

SB 49 Carbon Capture, Utilization, and Storage Senate Resources Committee

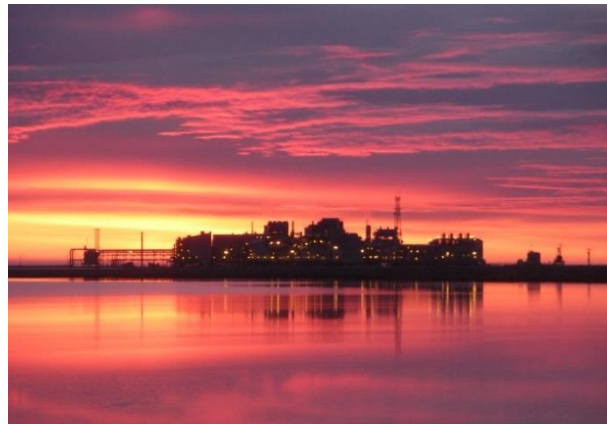


Presented by:

John Crowther, Deputy Commissioner, Department of Natural Resources

Haley Paine, Deputy Director, Division of Oil & Gas

March 10, 2023



OUTLINE



1. Introduction
2. CCUS project overview
3. Funding collection and revenue
4. High-level sectional summary
5. Section 14 Detail of DNR/DOG statutes
6. Sections 15–31 summary
7. Section 31 Detail of AOGCC statutes
8. Section 32–39 summary



Article VIII Alaska Constitution

- It is the policy of the State to encourage the settlement of its land and the development of its resources by making them available for maximum use consistent with the public interest.
- The legislature may provide for the leasing of, and the issuance of permits for exploration of, any part of the public domain or interest therein, subject to reasonable concurrent uses.

SB 49 AND THE ALASKA CONSTITUTION

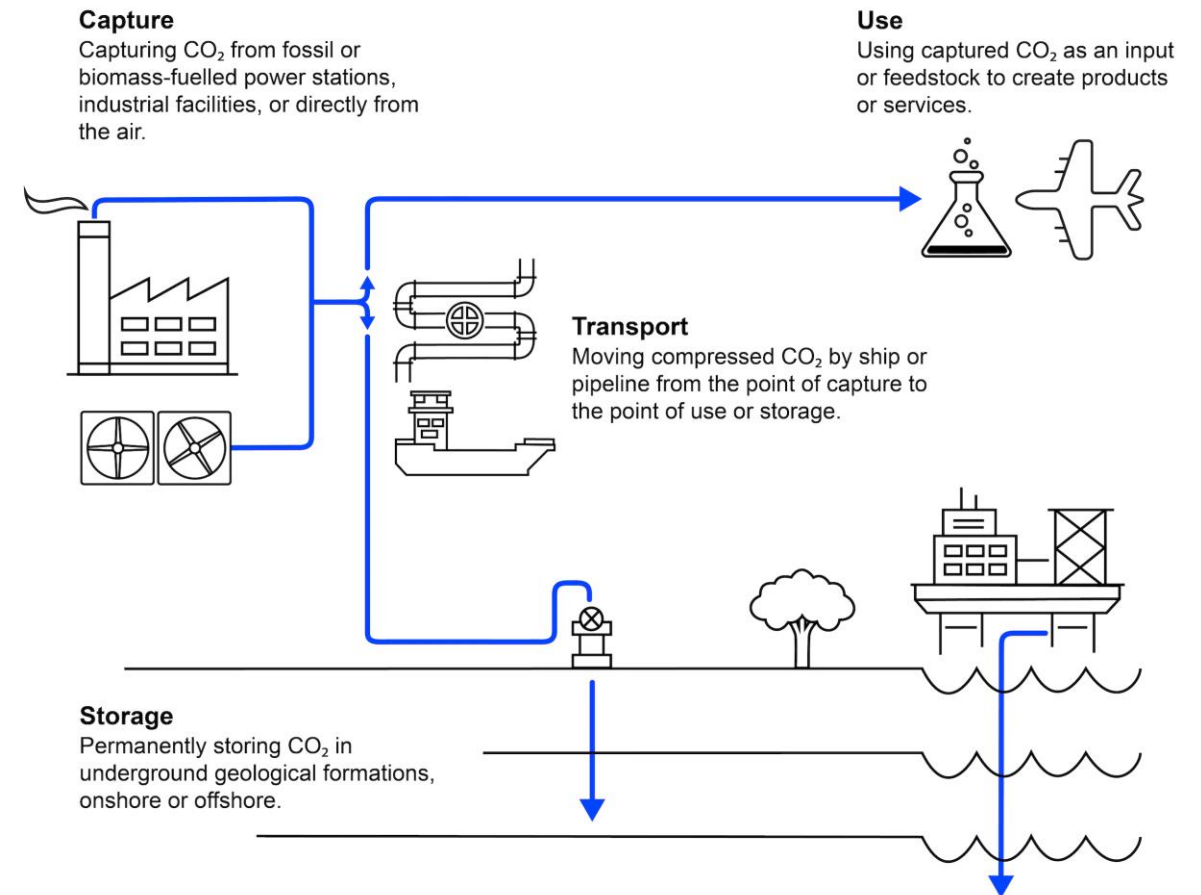


- Enables the State to maximize use of its pore space resource consistent with public interest.
- Provides for reasonable concurrent uses and protection of all parties.
- Empowers the Department of Natural Resources (DNR) and Alaska Oil and Gas Conservation Commission (AOGCC) to utilize existing authorities and expertise on carbon dioxide geologic storage.

WHAT IS CCUS?



Carbon capture, utilization and storage (CCUS) is a process that captures carbon dioxide emissions from industrial processes, point sources like coal-fired power plants, or from the air and either reuses or stores it so it will not enter the atmosphere.



