TERRA-Northwest Phase III to Kotzebue

Environmental Assessment

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Prepared for:

Bureau of Land Management

Prepared by:

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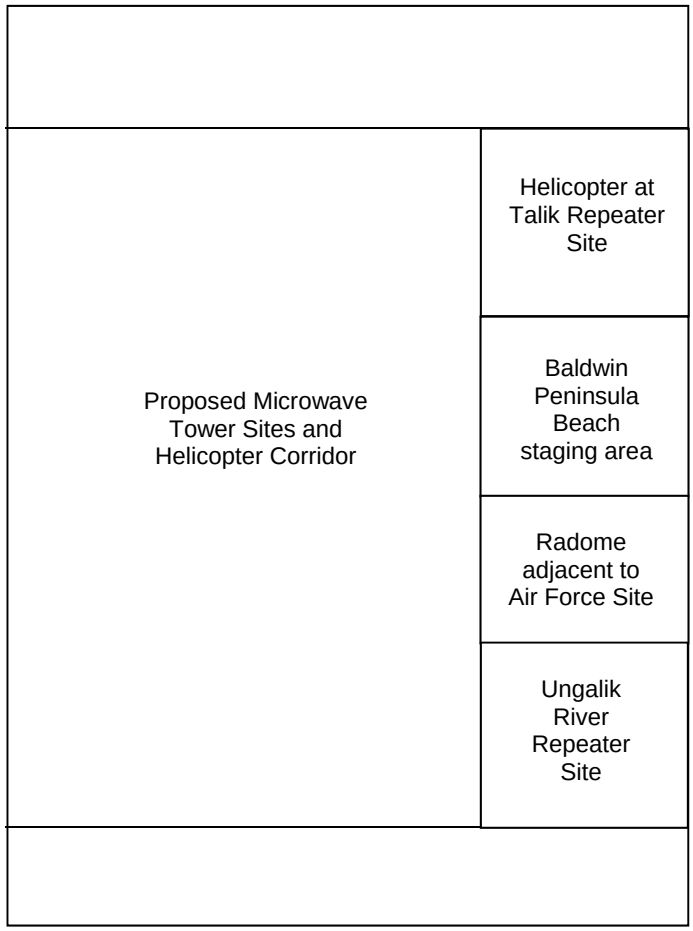

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LIST OF ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ACEC	Area of Critical Environmental Concern
ADCCED	Alaska Department of Commerce, Community and Economic Development
ADEC	Alaska Department of Environmental Conservation
ADFG	Alaska Department of Fish and Game
ADLWD	Alaska Department of Labor and Workforce Development
ADNR	Alaska Department of Natural Resources
agl	above ground level
AKEPIC	Alaska Exotic Plants Information Clearinghouse
AKNHP	Alaska Natural Heritage Program
ANILCA	Alaska National Lands Interest Conservation Act
APE	Area of Potential Effect
bgs	below ground surface
BLM	U.S. Bureau of Land Management
CFR	Code of Federal Regulations
CMP	Comprehensive Management Plan
dB	decibel
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FLPMA	Federal Land Policy and Management Act
FONSI	Finding of No Significant Impact
ft.	foot/feet
GMU	Game Management Unit
Hz	hertz
IRA	Indian Reorganization Act
km	kilometer/kilometers
Kbps	kilobytes per second

KIC	Kikiktagruk Inupiat Corporation
kWh	kilowatt hour
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
L_{max}	maximum sound level
MFP	Management Framework Plan
mi.	mile/miles
msl	mean sea level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NHT	National Historic Trail
NLCS	National Lands Conservation System
NPS	National Park Service
NRHP	National Register of Historic Places
NLUR	Northern Land Use Research
NSEDC	Norton Sound Economic Development Corporation
NTSA	National Trails System Act
NWI	National Wetlands Inventory
RFFA	Reasonably Foreseeable Future Action
R	Range
RMP	Resource Management Plan
ROPs	Required Operating Procedures
SHPO	State Historic Preservation Officer
SPCC	Spill Prevention, Control, and Countermeasure Plan
sq. ft.	square foot/feet
SRQU	Scenic Quality Rating Unit
T	Township
TERRA-NW	TERRA Northwest
TERRA-SW	TERRA Southwest
USC	United States Code
USAF	U.S. Air Force
USACE	U.S. Army Corps of Engineers

USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VRI	Visual Resource Inventory
VRM	Visual Resource Management
WACH	Western Arctic Caribou Herd

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1.0 Introduction

The Bureau of Land Management (BLM) is considering an application from Unicom, Incorporated (Unicom) for a right-of-way for a communication site lease to construct, operate, and maintain six remote microwave repeaters with associated equipment as part of a project to improve broadband internet services for communities in the Norton Sound and Northwest Arctic regions of Alaska. The application includes the construction of five microwave repeater towers on public land managed by BLM and one tower located near Kotzebue (known as a "community tower").

The Regulatory Commission of Alaska awarded a grant to Unicom for the purpose of delivering broadband Internet service from Shageluk to the existing fiber-optic network. This was named the TERRA-Northwest Project which connected to the DeltaNet (Yukon-Kuskokwim region) and TERRA-Southwest (Bristol Bay Region) backbone (Figure 1-1). Under the current proposal, TERRA-NW Phase III (TNW III) Project is the backbone segment from Shaktoolik to Kotzebue that is planned, funded, and pending for permits. The proposed activities of TNW III would include the construction, operation, and maintenance of five mountaintop microwave repeater towers and associated equipment on public land managed by BLM and one community tower in 2013 and 2014. A later phase, which could be planned for 2014 if funds become available, would include construction, operation, and maintenance of community towers and associated equipment located on private lands.

The TNW III Project would address the need for more reliable terrestrial broadband service for approximately 6,000 residents within a portion of the Northwest Arctic Borough and the Bering Straits Region of Alaska. At present, communities within these areas are linked to the Internet backbone by private satellite networks. Although satellite infrastructure provides telecommunication services in rural Alaska, its compatibility with broadband service is poor due to higher delays in connectivity and lower reliability. The TNW III Project would provide high-capacity, high-speed, and low-delay broadband connectivity, which would also improve Internet reliability to end users who connect to the system. The TNW III Project would provide communities with telecommunications infrastructure to facilitate economic development, improve services by health care providers, increase educational services, expand access to governmental, tribal, and non-profit entities, and improve Internet speed for residential users.

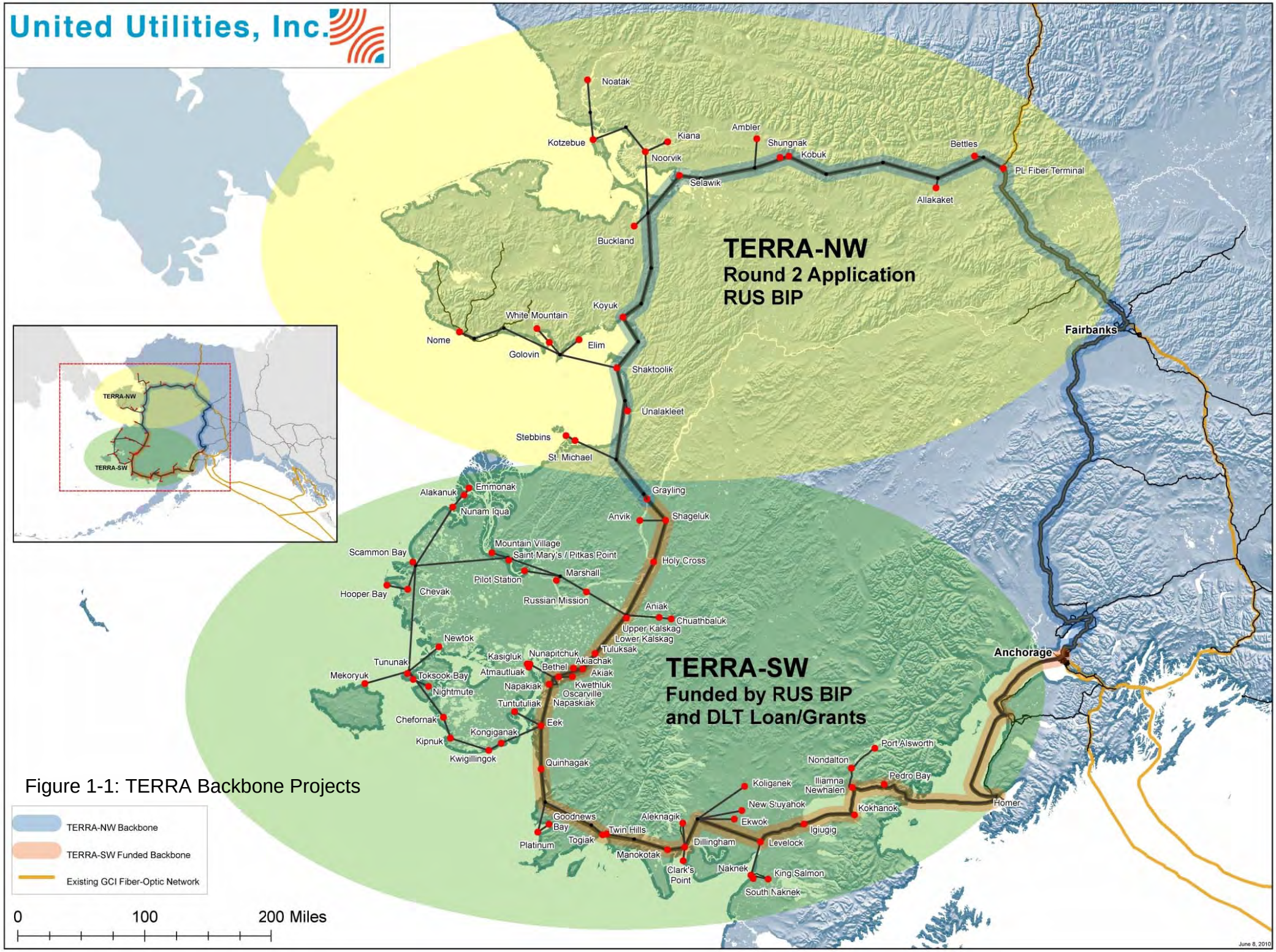


Figure 1-1: TERRA Backbone Projects

1.1 Purpose and Need for Action

Unicom has filed applications for rights-of-way with the BLM Anchorage Field Office to obtain authorization to construct, operate, maintain, and decommission six microwave repeater towers. BLM is required to respond to the application filed (serial numbers AA-99345, AA-93345A through AA-93345F.

The need for action is established by the BLM's responsibility under Title V of the Federal Land Policy and Management Act (FLPMA) of October 21, 1976 (90 Stat. 2776; 43 United States Code [USC] 1761), as amended, to respond to requests for rights-of-way across public lands. The purpose of the action is to provide access across public lands in a manner that is consistent with the provisions and objectives established for the management of resources within the respective planning area and to ensure that the public uses described herein will not cause unacceptable damage to public lands. Under 43 CFR §2800, it is BLM's objective to grant rights-of-way on public lands for communications sites in a manner that:

> (a) Protects the natural resources associated with public lands and adjacent lands, whether private or administered by a government entity;
>
> (b) Prevents unnecessary or undue degradation to public lands;
>
> (c) Promotes the use of rights-of-way in common considering engineering and technological compatibility, national security, and land use plans; and
>
> (d) Coordinates, to the fullest extent possible, all BLM actions under the regulations in this part with state and local governments, interested individuals, and appropriate quasi-public entities.

The decision to be made by BLM is whether to authorize both temporary construction and long-term rights-of-way through communication leases for each microwave repeater site, and if so, under what terms and conditions. BLM's decision on a right-of-way grant or lease are guided by the underlying authority derived from Title V, of the Federal Land Policy and Management Act (FLPMA) (90 Stat. 2776; 43 USC 1761), as amended, and in accordance with regulations found in 43 CFR § 2800.

1.2 Legal and Regulatory Context

In addition to meeting the requirements of BLM right-of-way regulations (Title V of FLPMA as amended by 43 CFR§2800), this EA is prepared to meet requirements of several statutes and regulations listed below.

