Scammon Bay Airport Feasibility Study

April 2024

Alternatives

CFAPT01005 / AIP 3-02-0255-005-2023

Prepared for:

State of Alaska
Department of Transportation & Public Facilities, Central Region
4111 Aviation Ave.
Anchorage, Alaska 99516-6900

Prepared by:

Stantec Consulting Services Inc.
725 E Fireweed Lane, Suite 200
Anchorage, AK 99503

EXECUTIVE SUMMARY

The Central Region of the Alaska Department of Transportation and Public Facilities (DOT&PF) is conducting an airport feasibility study for the Scammon Bay Airport (SCM). The purpose of this project is to improve the safety of aviation infrastructure in Scammon Bay.

The major issue facing the Scammon Bay Airport is flooding, which is destabilizing the airport surface and embankment, submerges the lighting system and navigational aids, and results in airport closures. The closures prevent residents from being able to evacuate during emergencies, access emergency medical services, send or receive mail, or have food and fuel delivered.

This report discusses the alternatives for improving the Scammon Bay Airport. Alternatives include:

- Alternative 1 (“No Action”) is used for comparison purposes and does not resolve the erosion and flooding threats.
- Alternative 2 (“Shift & Raise”) is shifting the runway 340 feet inland along its current alignment as protection from river movement. This alternative includes raising the surface elevation to +19.5 feet and installing erosion protection.
- Alternative 3 (“Near”) is moving the Airport onto the transition between lowlands and the Askinuk Mountains, near the community of Scammon Bay.
- Alternative 4 (“Castle Hill”) is moving the Airport to the valley between Castle Hill and the Askinuk Mountains.
- Alternative 5 (“Ridgeline”) is moving the Airport to the ridgeline above Scammon Bay in the Askinuk Mountains.

Evaluation criteria (i.e. safety, land status, environmental, constructability, utilities, and cost) are used to compare and contrast each alternative.

This report provides the data required to engage in meaningful public involvement. Public involvement is a valued step in the evaluation process and will contribute to the selection of a preferred alternative.

Prior to engaging in public involvement, Alternative 5 (“Ridgeline”) is the cheapest alternative but has the most risk. Wind direction, visibility, and runway alignment is the most uncertain for this alternative. Alternative 2 (“Shift & Raise”) is more expensive, but provides a beneficial mix of operational safety, passenger convenience, limited environmental impact, and cost effectiveness.

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LIST OF ACRONYMS

%	Percent
ADF&G	Alaska Department of Fish and Game
AHRS	Alaska Heritage Resources Survey
AWOS	Automated Weather Observing System
CY	Cubic Yards
DOT&PF	Alaska Department of Transportation and Public Facilities
ESA	Endangered Species Act
FAA	Federal Aviation Administration
Kcgc	Calcareous Graywacke and Conglomerate:
Klgr	Intermediate Granitic Rocks
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
Qs	Unconsolidated Surficial Deposits, Undivided
RSA	Runway Safety Area
SCM	Scammon Bay Airport
USFWS	U.S. Fish and Wildlife Service

1 INTRODUCTION

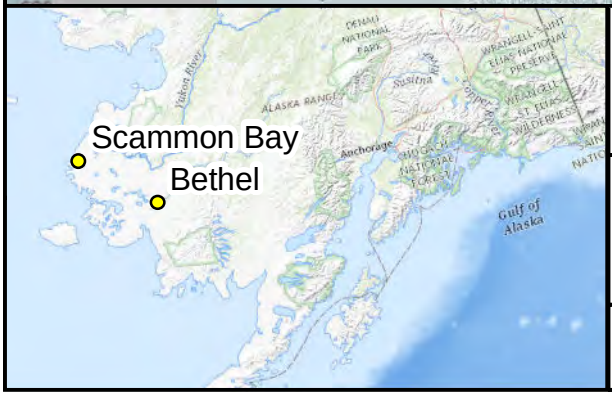
The Central Region of the Alaska Department of Transportation and Public Facilities (DOT&PF) is conducting an airport feasibility study for the Scammon Bay Airport (SCM) (Figure 1-1, 1-2).

SCM is a public DOT&PF-owned Commercial Service – Non-Primary, Community Off-Road airport. SCM has a single, gravel, 3,000-foot-long, 75-foot-wide runway, with medium-intensity runway edge lights.

The major issue facing the Scammon Bay Airport is flooding, which is destabilizing the airport surface and embankment, submerges the lighting system and navigational aids, and results in airport closures. The closures prevent residents from being able to evacuate during emergencies, access emergency medical services, send or receive mail, or have food and fuel delivered.

The Scammon Bay Airport provides the only year-round access to other communities and emergency health care infrastructure. There are no roads connecting Scammon Bay to other communities. During the summer, Scammon Bay is accessible by air and water. Barge service remains an important transportation mode for goods during the summer. During the winter, transportation can occur via air or over snow/ice. Air travel is the only way to reach the hub community of Bethel (150 miles away) throughout most of the year.

To coordinate the community's planning for building resilient aviation infrastructure, the need exists for an airport planning study to review the feasibility of potential alternative locations of an airport and compare them to the current site. This report evaluates potential alternatives for improving the Airport.



SCAMMON BAY
AIRPORT PLANNING STUDY

November 2023

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Figure 1-1: Project Location and Vicinity Map

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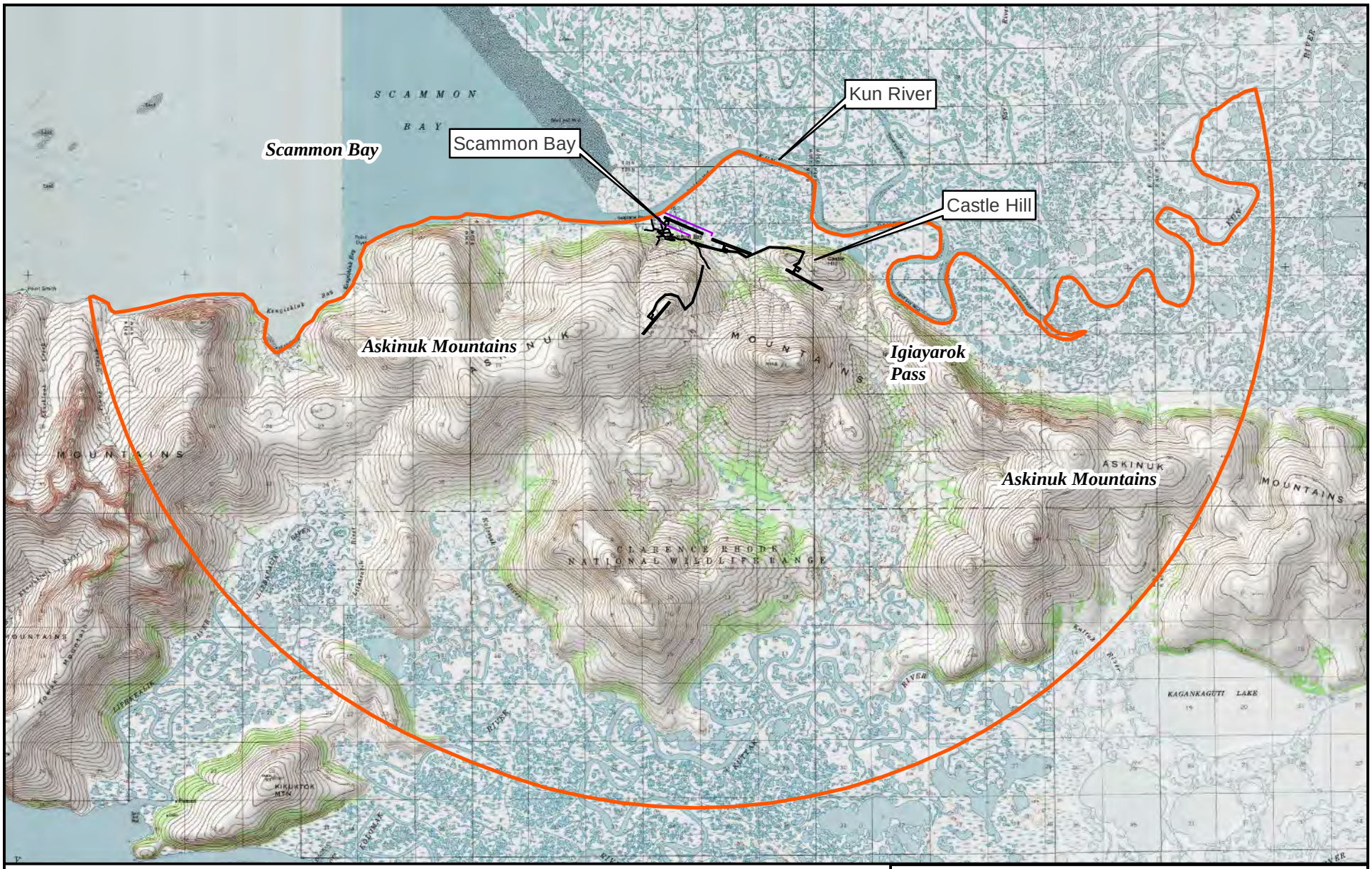

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Study Area
Airport Boundary
Alternatives (2024)
Road

Notes:
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet

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Figure 1-2: Study Area

2 EVALUATION CRITERIA

2.1 Safety and Airport Resiliency

2.1.1 Flooding and Erosion

Flooding of the runway has happened in the past and continues to be a threat to the Airport. HDR published a Coastal Report in 2022 (HDR, 2022a) which recommended that the runway have a surface elevation of 18.5 feet to meet a 50-year storm return period, with a 2 percent (%) Annual Exceedance Probability. The surface elevation of the current runway ranges from 10 to 17.5 feet.

HDR also published a Hydrology and Hydraulics Report in 2022 (HDR, 2022b) which recommended that the runway be shifted inland, by 340 feet along its current alignment, to account for river movement over a 50-year period. This report also recommended construction of a variety of erosion protection measures required to protect the airstrip.

2.1.2 Fog and Low Visibility

Fog and low visibility on the runway can limit an airport's ability to operate. Interviews with air carriers indicated qualitative evidence that the tops of the 1,000-foot Askinuk Mountain ridgelines can have lower visibility than the current Airport, located lower and in the river valley.

Similar observations have been reported at Newtok, where the old airport has more fog-free days than the relocated airport.

In an attempt to provide quantitative evidence for the elevation differences, weather data at SCM was obtained from the SCM Automated Weather Observing System (AWOS). The weather station provides visibility measurements at ground level, as well as cloud coverage elevation data. The AWOS does not provide visibility measurements at other elevations beyond ground level, however the cloud coverage elevation data can be used to make inferences about visibility at elevation. A total of 121,295 hours of AWOS data was analyzed for the period of 2010 through 2023. Weather was reported as fog or low visibility (less than 0.5 miles of visibility) at SCM 0.3% of the time. Weather was reported as overcast or broken conditions 6.7% of the time at 500 feet, and 17% of the time at 1,000 feet (Table 2-1). As a reference, the community of Scammon Bay is about 14 feet in elevation, Castle Hill is about 437 feet in elevation, and the ridges of the Askinuk Mountains are about 1,000 feet in elevation.

Table 2-1 Fog and Low Visibility: SCM 2010 - 2023

Weather	Hours	%
Hours rated as with fog or low visibility (<0.5 miles)	371	0.3%
Hours rated as Overcast or Broken at 100 feet	87	0.1%
Hours rated as Overcast or Broken at 500 feet (Top of Castle Hill)	8,134	6.7%
Hours rated as Overcast or Broken at 1,000 feet (Askinuk Mt. ridges)	20,606	17.0%
Other	92,097	75.9%
Total	121,295	100%

Key:
< – less than
% – percent
AWOS – Automated Weather Observing System
SCM – Scammon Bay Airport

Source: Observations between January 1, 2010, to November 1, 2023, at the SCM AWOS (https://www.mesonet.agron.iastate.edu/sites/locate.php?network=AK_ASOS)

It is important to note the possibility for error in interpreting these data. AWOS reports the bottom of the cloud layer but does not report the cloud layer thickness. In coastal Alaska, thin layers of broken or overcast clouds are common. Such layers may obscure visibility at the reported level but only be tens of feet thick. This situation can lead to conditions where an overcast cloud layer exists at a lower level (e.g., 200 feet) while clear visibility is present at 250 feet or higher (e.g., Castle Hill or Askinuk Mountains). Depending on the frequency of such situations, a higher-elevation alternative may be more feasible than the weather data would lead one to believe, as it is not possible to separate these situations from the rest of the dataset.

Despite these data limitations, the AWOS data do provide some level of quantitative support for the qualitative interview responses. There may be more low-visibility conditions at higher elevation airport alternatives than at lower-elevation airport alternatives.

2.1.3 Wind

Wind data from AWOS is available for SCM for the period of 2013 through 2022. Wind data shows that the current runway has All Weather 90.4% wind coverage for a 13-knot crosswind, and Instrument Weather 87.54% coverage for 13-knot crosswinds. Wind analysis revealed that no orientation of a single runway at SCM can meet the 95% crosswind criterion. The current orientation provides the maximum crosswind coverage that a single runway can obtain at SCM.

For wind coverages where a single runway cannot meet 95% coverage, the Federal Aviation Administration (FAA) recommends development of a crosswind runway or, when terrain does not allow,

increasing the runway dimensions to the next-largest set of requirements. At SCM, terrain makes creation of a crosswind runway cost-prohibitive, and this report recommends construction of the runway meet to the next-largest set of requirements for runway width for all alternatives.

Wind data is highly localized, and it is difficult to predict wind coverage for locations distant from where the data were collected (i.e., the current runway). The topography of the Askinuk Mountains and Kun River valley likely directs wind at orientations similar to SCM for other low, river-bottom alternatives.

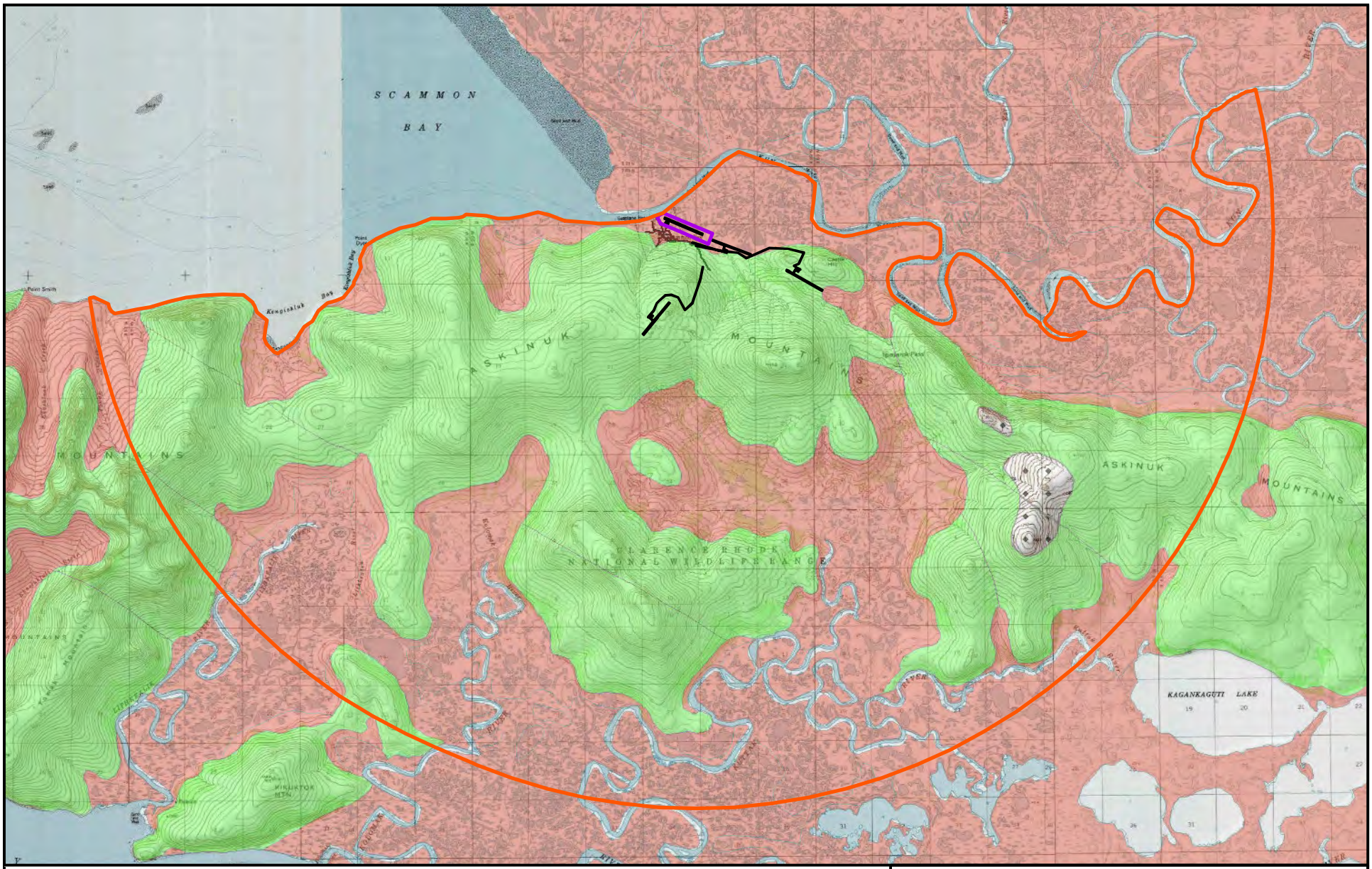
For higher-elevation alternatives, wind data is available for the Scammon Bay area from a third party. In 2017, a wind turbine analysis was completed at Scammon Bay that included wind direction and strength predictions (V3 Energy LLC, 2017). This data was collected at about 200 feet in elevation, next to the solid waste site. The wind turbine analysis report states that there are higher velocity winds at higher elevations, and that the predominant wind direction at higher elevations is different than those found at the current Airport. In the lowlands, the primary winds are from the east, along the current runway alignment. As elevation increases, the primary winds are from the north.

At higher elevations, the pattern of northerly winds creates a fundamental divergence between topography and wind direction for the purposes of airport planning. For medium- and high-elevation runway alternatives, the primary winds are from the north, but the topography rises steeply in that direction. Topography dictates an east/west-oriented runway in most locations, whereas crosswinds dictate a north/south-oriented runway. High-elevation alternatives (e.g., Askinuk Mountains) are located along the tops of ridges, where topography allows for a north/south oriented runway.

2.1.4 Geology and Potential Material Sites

The State of Alaska has mapped the geology of the study area. There are three types of formations in the study area (Figure 2-1, Wilson et al., 2015):

- Kcgc: Calcareous graywacke and conglomerate:
    - Kcgc deposits are located on an isolated location in the eastern part of the study area, likely too far from Scammon Bay to be efficiently developed.
- Klgr: Intermediate granitic rocks:
    - Klgr deposits occur on most of the hills in the study area and have a greater likelihood of being suitable as a material source.
- Qs: Unconsolidated surficial deposits, undivided:
    - Qs deposits occur on the low river valleys and are unlikely to be suitable for material source development.



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Notes:
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet

Study Area
Airport Boundary
Alternatives (2024)
Road

AK Geologic Map

Kcgc: Calcareous graywacke and conglomerate
Klgr: Intermediate granitic rocks
Qs: Unconsolidated surficial deposits, undivided

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Figure 2-1: Geotechnical Conditions

The suitability of "*Klgr: Intermediate granitic rocks*" for production of suitable material, including erosion protection armor stone, is unknown. Field verified geotechnical studies haven't been conducted. The potential exists that local material sources could be used to develop the required erosion protection material, or their functional equivalents. This deserves additional analysis to refine the costs.

2.1.5 Part 77 Surface Penetration

Topographic penetration of protected airspace surrounding the airport (Part 77 surfaces) was calculated for each alternative. This provides a visual representation of the potential hazards to navigation surrounding the airport alternatives.

