

October 13, 2026

KENAI LOOP GAS FIELD NATURAL GAS STORAGE LEASE

Preliminary Written Finding of the Director



Alaska Department of
**NATURAL
RESOURCES**
DIVISION OF OIL & GAS

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Director's Preliminary Written Finding and Decision

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I. Introduction

The Alaska Department of Natural Resources (DNR), Division of Oil and Gas (DO&G) received two applications for a natural gas storage lease under AS 38.05.180(u). A gas storage lease will dispose of an interest in state land. Under Alaska Statute (AS) 38.05.035(e), the Director of DO&G (Director) must determine, through a written finding, that a disposal of state land, resources, property, or interests will serve the best interests of the state.

ENSTAR Natural Gas Company, LLC (ENSTAR) and Hilcorp Cook Inlet, LLC (Hilcorp) each proposed to develop and operate a natural gas storage facility using the Upper Tyonek Formation, found in the Kenai Loop Gas Field (KLGF) Undefined Gas Pool. State owned lands in the KLGF were issued an oil and gas lease under ADL 391094, effective October 1, 2007.

ENSTAR's application, for a regulated gas storage facility, is centralized around the current KLGF facilities and proposes to convert existing gas production wells into gas storage service wells with plans to drill additional wells in the future to meet daily injection and withdrawal demand. The proposed project will require new compressors to achieve higher injection pressures and an expansion of the KLGF pad to allow for new injection and withdrawal facilities. ENSTAR represents it is under a contractual agreement with AIX Energy, LLC (AIX), the lessee of ADL 391094, to acquire the KLGF, subject to satisfaction of certain conditions and execution of definitive agreements in the fourth quarter of 2026.

The project purpose for Hilcorp's gas storage facility would be to store gas owned by Hilcorp, which may one day be converted to a regulated utility in the future to allow for storage of third-party gas. Hilcorp's application requests a larger area for a gas storage lease than ENSTAR's and is also inclusive of the KLGF. Hilcorp's proposal includes plans to construct a new gas storage facility, new storage wells, additional compressors, and a new pipeline. Their proposal describes securing surface and subsurface leasing and property rights and acquiring more information on the reservoir characteristics.

This preliminary finding describes for the public the facts and applicable laws relevant to the disposal and considers material issues raised during the public comment period. Specifically, the Director considered the market need for additional gas storage in Cook Inlet and balanced this against the risk of the reasonably foreseeable adverse effects of gas storage leasing. Next, the Director evaluated whether the Upper Tyonek Formation as described in the applications was suitable for gas storage purposes. Finally, the Director reviewed both applications to determine which of the two presented the most reasonable interpretation of the subsurface, offered a timely plan of development consistent with gas storage leasing, and prevented unreasonable interference with the rights and operations of the existing oil and gas lessee. For the reasons described herein, it is the preliminary finding of the Director that the disposal of the Kenai Loop Gas Storage Formation,¹ for the purposes of gas storage to ENSTAR would best serve the state's interest.

¹ For the purposes of this disposal finding, the Kenai Loop Gas Storage Formation within the Upper Tyonek Formation is described as:

“Within the Kenai Loop Gas Field, production is from two distinct intervals in the Upper Tyonek Formation between 8,600 feet and 10,500 feet true vertical depth subsea (TDVSS). The producing interval is defined as found in the Kenai Loop 1-1 (API 50133205950000) well on the gamma ray and resistivity logs at 9,692 feet measured depth (MD) and

II. Scope of Review

A. AS 38.05.035(e)

Under AS 38.05.035(e), the scope of this administrative review is limited to reasonably foreseeable, significant effects related to ENSTAR's and Hilcorp's proposed subsurface natural gas storage projects under the jurisdiction of DO&G. This review is limited to applicable statutes and regulations; material facts pertaining to the land, resources, or property, or interest in them, and issues that are material based on the statutes, regulations, and facts. Accordingly, the Director has considered generalized activities following issuance of the gas storage lease that are reasonably foreseeable and expected within the initial term of the lease. Unanticipated future uses or operations are beyond the scope of this review and will be subject to future reviews and authorizations.

B. AS 38.05.180(u)

Under AS 38.05.180(u), the Commissioner of DNR may authorize the subsurface storage of oil or gas to avoid waste or to promote conservation of natural resources. The oil or gas may be produced from state or other lands. However, storage must occur in land leased or subject to lease under AS 38.05.180. For the purposes of this evaluation the Director, under authority delegated by the Commissioner, considered the geologic, geophysical and engineering interpretations of the applicants to answer:

1. How large is the reservoir volume proposed for storage?
2. How much gas can the reservoir store and how rapidly can it be delivered?
3. What is the containment preventing stored gas from being lost?
4. How much native gas is left in the reservoir, what happens if additional native gas is found, and how are royalty owners protected?

C. Competitive Discussion

Although AS 38.05.180(u) and the associated regulations do not establish a competitive process for issuing a gas storage lease, the DO&G received two applications, ENSTAR's on May 7, 2026, and Hilcorp's on May 11, 2026. These applications both seek authorization to use the same reservoir, the Kenai Loop Gas Storage Formation of the KLGF Undefined Gas Pool, for natural gas storage. Because only one operator can feasibly develop and manage storage in a single subsurface reservoir without causing unreasonable interference, the DO&G was required to review both applications concurrently.

10,005 feet MD located in Section 33, T6N, R11W, Seward Meridian. For gas storage, the shallower zone, informally referred to as the 9,700-foot sand, and the deeper zone, informally referred to as the 10,000-foot sand, both reside in fluvial channel sandstones typical of Cook Inlet east side reservoirs. Coals, averaging 20–30 feet thick, interbed with silty sands and shales above the top and below the base of each of the two sand intervals, provide the required seals for gas containment. Net reservoir thicknesses of each sand average 44 feet for the 9,700-foot sand and 65 feet for the 10,000-foot sand. Therefore, the storage zone shall be limited to ~20 feet below a coal at 9,610 feet MD to the base of the 10,000-foot sand in Kenai Loop 1-1.”

The Director did not conduct a competitive disposal under AS 38.05.180 or 11 AAC 82. The Director instead followed the requirements of AS 38.05.035(e) to determine whether a disposal of an interest in state land is in the State's best interest based on material facts, reasonably foreseeable effects, and statutory criteria. The presence of overlapping applications necessitated a comparative evaluation only to the extent required to determine whether a gas storage lease in the KLGF is in the State's best interest and if so, which of the overlapping proposals would best meet the State's needs while complying with statutory constraints, including unreasonable interference with the existing oil and gas lessee under 11 AAC 83.505(3).

To make this determination, the DO&G evaluated each application against the criteria applied throughout this finding, including: understanding of the reservoir, containment, and subsurface resource; technical feasibility of safe, reliable gas storage operations; timelines for development; potential interference with existing lessee rights; and the ability of the applicant to meet the current and foreseeable regional need for storage capacity and deliverability.

This evaluation did not feature competitive bidding, nor was it a preference right or ranking exercise. It is a structured application of the best interest standard through the articulated criteria applied to two proposals that could not be simultaneously authorized within the same gas storage reservoir.

D. Best Interest Finding Process and Comments

The public process for this project initiated on June 5, 2026, with a 30-day public comment period on the gas storage lease applications.² The public notice was posted on the Alaska Online Public Notice system and published in the Anchorage Daily News and the Peninsula Clarion newspapers. Notices were circulated to the interested parties and other regulatory agencies with jurisdiction over oil and gas and development projects.

The notice and the applications were also posted on the DO&G website's Newsroom under Public Notices. The comment period closed July 7, 2026. The Department carefully considered all comments received.

The ENSTAR and Hilcorp applications received comments from the Alaska Department of Fish and Game (ADF&G), Division of Habitat during the comment period. Below is a summary of the submitted comments that were received during the comment period.

- Access to and along easements should be maintained throughout the project in accordance with AS 38.05.126 and AS 38.05.127, impacts to the area near the Kenai River should be limited with regard to personal use and sport fishing access.
- The area is used by migrating caribou from the Lowlands herd, active moose hunting occurs in this area, and registered bear bait sites also exist in the vicinity of this lease.

² Hilcorp's application published on the Alaska Online Public Notice System:
<https://aws.state.ak.us/OnlinePublicNotices/Notices/View.aspx?id=224117>

ENSTAR's application published on the Alaska Online Public Notice System:
<https://aws.state.ak.us/OnlinePublicNotices/Notices/View.aspx?id=224116>

Depending on proposed activities associated with the lease, mitigation measures to limit impacts to wildlife populations and users may be recommended.

- Work associated with gas storage leases impacting fish-bearing waterbodies may require a Fish Habitat permit from ADF&G Habitat Section.

The Director has addressed ADFG's comments on wildlife in Section G of this decision. Other comments on access and permitting are included in Chapters Seven (Governmental Powers to Regulate Oil and Gas) and Nine (Mitigation Measures) of the 2018 Cook Inlet Final Written Finding of the Director (Cook Inlet Final Finding³), which identify roles and responsibilities of agencies involved in review and permitting of oil gas activities and protections of other resources project area. Throughout this finding, portions of the Cook Inlet Final Written Finding of the Director are incorporated by reference because the Cook Inlet Final Finding establishes a substantial body of existing regional analysis that remains relevant to the Director's consideration of gas storage activities. The Cook Inlet Final Finding provides a comprehensive analysis of the physical, environmental, economic, social, and other factors relevant to the state's management and development of oil and gas resources within the Cook Inlet region. The geographic area considered in the Cook Inlet Final Finding encompasses the region in which this KLGF is located and provides an established framework for evaluating the compatibility of oil and gas related activities with the State's interests in the Cook Inlet area. Nothing in this adoption by reference is intended to predetermine the outcome of the DO&G's consideration of the gas storage applications. Where the impacts do differ, this finding will note the distinction.

The Hilcorp application received a comment submitted by ENSTAR during the comment period. Below is a summary of those comments.

- Expressed concerns about consolidation of control of the natural gas resource in Cook Inlet;
- Reservations over the large acreage footprint of the Hilcorp application;
- Concerns that Hilcorp's project does not address ENSTAR's objective in securing additional storage for new gas volumes;
- Environmental surface impacts; and
- Concerns about the development timeline.

The Director considered ENSTAR's comments in drafting this written finding, and DNR considers the factors stated in ENSTAR's comments in any disposal of oil and gas interest. The comments are addressed throughout this written finding, specifically in Sections V, VII, and IX.

³ 2018 Cook Inlet Final Written Finding published at:
<https://dog.dnr.alaska.gov/Document/Download/EB194450E6C74997B98755ED66766870/Cook%20Inlet%20Areawide%20Oil%20and%20Gas%20Lease%20Sale%20Final%20Finding%20of%20the%20Director.pdf>

III. Legal Description, Location, and Geographical Features

A. Kenai Loop Gas Field (existing field)

The Kenai Loop Gas Field (KLGf) is located within the City of Kenai, east of the Kenai Municipal Airport and North of the Kenai Spur Highway, and specifically described as follows:

- T6N, R11W, Seward Meridian, Alaska:
 - Section 28: S1/2SW1/4
 - Section 32: E1/2NE1/4
 - Section 33: N1/2, E1/2W1/4, NW1/4SW1/4, W1/2SE1/4
- Municipality: City of Kenai
- Native Corporation/Federally Recognized Tribes: Cook Inlet Regional Incorporated (CIRI);
- Alaska geographical features: River outwash plain;
- Area Plan: Kenai, Region 5
- Access: By road within City of Kenai

The KGLF encompasses acreage that contains mineral estate owned by the State of Alaska, Mental Health Trust, and Cook Inlet Region, Inc.

The estimated state-owned mineral estate is approximately 147.50 acres.

B. ENSTAR Project Area

The ENSTAR Project Area is located within the City of Kenai, east of the Kenai Municipal Airport and north of the Kenai Spur Highway, and specifically described as follows:

- T6N, R11W, Seward Meridian, Alaska;
 - Section 27: W1/2NW1/4, SW1/4
 - Section 28: E1/2, NE1/4NW1/4, S1/2NW1/4, SW1/4
 - Section 29: SE1/4NE1/4, E1/2SE1/4, SW1/4SE1/4
 - Section 32: E1/2
 - Section 33: All
 - Section 34: N1/2NW1/4, SW1/4NW1/4, NW1/4SW1/4
- Municipality: City of Kenai
- Native Corporation/Federally Recognized Tribes: Cook Inlet Regional Incorporated (CIRI);
- Alaska geographical features: River outwash plain;
- Area Plan: Kenai, Region 5
- Access: By road within City of Kenai

The ENSTAR Project Area encompasses acreage that contains mineral estate owned by the State of Alaska, the Mental Health Trust, and Cook Inlet Region, Inc.

The estimated state-owned mineral estate is approximately 500.00 acres.

C. Hilcorp Project Area

The Hilcorp Project Area is located within the City of Kenai, east of the Kenai Municipal Airport and north of the Kenai River, and specifically described as follows:

- T5N, R11W, Seward Meridian, Alaska
 - Sections 3 through 6: All
- T6N, R11W, Seward Meridian, Alaska
 - Sections 19 through 22: All
 - Sections 27 through 34: All
- Municipality: City of Kenai
- Native Corporation/Federally Recognized Tribes: Cook Inlet Regional Incorporated (CIRI);
- Alaska geographical features: River outwash plain;
- Area Plan: Kenai, Region 5
- Access: By road within City of Kenai

The Hilcorp Project Area encompasses acreage that contains mineral estate owned by the State of Alaska, the Mental Health Trust, Cook Inlet Region, Inc., the City of Kenai, and private ownership.