CCUS: INTRODUCTION

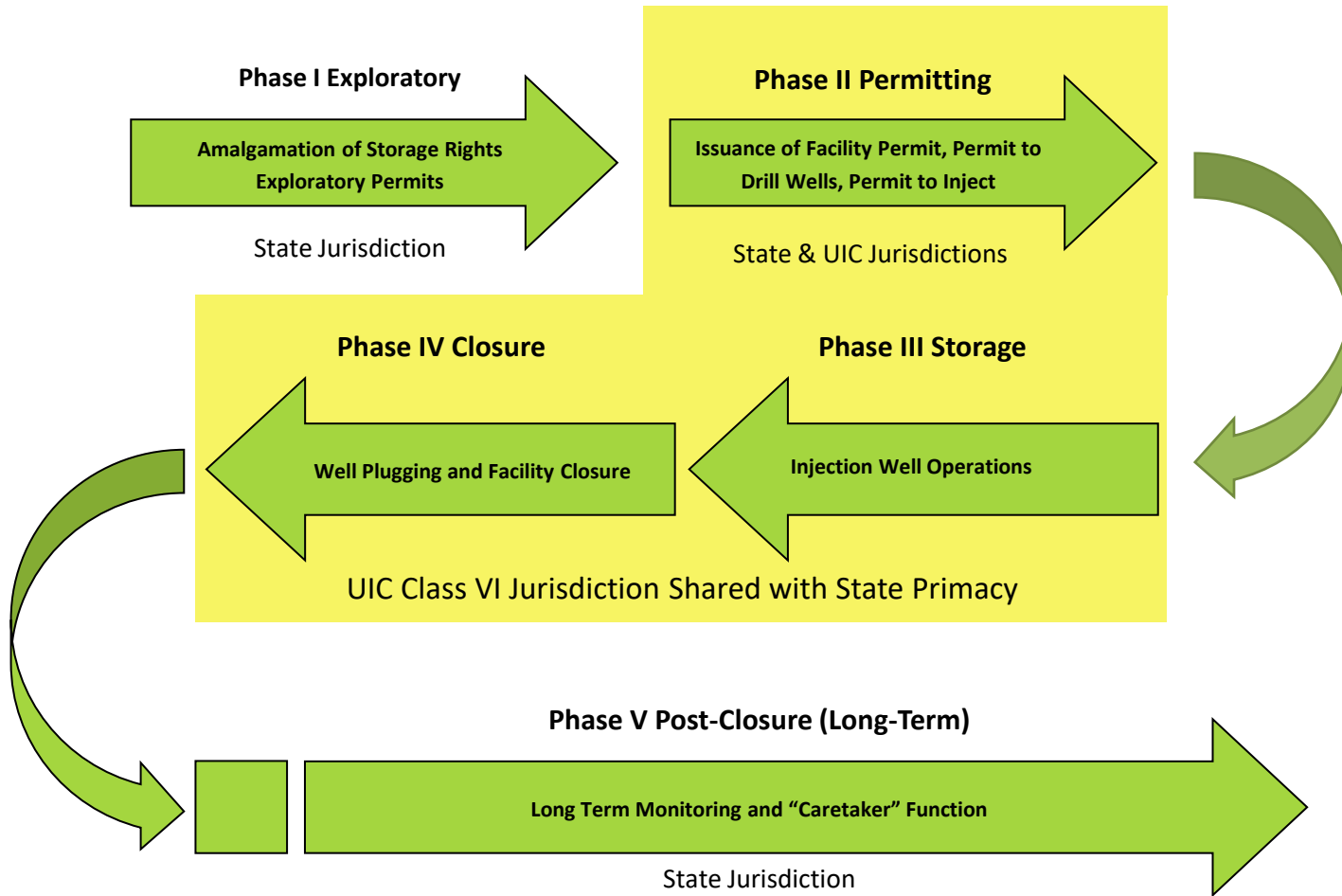


Why Now?

- The CCUS market is rapidly expanding, both within the U.S. and worldwide
- Federal legislation in the prior 18 months has included direct grants and tax incentives for CCUS, increasing industry interest, including outreach to the Department of Natural Resources (DNR)
- Federal funds are available for states seeking Class VI well permitting, showing federal support for state primacy
- Protracted project timelines and milestone requirements in the tax credit structure necessitate prompt action
- Sets the stage for continued development of Alaska's oil resources, and potential major gas development
- Corporations are actively seeking opportunities to meet their own carbon management goals

PROJECT OVERVIEW

CCUS PROJECT PHASES



- Safe Drinking Water Act of 1974 established Underground Injection Control Program
- Class VI – Well class specifically for underground storage of CO₂
- AOGCC Class II Underground Injection Control primacy since 1986
 - Oversee more than 950 active injection wells

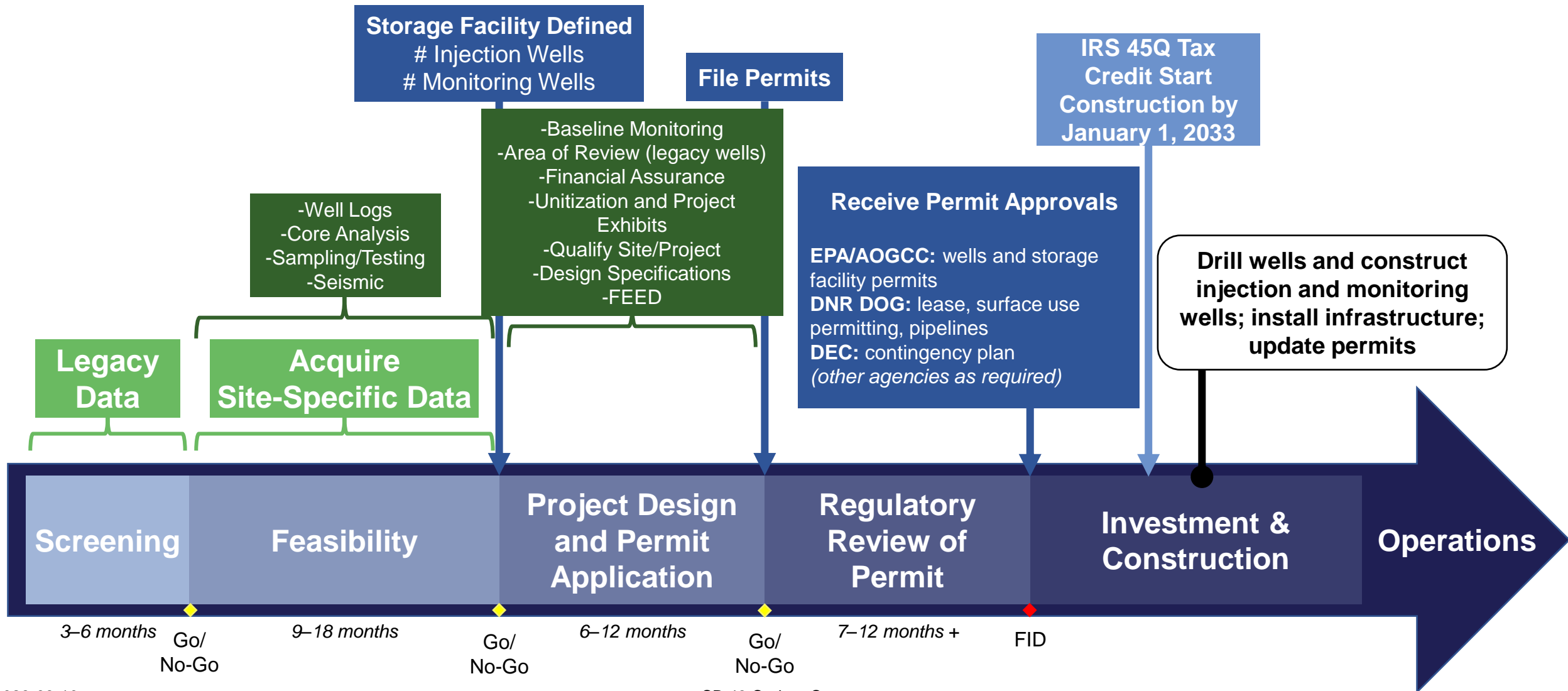
Yellow boxes show concurrent state and underground injection control (UIC) Class VI jurisdiction in Phases II, III, IV. Phase I and V show exclusive state jurisdiction.

