



Memorandum

February 14, 2024

TO: Representative Neal Foster, Co-Chair
Representative Bryce Edgmon, Co-Chair
Representative DeLena Johnson, Co-Chair
House Finance Committee

FROM: Joe Byrnes
Legislative Liaison, Department of Natural Resources

RE: Response to House Bill 50 questions from the House Finance Committee

Thank you for the opportunity to provide a refresher presentation on House Bill 50 - Carbon Storage to the House Finance Committee on Jan. 25, 2024. Below are DNR follow-up responses to two questions posed at that hearing.

Q: Representative Josephson asked for clarity around EOR and taxes.

Since the 1970s, carbon dioxide (CO₂) has been commonly used for enhanced oil recovery (EOR). Using CO₂ in this way results in a portion of, and ultimately all of, the CO₂ remaining underground in permanent storage. Until recently, most CO₂ EOR has depended on naturally occurring underground CO₂ deposits. In recent years, however, industry has begun to utilize CO₂ captured as a by-product of fossil fuel combustion, gasification, or other industrial processes. This transition to anthropogenic sources has been furthered by federal income tax credit incentive programs, commonly referred to as 45Q. Under the recent Inflation Reduction Act, the dollar figure of this tax credit has increased to \$60 per ton of CO₂ sequestered through EOR, compared with \$85 per ton for CO₂ stored in underground reservoirs not associated with EOR.

As explained by DNR Deputy Commissioner John Crowther in committee, an amendment by the House Resources Committee and supported by the administration decoupled Alaska's corporate tax structure from 45Q, thus preventing the recipient from receiving a credit toward both federal and state corporate income tax structures. See Section 37 of HB 50, version R. This avoids an entity earning both a federal and a state tax credit for the same work.

Oil and gas producers are subject to both state production tax and a federal income tax, and may also be subject to state income tax depending on their corporate structure. For state oil and gas production tax purposes, EOR costs are eligible lease expenditures as necessary for the production of oil and gas. Under the bill's current language, it is possible that an operator may apply eligible lease expenditures associated with EOR when calculating their production tax. The same operator may be eligible for a 45Q federal income tax credit. The lease expenditures apply only to the state's oil and gas production tax, and the federal 45Q tax credit applies only to federal corporate income tax.

Q: Representative Hannan asked for an explanation on how Cook Inlet seismicity could impact carbon sequestration.

Alaska is a seismically active region with many faults and frequent earthquakes. Although seismologists cannot predict individual events, they can assess the probability that certain regions may witness large, damaging earthquakes. The Cook Inlet region has a long history of large earthquakes, so building codes demand infrastructure in the area is engineered to survive these events. This requirement extends to oil and gas facilities and pipelines. Future carbon capture, utilization, and storage (CCUS) projects must also be resilient, and the federal Environmental Protection Agency (EPA) has strict requirements for regulating these CCUS wells. Under HB 50, the state would assume the responsibility for regulation from EPA, applying the EPA's requirements.

The primary potential earthquake-related risk to CCUS projects is the possibility of a fault rupturing through the impermeable seal rock that keeps the buoyant CO₂ trapped in the reservoir. Most large earthquakes in the Cook Inlet area are very deep and do not involve movement of faults within the shallower regions where carbon sequestration would occur. Available subsurface data indicate most shallow faults in Cook Inlet appear to be blind, meaning they do not break through to the seafloor, but instead cause broad upwarping (folds). This style of fault is less likely to rupture a seal and result in leaking of previously injected CO₂. Nevertheless, there is inherent uncertainty in fault hazard assessment and each project must evaluate all available data to ensure long-term geologic viability of the storage site.

It should be noted that the numerous oil and gas fields in Cook Inlet have successfully weathered many earthquakes, including the 1964 event that was the second largest ever recorded on Earth. The fact that the seals for existing hydrocarbon traps have not been breached during these historic events provides reasonable confidence in the long-term integrity of these potential sequestration sites.

Although this basin-wide knowledge is helpful, the essential evaluation of a carbon sequestration project will be at a project-specific level. Developers conduct site-specific studies to characterize a location's suitability by shooting seismic, drilling test wells, and evaluating cores and geochemistry to characterize the suitability of a particular horizon. The Alaska Oil and Gas

Conservation Commission (AOGCC) is the subsurface regulator for the entire state and has decades of experience evaluating hazards in Cook Inlet.