1.2.1 National Environmental Policy Act Requirements

Under the NEPA (42 USC4371) and its implementing regulations (40 CFR [Code of Federal Regulations] parts 1500-1508), BLM is required to make a decision on the Proposed Action based on a competent technical analysis that clearly communicates the environmental values and impacts associated with the action. In compliance with NEPA requirements, BLM will develop the appropriate decision document for the permit applications affecting lands under its management and arrive at a final determination based on regulatory authorities, regulations, and policies they must follow. This EA provides the foundation upon which BLM will base its decision to move forward on the Proposed Action and the ensuing permitting requirements.

1.2.2 Conformance with BLM Land Use Plans

The Proposed Action would be located on federal lands managed under the *Kobuk-Seward Peninsula Resource Management Plan* (RMP) (BLM 2008). The Iditarod National Historic Trail Comprehensive Management Plan (CMP) (BLM 1986b) is also relevant because portions of the project are near the Iditarod National Historic Trail (NHT).

The *Kobuk-Seward Peninsula RMP* was approved in 2008 and encompasses the project area beginning 3 miles south of Shaktoolik and extending beyond Kotzebue to the Icy Cape area. The Talik Repeater is in the Nulato Hills Area of Critical Environmental Concern (ACEC); this ACEC was designed to protect core winter range for the Western Arctic Caribou Herd (WACH).

The *Kobuk-Seward Peninsula RMP* established required operating procedures (ROPs) applicable to all BLM permitted activities within the boundary of the RMP. Project design features of the proposed action are aligned with all required ROPs in Table 2-11, Section 2.6.

1.2.3 Other Laws and Regulatory Requirements

- Subsistence Impact Evaluation under ANILCA Section 810
- National Historic Preservation Act of 1966 (NHPA) as amended (16 USC 470 et seq.)
- Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403) and Section 404 of the Clean Water Act (33 USC 1344)
- Magnuson-Stevens Fishery Conservation and Management Act (1996), Essential Fish Habitat provision

1.3 Scoping, Public Involvement, and Issue Identification

The purpose of scoping and early public involvement is to ensure that the residents in the affected communities and federally recognized tribes have an opportunity to learn about the proposed project, to ask questions, and to identify concerns and issues for further analysis. BLM offers to conduct government-to-government consultation with the federally recognized tribes in order to understand unique tribal perspectives and concerns as appropriate. When combined with the results of internal scoping among the agency resource specialists, these public and tribal concerns help to identify the issues and alternatives to be analyzed in the EA.

1.3.1 Scoping Meetings

BLM led public meetings in Buckland and Kotzebue on November 14 and 15, 2012 and in Koyuk and Shaktoolik on December 5 and 6, 2012. The scoping meetings provided an introduction to the project in the four communities nearest to the affected federal lands, and solicited input from local residents on issues and concerns associated with the project. The opportunity to provide comments from the scoping meetings extended through December 21, 2012.

The scoping meetings revealed public interest in the project and potential benefits, as well as concern with a variety of issues regarding the project design, alternatives, and potential impacts. The following topics and questions were raised during meetings.

Internet & Cellular Service:

- Location of community towers
- Speed and availability of local Internet coverage

- Improvements or changes to cellular service

Project Security:

- Potential for vandalism at towers located close to communities.
- Questions about security features to deter fuel theft and spills.

Public Safety Benefits:

- Towers with and without lights may serve as beacons for lost snowmachiners
- Interest in emergency shelter inside the modules

Wildlife Impacts:

- Questions about whether noise or odors would scare-away caribou or impact eiders
- Strong value for subsistence activities

Socioeconomic Impacts:

- Local hire and local purchasing
- Interest in local business leaders planning for economic opportunities associated with high-speed internet

1.3.2 Government-to-Government Consultation with Federally Recognized Tribes

BLM identified tribal governments potentially affected by the project. Letters were sent to eight tribal governments October 23, 2012 inviting them to consult on this project.

The tribes contacted were the Native Village of Buckland, Native Village of Shaktoolik, Native Village of Kiana, Native Village of Koyuk, Native Village of Deering, Noorvik Native Community, Native Village of Kotzebue, and Selawik IRA Council.

To date, there has been no response to BLM's invitations to enter into government-to-government consultation.

1.3.3 Issues to be Addressed

To focus this EA, specific issues were selected for further analysis and others were eliminated from evaluation. Based on the results of the scoping meetings and review by BLM specialists during an internal scoping meeting on October 24, 2012, the following issues were identified for further analysis in the EA. The issues in this EA are evaluated in Section 4.0, Environmental Consequences.

Biological Environment

Vegetation and Wetlands – Construction and operations may affect vegetation and wetlands. Preventative measures to avoid introduction and spread of non-native invasive species will be incorporated per the *2010 BLM Alaska Invasive Species Management Policy*.

Wildlife (Birds and Terrestrial Mammals) – Construction activities staged from coastal locations and operations of the tower sites may affect birds and waterfowl. Project construction and operations may result in impacts including disruption of wildlife habitats, or disturbance and displacement of wildlife species. Species to consider include the Western Arctic Caribou Herd (WACH), muskoxen, moose, furbearer species, brown bears, and migratory birds.

Threatened and Endangered Species – Designated Sensitive, Threatened, and Endangered species, such as the Spectacled eider and Steller's eider and polar bear, are potentially affected by the project, including the construction and operational phases. Seasonal timing of construction will be evaluated to reduce the intensity of impacts. Documentation of informal consultation with U.S. Fish and Wildlife Service is documented in Appendix C. The Endangerd Species Evaluation (finding of no adverse effect) is located in Appendix G.

Social Environment

Socioeconomic Resources – Impacts of the project may include greater economic activities in the region due to broadband Internet speed and commerce. Beneficial effects may include increased services in health, education, government, business, and households. The project may generate impacts associated with the staging areas for construction (e.g. Kotzebue, Koyuk, and Buckland).

Subsistence – Evaluation of the impacts to subsistence users of wildlife, fish, and plants should include whether the project may result in displacement of important subsistence species, restrictions on subsistence users, or increases in competition for subsistence resources. Important subsistence resources in the region include caribou, moose, muskox, and migratory birds. The ANILCA 810 Evaluation can be found in Appendix D.

Cultural Resources – Project construction has the potential to disturb cultural resources that are not yet identified in AHRS. One proposed tower is two miles from the Iditarod National Historic Trail. A cultural resource inventory and evaluation was conducted as a part of the Section 106 process and SHPO consultation will be completed (see Appendix A). Permit conditions would mitigate potential impacts.

Recreation – The project may affect the viewshed along the Iditarod National Historic Trail at the Ungalik River Repeater site or the aerial viewshed of recreationists within the project area. This may affect the recreation experiences of individuals. Impacts on the undeveloped natural landscapes of the region should be evaluated.

Lands with Wilderness Characteristics – The project may affect BLM-managed lands with wilderness characteristics and those potential impacts must be evaluated to determine if they impact or impair the wilderness characteristics.

Noise/Soundscapes – During construction, and later during annual refueling and maintenance operations, the use of helicopters would introduce new sound impacts within the transit corridor to the tower sites. Generators at the tower sites would introduce noise in the surrounding areas. Impacts of the sound levels across these distances should be evaluated with the inclusion of silencers and the 1,500 foot helicopter height during flight.

Visual Resources – New infrastructure at the microwave repeater sites would introduce visual impacts in an area that is otherwise undeveloped, with potential impacts to Iditarod NHT users, recreationists, and other users. Cumulative impacts associated with the community tower on non-federal lands should be evaluated.

Physical Environment

Soils – Installation of the microwave towers would alter or remove soils at the construction sites.

Hazardous Materials – Fuels and other hazardous materials used as part of the proposed project which pose a risk for spill and contamination at the site and en route. Heavy equipment use, vandalism, theft, fuel storage, fuel transfer, hydraulic line breaks should all be discussed in terms of spill risk and consequence. Prevention and response measures in the project design minimize spill risk.

1.3.4 Issues Dismissed

The following resources were determined to have negligible impact from the proposed action or there is a low risk to the resource because potential impacts have been disclosed in prior TERRA EA documents (USFWS 2011; BLM 2012a).

Cost of Service – Local residents raised concerns about the price and reliability of the broadband Internet service to be provided by local internet providers to households in the project area, however, the cost structure for service to households is not subject to direct review in this EA, as it falls outside the regulatory authorities of BLM. In addition, the cost structure for household service will be established by local internet providers, in negotiation with Unicom, only after the construction is completed. As a result, this EA will not provide a detailed analysis of the cost of service to households.

Air Quality – Emissions at the tower sites from the proposed use of diesel generators, helicopters, and mobile equipment was disclosed as having a negligible impact to air quality in the TERRA-NW Project (BLM 2012a). Therefore, it is expected that this project would have a similar, negligible impact to air quality. In addition, this project would have no measurable contribution to greenhouse gas emissions, but the effect of climate change on resources is discussed in the cumulative effects section of each relevant resource.

Environmental Justice – The project area population is majority Alaska Native and higher poverty rates and lower median family income than for the State of Alaska. The operation of the proposed action is estimated to have a beneficial impact on local employment and would have a beneficial economic contribution to the region. Therefore the project would not result in disproportionate adverse impacts to minority and low-income populations.

Fish/Essential Fish Habitat – There would be no direct impact to fish or essential fish habitat from the proposed project because there are no streams or waterbodies at the tower sites or staging areas. The tower closest to anadromous fish habitat is the Ungalik River site, which is located on a ridge above the river at least one mile away. The Koyuk and Buckland staging areas are on previously disturbed areas and the barge landings are a part of regular deliveries to the communities. The Baldwin Peninsula beach staging area is not near a fish-bearing stream. A discussion of risks to fishery resources or habitat due to fuel spill is discussed in the Hazardous Materials Section 4.14. The Essential Fish Habitat Determination (finding of no adverse effect) is located in Appendix F.

Hydrology – It was determined that construction and operations would not affect streams and water bodies by introducing silt because the tower sites are not near streams or waterbodies. The impacts related to the tower footprints are discussed in the Wetlands Section 4.2. The low probability of fuel spill impact to water quality is addressed in the Hazardous Materials Section 4.14.

Marine Life – There are no effects anticipated with this project. The majority of helicopter routes would be over land, therefore the risks to marine life associated with spills are minimized but still referenced in the Hazardous Materials Section 4.14.

Transportation – There would be a negligible effect to the regional transportation system because the transportation of workers/technicians to the project area would not displace other users of commercial fixed-wing aircraft. Bering Air has decided to purchase a new helicopter which will support GCI construction and operation activities. During the operations of the project, a proportion of the available flying time of the new helicopter would be dedicated to refueling and maintenance activities of Phase III repeaters as well as the field work associated with identifying future TERRA Backbone sites.

2.0 Alternatives

NEPA requires review of a reasonable range of alternatives in order to provide a comparison of the environmental effects of the Proposed Action.

Three alternatives will be analyzed in this EA:

1) No Action Alternative
2) Proposed Action with five towers on BLM land, one on private lands
3) Alternative Action with six towers on BLM land

Additional alternatives considered but dismissed from further analysis will also be described.

2.1 No Action – Alternative 1

Under the No Action Alternative, BLM would not grant the requested rights-of-way. The existing telecommunications and satellite internet service would continue or Unicom would have to seek other alternatives to providing broadband service not involving federal public lands. Satellite-based service may continue for the foreseeable future, incurring higher delays in connectivity and lower reliability.

2.2 Proposed Action – Alternative 2

The proposed TNW III Project is intended to extend broadband Internet service from Shaktoolik to Kotzebue. Five microwave repeater tower sites are proposed for construction, operation, and maintenance. Figure 2-1 demonstrates the repeater tower sites as well as the helicopter transit corridors associated with construction. During operations, helicopters would originate from Kotzebue and Unalakleet. The five tower sites (all within the Kateel River Meridian [KRM]) on BLM-managed lands are:

- **Ungalik River Repeater site**, located approximately 28 miles northeast of Shaktoolik, 22 miles southeast of Koyuk – Township (T.) 9 South (S.), Range (R.) 10 West (W.), KRM Sec. 21 and 28;
- **Dime Repeater site**, located approximately 17 miles northeast of Koyuk – T.4S., R.10W., KRM 3;
- **Talik Repeater site**, located approximately 44 miles northeast of Koyuk, 35 miles southeast of Buckland – T.1 North (N.), R.9W., KRM Sec. 4;
- **Harvey Repeater site**, located approximately 20 miles northeast of Buckland, 12 miles east of the coast – T.9N., R.9W., KRM Sec. 21
- **Baldwin Peninsula Repeater site**, located approximately 33 miles southeast of Kotzebue, 42 miles northwest of Buckland – T.13N., R.15W., KRM Sec.14

The sixth proposed tower site is a community tower located on private land in Kotzebue owned by Kikiktagruk Inupiat Corporation known as the KIC Site. The project characteristics are summarized in Table 2-1.