The estimated state-owned mineral estate is approximately 1,330.00 acres.

IV. Pore Space Ownership

On August 25, 1986, the Bureau of Land Management (BLM) conveyed the federal government's oil and gas mineral estate lying beneath the Kenai Airport to the State of Alaska via Patent No. 50-86-0386. Subsequently, effective October 1, 2007, the Department of Natural Resources issued oil and gas lease ADL 391094, comprising 1,048.640 acres within portions of Sections 13, 32, and 33 of T. 6 N., R. 11 W., S.M., to the predecessors of current lessee, AIX. Portions of ADL 391094 lie beneath the surface of the Kenai Airport, owned by the City of Kenai. Attachment 1 depicts ADL 391094, ADL 394695, and the generalized boundary of the proposed project areas.

AS 38.05.180(u) expressly authorizes the subsurface storage of oil or gas, whether or not produced from State-owned land, in land leased or subject to a State-issued oil and gas lease. In such circumstances, the Alaska legislature requires the underlying oil and gas lease to be extended "at least for the period of storage and so long thereafter as oil or gas not previously produced is produced in paying quantities." This statutory requirement has been incorporated into proposed ADL 394695 and this preliminary decision.

Alaska's gas storage statute is analogous to the federal Mineral Leasing Act, 30 U.S.C. § 226(m), which provides:

The Secretary of the Interior, to avoid waste or to promote conservation of natural resources, may authorize the subsurface storage of oil or gas, whether or not produced from federally owned lands, in lands leased or subject to lease under this chapter. Such authorization may provide for the payment of a storage fee or rental on such stored oil or gas or, in lieu of such fee or rental, for a royalty other than that prescribed in the lease when such stored oil or gas is produced in conjunction with oil or gas not previously produced. Any lease on which storage is so authorized shall be extended at least for the period of

storage and so long thereafter as oil or gas not previously produced is produced in paying quantities.

The BLM has previously exercised its authority under 30 U.S.C. § 226(m) to authorize gas storage within oil and gas leases located in the Swanson River Unit. Likewise, the DO&G is aware that similar gas storage leasing is now contemplated within oil and gas leases associated with the federally administered Beluga River Unit. The Director further notes that had Patent No. 50-86-0386 not been issued to the State of Alaska (or had Alaska not become a state), BLM would have continued to hold the exclusive authority to issue gas storage leases beneath the Kenai Airport within the United States' reserved oil and gas estate under 30 U.S.C.A § 226(m). However, through Patent No. 50-86-0386, the State of Alaska became the sole owner of the oil and gas estate, now reflected in the leasehold associated with ADL 391094, which exists at all depths below the surface beneath portions of the Kenai Airport. Thus, the State of Alaska holds all rights to gas storage that its predecessor, the United States, previously held in lands associated with Patent No. 50-86-0386. Such rights are exclusive to the State of Alaska.

V. Interaction with the Existing Oil and Gas Lease

The Department's regulation, 11 AAC 83.505, provides that a storage lease issued under AS 38.05.180(u):

- (1) does not give the storage lessee any right to drill for, develop, produce, extract, remove, or market oil, gas or other natural resources in and from the land covered by the storage lease other than oil or gas or both in an amount not greater than the amount of oil or gas both introduced into that land for storage;
- (2) does not prohibit the state from issuing oil and gas leases to others covering all or portions of the land covered by the storage lease;
- (3) must contain conditions that will prevent unnecessary or unreasonable interference with the rights and operations under any oil and gas lease, including conditions prohibiting the storage of oil or gas in any reservoir capable of producing oil or gas in paying quantities without the consent of the holder of any oil and gas lease covering the reservoir;
- (4) must contain a damage provision as stated in [11 AAC 83.160] and the reservations provided for in [11 AAC 83.155];
- (5) must provide for a storage fee or rental on stored oil or gas or both, as determined by the commissioner;
- (6) must specify its terms; and
- (7) must contain any other provision that the commissioner considers reasonable and necessary to protect the interests of Alaska.

The Director is hereby exercising her statutory authority under AS 38.05.180(u) to authorize the storage of natural gas within the State of Alaska's existing oil and gas leasehold of ADL 391094, and this preliminary decision and accompanying proposed lease are compliant with all elements

required under regulation 11 AAC 83.505. During the life of gas storage operations, ADL 391094 will remain active, authorizing the lessee to produce remaining native gas in conjunction with imported gas authorized under the gas storage lease, ADL 394695.

Per AS 38.05.180(u), “[g]as withdrawn from a gas storage facility regulated under AS 42.05 is considered to be non-native gas and is not considered to be produced and subject to royalty until all non-native gas injected into the gas storage facility has been withdrawn from the gas storage facility.” This statutory requirement is reflected in the proposed commercial terms associated with ADL 394695.

In sum, the Director finds: (1) the KLGF is not expected to be completely depleted of native natural gas—a condition acknowledged by both gas storage applicants—but instead retains a residual volume of native gas consistent with a high level of resource recovered. This remaining native gas is estimated at about 3.9 billion cubic feet (Bcf) based on ENSTAR’s analysis and 6.4 Bcf based on Hilcorp’s analysis, reflecting substantial but not total depletion of the reservoir; (2) KLGF’s significantly depleted reservoirs will be used as the vessel for storage of injected natural gas, whether sourced from other fields in Alaska or from imported liquified natural gas (LNG); (3) pressure from existing native gas will promote and facilitate non-native gas storage and re-production; (4) the KLGF’s significantly depleted gas reservoirs have considerable utility that will extend the economic life of the existing oil and gas lease, ADL 391094; and (5) issuance of a gas storage lease coincident with ADL 391094 will introduce new sources of revenue to the State of Alaska through receipt of rents associated with gas storage operations.

ENSTAR’s application presented an agreement with AIX, the lessee of ADL 391094, to acquire its interest in the Kenai Loop Gas Storage Formation, for the purposes of gas storage. Hilcorp’s application did not include any such agreement with AIX. Therefore, the Director finds only ENSTAR’s application has included evidence to meet the requirement of 11 AAC 83.505(3).

VI. Surface Use

The City of Kenai is an important stakeholder in any future natural gas storage operations occurring beneath portions of the Kenai Airport. As the exclusive surface owner, the City of Kenai has every right to negotiate reasonable commercial arrangements with the operator of the State’s natural gas storage lease to ensure that the City of Kenai is adequately compensated for reasonable use of municipal property. To that end, ENSTAR is directed to negotiate a comprehensive surface use agreement with the City of Kenai consistent with their municipal authorities and obligations. ENSTAR is further reminded of its statutory obligation under AS 38.05.130 to pay surface owners for any damages stemming from operations under a lease issued by the DNR. Absent evidence that satisfactory surface-use arrangements have been made by ENSTAR with the City of Kenai, the Director hereby reserves the right to impose additional bonding requirements on ENSTAR to sufficiently protect all adjacent surface owners, including the City of Kenai. AS 38.05.130; 11 AAC 82.600; 11 AAC 83.155.

VII. Environmental Considerations

A. Habitat, Fish, and Wildlife Resources and Their Uses

The Cook Inlet area includes a wide variety of habitats and a broad diversity of fish and wildlife that support a host of economic, recreational, and subsistence activities for residents and visitors. Most of the area's habitats and populations of fish and wildlife are healthy because of careful management and regulatory mechanisms in place for development. A few populations have been identified as threatened or endangered under the federal Endangered Species Act or as species of special concern by ADF&G. Cook Inlet includes areas established by state or federal law to protect and preserve natural habitat and wildlife populations and to maintain public use of these resources. Many of the special areas have legislatively defined restrictions on development activities. The Cook Inlet Final Finding discusses the habitat, fish, and wildlife resources of the region in Chapter Four. Those findings are incorporated here by reference, with some project specific detail provided below.

- **Fish and Fish Bearing Streams:** Overwintering juvenile salmon are expected in Processor Creek, a tributary of the Kenai River. ADF&G identifies this stream as rearing habitat for coho and sockeye salmon. No project activities will take place within this stream or on its banks. Vehicles and equipment will not be fueled, stored, or serviced within 100 feet of any water body. This project is not expected to have any effects on this stream.
- **Waterfowl and Cranes:** Trumpeter swans may nest in the Kenai Flats at the mouth of the Kenai River. The proposed project is outside any key nesting area and more than one mile outside the required 0.25-mile buffer area immediately surrounding the Kenai Flats. However, ENSTAR will consult with U.S. Fish and Wildlife Service regarding species of concern in the area. Sandhill cranes may migrate through the area, but the project sites are not optimal nesting habitat.
- **Bald Eagles:** Bald eagles are common in the project area. There are two known active eagle's nests approximately 2 miles southeast of the proposed project area near the intersection of Beaver Loop Road and Barbara Drive and are subject to a high level of human activity. This project is not expected to have any effects on these nests.
- **Migratory Birds:** In Alaska, all native birds, except the grouse and ptarmigan (which are protected by the State of Alaska), are protected under the Migratory Bird Treaty Act. The general nesting season is May 1 through July 15 for the Kenai area. If vegetation clearing or earthwork must occur during the nesting season, breeding bird surveys will be conducted before work is initiated. If an active nest is encountered at any time during vegetation clearing, it will be left in place and protected until young hatch and depart.
- **Caribou:** Caribou in the vicinity are part of the Kenai Lowlands caribou herd. The herd is relatively small, consisting of 100 to 150 individuals. Caribou forage on the Kenai Flats and may move through the area. However, disturbance to these animals from the proposed action is expected to be low since they are more likely to use other areas for summer foraging and have been documented to prefer other locations north of the project area for calving. Disturbance to these animals from the proposed action is

expected to be low since they are more likely to use other areas as this proposed project is expected to be situated on an existing active gravel pad. Any future development beyond the existing infrastructure would be evaluated through permitting processes.

- **Beluga Whales:** The project would not occur in beluga habitat; all project elements are onshore, approximately 1 mile from mean high water of the Kenai River.
- **Bears:** Black and brown bears have been observed in the City of Kenai, but sightings are uncommon. There is some potential that bears may occur in the vicinity of the project area, particularly during the summer and fall, where they might be found along streams feeding on spawning salmon. This project would have no significant impact on bears, as the affected area does not provide critical habitat for bears.
- **Moose:** Moose are common throughout the City of Kenai and regularly browse, mate and rear young near the project area. However, disturbance to these animals from the proposed action is expected to be low since they are more likely to use other areas for summer foraging as this proposed project is expected to be situated on an existing active gravel pad. Any future development beyond the existing infrastructure would be evaluated through permitting processes.

B. Reasonably Foreseeable Effects

Gas storage activities that may have cumulative effects on the area's habitats and fish and wildlife populations include seismic surveys, construction of gravel pads and support facilities, and drilling activities. Residual effects may include a slight increase in human and vehicular traffic in the operations area. Mitigation measures included in Chapter Nine of the Cook Inlet Final Finding, which ADL 394695 would be subject to, along with regulations imposed by other state, federal, and local agencies, are expected to avoid, minimize, and mitigate those potential effects. For an in-depth discussion of the reasonably foreseeable effects of oil or gas activity, refer to Chapter 8 of the Cook Inlet Final Finding.

- **Well Drilling:** During the drilling of the potential five boreholes for the injector wells, two types of waste will be created: drilling mud and cuttings. Drilling mud is primarily used to maintain well control, remove cuttings, cool, and lubricate the drill bit as it cuts through the ground, and cuttings are the sediments produced by the drill as it cuts through the earth. Drilling mud will be disposed of in accordance with Alaska Department of Environmental Conservation (DEC) and Alaska Oil and Gas Conservation Commission (AOGCC) standards and regulations.
- **Trash and Human Waste:** Trash and human waste could be generated during construction and operations. However, during well pad operations, there will be very little human presence on site and thus the likelihood of trash and human waste is expected to be minimal. No long-term storage of waste will be authorized. Any waste found or created on site is to be immediately removed.
- **Produced Water:** Produced water is naturally occurring salt water that is brought to the surface when natural gas is extracted from an underground reservoir. Improperly disposed of produced water may be hazardous to fish, wildlife, and habitats. Produced

water will be disposed of in accordance with DEC and AOGCC standards and regulations.

- Sound: Sound from this project could disturb wildlife and humans in the vicinity of the project site. The greatest potential for effects from noise will be during construction, especially during drilling of the injection wells.
- Light: Light from this project could disturb wildlife and humans in the vicinity of the project site. Lighting for the site will be set up for both security and operational purposes.

VIII. Socioeconomic Justification

A. Historic Gas Storage Use in Cook Inlet

Over the past 60 years, extensive exploration and development in the Cook Inlet area have resulted in it becoming a mature petroleum-producing basin. The area continues to be of interest to the petroleum industry, but the largest fields are fully mature and few new ones have been discovered recently. The AOGCC reports that annual gas production in the Cook Inlet Basin peaked at 196 Bcf in 2006. The Cook Inlet Basin previously exported natural gas until 2015. Since 2015, gas produced from the Cook Inlet Basin is used for in State demand which today is roughly 70 Bcf.⁴

As the Basin has matured, production rates have decreased, and over the last several years the available annual supply roughly met the annual demand. However, demand is seasonal, with lower demand during the summer and the highest demand during winter, when gas is used for heating. Because of underlying geologic conditions and established engineering practices for responsible reservoir management, production levels are generally maintained at a relatively steady rate year-round. A solution to meet the seasonal fluctuations in demand is to store underutilized gas produced during the summer in the ground for withdrawal during winter months when demand outpaces existing production. Subsurface gas storage has been used in this manner for decades in Cook Inlet to great success.

