEMENTAL (FY2024) cost: 0.0 *(separate supplemental appropriation required)*

Estimated CAPITAL (FY2025) cost: 0.0 *(separate capital appropriation required)*

Does the bill create or modify a new fund or account? Yes

(Supplemental/Capital/New Fund - discuss reasons and fund source(s) in analysis section)

ASSOCIATED REGULATIONS

Does the bill direct, or will the bill result in, regulation changes adopted by your agency? Yes

If yes, by what date are the regulations to be adopted, amended or repealed? 12/31/25

Why this fiscal note differs from previous version/comments:

Updated from the SLA 2023 to SLA 2024 fiscal note template. Updated financial information and analysis to reflect passage of SB48 during the 2023 legislative session, as well as updated program costs to reflect current program information.

Prepared By:	Brett W. Huber, Sr., Chairman	Phone:	(907)793-1223
Division:	Alaska Oil and Gas Conservation Commission	Date:	01/19/2024
Approved By:	Hannah Lager, Administrative Services Director	Date:	01/19/24
Agency:	Commerce, Community, and Economic Development		

STATE OF ALASKA **BILL NO.** SB 49
2024 LEGISLATIVE SESSION

Analysis

This bill expands existing authority and responsibilities of the Alaska Oil and Gas Conservation Commission (AOGCC) to create a regulatory structure for carbon capture, utilization, and storage (CCUS) in Alaska. This bill grants AOGCC authority to pursue primacy from the U.S. Environmental Protection Agency (EPA) over Class VI wells needed for CCUS injection and amends the general property laws of Alaska to clarify pore space ownership for private parties.

AOGCC anticipates that program management and administration may be accomplished through a combination of existing staff and contractual support. In FY2025, this program will be supported by two existing staff and existing funding added as part of SB48 which passed during the 2023 legislative session. In this fiscal note, costs for program support are included in the personal services and service line beginning in FY2026 to continue those positions and support the work associated with this legislation.

Personal Services:	$388.0 per year for one fully-exempt Senior Carbon Engineer (R26) and one fully-exempt Carbon Assistant (R18).
Services:	$300.0 in each year for other contractual services, which may include contracted expertise for project development and operation and legal costs. $50.0 beginning in FY2026 for statewide and department allocated core services costs.

FY2025 activity will mainly be focused on obtaining primacy. Some expenditures for this program may be offset by potential grant receipts through the EPA Class VI Grant Program. In order to accept these federal funds, AOGCC will require a capital appropriation.

The volume of permit applications and program activity beginning in FY2026 is not known. Revenues collected will be deposited into the new Carbon Dioxide Storage Facility Administrative Fund and used to support the costs of regulating the program following its inception (anticipated in FY2026). Revenue collections are shown in this note as equal to expenditures beginning in FY2026.

Regulations in support of the program will be required.

Fiscal Note

State of Alaska
2024 Legislative Session

Bill Version: SB 49
Fiscal Note Number:
() Publish Date:

Identifier: SB049-DEC-AQ-01-11-24
Title: CARBON STORAGE
Sponsor: RLS BY REQUEST OF THE GOVERNOR
Requester: Senate Resources Committee

Department: Department of Environmental Conservation
Appropriation: Air Quality
Allocation: Air Quality
OMB Component Number: 2061

Expenditures/Revenues

Note: Amounts do not include inflation unless otherwise noted below. (Thousands of Dollars)

	FY2025 Appropriation Requested	Included in Governor's FY2025 Request	Out-Year Cost Estimates				
OPERATING EXPENDITURES	**FY 2025**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**FY 2030**
Personal Services							
Travel							
Services							
Commodities							
Capital Outlay							
Grants & Benefits							
Miscellaneous							
Total Operating	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Fund Source (Operating Only)

None							
Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Positions

Full-time							
Part-time							
Temporary							

Change in Revenues

None							
Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Estimated SUPPLEMENTAL (FY2024) cost: 0.0 *(separate supplemental appropriation required)*

Estimated CAPITAL (FY2025) cost: 0.0 *(separate capital appropriation required)*

Does the bill create or modify a new fund or account? No

(Supplemental/Capital/New Fund - discuss reasons and fund source(s) in analysis section)

ASSOCIATED REGULATIONS

Does the bill direct, or will the bill result in, regulation changes adopted by your agency? No

If yes, by what date are the regulations to be adopted, amended or repealed?