Table 2-1 Alternative 2: Proposed Repeater Sites for TNW III to Kotzebue

Microwave Tower Type	Location Name	Description	Latitude	Longitude	Elevation (ft.)	Tower Height (ft.)	Land Owner	Construction Staging Area	Operations Staging Area
Phase III – Backbone network from Shaktoolik to Kotzebue (Construction 2013-2014)									
Mountain top Repeater	Ungalik River	28 mi NE of Shaktoolik	64^0 41 12.0 N	160^0 40 48.1 W	21	80	BLM Anchorage Field Office (AFO)	Koyuk	Unalakleet
Mountain top Repeater	Dime	17 mi NE of Koyuk	65^0 05 51.4 N	160^0 42 57.3 W	997	60	BLM AFO	Koyuk	Unalakleet
Mountain top Repeater	Talik	44 mi NE of Koyuk	65^0 31 13.8 N	160^0 32 23.5 W	827	60	BLM Central Yukon Field Office (CYFO)	Buckland	Kotzebue
Mountain top Repeater	Harvey	20 mi NE of Buckland	66^0 09 38.5 N	160^0 34 47.7 W	2,025	60	BLM (CYFO)	Buckland	Kotzebue
Repeater	Baldwin Peninsula	33 mi SE of Kotzebue	66^0 31 14.9 N	161^0 50 52.4 W	2,400	250	BLM (CYFO)	On-site	Kotzebue
Community Tower	KIC Site	5 mi south of town	66^0 50 21.9 N	162^0 34 30.5 W	150	250	KIC Corporation	Kotzebue	Kotzebue
Source: Unicom Microwave Repeater Development Plan – Form 299 Long Term Lease Application Resubmission, November 20, 2012.									

To summarize the two BLM actions that are being considered, Table 2-2 outlines the characteristics of the temporary construction and long-term authorization rights-of-way.

Table 2-2 BLM Action Summary for Alternative 2 (Preferred Alternative)

Alternative 2 – Five Towers on BLM Land	Temporary Construction	Long-term authorization
Who	Unicom and its subcontractors	Unicom and its subcontractors
What	Construction of 5 towers, associated equipment	Operation of 5 towers, associated equipment
When	Summer 2013-Winter 2014	2014-2034
Where	See Table 2-1 for list of tower locations; Construction staging predominantly from Koyuk and Buckland although helicopters originate from Kotzebue and Nome	See Table 2-1 for list of tower locations; Helicopters would start from Kotzebue and Nome to provide maintenance and refueling support
How Long	18-month period	20-year authorization

2.2.1 Construction Details

The construction phase would permit activities within a temporary footprint of 225,000 square feet or 5.16 acres per site, as shown in the representative site plan in Figure 2-2. The representative site plan for the community tower in Kotzebue is shown in Figure 2-3. The figures demonstrate that the community tower differs from the remote sites because it does not contain power infrastructure, but requires a gravel pad. Combined, the five remote tower sites on BLM lands represent a total of 25.8 acres of land affected during the temporary (18-month) construction period in 2013 and 2014.

Temporary construction facilities and equipment planned at each remote tower site are listed in Table 2-3, and additional details are available in the Plan of Development (Appendix B), including a series of design ("typical") diagrams. During the construction period, temporary areas would provide for component preparation and assembly, lodging, food preparation, and waste management. These items are transported off the site at completion of construction.

Table 2-3 Alternative 2: Proposed Temporary Construction Facilities and Equipment for the Microwave Repeater Sites

Facility	Dimensions	Description
Heavy tent structures	10 ft. x 20 ft.	Plywood platforms would be constructed under each tent to protect the ground and level the tent. Tents would be secured from high winds using gabion baskets (weight) and "duck bill" anchors.
Cooking facilities	N/A	These would include electric hot plates, a microwave oven, and a conventional oven inside the cooking tent.
Food Containers	55-gallon drums	The cooking tent would contain drums of dry goods and canned goods. These drums would also be used to contain food waste and deter wildlife from gaining access. Drums would be transported off site for disposal in an approved location and carried back empty.
Portable sanitary facility (toilet):	1 per site	All human waste would be incinerated on site with an electric, flameless Incinolet device.

Facility	Dimensions	Description
Gray water drums	55-gallon drum	Cooking and hand-washing wastewater would be contained in one 55-gallon drum and would be released via a hose in a manner than avoids trenching.
Trash bags	N/A	Commercial trash bags would be used for dry garbage (plastic, paper, etc.), and they would be secured from the wind with cargo nets while awaiting transport.
Fuel	Six 55-gallon drums and two 300-gallon fuel bladders	Six 55-gallon drums (four for low-sulfur diesel fuel and two for gasoline) at each site during site construction would have integrated containment and would be covered to prevent rain/fuel mixing and overflow. Two 300-gallon fuel bladders will also be in place, one for aviation jet-A fuel, and one for low sulfur #1 diesel fuel. The fuel bladders will be stored in temporary containment dams.
Mini backhoe	7.3 ft. x 5.1 ft. tracks, 7,835 lb.	CAT 303 or equivalent for site excavation, drilling, material handling. Capstan winches attached to the excavator to support tower erection.
Air compressor	N/A	225 cubic feet per minute air compressor; used for leveling of competent rock (with jackhammer attachment) as well as drilling of rock anchor holes.
Additional Equipment	N/A	Freshwater drums, portable heating, chest freezers, miscellaneous hand tools.
Diesel Generators	N/A	2kW to 25kW portable generators will be used for camp and tool power.
Spill Response Materials	N/A	Sorbent pads, boom, granular sorbent, and spilled material containers.
Source: Unicom Microwave Repeater Development Plan – Form 299 Long Term Lease Application Resubmission, November 20, 2012.		

After construction, the 20-year long-term lease accommodates a much smaller footprint, reducing from 5.16 acres to 0.69 acres; of that, 0.08 acres would be modified due to the placement of foundation piles. Table 2-4 is a summary of the lease footprints, including a comparison of the Kotzebue Community Tower options.

Table 2-4 Tower Site Lands (per Site) Affected by Project Phase

Project Phase	Square Feet	Acres	Term	Comment
Construction Grant (Temporary)	225,000	5.16	3 years	**Remote sites**: includes large enough area for multiple helicopter landing options at remote sites.
Operations Long-Term Lease	30,000	0.69	20 years	**All sites**: includes area for undeveloped helipad at remote sites.
Modified Footprint during Operations	3,500	0.08	20 years	**Remote sites:** maximum area utilized for the placement of towers, modules, and tanks within long-term lease area. Of the 5 remote sites, there are 3 upland sites and 2 sites containing jurisdictional wetlands.
Gravel Fill at the KIC or USAF Site (Construction & Operation)	14,000	0.32	20 years	Approx. dimension of gravel pad at **KIC Site (Alternative 2)** or **USAF Site (Alternative 3)** for tower, module and equipment staging.

The major facilities remaining at each repeater site for the life of the lease include the tower and antennas, the power module shelter, the communication equipment shelter, and the fuel tanks. For details on dimensions, characteristics, additional equipment, and staging areas, see Table 2-5. Representative photographs of the proposed facilities during construction are shown in Figure 2-4.

Helicopter support operations would originate from Bering Air in Nome then transport equipment and technicians to sites or staging areas. Equipment staged in Koyuk would be transported to Ungalik and Dime repeater sites; equipment staged in Buckland would likely head to the Harvey and Talik repeater sites. Staging areas and their routes for construction, annual maintenance, and annual refueling are summarized in Table 2-6. Weather may be a factor for helicopter flight path variability; this is one reason the helicopter routes are depicted as a corridor in Figure 2-1.

The Hughes 500-E or Robinson R-44 "light-lift" helicopters would be employed to move personnel and light equipment and supplies throughout the five-month construction period. The Bell UH-1H Huey "medium-lift" helicopter would be used to ferry most of the equipment and building materials, primarily during June, July and August. The Erikson Air Crane would be used to lift the pre-fabricated power module shelter and communications equipment shelter during late June and early July for the mountain top repeater tower sites and late June and early August for the Baldwin Peninsula tower site. The Erickson Air Crane "heavy-lift" helicopter is uniquely large; it would travel from outside of Alaska for work on this project. The estimated numbers of helicopter trips and helicopter types are summarized in Table 2-6.

Table 2-5 Alternative 2: Proposed Facilities for the Microwave Repeater Sites

Facility	Dimensions	Description
Lattice-Type Tower	60 ft. tall	This tower is free-standing lattice and does not require guy wires. The tower would be plain, galvanized finish (steel gray) and would not be lighted.
Lattice-Type Tower	250 ft. tall	The Baldwin Peninsula Tower and Kotzebue Community Tower would be plain, galvanized finish (steel gray) and would be lighted as per FAA regulations; steady red and white lights at the top of the tower and red lights at mid height (red is lit during the night and white during the day). A BLM permit stipulation would require Unicom to apply to the FAA for a waiver to allow use of blinking (rather than steady) lights on the towers on BLM land (Baldwin Peninsula Tower and the Kotzebue Community Tower site) to reduce the risk of bird collisions.
Microwave Antennas	8-10 ft. diameter	Four ultra-high performance microwave-style antennas would be installed at each site.
Communications Equipment Shelter	10 ft. x 30 ft. x 10 ft.	The prefabricated shelter would be mounted on foundation piers, fiberglass exterior, painted matte gray in color. Each shelter would contain flooded lead-calcium batteries (C&D, series LCT-1680) for 48 hours of emergency power.
Power Module Shelter	10 ft. x 20 ft. x 10 ft.	The prefabricated power module shelter would also be mounted on foundation piers. It would be metal sided and painted matte gray. The shelter would contain two Maganplus 282csl1504 generators with Isuzu 3CE1BZG1 engines. Silencer is a GT- 301-5100 hospital grade. Arctic-grade construction standards include snow hoods to protect exhaust and ventilation systems from malfunction due to snow loads. Drip pans would be in place beneath the engine units. The floor would be sealed with petroleum-resistant sealant and the power module foundation

Facility	Dimensions	Description
		itself would be installed such that the floor would be sloped, and any spills to the shelter would flow to the exhaust side of the shelter (the platform edge would be 0.5 inches higher than the opposite edge of the shelter).
Greer Fuel Tanks	4,500-gallon	Each site would host two tanks, totaling 9,000 gallons of #1 diesel that would be painted matte gray in color. The tanks are specified as double-wall for containment and they would be connected to the power equipment shelter via dual containment piping (with leak PermAlert Ultra series detection integrated into piping). Each site would also have one refueling platform over one tank. They would feature: • Steel Tank Institute design outer wall leak containment and leak detection sumps at each end of the tanks; • Overfill shutoff valve; • Overfill spill containment; • Overfill alarm audible to the operator; • Leak detection sensor in the sump; • Low-/high-level alarm sensor within the tank; and • Remote alarm reporting system that would report to off-site operators.
Piping	N/A	Piping between the tanks and the equipment shelter would feature the following: • All piping would be aboveground; • All piping would be spill-contained, double-wall piping; • Piping would be sloped toward the equipment shelter; • Any leaked fuel would be collected in a containment sump within the shelter; and • A liquid sensor within the sump would transmit an alarm to off-site operators.
Spill Response Kit	N/A	Spill response materials would be kept on site to support maintenance operations. These would include (at a minimum) sorbent pads, boom, granular sorbent, and disposal drum.
Staging Areas		**Activities**
City of Buckland	For Harvey and Talik Sites	A regularly scheduled material barge would stop in Buckland to offload shelters and fuel tanks. A heavy-lift helicopter would fly these items to the site. Light-lift helicopters would deliver other equipment and the crews to install these facilities.
City of Koyuk	For Unglaik River and Dime Sites	A regularly scheduled material barge would stop in Koyuk to offload shelters and fuel tanks. A heavy-lift helicopter would fly these items to the site. Light-lift helicopters would deliver other equipment and the crews to install these facilities.
Bear Creek Camp	Leased from ADNR	Refueling and resupply/staging point and a safe place to stop mid-route if helicopters cannot reach intended locations. Will have permit from ADNR for a small camp of one to two people with sleeping and cooking tents and a fuel depot consisting of (3 ea.) 55 gallon drums of AvGas, JetA, diesel fuel, and gasoline.
Baldwin Peninsula Beach		A material barge would be commissioned to unload materials and equipment to a beach staging area in the fall of 2013 for overland transport in winter 2013/2014.
City of Kotzebue		General staging of Bering Air and technical crews.