Natural gas storage facilities work by taking pipeline gas and compressing it to inject into wells underground. There, the gas is contained in the subsurface reservoir pore space until the demand for gas exceeds what is available from existing producing fields, and the system is put into reverse, and the gas is removed from the underground storage reservoir. The gas is treated again for any naturally occurring contamination (like produced water) and is returned to the pipeline delivery system for consumer usage. The most common type of natural gas storage utilizes depleted natural gas reservoirs where the majority of natural gas has already been removed. This makes them ideal storage containers as they are geologically proven to be capable of holding known quantities of natural gas and are typically located near the existing pipeline infrastructure that can be repurposed for gas storage utility.

⁴ Waston, B. 2026. Demand for Natural Gas in Southcentral Alaska. Edited by ISER. 21 p. ISER 1851. Anchorage, AK. https://scholarworks.alaska.edu/cgi/viewcontent.cgi?article=3086&context=uaa_iser_reports (Accessed September 10, 2026).

Existing regulated gas storage utilities in the Cook Inlet area include the Kenai Gas Field Sterling Pool 6, operated by Hilcorp Alaska Gas Storage, LLC, and the Cannery Loop-Sterling C Gas Pool, operated by Cook Inlet Natural Gas Storage Alaska (CINGSA), who shares parent company TriSummit Utilities with ENSTAR. These facilities are permitted for approximately 38 and 13 Bcf of gas storage capacity, respectively, and have a combined delivery rate of about 345 million cubic feet of gas per day. Regulated gas storage facilities provide for third party use of storage space in the reservoir, with rates for storage services under the review of the Regulatory Commission of Alaska (RCA). Pretty Creek and Swanson River Units include reservoirs approved for non-RCA regulated gas storage, where the existing oil and gas lessee, Hilcorp, maintains exclusive use of the storage space. Hilcorp also has a pending application before the DO&G for a gas storage lease at the Beluga River Unit.

Although Cook Inlet's existing storage facilities have historically provided reliable peak season deliverability, recent operational events demonstrate the importance of maintaining redundant and diverse storage capacity. On February 6, 2024, ENSTAR testified to the State of Alaska House Energy Committee that on January 14, 2024, the CINGSA facility experienced a significant well sanding incident that temporarily reduced the withdrawal capacity during a period of elevated demand. It was further noted that system reliability was preserved only because alternative supplies and storage resources were available to offset the reduced performance at CINGSA.⁵ This event underscores that reliance on a single major storage facility poses a material risk to system stability. Establishing additional storage reservoirs provides redundancy, reduces the consequences of equipment or well failures, and enhances the overall resilience of the gas supply network.

B. Long-Term Contracts

Long-term gas supply contracts between Cook Inlet producers and Southcentral Alaska utilities require producers to meet fixed annual and seasonal deliverability obligations. As Cook Inlet production has matured and production declined, producers increasingly rely on underground gas storage to accumulate gas during the summer months in order to satisfy future contractual commitments. DNR presented its Cook Inlet Gas Forecast to the Alaska Legislative Joint Resources Committee on August 20, 2026. It showed that annual production is projected to fall below regional demand beginning in the early 2030s. This forecast requires both new gas development and the use of stored gas to meet utility needs through approximately 2033. Under these conditions, and absent other energy solutions, producers must store gas produced today to ensure that sufficient volumes are available to meet multi-year contractual obligations during projected supply deficits.⁶

This was further described on September 10, 2026, when Hilcorp testified in front of the Joint Resources Committee, that it had approximately 30 Bcf of gas stored in Kenai Pool 6 and nearly all of it was committed to ENSTAR for later delivery. Hilcorp also went on to say that releasing this stored gas earlier would require contract changes because doing so would impair Hilcorp's ability to make the same volume available in the future. These statements indicate that storage is being

⁵ A recording of the Alaska House Energy Committee hearing on February 6, 2024:
<https://www.akleg.gov/basis/Meeting/Detail?Meeting=HENE%202024-02-06%2011:00:00>

⁶ A recording of the August 20, 2026, hearing can be found at this website:
<https://www.akleg.gov/basis/Meeting/Detail?Meeting=SRES%202026-08-20%2014:00:00>

used not solely to meet this upcoming winter's peak deliverability, but to fulfill obligations extending into future contract years.⁷

Accordingly, underground gas storage has become an essential instrument for maintaining the reliability of long-term gas contracts. More storage capacity improves the ability of both producers and utilities to meet contractually required deliverability in future years and supports overall system reliability as Cook Inlet production continues to decline.

C. Gas Storage's Relation to LNG Imports and AKLNG

Multiple entities are evaluating LNG import projects to bridge energy needs as long-term solutions are developed. This finding does not include detailed analysis of these projects, but references them to acknowledge that all could potentially use or require additional natural gas storage facilities to manage energy supply and security requirements for Alaska consumers. Similarly, AKLNG, as a long-term energy solution for the Railbelt, could potentially benefit from storage availability from a redundancy and commodity management perspective.

Regarding LNG imports, Cook Inlet LNG, LLC is advancing an offshore LNG import project utilizing a Floating Storage and Regasification Unit with initial deliveries identified for mid-2029.⁸ Because LNG is delivered in cargoes rather than continuous flow, adequate underground storage is necessary to manage delivery timing and to provide the high-rate winter deliverability required by utilities. Similarly, Harvest Midstream is progressing operations to repurpose the existing Kenai LNG facility for LNG imports as early as 2029.⁹ Again, this project will likely depend on regional storage to balance cargo scheduling with seasonal demand profiles. ENSTAR has also identified that initial development of facilities associated with a phased Alaska LNG project could be utilized for import and later transitioned to export facilities.

The AKLNG pipeline aims to deliver North Slope gas to the Kenai Peninsula.¹⁰ Although AKLNG will provide a continuous supply of natural gas, the seasonal variations in utility demand will require underground storage to support system reliability and ensure winter deliverability. While these public project descriptions do not explicitly identify underground storage as a required component of LNG import or AKLNG operations, their delivery profiles, combined with DNR's Cook Inlet production forecast, show that storage would help ensure dependable supply under these scenarios.

⁷A recording of the September 10, 2026, hearing can be found at this website: <https://www.akleg.gov/basis/Meeting/Detail?Meeting=SRES%202026-09-10%2013:00:00>.

⁸ Federal Energy Regulatory Commission's (FERC) document library shows an approval of Cook Inlet LNG's pre-filing request dated June 17, 2026. The document number is PF Approval_PF26-11.pdf.

⁹ FERC authorization for Trans-Foreland Pipeline Company LLC, a subsidiary of Harvest Midstream, to construct the Kenai LNG export terminal: <https://www.ferc.gov/sites/default/files/2020-12/C-3-121720.pdf>.

¹⁰ Permitting dashboard for Federal Infrastructure Projects showing approval of the AKLNG project: <https://www.permits.performance.gov/permitting-project/fast-41-covered-projects/alaska-lng-project>.

IX. Geological and Engineering Characteristics and Project Scope

Although neither statute nor regulation prescribes a specific methodology for evaluating applications for gas storage leases, the DO&G used its technical and subject matter expertise and employed a matrix as an internal technical tool to ensure each application was assessed consistently and in accordance with the best interest standard under AS 38.05.035(e) and the requirements of AS 38.05.180(u). The matrix does not constitute a competitive scoring system; rather it provides a structured framework for evaluating the geologic and engineering sufficiency of each proposal. Each application received by the DO&G for gas storage leases in the Kenai Loop Gas Storage Formation was evaluated against this matrix to address four questions:

1. How large is the reservoir volume proposed for storage?
2. How much gas can the reservoir store and how rapidly can it be delivered?
3. What is the containment preventing stored gas from being lost?
4. How much native gas is left in the reservoir, what happens if additional native gas is found, and how are royalty owners protected?

More than 30 specific items were examined for each application to ensure that the Director understood the potential operator's assessment of the storage resource and ensure that the potential operators had the information required to best serve the needs of the State and its people.

Additionally, the surface facilities work proposed in each application was evaluated for surface facilities design and storage gas deliverability.

A. Data Submission

The applicants were asked to provide specific data, information and interpretations to support the matrix described above.

1. ENSTAR

ENSTAR provided significant digital and analog information that addressed the four questions above, including information directly showing the area, thickness, pay maps, hydrocarbon storage volume (HCSV), existing and planned wells, example seismic and well-log cross-sections, all subsurface pressure data, and other data and information that characterize the subsurface resource. Some desired data and information were missing from ENSTAR's initial submission, however, they supplied the additional information in a timely manner.

In addition, ENSTAR provided detailed information on their dynamic reservoir model used to model storage reservoir pressure during injection and withdrawal showing that the reservoir could supply stored gas to Railbelt customers without being lost in or outside the reservoir. Combined with a data-rich P/z plot, the amount of remaining gas in the reservoir could be calculated with confidence at 3.90 Bcf.

ENSTAR met with DO&G staff for two technical meetings on August 25, 2026, and September 23, 2026. These technical meetings included assessments of the data and information and their

interpretation of them. ENSTAR's representatives answered questions and explained their interpretations in detail. The data provided by ENSTAR informed the allocation of storage pore space amongst the various pore space owners.

2. Hilcorp

In their initial application, Hilcorp did not provide the necessary information to assess the storage resource size and containment of stored gas. A request by the DO&G for additional data and information did not elicit the missing items.

Specifically, Hilcorp did not provide a map of the storage area showing trapping geometries in either their interpreted depth structure map or isochore map. In addition, they only provided analog information, not the requested digital grids. Hilcorp did provide a net pay map showing additional gas resources extending off to the north-east, which suggested a lack of storage closure. Analysis of these maps suggests that publicly available data, and specifically the Kenai Loop 3D dataset, was not used to interpret data in sections 27 and 28 of the proposed lease area.¹¹ Hilcorp did not show a gas-down-to or reservoir zero-edge truncation to contain injected storage gas in any of their provided maps.

Hilcorp met with the DO&G for a technical meeting on September 3, 2026. During the technical meeting Hilcorp shared that they did not have a solid understanding of the reservoir geometry and that they had significant uncertainty where the reservoir was and its extent. This was further confirmed by Hilcorp's application stating that it proposed an exploration and feasibility model to drill and test wells in an initial period to confirm the reservoir was suitable for storage. Based on the maps and other information provided, it appears Hilcorp did not use all publicly available data to support their application.

During the technical meeting, Hilcorp estimated that 6.4 Bcf of native gas remains in the reservoir, significantly higher than ENSTAR's estimate of 3.9 Bcf. Hilcorp's interpretation relied on fewer *P/z* data points, which contributed to its higher estimate. Based on the more comprehensive dataset provided by ENSTAR, along with DO&G's own technical analysis, the Director concludes that ENSTAR's estimate is the more reliable representation of remaining native gas.

Hilcorp also stated an intention to produce all remaining working gas before converting the field to storage. Production of native gas is not authorized under AS 38.05.180(u) or 11 AAC 83.505; any additional production would require an oil and gas lease. Native gas within the reservoir serves as part of the necessary cushion gas for storage operations, and it was unclear how Hilcorp's plan to produce the remaining native gas supported their application for gas storage or worked within their timeline to begin commercial operation by the end of 2028. This uncertainty further informed the Director's evaluation of the proposal.

¹¹ Available from the State of Alaska Geologic Material Center at <https://dggs.alaska.gov/gmc/seismic-order.html>.

B. Geologic and Engineering Evaluation

1. ENSTAR

ENSTAR provided all requested information, except for data that had never been acquired.¹² In addition, ENSTAR provided results of a dynamic reservoir model showing injectability and production rates supporting the delivery of stored gas to Railbelt customers.

The data and information provided by ENSTAR were complete, well organized, and more than sufficient to assess the matrix of four questions. ENSTAR met twice with the Division, with the second time focused on detailed questions surrounding the production history match of their dynamic model.

2. Hilcorp

Hilcorp provided about one quarter of the requested data and information, did not appear to use all publicly available data, did not provide maps showing trapping or pinch-out geometries, did not present a dynamic model, did not provide digital HCSV grids to allocate storage pore space amongst the owners, and expressed significant uncertainties on the size, shape and extent of the storage reservoir.

The data and information provided by Hilcorp were incomplete and did not answer the matrix of four questions.

C. Required Engineering and Facility Work

1. ENSTAR

ENSTAR's proposal seeks to reuse the existing AIX KLGF infrastructure and expand the pad to the west toward Marathon Road to house compressor and auxiliary buildings as well as office and meeting spaces and a warehouse structure. The initial plan would re-use three of the existing wells for storage operations, albeit with larger tubing sizes to enable higher flow rates. The wells are currently completed with 2-7/8" tubing from surface and would be worked over and re-completed with 4-1/2" x 2-7/8" tubing. The proposed project would require new compressors to achieve higher injection pressures. ENSTAR proposes operating the field up to the discovery pressure of 5,395 pounds per square inch (psi). A future Phase 2 could see up to six additional wells being drilled to increase injection and production capabilities if needed. The Phase 2 wells would be completed with 4-1/2" tubing completions with 7" cemented liners. The initial proposed facility is designed so additional compression, separation, dehydration, and measurement could be accommodated.