Source: Interstate Oil and Gas Compact Commission, 2014

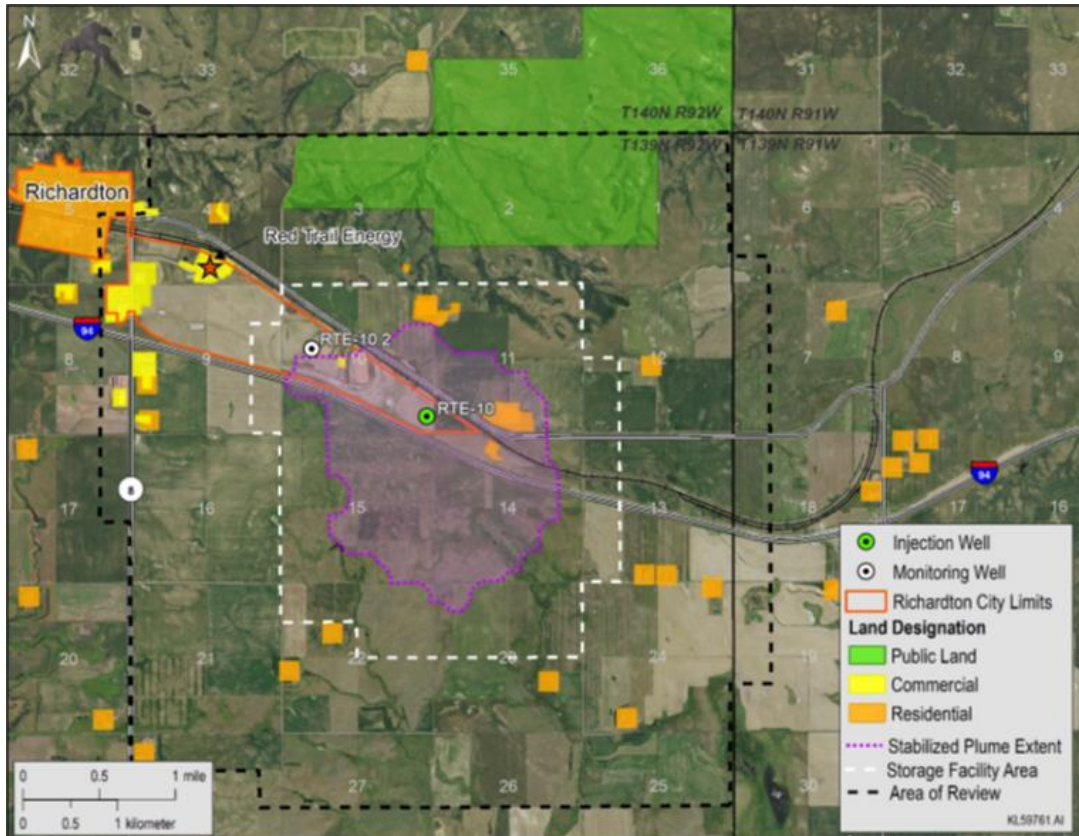
CCUS PROJECT TIMELINE



GENERALIZED TIMELINE TO IMPLEMENT GEOLOGIC CO₂ STORAGE



RED TAIL ENERGY PROJECT

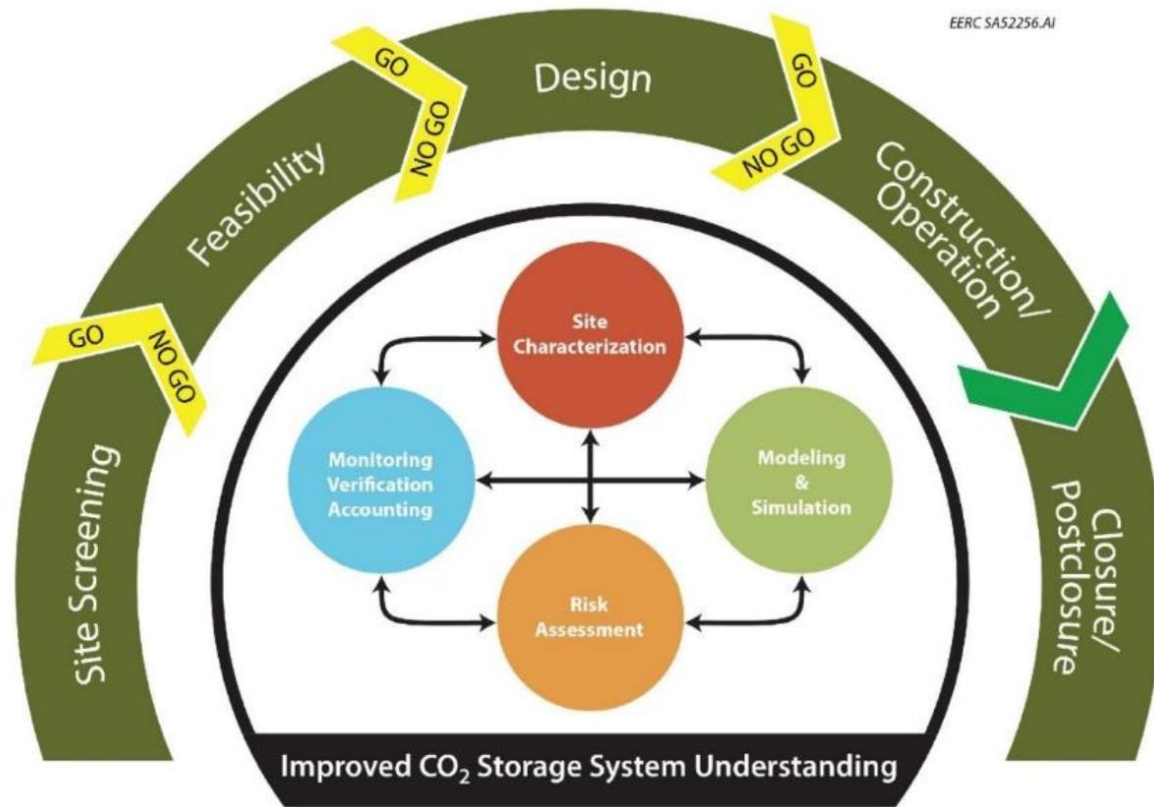


Once the permits are approved, the exploratory hole drilled in spring 2020 will be converted into the CO₂ injection well. The second test site, drilled in October, will be converted into a monitoring well for the CCS project.

Source: Energy & Environmental Research Center University of North Dakota

Project surface acreage: 3,480 acres (white outline)
Emissions: 180,000 metric ton/year (~200,000 ton/year)

RED TAIL ENERGY PROJECT

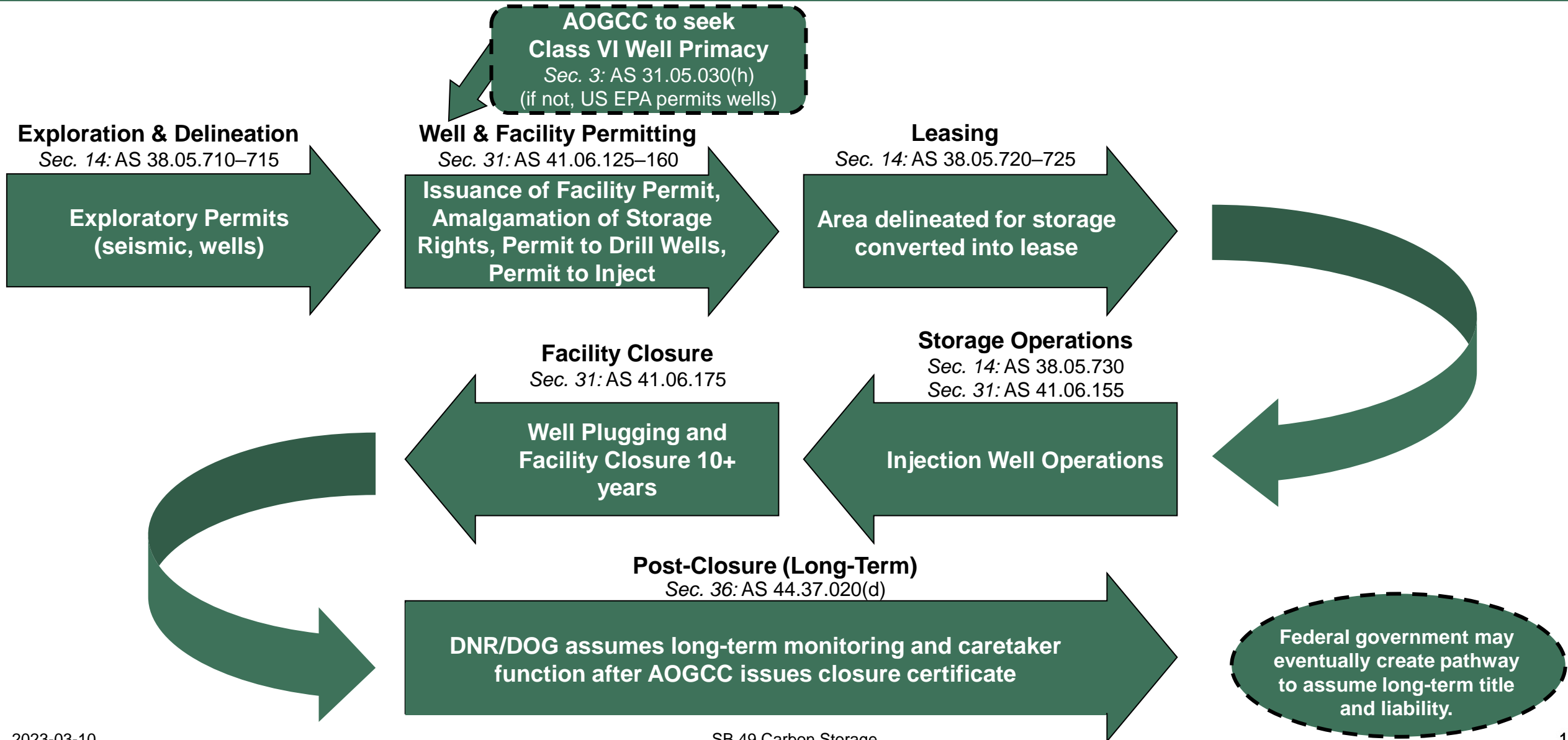


Red Tail Energy

- 5-year evaluation and design period
- North Dakota granted primacy for Class VI wells on April 24, 2018
- North Dakota CO₂ Storage Facility (Class VI) permit on October 19, 2021
- Commercial operation started on June 16, 2022

Source: Energy & Environmental Research Center University of North Dakota

CCUS PHASES AND LEGISLATION



PROJECT AUTHORIZATIONS



Carbon Storage Exploration License

- Grants exclusive right to explore area for carbon storage site
- 5-year term
- Work commitment and annual rental requirements
- Conversion to lease based on obtaining Carbon Storage Permit and completion of work commitment
- Does not authorize specific activities – require further permits

DNR

Carbon Storage Facility Permit

- Approves use of subsurface storage “container”
- Amalgamates pore space based on geological and engineering data
- Provides for protection of other mineral and property interests
- Establishes monitoring and bonding requirements
- Guides operations over life of project

AOGCC

Carbon Storage Lease

- Exclusive right to store CO₂ in reservoir on state lands as defined under the Storage Facility Permit
- Includes terms for revenue to the state
- Valid over life of injection and site closure
- Required for EOR reservoirs that transition to sequestration