For instance, the AOGCC currently has primacy over Class II disposal and enhanced oil recovery wells in Cook Inlet. For the Class II program, AOGCC requires operators to report on seismicity and its effects in the annual report required by the Area Injection Order (AIO). Class II well operators are required to report any evidence of induced seismicity; to date no operators have produced evidence of seismic impacts.

The Class VI injection well program for CCUS requires extensive evaluation of seismicity and faulting prior to the approval of, and during the course of operations of, a carbon storage facility. Per the federal code 40 CFR 146.82(a), an application for a facility would require at a minimum:

1. Information on the geologic structure and hydrogeologic properties of the proposed sequestration site and overlying formations, to include:
 - a. geologic and topographic maps and cross-sections illustrating regional geology, geologic structure, and hydrology;
 - b. maps and cross-sections to a scale needed to detail the local geology, geologic structure, and hydrology. The maps and cross-sections must extend at least two miles beyond the area of review;
 - c. the location, orientation, and properties of known or suspected faults and fractures that may transect the confining zone(s) in the area of review and a determination that they would not interfere with containment;
 - d. maps and stratigraphic cross-sections showing the general vertical and lateral limits of all Underground Sources of Drinking Water (USDWs), water wells and springs within the area of review, their position relative to the injection zone(s) and the direction of water movement, if known;
 - e. in areas with limited subsurface well control or where the subsurface geology is in doubt and cannot be described adequately, the commissioner may request the applicant to provide geophysical seismic data of the project area.
2. Application Technical Information
 - a. data on the depth, areal extent, thickness, mineralogy, porosity, permeability, and capillary pressure of the injection and confining zone(s); including geology/facies changes based on field data which may include geologic cores, outcrop data, seismic surveys, well logs, and names and lithologic descriptions;
 - b. geomechanical information on fractures, stress, ductility, rock strength, and in situ fluid pressures within the confining zone(s);
 - c. information on the region's seismic history including the presence and depth of seismic sources and a determination that the seismicity would not interfere with containment;

- d. a tabulation of all wells within the area of review that penetrate the base of the USDW. Such data must include a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any other information the commissioner may require; and
- e. baseline geochemical data on subsurface formations, including injection zones, confining zones and all USDWs in the area of review.

Further, 40 CFR 146.90(g), includes ongoing testing and monitoring to track the extent of the carbon dioxide plume and the presence or absence of elevated pressure (*e.g.*, the pressure front) by using direct methods in the injection zone(s); and indirect methods (*e.g.*, seismic, electrical, gravity, or electromagnetic surveys, or down-hole carbon dioxide detection tools).

Attached to this letter are the requested sectional slides that were omitted from the January 25 presentation. Please note the change in numbering of the sections with CSHB 50(FIN) work draft R, which removes Section 3, the Class VI primacy authorization that passed last session as part of SB 48, from CSHB 50(RES) version U.

Thank you for the opportunity to present HB 50 to the committee.

SECTIONAL SUMMARY: 1 – 16



Section (Agency)	Summary
1	Short title of bill: Carbon Capture, Utilization, and Storage Act
2 (AOGCC)	AS 31.05.027 – Grants AOGCC jurisdiction to regulate carbon storage unit operations in the state like oil and gas (<i>bill Sec. 16</i>)
3 (AOGCC)	AS 31.05.030(h) – Authorizes AOGCC to seek primary enforcement authority for permitting and regulating Class VI injection wells for CO ₂
4 (AOGCC)	AS 31.05.030(m) – Conforming changes to clarify authority in the <i>Geothermal Resources</i> part of AS 41.06.
5 (AOGCC)	AS 37.05.146(c) – Adds carbon dioxide storage facility administrative fund to list of separate funds with sources not from UGF appropriations (<i>bill Sec. 33, proposed AS 41.06.160</i>)
6 (DNR/AOGCC)	AS 37.14.850 – Creates Carbon Storage Closure Trust Fund to provide non-sweepable fund account for post-closure operations of State agencies. Fund source is an injection surcharge (<i>bill Sec. 33, proposed AS 41.06.175</i>)
7 (DNR)	AS 38.05.069(e) – Adds carbon storage (<i>bill Sec. 16</i>) to mineral estate disposal exemptions for agricultural lands disposal
8 (DNR)	AS 38.05.070(a) – Adds exemption for carbon storage leasing (<i>bill Sec. 16</i>) from generalized state land leasing provisions in AS 38.05.070–105 (when state lands are leased for purposes other than extraction of natural resources)
9 (DNR)	AS 38.05.130 – Adds carbon storage to provisions requiring lessees to pay damages to landowners and post bond for that purpose; and providing lessee access to the mineral estate if a surface owner refuses to engage in a surface use agreement; same statutory process that exists for other mineral estate development of split estate created by AS 38.05.125
10–13 (DNR/DOG)	AS 38.05.135(a)–(e) – Adds carbon storage program (<i>bill Sec. 16</i>) to mineral leasing statutes primarily providing for revenue collection by adding reference to injection charges (<i>proposed Sec. 38.05.700(c)</i>)
14 (DNR)	AS 38.05.140(a) – Adds carbon storage provision to exemptions for coal bed methane under AS 38.05.180(gg) and unconventional gas under AS 38.05.180(ff) because carbon storage leasing might be possible in unmineable coal seams
15 (DNR)	AS 38.05.184 – Adds carbon storage leases to prohibition in the Kachemak Bay oil and gas closure area
16 (DNR/DOG)	Adds new sections to AS 38.05 <i>Alaska Land Act</i> as Article 15A <i>Carbon Storage Exploration Licenses; Leases</i> (<i>proposed AS 38.05.700–795</i>); detailed summary after next slide