Under a fully developed nine well scenario, ENSTAR plans to have peak withdrawal and injection capacity of 150 million standard cubic feet per day (MMscf/D). During the initial three-well scenario, those rates would be scaled down to roughly 30%. In either case, the total working gas volume would be about 20.5 Bcf and the cushion gas volumes would be approximately 8 Bcf.

¹² This includes items like 4D seismic, seal capillary pressure studies, etc.

ENSTAR also represented it has the necessary contractual alignment in place with AIX to use the facilities as described in the application.

2. Hilcorp

Hilcorp's plans call for the potential development of a new approximately 3.75-acre pad leased from the City of Kenai or private owners to the north of the current AIX surface infrastructure. The initial proposal includes plans to drill four new, grassroots wells completed with 7" casing and 4.5" tubing as well as associated surface equipment such as separators, injection and production compressors, dehydrators, and other auxiliary equipment. If a commercial agreement could be reached with AIX, Hilcorp would further consider utilization of two of the current Kenai Loop production wells for storage operations, however, the use of these wells is not necessary to move forward with the project. All wells not covered by a commercial or transfer agreement would have to be abandoned by AIX upon termination of the oil and gas lease.¹³

Hilcorp's proposal calls for drilling to commence in the second half of 2027 with surface facility construction to commence before 2028, and the facility being ready for commercial operation by late 2028. In their initial application, Hilcorp stated that under a four well scenario, a working gas volume would be about 28 to 33 Bcf with a maximum withdrawal rate of 20 to 30 MMscf/D. The maximum operating pressure would be 3,000 psi. In the subsequent technical meeting on September 3, 2026, Hilcorp presented working volumes under this initial scenario that were significantly reduced, with the maximum operating pressure slightly reduced. The application was not amended to reflect these changes.

D. Conclusion

Based on the DO&G's evaluation matrix and the information submitted, ENSTAR's application demonstrated a comprehensive and well-supported understanding of the reservoir and its suitability for gas storage. ENSTAR provided the requested data, supplemented it promptly when needed, and supplied detailed geologic, engineering, and dynamic modelling analyses that allowed the DO&G to assess storage capacity, containment, and deliverability. In contrast, Hilcorp's application lacked the required information, did not appear to incorporate all publicly available data, and reflected significant uncertainties about the reservoir's geometry, extent, and ability to contain stored gas. As a result, Hilcorp's application was considered to be insufficient, and ENSTAR's application more clearly met the best interest requirements of AS 38.05.035(e) and AS 38.05.180(u).

X. Commercial Terms

AS 38.05.180(u) does not establish a competitive process for gas storage leasing and does not require the DO&G to evaluate or rank commercial proposals; however, ENSTAR and Hilcorp both

¹³ The Division is unaware of any commercial negotiations between Hilcorp and AIX. AIX maintains that it is under a confidential contractual agreement with ENSTAR. Additionally, AIX stated that it intends to continue operations to restore production to the KLGF if establishment of a gas storage facility does not receive the necessary approvals in its request for Suspension of Production on November 24, 2025, and reiterated this in a letter to the Commissioner of DNR dated August 12, 2026.
<https://dog.dnr.alaska.gov/Document/Download/158CF8683AEA41DA9F1532F639F9E9D4/Kenai%20Loop%20Gas%20Field%20request%20for%20suspension%20of%20production.pdf>.

included commercial terms in their applications. The information is presented solely for context and does not constitute a competitive evaluation, ranking or preference. No weighting is applied to commercial terms, and they do not affect the determination of which application best serves the State's interest under AS 38.05.035(e).

A. ENSTAR

ENSTAR provided lease terms with a storage fee equal to the assessed fair market value of the land with a review every five years. The terms also suggested a royalty payment schedule for native gas that is already in the reservoir and yet to be produced.

B. Hilcorp

Hilcorp provided lease terms with a storage fee equal to One Hundred Dollars (\$100.00) per leased acre. This fee would be indexed to Consumer Price Index for All Urban Consumers, as published by the U.S. Bureau of Labor Statistics and be adjusted every two years. Hilcorp proposed the volume of native gas be defined in total and as amount recoverable. The recoverable native gas would be royalty bearing for all gas that exceeded the total of gas injected. The royalty terms would be those of the existing oil and gas lease.

C. Final Terms

After review of both of the applications, the Director finds the following lease terms to be in the State's best interest. The lessee shall pay a minimum annual fee of \$10,000 plus \$5,000 for each additional well drilled during the term of this lease. The lessee shall also pay an annual volume fee of \$0.012 per thousand standard cubic feet, computed monthly and paid annually for all volumes of non-native gas produced. The original gas in place of native gas from the gas storage formation shall be 32.5 Bcf and that there are 3.9 Bcf of remaining native gas in the gas storage formation under the leased area based on a straight-line P/z interpretation of the entire Kenai Loop Gas Field well production history data set. Lessee shall pay royalty to the state for native gas withdrawn from the gas storage formation that exceeds the sum of total gas injections. Further, any future oil or condensate production shall be deemed as native reservoir liquids and be subject to the current oil and gas lease terms in place.

Royalty on native gas will be paid under the terms of the existing oil and gas lease.

XI. Director's Finding and Decision

Based on the review conducted under AS 38.05.035(e) and AS 38.05.180(u), and after evaluating the applications submitted by ENSTAR Natural Gas Company, LLC and Hilcorp Cook Inlet, LLC, the Director makes the following **preliminary findings**:

1. **A gas storage lease in the Kenai Loop Gas Storage Formation would serve the State's interest.**

The record demonstrates a clear need for additional underground natural gas storage capacity in Cook Inlet to support regional system reliability, fulfill long-term contractual

deliverability obligations, and provide redundancy as basin production continues to decline. Development of storage at the Kenai Loop Gas Field aligns with statutory objectives to avoid waste, conserve natural resources, and maintain dependable energy supply for Southcentral Alaska.

2. The Kenai Loop Gas Storage Formation appears technically suitable for gas storage and is supported by sufficient data.

ENSTAR's geologic and engineering information indicates that the reservoir has adequate volume, injectivity, withdrawal capacity, and containment for effective storage operations. ENSTAR's modeling and pressure data allow for a reliable assessment of working gas, cushion gas, and remaining native gas. Hilcorp's application did not provide the data required to support equivalent technical conclusions.

3. The State has clear authority over the pore space associated with the oil and gas mineral estate and may authorize its use for gas storage.

The pore space within the Kenai Loop Gas Storage Formation is inseparable from the State-owned oil and gas mineral estate conveyed under Patent No. 50-86-0386 and leased under ADL 391094. Under AS 38.05.180(u), the State holds exclusive authority to authorize subsurface gas storage within this estate.

4. Only ENSTAR demonstrated the ability to avoid unreasonable interference with the existing oil and gas lessee.

Under 11 AAC 83.505(3), gas storage operations must not unreasonably interfere with ongoing oil and gas lease activities. ENSTAR submitted evidence of a contractual agreement with AIX, the lessee of ADL 391094, supporting coordinated operations. Hilcorp did not provide any such agreement or show how interference would be avoided.

5. ENSTAR presented a timely and feasible development plan consistent with current regional needs.

ENSTAR proposes to use existing KLGF infrastructure and advance a regulated utility scale storage development in the near term. Hilcorp's reliance on exploratory drilling to determine reservoir suitability introduces significant uncertainty and is inconsistent with the immediacy of regional storage needs.

6. ENSTAR's application contains thorough and robust technical information; Hilcorp's submission was not as comprehensive in the technical information needed for review.

ENSTAR provided comprehensive reservoir characterization, digital data, mapping, engineering design, and modeling required for DO&G's review. Hilcorp's submission lacked key information, did not incorporate all available public data, and reflected unresolved uncertainties regarding reservoir geometry, storage closure, and native gas estimation.

7. The Director evaluated potential environmental impacts and preliminarily finds they can be effectively mitigated.

The reasonably foreseeable environmental effects of gas storage activities—including potential impacts to fish and wildlife, habitats, water resources, noise, and light—can be avoided, minimized, or mitigated through existing state and federal regulatory requirements, project-specific operational controls, and the mitigation measures

incorporated from the 2018 Cook Inlet Final Written Finding. With these safeguards in place, environmental considerations do not preclude issuance of a storage lease.

8. A gas storage lease would support continued value from the State's mineral estate.

Utilizing the partially depleted reservoir for natural gas storage would extend the productive life of ADL 391094, facilitate continued recovery of remaining native gas consistent with statute, and generate new revenues to the State associated with non-native gas storage operations.

On the basis of the facts and issues discussed above, comments received, applicable laws and regulations, and the documents reviewed during preparation of this finding, the Director has concluded that issuing gas storage lease ADL 394695 will best serve the interests of the state of Alaska.

This preliminary finding is subject to revision based on comments received by DO&G during the period set out for receipt of public comment, as provided in AS 38.05.035(e)(5)(A). Members of the public are encouraged to comment on any part of this preliminary finding. In commenting, please be as specific as possible.

Comments must be in writing and received by November 13, 2026, to be considered and must be sent to Best Interest Findings:

By mail: Alaska Department of Natural Resources
Division of Oil and Gas
550 W 7th Ave, Suite 1100
Anchorage, AK 99501-3560

By fax: 907-269-8938

By email: dog.bif@alaska.gov

The DO&G complies with Title II of the Americans with Disabilities Act of 1990. This publication will be made available in alternate communication formats upon request. Please contact the Best Interest Findings Group at (907) 269-8800 or dog.bif@alaska.gov.

Following review of comments on this preliminary best interest finding and any additional available information, the Director will make a final determination whether disposal of gas storage lease ADL 394695 to ENSTAR is in the best interest of the state and will issue a final finding and decision. To be eligible to file a request for reconsideration to the DNR commissioner under AS 38.05.035(i), a person must provide written comments during the comment period set out in the previous paragraph. A copy of the final decision can be sent to any person commenting on the preliminary decision and will include an explanation of the appeal process.



Haley Paine
Director, Division of Oil and Gas

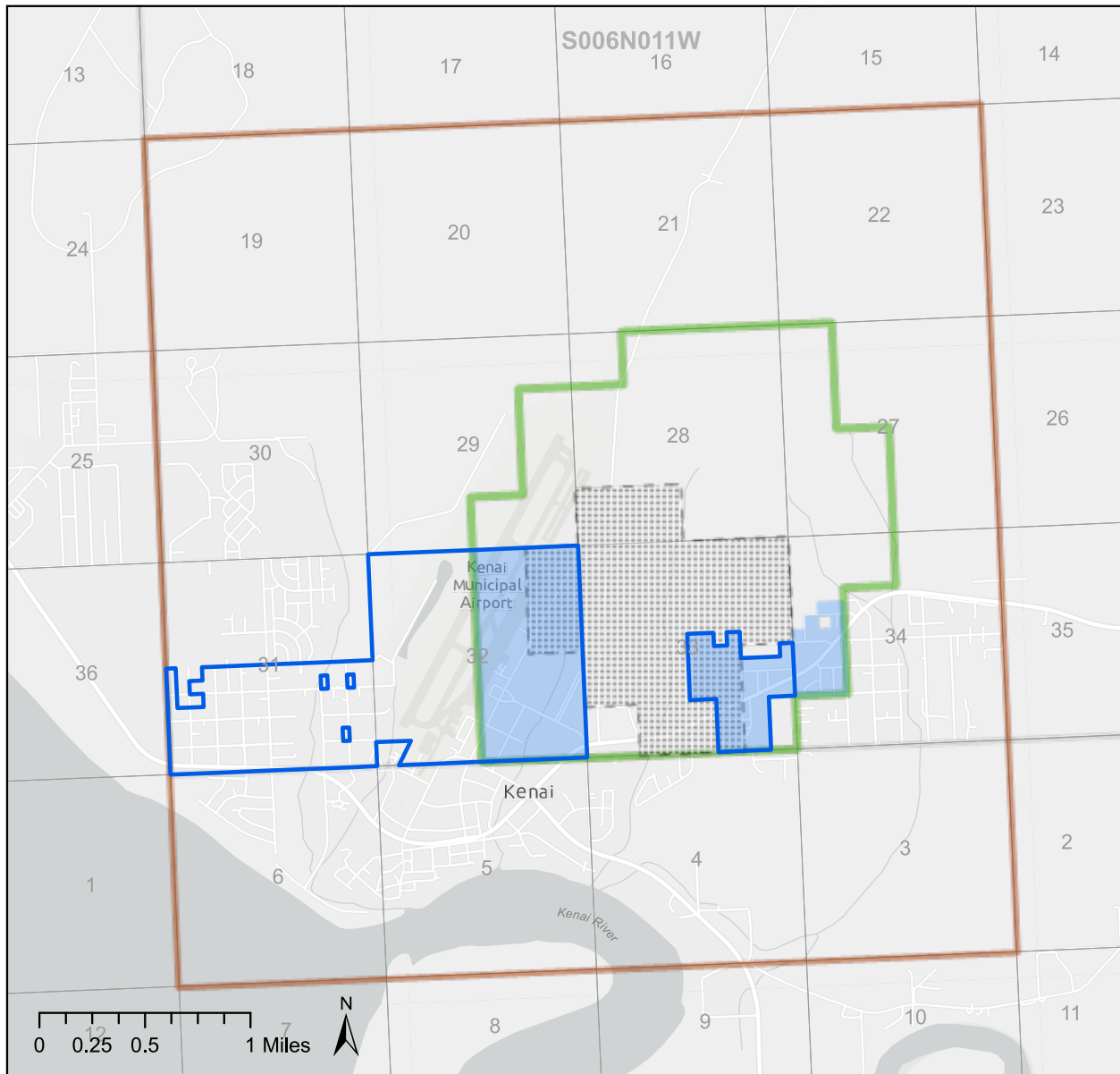
Attachment 1: Map of Kenai Loop Proposed Gas Storage Lease ADL 394695