DNR

Closure Certificate

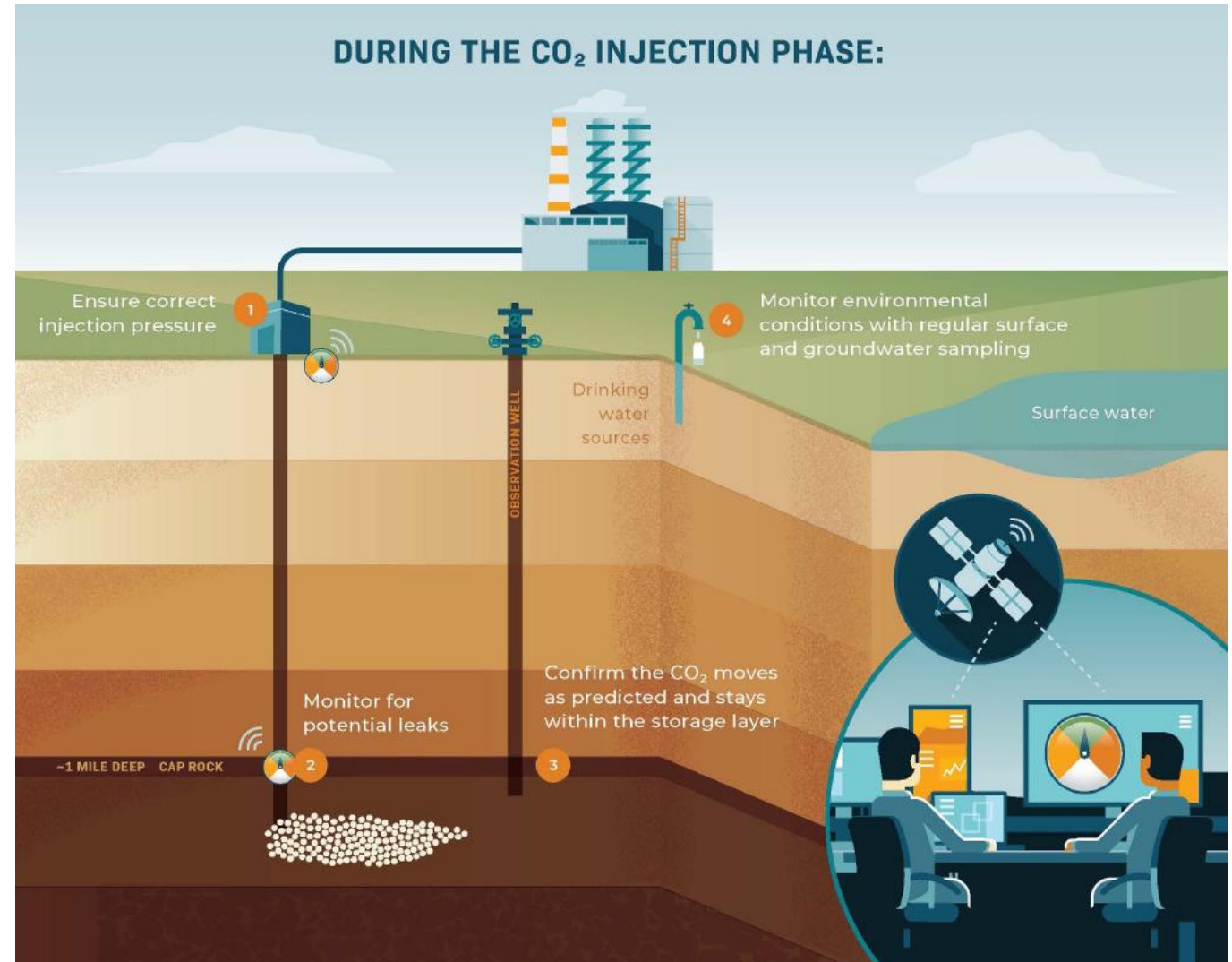
- Operator may apply at least 10 years post-injection
- Public notice & hearing
- Must demonstrate stabilization of CO₂ plume and remediation activities complete
- Title to CO₂ and long-term monitoring and maintenance transfer to state
- Funded by carbon storage trust fund over life of project

AOGCC

ONGOING OVERSIGHT



- Onsite inspection program
- Wellwork sundries
- Drilling permits
- Monthly reports
 - Metering
 - Injection
 - Volumes
- Pressure surveys
- Well logs
- Data from monitoring wells
- Plume monitoring



FUNDING & REVENUE

FUNDING SOURCES



Regulatory Program AOGCC

- **Carbon Dioxide Storage Facility Administrative Fund**
 - **Sec. 31: AS 41.06.165**
 - Creates fund to cover AOGCC operating costs associated with oversight of carbon storage, like fees collected for oil and gas oversight
 - Income account revenue sources:
 - Fees received under AS 41.06.165(a) - per ton fee
 - Fees received under AS 41.06.125 (permit review) and 41.06.200 (determining storage amounts)
 - Earnings on the fund

Leasing & Licensing State Lands DNR

- **Carbon storage exploration licenses and leases**
 - **Sec. 14: AS 38.05.710 & AS 38.05.720**
 - Establishes a minimum rental rate of \$20 per acre.
 - Establishes a minimum injection charge of \$2.50 per ton of carbon dioxide
 - Other commercial terms as applicable
 - **Sec. 14: AS 38.05.735**
 - Payments from carbon storage exploration licenses and carbon storage leases flow to the general fund and Alaska Permanent Fund (Art. IX, Sec. 15, Alaska Constitution)

FUNDING: CLOSURE TRUST FUND



Sec. 4: AS 37.14.850. Carbon storage closure trust fund.

- Industry-funded and state-administered trust fund to be used solely for long-term monitoring of the site during the Post-Closure Period
- Income account revenue sources:
 - Payments received under AS 37.14.850(c)
 - AS 41.06.180. Carbon storage facility injection surcharge (*Bill Sec. 31*)
 - Amount set by AOGCC on issuance of storage facility permit
 - Based on anticipated expenses to be incurred post-closure phases
 - Earnings on the account
- State may utilize funds directly or purchase policies as markets mature

Hypothetical Revenue Opportunities



1. Regional Power Facility

- 250,000 metric tons/year, \$2.50 metric ton/year
- 20-year life
- Acreage ~1200 acres during injection, \$20 acre/year