Why this fiscal note differs from previous version/comments:

Updated from SLA2023 to SLA2024 fiscal note template. This fiscal note zeros out the previous indeterminate note based on additional information provided during the committee process. DEC does not anticipate any costs associated with this legislation.

Prepared By: Jason Olds, Director — Phone: (907)465-5109
Division: Air Quality — Date: 01/15/2024 11:00 AM
Approved By: Megan Kohler, Administrative Services Director — Date: 01/15/24
Agency: Department of Environmental Conservation

FISCAL NOTE ANALYSIS

STATE OF ALASKA **BILL NO.** SB49
2024 LEGISLATIVE SESSION

Analysis

The Division of Air Quality supports the efforts described in this bill to reduce carbon emissions into the atmosphere.

The Division of Air Quality's mission is to control and mitigate air pollution and to conserve the clean air. This bill allows companies to inject the CO2 stream into underground geologic formations in order to permanently sequester the carbon rather than emit it into the atmosphere.

There is no fiscal impact to the Department of Environmental Conservation as a result of this legislation.

Fiscal Note

State of Alaska
2024 Legislative Session

Bill Version: SB 49
Fiscal Note Number:
() Publish Date:

Identifier: SB49-DNR-DOG-01-19-24
Title: CARBON STORAGE
Sponsor: RLS BY REQUEST OF THE GOVERNOR
Requester: (S)RES

Department: Department of Natural Resources
Appropriation: Oil & Gas
Allocation: Oil & Gas
OMB Component Number: 439

Expenditures/Revenues

Note: Amounts do not include inflation unless otherwise noted below. (Thousands of Dollars)

	FY2025 Appropriation Requested	Included in Governor's FY2025 Request	Out-Year Cost Estimates				
OPERATING EXPENDITURES	**FY 2025**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**FY 2030**
Personal Services							
Travel							
Services							
Commodities							
Capital Outlay							
Grants & Benefits							
Miscellaneous							
Total Operating	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Fund Source (Operating Only)

None							
Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Positions

Full-time							
Part-time							
Temporary							

Change in Revenues

None	***	***	***	***	***	***	***
Total	*******	*******	*******	*******	*******	*******	*******

Estimated SUPPLEMENTAL (FY2024) cost: 0.0 *(separate supplemental appropriation required)*

Estimated CAPITAL (FY2025) cost: 0.0 *(separate capital appropriation required)*

Does the bill create or modify a new fund or account? Yes

(Supplemental/Capital/New Fund - discuss reasons and fund source(s) in analysis section)

ASSOCIATED REGULATIONS

Does the bill direct, or will the bill result in, regulation changes adopted by your agency? Yes
If yes, by what date are the regulations to be adopted, amended or repealed? 6/31/2025

Why this fiscal note differs from previous version/comments:

The work necessary to stand up the Carbon Capture, Utilization, and Storage Program within the Division of Oil & Gas will be managed with existing staff resources. Updated from SLA2023 to SLA2024 fiscal note template.

Prepared By: Haley Paine, Deputy Director — Phone: (907)269-8800
Division: Oil and Gas — Date: 01/19/2024 11:35 AM
Approved By: Theresa Cross, Administrative Services Director — Date: 01/19/24
Agency: Natural Resources

FISCAL NOTE ANALYSIS

STATE OF ALASKA **BILL NO.** SB 49
2024 LEGISLATIVE SESSION

Analysis

Purpose of Legislation
The purpose of this legislation is to establish a comprehensive regulatory structure for Carbon Capture, Utilization, and Storage ("CCUS") projects within the State of Alaska. The bill allows DNR to lease State lands for carbon storage projects, establishes a CCUS regulatory regime within the Alaska Oil & Gas Conservation Commission ("AOGCC"), allows AOGCC to pursue primacy for UIC Class VI carbon dioxide injection wells, and expands existing regulatory authority over oil & gas pipelines to carbon dioxide pipelines.

New Positions
The work necessary to stand up the Carbon Capture, Utilization, and Storage Program within the Division of Oil & Gas will be managed with existing staff resources.

Travel & Services
No travel or services are required for this bill.

Capital Costs
No capital costs are required for this bill.