2.2 Land Status

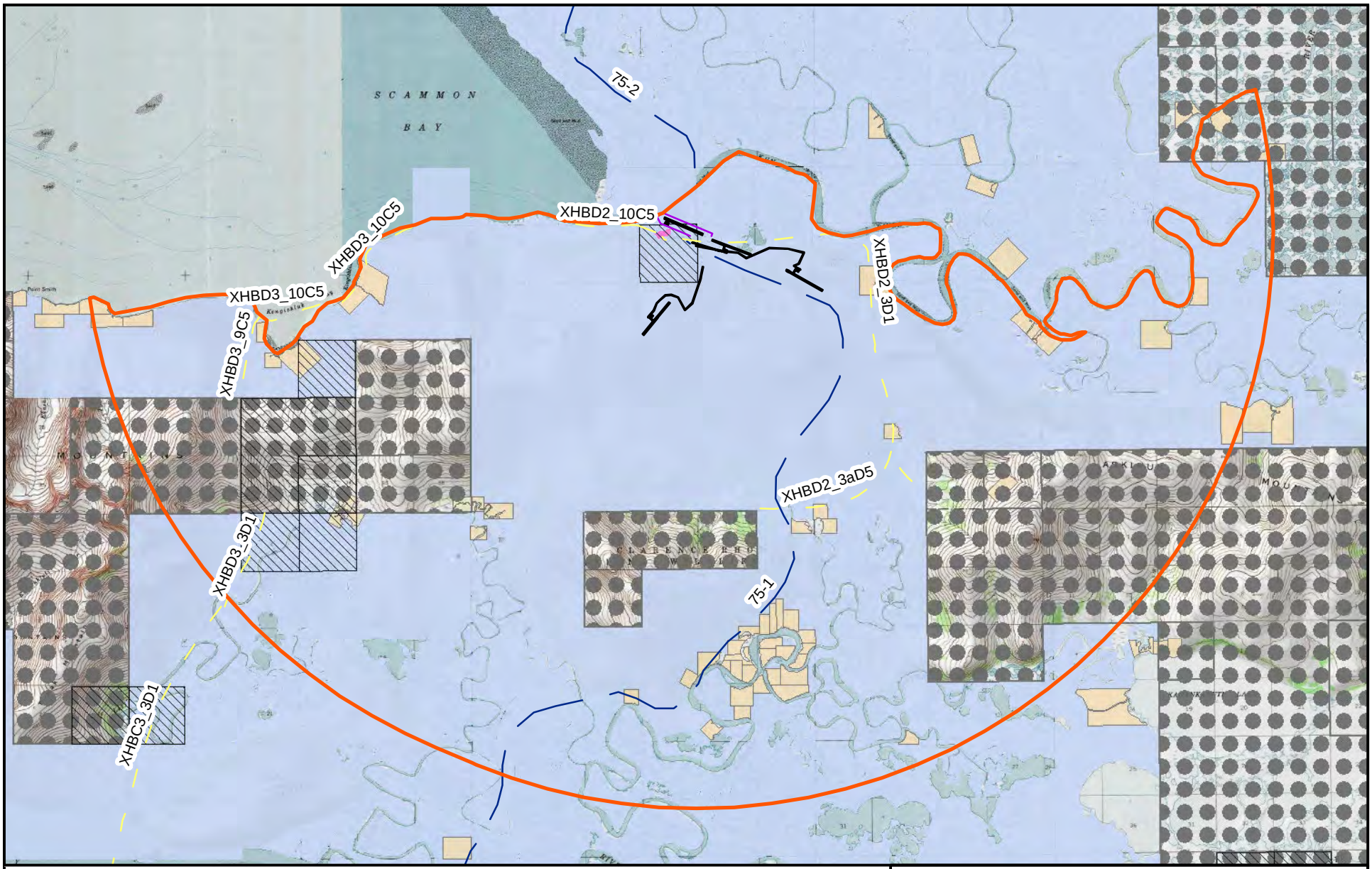
2.2.1 Land Use/Ownership

Land analysis is based on publicly available Bureau of Land Management (BLM, 2023) and State of Alaska databases (ADNR, 2023). Further research is warranted to confirm title and boundaries, and no on-the-ground survey has been conducted.

The majority of the study area is owned by Alaska Native organizations (Figure 2-2), including Askinuk Corporation (surface), and Calista Corporation (subsurface). Alaska Native allotments, which are private lands owned by individuals or their heirs, are interspersed throughout the area. The federal National Wildlife Refuge also owns a significant portion of land. National Wildlife Refuge and Alaska Native allotments were removed from consideration in this report, as they are unlikely to be suitable for airport development.

Multiple RS2477 trails and 17(b) easements exist throughout the area. These easements provide overland access between lands of different ownership types. The project can take advantage of these easements to build access roads (if needed), but the project cannot obstruct overland access for other users. For example, public access to a runway is typically restricted. For runways intersecting RS2477 trails or 17(b) easements, the airport can provide functionally equivalent public access by constructing a public trail around the airport.

Inside of the existing community of Scammon Bay, land use is split between Alaska Native organizations, the State of Alaska, and private lands. There are no local or borough zoning areas.



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Notes:
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- Study Area
- Airport Boundary
- Alternatives (2024)
- 17(b) Easement
- RS2477 Trails
- ANCSA Selected
- National Wildlife Refuge
- Native Allotments
- Private Lands
- Conveyed Native Lands

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Figure 2-2: Land Ownership

Previous planning efforts with the community have revealed that the community would be interested in acquiring the land for the local dock and dock access road, which are currently on Airport property owned by Alaska DOT&PF.

2.2.2 Subsistence Use (Fish, Marine Mammals, Ptarmigan, Migratory Birds, Moose, Bear, Berries)

Local subsistence use information comes from three main sources and is summarized on Figures 2-3 through 2-8. Alaska Department of Fish and Game (ADF&G) provides subsistence harvest and use data for Scammon Bay in two studies from 2013 and 2017 (Ikuta et al., 2016; Godduhn et al., 2020). Huntington, Nelson, and Quakenbush (2017) also provide information from traditional knowledge interviews held with Scammon Bay residents in January 2017 on marine mammals. (The Donlin Mine Environmental Impact Statement [USACE, 2018] also discusses Scammon Bay subsistence based on Ikuta et al., 2016.)

Fish and marine mammals have subsistence activity in areas around waterways such as Scammon Bay, Kun River, and Kuttak River (Figures 2-3, 2-5, and 2-6). The Kun River is also noted summer habitat for young, bearded seal (Huntington et al., 2017). Airport alternative development is not anticipated to impact fish and marine mammals, although some alternatives may require crossing fish bearing streams or the placement of fill in the Kun River.

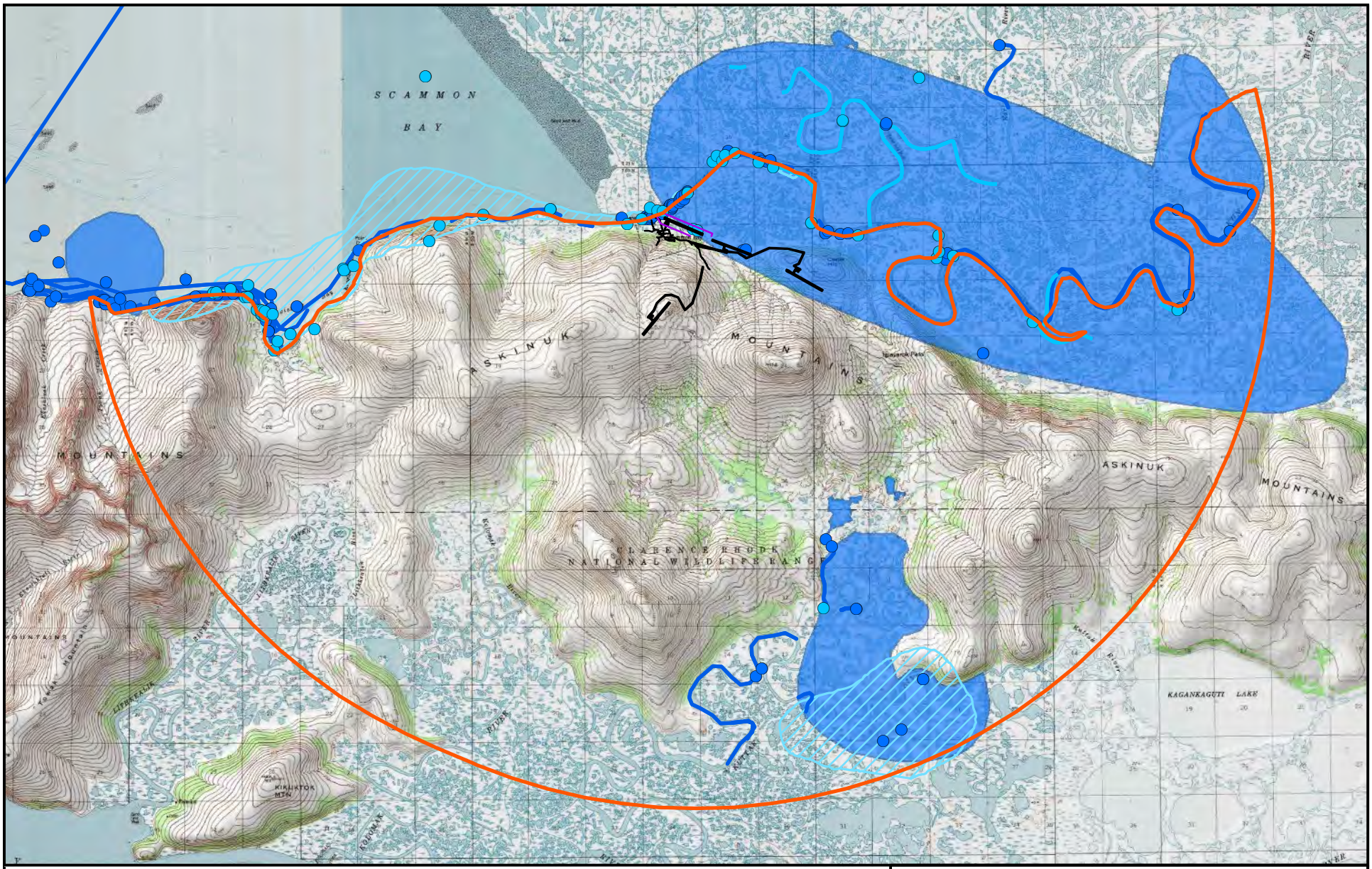
For land resources, subsistence users report high use of moose, migratory and resident birds, berries, and vegetation (Figures 2-4, 2-5, 2-7, and 2-8). Bird species include ptarmigan, grouse, ducks, and geese. Land mammals include moose and black bear. Berries and greens are also important subsistence resources.

2.3 Environmental

2.3.1 Noise

Aircraft approach and depart from the Airport directly adjacent to the community of Scammon Bay. This subjects the community to aircraft noise.

In many rural Alaskan communities, aircraft noise is not seen as a negative impact, but rather as a welcome reminder of the connection to larger hub communities and infrastructure. The noise of incoming aircraft acts as an announcement to community members who are awaiting a departure or a delivery to the community.



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Notes:
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet

- Study Area
- Airport Boundary
- Alternatives (2024)
- Road
- 2013 Subsistence Study
- 2017 Subsistence Study
- 2013 Subsistence Study
- 2017 Subsistence Study
- 2013 Study (Fish)
- 2017 Study

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Figure 2-3: Subsistence: Fishing

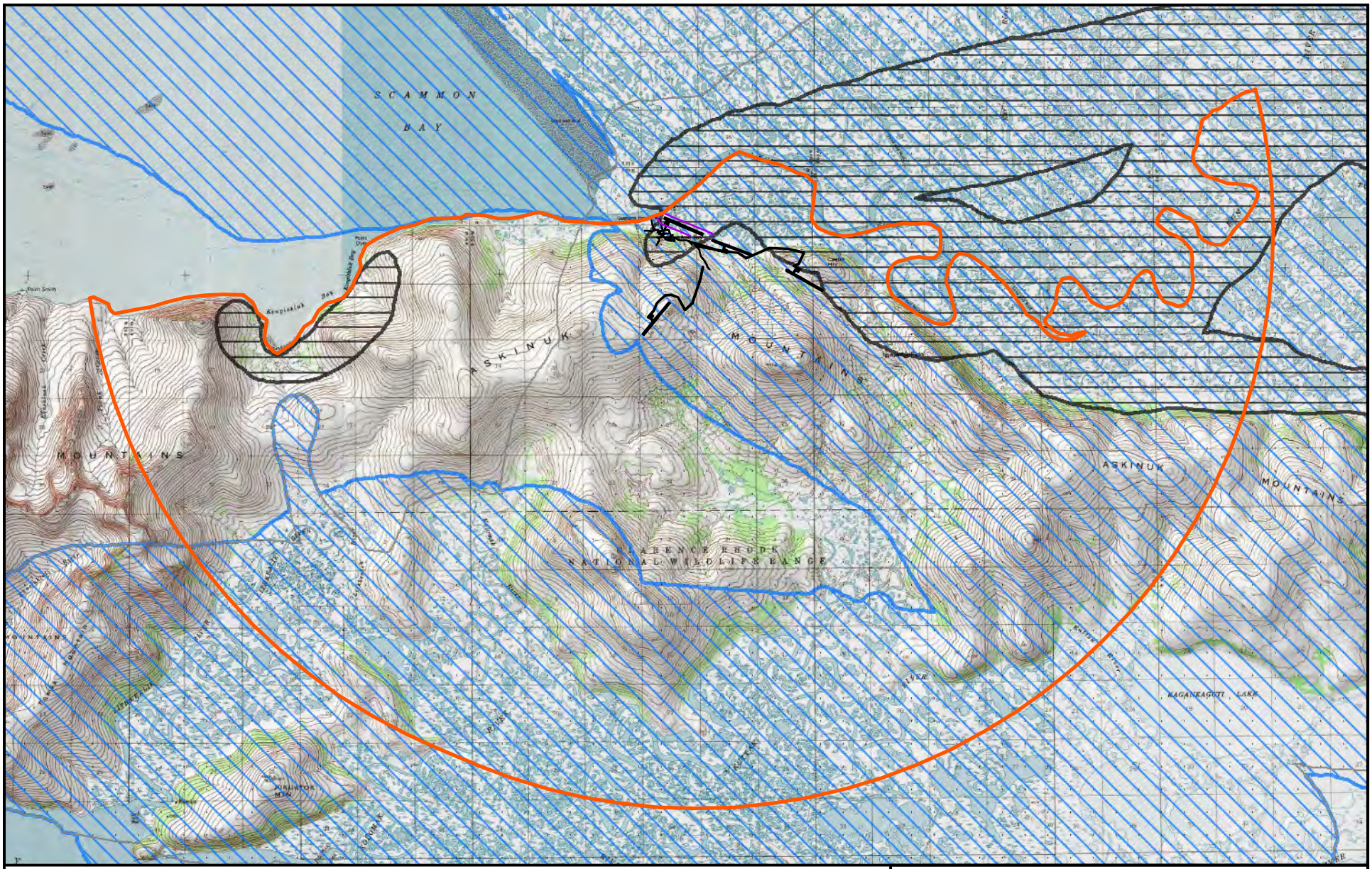

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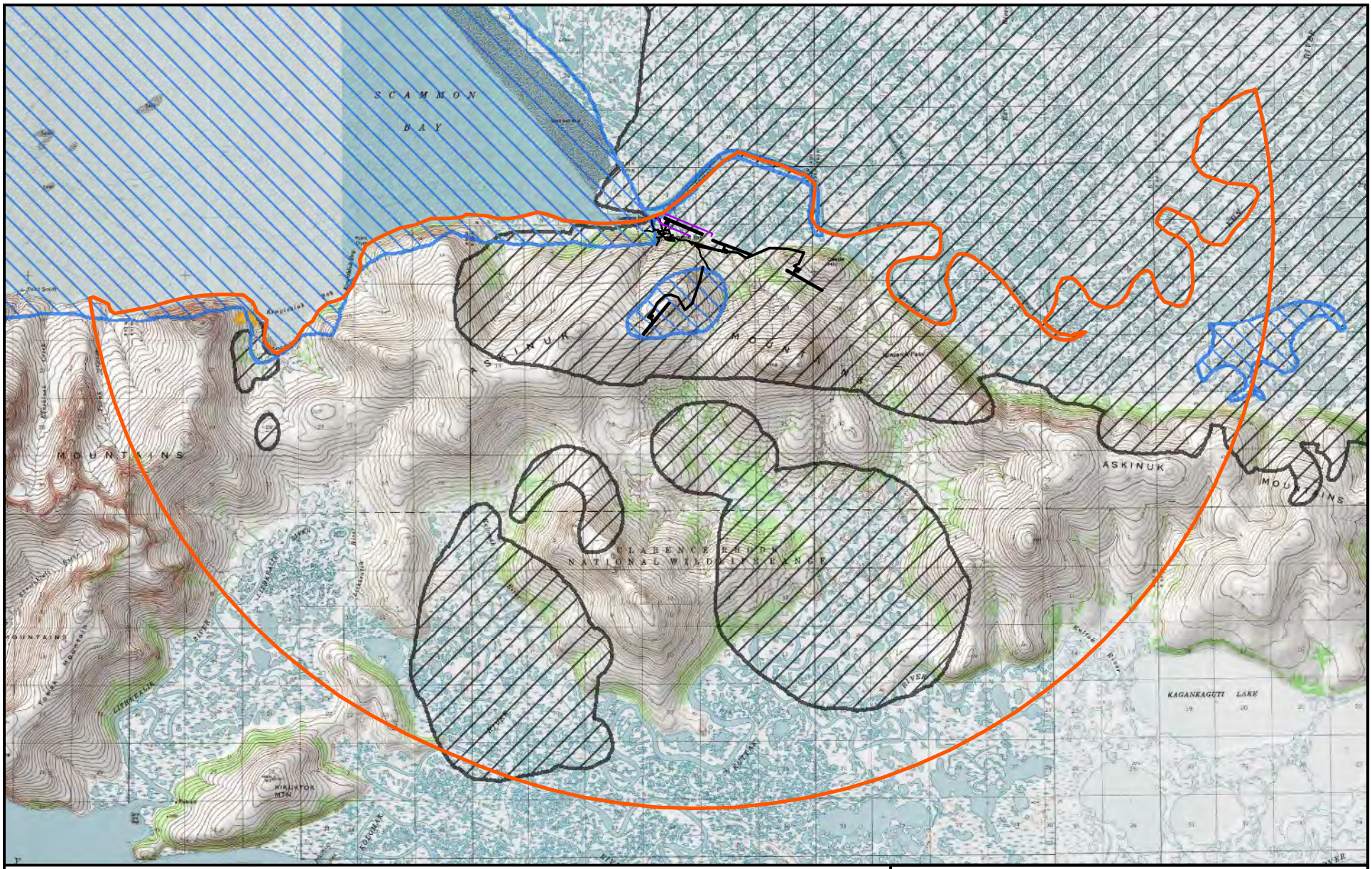
Figure 2-4: Subsistence: Birds, Moose



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Notes:
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet
2. High areas are used for spotting seals in the water

- Study Area
- Airport Boundary
- Alternatives (2024)
- Road

2013 Subsistence Study

- Black Bear
- Berries & Greens
- Seals

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Figure 2-5: Subsistence: Bears, Berries, Seals

Wildlife such as birds, marine mammals, and fish are also subject to potential impacts from aircraft noise. These impacts are likely greater in habitats that attract these species (near the river for marine mammals and fish, or near migratory bird concentration areas [which may include wetlands and riverine habitats).

2.3.2 Wetlands

The Scammon Bay Airport is located in the lowlands between the community and the Kun River. Field-verified wetland mapping is not available for the area, but desktop mapping is provided by Flagstad et al. (2018: Figure 2-9). The quality of this mapping when compared to more recent aerial imagery indicates that areas mapped as uplands may be wetlands. Since this is the best available information, it was used to calculate acreages from access road and airport footprints; but mapping should be updated.

2.3.3 Endangered Species Act

The waterways in the region are listed by the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) as potential habitat for species listed under the Endangered Species Act (ESA). These species include the: fin whale, North Pacific right whale, humpback whale, bearded seal, ringed seal, short-tailed albatross, polar bear, wood bison, spectacled eider, and Steller's eider. Of those species, critical habitat is listed in the area of analysis for polar bear, spectacled eider, and Steller's eider (USFWS, 2023).

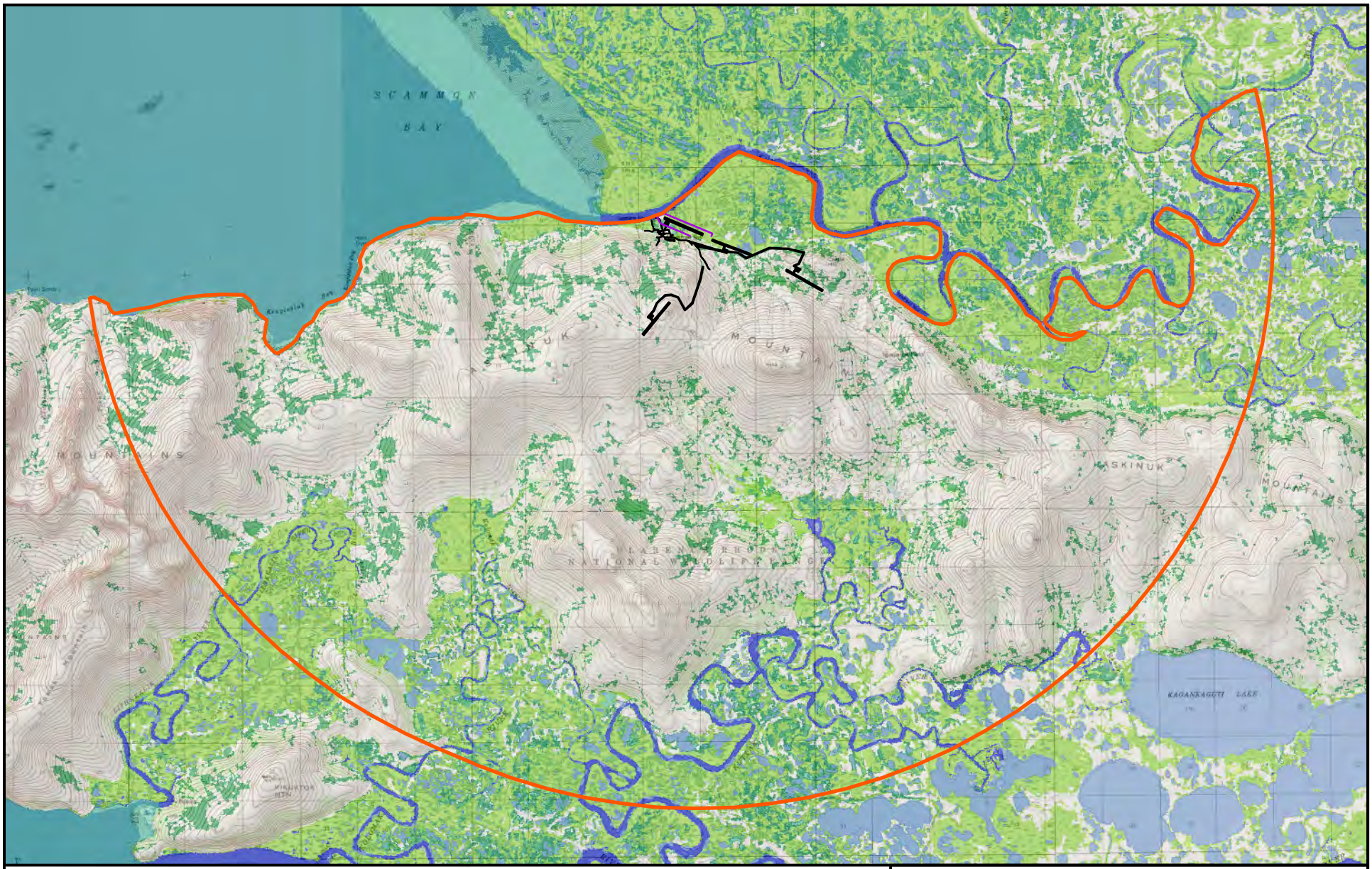
2.3.4 Marine Mammal Protection Act

Most marine mammals protected under the Marine Mammal Protection Act (MMPA) are also protected under the ESA. The species that are not protected under the ESA but that are protected under the MMPA, and that NMFS indicates have habitat adjacent to the Airport, consist of the spotted seal (NMFS, 2023).