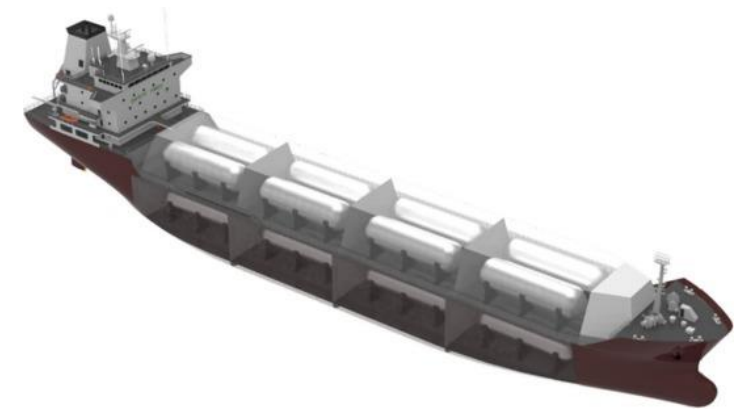
Chugach Electric Association, Inc. Southcentral Power Project

2. North Slope Emitting Facility

- 2,000,000 metric tons/year (50/50 EOR & Storage), \$2.50 metric ton/year (Storage)
- 20-year life
- Acreage ~10,000 acres during injection, \$20 acre/year

3. CO₂ Import & Sequestration Facility

- 10,000,000 metric tons/year, \$2.50 acre/year
- 40-year life
- Acreage ~ 50,000 acres during injection, \$20 acre/year



Conceptual design of CO₂ carrier.
Comparison of CO₂ liquefaction pressures for ship-based carbon capture and storage (CCS) chain. Int J Greenhouse Gas Control, 52 (2016)

EOR = enhanced oil recovery

Hypothetical Revenue Opportunities



- Not all CO₂ emissions are feasibly captured – technology continues to rapidly develop
- Capital expenditures to retrofit existing facilities cannot be met by existing incentives in some cases
- Import of CO₂ is dependent on further development of shipping technology and infrastructure
- Timing from bill passage, if project through screening phase:
 - Licensing Revenues \leq 2 years
 - Leasing Revenues \leq 5 years



Hypothetical Revenue Opportunities*

Hypothetical State Revenues	Scenario	Scenario	Totals	Year 1 0	Year 2 1	Year 3 2	Year 4 3	Year 5 4	Year 6 5	Year 7 6	Year 8 7	Year 9 8	Year 10 9
	1	Regional Power Facility CCUS	\$11,796,641 Over 20 years	\$92,753	\$92,753	\$92,753	\$24,921	\$24,921	\$573,427	\$573,427	\$573,427	\$573,427	\$573,427
		Exploration License		\$92,753	\$92,753	\$92,753							
		Development Lease					\$24,921	\$24,921					
		Injection							\$625,000	\$625,000	\$625,000	\$625,000	\$625,000
		Additional EOR Oil Revenue											
		Reduced Pollution Charges							-\$51,573	-\$51,573	-\$51,573	-\$51,573	-\$51,573
	2	North Slope Facility Standalone CCUS Project	\$210,761,893 Over 20 years	\$371,013	\$371,013	\$371,013	\$99,686	\$99,686	\$10,472,474	\$10,472,474	\$10,472,474	\$10,472,474	\$10,472,474
		Exploration License		\$371,013	\$371,013	\$371,013							
		Development Lease					\$99,686	\$99,686					
		Injection							\$2,500,000	\$2,500,000	\$2,500,000	\$2,500,000	\$2,500,000
		Additional EOR Oil Revenue							\$8,385,059	\$8,385,059	\$8,385,059	\$8,385,059	\$8,385,059
		Reduced Pollution Charges							-\$412,584	-\$412,584	-\$412,584	-\$412,584	-\$412,584
	3	CO2 Import for Sequestration (10m)	\$1,014,120,959 Over 40 years	\$3,710,130	\$3,710,130	\$3,710,130	\$996,857	\$996,857	\$996,857	\$25,000,000	\$25,000,000	\$25,000,000	\$25,000,000
		Exploration License		\$3,710,130	\$3,710,130	\$3,710,130							
		Development Lease					\$996,857	\$996,857	\$996,857				
		Injection								\$25,000,000	\$25,000,000	\$25,000,000	\$25,000,000
		Additional EOR Oil Revenue											
		Reduced Pollution Charges											

Additional barrels of oil and revenue for North Slope facility assumes ½ of the CO₂ injected is for EOR purposes and other ½ is permanently sequestered.

Reduction in revenue to the Department of Environmental Conservation assumes that a certain factor of scheduled pollutants would be removed from the emissions process with every ton of CO₂ captured.

*These scenarios represent a “best case,” hypothetical scenario relying on assumptions believed to be reasonable, including market conditions in other jurisdictions, and maturely developed capture, transportation and sequestration technology. They are developed purely for high-level scoping purposes. The Alaska market development will likely include a range of different commercial and economic arrangements.