Source: (Unicom 2012)

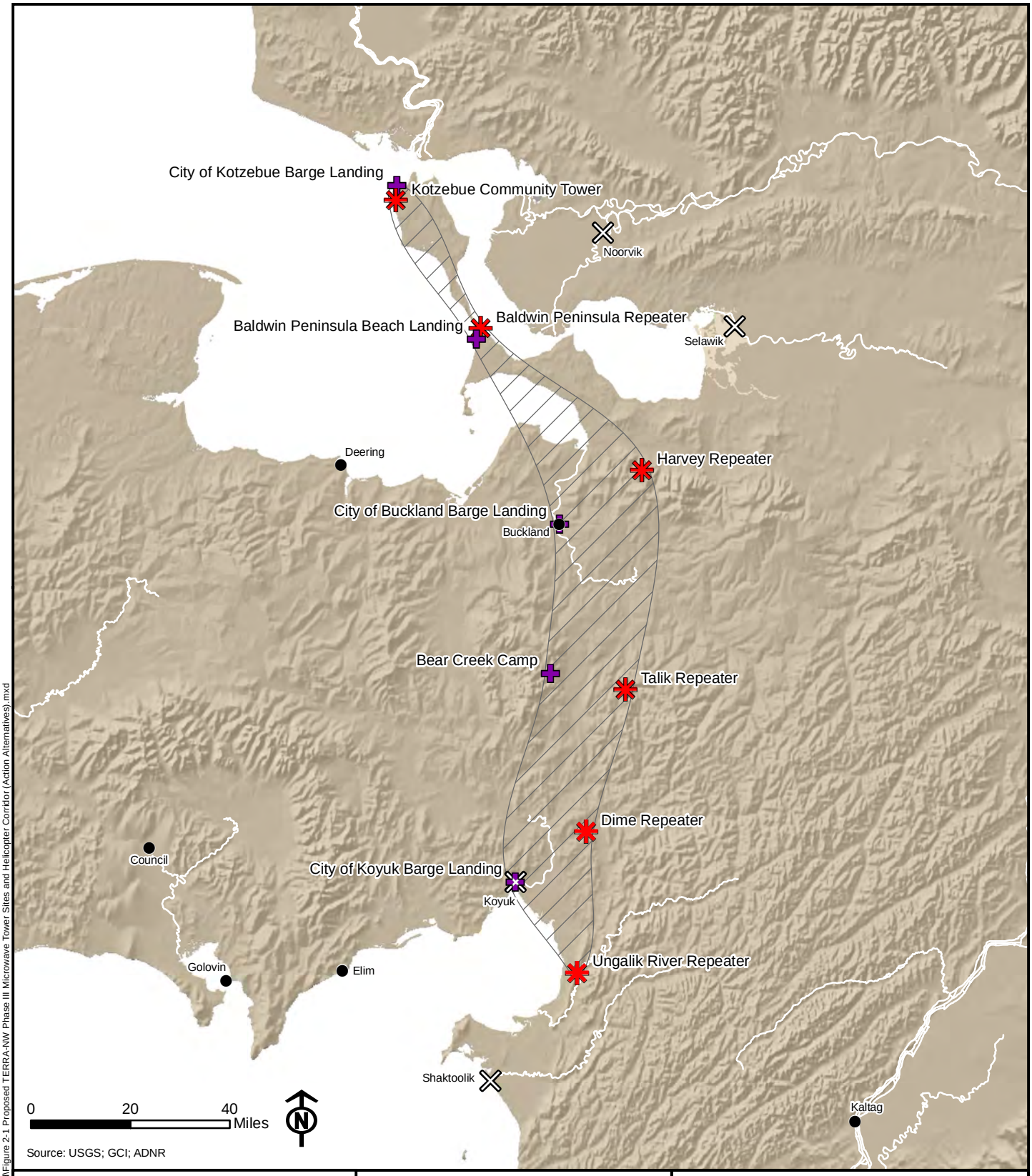
Table 2-6 Alternative 2: Helicopter Construction and Operations Support – Number of Trips Summary for Entire Construction Effort

Activity	Construction	Construction	Construction	Annual Maintenance	Annual Refueling
Helicopter	**Erickson Air Crane (heavy-lift)**	**Bell UH-1H Huey (medium-lift)**	**Hughes 500-E or R-44 (light-lift)**	**Hughes 500-E or R-44 (light-lift)**	**Bell UH-1H Huey (medium-lift)**
Ungalik River Tower Site	8	30-40	60-75	4	14
Dime Tower Site	24	50-60	75-80	4	14
Talik Tower Site	8	30-40	60-75	4	14
Harvey Tower Site	8	30-40	60-75	4	14
Baldwin Peninsula Tower Site	6	5	20	4	14

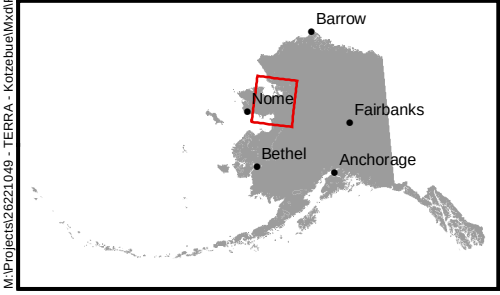
Notes:

- Trip numbers are estimates based on construction contractor estimates and past TERRA projects.
- Additional trips associated with emergency maintenance are not included in the Annual Maintenance numbers. Batteries would be replaced once in 20 years and the generators would be replaced every 5-7 years.
- Dime Tower Site would serve as a refueling station for the heavy-lift and medium lift helicopters due to the distance to Talik and weights of the modules. Fuel will be stored in temporary bulk fuel tanks, including storage of Jet-A fuel.

Source: (Unicom 2012)



Source: USGS; GCI; ADNR



Legend

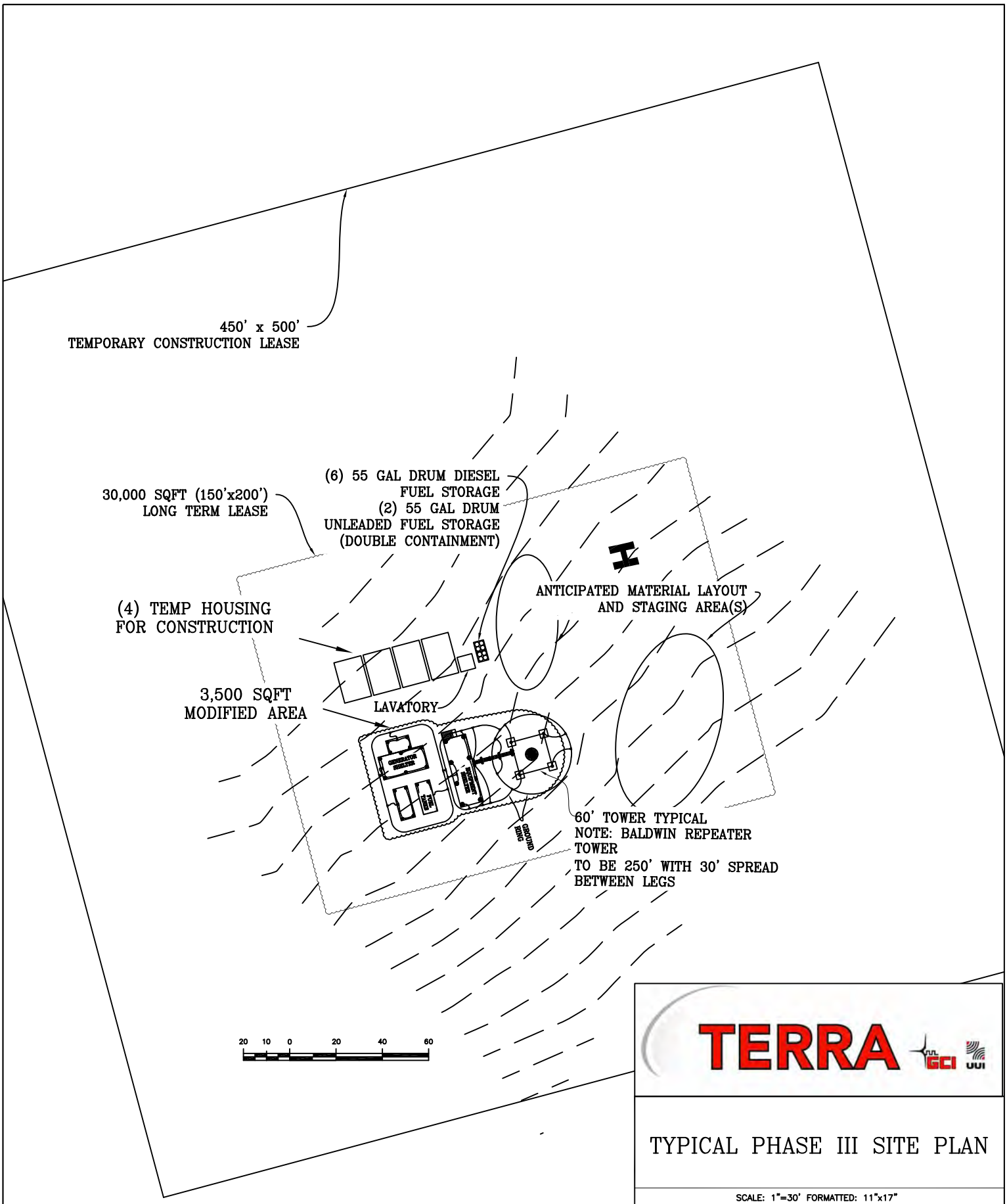
- Repeater Location
- Future TERRA Community Tower Site
- Helicopter Support Site
- Helicopter Corridor during Construction

TERRA-Northwest Phase III Environmental Assessment

Figure 2-1:
Microwave Tower Sites and Helicopter Corridor (Alternative 2 and 3)

Jan 2013

M:\Projects\26221049 - TERRA - Kotzebue\Mxd\Figure 2-1 Proposed TERRA-NW Phase III Microwave Tower Sites and Helicopter Corridor (Action Alternatives).mxd