SECTION DETAIL: SECTION 16 (DNR/DOG)



Proposed Section	Summary
AS 38.05.700	<p>Provision for applicability carbon storage statutes and authority for DNR to adopt regulations to implement these statutes.</p>
AS 38.05.705	<p>Allows the commissioner to issue carbon storage exploration licenses on state land and establishes work commitment obligations, minimum economic terms, bonding requirements, default provisions, and renewal provisions.</p> <ul style="list-style-type: none"> • 5-year exploration license term • Conversion of the license to a lease upon fulfillment of work commitment, acquiring storage facility permit from AOGCC, ability to meet commercial terms
AS 38.05.710	<p>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.</p> <ul style="list-style-type: none"> • Identify land, minimum work commitment, economic terms, 90 days for competing proposals • Written finding – including competitive process if competing proposals are submitted • Subsection 715(h) provides a right-of-first-refusal opportunity for existing lessees under AS 38.05.135–181 (i.e., mineral lessees for coal, oil and gas, geothermal, or other exploitable minerals).
AS 38.05.715	<p>Provision allowing conversion of an AS 38.05.705–710 carbon storage exploration license to a carbon storage lease.</p>
AS 38.05.720	<p>An oil and gas lessee converting from enhanced oil recovery to carbon storage must apply for a carbon storage lease.</p>
AS 38.05.725	<p>Requirements for plans of development and operations, and provision for unitization, as with oil and gas leasing.</p>
AS 38.05.730	<p>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.</p>
AS 38.05.795	<p>Definitions for specific terms used in the proposed Article 15A <i>Carbon Storage Exploration Licenses; Leases</i></p>

SECTIONAL SUMMARY:17–33



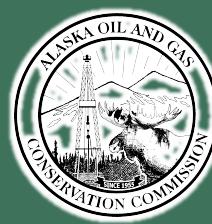
Section (Agency)	Summary
17 (DNR/DOG)	AS 38.35.020(a) – Amended to include carbon dioxide for pipeline transportation right-of-way (ROW) leasing purposes
18 (DNR/DOG)	AS 38.35.020(b) – Amended to allow the DNR commissioner to exempt pipelines from ROW leasing when transporting carbon dioxide for enhanced oil recovery or pressure support within existing fields (does <i>not</i> exempt pipelines from regulation, just a ROW)
19 (DNR/DOG)	AS 38.35.122 – Conforming amendment to bring some carbon dioxide pipelines under the same title as “product” pipelines
20–23 (DNR/DOG)	AS 38.35.230 – Amends definitions of “lease,” “pipeline” or “pipeline facility,” “transportation,” and adds “carbon dioxide” to accommodate carbon dioxide pipeline provisions
24–32 (AOGCC)	AS 41.06.005–060 – Conforming amendments separates AS 41.06 into two articles – one for geothermal and one for carbon storage
33 (AOGCC)	AS 41.06 – Adds new sections as Article 2. <i>Carbon Dioxide Injection and Storage</i> beginning at AS 41.06.105. Detailed summary on slide after next.