Huntington, Nelson, and Quakenbush (2017) report on traditional knowledge interviews held with Scammon Bay residents in January 2017. Interviewees reported the importance and presence of ringed seals, spotted seals, bearded seals, walrus, and beluga whales in the area. The Kun River was reported as important for young, bearded seal summer habitat. Other species reported by interviewees in the region include ribbon seals, sea lions, killer whales, porpoises, and sea otters.

2.3.5 Fish

The Kun River is listed as an Anadromous Water body by the ADF&G for chum salmon, inconnu/sheefish, and whitefishes (Figure 2-10; Giefer and Graziano, 2023).



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Notes:
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Study Area
Road
Airport Boundary
Alternatives (2024)

Vegetation Map

Marine
Marine Wetland
Bryophyte
Emergent Wetland
Forested/Shrub Wetland
Pond; Lake
Riverine
Upland

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Figure 2-6: Wetlands

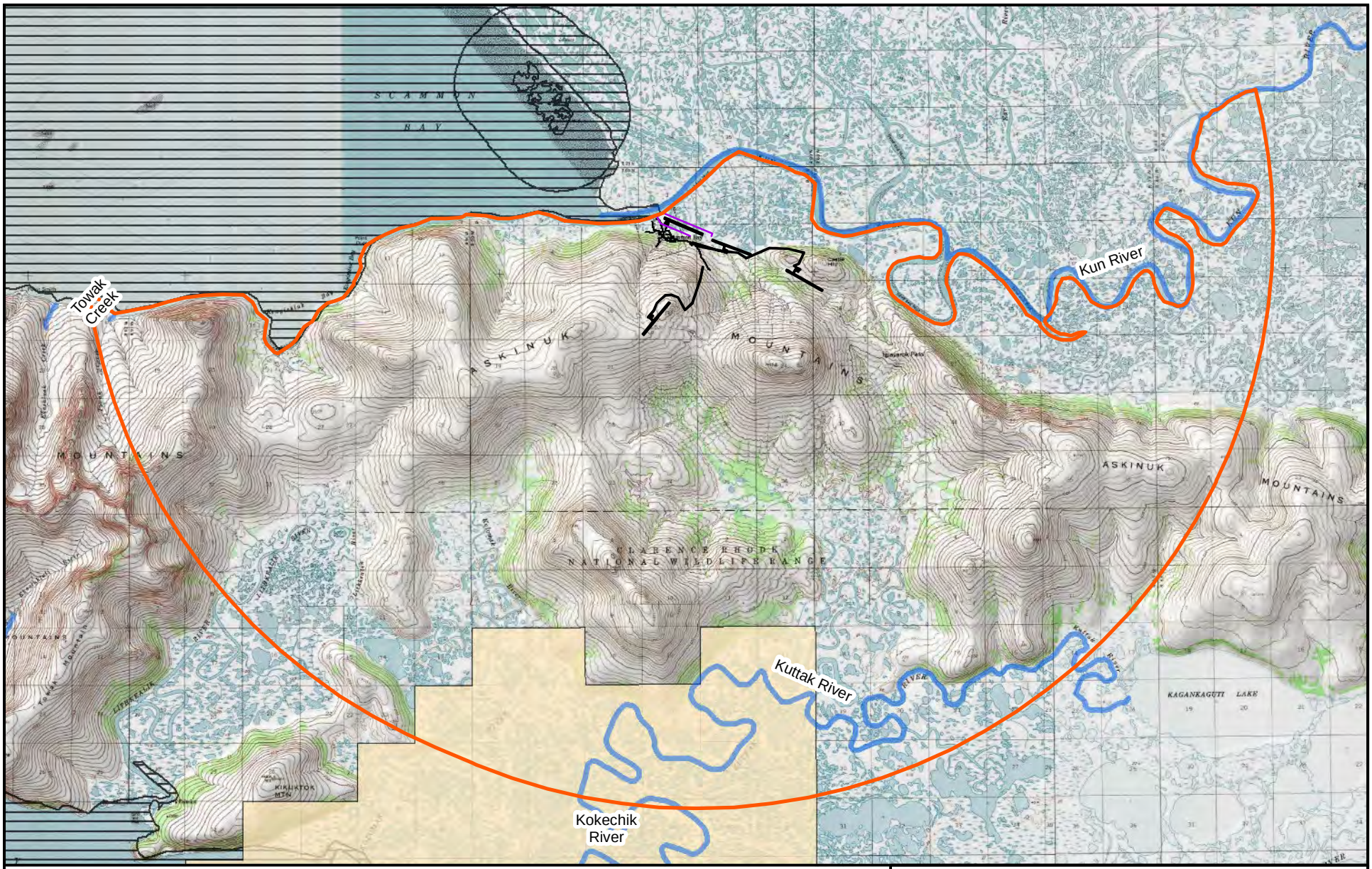

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Figure 2-7: Protected Species

The cross-runway culvert has not recently been sampled to determine if it provides fish habitat. The 1991 Environmental Assessment for the Airport reports that blackfish inhabit the creek flowing under the runway (ADOT&PF, 1991).

2.3.6 Birds

The FAA's Alaska Supplement warns pilots that the runway hosts birds.

The USFWS does not map the locations of vulnerable bird habitat but does provide some generalized area descriptions. This information lists the immediate area around the Airport as being occupied by Black Turnstones, a Bird of Conservation Concern, which is most likely present in May, June, and July (USFWS, 2023).

The USFWS lists the larger Study Area as also hosting birds identified by the USFWS as vulnerable. Species include the Common Eider, Long-tailed Duck, Red-breasted Merganser, and Red-throated Loon (USFWS, 2023).

The USFWS recommends time periods during which to avoid vegetation clearing to reduce consequent impacts to migratory birds (USFWS, 2024). The time period to avoid is most migratory bird nesting is from May 5 through July 25. In areas with Black Scoter, the time period is from May 20 through August 10, and in areas with Canada Geese, the time period is from April 20 to July 25.

2.3.7 Cultural Resources

The State of Alaska maintains the Alaska Heritage Resources Survey (AHRS), a database of cultural resource information. Importantly, this is a listing of known sites. Most of the state is un-surveyed, and the available data does not prove an absence of cultural resources.

No cultural resource fieldwork has been conducted for this alternative analysis.

AHRS data is confidential; therefore, the data are not presented in this report but are discussed in general terms relating to their influence on site selection.

An AHRS polygon covers the entire Scammon Bay community area, including the current Airport. The polygon denotes the entire community area as a listing in the AHRS database—this is a fairly common occurrence for historically occupied communities in this region of Alaska. The runway alternatives that maintain the current location, or shift the runway slightly away from the river, do overlap with this large

polygon. Development of these alternatives would need to incorporate considerations for this cultural resource.

There are no listings in the AHRS database that are located near the other runway relocation alternatives.

2.3.8 Contaminated Sites

The Alaska Department of Environmental Conservation contaminated sites atlas reports two Active and one Cleanup Complete contaminated sites off Airport property (ADEC, 2023). None are located in an area with potential for airport development. While potential contamination plumes are unknown, it is assumed from their topographic position that contamination does not impact the current airport, or proposed alternatives. Any airport operations will help prevent contamination of water and soil by following current regulations, including on fuel storage and handling.

2.3.9 Passenger Convenience

Passenger convenience is greatly increased for an airport located near the community. All of the buildings in the current community are less than 0.7 miles from SCM, as measured from the airport apron to the farthest residential building. This proximity is important, because most residents arrive at the Airport by walking, or in open-air, off-road vehicles. There is no passenger shelter at SCM; during inclement weather, residents listen for the aircraft prior to travelling to the Airport.

Flights also arrive at unexpected times, and residents value the close proximity of the Airport to be able to adapt to flight schedules. The air carrier-reported data for 2022 indicate that Grant Aviation and Ryan Air completed 89% and 70% of their scheduled flights, respectively (USBTS, 2023). Flight radar tracking data indicate that only 19% of scheduled flights to Scammon Bay were completed between October 7 and December 7, 2023 (FlightRadar24.com). This disparity may come from different data collection methods (U.S. Bureau of Transportation Statistics data is air carrier self-reported, Flight Radar data is from third party air traffic monitoring), but it illustrates uncertainty regarding the reliability of air service at SCM.

SCM is also a center for a large quantity of freight and mail. These are unloaded onto the apron, often by local residents, who transport the freight and mail directly to the community. A distant airport is likely to create additional hurdles to mail and freight handling, as fewer residents will be present to offload the aircraft and transport the materials into town.

2.4 Constructability

2.4.1 Constructability

SCM provides the only year-round access to other communities and emergency health care infrastructure and plays a vital role in the daily life of the residents of Scammon Bay. Closure of the Airport due to construction prevents residents from being able to access emergency medical services, as well as prohibits the delivery of food, medical supplies, and fuel.

Consequently, air service must remain uninterrupted during construction. For alternatives located on, or adjacent to, the current runway, this may include partial runway closures, nightly closures, half-width runway operations, and reduced-length runway operations. The different elevations of partially-raised runways must be considered during design, as they may prevent safe runway operations (aircraft cannot land immediately adjacent to a large topographic change in the runway).

2.4.2 Solid Waste Disposal Sites

The FAA recommends solid waste facilities be located 5,000 feet from a runway. The current Airport is 3,560 feet from a solid waste facility and 550 feet from the sewage lagoon.

2.5 Materials

2.5.1 Material Source

Material source(s) are one of the primary cost drivers of construction. The relative cost of material is lower if a local material site is developed. The exact location of a local material site is currently unknown, as coordination will need to take place to understand local preferences. The alternative to a local material source is barging in material from outside of Scammon Bay, which has higher relative costs. Planning level cost estimates for local and barged-in material are incorporated into the cost estimate for comparison.

Land surface and subsurface ownership in the area is primarily by Alaska Native organizations. In the past, local residents in Scammon Bay have been against the use of their existing material source for large projects.

If the local organizations support the airport improvement project, local material site development may be possible. Development of a local material site would decrease the cost and increase the likelihood for the project to proceed.

If a local material source were developed, material source location would be important. Material sources close to the proposed development are cheaper than material sources distant from proposed development. Material sources would most likely be developed in *Klgr: Intermediate granitic rocks*, because *Qs: Unconsolidated surficial deposits* are likely to be low-quality material (Figure 2-1).

2.6 Utilities

The Airport requires power to operate the runway lights. The Airport also utilizes local telecommunications to provide weather reporting and other information. Both of these utilities are based in Scammon Bay. There is no refueling that occurs at the airport currently, and none is anticipated for the future. An airport in close proximity to Scammon Bay will have minimal utility expense, while a distant airport will need to build utilities from Scammon Bay to the airport.

2.7 Cost

A planning level cost estimate was developed to estimate the cost to build each alternative. The primary driver of cost is the cubic yards of material required to build the infrastructure. The quantity of material required is directly related to the topographic elevation changes that must be leveled to develop a suitable airport, access road, and similar infrastructure.

The cost for each cubic yard of material is directly related to the development of local material, or barged material (Table 2-2). Excavated materials will be used to build the embankment (as suitable). The cost for excavation, borrow, subbase, and crushed aggregate was developed from research into other project pricing. The price for armor stone and underlayer stone came from estimates at Nome of between $150 – 175/ton, not including barging. The price for barging materials was developed from contractors who have worked in Scammon Bay, and estimated barging of materials to Scammon Bay as $90-100/ton.

Table 2-2 Cost Assumptions

Factor	Cost
Local Material	
Unclassified Excavation	$20/cy
Borrow	$40/cy
Subbase	$75/cy
Crushed Aggregate Surface Course	$70/ton
Primary Armor Stone, Class I	$186/ton
Underlayer Stone, Class I	$164/ton
Barged Material	
Unclassified Excavation	$20/cy
Borrow	$133/cy
Subbase	$175/cy
Crushed Aggregate Surface Course	$140/ton
Primary Armor Stone, Class I	$286/ton
Underlayer Stone, Class I	$264/ton

Access roads are assumed to be 24 feet top width, 4:1 side slopes, and 4 – 6 feet for ditches for a total of an 80 feet wide for a disturbance footprint.

A 25% design contingency was added for each estimate, which includes drainage improvements and muck excavation.

The estimates include 22% Construction Engineering and 7% Indirect Cost Allocation Plan.

Erosion protection is originally detailed in HDR (2022a). HDR provided a range of alternatives, the medium price alternatives ranged between $15 - $33 million. The cheapest option, the marine mattress embankment armor, was discarded due to risk of use in icing conditions. Stantec estimated the cost for embankment armor using primary armor stone and underlaying stone.

The purchase of new land was estimated by DOT&PF to be $1,000 per acre, with the assumption that the existing airport land of (87.5 acres) will be exchanged at a 1:1 ratio for new acreage, if the old airport land is not required for the new alternative.

The cost to maintain long airport access roads in rural Alaska is very difficult to estimate. DOT&PF uses individual local contractors to maintain rural airports, and an average cost for 8 airports in the region is $26,822/year. Airports with access roads up to 2 miles are about $40,000/year. DOT&PF generally does not provide maintenance of long access roads to communities, and FAA generally does not provide funding for construction access roads that are not solely for the airport. For alternatives with long access

roads, the community would need to maintain access, particularly in the winter. This would come with a large financial burden, as communities generally don't have these capabilities.

2.8 Public Opinion

Public opinion is an important element to infrastructure planning. Alternatives will be presented to the community, and input will be incorporated into the design.

3 ALTERNATIVES

Five alternatives were evaluated.

Alternative 1 is the No Action Alternative.

Alternative 2 ("Shift & Raise") is to shift the runway longitudinally 340 feet inland to provide additional protection from river movement, raise the Runway Safety Area (RSA) edge elevation to +19.5 feet, and install erosion protection.

Alternative 3 ("Near") is to move the Airport onto the transition between lowlands and the Askinuk Mountains, near the community of Scammon Bay.

Alternative 4 ("Castle Hill") is to move the Airport into the valley between Castle Hill and the Askinuk Mountains.

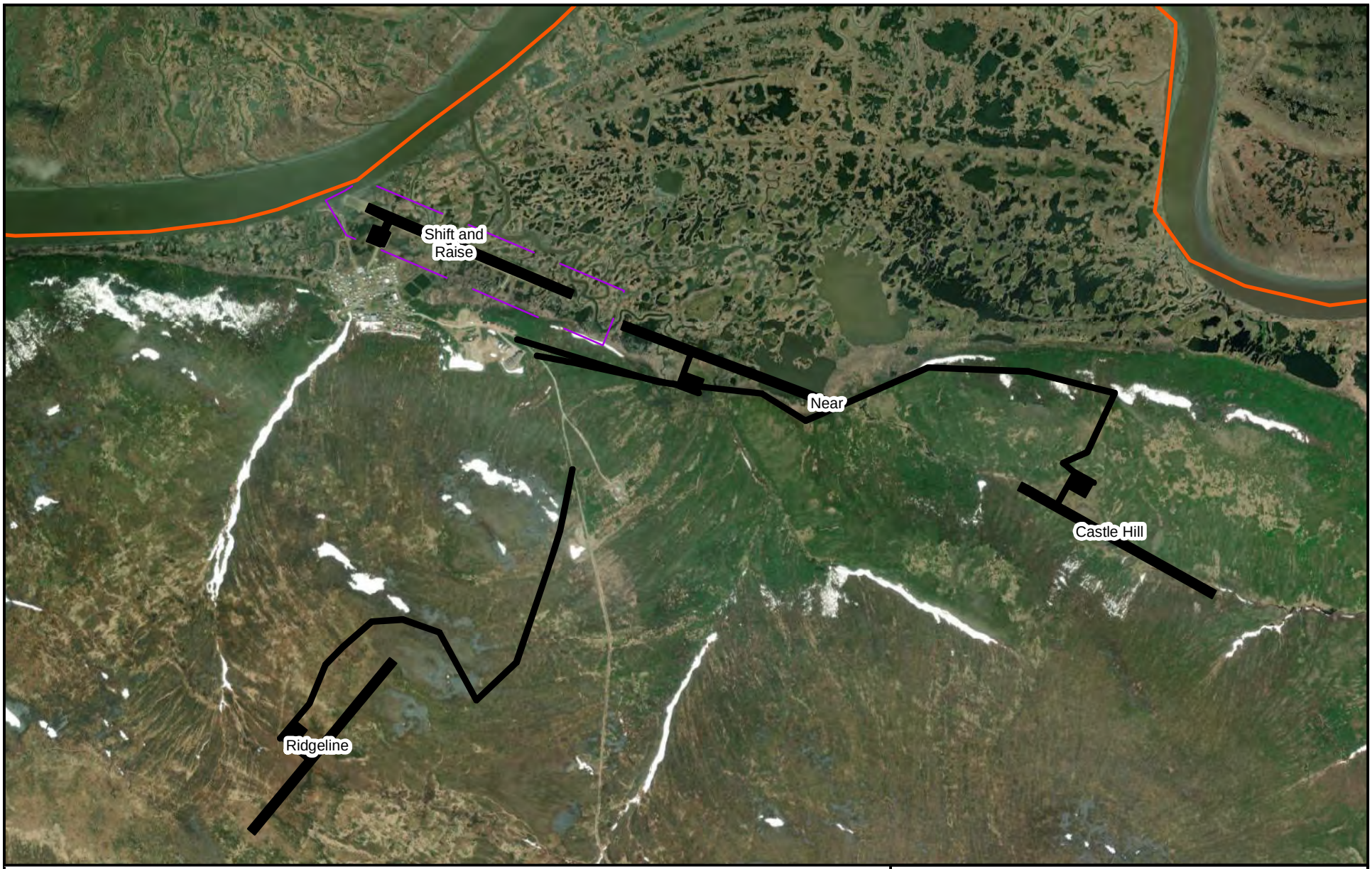
Alternative 5 ("Ridgeline") is to move the Airport on to the ridgeline above Scammon Bay in the Askinuk Mountains.

Figures 3-1 and 3-2 provide the alternatives and alternative design.

Table 3-1 summarizes each alternative against the evaluation criteria.

Detailed cost estimates are in Appendix A.

Maps for each of the alternatives are provided for each screening criteria where the previous maps were at too large of a scale to provide detailed analysis (Figure 3-3 to 3-10).