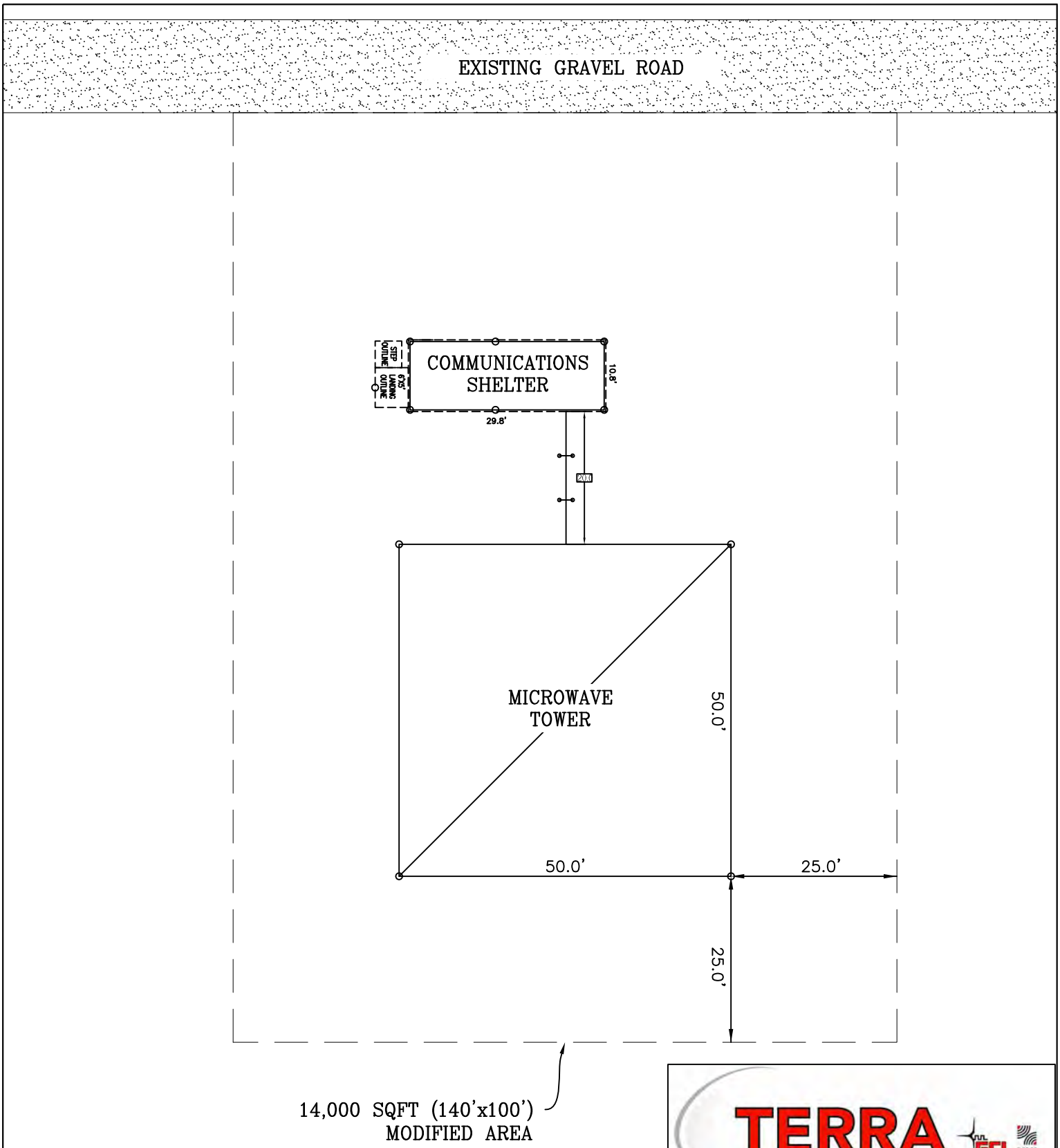
TERRA GCI UUI

TYPICAL PHASE III SITE PLAN

SCALE: 1"=30' FORMATTED: 11"x17"

DRAFTED BY: T.WEIST	DATE: 07/13/2012
DESIGNER/PROJECT ENGINEER: C. GILL	

REVISION	DATE
REV FOR 8.5X11	03/14/2013



TERRA GCI UUI

TYPICAL PHASE III
VILLAGE SITE PLAN

SCALE: 1"=20' FORMATTED: 8.5"x11"

DRAFTED BY: T.WEIST	DATE: 03/14/2013
DESIGNER/PROJECT ENGINEER: C. GILL	

REVISION	DATE

Figure 2-4: Examples of Construction at a Remote Repeater Tower Sites
(left TERRA-SW Caribou Saddle; right TERRA-NW Otter Creek)

During the operations period, the proposed maintenance and refueling flights would occur four to five days per site per year. Taking the five microwave repeater sites together, during the operations period, a total of 90 flights would take place over a period of 12 to 15 days each year. Maintenance and refueling flights would originate from Koyuk for the Ungalik River and Dime tower sites, Buckland for the Harvey and Talik tower sites, and from Kotzebue for the Baldwin Peninsula tower site. Each trip would transport 500 gallons of diesel fuel in "Fuel Easy" fuel bladders, taking the safest direct route to the tower sites. The construction season schedule is summarized in Table 2-7.

Table 2-7 Alternative 2: Proposed Mountaintop Microwave Tower Construction Schedules

Timing	Activity
June to Early July, 2013	Mobilization of materials and equipment to staging areas.
June 2013	Tower camp construction.
Late June to September 2013	Installation of foundation, towers, and fuel tanks.
July 2013	Heavy lift transport of fuel tanks, prefabricated shelters, and heavy construction equipment
June to July 2014	Antenna, fuel piping (between power module and tanks), battery installation and initial startup of the site. Fuel transportation and tank filling is expected at this time.
August to September 2014	Communications equipment installation (in the communications shelter), link commissioning (between sites) and site commissioning. Staging yards clearing, cleanup, and remediation / revegetation.
October 2014	Final punch list and acceptance.

Source: Unicom Microwave Repeater Development Plan – Form 299 Long Term Lease Application Resubmission, November 20, 2012

During the operation of the remote repeaters, scheduled maintenance occurs twice a year in July and September in addition to any emergency maintenance trips. Over the twenty year life of the facility, the batteries will be replaced once and the generators will be replaced every 5-7 years with the use of a medium-lift helicopter. Refueling is required once a year; 500-gallon fuel

bladders are transported using a medium-lift helicopter for a total of 14 round trips (to refill 7,000 gallons). A crew on the ground guides the bladder from the hovering helicopter to refill the fuel tanks on the ground. This effort takes about 2-3 days during June or July at every site except the Kotzebue Community Tower which would receive electricity from a local source.

Decommissioning of the site at the end of the lease or the replacement of the technology would entail the reverse of the installation process, though within a shorter timeframe. The remaining fuel would be pumped out of the tanks and backhauled with the rest of the facilities. Once down to the foundation level, the grout in the pile foundations would be broken-up to approximately six inches below grade. The ground would be re-graded and recommended fertilization or replanting of native species would occur.

2.2.2 Features Unique to Baldwin Peninsula Repeater Site Construction

Baldwin Peninsula Repeater site construction involves the transport of equipment by land and helicopter. The Baldwin Peninsula site requires different equipment than the other remote sites to drill and construct the foundations in the winter due to the geology of the site. The heavy-lift helicopter would still be utilized to transport and set down the modules and fuel tanks.

Baldwin Peninsula utilizes unique construction equipment in order to move supplies from the beach staging area to the tower site in order to construct the tower foundations in winter (a list can be found in Plan of Development Appendix B). A specially remodeled barge would land directly on the beach where a CAT loader would move equipment into connexes resting on crane mats for storage through the fall. In the winter when the ground is frozen at least 12 inches deep and six inches of snow cover is available, a Kobelco CK 1000 Series II Crane would move equipment to the top of the bluff where a variety of vehicles equipped with mat-tracks would drive it about 2.6 miles to the tower site.

The construction schedule for the Baldwin Peninsula site starts in the fall of 2013 when materials are staged at a beach on the western side of the peninsula. After the materials are driven to the eastern side of the peninsula in early winter, construction of the foundation and tower would occur in late winter/early spring, lasting about 45-60 days. (The crane on the beach would be picked-up the following summer when the barge can return.) The shelters, fuel tanks and tower would be erected utilizing on-site cranes. The backup plan would be to revert to the heavy-lift helicopter as used on the mountain tops. During the summer of 2014, the remaining elements of the site would be installed via helicopter. The Baldwin Peninsula site would come online at roughly the same time as the mountain top repeaters. The construction season schedule is summarized in Table 2-8

Table 2-8 Alternative 2: Proposed Baldwin Peninsula Microwave Tower Construction Schedule

Timing	Activity
September 2013	Staging of equipment and materials on beach landing along the Baldwin Peninsula for winter overland transport to tower site.
February 2014	Overland transport
March to April 2014	Installation of pile foundation and build tower
May to July 2014	Install prefabricated shelter and fuel tanks; demobilize staging area

Timing	Activity
August to September 2014	Install fuel piping (between power module and tanks), battery installation and initial startup of the site. Fuel transportation and tank filling is expected at this time. Communications equipment installation, link commissioning (between sites) and site commissioning. Staging yards clearing, cleanup, and remediation / revegetation.
October 2014	Final punch list and acceptance.

Source: Unicom Microwave Repeater Development Plan – Form 299 Long Term Lease Application Resubmission, November 20, 2012

2.3 Six Towers on BLM Land – Alternative 3

Under Alternative 3, the Kotzebue Community Tower would be located at the USAF Site approximately two miles south of town (see Figure 2-5). The site is located on BLM land withdrawn for use by the Department of Air Force and was identified by Unicom as a potential alternative location because it meets adequate engineering specifications. A radar dome and a communication tower are adjacent to the site as well as a gravel pad, offering the potential to co-locate the new tower. BLM would obtain concurrence from USAF prior to authorization of a ROW of this site if it is chosen.

Construction and maintenance activities associated with USAF Site would be similar to the KIC Site indicated in Alternative 2. Search of the Alaska Department of Environmental Conservation Contaminated Sites Program database indicates there is likely contamination under the USAF site. This is discussed in Section 4.14 Hazardous Materials.

Table 2-9 Proposed Community Tower Site on BLM Land under Alternative 3

Microwave Tower Type	Location Name	Description	Lat	Long	Elevation (ft.)	Tower Height (ft.)	Owner	Construction & Staging Area
Phase III – Backbone network from Shaktoolik to Kotzebue (Construction 2013-2014)								
Kotzebue Community Tower	USAF Site	4.5 mi south of city	66^0 50 31.8 N	162^0 35 25.8 W	150	125	BLM (CYFO)	Kotzebue (via road)

2.4 Summary Comparison of Impacts by Alternative

Table 2-10 Alternatives Impacts Summary

Impact Topic	Alternative 1 – No Action	Alternative 2 – Five Tower Sites on BLM Lands	Alterative 3 – Six Tower Sites on BLM Lands
Wetlands and Vegetation	None.	Direct impacts to wetlands and vegetation are anticipated to be of low to high intensity (temporary compression versus excavation) affecting a very small area (local extent). The chance of adverse impact from the introduction of non-native invasive species would be low due to the prevention, monitoring, and mitigation plan that will be developed with the BLM. The impact would be long-term to permanent in duration, considering the slow regrowth of affected vegetation. The impact would affect common wetlands, considering the large swaths of similar wetland types and common to unique vegetation resources considering the possibility of uprooting rare or sensitive species in the Talik Repeater area. Indirect effects associated with the fill of wetlands at the Kotzebue Community Tower KIC Site on non-federal lands. For the operations phase of the preferred alternative, very little new impact is introduced by the helicopter-supported maintenance and refueling flights.	Similar to Alternative 2 except there would be one more tower constructed on federal instead of private land. The impacts associated with wetlands fill for a gravel pad at the USAF would be considered “direct” because they are on federal lands.
Terrestrial Mammals	None.	Direct impacts to terrestrial mammals vary depending on location, timing, and activity. Impacts would be of low to medium intensity because changes may be noticeable but they are not expected to result in population-level effects. The duration of impacts is limited to temporary (construction) and long-term (life of project), and are not expected to persist if the towers were removed. The geographic extent of impacts would generally be limited to the immediate vicinity of the project activity, but could extend to the region if migratory species are affected. The context of impacts is common because impacts to rare or sensitive species are not considered in this section.	Similar to those under Alternative 2. There would be one more tower constructed on federal instead of private land, but this would not represent a measurable change in impact to behavioral disturbance, habitat loss, or injury/mortality.