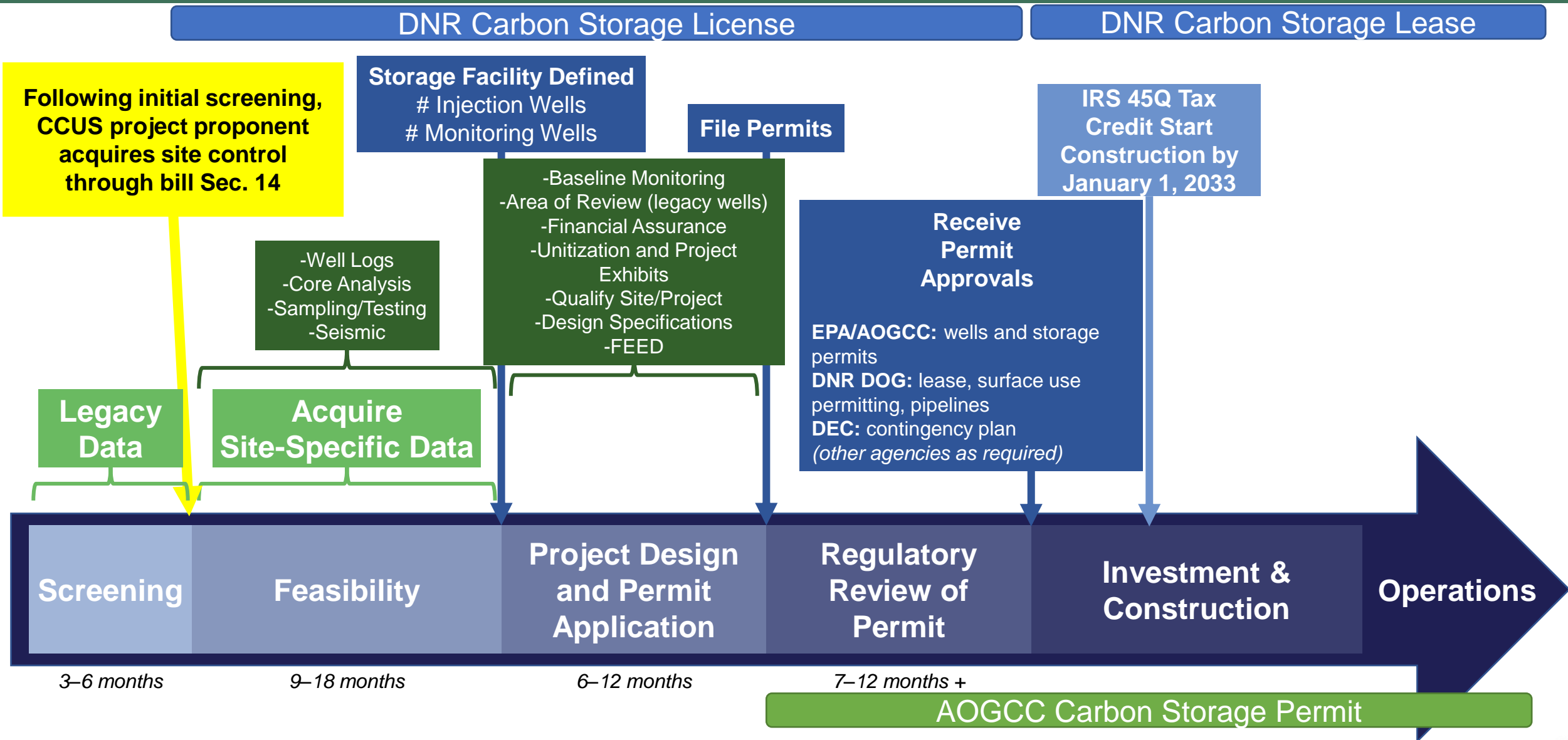
SECTIONAL SUMMARY

SECTIONAL SUMMARY



Section (Agency)	Summary
1	Short title of bill: Carbon Capture, Utilization, and Storage Act
2 (AOGCC)	Grants AOGCC jurisdiction to regulate carbon storage unit operations in the state like oil and gas (<i>bill</i> Sec. 14)
3 (AOGCC)	Authorizes AOGCC to seek primary enforcement authority for permitting and regulating Class VI injection wells for CO ₂
4 (DNR/AOGCC)	Creates Carbon Storage Closure Trust Fund to provide non-sweepable fund for post-closure operations of State agencies (<i>bill</i> Sec. 31, <i>proposed</i> AS 41.06.180)
5 (DNR)	Adds carbon storage (<i>bill</i> Sec. 14) to mineral estate disposal exemption for agricultural lands disposal in AS 38.05.069(e)
6 (DNR)	Adds carbon storage (<i>bill</i> Sec. 14) exemption to AS 38.05.070(a) for when state lands are leased for purposes other than extrication of natural resources
7 (DNR)	Adds carbon storage to provisions requiring lessees to pay damages to landowners and to post bonds for that purpose; and providing lessee access to access to the 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 of split estate created by AS 38.05.125
8–11 (DNR/DOG)	Adds carbon storage program (<i>bill</i> Sec. 14) to mineral leasing statutes under AS 38.05.135, primarily providing for revenue collection
12 (DNR)	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 on unmineable coal seams
13 (DNR)	Adds carbon storage leases to prohibition in the Kachemak Bay oil and gas closure area
14 (DNR/DOG)	Adds new sections to AS 38.05 <i>Alaska Land Act</i> as Article 15A <i>Carbon Storage Exploration Licenses; Leases</i> (proposed AS 38.05.700–795); detailed summary on next slide

CCUS PROJECT THEORETICAL TIMELINE



SECTION DETAIL: SECTION 14 (DNR/DOG)



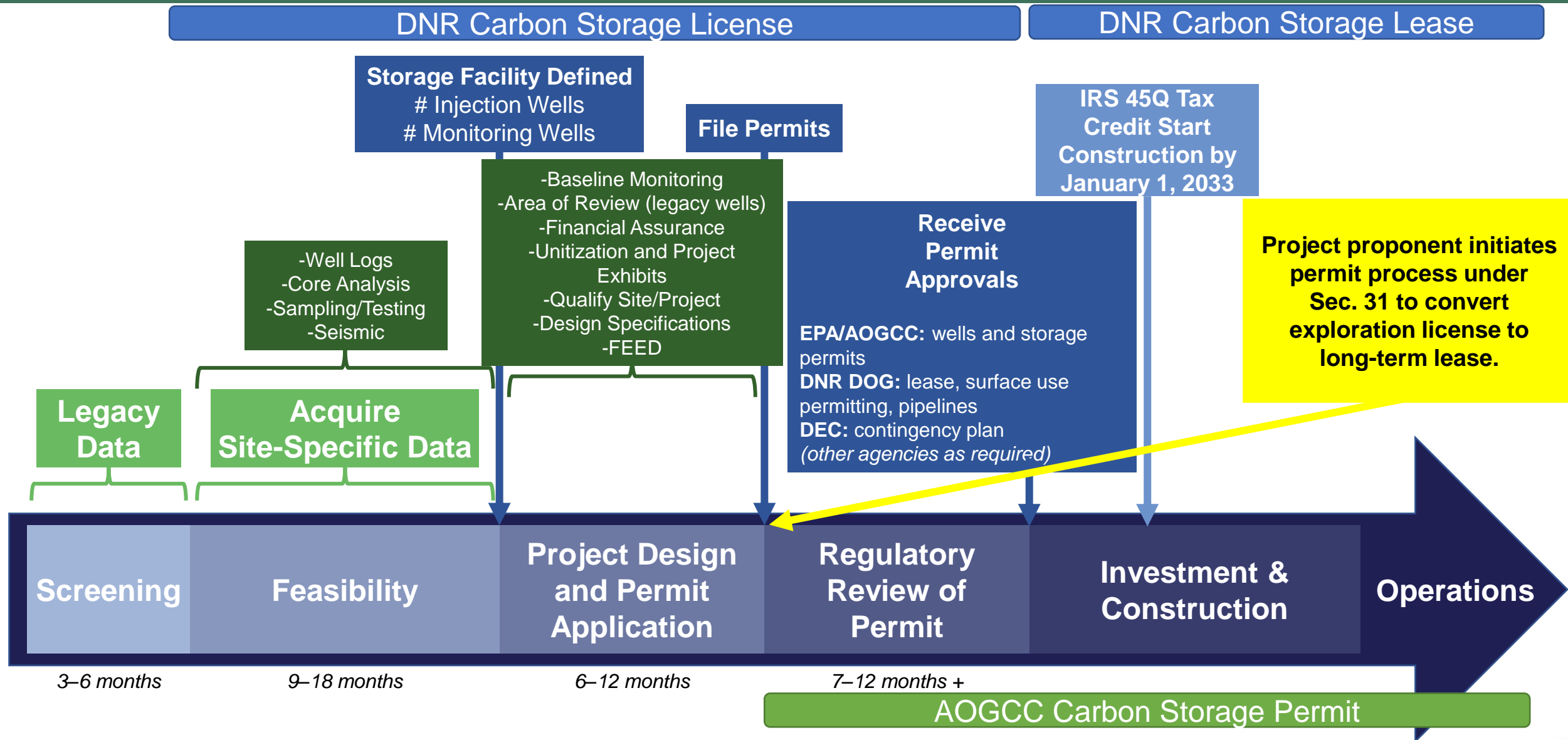
Proposed Section	Summary
AS 38.05.700	Policy statement that it is in the public interest to promote geologic storage of carbon dioxide
AS 38.05.705	Provision for applicability carbon storage statutes and authority for DNR to adopt regulations to implement these statutes.
AS 38.05.710	<p>Allows the commissioner to issue carbon storage exploration licenses on state land and establishes work commitment obligations, minimum economic terms, bonding requirements, default provisions, renewal provisions, and the escalation of minimum economic terms.</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 38.05.715	<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 38.05.720	Provision allowing conversion of an AS 38.05.715 carbon storage exploration license to a carbon storage lease.
AS 38.05.725	An oil and gas lessee converting from enhanced oil recovery to carbon storage must apply for a carbon storage lease.
AS 38.05.730	Requirements for plans of development and operations, and provision for unitization, as with oil and gas leasing.
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.
AS 38.05.795	Definitions for specific terms used in the proposed <i>Article 15A Carbon Storage Exploration Licenses; Leases</i>