Attachment 2: Lease Form for Proposed Gas Storage Lease ADL No. 394695

Attachment 1

Kenai Loop Proposed Gas Storage Lease

ADL 394695



-  Kenai Loop Gas Field
-  ADL 391094 AIX Oil and Gas Lease
-  ENSTAR Proposed Project Area
-  Hilcorp Proposed Project Area
-  ADL 394695 Proposed Storage Boundary

State Lands to be Leased:

- T6N, R11W, Seward Meridian, Alaska;
 - Section 32 – E1/2 (320 acres)
 - Section 33 – Surveyed Lots 5, 6, 8, 9, 13–40 inclusive, E1/2 SW1/4 SE1/4 and W1/2 SE1/4 SE1/4 (120 acres);
 - Section 34 – Surveyed Lots 39, 40, 52, 53, 55, 57–59 inclusive, 79–88 inclusive, and 111–116 inclusive (60 acres)

The Kenai Loop Gas Storage Formation is defined as:

Within the Kenai Loop Gas Field, production is from two distinct intervals in the Upper Tyonek Formation between 8,600 feet and 10,500 feet true vertical depth subsea (TDVSS). The producing interval is defined as found in the Kenai Loop 1-1 (API 50133205950000) well on the gamma ray and resistivity logs at 9,692 feet measured depth (MD) and 10,005 feet MD located in Section 33, T6N, R11W, Seward Meridian. For gas storage, the shallower zone, informally referred to as the 9,700-foot sand, and the deeper zone, informally referred to as the 10,000-foot sand, both reside in fluvial channel sandstones typical of Cook Inlet east side reservoirs. Coals, averaging 20–30 feet thick, interbed with silty sands and shales above the top and below the base of each of the two sand intervals, provide the required seals for gas containment. Net reservoir thicknesses of each sand average 44 feet for the 9,700-foot sand and 65 feet for the 10,000-foot sand. Therefore, the storage zone shall be limited to ~20 feet below a coal at 9,610 feet MD to the base of the 10,000-foot sand in Kenai Loop 1-1.

Gas Storage Lease
Form No. DO&G 202610

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES

Gas Storage Lease ADL No. 394695

THIS LEASE is entered into _____, between the State of Alaska, "the state," and ENSTAR Natural Gas Company, LLC, "the lessee".

In consideration of the payment made by the lessee to the state, and subject to the provisions of this lease, including the mitigation measures, exhibits, and addendums attached to this Lease, and by reference incorporated in this lease, the state and the lessee agree as follows:

1. GRANT. (a) The state grants to the lessee:

- (1) the right for Storage of Gas in the Gas Storage Formation under the following tract of land, as depicted on Exhibit A:

T. 6 N., R. 11 W. Seward Meridian, Alaska

Section 32: Surveyed, E1/2, 320.00 acres;

Section 33: Surveyed, Lots 5, 6, 8, 9, 13 through 40 inclusive, E1/2SW1/4SE1/4 and W1/2SE1/4SE1/4, 120.00 acres;

Section 34: Surveyed, Lots 39, 40, 52, 53, 55, 57 through 59 inclusive, 79 through 88 inclusive, and 111 through 116 inclusive, 60.00 acres;

containing approximately 500.00 acres, more or less, within the storage area as depicted on Exhibit A.

Gas Storage Formation Description

Within the Kenai Loop Gas field, production is from two distinct intervals in the Upper Tyonek Formation between 8,600 feet and 10,500 feet true vertical depth subsea (TVDSS). The producing interval is defined as found in the Kenai Loop 1-1 (API 50133205950000) well on the gamma ray and resistivity logs at 9,692 feet measured depth (MD) and 10,005 MD located in Section 33, T6N, R11W, Seward Meridian. For gas storage, the shallower zone, informally referred to as the 9,700-foot sand, and the deeper zone, informally referred to as the 10,000-foot sand, both reside in fluvial channel sandstones typical of Cook Inlet east side reservoirs. Coals, averaging 20–30 feet thick, interbed with silty sands and shales above the top and below the base of each of the two sand intervals, provide the required seals for gas containment. Net reservoir thicknesses of each sand average 44 feet for the 9,700-foot sand and 65 feet for the 10,000-foot sand. Therefore, the storage zone shall be limited to the interval ~20 feet below a coal at 9,610 feet MD to the base of the 10,000-foot sand in Kenai Loop 1-1.

(and referred to in this Lease as the "leased area"); and

- (2) the right, subject to reasonable concurrent uses as determined by the state, to use the surface within the leased area as necessary for the purpose of Gas Storage, subject to the lessee obtaining the required federal, state, borough and municipal agency approvals, as required by law.

(b) The state makes no representations or warranties, express or implied, as to title, accessibility, suitability for use for any purpose, or to quiet enjoyment of, the leased area and is not liable to the lessee, or any third party, for any deficiency in title to the leased area. Neither the lessee, including any successor in interest to the lessee, or any third party, is entitled to any refund based on a deficiency in title to the leased area for any payments a lessee or a third party has made under this lease.

2. RESERVED RIGHTS. The state reserves all rights not expressly granted to the lessee by this lease that are not inconsistent with lessee's right to enjoyment of the rights granted to it under this Lease. These reserved rights include:

- (a) The right to conduct geological and geophysical surveys within the leased area;
- (b) The right to explore for, develop, and remove natural resources, other than Storage Gas on or from the leased area;

(c) The right to establish or grant easements and rights-of-way upon, through, or within the Lease area for any lawful purpose;

(d) The right to dispose of land within the leased area for well sites and well bores of wells drilled from or through the leased area to explore for or produce oil and gas resources in and from lands not within the leased area; and

(e) The right to manage and dispose of the leased area or interests in that land by grant, lease, permit, or otherwise to third parties.

(f) The right to store, without limitation, the State of Alaska's Royalty Gas in the leased area, free of all costs. All such costs, including transportation, injection, storage and production costs shall be borne by the purchaser of the State of Alaska's Royalty Gas. The lessee shall not be liable for the loss or destruction of stored Royalty Gas from causes beyond the lessee's ability to control.

3. **TERM.** This lease is issued for an initial term of twenty-five (25) years from the effective date of the lease.

4. **RENEWAL AND EXTENSION.** (a) This Lease may be renewed for one or more additional ten (10) year terms if, at the end of the initial term, the lessee is diligently conducting operations, unless the commissioner finds that the extension will adversely affect the interests of the state. The lessee shall apply to renew or extend this lease at least 180 days prior to lease expiration.

(b) If the state issues a written direction to suspend operations or production from the leased area or issues a written approval of such action, a period of time equivalent to the period of suspension will be added to the lease term.

(c) If the state determines that the lessee has been prevented by Force Majeure, after efforts made in good faith, from performing any act that would extend the Lease, the Lease will not expire during the period of Force Majeure, and the state will grant a reasonable extension of time that may be different than the period of Force Majeure.

(d) Nothing in subparagraphs (b) and (c) suspends the obligation to pay fees, rentals, royalties or other production or profit-based payments to the state from operations on the leased area that are not affected by any suspension or Force Majeure.

5. **GAS STORAGE FEE.** The lessee shall pay: (a) an annual fee to the state of \$10,000, plus \$5,000 for each additional well drilled during the term of this lease.

(b) An annual volume fee of \$0.012 per thousand standard cubic feet computed monthly and paid annually for all volumes of non-native gas that are produced from the Gas Storage Formation.

(c) The minimum annual fee and additional costs for wells drilled will be credited towards the annual volume fee for each lease year.

6. **NATIVE GAS ROYALTY.** (a) The state and lessee agree for the purposes of this lease that as of September 1, 2026, the original gas in place of Native Gas from the Gas Storage Formation shall be 32.5 billion cubic feet (Bcf) and that there are 3.90 Bcf of remaining Native Gas in the Gas Storage Formation under the leased area based on a straight-line *P/z* interpretation of the entire Kenai Loop Gas Field well production history data set. Further, any future oil condensate production shall be deemed as native liquids and be subject to the current oil and gas lease terms in place.

(b) Gas withdrawn from this facility is considered to be non-native gas and is not subject to royalty until the cumulative withdrawn volume exceeds the cumulative injected volume.

(c) Royalty on the Native Gas withdrawn from the Gas Storage Formation under the leased area will be paid under the terms of the applicable Oil and Gas leases, as indicated in Exhibit B - Native Gas Royalty Payment Schedule. If Native Gas is withdrawn from state land with no applicable Oil and Gas lease, the lessee shall pay the state monthly royalty of the full market value of the Gas at the time it is withdrawn.

7. **THIRD PARTY STORAGE.** (a) The gas storage facility shall be regulated by the Regulatory Commissioner of Alaska.

(b) The lessee shall make the gas storage facility available to third parties under the terms and conditions defined in a tariff approved by the Regulatory Commission of Alaska.

8. **RECORDS.** The lessee shall maintain records showing the development, production, and operations of the leased area (including records of development, operating expenses, and volumes), and disposition (including records of sales prices, volumes, and purchasers) of all Gas from the Gas Storage Formation. The lessee shall permit the state or its agent to examine these records at all reasonable times, and to make copies of those records. Upon request by the state, the lessee's records shall be made available to the state at the state office designated by the state. The lessee's records of development, production, and disposition must employ methods and techniques that will ensure the most accurate figures reasonably available. The lessee shall use generally accepted accounting principles (GAAP) consistently applied for its financial accounting records. The state is entitled to review all other relevant documents including those not subject to GAAP.

9. **PAYMENTS.** All payments to the state under this Lease must be made payable in the manner directed by the state, and unless otherwise specified, must be delivered to the state at:

Attachment 2: Lease Form for Proposed Gas Storage Lease ADL No. 394695

DEPARTMENT OF NATURAL RESOURCES 550
WEST 7th AVENUE, SUITE 1410
ANCHORAGE, ALASKA 99501-3561
ATTENTION: FINANCIAL SERVICES SECTION

or in person at either of the Department's Public Information Centers located at:

550 W. 7th Ave.,
Suite 1360 Anchorage, Alaska

3700 Airport Way
Fairbanks, Alaska

or to any depository designated by the state with at least 60 days notice to the lessee.

10. **PLAN OF OPERATIONS.** (a) A plan of operations must be approved by the state before any operations may be undertaken on or in the leased area.

(b) The lessee shall meet with the state annually to discuss lessee's ongoing operations, and any future plans for development and operation.

11. **PLAN OF DEVELOPMENT.** (a) The lessee shall file two copies of an application for approval by the state of a development plan that must describe the lessee's plans under this Lease. The plan must include the estimated size in surface acreage or shape, total capacity, and working capacity of the Gas Storage Formation, design and schedule for drilling of storage injection and withdrawal wells and any other engineering, geological, or operational data that may be requested by the Division. The development plan must include maps and statements describing long-range activities for the leased area; plans for expansion or contraction of this Lease; details of proposed operations for at least one year following submission of the plan; and the sequence and schedule of the operations (Injection and Withdrawal volumes) to be conducted on or in the leased area, including the date operations are proposed to begin and their proposed duration. Lessee shall have an approved development plan prior to commencing Storage operations. No development of the leased area may occur until a plan of development has been approved by the state.

(b) The development plan must be revised, updated, and submitted to the state for approval 60 days prior to the expiration of the previously approved plan. The lessee shall notify the Division of any anticipated changes in a project resulting in alteration of conditions that were originally approved, including: increase in size of the project; increase in the approved zone pressure; changes in the Injection and Withdrawal intervals; changes in the observation and collection intervals; or monitoring procedures. No changes may occur until approved by the state.

(c) The lessee shall annually submit a Storage Lease Production and Injection Report in digital format (MS Excel), summarizing monthly production/injection, including cumulative production/injection, number of wells, wells days, average daily production/injection, and net injection, from inception to date, as reported to AOGCC. The operator of the lease will provide the state an electronic operator report as specified in State of Alaska Oil and Gas Royalty Reporting Instructions (11 AAC 04).

(d) If this lease is comprised of acreage committed in whole or in part to a unit agreement approved by the state, the gas storage plan of development shall be subject to the unit plan of development regulations.