N

0 0.15 0.3 Miles

1:27,972 (At original document size)

Notes:
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet

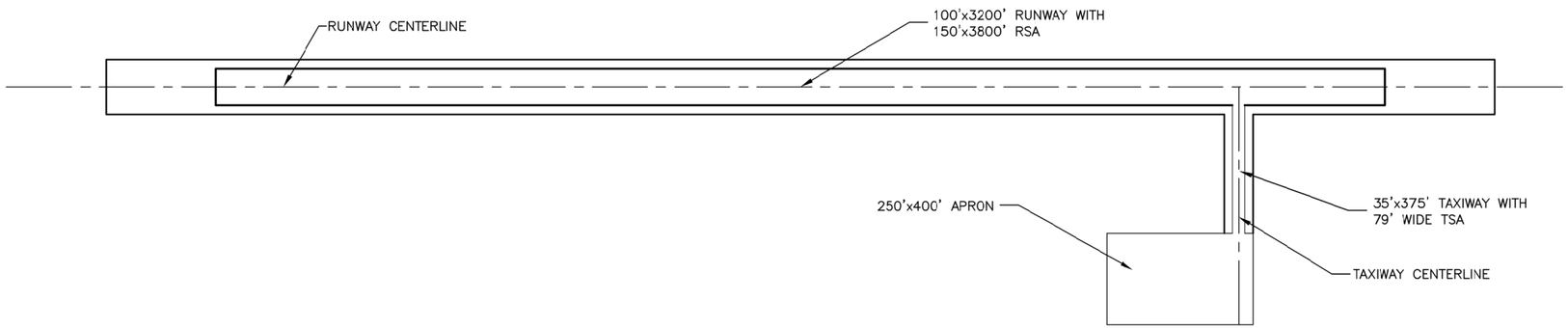
Study Area
Airport Boundary
Alternatives (2024)

SCAMMON BAY
AIRPORT PLANNING STUDY

STATE OF ALASKA
Department of Transportation and Public Facilities
4111 Aviation Ave, Anchorage, Alaska 99516

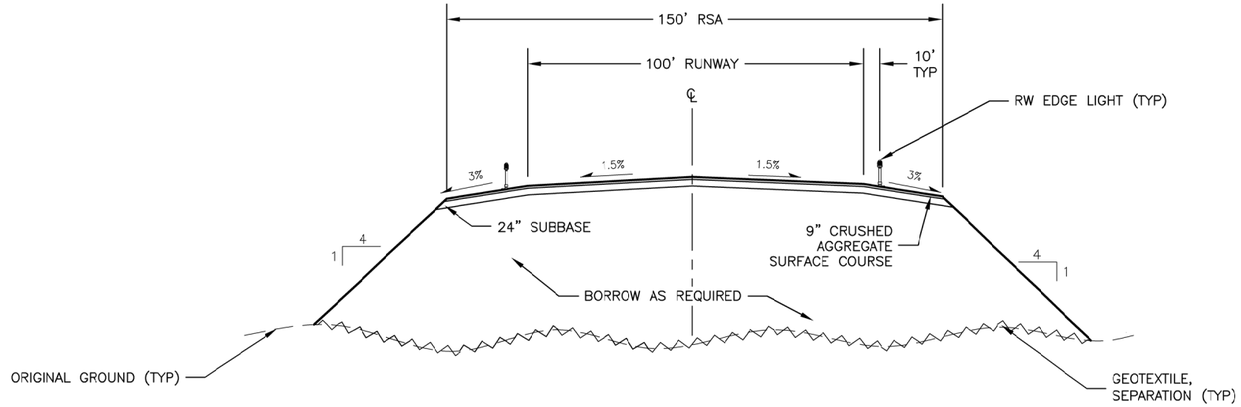
April 2024

Figure 3-1: Alternatives



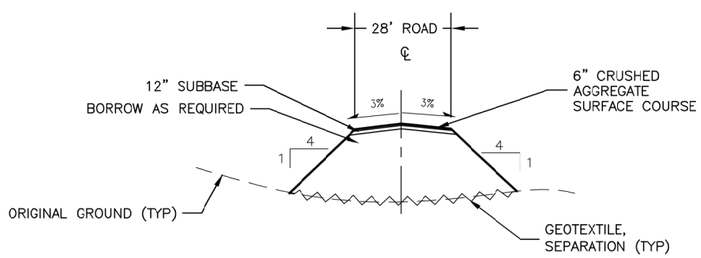
1 SCAMMON BAY AIRPORT ALTERNATIVES – AIRPORT PLAN

SCALE: NTS



2 RUNWAY SECTION

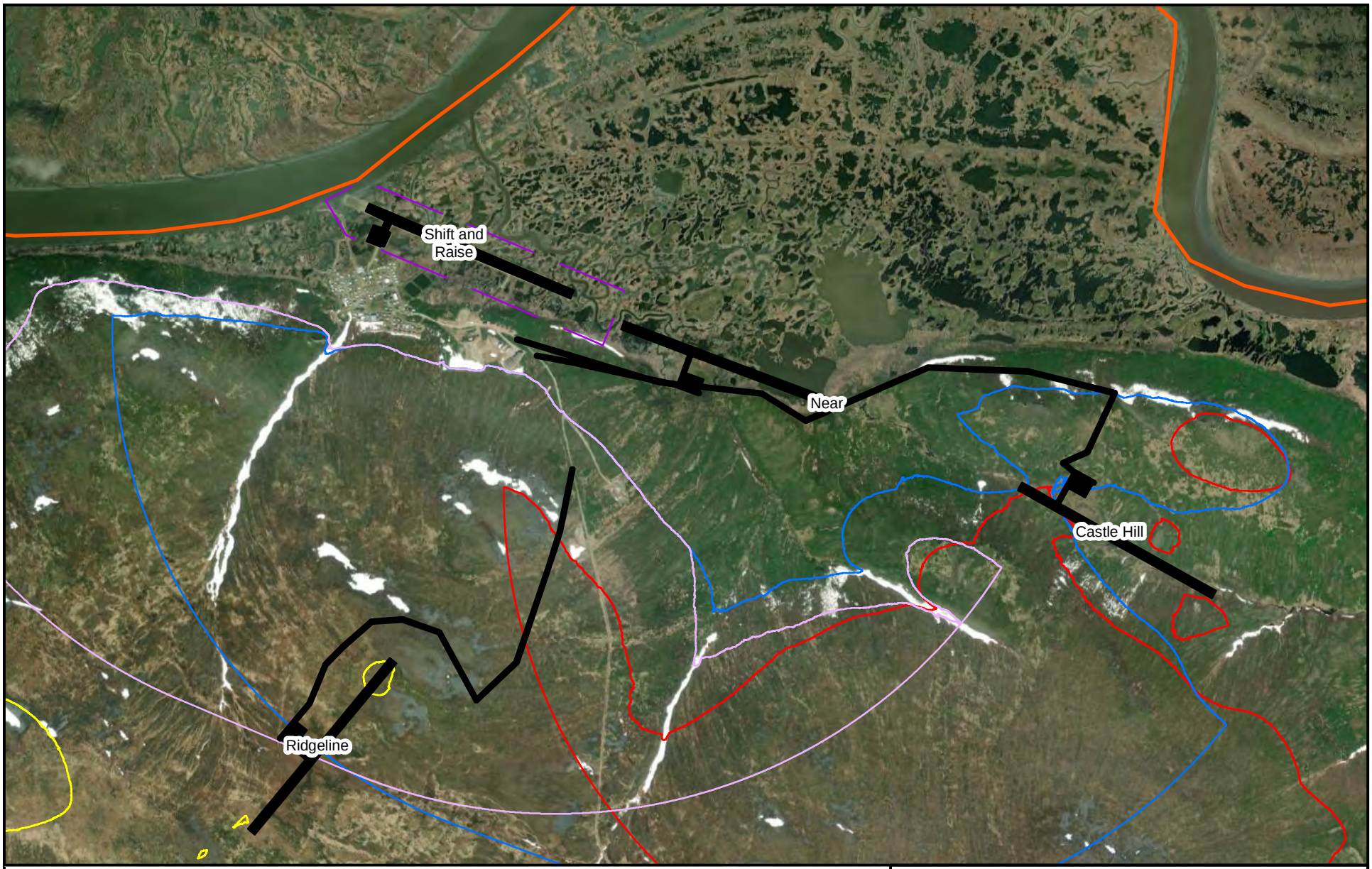
SCALE: NTS



3 ROAD SECTION

SCALE: NTS

Figure 3-2 Alternative Design



N

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1:27,972 (At original document size)

Notes:
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet

Study Area
Airport Boundary
Alternatives (2024)

Part 77 Penetrations
Shift & Raise
Near
Castle Hill
Ridge

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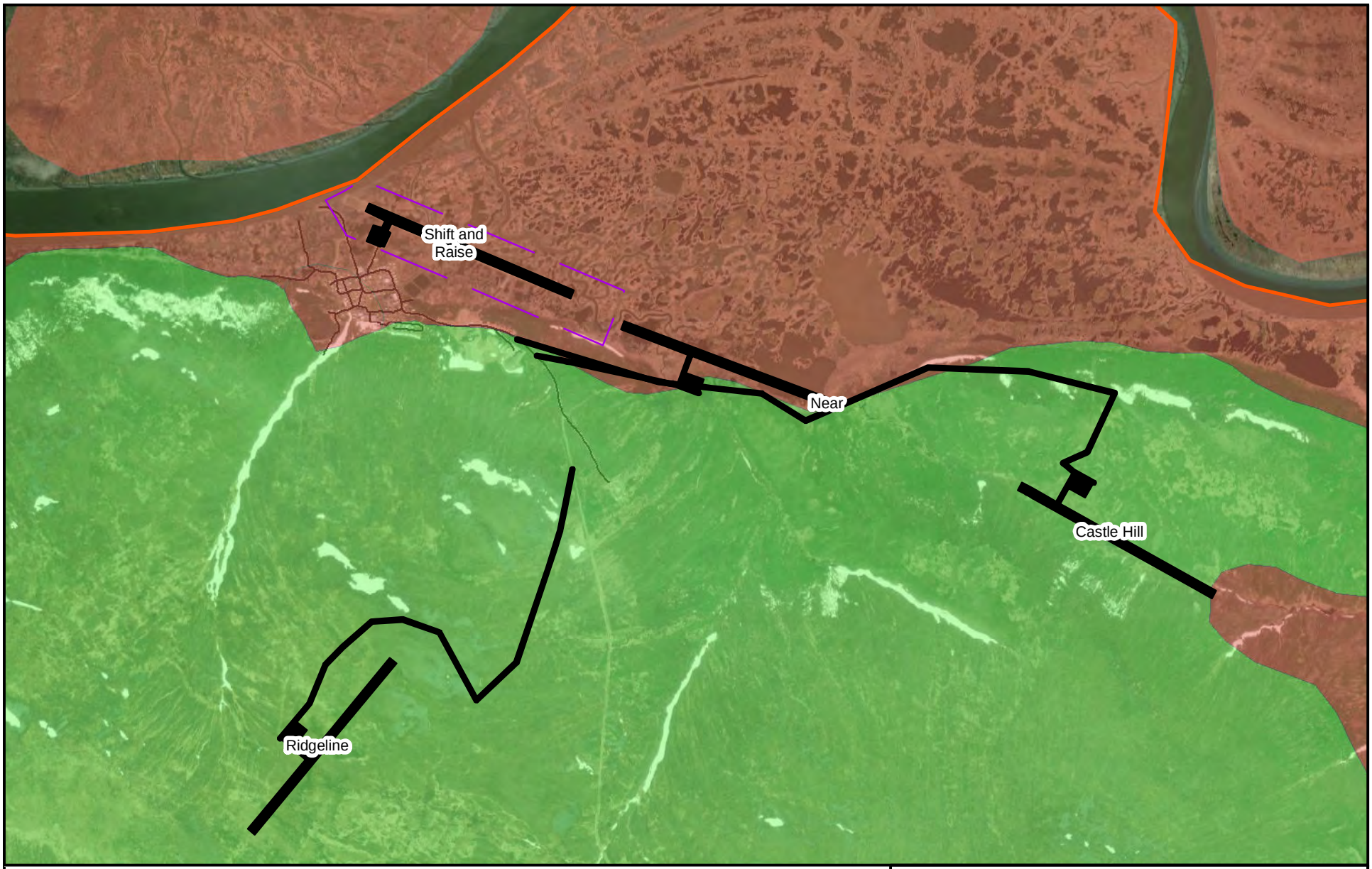
Figure 3-3: Part 77 Airspace Penetrations



N

0 0.15 0.3
Miles

1:27,972 (At original document size)

Notes:
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet

Study Area
Airport Boundary
Alternatives (2024)
Road

AK Geologic Map
Klgr: Intermediate granitic rocks
Qs: Unconsolidated surficial deposits, undivided

SCAMMON BAY
AIRPORT PLANNING STUDY

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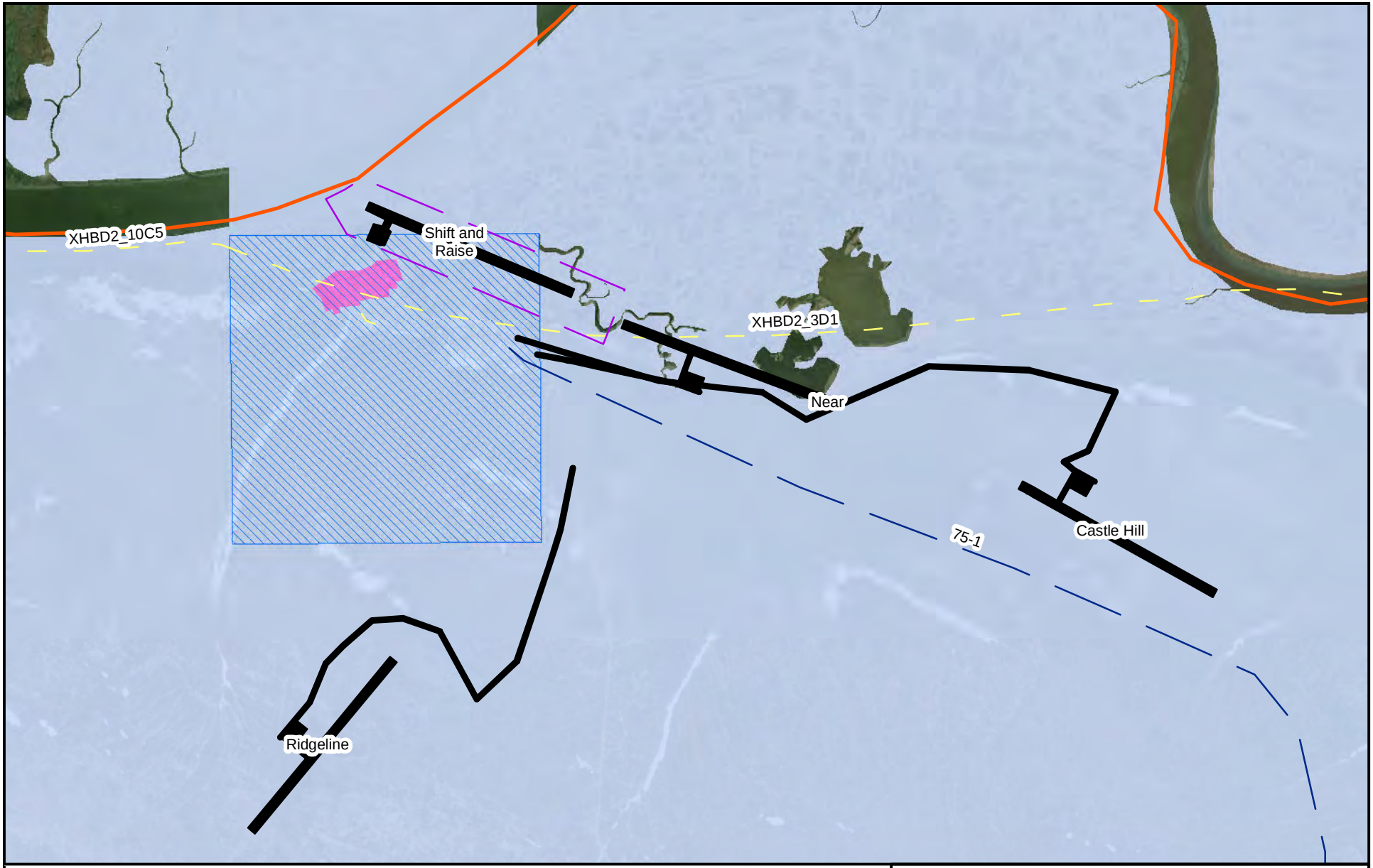
Figure 3-4: Alternatives: Geotechnical Conditions



N

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1:27,972 (At original document size)

Notes:
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet

Study Area
Airport Boundary
Alternatives (2024)
17(b) Easement
RS2477 Trails
ANCSA Selected
Private Lands
Conveyed Native Lands

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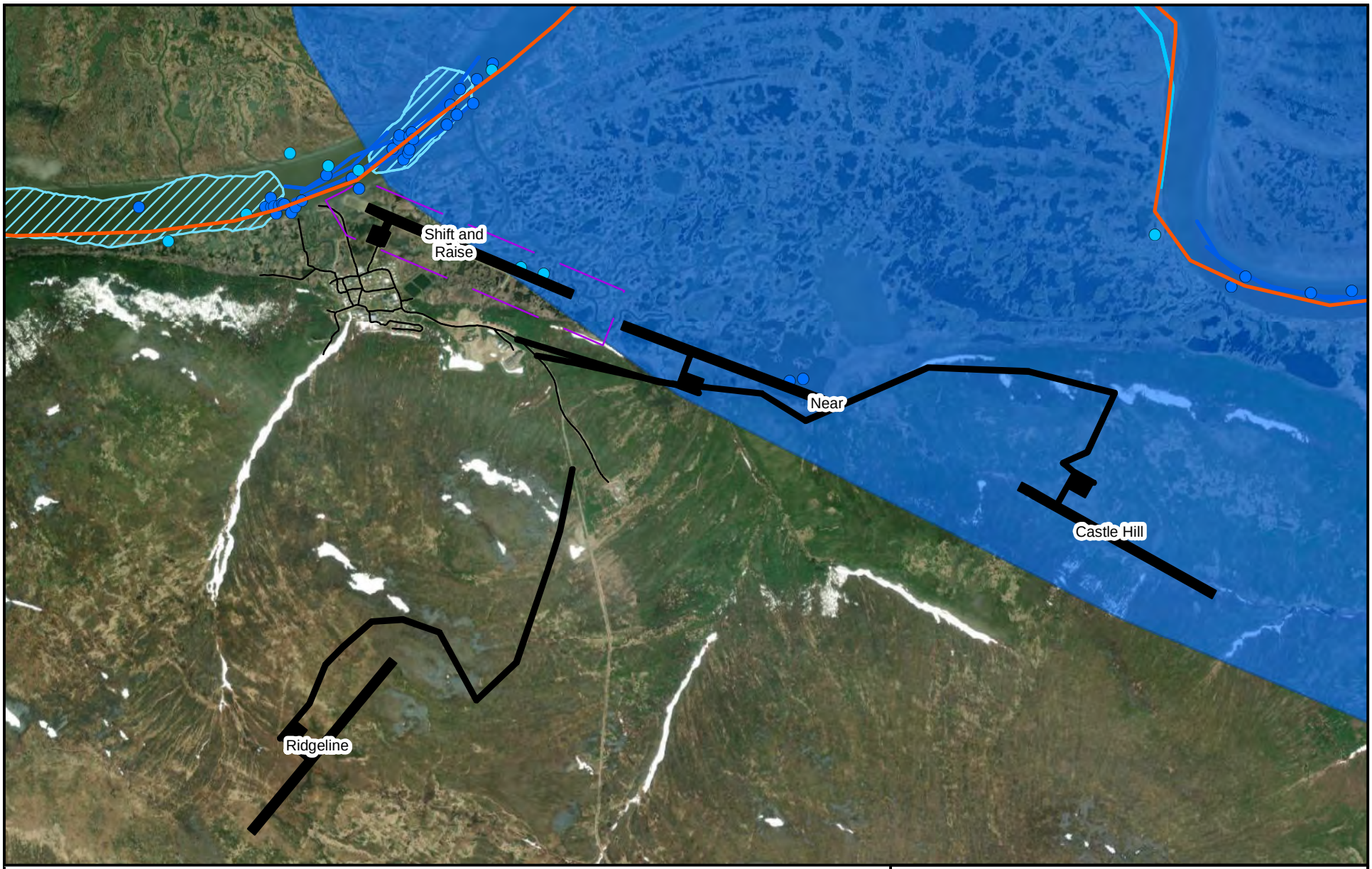
Figure 3-5: Alternatives: Land Ownership



N

0 0.15 0.3 Miles

1:27,972 (At original document size)

Notes:
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet

Study Area
Airport Boundary
Alternatives (2024)
Road
2013 Subsistence Study
2017 Subsistence Study
2013 Subsistence Study
2017 Subsistence Study
2013 Study (Fish)
2017 Study

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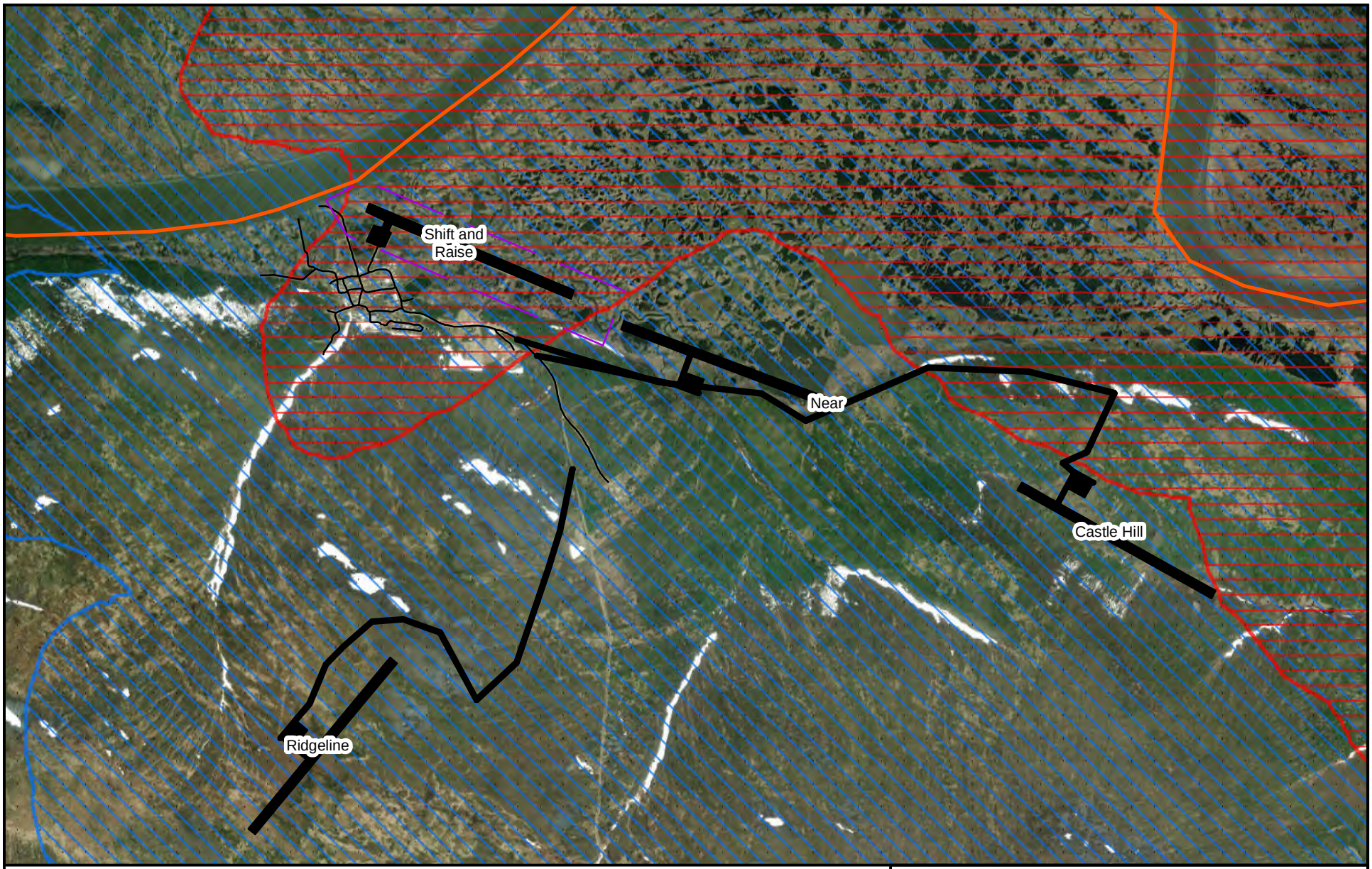
Figure 3-6: Alternatives: Subsistence: Fishing