SECTIONAL SUMMARY: SECS. 15–31



Section (Agency)	Summary
15 (DNR/DOG)	Amends AS 38.35.020(a) to include carbon dioxide for pipeline transportation right-of-way (ROW) leasing purposes
16 (DNR/DOG)	Amends AS 38.35.020(b) to allow the DNR commissioner to exempt pipelines from ROW leasing when transporting carbon dioxide for enhanced oil recovery or pressure support
17 (DNR/DOG)	Conforming amendment to AS 38.35.122 to bring some carbon dioxide pipelines under the same title as “product” pipelines
18–20 (DNR/DOG)	Amends AS 38.35.230 definition of “lease,” “pipeline” or “pipeline facility,” and “transportation” to include provisions for carbon dioxide
21 (DNR/DOG)	Amends AS 38.35.230 to add a definition for “carbon dioxide” cross referencing the definition used in AS 38.05.795
22–30 (AOGCC)	Conforming amendments separates AS 41.06 into two articles – one for geothermal and one for carbon storage (AS 41.06.005–060)
31 (AOGCC)	Adds new sections to AS 41.06 as Article 2. <i>Carbon Dioxide Injection and Storage</i> beginning at AS 41.06.105. Detailed summary on slide after next.

CCUS PROJECT THEORETICAL TIMELINE



SECTION DETAIL: SECTION 31 (AOGCC)



Proposed Sections	Summary
AS 41.06.105	Contains a policy statement 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; recognizes that in the event cooperation of mineral interest holders in an area cannot be obtained, regulatory procedures that enable cooperative management are required
AS 41.06.110	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 41.06.115	<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 as to 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 specifically 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 41.06.120	Provides that waste is prohibited in a carbon storage facility or reservoir

SECTION DETAIL: SECTION 31 (AOGCC)



Proposed Sections	Summary
AS 41.06.125	Provides permit requirements for storage facilities
AS 41.06.130	Creates a public hearing requirement for storage facility permits issued by AOGCC – notice is given to property owners within ½ mile
AS 41.06.135	Specifies the criteria for the AOGCC to approve a carbon storage facility permit
AS 41.06.140	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 41.06.145	Concerns amalgamation of property interests for storage facilities
AS 41.06.150	Creates specifications for recording a carbon storage facility certificate to put future property purchasers on notice
AS 41.06.155	Creates statutory requirements for AOGCC to ensure environmental protection and reservoir integrity in storage facilities and reservoirs
AS 41.06.160	Clarifies preservation of rights, including deconfliction of development of other minerals by drilling through or near a storage reservoir
AS 41.06.165	Provides authority for AOGCC to collect fees and establishes the “carbon dioxide storage facility administrative fund” under the general fund
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
AS 41.06.175	Specifies the eight factor criteria for certificate of completion a transfer of title of CO ₂

SECTION DETAIL: SECTION 31 (AOGCC)



Proposed Section	Summary
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 (<i>bill</i> Sec. 4)
AS 41.06.185	Provision for AOGCC to impose civil penalties for violations of its carbon storage statutes
AS 41.06.190	Excludes AOGCC’s carbon storage statutes from enhanced oil recovery (EOR), except for when an EOR-related reservoir is converted to a storage reservoir
AS 41.06.195	Authority for AOGCC to enter into agreements with other government entities and agencies for carbon storage purposes
AS 41.06.200	Authority for AOGCC to determine amounts for injection and storage, including EOR; provides for fees and applicability for credits and other carbon management goals
AS 41.06.210	Definitions for terms used in AOGCC’s carbon storage statutes

SECTIONAL SUMMARY: 32–39



Section (Agency)	Summary
32–35 (DNR/Parks)	<p>Conforming amendments to parks and recreational facilities laws (AS 41.21)</p> <ul style="list-style-type: none">• Wood-Tichik – excluded• Willow Creek – permitted• Kenai River Management Area – permitted• Alaska Chilkat Bald Eagle Preserve – excluded
36 (DNR/DOG)	<p>Adds new subsection AS 44.37.020(d) for DNR to administer storage facilities and stored carbon after certificate of completion is issued under proposed AS 41.06.175 (<i>bill</i> Sec. 31)</p>
37–39 (DNR/AOGCC)	<p>General provisions for authority to adopt regulations, title change for chapter AS 41.06, and effective date of the legislation</p>

QUESTIONS?



Joe Byrnes
Legislative Liaison
Department of Natural Resources
907-465-4730
Joe.Byrnes@alaska.gov