12. **INFORMATION ACQUIRED FROM OPERATIONS.** (a) The lessee shall submit to the state all geological, geophysical, and engineering data and analyses obtained from the Lease within 30 days following the completion of a well. The lessee shall submit to the state data and analyses acquired subsequent to well completion within 30 days following acquisition of that data. The state may waive receipt of operational data from some development, service or injection wells. The state will inform the operator of the waiver prior to well completion. The lessee shall submit the data and analyses to the Division of Oil and Gas, Department of Natural Resources, at the location specified in paragraph 25 of this Lease. The data and analyses shall include the following:

1) a copy of the completion report (AOGCC form 10-407) with an attached well summary, including daily drilling reports, formation tops encountered, a full synopsis of drill stem and formation testing data, an identification of zones of abnormal pressure, oil and gas shows and cored intervals;

2) latitudinal and longitudinal coordinates for the completed surface and bottom hole locations;

3) a copy of the permit to drill (AOGCC form 10-401 only, additional documentation not required) and the survey plat of the well location;

4) a paper copy (no sepiacopies) of all final 2-inch open hole and cased hole logs, including measured depth and true-vertical depth versions, specialty logs (such as Schlumberger's MDT, CMR, formation microscanners and dipmeter logs), composite mud or lithology log and report, measured-while-drilling (MWD) and logged-while-drilling (LWD) logs, velocity and directional surveys;

5) a digital version of well logs in LAS or LIS format, a digital version of velocity surveys in SEG Y format, a digital version of directional surveys in ASCII format or MS Excel spreadsheet (other formats may be acceptable upon agreement with the Division of Oil and Gas); and

6) a digital or paper copy (whichever is appropriate) of all available well analyses, including geochemical analyses, core analyses (porosity, permeability, capillary pressure, photos, and descriptions), paleontologic and palynologic analyses, thermal maturation analyses, build up analyses, periodic material balance (P/z), reservoir pressure measurements, and fluid PVT analyses (an ASCII format digital version of the above information shall also be submitted, if available). The state may require the lessee to submit

additional information in accordance with the applicable statutes and regulations in effect at the time of the completion date of the well.

(b) Any information submitted to the state by the lessee in connection with this Lease will be available at all times for use by the state and its agents. The state will keep information confidential as provided in AS 38.05.035(a)(8) and its applicable regulations. In accordance with AS 38.05.035(a)(8)(C), in order for geological, geophysical and engineering information submitted under paragraph 12(a) of this Lease to be held confidential, the lessee must request confidentiality at the time the information is submitted. The information must be marked **CONFIDENTIAL**.

13. **DILIGENCE AND PREVENTION OF WASTE.** (a) All operations on or into the leased area shall be carried on in a safe and workmanlike manner; in compliance with all state, federal, borough, or municipal permits and authorizations; in accordance with generally accepted, good engineering practices; with due regard for the protection of life and property, preservation of the environment and conservation of natural resources for future productive uses. The lessee shall carry out, at the lessee's expense, all orders and requirements of the state relative to the prevention of waste and to the preservation of the leased area. If the lessee fails to carry out these orders, the state will have the right but not the obligation, together with any other available legal recourse, to enter the leased area to repair damage or prevent waste at the lessee's expense.

(b) The lessee shall exercise reasonable diligence as determined by the state in conducting operations on the leased area unless consent to suspend operations temporarily is granted by the state.

(c) Metering equipment shall be maintained and operated so that it will meet acceptable standards of accuracy in order to measure production from the leased area. Use of such equipment shall be discontinued at any time the state determines that acceptable standards of accuracy are not being maintained. Storage operations shall be suspended until measurement accuracy has been obtained.

14. **INSPECTION.** The lessee shall keep open at all reasonable times, for inspection by any duly authorized representative of the state:

(a) the leased area or development area including all wells, improvements, machinery and fixtures; and

(b) all reports and records relative to operations, surveys, or investigations, on or with regard to the leased area or operation. Upon request, the lessee shall furnish the state with copies of or extracts from the reports and records. The lessee must maintain on site copies of any permit required by a state, federal, or local government.

15. **SUSPENSION.** The state may from time to time direct or approve in writing a suspension of operations under this Lease.

16. **ASSIGNMENT.** This Lease, or an interest in this Lease, may, with the approval of the state, be assigned, subleased, or otherwise transferred to any person or persons qualified to hold an oil and gas lease. No assignment, sublease, or other transfer of an interest in this Lease will be binding upon the state unless approved by the state. The lessee shall remain liable for all obligations under this Lease accruing prior to the approval by the state of any assignment, sublease, or other transfer of an interest in this Lease.

17. **SURRENDER.** The lessee, at any time, may file with the state a written surrender of all rights under this Lease or any portion of the leased area comprising one or more legal subdivisions, subject to approval by the state. That surrender will be effective as of the date of approval, subject to the continued obligations of the lessee to make payment of all accrued royalties and fees and to place all wells and surface facilities on the surrendered land in a condition satisfactory to the state for suspension or abandonment. Once all obligations are fulfilled, the lessee will be released from all obligations under this Lease with respect to the surrendered lands.

18. **REQUIRED OPERATIONS.** Lessee shall use the Gas Storage Formation for Storage operations to maintain the Lease. Any consecutive 12-month period without Storage operations will constitute a default of the Lease under paragraph 19, unless cessation of Storage operations is undertaken pursuant to an approved suspension of operations under paragraph 15, or an approved process of cessation of Storage operations under a state approved plan of development to withdraw the remaining Non-Native and Native Gas under the terms of the underlying Oil and Gas Lease. For the purposes of this paragraph, storage operations mean the Injection or Withdrawal of Non-Native Gas.

19. **EXPANSION.** If the lessor determines that Gas is migrating from the Gas Storage Formation to other formations or that Gas within the Gas Storage Formation is expanding beyond the limits of the Leased Area or Gas Storage Area, this lease may be amended, effective as of the date prescribed by the Lessor, to include additional formations or lands subject to the same terms and conditions applicable to the lands and formations previously committed to this lease.

20. **TERMINATION FOR DEFAULT.** Failure of the lessee to perform timely its obligations under this Lease, or the failure of the lessee otherwise to abide by all express and implied provisions of this Lease is a default of the lessee's obligations under this Lease. The state may terminate this Lease in an administrative proceeding whenever the lessee fails, within 60 days after written notice of that default, to begin and diligently prosecute operations to remedy that default.

21. **RIGHTS UPON TERMINATION.** (a) Upon the expiration or earlier termination of this Lease or any portion of the

leased area, the lessee will be directed in writing by the state to remove from the leased area or portion of the leased area all machinery, equipment, tools, materials, and Non-Native Gas within the Gas Storage Formation within a period of one year.

(b) Any machinery, equipment, tools, materials, or Non-Native Gas that the lessee has not removed from the leased area or portion of the leased area become the property of the state, or may be removed by the state at the lessee's expense.

(c) At the option of the state, all improvements such as roads, pads, and wells must either be abandoned and the sites rehabilitated by the lessee to the satisfaction of the state, or be left intact and the lessee absolved of all further responsibility as to their maintenance, repair, and eventual abandonment and rehabilitation.

(d) Subject to the above conditions, the lessee shall deliver up the leased area or those portions of the leased area to the satisfaction of the state.

22. **DAMAGES AND INDEMNIFICATION.** (a) No rights under this Lease may be exercised by the lessee until the lessee has provided to pay the owner of the land subject to this Lease, his lessees and permittees, full payment for all damages that may be sustained by the owner by reason of the exercise of the rights granted by this Lease. If the owner for any reason does not settle the damages, the lessee may enter the land after posting a surety bond determined by the state, after notice and an opportunity to be heard, to be sufficient as to form, amount, and security to secure to the owner, his lessees and permittees, payment for damages, and may institute legal proceedings in a court of competent jurisdiction where the land is located to determine the damages which the owner of the land may suffer. The lessee agrees to pay for any damages that may become payable under AS 38.05.130 and to indemnify the state and hold it harmless from and against any claims, demands, liabilities, and expenses arising from or in connection with such damages.

(b) The lessee shall indemnify the state for, and hold it harmless from, any claim, including claims for loss or damage to property or injury to any person caused by or resulting from any act or omission committed under this Lease by or on behalf of the lessee or any third party; this indemnification does not limit the state's remedies against any third party, including a gas storage service user.

(c) The lessee expressly waives any defense to an action for breach of a provision of this Lease or damages resulting from any harm to the environment that is based on an act or omission committed by an independent contractor in the lessee's employ. The lessee expressly agrees to assume responsibility for all actions of its independent contractors.

(d) The lessee is not responsible to the state under this subparagraph for any loss, damage, or injury caused by or resulting from the sole negligence of the state.

23. **BONDS.** (a) The lessee shall furnish a bond prior to the commencement of lease operations in an amount established by the state and must maintain that bond as long as required by the state.

(b) The state may, after notice to the lessee and a reasonable opportunity to be heard, require a bond in a reasonable amount greater than the amount specified by law where a greater amount is justified by the nature of the surface and its uses, the degree of risk, and the nature of the activity involved in the types of operations being or to be carried out under this Lease. A statewide bond will not satisfy any requirement of a bond imposed under this subparagraph, but may be considered by the state in determining the need for and the amount of any additional bond under this subparagraph.

24. **AUTHORIZED REPRESENTATIVES.** The Director of the Division of Oil and Gas, Department of Natural Resources, State of Alaska, and the person executing this Lease on behalf of the lessee will be authorized representatives for their respective principals for the purposes of administering this Lease. The state or the lessee may change the designation of its authorized representative, or the address to which notices to that representative are to be sent, by a notice given in accordance with paragraph 24 below. Where activities under a development plan are underway, the lessee shall also designate, by a notice under paragraph 24 below, by name, job title, and address, an agent who will be present in the state during all lease activities.

25. **NOTICES; PROTEST.** (a) Any notices required or permitted under this Lease must be by electronic media producing a permanent record or in writing and must be given personally or by registered or certified mail, return receipt requested, addressed as follows:

TO THE STATE:

DIRECTOR, DIVISION OF OIL AND GAS
DEPARTMENT OF NATURAL RESOURCES
550 WEST 7th AVENUE, SUITE 1100
ANCHORAGE, ALASKA 99501-3563

TO THE LESSEE:

UNION OIL COMPANY OF CALIFORNIA
3800 CENTERPOINT DRIVE, SUITE 100
ANCHORAGE, AK 99503
ATTENTION: LAND MANAGER

(b) Any notice given under this paragraph will be effective when delivered to the above authorized representative.

(c) A lessee who wishes to protest the amount of money due the state under this Lease or any action of the state regarding a provision of this Lease must file a written protest with the Division within 30 days after the mailing date of the state's notice or bill. A lessee who fails to file a protest within the required time waives any further right to protest. The state will establish the administrative appeal procedure to be followed and will inform the lessee of the procedure no later than 30 days after the filing of the written protest.

26. **STATUTES AND REGULATIONS.** This Lease is subject to all applicable state, federal, and municipal statutes, regulations, and ordinances in effect on the effective date of this Lease, and to all statutes, regulations and ordinances placed in effect after the effective date of this Lease. A reference to a statute or regulation in this Lease includes any change in that statute or regulation whether by amendment, repeal and replacement, or other means. This Lease does not limit the power of the State of Alaska or the United States of America to enact and enforce legislation or to promulgate and enforce regulations affecting, directly or indirectly, the activities of the lessee or its agents in connection with this Lease or the value of the interest held under this Lease. In case of conflicting provisions, statutes and regulations take precedence over this Lease.

27. **INTERPRETATION.** (a) This Lease is to be interpreted in accordance with the law of the State of Alaska. The paragraph headings are not part of this Lease and are inserted only for convenience. The state and the lessee expressly agree that any judicial proceeding affecting this Lease shall be conducted in the state Superior Court, Third Judicial District, at Anchorage.

(b) The term "including" when used in this Lease shall be construed as though followed by the phrase "but not limited to."

28. **INTEREST IN REAL PROPERTY.** It is the intention of the state and the lessee that the rights granted to the lessee by this Lease constitute an interest in real property in the leased area.

29. **WAIVER OF CONDITIONS.** The state reserves the right to waive any breach of a provision of this Lease, but any waiver extends only to the particular breach waived and does not limit the rights of the state with respect to any future breach; nor will the waiver of a particular breach prevent cancellation of this Lease for any other cause or for the same cause occurring at another time. Notwithstanding the foregoing, the state will not be deemed to have waived a provision of this Lease unless it does so in writing.

30. **SEVERABILITY.** If it is finally determined in any judicial proceeding that any provision of this Lease is invalid, the state and the lessee may jointly agree by a written amendment to this Lease, that, in consideration of the provisions in that written amendment, the invalid portion will be treated as severed from this Lease and that the remainder of this Lease, as amended, will remain in effect.

31. **NONDISCRIMINATION.** The lessee and the lessee's contractors and subcontractors may not unlawfully discriminate against any employee or applicant for employment.

32. **BINDING EFFECT.** The state and the lessee agree that this Lease, including all attachments and documents that are incorporated in this Lease by reference, contains the entire agreement between the parties, and each of the covenants and conditions in this Lease, including any attachments, will be binding upon the parties and upon their respective heirs, administrators, successors, and assigns.