New Fund - Carbon Storage Closure Trust Fund
The legislation creates a new "Carbon Storage Closure Trust Fund." The fund will be funded through payments from Carbon Storage Facility operators based on the volume of injected carbon. The payment amounts will be set by the Alaska Oil & Gas Conservation Commission at the time that a permit is issued for the facility. The fund is intended to be used for long-term monitoring and maintenance related to injected underground carbon after a carbon storage facility has ceased operation and the operator has dismantled infrastructure and remediated the facility site except for the underground carbon.

Regulations
This legislation is likely to result in DNR issuing new regulations concerning the evaluation of applications for carbon storage licenses and leases and for establishing a competitive bidding process for competing license applications. DNR anticipates that regulations should be promulgated within 12 months of final passage. DNR is likely to coordinate regulatory proposals with other agencies involved in CCUS oversight activities to ensure harmonization of regulatory programs given the complexity of the subject matter.

Fiscal Note

State of Alaska
2024 Legislative Session

Bill Version: SB 49
Fiscal Note Number:
() Publish Date:

Identifier: SB49-DOR-TAX-01-15-24
Title: CARBON STORAGE
Sponsor: RLS BY REQUEST OF THE GOVERNOR
Requester: Senate Resources

Department: Department of Revenue
Appropriation: Taxation and Treasury
Allocation: Tax Division
OMB Component Number: 2476

Expenditures/Revenues

Note: Amounts do not include inflation unless otherwise noted below. (Thousands of Dollars)

	FY2025 Appropriation Requested	Included in Governor's FY2025 Request	Out-Year Cost Estimates				
OPERATING EXPENDITURES	**FY 2025**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**FY 2030**
Personal Services							
Travel							
Services							
Commodities							
Capital Outlay							
Grants & Benefits							
Miscellaneous							
Total Operating	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Fund Source (Operating Only)

None							
Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Positions

Full-time							
Part-time							
Temporary							

Change in Revenues

None	***		***	***	***	***	***
Total	*******	**0.0**	*******	*******	*******	*******	*******

Estimated SUPPLEMENTAL (FY2024) cost: 0.0 *(separate supplemental appropriation required)*

Estimated CAPITAL (FY2025) cost: 0.0 *(separate capital appropriation required)*

Does the bill create or modify a new fund or account? Yes

(Supplemental/Capital/New Fund - discuss reasons and fund source(s) in analysis section)

ASSOCIATED REGULATIONS

Does the bill direct, or will the bill result in, regulation changes adopted by your agency? No

If yes, by what date are the regulations to be adopted, amended or repealed? N/A

Why this fiscal note differs from previous version/comments:

Updated from SLA2023 format to SLA2024 fiscal note format.

Prepared By: Fadil Limani, Deputy Commissioner — Phone: (907)465-3761
Division: Commissioner's Office — Date: 01/15/2024
Approved By: Adam Crum, Commissioner — Date: 01/15/24
Agency: Department of Revenue

FISCAL NOTE ANALYSIS

STATE OF ALASKA **BILL NO.** SB 49
2024 LEGISLATIVE SESSION

Analysis

The last several years have witnessed a rapid acceleration of interest in Carbon Capture, Utilization, and Sequestration (CCUS) technologies and projects. CCUS projects seek to capture anthropogenic CO_2, chiefly from industrial sources, and inject the CO_2 stream into underground geologic formations in order to permanently sequester the carbon rather than emit it into the atmosphere.

Federal Legislation in 2022 and 2023, primarily the Inflation Reduction Act, has increased the amount of an existing credit known as the "45Q." The 45Q, in short, allows for a credit against both federal and state corporate income taxes on a per ton of C02 basis for either sequestration of C02 for permanent storage or for enhanced oil recovery (at a lower credit level).

This bill would empower regulatory agencies to apply for class VI primacy from the federal government and establish a framework for application, storage, potential remediation of Carbon Capture, Sequestration, Utilization and Storage. It establishes several funds for the deposit of moneys generated from the program. The Department believes that the funds can be established and invested using existing resources.

Revenue potential is uncertain at this stage. While the 45Q credit will reduce the state's corporate income tax collection because the state tax code adopts by reference the federal code, there are numerous fees, penalties, and other charges that will generate the revenue necessary to administer this new program. Additionally, there is the potential for the state to monetize carbon injection from other jurisdictions for a fee once the program is underway. For these reasons, and because obtaining class VI primacy from the Environmental Protection Agency will take time, the Department of Revenue cannot say within an acceptable margin of error what the ultimate revenue potential will be at this stage.