SECTION DETAIL: SECTION 33 (AOGCC)



Proposed Sections	Summary
AS 41.06.105	Provides AOGCC jurisdiction over carbon dioxide storage facilities to prevent waste, protect correlative rights, and ensure public health and safety; "waste" is defined in AS 41.06.210
AS 41.06.110	<p>Concerns AOGCC's authority to carry out the purposes and intent of AS 41.06.105–210</p> <ul style="list-style-type: none"> (a) contains an expansive statement of AOGCC's jurisdiction over persons and property necessary to carry out the purposes and intent of AS 41.06.105–210 – the State's police power (b) allows AOGCC to suspend its statutes for lands committed to federal units, provided the conservation of resources is provided for (c) contains a list of specific AOGCC regulatory authorities (d) wells drilled for carbon dioxide are subject to AOGCC's jurisdiction under AS 31.05 unless covered by AS 41.06.105–210 (e) AS 41.06.105–210 do not limit DNR's authority over (1) carbon storage exploration licensing or leasing; or (2) approval and management of carbon storage units or operations that include state land
AS 41.06.115	Provides that waste is prohibited in a carbon storage facility or reservoir
AS 41.06.120	Provides permit requirements for storage facilities
AS 41.06.125	Creates a public hearing requirement for storage facility permits issued by AOGCC – notice is given to property owners within ½ mile
AS 41.06.130	Specifies the criteria for the AOGCC to approve a carbon storage facility permit
AS 41.06.135	Allows AOGCC to include parameters, limitations, or restrictions in a permit and to protect and adjust rights and obligations of persons affected by geologic storage
AS 41.06.140	Concerns amalgamation of property interests for storage facilities

SECTION DETAIL: SECTION 33 (AOGCC)



Proposed Sections	Summary
AS 41.06.145	Creates specifications for recording a carbon storage facility certificate to put future property purchasers on notice
AS 41.06.150	Creates statutory requirements for AOGCC to ensure environmental protection and reservoir integrity in storage facilities and reservoirs
AS 41.06.155	Clarifies preservation of rights, including deconfliction of development of other minerals by drilling through or near a storage reservoir
AS 41.06.160	Authority for AOGCC to collect fees and establishes the "carbon dioxide storage facility administrative fund" under the general fund
AS 41.06.165	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
AS 41.06.170	Specifies the eight factor criteria for certificate of completion a transfer of title of CO ₂
AS 41.06.175	AOGCC will collect a "carbon storage facility injection surcharge" for post-closure administration, deposited in the "carbon storage closure trust fund" established in AS 37.14.850 (<i>bill Sec. 6</i>)
AS 41.06.180	AOGCC may impose civil penalties for violations of its carbon storage statutes
AS 41.06.185	Excludes AOGCC's carbon storage statutes from enhanced oil recovery (EOR), except when an EOR-related reservoir is converted for storage
AS 41.06.190	Authority for AOGCC to enter into agreements with other government entities and agencies for carbon storage purposes
AS 41.06.195	AOGCC authority to determine injection and storage amounts, and providing for fees
AS 41.06.210	Definitions for terms used in AOGCC's carbon storage statutes

SECTIONAL SUMMARY: 34–43



Section (Agency)	Summary		
34–37 (DNR/Parks)	Conforming amendments to parks and recreational facilities laws (AS 41.21) <ul style="list-style-type: none"> AS 41.21.167(a) Wood-Tikchik State Park carbon storage prohibited AS 41.21.491(d) Willow Creek State Recreation Area carbon storage permitted AS 41.21.502(c) Kenai River Special Management Area carbon storage permitted AS 41.21.617 Alaska Chilkat Bald Eagle Preserve carbon storage prohibited 		
38 (DOR)	AS 43.20.036 – Adds new subsection (k) prohibiting 45Q tax credits from being applied against corporate state income tax.		
39 (DNR/DOG)	AS 44.37.020 – Adds new subsection (d) for DNR to administer storage facilities and stored carbon after certificate of completion is issued (<i>bill Sec. 33, AS 41.06.170</i>)		
40 (DEC)	AS 46.03.020 – Amended to provide the DEC authority under Title 46 to adopt regulations for carbon dioxide pipelines		
41–43 (DNR/AOGCC)	General provisions for authority to adopt regulations, title change for chapter AS 41.06, and effective date of the legislation		

QUESTIONS?