33. **DEFINITIONS.** The following words have the following meanings unless the context unavoidably requires otherwise:

- 1) "Associated Substances" means all substances except helium produced as an incident of production of Oil or Gas by ordinary production methods and not defined in this Lease as Oil or Gas;
- 2) "Commissioner" means the Commissioner of Natural Resources;
- 3) "Division" means the Division of Oil and Gas, Department of Natural Resources;
- 4) "Drilling" means the act of boring a hole to reach a proposed bottom hole location through which Gas may be injected or withdrawn, and includes redrilling, sidetracking, deepening, or other means necessary to reach the proposed bottom hole location, testing, logging, plugging, and other operations necessary and incidental to the actual boring of the hole;
- 5) "Force Majeure" means war, riots, act of God, unusually severe weather, or other acts of nature;
- 6) "Gas" means all natural Gas (except helium gas) and all other hydrocarbons that are not defined in this Lease as Oil;
- 7) "Gas Storage Formation" means the reservoirs described in paragraph 1;
- 8) "Injection" means the deposit of Non-Native Gas into the Gas storage Formation;
- 9) "Native Gas" means Gas within the Gas Storage Formation that has not been produced and for which production royalties have not been paid;
- 10) "Non-Native Gas" means Gas injected into the leased area that has been previously produced and for which production royalties have been paid;

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- 11) "Oil" means crude petroleum Oil and other hydrocarbons, regardless of gravity, that are produced in liquid form by ordinary production methods, including liquid hydrocarbons known as distillate or condensate recovered by separation from Gas other than at a Gas processing plant;
- 12) "Produced Gas" means Gas for which royalty has been paid to the mineral owner;
- 13) "Storage" means the compression, injection, containment, Withdrawal, treatment, processing, transportation, marketing and selling of Non-Native Gas;
- 14) "Withdrawal" means the removal of Gas from the Gas Storage Formation.

34. EFFECTIVE DATE.

This Gas Storage Lease is entered into effective _____.

BY SIGNING THIS LEASE, the state as lessor and the lessee agree to be bound by its provisions.

STATE OF ALASKA

By: _____
Haley Paine, Director
Division

STATE OF ALASKA)
) ss.
Third Judicial District)

On _____, before me appeared _____ of the Division of Oil and Gas of the State of Alaska, Department of Natural Resources, and who executed this lease and acknowledged voluntarily signing it on behalf of the State of Alaska as lessor.

Notary public in and for the State of Alaska
My commission expires _____

LESSEE: ENSTAR Natural Gas Company, LLC

Signature: _____

Printed Name/Title: _____

On _____, before me appeared _____ for ENSTAR Natural Gas Company, LLC and who executed this lease and acknowledged voluntarily signing it on behalf of ENSTAR Natural Gas Company, LLC as lessee.

Notary public in and for the State of Alaska
My commission expires _____

Mitigation Measures

Operations will be conditioned by mitigation measures that are attached to any leases issued and are binding on the lessee. These measures were developed to mitigate potential effects of lease-related activities, considering all information made known to the director. Additional measures may be imposed when the lessee submits a proposed plan of operations (11 AAC 83.158(e) and 11 AAC 83.346(e)) for exploration, production, development, or transportation uses, or in rights-of-way for other pipelines. The director may consult with local government organizations and other agencies in implementing the mitigation measures below. The lessee is subject to applicable local, state, and federal laws and regulations, as amended.

The director may grant exceptions to these mitigation measures upon a showing by the lessee that compliance with the mitigation measure is not practicable and that the lessee will undertake an equal or better alternative to satisfy the intent of the mitigation measure. Requests and justifications for exceptions must be included in the plan of operations application as specified by the application instructions, and decisions of whether to grant exceptions will be made during the plan of operations review.

1. Facilities and Operations

- a. Oil and gas facilities, including pipelines, will be designed using industry-accepted engineering codes and standards. Technical submittals to the Division of Oil and Gas (DOG) that reflect the "practice of engineering," as defined by AS 08.48.341, must be sealed by a professional engineer registered in the State of Alaska.
- b. A plan of operations will be submitted and approved before conducting exploration, development, or production activities in accordance with 11 AAC 83.
- c. Facilities will be designed and operated to minimize sight and sound impacts in areas of high residential, recreational, and subsistence use and important wildlife habitat.
- d. The siting of facilities, including roads, airstrips, and pipelines, is prohibited within one-half mile of the coast as measured from the mean high water mark and 500 feet of all fish bearing waterbodies.
- e. Notwithstanding (d) above, the siting of facilities is prohibited within one-half mile of the banks of the Harriet, Alexander, Lake, Deep, and Stariski creeks, and the Drift, Big, Kustatan, McArthur, Chuitna, Lewis, Theodore, Beluga, Susitna, Little Susitna, Kenai, Kasilof, Ninilchik, and Anchor rivers as measured from the ordinary high water mark. Facilities may be sited, on a case-by-case basis, within the one-half mile buffer for the creeks and rivers identified here in A.1.(e) if the lessee demonstrates that siting of such facilities outside this buffer zone is not feasible or prudent, or that a location within the buffer is environmentally preferable.
- f. Impacts to identified wetlands will be minimized to the satisfaction of the director, in consultation with Alaska Department of Fish and Game (ADF&G) and Alaska Department of Environmental Conservation (ADEC). The director will consider whether facilities are sited in the least sensitive areas.
- g. Exploration roads, pads, and airstrips will be temporary. Use of gravel roads, pads, and airstrips may be permitted on a case-by-case basis by the director, in consultation with Division of Mining, Land, and Water (DMLW) and ADF&G.
- h. Road and pipeline crossings will be aligned perpendicular or near perpendicular to watercourses.
- i. Pipelines
 - i. Will use existing transportation corridors and be buried where soil and geophysical conditions permit.
 - ii. In areas with above ground placement, pipelines must be designed, sited, and constructed to allow for the free movement of wildlife and to avoid significant alteration of large ungulate movement and migration patterns.
 - iii. Where practicable, pipelines must be located on the upslope side of roadways and construction pads, unless it is determined that an alternative site is environmentally acceptable.
 - iv. Pipelines and gravel pads will facilitate the containment and cleanup of spilled fluids.
 - v. Pipelines that must cross marine waters will be constructed beneath the marine waters using directional drilling techniques, unless the director, in consultation with ADF&G and the local borough, approves an alternative method based on technical, environmental, and economic justification. Offshore pipelines must be located and constructed to prevent obstruction to marine navigation and fishing operations.
- j. Causeways, docks, artificial gravel islands, and bottom founded structures will not be located in river mouths, estuaries, or active river deltas, except as provided for in (k) below.
- k. Each proposed structure will be reviewed on a case-by-case basis. Causeways, docks, artificial gravel islands and bottom founded structures may be permitted if the director, in consultation with ADF&G and ADEC, determines that a causeway or other structures are necessary for field development and that no practicable alternatives exist. Approved causeways will be designed, sited, and constructed to minimize significant changes to nearshore oceanographic circulation patterns and water quality characteristics (e.g., salinity, temperature, suspended sediments) that result in exceedances of water quality criteria, and must maintain free passage of marine and anadromous fish and marine mammals. A monitoring program may be required to address the objectives of water quality and free passage of fish and marine mammals, and mitigation will be required where significant deviation from objectives occurs.

- l. Upon abandonment of material sites, drilling sites, roads, pipelines, buildings or other facilities, such facilities must be removed and the site rehabilitated to the satisfaction of the director, unless the director, in consultation with any non-state surface owner, as applicable, determines that such removal and rehabilitation is not in the state's interest.
- m. Material sites required for exploration and development activities will be:
 - i. restricted to the minimum necessary to develop the field efficiently and with minimal environmental damage,
 - ii. where practicable, designed and constructed to function as water reservoirs for future use, and
 - iii. located outside active floodplains of a watercourse unless the director of DMLW, after consultation with ADF&G, determines that there is no practicable alternative, or that a floodplain site would enhance fish and wildlife habitat after mining operations are completed and the site is closed.
- n. The director may include plan stipulations if necessary to reduce or eliminate adverse impacts to fish and wildlife or to protect the environment.

2. Fish Wildlife and Habitat

- a. Detonation of explosives is prohibited in open water areas of fish bearing water bodies and in fish bearing water bodies that are not solidly frozen, including the substrate unless otherwise approved. Blasting criteria have been established by ADF&G and are available from ADF&G upon request. The location of known fish-bearing waters within the project area can be obtained from ADF&G.
- b. Any water intake structures in fish bearing water bodies will be designed, operated, and maintained to minimize fish entrapment, entrainment, or injury. All water withdrawal equipment must use fish screening devices approved by ADF&G.
- c. Removal of snow from fish-bearing rivers, streams, and natural lakes is subject to prior written approval by ADF&G. Compaction of snow cover overlying fish-bearing waterbodies is prohibited except for approved crossings. If ice thickness is not sufficient to facilitate a crossing, then ice or snow bridges may be required.
- d. Surface entry is prohibited in parcels that are within the Kenai River Special Management Area.
- e. Surface entry, other than access, is prohibited on state lands within the Kenai National Wildlife refuge.
- f. The lessee is prohibited from placing drilling rigs and lease-related facilities and structures within an area near the Kenai River composed of: all land within Section 36 in T6N, R11W that is located south of a line drawn from the protracted NE corner to the protracted SW corner of the section; all land within the western half of Section 31 in T6N, R10W and Section 6 in T5N, R10W; and all land within Section 1 in T5N, R11W.
- g. Surface entry into the critical waterfowl habitat along the Kaslof River is prohibited. Directional drilling from adjacent sites may be allowed.
- h. Surface entry is prohibited within one-quarter mile of trumpeter swan nesting sites between April 1 and August 31. The siting of permanent facilities, including roads, material sites, storage areas, powerlines, and above ground pipelines is prohibited within one-quarter mile of known nesting sites. Trumpeter swan nesting sites will be identified by ADF&G at the request of the lessee.
- i. The director, in consultation with ADF&G, will restrict or modify lease related activities if scientific evidence documents the presence of Steller's eiders from the Alaska breeding population in the lease area and it is determined that oil and gas exploration and development will impact them or their over-wintering habitat in the near-shore waters of Cook Inlet.
- j. The director, in consultation with ADF&G, may impose seasonal restrictions on activities located in and adjacent to important waterfowl and shorebird habitat during the plan of operations approval stage.
- k. A lessee must consult with ADF&G before commencing any activities to identify the locations of known brown bear den sites that are occupied in the season of proposed activities.
- l. Exploration and production activities will not be conducted within one-half mile of occupied brown bear dens unless alternative mitigation measures are approved by ADF&G.
- m. A lessee who encounters an occupied brown bear den not previously identified by ADF&G shall report it to the Division of Wildlife Conservation, ADF&G, within 24 hours. The lessee will avoid conducting mobile activities one-half mile from discovered occupied dens unless alternative mitigation measures are approved by the director, with concurrence from ADF&G. Non-mobile facilities will not be required to relocate.
- n. For projects in proximity to areas frequented by bears, the lessee is required to prepare and implement a human-bear interaction plan designed to minimize conflicts between bears and humans. The plan will include measures to:
 - i. minimize attraction of bears to facility sites;
 - ii. organize layout of buildings and work areas to minimize interactions between humans and bears;
 - iii. warn personnel of bears near or on facilities and the proper actions to take;
 - iv. if authorized, deter bears from the drill site;
 - v. provide contingencies in the event bears do not leave the site;
 - vi. discuss proper storage and disposal of materials that may be toxic to bears; and
 - vii. provide a systematic record of bears on the site and in the immediate area.
- o. Surface entry within the core calving area of the Kenai Lowlands Caribou Herd is prohibited, except that surface entry for seismic exploration may be allowed from October 16 to March 31.

- p. Exploration and development activities may be restricted or prohibited between April 1 and October 15 within the core summer habitat of the Kenai Lowlands Caribou Herd, except that maintenance and operation of production wells may be allowed year-round. Permanent roads, or facilities other than production wells, may also be restricted or prohibited within this area. Facilities within the core summer habitat of the Kenai Lowlands Caribou Herd that require year-round access must be located in forested areas, where practical.
- q. Pipelines must be buried within the core summer habitat of the Kenai Lowlands Caribou Herd.
- r. The director, in consultation with ADF&G, may impose additional and seasonal restrictions on activities located in, or requiring travel through or overflight of, important caribou or other large ungulate calving and wintering areas during the plan of operations approval stage.
- s. No permanent or temporary oil and gas exploration or development may occur within High Value/High Sensitivity (Type 1) beluga whale habitat areas, unless it occurs on upland areas (above Mean Higher Water datum). Type 1 habitat areas include the following tracts: 320-334, 391-409, 410, 462, 464-475, 476-481, 483, 484, 485, 486, 493, 494, 497, 498, 522, 524-537, 538, 539, 540, 541, 542, 543, 544, 547-552, 559, 575-577, 579, 581, 582, 585, 586, 590, 593, 594, 598, 616-618, 620-623, 627, 655-658, and 662.
- t. The director will assess oil and gas-related activities within all High Value (Type 2) beluga whale habitat areas on a case-by-case basis. No permanent surface entry or structures are allowed, and temporary activities and structures, for example exploration drilling, will only be allowed between November 1 and April 1 of each year, unless it occurs on upland areas, within the following tracts: 021, 022, 126, 127, 129-132, 161, 162, 175, 177, 211, 218, 257, 301, 302, 373, 376, 377, and 384.
- u. The director will assess oil and gas-related activities within the remaining tracts (Type 3 habitat areas) on a case-by-case basis.

3. Subsistence, Commercial, and Sport Harvest Activities

- a. Lease-related use may be restricted, if necessary, to prevent unreasonable conflicts between lease-related activities and subsistence, commercial, sport, personal use, and educational fish and wildlife harvest activities. Traditional and customary access to subsistence areas will be maintained unless reasonable alternative access is provided to subsistence users. "Reasonable access" is access using means generally available to subsistence users. The lessee will consult with nearby communities, and native organizations for assistance in identifying and contacting local subsistence users.
- b. Before submitting a plan of operations that has the potential to disrupt subsistence activities, the lessee will consult with the potentially affected subsistence communities to discuss the siting, timing, and methods of proposed operations and safeguards or mitigating measures that could be implemented by the operator to prevent unreasonable conflicts. The parties will also discuss the reasonably foreseeable effect on subsistence activities of any other operations in the area that they know will occur during the lessee's proposed operations. Through this consultation, the lessee will make reasonable efforts to ensure that exploration, development, and production activities are compatible with subsistence hunting and fishing activities and will not result in unreasonable interference with subsistence harvests.