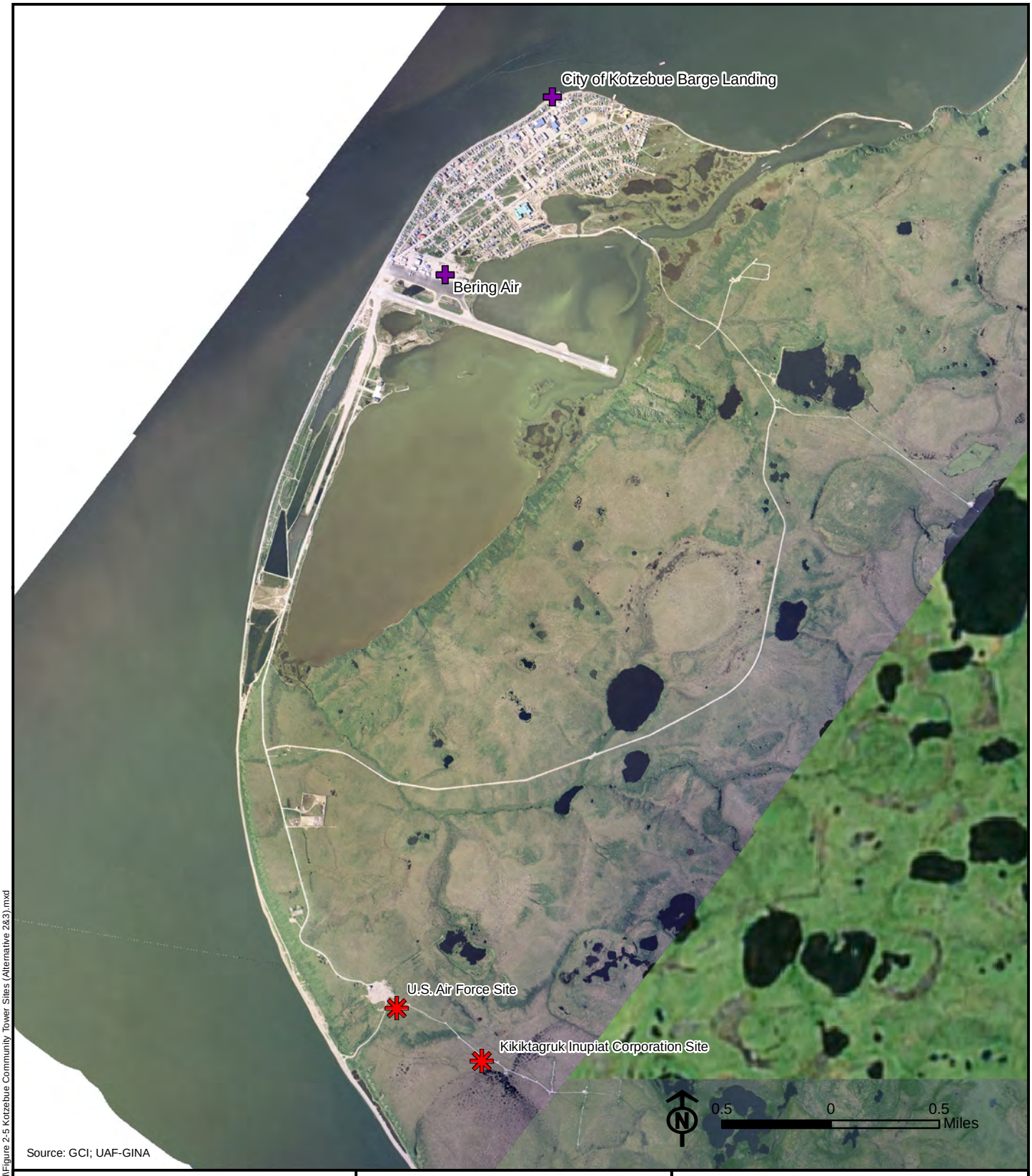
Impact Topic	Alternative 1 – No Action	Alternative 2 – Five Tower Sites on BLM Lands	Alterative 3 – Six Tower Sites on BLM Lands
Birds	None.	Direct impacts to birds would vary depending on location, timing, and activity. Impacts would be of low to medium intensity because while changes may be noticeable they are not expected to result in population-level effects. The duration of the impact would be limited to temporary (construction) and long-term (life of project), and are not expected to persist if the towers were removed. The geographic extent of impacts would generally be limited to the immediate vicinity of the project activity, but could extend to the region if migratory species are affected. The context could range from common to important because sensitive species could occur at all sites.	Similar to those described under Alternative 2. The difference in the location of the sixth tower site would not change the level of magnitude, duration, extent, or context of impacts.
Threatened and Endangered Species	None.	**Spectacled and Steller's Eiders** Under Alternative 2, impacts to spectacled or Steller's eider are unlikely to occur. If they did (an individual collided with a tower or was disturbed during migration), the impact would be of low intensity because while changes would be noticeable they are not expected to result in population-level effects. The chance of a collision or disturbance causing "take" of a listed eider is considered discountable. The duration of impacts is limited to temporary (construction) and long-term (life of project), and is not expected to persist if the towers were removed. The geographic extent of impacts would generally be limited to the immediate vicinity of the project activity, but could extend to the region since eiders are migratory. The context of impacts is important because both species are ESA-listed. **Polar Bears** Under Alternative 2, impacts to polar bears are unlikely to occur because the species so seldom occurs in the project area. If impacts did occur (i.e., an individual was disturbed or killed), the impact would be of moderate intensity because while changes would be noticeable they are not expected to result in population-level effects. Because the USFWS's Polar Bear Interaction Guidelines will be followed to avoid conflicts, the chance of a "take" is considered	**All Five Species** The magnitude of impacts to all ESA-listed or candidate species (important in context) would be low because changes to habitat, behavior or injury/mortality, if they occur, may be noticeable, but would not be expected to result in population-level effects. The impacts associated with operations are long-term but not expected to persist if the towers were removed. The geographic extent of impacts would generally be limited to the immediate vicinity of the project activity, but could extend to the region if migratory species (eiders) are affected.

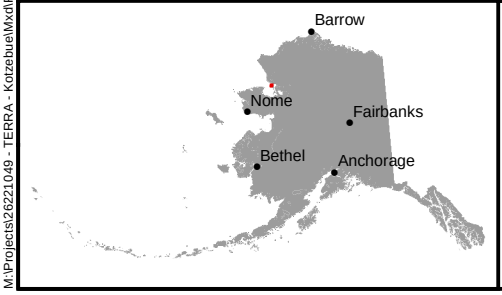
Impact Topic	Alternative 1 – No Action	Alternative 2 – Five Tower Sites on BLM Lands	Alterative 3 – Six Tower Sites on BLM Lands
		discountable. The duration of impacts would be limited to temporary (construction) and long-term (life of project), and is not expected to persist if the towers were removed. The geographic extent of impacts would generally be limited to the immediate vicinity of the project activity. The context of impacts is important because polar bears are ESA-listed. **Kittlitz's Murrelet and Yellow-billed Loon** Under Alternative 2, impacts to Kittlitz's murrelet and yellow-billed loon are unlikely to occur because these species rarely occur in the project area. If impacts did occur, they would be of low intensity because while changes would be noticeable they are not expected to result in population-level effects. The duration of impacts is limited to temporary (construction) and long-term (life of project), and are not expected to persist if the towers were removed. The geographic extent of impacts would generally be limited to the immediate vicinity of the project activity. The context of impacts is important because these species are candidates for listing under the ESA.	
Socioeconomics	The need for improved telecommunications/broadband infrastructure and service would not be addressed, and no new impacts would be generated under the implementation of Alternative 1. Alternative 1 would perpetuate the existing conditions and would not contribute to cumulative impacts to socioeconomic conditions.	During construction, local employment and spending would be low intensity because it would be less than a five percent increase in employment, revenue generation, and tourism levels. During the 20-year lifespan of the project, the changes in social indicators would be slight; there would be higher changes during the construction period that would last only during the construction seasons. Therefore duration of impacts would be temporary. Effects would be felt in only three communities: Buckland, Koyuk and Kotzebue, and so the extent of impact would be regional. The context of the impacts would be unique, as the communities affected predominantly Alaska Native and low-income.	Impacts to Socioeconomics would be the same is those in described in Alternative 2.

Impact Topic	Alternative 1 – No Action	Alternative 2 – Five Tower Sites on BLM Lands	Alterative 3 – Six Tower Sites on BLM Lands
Subsistence	None.	Impacts to subsistence resources would vary depending on location, timing, and activity. Impacts would be considered of low intensity because while changes may be noticeable during construction, these impacts are unlikely to result in population-level effects that would noticeably change subsistence resources or resulting harvest levels. The duration of the direct impact would be long-term and not expected to persist when the towers are removed. The geographic extent of impacts would generally be local, limited to the immediate vicinity of the project activity. The context of impacts would be common and would only affect locally abundant subsistence resources and is unlikely to change subsistence harvest and sharing practices.	Impacts to Subsistence would be the similar to those described in Alternative 2. The difference in the location of the sixth tower site would not change the level of magnitude, duration, extent, or context of impacts.
Recreation	None.	In summary, the direct and indirect impacts of Alternative 2 on recreation would be of medium intensity, due to displacement of recreational uses and noise disturbance in small areas during construction and increased search and rescue resources during operations. The noise disturbance associated with annual helicopter refueling trips would be intermittent, limited to 2-3 days per site for the life of the project, causing temporary displacement. These impacts would be long-term lasting the life of the project. The beneficial effects of improved emergency capabilities would be of regional extent, affecting a large portion of the project area. The recreation patterns affected would generally be considered resources that are common in context.	Impacts to Recreation would be the same as those described under Alternative 2.
Lands with Wilderness Characteristics	None.	Impacts to visual resources are consistent with existing VRM objectives defined in the Kobuk-Seward RMP (BLM 2008).	The effects of Alternative 3 would be similar to those described in Alternative 2.

Impact Topic	Alternative 1 – No Action	Alternative 2 – Five Tower Sites on BLM Lands	Alterative 3 – Six Tower Sites on BLM Lands
Noise	None.	Helicopter over flights and landings would cause a degree of disturbance, but the effect would be temporary in nature. The helicopter flights would be dispersed over multiple flight paths and the aircraft are required to fly at or above 1,500 ft., which would lessen the magnitude of sound at ground level and thereby minimize noise impacts. Helicopter-supported refueling activities would only last 2-3 days per site. Impacts from noise associated with the generators at the tower sites are of low intensity. The geographic extent would be local confined to a small area as impacts would occur at site-specific locations within the project area. The duration of the impact would be long-term with changes in noise more intense during the project construction period (2 years), but limited to refueling and maintenance trips for the 20-year life of the project. The context of the impact would be common because the soundscape is not depleted in the locality and project-generated noise would affect an ordinary soundscape.	Impacts to Noise would be the similar to those described under Alternative 2.
Visual Resources	None.	Impacts to visual resources are consistent with existing VRM objectives defined in the *Kobuk-Seward RMP*.	The effects of Alternative 3 would be similar to those described in Alternative 2.
Cultural Resources	No historic properties effected.	No direct or indirect adverse effects are anticipated on cultural resources eligible for listing on the NRHP at the five BLM properties. Additional surveys and determinations of effect will be completed for the Baldwin Peninsula Beach Landing Area, Ice Road, and KIC Site prior to construction at these sites.	Similar to Alternative 2; an additional survey would be required for the USAF Site prior to construction.

Impact Topic	Alternative 1 – No Action	Alternative 2 – Five Tower Sites on BLM Lands	Alterative 3 – Six Tower Sites on BLM Lands
Soils	None.	Topsoil removal/excavation and facility installation would result in direct and indirect impacts to soils that would be high in intensity resulting in obvious changes to soils and permanent in duration as the soil character within the footprint would not be anticipated to return. The impact to soil resources would be localized in extent to the project footprint. This affected resource would be considered common in context and ordinary throughout the region. The permanent direct impact to soils at the five BLM owned land tower sites would fall within the excavation area for a total of 4.0 acres. The indirect impacts to soils at the one tower site on non-federal lands would amount to 0.8 acres.	Impacts to Soils would be the similar to those described under Alternative 2.
Hazardous Materials	None.	This section presented three scenarios for hazardous materials releases to impact resources. The scenario with the greatest risk to resources would be the rupture of a 4,500-gallon fuel tank during operations at a site with wetlands. The probability of occurrence is low given established procedures and design features of the project. The intensity of impact impacts to wetlands, wildlife, and fish would be high due to the measurable loss of ecological function with the affected area. However, the extent of the spill would be local due to the limited amount of fuel held within the tank. Impacts to resources would be reduced with clean-up and removal of contaminated materials, but impacts would be long-term in duration for the recovery of typical mixed shrub sedge tussock tundra habitat. The habitats and wildlife affected in these scenarios would be important resources.	Impacts from hazardous materials release would be the similar to those described under Alternative 2.