N

0 0.15 0.3 Miles

1:27,999 (At original document size)

Notes:
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet

Study Area
Airport Boundary
Alternatives (2024)
Road

2013 Subsistence Study
Ptarmigan & Grouse
Ducks & Geese
Moose

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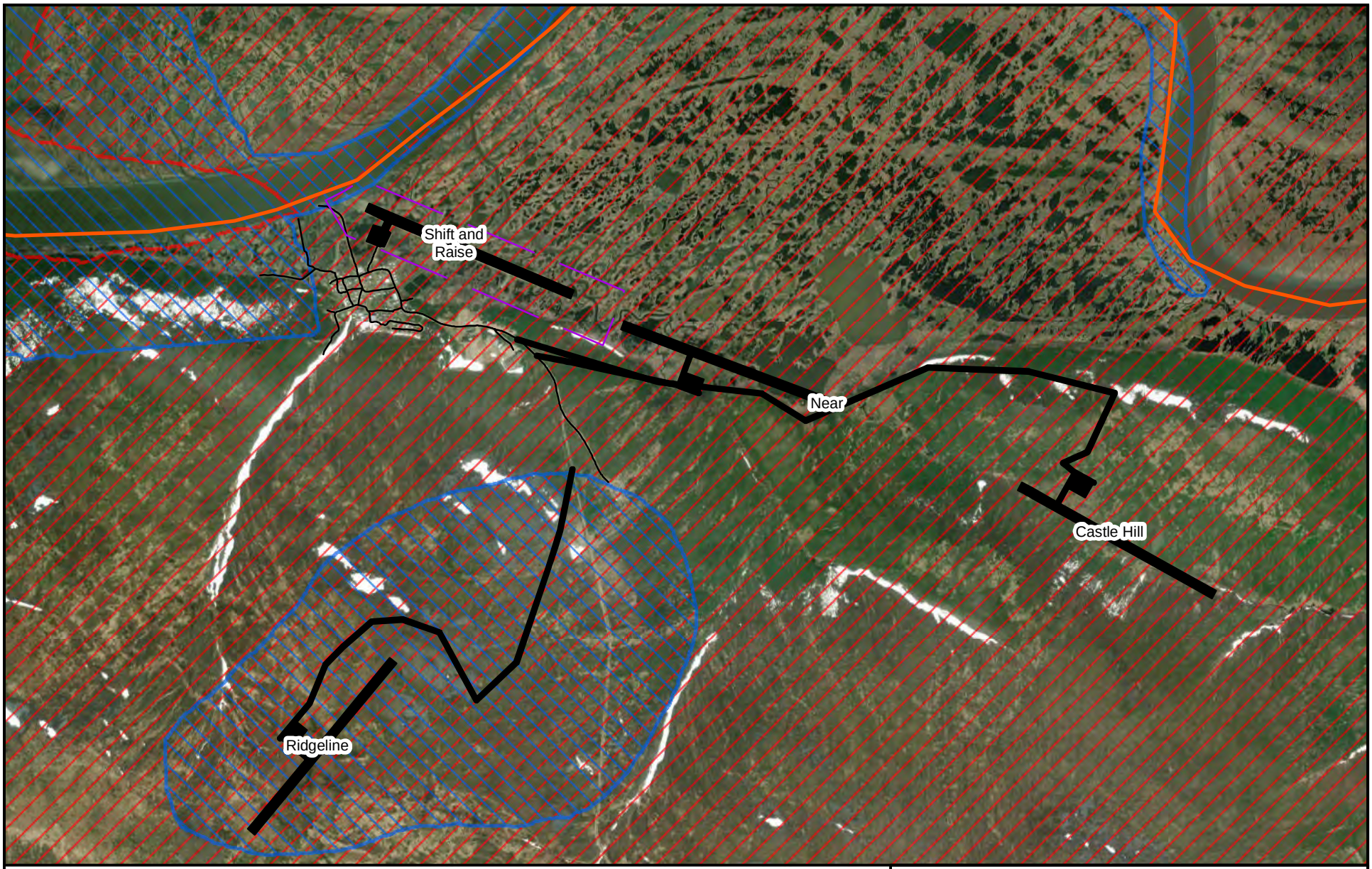
Figure 3-7: Alternatives: Subsistence: Birds, Moose



N

0 0.15 0.3 Miles

1:27,972 (At original document size)

Notes:
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet
2. High areas are used for spotting seals in the water

Study Area
Airport Boundary
Alternatives (2024)
Road

2013 Subsistence Study
Berries & Greens
Seals

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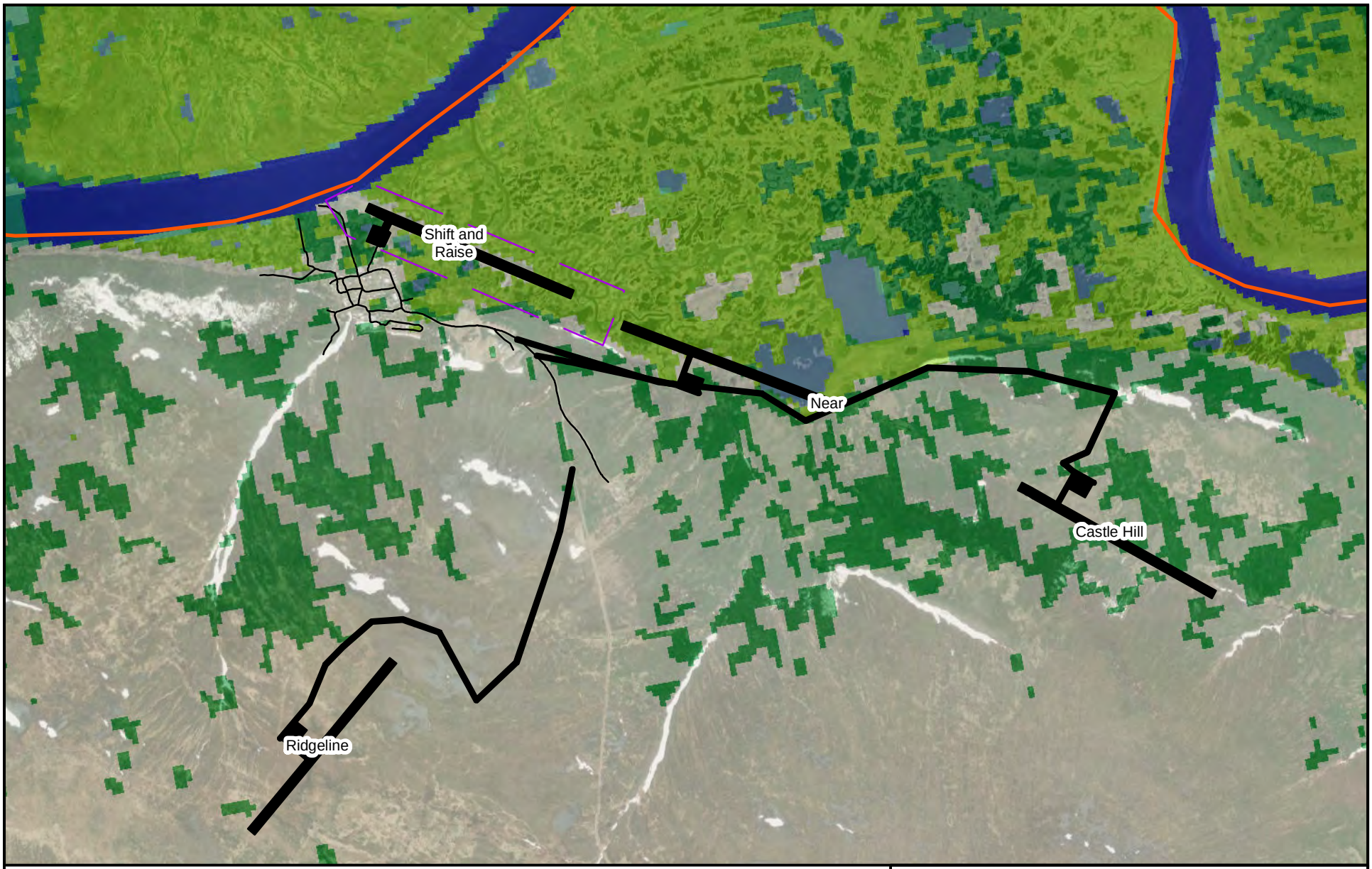
Figure 3-8: Alternatives: Subsistence: Bears, Berries, Seals



N

0 0.15 0.3 Miles

1:27,972 (At original document size)

Notes:
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet

Study Area
Road
Airport Boundary
Alternatives (2024)

Vegetation Map
Marine
Marine Wetland
Emergent Wetland
Forested/Shrub Wetland
Pond; Lake
Riverine
Upland

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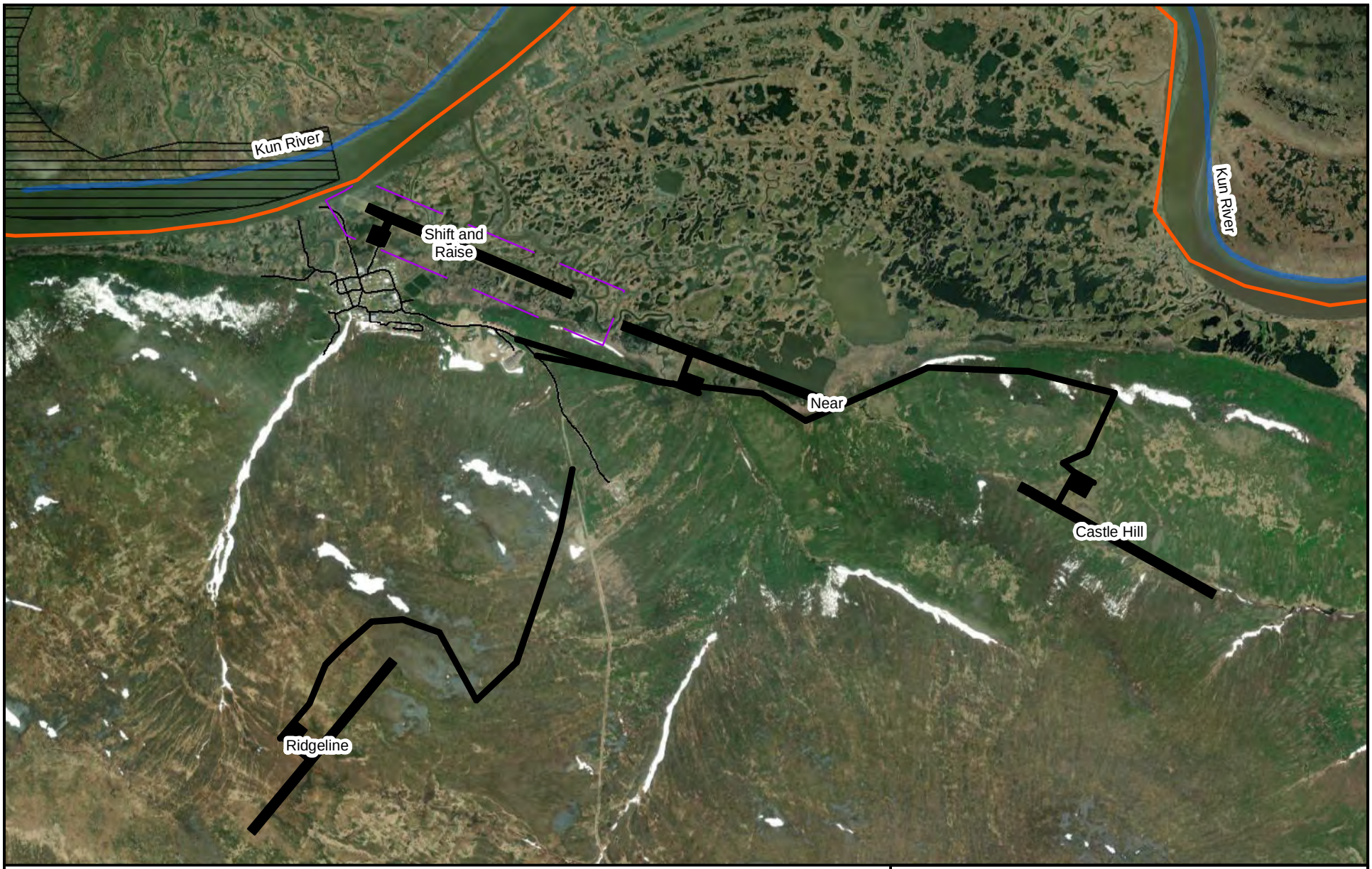
Figure 3-9: Alternatives: Wetlands



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1:27,972 (At original document size)

Notes:
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet

- Study Area
- Airport Boundary
- Alternatives (2024)
- Road
- Anadromous Waters
- Polar Bear Critical Habitat

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Figure 3-10: Alternatives: Protected Species

Table 3-1 Alternative Evaluation

Evaluation Factor	1: No Action	2: Shift & Raise	3: Near	4: Castle Hill	5: Ridgeline
Safety and Airport Resiliency					
Elevation (Floodplain)	+10 - +17.5 feet	+19.5 feet	+19.5 feet	+138 feet	+1,013 feet
Distance from river	0 feet	340 feet	11,000 feet	Above Floodplain	Above Floodplain
Fog and Low Visibility	0.3%	0.3%	0.3%	~0.3 - 6.7%	17.0%
Wind Coverage	90.4%	90.4%	Unknown	Unknown	Unknown
Wind Strength (Elevation)	N/A	Similar to SCM	Unknown	Unknown	Higher
Airport Geology	Good (Established pad)	Poor (Qs)	Poor (Qs)	Good (klgr)	Good (klgr)
Land Status					
Land Ownership	DOT&PF	DOT&PF & Calista and Askinuk	Calista and Askinuk	Calista and Askinuk	Calista and Askinuk
Likelihood of Acquisition	N/A	Likely, and already on approved Airport Layout Plan	Uncertain	Uncertain	Uncertain
Subsistence Resources	No significant	Low (Fish, Moose, Grouse, Waterfowl, Berries)	Medium (Fish, Moose, Grouse, Waterfowl, Berries)	Medium (Fish, Grouse, Waterfowl, Berries)	Medium (Grouse, Waterfowl, Berries)
Environmental					
Noise (Impacts to Residents)	Medium	Medium	Low	Low	Low
Wetlands (Unverified NWI)	0	2.5 acres	11.4 acres	9.5 acres	0.3 acres
Endangered Species	No significant	No significant	No significant	No significant	No significant
Marine Mammal Protection Act	No significant	No significant	No significant	No significant	No significant
Fish	No significant	Runway culvert	No significant	No significant	No significant
Birds & Other Wildlife Habitat	No significant	16.6 acres	20.9 acres	39.7 acres	33.2 acres
AHRS Cultural Resources	No known	Potential impacts to known area	No known areas	No known areas	No known areas
Contaminated Sites	No significant	No significant	No significant	No significant	No significant
Passenger Convenience	Best	Best	Medium	Low	Very Low
Distance to Community Center	0.3 miles	0.3 miles	2.2 miles	4.5 miles	6 miles

Evaluation Factor	1: No Action	2: Shift & Raise	3: Near	4: Castle Hill	5: Ridgeline
Constructability					
Constructability	Feasible	Challenge	Feasible	Feasible	Feasible
Distance to Solid Waste	3,560 feet	3,260 feet	3,800 feet	14,000 feet	10,900 feet
Distance to Sewage Lagoon	550 feet	550 feet	7,000 feet	9,500 feet	6,000 feet
Maintenance of Access Road	Easy	Easy	Difficult	Very Difficult	Very Difficult
Materials					
Unclassified Excavation	0	15,440 cy	40,306 cy	166,594 cy	47,991 cy
Borrow	0	161,330 cy	370,691 cy	284,495 cy	224,174 cy
Subbase	0	51,215 cy	58,313 cy	72,222 cy	67,426 cy
Crushed Aggregate Surface Course	0	38,515 ton	41,369 ton	52,797 ton	47,539 ton
Primary Armor Stone, Class I	0	61,353 ton	61,353 ton	0	0
Underlayer Stone, Class I	0	53,731 ton	53,731 ton	0	0
Material Source Distance (Local)	0	7,300 feet	2,000 feet	600 feet	2,000 feet
Utilities					
Utilities (Cost)	No significant	$237,000	$1,838,500	$3,677,000	$4,911,000
Erosion Protection Materials*	$0	$20,223,492 Local, $31,731,868 Barged	$20,223,492 Local, $31,731,868 Barged	$0	$0
Land Purchase	No significant	$3,000	$5,000	$23,000	$17,000
Cost Summary					
Total Cost (Local Option)	$0	$75,642,172.51	$94,588,701.28	$66,714,222.21	$59,398,368.40
Total Cost (Barged Option)	$0	$130,430,801.50	$182,828,675.60	$126,997,026.70	$109,266,097.40
Public Opinion	TBD	TBD	TBD	TBD	TBD

*HDR 2022a estimated a variety of erosion protection measures to implement with Alternative 2; ranging in cost from $11 million to $67.7 million. Stantec provided an updated cost estimate.

3.1 Alternative 1: No Action

The No Action alternative is included as a comparison for the other alternatives. It does not meet the purpose and need of addressing the flooding and erosion threats to the Airport.

3.2 Alternative 2 ("Shift & Raise")

Alternative 2 ("Shift & Raise") will shift the runway longitudinally 340 feet inland to provide additional protection from river movement, raise the Runway Safety Area (RSA) edge elevation to +19.5 feet, and install embankment armor.

Safety and Reliability

Alternative 2 ("Shift & Raise") provides safety and reliability for the community. By shifting the airport 340 feet and raising it to 19.5 feet, it protects the airport from forecasted floods and erosion. (An elevation of 19.5 feet was selected to provide 1 foot of freeboard above the forecasted flood level of 18.5 feet.)

The fog and visibility characteristics would match the current airport and be favorable (only 0.3% of the time less than 0.5 miles).

Wind coverage is known at 90.4%, below the recommended 95%, but more certain than other alternatives.

The areas of the alternative that requires new development would be in poor geology. This area is limited to the extension of the current infrastructure (which was also constructed on similar poor geology).

Penetrations to Part 77 surfaces include the hills to the south of the runway.

Land Status

This alternative likely requires some land acquisition. These would need to be negotiated with local and regional native corporations, at an estimated price of $3,000. The current ultimate Airport Layout Plan currently includes the planned property acquisition required for this development. Airport leasing prefers this alternative.

The local community is potentially interested in acquiring some airport lands to build or improve community infrastructure, such as a tank farm, fueling infrastructure, barge landing, or dock. A specific question arose, about if the "Shift & Raise" alternative would allow the land to be sold. Figure 3-11

depicts the protected land for the existing runway and the "Shift & Raise" alternative. Protecting the land along the approach and departure of the runway is an important safety measure for low flying aircraft, passengers, and the public on the ground. The existing protected land is smaller than the aircraft using the airport requires. The "Shift & Raise" alternative would expand and shift the protected land to meet current safety standards. Both the "No Action" and the "Shift & Raise" alternatives would discourage the improvement and/or sale of land from the airport to other parties due to these safety concerns.

Environmental

Environmental and subsistence concerns are the least, except for the No Action alternative. Alternative 2 ("Shift & Raise") takes advantage of existing infrastructure, but some new infrastructure is required for the extended runway. This will include filling wetlands, converting habitat that may support wildlife (such as birds), and development of areas that may be used for subsistence use. Ground disturbance would also be in the cultural resource zone surrounding Scammon Bay.

Passenger convenience is very high due to the close location to the community.