4. Fuel, Hazardous Substances, and Waste

- a. The lessee will ensure that secondary containment is provided for the storage of fuel or hazardous substances and sized as appropriate to container type and according to governing regulatory requirements in 18 AAC 75 and 40 CFR 112. Containers with an aggregate storage capacity of greater than 55 gallons that contain fuel or hazardous substances will not be stored within 100 feet of a waterbody or within 1,500 feet of a current surface drinking water source.
- b. During equipment storage or maintenance, the lessee will ensure that the site is protected from leaking or dripping fuel and hazardous substances by the placement of drip pans or other surface liners designed to catch and hold fluids under the equipment, or by creating an area for storage or maintenance using an impermeable liner or other suitable containment mechanism.
- c. During fuel or hazardous substance transfer, the lessee will ensure that a secondary containment or a surface liner is placed under all container or vehicle fuel tank inlet and outlet points, hose connections, and hose ends. Appropriate spill response equipment, sufficient to respond to a spill of up to five gallons, must be on hand during any transfer or handling of fuel or hazardous substances.
- d. The lessee will ensure that vehicle refueling will not occur within the annual floodplain, except as addressed and approved in the plan of operations. This measure does not apply to water-borne vessels.
- e. The lessee will ensure that all independent fuel and hazardous substance containers are permanently marked with the contents and the lessee's or contractor's name.
- f. The lessee will ensure that a fresh water aquifer monitoring well and quarterly water quality monitoring, is in place down gradient of a permanent storage facility, unless alternative acceptable technology is approved by ADEC.
- g. The lessee will ensure that waste from operations is reduced, reused, or recycled to the maximum extent practicable. Garbage and domestic combustibles must be incinerated whenever possible or disposed of at an approved site in accordance with 18 AAC 60.

- h. Proper disposal of garbage and putrescible waste is essential to minimize attraction of wildlife. The lessee must use the most appropriate and efficient method to achieve this goal. The primary method of garbage and putrescible waste is prompt, on-site incineration in compliance with State of Alaska air quality regulations. The secondary method of disposal is on-site frozen storage in animal-proof containers with backhaul to an approved waste disposal facility. The tertiary method of disposal is on-site non-frozen storage in animal proof containers with backhaul to an approved waste disposal facility. Daily backhauling of non-frozen waste is required unless safety considerations prevent it.
- i. New solid waste disposal sites, other than for drilling waste, will not be approved or located on state property for exploration.
- j. The preferred method for disposal of muds and cuttings from oil and gas activities is by underground injection. The lessee will ensure that drilling mud and cuttings will not be discharged into lakes, streams, rivers, or wetlands. On-pad temporary cuttings storage may be allowed as necessary to facilitate annular injection and backhaul operations.

5. Access

- a. Public access to, or use of, the lease area may not be restricted except within the immediate vicinity of drill sites, buildings, and other related structures. Areas of restricted access must be identified in the plan of operations. Lease facilities and operations will not block access to or along navigable or public waters as defined in AS 38.05.965.

6. Historic, Prehistoric, and Archaeological Sites

- a. Before the construction or placement of any structure, road, or facility supporting exploration, development, or production activities, the lessee must conduct an inventory of prehistoric, historic, and archeological sites within the area, including a detailed analysis of the effects that might result from that construction or placement.
- b. The inventory of prehistoric, historic, and archeological sites must be submitted to the director and the Office of History and Archeology (OHA). If a prehistoric, historic, or archeological site or area could be adversely affected by a lease activity, the director, after consultation with OHA, will direct the lessee as to the course of action to take to avoid or minimize adverse effects.
- c. If a site, structure, or object of prehistoric, historic, or archaeological significance is discovered during lease operations, the lessee shall report the discovery to the director as soon as possible. The lessee will make all reasonable efforts to preserve and protect the discovered site, structure, or object from damage until the director, after consultation with the State Historic Preservation Office, has directed the lessee on the course of action to take for its preservation.

7. Hiring Practices

- a. The lessee is encouraged to employ local and Alaska residents and contractors, to the extent they are available and qualified, for work performed in the lease area. The lessee will submit, as part of the plan of operations, a hiring plan that will include a description of the operator's plans for partnering with local communities to recruit, hire, and train local and Alaska residents and contractors. As a part of this plan, the lessee is encouraged to coordinate with employment and training services offered by the State of Alaska and local communities to train and recruit employees from local communities.
- b. In accordance with Administrative Order 278, the lessee is encouraged to employ apprentice labor to perform at least 15 percent of total work hours, to the extent they are available and qualified, for work performed in the lease area. The lessee will submit, as part of the plan of operations, a hiring plan detailing the means by which the lessee might incorporate apprentice labor.
- c. A plan of operations application must describe the lessee's past and prospective efforts to communicate with local communities and interested local community groups.
- d. A plan of operations application must include a training program
 - i. for all personnel including contractors and subcontractors;
 - ii. designed to inform each person working on the project of environmental, social, and cultural concerns that relate to that person's job;
 - iii. using methods to ensure personnel understand and use techniques necessary to preserve geological, archeological, and biological resources; and
 - iv. designed to help personnel increase their sensitivity and understanding of community values, customs, and lifestyles in areas where they will be operating.

Definitions

Facilities – Any structure, equipment, or improvement to the surface, whether temporary or permanent, including, but not limited to, roads, pads, pits, pipelines, power lines, generators, utilities, airstrips, wells, compressors, drill rigs, camps, and buildings.

Hazardous substance – As defined under 42 USC 9601 – 9675 (Comprehensive Environmental Response, Compensation, and Liability Act of 1980).

Important wetlands – Those wetlands that are of high value to fish, waterfowl, and shorebirds because of their unique characteristics or scarcity in the region or that have been determined to function at a high level using the hydrogeomorphic approach.

Minimize – To reduce adverse impacts to the smallest amount, extent, duration, size, or degree reasonable in light of the environmental, social, or economic costs of further reduction.

Plan of operation – A lease plan of operations under 11 AAC 83.158 and a unit plan of operations under 11 AAC 83.346.

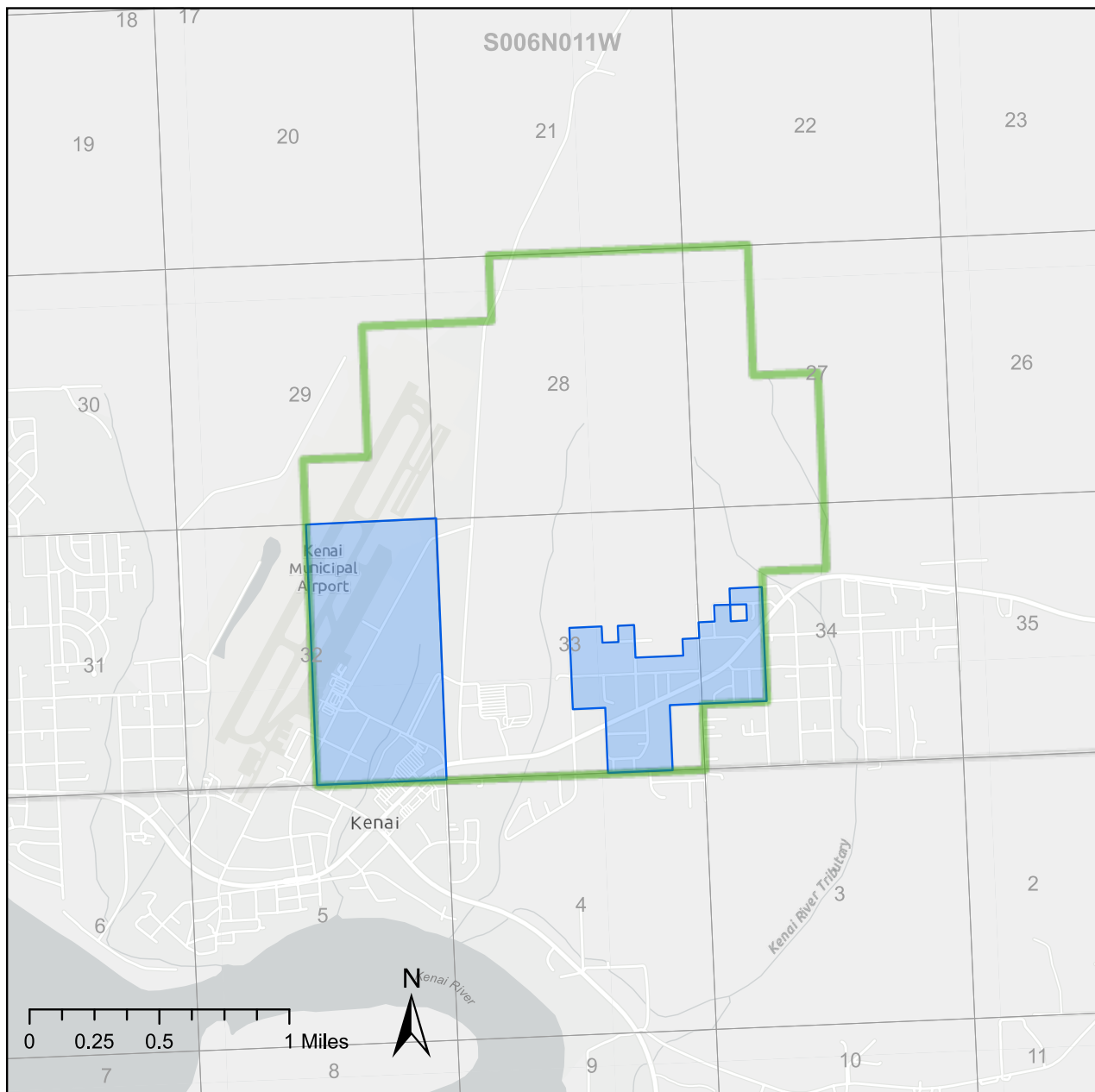
Practicable – Feasible in light of overall project purposes after considering cost, existing technology, and logistics of compliance with the mitigation measure.

Secondary containment – An impermeable diked area, portable impermeable containment structure, or integral containment space capable of containing the volume of the largest independent container. The containment will, in the case of external containment, have enough additional capacity to allow for local precipitation.

Temporary – No more than 12 months.

Exhibit A

Kenai Loop Proposed Gas Storage Lease ADL 394695



- ENSTAR Proposed Project Area
- ADL 394695 Proposed Storage Boundary

State Lands to be Leased:

- T6N, R11W, Seward Meridian, Alaska;
- Section 32 – E1/2 (320 acres)
 - Section 33 – Surveyed Lots 5, 6, 8, 9, 13–40 inclusive, E1/2 SW1/4 SE1/4 and W1/2 SE1/4 SE1/4 (120 acres)
 - Section 34 – Surveyed Lots 39, 40, 52, 53, 55, 57–59 inclusive, 79–88 inclusive, and 111–116 inclusive (60 acres)

The Kenai Loop Gas Storage Formation is defined as:

Within the Kenai Loop Gas Field, production is from two distinct intervals in the Upper Tyonek Formation between 8,600 feet and 10,500 feet true vertical depth subsea (TDVSS). The producing interval is defined as found in the Kenai Loop 1-1 (API 50133205950000) well on the gamma ray and resistivity logs at 9,692 feet measured depth (MD) and 10,005 feet MD located in Section 33, T6N, R11W, Seward Meridian. For gas storage, the shallower zone, informally referred to as the 9,700-foot sand, and the deeper zone, informally referred to as the 10,000-foot sand, both reside in fluvial channel sandstones typical of Cook Inlet east side reservoirs. Coals, averaging 20–30 feet thick, interbed with silty sands and shales above the top and below the base of each of the two sand intervals, provide the required seals for gas containment. Net reservoir thicknesses of each sand average 44 feet for the 9,700-foot sand and 65 feet for the 10,000-foot sand. Therefore, the storage zone shall be limited to ~20 feet below a coal at 9,610 feet MD to the base of the 10,000-foot sand in Kenai Loop 1-1.

Exhibit B

[Native Gas Royalty Payment Schedule - paragraph 6(b)]

Kenai Loop Gas Storage Lease - Native Gas Royalty Payment Schedule

O&G Lease (ADL)	DNR O&G Lease Segment	Legal Description	Total Acreage	Royalty Owner	Royalty %	ORRI Royalty %	Working Interest Owners	Working Interest %	Native Gas Withdrawal Royalty Allocation
391094	1	T. 6 N., R. 11 W., S.M., AK SECTION 32: Surveyed, E1/2 SECTION 33: Surveyed, Lots 5, 6, 8, 9, 13-40 inclusive, E1/2SW1/4SE1/4, and W1/2SE1/4SE1/4	440.00	State of Alaska	12.500	11.00%	AIX Energy, LLC	100	88.00%
Unleased	Unleased	T. 6 N., R. 11 W., S.M., AK SECTION 34: Surveyed, Lots 39, 40, 52, 53, 55, 57-59 inclusive, 79-88 inclusive, and 111-116 inclusive	60.00	State of Alaska	Unleased	Unleased	Unleased	Unleased	12.00%
Total Lease Acreage			500.00				Total Lease	Allocation	100.000000%