Legend

Repeater Location

Equipment Staging Area

TERRA-Northwest Phase III Environmental Assessment

Figure 2-5:
Kotzebue Community Tower Sites (Alternative 2 and 3)

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2.5 Project Design Features

The proposed TNW III Project includes numerous design features and operational plans to reduce impacts. The project design features summarized below are common to all action alternatives and respond directly to the required operating procedures of the *2008 Kobuk Seward Peninsula Resource Management Plan* Record of Decision (BLM 2008). ROPs are requirements, procedures, management practices, or design features that BLM adopts as operational requirements. They are applied as conditions of approval to permits. ROPs are not selected as a condition of the permitted activities if the applicant has included them as part of the proposal or has identified an alternative method to meet the resources objective. Table 2-11 aligns project design features of the TNW III project with the ROPs that apply to the environmental consequences identified in this EA.

In addition, there are project design features of the TNW III Project associated with public safety that are not mandated by ROPs. They include:

- Mobotics cameras on site to monitor equipment.
- Module buildings would have key pads and a phone number posted so someone could call Unicom to get access for shelter under an emergency.
- FAA requirements/features for the 250-foot Kotzebue Community and Baldwin Peninsula towers that provide safety to aviation including lights and tower paint color.

Table 2-11 Project Design Features to Achieve Required Operating Procedures (ROPs)

Required Operating Procedure (ROPs)	Objective	Project Specific Design Features or Procedures (from the Plan of Development)
Vegetation - 1	Treatments to alter the vegetative composition of a site, such as prescribed burning, seeding, or planting will be based on the potential of the site and will: retain or promote infiltration, permeability, and soil moisture storage; contribute to nutrient cycling and energy flow; protect water quality; help prevent the introduction and spread of noxious weeds; contribute to the diversity of plant communities, and plant community composition and structure; and support the conservation of threatened and endangered species, other special status species, and species of local importance.	A monitoring and mitigation plan for invasive species will be developed in consultation with BLM. It is based on management objectives designed to prevent introduction of noxious and invasive weeds. This plan will include preventative measures including: • Power wash of materials, equipment, tools, and accessories prior to transit, along with mid-season inspection; • Use of native species in re-vegetation and weed-free mulch; • Suitable topsoil to be conserved for use in reclamation; • Annual monitoring during annual site maintenance to ensure early detection and rapid response to prevent ecological damage that could otherwise be caused by invasive plants at remote tower sites, with reporting of results. The duration of the monitoring will be specified in the plan.
Vegetation - 2	Minimize disturbance to vegetative resources from permitted activities	The transport of supplies to the Baldwin Peninsula site will not occur until the ground is frozen 12 inches with 6 inches snow cover to minimize, to the maximum extent practicable, disturbance to the tundra mat and wetlands. Unicom will notify BLM when conditions are adequate for a notice to proceed. Construction at the KIC Site would be developed using existing roads. Personnel would not be allowed to use all-terrain vehicles at any of the sites at any time.
Water, Riparian, and Wetlands -1	Manage human use to achieve and maintain water quality standards and avoid waste management problems and water quality impacts.	The Incinolet will utilized to burn human waste (no waste is stored on-site) Non-toxic solid waste will be incinerated on-site with a Smart Ash device. Any remaining household wastes will be transported off-site.
Water, Riparian, and Wetlands -2	Land management practices will be directed to avoid or minimize adverse impacts upon the hydrological, habitat, subsistence, and recreational values of public wetlands.	Unicom will submit a permit to the U.S. Army Corp of Engineers for work in wetlands located in the Baldwin Peninsula, Dime, and KIC tower sites. Coordinate with guided fishing and hunting operations to inform about the construction season activities, so they can consider alternate locations. Helicopter-supported refueling activities are scheduled to occur in June or July and maintenance activities in late September.

Required Operating Procedure (ROPs)	Objective	Project Specific Design Features or Procedures (from the Plan of Development)
Water, Riparian, and Wetlands - 5	Provide for maintenance of proper functioning condition in riparian areas and protection of water quality by minimizing impacts of other permitted activities and vegetation treatments.	Proposed towers are not in riparian areas. Wetlands were avoided at sites where feasible. Corps permit submitted for Dime, Baldwin Peninsula and Kotzebue Community Tower KIC Site.
Special Status Species - 1	Fish, wildlife, sensitive plants, and habitat will be managed to ensure compliance with the Endangered Species Act (ESA) and to ensure progress towards recovery of listed threatened or endangered species.	Unicom will comply with requirements of ESA as per Section 7 Consultation. To prevent disturbing ground nesting birds, Unicom would survey the site for nesting at the construction sites prior to vegetation clearing or ground disturbance. Bird mortalitiesin the immediate vicinity of the towers will be recorded on the site report form during annual refueling and maintenance visits. If any mortalities are found the USFWS would be notified. Unicom will be required to submit a waiver for blinking lights at the Baldwin Peninsula and Kotzebue Community Tower sites as mitigation for potential bird strikes.
Fish and Wildlife - 2	Maintain and protect fish and wildlife habitat on public lands and provide for the habitat needs of fish and wildlife resources necessary to maintain or enhance such populations.	Overland transport of equipment and fuel to the Baldwin Peninsula will occur in winter and helicopter transport of equipment and fuel to mountain top repeater sites will be used to avoid vehicular travel and stream crossings. During the operations period of the project, helicopter flights for refueling the microwave repeater sites will be limited to a period outside of the intensive hunting, fishing, and recreation activities - June and July. Helicopters will be restricted to an altitude of 1,500 feet and must maintain a 1,500 foot buffer around wildlife. The seasonal window and 1,500 foot buffer for helicopter-supported refueling would reduce the impacts on wildlife. During construction, food would be stored in 55-gallon drums. All camp and construction waste would be contained in drums or large, commercial trash bags and would be removed from the site periodically. The trash bags would be used for dry garbage (plastic, wood pieces, etc.) and would be secured from the wind with cargo nets while awaiting transport. These measures would deter wildlife such as bears from accessing garbage or food at the proposed tower sites, although attraction may still occur, and would also minimize dangerous interactions or ingestion that could injure or kill wildlife.

Required Operating Procedure (ROPs)	Objective	Project Specific Design Features or Procedures (from the Plan of Development)
Fish and Wildlife - 3	Avoid heavy concentration of activities in sensitive fish, wildlife, and plant habitats.	Lattice tower design and lack of guy wires, reduce the risk of birds colliding with the towers. . Unicom will be required to submit a waiver for blinking lights at the Baldwin Peninsula and Kotzebue Community Tower sites as mitigation for potential bird strikes. Lights used during construction or operational maintenance would be downturned. Bird mortality surveys will be conducted during each refueling and maintenance visit to every tower site and results recorded on site report forms. If any bird mortalities are found, the USFWS would be notified.
Fish and Wildlife - 4	Avoid disruption of wildlife movement and subsistence use.	Helicopters would be restricted to an altitude of 1,500 feet above ground level and avoid approaching within 1,500 feet of wildlife.
Subsistence - 1	Prevent unreasonable conflicts between subsistence use and permitted activities on BLM managed lands.	Unicom consulted with subsistence communities on ways to minimize impacts to subsistence during the scoping period and EA comment period.
Cultural and Paleontological - 1	Management practices will consider protection and conservation of known cultural resources, including historical sites and prehistoric sites.	Conduct cultural resource surveys and ARPA Reports to comply with Section 106 consultation requirements. Prior to ground-disturbing construction, field surveys and documentation would be conducted on sites that were not surveyed (e.g. Baldwin Peninsula beach, Baldwin Peninsula overland route, and Kotzeube Community Tower site). If cultural resources are inadvertently discovered during construction, work would be stopped and the cultural resources assessed and impacts mitigated.
Visual Resource Management - 1	Manage permitted activities to meet Visual Resource Management Class Objectives.	Associated structure of the Ungalik River Repeater would be painted white/off white, as views of these structures from the Iditarod National Historic Trail would be experienced primarily during periods of contiguous snow cover. Towers and associated structures (modules and fuel tanks) at the remote repeater sites and Kotzebue Community Tower site would be painted gray to blend with landscape character elements of summer months. The paint would be matte (non-reflective or light absorbing finish to reduce reflection. Antenna covers would also use a non-reflective color scheme. Landforms will not be modified and vegetation removal would be minimal at each site.

Required Operating Procedure (ROPs)	Objective	Project Specific Design Features or Procedures (from the Plan of Development)
Fire Management - 1	Reduce impacts to water quality, riparian habitat, vegetation, soils, and fish habitat from fire suppression activities.	Unicom would be held financially responsible for any actions or activities that results in a wild land fire. The power generator is equipped with manufacturer approved and functional spark arrestors. Helicopters chartered by Bering Air have the exhaust/cooling system located high on the fuselage.
Hazardous Materials and Waste Management - 1	Protect the health and safety of permittees, lessees, and the general public by avoiding the disposal of solid waste and garbage near areas of human activity.	Areas of operation will be left clean of all debris. Putrescible waste will be incinerated. Domestic waste will be incinerated; gray water would be screened then disposed onsite through a hose that is moved around to avoid erosion. Non-hazardous wastes like plastics will be backhauled for proper disposal.
Hazardous Materials and Waste Management - 2	Minimize impacts on the environment from non-hazardous waste generation.	Construction personnel would be required to keep the camp area clean, including waste disposal in incineration devices and erosion control from disposal of gray water. Areas of operation will be left clean of all debris. There is no all-terrain vehicle use for transportation on-site. Stockpiles of soil, sand, and other material will be covered with tarps.
Hazardous Materials and Waste Management - 3	Minimize the impacts to fish, wildlife, and the environment, from hazardous materials, oil spills, and other chemical spills.	SPCC Plan includes the requirement of secondary containment. Any spills would be cleaned immediately following ADEC procedures. Sufficient oil-spill cleanup materials (absorbents, containment devices, etc.) will be stored at Bear Creek Fueling Point and Kotzebue, Buckland, Koyuk, at the tower sites and the Baldwin Peninsula beach to accommodate the fuel tanks, fuel bladders and heavy equipment. All fuel containers will be marked with the Unicom's identification, product type (diesel), and year and month filled and purchased. Fuel storage is over 100 feet from any river, lake, or stream. Hazardous materials/toxic substances, as defined by EPA (i.e., used oils/petroleum products, batteries), will be handled and disposed of in accordance with EPA and ADEC guidelines. Staff will be trained on fuel spill reporting and emergency response procedures. Project design includes secondary containment facilities and drip pans under motorized equipment when running (e.g. generators). Detailed Spill Prevention, Control and Countermeasure Plan (SPCC) required as

Required Operating Procedure (ROPs)	Objective	Project Specific Design Features or Procedures (from the Plan of Development)
		part of permit stipulations, for construction sites hazardous materials storage, helicopter fuel transportation, fueling operations.
Soils - 1	Minimize soil erosion by stabilizing disturbed areas as soon as possible. Where permitted operations result in surface disturbance, return land to its pre-disturbance condition to the extent possible.	Excavation topsoil will be saved for re-spreading over construction site; Topsoil will be stored on plywood; Topsoil will be covered with tarps; When replaced, the topsoil will be re-graded and contoured to match the neighboring topography. Recommended fertilization or replanting, if any, of native species and/or vegetation will be done as in accordance with the BLM Alaska Invasive Species Management Policy as it relates to the tundra environment. Plywood platforms will be constructed under each tent to protect the ground and level the tents for crew housing. Operate under approved Storm Water Pollution Prevention Plan (SWPPP) to control erosion at tower sites.

2.6 Alternatives Considered, but Eliminated from Detailed Analysis

The following alternatives were considered, but were ultimately eliminated from further analysis because they do not meet BLM's objectives for granting rights-of-way (listed in Section 1.1).

2.6.1 Overland Fiber-Optic Cable

An overland fiber-optic cable would supply service using a buried and pole-mounted fiber-optic cable between communities, without use of microwave signals transmitted through remote repeater towers and received by community towers. Over 500 miles of cable would traverse rivers, anadromous streams, and wetlands on federal, state, and private lands instead of a few microwave repeater sites. Installation could occur in winter months for some portions to reduce environmental impacts. The overland alignment would traverse lands under many different ownership and management regimes. There is great topographic and climatic variability along the route that would make a fiber-optic cable extremely difficult to install from a technical perspective and at a current funding levels. The construction of microwave tower sites in lieu of an overland fiber system represents a sizable cost savings. At this time, an overland fiber-optic cable is economically infeasible due to the increased costs. This alternative was eliminated due to the unnecessary environmental damage associated with impacts to wetlands, wildlife (particularly bird strikes), and unidentified cultural resources.