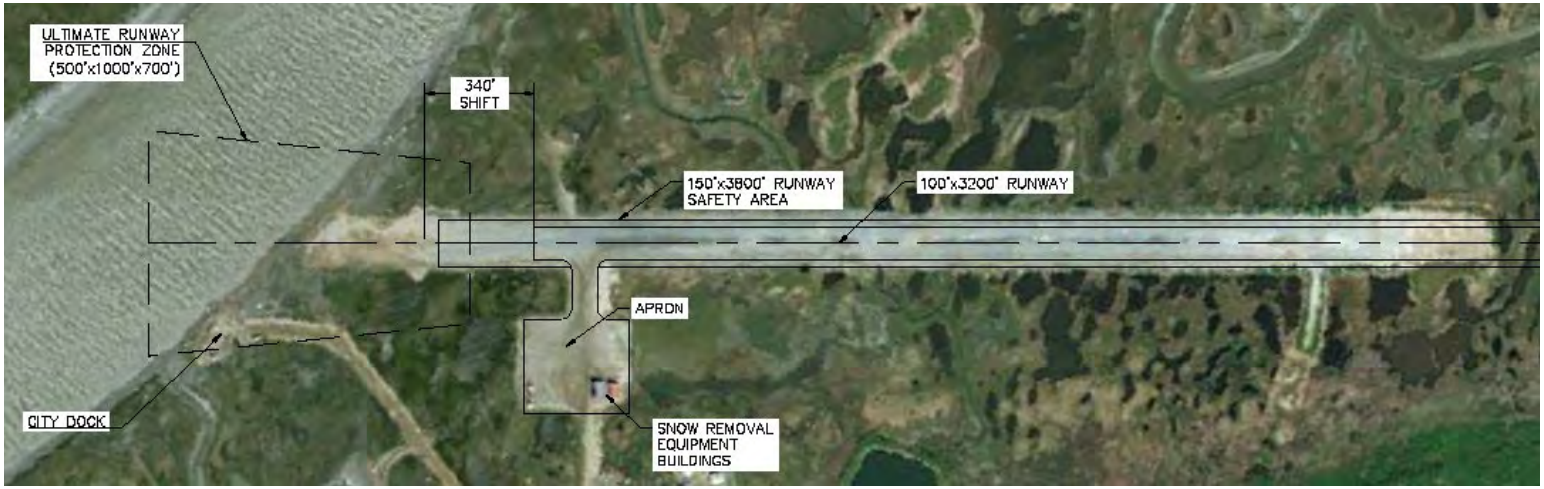
Constructability

Constructability is a challenge for the alternative. Air service to the community cannot be shut down for extended periods of time since the Airport is the community's connection to medical facilities and other essential services. More detailed design is required to evaluate feasible construction methods. Some alternatives include:

- Long, gradual fills: Fills could happen at night over the entire length of the runway, and have compaction and grading completed well enough to allow aircraft operations to occur during the day. This would require the use of a quality source of material, which can support aircraft operations during construction.
- Shut down the runway: The contractor could have set periods of time to close the Airport and do sequential lifts of the runway. These can be alternated with periods of the Airport being open, during which the contractor can create the material needed for the next lift.

Figure 3-11 Protected Airspace adjacent to the Kun River

Existing Runway (above)



Alternative 2: Shift & Raise

- Halfwidth Operations: These are difficult given the narrow dimensions of the runway. If required, the runway could be widened, allowing half width operations and simultaneous construction. Elevation grades would need to be controlled, because steep embankments are not preferred immediately adjacent to active runways.

Materials

Required quantities of material are relatively low for the airport improvements, but high for the erosion protection.

The source of erosion protection materials is unknown. Barging in armor stone is very expensive, and field verified geotechnical studies haven't been conducted. The potential exists that local material sources could be used to develop the required erosion protection material, or their functional equivalents. This deserves additional analysis to refine the costs.

Trucking of materials in community residential areas can be a concern in small communities. Haul trucks pose a safety and aesthetics impact to the community. These impacts differ for barged material and locally developed material. Barged material would require limited trucking in the community since the alternative is very close to the river landing. Locally developed material sources east of town would have the potential to increase trucking in the community as they haul material to the airport. These impacts would be reduced if the haul route along the eastern side of the runway is reopened – allowing trucks to avoid trips through town.

Cost

The cost for Alternative 2 is high due to the erosion protection cost. The cost for this alternative is estimated to be $75,642,172 for the option using local material, and $130,430,801 for the option using barged material.

3.3 Alternative 3 ("Near")

Alternative 3 ("Near") is moving the Airport onto the transition between lowlands and the Askinuk Mountains, near the community of Scammon Bay. This alternative would require building the Airport to the +19.5 feet elevation (to provide 1 foot of freeboard above the forecasted flood level of 18.5 feet) and installing the embankment armor.

Safety and Reliability

Alternative 3 (“Near”) provides safety and reliability for the community in a similar manner as Alternative 2, by building the RSA up to an elevation of 19.5 feet and installing the embankment armor.

The fog and visibility characteristics and wind characteristics are unknown for this alternative. The V3 Energy (2017) report provides some insights, indicating winds may predominate cross runway but was taken at a higher elevation, and so the local accuracy is unknown. The local topography likely has a large impact on weather.

The areas of the alternative that requires new development would be in poor geology.

The access road will need to be to be regularly maintained, which has proven to be a large, and potentially insurmountable, burden for other similar communities. Airport access roads are generally not maintained by the airport maintenance equipment, and communities such as Scammon Bay do not have local road maintenance equipment or services.

Penetrations to Part 77 surfaces include the hills to the south of the runway and Castle Hill, which restricts the freedom of pilots to navigate to this alternative.

Land Status

This alternative requires acquisition of land for the access road and airport. The current airport would likely be traded back to the community. This alternative has a relatively short access road off of the existing public access road, minimizing the land acquisition hurdles.

Environmental

Environmental and subsistence concerns are the least of the move alternatives, because this requires less disturbance of new land. This alternative would require new infrastructure, including filling wetlands, converting habitat that may support wildlife (such as birds), and development of areas that may be used for subsistence use.

Passenger convenience is medium due to the medium distance to the community.

Constructability

Constructability challenges for this alternative focus on the access road construction and leveling of the site to allow for the transition between the hill and lowland wetlands.

Utilities would need to be expanded into the area.

The access road would be difficult for the community to maintain in the winter.

Materials

Required quantities of material are relatively low for the different new airport location alternatives.

Trucking impacts differ for differ for barged material and locally developed material. Barged material would require extensive trucking through the community. Locally developed material sources would reduce the trucking in the community, since construction traffic could be largely located east of town.

Cost

The cost for Alternative 2 is the highest, because it requires both the construction of a new airport, and erosion protection (due to its low elevation). The cost is estimated to be $94,588,701 for the option using local material, and $182,828,675 for the option using barged material. The cost would also need to add in the maintenance of the access road.

3.4 Alternative 4 (“Castle Hill”)

Alternative 4 (“Castle Hill”) will move the Airport into the valley between Castle Hill and the Askinuk Mountains.

Safety and Reliability

Alternative 4 (“Castle Hill”) addresses potential erosion and flooding by moving the Airport to a higher elevation, removing it from future river erosion or flooding.

The fog and visibility characteristics are more uncertain but is assumed to be between 0.3 – 6.7% below 0.5 miles of visibility.

Wind coverage is uncertain. The V3 Energy LLC, (2017) wind rose is from a similar elevation (~200 feet) but was positioned in a pass, and indicated are in a different winds at 10m and 50m heights. Complicating matters, the runway would be placed in a valley, surrounded by hills which may change the direction of wind. A weather station would need to be installed to confirm local conditions.

Geotechnical conditions are expected to be better than the low laying wetland areas.

The access road will need to be to be regularly maintained, which has proven to be a large, and potentially insurmountable, burden for other similar communities. There isn't an example of an airport access road this long being successfully maintained in other similar communities in Alaska, which may result in this airport alternative being unusable during the winter.

Penetrations to Part 77 surfaces include the hills to the south of the runway and Castle Hill, which restricts the freedom of pilots to navigate to this alternative.

Land Status

This alternative requires land acquisition similar to Alternative 3. Acquisition would need to be negotiated with local and regional native corporations.

Environmental

Potential environmental and subsistence concerns are mixed for this alternative. Wetland impacts are potentially higher than Alternative 3, due to the favorable topography and elevation. Subsistence and wildlife impacts may be increased due to the larger overall footprint of disturbance.

Drainage channels would be constructed as appropriate and is assumed to be included in the 25% design contingency fee estimate.

Elevated areas have an increased likelihood for hosting cultural resources, so this alternative may have undiscovered cultural resources.

Passenger convenience is low for this alternative. It is not close to the community and would require travel by vehicle to the Airport. Residents would not be able to see airport activity, making timing of arrivals and departures more difficult.

Constructability

Constructability challenges for this alternative focus on the longer distance from the community, requiring improvements in access roads and new infrastructure.

Utilities would need to be expanded into the area.

The access road would be very difficult for the community to maintain in the winter.

Materials

This alternative avoids the need for erosion protection materials; but requires a lot of material to build the access road and new airport.

Similar to other alternatives, there is a difference in the potential impacts from barged material and local material. Local material sources are likely available to be developed near the alternative, which reduces the cost and impacts to the community.

Barged material and equipment would need to travel through the community, which is a potential safety hazard and negative community impact.

Cost

The cost for Alternative 4 is high because of the long new access road and the construction of a new airport. Prior to selecting this particular location on Castle Hill, other locations were evaluated around Castle Hill, and all of them have high degrees of topography change. The best location was selected and is situated in a flat pass between Castle Hill and the Askinuk Mountains. The cost is estimated to be $66,714,222 for the option using local material, and $126,997,026 for the option using barged material. The cost would also need to add in the maintenance of the access road.

3.5 Alternative 5 (“Ridgeline”)

Alternative 5 (“Ridgeline”) is to move the Airport on to the ridgeline above Scammon Bay in the Askinuk Mountains.

Safety and Reliability

Alternative 5 (“Ridgeline”) addresses potential lowland riverine erosion and flooding by moving the Airport to the top of the Askinuk Mountains.

The impact of weather on airport operations is the most uncertain for this alternative. Wind studies indicate winds come from the north (rather than the east) and are at a higher velocity than the existing airport. This requires rotation of the runway. A future wind study will be required to determine the best runway alignment. Runway alignment to provide wind coverage is particularly important for this alternative, because the winds run opposite to the topography, resulting in even small alignment shifts requiring large additional costs in materials to compensate for the steep hillside.

Fog and visibility also appear to be worse for this alternative, with up to 17% of the time being below 0.5 miles.

Geology for this alternative is expected to be favorable.

The access road will need to be to be regularly maintained, which has proven to be a large, and potentially insurmountable, burden for other similar communities. There isn't an example of an airport access road this long being successfully maintained in other similar communities in the region, which may result in this airport alternative being unusable during the winter.

Penetrations to Part 77 surfaces include the peaks to the southwest of the runway.

Land Status

This alternative requires land acquisition, including improvements of the access road, and construction of an extension of the access road, including acquisition of title for these improvements. These would need to be negotiated with local and regional native corporations.

The access road will also need to be to be regularly maintained, which has proven to be a large burden for other communities with small populations.

Environmental

Potential environmental and subsistence concerns are mixed for this alternative. Preliminary indications of wetlands impacts are less than Alternative 3 and 4 but the mapping is of low quality in this area. Subsistence and wildlife impacts may be increased due to the use of the ridgelines for subsistence activities.

Elevated areas have an increased likelihood for hosting cultural resources, so this alternative may have undiscovered cultural resources. This is supported by the subsistence mapping, which reports using ridgelines for spotting seals. This activity can lead to high levels of cultural resources since the same locations have often been used to spot marine mammals for generations.

Passenger convenience is very low for this alternative. It is not close to the community and would require travel up to the ridgelines. Access in winter would be particularly difficult and require road maintenance that may not be feasible with current local maintenance. This could result in an airport that is not useable for the local community.

Constructability

Constructability challenges are focused on the long distance from the community. Access roads, utilities, and new infrastructure will be required.

The access road would be very difficult for the community to maintain in the winter.

Materials

This alternative avoids the need for erosion protection materials; but requires a lot of material to build the access road and new airport.

Similar to other alternatives, there is a difference in the potential impacts from barged material and local material. Local material sources are likely available to be developed near the alternative, which reduces the cost and impacts to the community.

Barged material and equipment would need to travel through the community, which is a potential safety hazard and negative community impact.

Cost

The cost for Alternative 5 must balance the uncertainty about wind direction and the excavation and fill required to reshape the topography into a flat runway. The current orientation takes advantage of the natural ridge to minimize cost. The Alternative also requires an extension of the access road. The cost is estimated to be $59,398,368 for the option using local material, and $109,266,097 for the option using barged material. The cost would also need to add in the maintenance of the access road.

3.6 Alternatives Considered and Deemed Not Feasible

Three alternatives were considered at a high level, but rejected from further analysis:

- North of the Kun River: An airport could be constructed on the north side of the Kun River. This was rejected because of the extensive lowlands in this area would subject the airport to the same floodwaters threatening the current location. Construction of a bridge over the Kun River was also noted as too expensive.

- Lowlands South of the Kun River: An airport could be constructed south of the Kun River, in the large wetland complex northeast of the existing community of Scammon Bay. This was rejected

because the lowlands would subject the airport to the same floodwaters threatening the current location. In addition, moving the airport from the Kun River does not remove the need to provide costly erosion protection. The erosion modeling (HDR, 2022a) indicated that erosion takes places during flooding at all locations of the airport, not just along the Kun River.

- Raise: The current airport could be raised, without shifting it away from the Kun River. This would subject the airport to the continued erosion threat. The primary benefit is that this alternative would not require new land acquisition.

4 RECOMMENDATIONS

Alternative 1 ("No Action") does not address the flooding and erosion threats to the airport.

Alternative 2 (“Shift & Raise”) raises and shifts the runway embankment allowing for greater armoring of the runway and shifting the remainder of the runway away from the river. This alternative offers operational safety, passenger convenience, and environmental impact is within the existing footprint of the airport. This alternative requires land acquisition near the current airport, so there would be a low risk to delay in design and construction.

Alternative 3 ("Near") is perhaps the least feasible due to requiring both erosion protection and having poor topography – which negatively impacts wind and Part 77 surfaces. This alternative also does not offer the same level of operational safety and passenger convenience as Alternative 2. This alternative would require land acquisition through and construction of a new access road, which could delay much needed airport improvements for the community. Maintenance of the access road would be difficult.

Alternative 4 ("Castle Hill") is avoids the cost of erosion protection in Alternative 3, but it does not offer the same level of operational safety, passenger convenience, and will cause significant environmental and wetlands disturbance. Maintenance of the access road may prove very difficult or infeasible. This alternative would require land acquisition and construction of a new access road, which could delay much needed airport improvements for the community.

Alternative 5 (“Ridgeline”) has the lowest cost estimate because it does not require the additional flooding and erosion protection of lowland alternatives. Due to lack of data for wind and visibility, this may be the least feasible option, or most uncertain. It is unclear what the ultimate runway and crosswind configuration would be for the Ridgeline alternative. Installation of a weather station and further analysis would be needed to determine the feasibility of this alternative. If the alignment is significantly different, the cost of excavation and fill will increase and reduce the overall cost savings.

Although Alternative 5 (“Ridgeline”) would provide for operational safety, it would not allow for passenger convenience and would cause significant environmental impact. This alternative would require land acquisition and construction of a new access road, which could delay much needed airport improvements for the community. Maintenance of the access road may prove very difficult or infeasible.

The selection of a preferred alternative is highly dependent on material costs and likelihood of reasonable land acquisition. If materials must be barged to Scammon Bay, Alternative 2 (“Shift & Raise”) becomes

the only viable replacement to Alternative 5 (“Ridgeline”). The material required for Alternative 3 (“Near”) and Alternative 4 (“Castle Hill”) cause them to be too expensive when balancing their drawbacks.

Alternative 2 (“Shift & Raise”) provides the best combination of operational safety, passenger convenience, and limited environmental impacts and is likely the most cost-effective alternative. This alternative also requires the least land acquisition, which would minimize the risk for project design and construction to begin without delay.

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APPENDIX A: COST ESTIMATE

Engineer's Quantity Calculations

for

State of Alaska
Department of Transportation & Public Facilities
Central Region

Construction Project:

Scammon Bay Airport Feasibility Study

AIP No. 3-02-0255-005-2023

Project No. CFAPT01005

Prepared by: Stantec

ARCHITECTURE · ENGINEERING · LAND SURVEYING · PLANNING

4/25/2024

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Prepared by: Stantec

ARCHITECTURE · ENGINEERING · LAND SURVEYING · PLANNING

Cost Summary

Alternative	Construction Cost Estimate	Local or Barged Material	Notes
Raise and Shift Existing Airport 340' East	$75,642,173	Local	
Raise and Shift Existing Airport 340' East	$130,430,802	Barged	
Relocate Airport South to Ridgeline	$59,398,368	Local	
Relocate Airport South to Ridgeline	$109,266,097	Barged	
Relocate Airport to Castle Hill Location	$66,714,222	Local	
Relocate Airport to Castle Hill Location	$126,997,027	Barged	
Relocate Airport East to Near	$94,588,701	Local	
Relocate Airport East to Near	$182,828,676	Barged	

Engineer's Estimate

Project Name: **Project Number:** CFAPT01005

SCAMMON BAY AIRPORT RELOCATION: Raise & Shift (Local Material) **AIP 3-02-0255-005-2023**

Item No	Pay Item	Pay Unit	Quantity	Unit Price	Amount
	Land Purchase	Acre	3	$1,000	$3,000
D701.010.0072	CS Pipe, 72-inch	LF	300	$1,200	$360,000
G100.010.0000	Mobilization and Demobilization	LS	ALL REQUIRED	$3,500,000	$3,500,000
G115.010.0000	Worker Meals and Lodging, or Per Diem	LS	ALL REQUIRED	$1,500,000	$1,500,000
G130.010.0000	Field Office	LS	ALL REQUIRED	$60,000	$60,000
G130.020.0000	Field Laboratory	LS	ALL REQUIRED	$30,000	$30,000
G130.060.0000	Nuclear Testing Equipment Storage Shed	EACH	1	$20,000	$20,000
G130.090.0000	Engineering Communications	CS	ALL REQUIRED	$10,000	$10,000
G131.010.0000	Engineering Transportation (Truck)	EACH	4	$50,000	$200,000
G131.020.0000	Engineering Transportation (ATV)	EACH	1	$15,000	$15,000
G135.010.0000	Construction Surveying by the Contractor	LS	ALL REQUIRED	$200,000	$200,000
L100.010.0000	Airport Lighting	LS	ALL REQUIRED	$1,500,000	$1,500,000
L132.010.0010	Install Approach Lighting Aids, PAPI	LS	ALL REQUIRED	$500,000	$500,000
P152.010.0000	Unclassified Excavation	CY	15,440	$20	$308,800
P152.190.0000	Borrow	CY	161,330	$40	$6,453,183
P154.010.0000	Subbase Course	CY	51,215	$75	$3,841,111
P167.020.0000	Dust Palliative	LS	ALL REQUIRED	$250,000	$250,000
P185.010.0000	Primary Armor Stone, Class I	TON	61,353	$186	$11,411,575
P185.090.0000	Underlayer Stone, Class I	TON	53,731	$164	$8,811,917
P299.020.0000	Crushed Aggregate Surface Course	TON	38,515	$70	$2,696,037
P640.020.0000	Segmented Circle (Panel-Type)	LS	ALL REQUIRED	$50,000	$50,000
P641.010.0000	Erosion, Sediment, and Pollution Control Administration	LS	ALL REQUIRED	$50,000	$50,000
P641.030.0000	Temporary Erosion, Sediment, and Pollution Control	LS	ALL REQUIRED	$300,000	$300,000
P641.040.0000	Temporary Erosion, Sediment, and Pollution Control Additives	CS	ALL REQUIRED	$200,000	$200,000
P641.070.0000	SWPPP Manager	LS	ALL REQUIRED	$150,000	$150,000
P681.010.0000	Geotextile, Separation	SY	60,336	$4	$241,344
S142.040.0000	Equipment Storage Building	LS	ALL REQUIRED	$4,000,000	$4,000,000
U400.0X0.00X0	Utility Extensions	LS	ALL REQUIRED	$237,000	$237,000
				Subtotal:	$46,898,968
	DESIGN CONTINGENCY		Design Contingency	25.00%	$11,724,742
				Subtotal:	$58,623,710
			Construction Engineering	22%	$12,897,216
			ICAP	7.03%	$4,121,247
				Total	$75,642,173

Engineer's Estimate

Project Name: **Project Number:** CFAPT01005

SCAMMON BAY AIRPORT RELOCATION: Raise & Shift (Barged Material) **AIP 3-02-0255-005-2023**

Item No	Pay Item	Pay Unit	Quantity	Unit Price	Amount
	Land Purchase	Acre	3	$1,000	$3,000
G100.010.0000	Mobilization and Demobilization	LS	ALL REQUIRED	$3,500,000	$3,500,000
G115.010.0000	Worker Meals and Lodging, or Per Diem	LS	ALL REQUIRED	$1,500,000	$1,500,000
G130.010.0000	Field Office	LS	ALL REQUIRED	$60,000	$60,000
G130.020.0000	Field Laboratory	LS	ALL REQUIRED	$30,000	$30,000
G130.060.0000	Nuclear Testing Equipment Storage Shed	EACH	1	$20,000	$20,000
G130.090.0000	Engineering Communications	CS	ALL REQUIRED	$10,000	$10,000
G131.010.0000	Engineering Transportation (Truck)	EACH	4	$50,000	$200,000
G131.020.0000	Engineering Transportation (ATV)	EACH	1	$15,000	$15,000
G135.010.0000	Construction Surveying by the Contractor	LS	ALL REQUIRED	$200,000	$200,000
L100.010.0000	Airport Lighting	LS	ALL REQUIRED	$1,500,000	$1,500,000
L132.010.0010	Install Approach Lighting Aids, PAPI	LS	ALL REQUIRED	$500,000	$500,000
P152.010.0000	Unclassified Excavation	CY	15,440	$20	$308,800
P152.190.0000	Borrow	CY	161,330	$133	$21,456,833
P154.010.0000	Subbase Course	CY	51,215	$175	$8,962,593
P167.020.0000	Dust Palliative	LS	ALL REQUIRED	$250,000	$250,000
P185.010.0000	Primary Armor Stone, Class I	TON	61,353	$286	$17,546,831
P185.090.0000	Underlayer Stone, Class I	TON	53,731	$264	$14,185,037
P299.020.0000	Crushed Aggregate Surface Course	TON	38,515	$140	$5,392,074
P640.020.0000	Segmented Circle (Panel-Type)	LS	ALL REQUIRED	$50,000	$50,000
P641.010.0000	Erosion, Sediment, and Pollution Control Administration	LS	ALL REQUIRED	$50,000	$50,000
P641.030.0000	Temporary Erosion, Sediment, and Pollution Control	LS	ALL REQUIRED	$300,000	$300,000
P641.040.0000	Temporary Erosion, Sediment, and Pollution Control Additives	CS	ALL REQUIRED	$200,000	$200,000
P641.070.0000	SWPPP Manager	LS	ALL REQUIRED	$150,000	$150,000
P681.010.0000	Geotextile, Separation	SY	60,336	$4	$241,344
S142.040.0000	Equipment Storage Building	LS	ALL REQUIRED	$4,000,000	$4,000,000
U400.0X0.00X0	Utility Extensions	LS	ALL REQUIRED	$237,000	$237,000
				Subtotal:	$80,868,512
	DESIGN CONTINGENCY		Design Contingency	25.00%	$20,217,128
				Subtotal:	$101,085,640
			Construction Engineering	22%	$22,238,841
			ICAP	7.03%	$7,106,321
				Total	$130,430,802

Engineer's Estimate

Project Name: **Project Number:** CFAPT01005

SCAMMON BAY AIRPORT RELOCATION: Near (Local Material) **AIP 3-02-0255-005-2023**

Item No	Pay Item	Pay Unit	Quantity	Unit Price	Amount
	Land Purchase	Acre	5	$1,000	$5,000
G100.010.0000	Mobilization and Demobilization	LS	ALL REQUIRED	$3,500,000	$3,500,000
G115.010.0000	Worker Meals and Lodging, or Per Diem	LS	ALL REQUIRED	$1,500,000	$1,500,000
G130.010.0000	Field Office	LS	ALL REQUIRED	$60,000	$60,000
G130.020.0000	Field Laboratory	LS	ALL REQUIRED	$30,000	$30,000
G130.060.0000	Nuclear Testing Equipment Storage Shed	EACH	1	$20,000	$20,000
G130.090.0000	Engineering Communications	CS	ALL REQUIRED	$10,000	$10,000
G131.010.0000	Engineering Transportation (Truck)	EACH	4	$50,000	$200,000
G131.020.0000	Engineering Transportation (ATV)	EACH	1	$15,000	$15,000
G135.010.0000	Construction Surveying by the Contractor	LS	ALL REQUIRED	$500,000	$500,000
L100.010.0000	Airport Lighting	LS	ALL REQUIRED	$1,500,000	$1,500,000
L132.010.0010	Install Approach Lighting Aids, PAPI	LS	ALL REQUIRED	$500,000	$500,000
P152.010.0000	Unclassified Excavation	CY	40,306	$20	$806,111
P152.190.0000	Borrow	CY	370,691	$40	$14,827,644
P154.010.0000	Subbase Course	CY	58,313	$75	$4,373,472
P167.020.0000	Dust Palliative	LS	ALL REQUIRED	$250,000	$250,000
P185.010.0000	Primary Armor Stone, Class I	TON	61,353	$186	$11,411,575
P185.090.0000	Underlayer Stone, Class I	TON	53,731	$164	$8,811,917
P299.020.0000	Crushed Aggregate Surface Course	TON	41,369	$70	$2,895,796
P640.020.0000	Segmented Circle (Panel-Type)	LS	ALL REQUIRED	$50,000	$50,000
P641.010.0000	Erosion, Sediment, and Pollution Control Administration	LS	ALL REQUIRED	$50,000	$50,000
P641.030.0000	Temporary Erosion, Sediment, and Pollution Control	LS	ALL REQUIRED	$300,000	$300,000
P641.040.0000	Temporary Erosion, Sediment, and Pollution Control Additives	CS	ALL REQUIRED	$200,000	$200,000
P641.070.0000	SWPPP Manager	LS	ALL REQUIRED	$150,000	$150,000
P681.010.0000	Geotextile, Separation	SY	210,251	$4	$841,005
S142.040.0000	Equipment Storage Building	LS	ALL REQUIRED	$4,000,000	$4,000,000
U400.0X0.00X0	UTILITY EXTENSIONS	LUMP SUM	ALL REQUIRED	$1,838,500	$1,838,500
				Subtotal:	$58,646,021
	DESIGN CONTINGENCY		Design Contingency	25.00%	$14,661,505
				Subtotal:	$73,307,526
			Construction Engineering	22%	$16,127,656
			ICAP	7.03%	$5,153,519
				Total	$94,588,701

Engineer's Estimate

Project Name: **Project Number:** CFAPT01005

SCAMMON BAY AIRPORT RELOCATION: Near (Local Material) **AIP 3-02-0255-005-2023**

Item No	Pay Item	Pay Unit	Quantity	Unit Price	Amount
	Land Purchase	Acre	5	$1,000	$5,000
G100.010.0000	Mobilization and Demobilization	LS	ALL REQUIRED	$3,500,000	$3,500,000
G115.010.0000	Worker Meals and Lodging, or Per Diem	LS	ALL REQUIRED	$1,500,000	$1,500,000
G130.010.0000	Field Office	LS	ALL REQUIRED	$60,000	$60,000
G130.020.0000	Field Laboratory	LS	ALL REQUIRED	$30,000	$30,000
G130.060.0000	Nuclear Testing Equipment Storage Shed	EACH	1	$20,000	$20,000
G130.090.0000	Engineering Communications	CS	ALL REQUIRED	$10,000	$10,000
G131.010.0000	Engineering Transportation (Truck)	EACH	4	$50,000	$200,000
G131.020.0000	Engineering Transportation (ATV)	EACH	1	$15,000	$15,000
G135.010.0000	Construction Surveying by the Contractor	LS	ALL REQUIRED	$500,000	$500,000
L100.010.0000	Airport Lighting	LS	ALL REQUIRED	$1,500,000	$1,500,000
L132.010.0010	Install Approach Lighting Aids, PAPI	LS	ALL REQUIRED	$500,000	$500,000
P152.010.0000	Unclassified Excavation	CY	40,306	$20	$806,111
P152.190.0000	Borrow	CY	370,691	$133	$49,301,918
P154.010.0000	Subbase Course	CY	58,313	$175	$10,204,769
P167.020.0000	Dust Palliative	LS	ALL REQUIRED	$250,000	$250,000
P185.010.0000	Primary Armor Stone, Class I	TON	61,353	$286	$17,546,831
P185.090.0000	Underlayer Stone, Class I	TON	53,731	$264	$14,185,037
P299.020.0000	Crushed Aggregate Surface Course	TON	41,369	$140	$5,791,593
P640.020.0000	Segmented Circle (Panel-Type)	LS	ALL REQUIRED	$50,000	$50,000
P641.010.0000	Erosion, Sediment, and Pollution Control Administration	LS	ALL REQUIRED	$50,000	$50,000
P641.030.0000	Temporary Erosion, Sediment, and Pollution Control	LS	ALL REQUIRED	$300,000	$300,000
P641.040.0000	Temporary Erosion, Sediment, and Pollution Control Additives	CS	ALL REQUIRED	$200,000	$200,000
P641.070.0000	SWPPP Manager	LS	ALL REQUIRED	$150,000	$150,000
P681.010.0000	Geotextile, Separation	SY	210,251	$4	$841,005
S142.040.0000	Equipment Storage Building	LS	ALL REQUIRED	$4,000,000	$4,000,000
U400.0X0.00X0	UTILITY EXTENSIONS	LUMP SUM	ALL REQUIRED	$1,838,500	$1,838,500
				Subtotal:	**$113,355,763**
	DESIGN CONTINGENCY		Design Contingency	25.00%	$28,338,941
				Subtotal:	$141,694,703
			Construction Engineering	22%	$31,172,835
			ICAP	7.03%	$9,961,138
				Total	**$182,828,676**

Engineer's Estimate

Project Name: **Project Number:** CFAPT01005

SCAMMON BAY AIRPORT RELOCATION: Castle Hill (Local Material) **AIP 3-02-0255-005-2023**

Item No	Pay Item	Pay Unit	Quantity	Unit Price	Amount
	Land Purchase	Acre	23	$1,000	$23,000
G100.010.0000	Mobilization and Demobilization	LS	ALL REQUIRED	$3,500,000	$3,500,000
G115.010.0000	Worker Meals and Lodging, or Per Diem	LS	ALL REQUIRED	$1,500,000	$1,500,000
G130.010.0000	Field Office	LS	ALL REQUIRED	$60,000	$60,000
G130.020.0000	Field Laboratory	LS	ALL REQUIRED	$30,000	$30,000
G130.060.0000	Nuclear Testing Equipment Storage Shed	EACH	1	$20,000	$20,000
G130.090.0000	Engineering Communications	CS	ALL REQUIRED	$10,000	$10,000
G131.010.0000	Engineering Transportation (Truck)	EACH	4	$50,000	$200,000
G131.020.0000	Engineering Transportation (ATV)	EACH	1	$15,000	$15,000
G135.010.0000	Construction Surveying by the Contractor	LS	ALL REQUIRED	$500,000	$500,000
L100.010.0000	Airport Lighting	LS	ALL REQUIRED	$1,500,000	$1,500,000
L132.010.0010	Install Approach Lighting Aids, PAPI	LS	ALL REQUIRED	$500,000	$500,000
P152.010.0000	Unclassified Excavation	CY	166,594	$20	$3,331,876
P152.190.0000	Borrow	CY	284,495	$40	$11,379,787
P154.010.0000	Subbase Course	CY	72,222	$75	$5,416,667
P167.020.0000	Dust Palliative	LS	ALL REQUIRED	$250,000	$250,000
P299.020.0000	Crushed Aggregate Surface Course	TON	52,797	$70	$3,695,767
P640.020.0000	Segmented Circle (Panel-Type)	LS	ALL REQUIRED	$50,000	$50,000
P641.010.0000	Erosion, Sediment, and Pollution Control Administration	LS	ALL REQUIRED	$50,000	$50,000
P641.030.0000	Temporary Erosion, Sediment, and Pollution Control	LS	ALL REQUIRED	$300,000	$300,000
P641.040.0000	Temporary Erosion, Sediment, and Pollution Control Additives	CS	ALL REQUIRED	$200,000	$200,000
P641.070.0000	SWPPP Manager	LS	ALL REQUIRED	$150,000	$150,000
P681.010.0000	Geotextile, Separation	SY	251,111	$4	$1,004,445
S142.040.0000	Equipment Storage Building	LS	ALL REQUIRED	$4,000,000	$4,000,000
U400.0X0.00X0	UTILITY EXTENSIONS	LUMP SUM	ALL REQUIRED	$3,677,000	$3,677,000
				Subtotal:	**$41,363,542**
	DESIGN CONTINGENCY		Design Contingency	25.00%	$10,340,885
				Subtotal:	$51,704,427
			Construction Engineering	22%	$11,374,974
			ICAP	7.03%	$3,634,821
				Total	**$66,714,222**

Engineer's Estimate

Project Name: **Project Number:** CFAPT01005

SCAMMON BAY AIRPORT RELOCATION: Castle Hill (Barged Material) **AIP 3-02-0255-005-2023**

Item No	Pay Item	Pay Unit	Quantity	Unit Price	Amount
	Land Purchase	Acre	23	$1,000	$23,000
G100.010.0000	Mobilization and Demobilization	LS	ALL REQUIRED	$3,500,000	$3,500,000
G115.010.0000	Worker Meals and Lodging, or Per Diem	LS	ALL REQUIRED	$1,500,000	$1,500,000
G130.010.0000	Field Office	LS	ALL REQUIRED	$60,000	$60,000
G130.020.0000	Field Laboratory	LS	ALL REQUIRED	$30,000	$30,000
G130.060.0000	Nuclear Testing Equipment Storage Shed	EACH	1	$20,000	$20,000
G130.090.0000	Engineering Communications	CS	ALL REQUIRED	$10,000	$10,000
G131.010.0000	Engineering Transportation (Truck)	EACH	4	$50,000	$200,000
G131.020.0000	Engineering Transportation (ATV)	EACH	1	$15,000	$15,000
G135.010.0000	Construction Surveying by the Contractor	LS	ALL REQUIRED	$500,000	$500,000
L100.010.0000	Airport Lighting	LS	ALL REQUIRED	$1,500,000	$1,500,000
L132.010.0010	Install Approach Lighting Aids, PAPI	LS	ALL REQUIRED	$500,000	$500,000
P152.010.0000	Unclassified Excavation	CY	166,594	$20	$3,331,876
P152.190.0000	Borrow	CY	284,495	$133	$37,837,791
P154.010.0000	Subbase Course	CY	72,222	$175	$12,638,889
P167.020.0000	Dust Palliative	LS	ALL REQUIRED	$250,000	$250,000
P299.020.0000	Crushed Aggregate Surface Course	TON	52,797	$140	$7,391,533
P640.020.0000	Segmented Circle (Panel-Type)	LS	ALL REQUIRED	$50,000	$50,000
P641.010.0000	Erosion, Sediment, and Pollution Control Administration	LS	ALL REQUIRED	$50,000	$50,000
P641.030.0000	Temporary Erosion, Sediment, and Pollution Control	LS	ALL REQUIRED	$300,000	$300,000
P641.040.0000	Temporary Erosion, Sediment, and Pollution Control Additives	CS	ALL REQUIRED	$200,000	$200,000
P641.070.0000	SWPPP Manager	LS	ALL REQUIRED	$150,000	$150,000
P681.010.0000	Geotextile, Separation	SY	251,111	$4	$1,004,445
S142.040.0000	Equipment Storage Building	LS	ALL REQUIRED	$4,000,000	$4,000,000
U400.0X0.00X0	UTILITY EXTENSIONS	LUMP SUM	ALL REQUIRED	$3,677,000	$3,677,000
				Subtotal:	$78,739,535
	DESIGN CONTINGENCY		Design Contingency	25.00%	$19,684,884
				Subtotal:	$98,424,418
			Construction Engineering	22%	$21,653,372
			ICAP	7.03%	$6,919,237
				Total	$126,997,027

Engineer's Estimate

Project Name: **Project Number:** CFAPT01005

SCAMMON BAY AIRPORT RELOCATION: Ridgeline (Local Material) **AIP 3-02-0255-005-2023**

Item No	Pay Item	Pay Unit	Quantity	Unit Price	Amount
	Land Purchase	Acre	17	$1,000	$17,000
G100.010.0000	Mobilization and Demobilization	LS	ALL REQUIRED	$3,500,000	$3,500,000
G115.010.0000	Worker Meals and Lodging, or Per Diem	LS	ALL REQUIRED	$1,500,000	$1,500,000
G130.010.0000	Field Office	LS	ALL REQUIRED	$60,000	$60,000
G130.020.0000	Field Laboratory	LS	ALL REQUIRED	$30,000	$30,000
G130.060.0000	Nuclear Testing Equipment Storage Shed	EACH	1	$20,000	$20,000
G130.090.0000	Engineering Communications	CS	ALL REQUIRED	$10,000	$10,000
G131.010.0000	Engineering Transportation (Truck)	EACH	4	$50,000	$200,000
G131.020.0000	Engineering Transportation (ATV)	EACH	1	$15,000	$15,000
G135.010.0000	Construction Surveying by the Contractor	LS	ALL REQUIRED	$500,000	$500,000
L100.010.0000	Airport Lighting	LS	ALL REQUIRED	$1,500,000	$1,500,000
L132.010.0010	Install Approach Lighting Aids, PAPI	LS	ALL REQUIRED	$500,000	$500,000
P152.010.0000	Unclassified Excavation	CY	47,991	$20	$959,825
P152.190.0000	Borrow	CY	224,174	$40	$8,966,964
P154.010.0000	Subbase Course	CY	67,426	$75	$5,056,944
P167.020.0000	Dust Palliative	LS	ALL REQUIRED	$250,000	$250,000
P299.020.0000	Crushed Aggregate Surface Course	TON	47,539	$70	$3,327,748
P640.020.0000	Segmented Circle (Panel-Type)	LS	ALL REQUIRED	$50,000	$50,000
P641.010.0000	Erosion, Sediment, and Pollution Control Administration	LS	ALL REQUIRED	$50,000	$50,000
P641.030.0000	Temporary Erosion, Sediment, and Pollution Control	LS	ALL REQUIRED	$300,000	$300,000
P641.040.0000	Temporary Erosion, Sediment, and Pollution Control Additives	CS	ALL REQUIRED	$200,000	$200,000
P641.070.0000	SWPPP Manager	LS	ALL REQUIRED	$150,000	$150,000
P681.010.0000	Geotextile, Separation	SY	188,288	$4	$753,151
S142.040.0000	Equipment Storage Building	LS	ALL REQUIRED	$4,000,000	$4,000,000
U400.0X0.00X0	Utility Extensions	LS	ALL REQUIRED	$4,911,000	$4,911,000
				Subtotal:	$36,827,633
	DESIGN CONTINGENCY		Design Contingency	25.00%	$9,206,908
				Subtotal:	$46,034,541
			Construction Engineering	22%	$10,127,599
			ICAP	7.03%	$3,236,228
				Total	$59,398,368

Engineer's Estimate

Project Name: **Project Number:** CFAPT01005

SCAMMON BAY AIRPORT RELOCATION: Ridgeline (Barged Material) **AIP 3-02-0255-005-2023**

Item No	Pay Item	Pay Unit	Quantity	Unit Price	Amount
	Land Purchase	Acre	17	$1,000	$17,000
G100.010.0000	Mobilization and Demobilization	LS	ALL REQUIRED	$3,500,000	$3,500,000
G115.010.0000	Worker Meals and Lodging, or Per Diem	LS	ALL REQUIRED	$1,500,000	$1,500,000
G130.010.0000	Field Office	LS	ALL REQUIRED	$60,000	$60,000
G130.020.0000	Field Laboratory	LS	ALL REQUIRED	$30,000	$30,000
G130.060.0000	Nuclear Testing Equipment Storage Shed	EACH	1	$20,000	$20,000
G130.090.0000	Engineering Communications	CS	ALL REQUIRED	$10,000	$10,000
G131.010.0000	Engineering Transportation (Truck)	EACH	4	$50,000	$200,000
G131.020.0000	Engineering Transportation (ATV)	EACH	1	$15,000	$15,000
G135.010.0000	Construction Surveying by the Contractor	LS	ALL REQUIRED	$500,000	$500,000
L100.010.0000	Airport Lighting	LS	ALL REQUIRED	$1,500,000	$1,500,000
L132.010.0010	Install Approach Lighting Aids, PAPI	LS	ALL REQUIRED	$500,000	$500,000
P152.010.0000	Unclassified Excavation	CY	47,991	$20	$959,825
P152.190.0000	Borrow	CY	224,174	$133	$29,815,157
P154.010.0000	Subbase Course	CY	67,426	$175	$11,799,537
P167.020.0000	Dust Palliative	LS	ALL REQUIRED	$250,000	$250,000
P299.020.0000	Crushed Aggregate Surface Course	TON	47,539	$140	$6,655,496
P640.020.0000	Segmented Circle (Panel-Type)	LS	ALL REQUIRED	$50,000	$50,000
P641.010.0000	Erosion, Sediment, and Pollution Control Administration	LS	ALL REQUIRED	$50,000	$50,000
P641.030.0000	Temporary Erosion, Sediment, and Pollution Control	LS	ALL REQUIRED	$300,000	$300,000
P641.040.0000	Temporary Erosion, Sediment, and Pollution Control Additives	CS	ALL REQUIRED	$200,000	$200,000
P641.070.0000	SWPPP Manager	LS	ALL REQUIRED	$150,000	$150,000
P681.010.0000	Geotextile, Separation	SY	188,288	$4	$753,151
S142.040.0000	Equipment Storage Building	LS	ALL REQUIRED	$4,000,000	$4,000,000
U400.0X0.00X0	Utility Extensions	LUMP SUM	ALL REQUIRED	$4,911,000	$4,911,000
				Subtotal:	$67,746,166
	DESIGN CONTINGENCY		Design Contingency	25.00%	$16,936,541
				Subtotal:	$84,682,707
			Construction Engineering	22%	$18,630,196
			ICAP	7.03%	$5,953,194
				Total	$109,266,097

Quantities

RAISE EXISTING - Alternative eliminated, but used for Raise & Shift Calculations

	Alternative	X section End Area	Length	Width	Depth	Area (SY)	Volume (CY)	Tons (x2)
Runway	Sta. 2+30-29+00	1951	2670				192932	
	29+00-38+30	1024	930				35271	
	Total Fill						**228203**	
	Subbase		3800	150	2		42222	
	CABC		3800	150	0.75		15833	
	Borrow						170148	
	Geotextile Fabric							
APRON	Total Fill							
	Surface Area		250	400	8		29630	
	Side Slopes		1100	32	8		5215	
	CABC		250	400	0.75		2778	
	Subbase		250	400	2.00		7407	
	Borrow						24659	
	Geotextile Fabric							
Road	Total Fill	408	**400**				**6044**	
	CABC		400	28	0.5		207	
	Subbase		400	28	1		415	
	Borrow						5422	
	Geotextile Fabric							
Taxiway	Total Fill	999	200				7400	
	CABC		200	79	0.75		439	
	Subbase		200	79	2		1170	
	Borrow						5791	
	Geotextile Fabric	0						
Airport	Borrow						206020	412040
	Subbase						51215	102430
	CABC						19257	38515
	Geotextile Fabric							

Quantities

RAISE & SHIFT EXISTING

	Alternative	X section End Area	Length	Width	Depth	Area (SY)	Volume (CY)	Tons (x2)
Runway	5+70-29+00	1951	2330				168364	
	29+00-38+30	1024	930				35271	
	38+30-41+70	2548	340				32086	
	200' Extension	2410	250				22315	
	Total Fill						258036	
	Subbase		3800	150	2		42222	
	CABC		3800	150	0.75		15833	
	Minus Borrow for Bank Armor	165.31	9650				59083	
	Unclassified Ex for Bank Armor	43.2	9650				15440	
	Borrow						125457	
	Geotextile Fabric		500	150		8333		
APRON	**Same as Raise RW Alt**							
	Total Fill						34844	
	CABC						2778	
	Subbase						7407	
	Borrow						24659	
	Geotextile Fabric						0	
Road	**Same as Raise RW Alt**							
	Total Fill						**6044**	
	CABC						207	
	Subbase						415	
	Borrow						5422	
	Geotextile Fabric						0	
Taxiway	**Same as Raise RW Alt**							
	Total Fill						7400	
	CABC						439	
	Subbase						1170	
	Borrow						5791	
	Geotextile Fabric						0	
Airport	Borrow						161330	322659
	Subbase						51215	102430
	CABC						19257	38515
	Geotextile Fabric					60336		
	Erosion Protection		10450					
	Excavation						15440	

Quantities

Ridgeline

	Alternative	X section End Area	Length	Width	Depth	Area (SY)	Volume (CY)	Tons (x2)
Runway	Total Fill						167956	
	Subbase	332	3800				46726	
	CABC	115.1	3800				16199	
	Borrow						167956	
	Excavation						22482	
	Geotextile Fabric					91231		
APRON and TW	Total Fill						20857	
	Surface Area							
	Side Slopes							
	CABC-Apron		200	400	0.75		2222	
	CABC-TW		300	79	0.75		658	
	Subbase-Apron		200	400	2		5926	
	Subbase-TW		300	79	2		1756	
	Borrow						20857	
	Geotextile Fabric					17890		
Road	Total Fill	173	9500				60870	
	CABC	15.2	9500		0.5		5348	
	Subbase	37	9500		1		13019	
	Borrow						35361	
	Geotextile Fabric		9500	75		79167		
	Excavation	145	9500				51019	
Airport	Borrow						224174	
	Subbase						67426	
	CABC						23770	47539
	Geotextile Fabric					188288		
	Excavation						47991	

Quantities

CASTLE HILL

	Alternative	X section End Area	Length	Width	Depth	Area (SY)	Volume (CY)	Tons (x2)
Runway	Total Fill						377778	
	Subbase	332	3800				46726	
	CABC	115.1	3800				16199	
	Borrow						218376	
	Excavation						96477	
	Geotextile Fabric					120993		
APRON and TW	Total Fill						28594	
	Surface Area							
	Side Slopes							
	CABC-Apron		200	400	0.75		2222	
	CABC-TW		300	79	0.75		658	
	Subbase-Apron		200	400	2		5926	
	Subbase-TW		300	79	2		1756	
	Borrow						17730	
	Geotextile Fabric					21785		
	Excavation						302	
Road	Total Fill	173	13000				83296	
	CABC	15.2	13000		0.5		7319	
	Subbase	37	13000		1		17815	
	Borrow						48389	
	Geotextile Fabric		13000	75		108333		
	Excavation	145	13000				69815	
Airport	Borrow						284495	
	Subbase						72222	
	CABC						26398	52797
	Geotextile Fabric					251111		
	Excavation						166594	

Quantities

Near

	Alternative	X section End Area	Length	Width	Depth	Area (SY)	Volume (CY)	Tons (x2)
Runway	Total Fill						354983	
	Subbase	332	3800				46726	
	CABC	115.1	3800				16199	
	Borrow						292058	
	Excavation						20000	
	Geotextile Fabric					109422		
APRON and TW	Total Fill						78587	
	CABC-Apron		200	400	0.75		2222	
	CABC-TW		300	79	0.75		658	
	Subbase-Apron		200	400	2		5926	
	Subbase-TW		300	79	2		1756	
	Borrow						68025	
	Geotextile Fabric							
	Excavation					25076	5000	
Road	Total Fill	173	2850				18261	
	CABC	15.2	2850				1604	
	Subbase	37	2850				3906	
	Borrow						10608	
	Geotextile Fabric		2850	75		23750		
	Excavation	145	2850				15306	
Airport	Borrow						370691	
	Subbase						58313	
	CABC						20684	41369
	Geotextile Fabric					210251		
	Excavation						40306	

Utility Estimate

PROJECT NAME: AMATS: Scammon Bay "Ridgeline" estimate
Location: Scammon Bay, AK

Utility Company	Description of Work and Location	Unit	Unit Cost	Total
UUI (GCI)	Install aerial 25- 100 pair (6 miles = 31680 ft)	31680	$ 45.00	$ 1,425,600.00
AVEK	Install aerial single phase poles and line (6 miles = 127 poles)	127	$ 21,000.00	$ 2,667,000.00
			Subtotal cost of utility works :	$ 4,092,600.00
			20%	$ 818,520.00
			Total cost of utility works :	**$ 4,911,120.00**

Assumed distance from community center is new installation length. This can be updated once final location is selected, the exact length of the access road needed for the airport is finalized, and reviewing AVEC poles for closer connections to tie into. Assumed 20% mark up for barging in freight.

PROJECT NAME: AMATS: Scammon Bay "Castle Hill" estimate
Location: Scammon Bay, AK

Utility Company	Description of Work and Location	Unit	Unit Cost	Total
UUI (GCI)	Install aerial 25- 100 pair (4.5 miles = 23760 ft)	23760	$ 45.00	$ 1,069,200.00
AVEK	Install aerial single phase poles and line (4.5 miles = 95 poles)	95	$ 21,000.00	$ 1,995,000.00
			Subtotal cost of utility works :	$ 3,064,200.00
			20%	$ 612,840.00
			Total cost of utility works :	**$ 3,677,040.00**

Assumed distance from community center is new installation length. This can be updated once final location is selected, the exact length of the access road needed for the airport is finalized, and reviewing AVEC poles for closer connections to tie into. Assumed 20% mark up for barging in freight.

PROJECT NAME: AMATS: Scammon Bay "Shift and Raise" estimate
Location: Scammon Bay, AK

Utility Company	Description of Work and Location	Unit	Unit Cost	Total
UUI (GCI)	Install aerial 25- 100 pair (.3 miles = 1584 ft)	1584	$ 45.00	$ 71,280.00
AVEK	Install aerial single phase poles and line (.3 miles = 6 poles)	6	$ 21,000.00	$ 126,000.00
			Subtotal cost of utility works :	$ 197,280.00
			20%	$ 39,456.00
			Total cost of utility works :	**$ 236,736.00**

Assumed distance from community center is new installation length. This can be updated once final location is selected and determining if new services will be needed. Assumed 20% mark up for barging in freight.

State of Alaska
Department of Transportation and Public Facilities
Central Region Highway Design

0					
P152.010.0000 - Unclassified Excavation					
SHEET NUMBER	1	OF	1	PIH	
CALCULATED BY	JAG			DATE	4/24/2024
CHECKED BY				DATE	

P152.010.0000 - Unclassified Excavation

P152.01

Engineers Est. Quantity = CY

$ -

CY

Project	Year	Quantity	Unit	Low Bidder 1	2nd Low Bidder 2	3rd Low Bidder 3	Remarks
Kaltag Airport Improvements	2021	2,800	CY	$ 19.40	$ 12.50	$ 18.00	
Bethel Airport Parallel Runway I	2019	26,910	CY	$ 10.00	$ 17.00		
CHEFORNAK AIRPORT REHA	2022	9,400	CY	$ 24.00	$ 24.00		
Saint Mary's Airport Improveme	2022	13340	CY	$ 19.65	$ 6.24	$ 30.00	
			CY				
			CY				
			CY				

	Average Unit Price	Median Price
By All	$ 18.08	$ 18.70
By Projects	$ 18.19	

USE $20/CY

State of Alaska
Department of Transportation and Public Facilities
Central Region Highway Design

0					
P152.200.0000 - BORROW					
SHEET NUMBER	1	OF	1	PIH	
CALCULATED BY	JAG			DATE	4/5/2024
CHECKED BY				DATE	

P152.200.0000 - BORROW

P152.20

Engineers Est. Quantity =

TON

$ -

TON

Project	Year	Quantity	Unit	Low Bidder 1	2nd Low Bidder 2	3rd Low Bidder 3	Remarks
KWETHLUK AIRPORT REHAB	2023	2,940	TON	$ 76.00	$ 215.20	$ 434.85	
CHEFORNAK AIRPORT REHA	2022	38,940	TON	$ 85.00	$ 155.00		
MEKORYUK AIRPORT REHAE	2023	12,386	TON	$ 157.00	$ 185.00	$ 166.00	
CHEFORNAK AIRPORT REHA	2022	38940	TON	$ 85.00	$ 155.00		
Shishmaref Airport Erosion Con	2022	23000	TON	$ 95.00	$ 105.50	$ 159.01	
			TON				
			TON				

	Average Unit Price	Median Price
By All	$ 159.50	$ 155.00
By Projects	$ 154.24	

Average Unit Price (Low Bidder)

$ 99.60 TON $ 122.06

= 200 CY

Assume 1/3 discount for quantity

USE: 133.33 CY

State of Alaska
Department of Transportation and Public Facilities
Central Region Highway Design

0					
P152.200.0000 - BORROW					
SHEET NUMBER	1	OF	1	PIH	
CALCULATED BY	JAG			DATE	4/24/2024
CHECKED BY				DATE	

P152.200.0000 - BORROW

P152.20

Engineers Est. Quantity =

TON

$ -

TON

Project	Year	Quantity	Unit	Low Bidder 1	2nd Low Bidder 2	3rd Low Bidder 3	Remarks
Kaltag Airport Improvements	2021	2,900	TON	$ 53.15	$ 35.00	$ 25.00	
Bethel Airport Parallel Runway I	2019	45,300	TON	$ 18.00	$ 13.00		
SLEETMUTE AIRPORT RESUI	2022	10,960	TON	$ 48.00	$ 47.00		
Saint Mary's Airport Improveme	2022	24450	TON	$ 18.80	$ 12.41	$ 15.00	
Marshall Airport Improvements	2023	214300	TON	$ 34.00	$ 48.16		
			TON				
			TON				

	Average Unit Price	Median Price
By All	$ 30.63	$ 29.50
By Projects	$ 31.44	

Use $60/CY

1/3 discount for quantity

Use $40/CY

State of Alaska
Department of Transportation and Public Facilities
Central Region Highway Design

0					
P152.190.0000 - BORROW					
SHEET NUMBER	1	OF	1	PIH	
CALCULATED BY	JAG			DATE	4/24/2024
CHECKED BY				DATE	

P152.190.0000 - BORROW

P152.19

Engineers Est. Quantity =

CY

$ -

TON

Project	Year	Quantity	Unit	Low Bidder 1	2nd Low Bidder 2	3rd Low Bidder 3	Remarks
Eagle Airport Electrical Equipm	2022	37	CY	$ 492.00	$ 225.00	$ 35.00	
South Naknek Airport Runway F	2019	29,600	CY	$ 75.00	$ 110.00	$ 105.00	
Bettles Airport Lighting and Res	2021	2,975	CY	$ 11.00	$ 10.00	$ 36.00	
KWETHLUK AIRPORT REHAB	2023	460	CY	$ 153.00	$ 311.30	$ 1,012.66	
			CY				
			CY				
			CY				

	Average Unit Price	Median Price
By All	$ 214.66	$ 107.50
By Projects	$ 214.66	

NOT USED

State of Alaska
Department of Transportation and Public Facilities
Central Region Highway Design

0					
P154.020.0000 - SUBBASE COURSE					
SHEET NUMBER	1	OF	1	PIH	
CALCULATED BY	JAG			DATE	4/24/2024
CHECKED BY				DATE	

P154.020.0000 - SUBBASE COURSE

P154.02

Engineers Est. Quantity =

TON

$ -

TON

Project	Year	Quantity	Unit	Low Bidder 1	2nd Low Bidder 2	3rd Low Bidder 3	Remarks
Noorvik Airport Rehabilitation	2021	34,131	TON	$ 24.00	$ 40.00	$ 39.00	
Kaltag Airport Improvements	2021	8,700	TON	$ 27.10	$ 50.00	$ 28.00	
Saint Mary's Airport Improveme	2022	18,530	TON	$ 29.05	$ 21.87	$ 30.00	
Marshall Airport Improvements	2023	56300	TON	$ 48.00	$ 72.67		
			TON				
			TON				
			TON				

	Average Unit Price	Median Price
By All	$ 37.24	$ 30.00
By Projects	$ 39.17	

Use $37.24/Ton

=$75/CY **Local Material**

Due to lack of AASHTOWare data - Use $175/CY for Barge Cost

State of Alaska
Department of Transportation and Public Facilities
Central Region Highway Design

0					
P299.020.0000 Crushed Aggregate Surface Course					
SHEET NUMBER	1	OF	1	PIH	
CALCULATED BY	JAG			DATE	4/8/2024
CHECKED BY				DATE	

P299.020.0000 Crushed Aggregate Surface Course

P299.02

Engineers Est. Quantity = Ton

$ -

Ton

Project	Year	Quantity	Unit	Low Bidder 1	2nd Low Bidder 2	3rd Low Bidder 3	Remarks
KWETHLUK AIRPORT REHAB	2023	38,971	Ton	$ 156.00	$ 215.00	$ 449.59	
CHEFORNAK AIRPORT REHA	2022	46,320	Ton	$ 93.00	$ 175.00		
MEKORYUK AIRPORT REHAE	2023	1,872	Ton	$ 188.00	$ 195.00	$ 180.00	
CHEFORNAK AIRPORT REHA	2022	46320	Ton	$ 93.00	$ 175.00		
Shishmaref Airport Erosion Con	2022	1600	Ton	$ 150.00	$ 256.00	$ 199.43	
KIPNUK AIRPORT REHABILIT	2021	49010	Ton	$ 110.00	$ 170.10		
			Ton				

	Average Unit Price	Median Price
By All	$ 187.01	$ 175.00
By Projects	$ 178.51	

Average Low Bidder, similar quantity

$ 113.00

Inflate @ 10% per year

136

Use $140

State of Alaska
Department of Transportation and Public Facilities
Central Region Highway Design

0					
P299.020.0000 Crushed Aggregate Surface Course					
SHEET NUMBER	1	OF	1	PIH	
CALCULATED BY	JAG			DATE	4/24/2024
CHECKED BY				DATE	

P299.020.0000 Crushed Aggregate Surface Course

P299.02

Engineers Est. Quantity = Ton

$ -

Ton

Project	Year	Quantity	Unit	Low Bidder 1	2nd Low Bidder 2	3rd Low Bidder 3	Remarks
Kaltag Airport Improvements	2021	13,000	Ton	$ 70.20	$ 115.00	$ 135.00	
Marshall Airport Improvements	2023	51,400	Ton	$ 65.00	$ 85.97		
Noorvik Airport Rehabilitation	2021	44,577	Ton	$ 38.65	$ 52.00	$ 47.00	
Ekwok Airport & New Stuyahok	2021	50570	Ton	$ 26.00	$ 60.00	$ 53.00	
			Ton				
			Ton				
			Ton				

	Average Unit Price	Median Price
By All	$ 67.98	$ 60.00
By Projects	$ 68.61	

Use $70/TON

State of Alaska
Department of Transportation and Public Facilities
Central Region Highway Design

0					
P185.010.0000 Primary Armor Stone, Class I					
SHEET NUMBER	1	OF	1	PIH	
CALCULATED BY	JAG			DATE	4/23/2024
CHECKED BY				DATE	

P185.010.0000 Primary Armor Stone, Class I

P185.01

Engineers Est. Quantity = Ton

$ -

Ton

Project	Year	Quantity	Unit	Low Bidder 1	2nd Low Bidder 2	3rd Low Bidder 3	Remarks
Shishmaref Airport Erosion Con	2023	8,300	Ton	$ 265.00	$ 273.00	$ 319.02	
			Ton				
			Ton				
			Ton				
			Ton				
			Ton				
			Ton				

	Average Unit Price	Median Price
By All	$ 285.67	$ 273.00
By Projects	$ 285.67	

Use $286/TON Barged

Due to lack of AASHTOWare data for locally available Armor Stone, use $186/TON

State of Alaska
Department of Transportation and Public Facilities
Central Region Highway Design

0					
P185.090.0000 Underlayer Stone, Class I					
SHEET NUMBER	1	OF	1	PIH	
CALCULATED BY	JAG			DATE	4/23/2024
CHECKED BY				DATE	

P185.090.0000 Underlayer Stone, Class I

P185.09

Engineers Est. Quantity = Ton

$ -

Ton

Project	Year	Quantity	Unit	Low Bidder 1	2nd Low Bidder 2	3rd Low Bidder 3	Remarks
Shishmaref Airport Erosion Con	2022	5,800	Ton	$ 210.00	$ 270.00	$ 310.27	
			Ton				
			Ton				
			Ton				
			Ton				
			Ton				
			Ton				

	Average Unit Price	Median Price
By All	$ 263.42	$ 270.00
By Projects	$ 263.42	

USE $264/TON

Due to lack of AASHTOWare data for locally available Armor Stone, use $164/TON

State of Alaska
Department of Transportation and Public Facilities
Central Region Highway Design

0					
611.2011.000A Underlayer Rock					
SHEET NUMBER	1	OF	1	PIH	
CALCULATED BY	JAG			DATE	4/23/2024
CHECKED BY				DATE	

611.2011.000A Underlayer Rock

611.201

Engineers Est. Quantity =

Ton

$ -

Ton

Project	Year	Quantity	Unit	Low Bidder 1	2nd Low Bidder 2	3rd Low Bidder 3	Remarks
ALASKA PENINSULA HIGHW/	2019	460	Ton	$ 220.00	$ 280.00	$ 236.00	
			Ton				
			Ton				
			Ton				
			Ton				
			Ton				
			Ton				

	Average Unit Price	Median Price
By All	$ 245.33	$ 236.00
By Projects	$ 245.33	

NOT USED

State of Alaska
Department of Transportation and Public Facilities
Central Region Highway Design

0					
611.2000.0000 Armor Rock					
SHEET NUMBER	1	OF	1	PIH	
CALCULATED BY	JAG			DATE	4/23/2024
CHECKED BY				DATE	

611.2000.0000 Armor Rock

611.200

Engineers Est. Quantity =

Ton

$ -

Ton

Project	Year	Quantity	Unit	Low Bidder 1	2nd Low Bidder 2	3rd Low Bidder 3	Remarks
Shishmaref Sanitation Road En	2019	6,121	Ton	$ 215.00	$ 196.00	$ 219.79	
Northern Region Deep Culverts	2020	7,794	Ton	$ 60.00			
CHINIAK HWY EROSION RES	2018	1,729	Ton	$ 61.00	$ 95.00	$ 100.00	
			Ton				
			Ton				
			Ton				
			Ton				

	Average Unit Price	Median Price
By All	$ 135.26	$ 100.00
By Projects	$ 118.53	

NOT USED

State of Alaska
Department of Transportation and Public Facilities
Central Region Highway Design

0					
611.0002.0004 RIPRAP CLASS 4					
SHEET NUMBER	1	OF	1	PIH	
CALCULATED BY	JAG			DATE	4/23/2024
CHECKED BY				DATE	

611.0002.0004 RIPRAP CLASS 4

611.000

Engineers Est. Quantity =

Ton

$ -

Ton

Project	Year	Quantity	Unit	Low Bidder 1	2nd Low Bidder 2	3rd Low Bidder 3	Remarks
KALIFORNSKY BEACH ROAD	2019	450	Ton	$ 156.20	$ 135.00	$ 185.00	
JNU MENDENHALL RIVER FL(	2023	1,913	Ton	$ 69.00	$ 85.00	$ 95.00	
TOFTY ROAD SULLIVAN CRE	2021	230	Ton	$ 120.00	$ 58.00	$ 246.76	
SEWARD HMY: MP 17-22.5 RE	2021	7800	Ton	$ 100.00	$ 50.00	$ 165.00	
Parks Highway Bridge Replacer	2021	100	Ton	$ 74.75	$ 85.00	$ 98.00	
			Ton				
			Ton				

	Average Unit Price	Median Price
By All	$ 114.85	$ 98.00
By Projects	$ 114.85	

NOT USED

State of Alaska
Department of Transportation and Public Facilities
Central Region Highway Design

0					
611.0001.0003 RIPRAP CLASS 3					
SHEET NUMBER	1	OF	1	PIH	
CALCULATED BY	JAG			DATE	4/23/2024
CHECKED BY				DATE	

611.0001.0003 RIPRAP CLASS 3

611.000

Engineers Est. Quantity = CY

$ -

CY

Project	Year	Quantity	Unit	Low Bidder 1	2nd Low Bidder 2	3rd Low Bidder 3	Remarks
Gulkana River Boat Launch Mu	2021	200	CY	$ 95.00	$ 92.00	$ 90.00	
Delta River Flooding - Larry Spe	2020	1,700	CY	$ 41.00	$ 60.00	$ 70.00	
QUARTZ CREEK BRIDGE REF	2022	3,100	CY	$ 248.00	$ 290.00		
			CY				
			CY				
			CY				
			CY				

	Average Unit Price	Median Price
By All	$ 123.25	$ 91.00
By Projects	$ 139.44	

NOT USED