2.6.2 Underwater Cable around the Seward Peninsula

A submarine cable route connecting Nome to Kotzebue around the Seward Peninsula and across Kotzebue Sound would minimize terrestrial impacts but cause environmental damage to the marine environment; notwithstanding sea ice and other the technical barriers. The villages would remain on satellite while only the population hubs of Nome and Kotzebue would receive high-speed internet and improved reliability thus not meeting the requirements of some of the project funding sources. This alternative was eliminated due to unnecessary environmental damage.

2.6.3 Alternative Sites

Talik Repeater falls within the Nulato Hills ACEC. BLM's objective when granting rights-of-way require compatibility with land use plans. An alternative to Talik and other mountain top sites were considered by Unicom, but are not technically feasible because they do not meet line of sight criteria.. Towers must be in line-of-sight from the previous tower and the signal cannot stretch more than 50 miles over land (the distance must be shorter if the microwave travels over water).

An alternative to Talik and other mountain top sites to avoid the ACEC would result in unnecessary environmental damage associated with the additional footprint, additional helicopter trips, and additional incursions into lands with wilderness characteristics.

2.6.4 Alternative Power Sources to Reduce Carbon Footprint

A BLM objective when granting rights-of-way requires the protection of natural resources. The use of alternative fuels (e.g. propane) and renewable energy (e.g. solar, wind) as a power source for the remote microwave repeaters would reduce the carbon footprint of the project, and potentially reduce the risk of diesel fuel spill during refueling or routine operations. Alternative power sources were evaluated in detail as part of the environmental review of the TERRA-SW

Project (Electric Power Systems Inc. 2010; USFWS 2011). The evaluation was based upon the availability of adequate energy to meet module power needs as well as the feasibility, reliability, and cost of installation, operations, and maintenance.

The alternative power analysis in the TERRA-SW Project looked at propane, solar, and wind energy as stand-alone or supplemental power source alternatives to the diesel generator systems. Telecommunications equipment operation must be extremely reliable.

- Hydroelectric and geothermal renewable energy sources were not evaluated as they were not practical within the vicinity of the proposed mountaintop tower sites. The major findings were that propane fuel results in some environmental benefit, but the volume required would cause more frequent refueling trips by helicopter.
- Solar insolation values are assumed to be inadequate for the approximately 68,000 kilowatt hours per year to power the communications modules. Energy storage would require significantly larger batteries and current solar panel technology is more vulnerable to damage to extreme weather and icing conditions, and more frequent maintenance trips.
- Wind loads might be adequate but not continuously. A wind-diesel system would require greater maintenance (cost) as a diesel system and generate potential avian collisions along with a change to the viewshed.
- A solar-wind hybrid with battery would be similarly cost prohibitive as well as present a technical complexity that challenges the requirement for a stable and reliable energy source.

2.6.5 Expand the Use of the Satellite Network

Satellites provide the existing telecommunication services for the project area in the form of voice service and bandwidth-constrained internet service for telemedicine and distance-learning providers (interactive applications). The TERRA project was designed to expand broadband internet needs because they are not currently being met by the existing satellite network. The total satellite capacity is limited by the number of transponders built into operational satellites. It is not possible to add transponders to in-orbit satellites.

In addition to limited capacity, satellite technology generates a much greater delay or latency in the delivery of information from one place to another when compared to terrestrial options because the signal must travel to and from a geostationary satellite orbiting more than 22,300 mi. above the Earth. High-latency satellite networks require software applications, servers, and computer workstations to be specially tuned to achieve adequate performance or else data transfer suffers dramatically. Interactive applications suffer significantly in high-latency networks because latency restricts data throughput speeds. Satellite latency is a product of basic physics and would deter the use of highly desired, modern applications.

This alternative was dismissed because BLM rights-of-way objectives promote technological compatibility which infers the use of the best available technology.

3.0 Affected Environment

The discussion of the affected environment includes a description of the existing conditions at each repeater site, in the vicinity of the sites.

3.1 Wetlands and Vegetation

In July 2012, URS biologists visited the proposed Ungalik River, Dime, Talik, Harvey, and Baldwin Peninsula Repeater sites as well as the Kotzebue Community Tower USAF site to survey for vegetation and wetlands. The survey objective was to create a baseline characterization of the vegetation present, identify any wetlands present, and document the occurrence of any invasive, rare, or sensitive plant species within the project areas. Details on invasive and rare and sensitive species are provided in Sections 3.1.8 and 3.1.9 respectively.

Vegetation surveys and wetland determinations were conducted concurrently at the sites. For vegetation, a general survey was conducted of the whole construction footprint and nearby areas to document species present and determine the primary vegetation communities. Five representative one-quarter meter square plots were established at each site to determine cover by dominant species (URS 2012). Wetland determinations were performed according to the 1987 Corps of Engineers Wetland Delineation Manual (U.S. Army Corps of Engineers [USACE] 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region Version 2.0 (USACE 2007). Three of the proposed repeater sites on BLM-managed lands met the USACE criteria for jurisdictional wetlands:

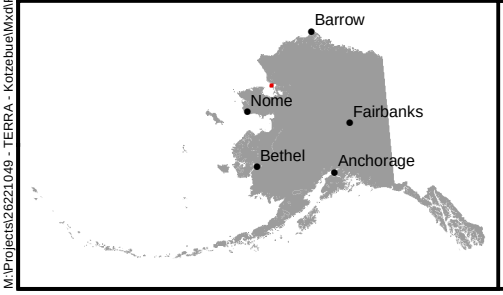
- Dime Repeater – footprint contained areas of wetlands
- Baldwin Peninsula – entire footprint and surrounding area contained wetlands
- Kotzebue Community Tower USAF site – footprint contained wetlands and surrounding are met the criteria for wetlands
- Kotzebue Community Tower KIC Site (private) - not visited; National Wetlands Inventory (NWI) database indicates wetlands

A summary of the vegetation and wetland survey results can be found in Table 3.1-1 and Figure 3-1 shows the NWI mapping for the two alternate Kotzeube Community Tower sites.

Table 3.1-1 Vegetation and Wetlands Survey Summary

Site	Primary/ Secondary Vegetation Community	Wetland Presence and Cowardin Classification*
Ungalik River Repeater	Dryas dwarf shrub tundra/ Shrub sedge tundra	No wetlands present
Dime Repeater	Dwarf shrub sedge tundra	Wetlands present –(PSS1B)*
Talik Repeater	Dwarf shrub/ ericaceous shrub/ dwarf Dryas tundra	No wetlands present
Harvey Repeater	Dryas dwarf shrub	No wetlands present
Baldwin Peninsula Repeater	Dwarf shrub/ tussock tundra	Wetlands present – (PSS1/EM1B)
Kotzebue Community Tower KIC Site	Dwarf shrub/ tussock tundra	Assumed wetlands present – (PSS1/EM1B)
Kotzebue Community Tower USAF site	Dwarf shrub/ tussock tundra	Wetlands present – (PSS1/ EM1B)

*P – Palustrine SS – Scrub-Shrub EM – Emergent 1 – Broad-Leaved Deciduous B – Saturated
Source: URS 2012; National Wetlands Inventory Database



Legend

Repeater Location

TERRA-Northwest Phase III Environmental Assessment

Figure 3-1:
Wetlands Mapping of Community Tower Sites (Alternative 2 and 3)

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M:\Projects\26221049 - TERRA - Kotzebue\Mxd\Figure 3-1 Wetlands Mapping of Community Tower Sites (Alternative 2&3).mxd

3.1.1 Ungalik River Repeater

The proposed Ungalik River Repeater site is located on the crest of the western most ridges in the Nulato Hills, 28.6 miles northeast of the community of Shaktoolik, approximately 0.7 mile west of Ungalik River and 2.8 miles west from Norton Bay. The elevation of the site of is approximately 1,000 feet. The site slopes to the west and toward a broad low terrace adjacent to Norton Bay. To the east, the terrain is steep and descends down to the Ungalik River. The repeater location is in a slight saddle between two prominent rock outcrops.

Two prominent vegetation communities were found at this site: a Dryas dwarf tundra and dwarf shrub/mesic herb tundra community. The Dryas dwarf shrub tundra occurs on the steep terrain and wind-swept ridge tops on either side of the repeater location and is heavily dominated by the prostrate shrub mountain avens (*Dryas octapetala*) and exposed gravel. Other dwarf shrubs in this community include black crowberry (*Empetrum nigrum*), alpine azalea *(Loiseleruia procumbens*), bearberry (*Arctostaphalos rubra*) and narrowleaf Labrador tea (*Ledum decumbens*). These species constitute 50 percent of the vegetative cover, with the remaining portion comprised of moss, lichen (*Cladina* spp.) and unvegetated rocky patches.

The dwarf shrub/mesic herb community has a diverse complement of dwarf shrubs including dwarf birch (*Betula nana*), crowberry, bog blueberry (*Vaccinium uliginosum*) and Labrador tea as well as low shrubs such as young Alaska birch, green alder (*Alnus viridus*), arctic willow (*Salix arctica*) and diamondleaf willow (*Salix planifolia*). Herbaceous species include Bigelow's sedge (*Carex Bigelowii*), arctic lupine (*Lupinus arcticus*), monk's hood (*Aconitum delphinifolium*), fireweed (*Epilobium angustifolium*), Labrador and whorled louseworts (*Pedicularis Labradorica, P. verticillata*), narrowleaf saw-wort (*Saussurea angustifolia*), Scotch false asphodel (*Tofieldia pusilla*), snow arnica (*Arnica frigida*), and alpine bistort (*Polygonum viviparum*).

The vegetation does not meet the criteria for hydrophytic vegetation or wetland hydrology and therefore does not meet the USACE criteria as a wetland.

Downslope from the site the vegetation grades into a tall shrub community of Alaska and shrub birch (*Betula neoalasakana and B. glanulosa*), green alder (*Alnus sinuate*) and willow (*Salix* spp). White spruce (*Picea glauca*) and birch become more prominent on the lower slopes of the ridge. Very little gravel or exposed rock occurs in alpine meadow habitat. On the other side of the saddle the elevation rises and vegetation changes back to the Dryas dwarf tundra community with exposed gravel.

3.1.2 Dime Repeater

The proposed Dime Repeater site is located on a low ridge in the eastern portion of the Koyuk River Valley, 19 miles northeast of Koyuk. The elevation of the site is approximately 827 feet. The proposed repeater site is near the center at the crest of a broad ridge top in series of low, gently rounded hills. The site is characterized by a mosaic of open stripes of stone groupings and low shrub tundra with a moderate amount of microrelief in some areas of the site and evidence of cryoturbation (frost churning). The northern portion of the site was found relatively dry and open and the southern portion, downslope of the proposed repeater location, was considerably wetter with standing water in small depressions. The side slopes of the ridges supported stands of tall shrub communities and open forests of Alaska birch and white spruce. The site drains to the south-southeast and a very small amount of flowing water was evident in the low point of the

drainage at the southern extent of the site, downslope from the proposed repeater location. There are other waterbodies in the vicinity of this site.

Folious and fruiticose lichens make up a majority of the ground cover with the higher areas of microrelief supporting the highest degree of cover by lichen. Wind-blown dwarf white spruce (<2 feet high) were scattered in lower areas to the south (down slope) of the site with stripes of wetter and greener vegetation, most noticeable from the air.

The site vegetation is dominated by dwarf shrub primarily consisting of dwarf birch, Labrador tea, crowberry, lingonberry (*Vaccinium vitis-idaea*), bog blueberry, and diamondleaf willow. The herbaceous component consists of primarily Bigelow's sedge, and water sedge (*C. aquatilis*), Arctic sweet-coltfoot (*Petasites frigidus)* with minor amounts of cloudberry (*Rubus chamaemorus*), lingonberry, and large-leaf bent grass (*Arctagrostis latifolia*). Lichen (*Cetraria* spp. and *Sterocaulon* spp.) made up approximately 70 percent of the cover. Wet depressions supported some sphagnum moss (*Sphagnum* spp). Other minor species in this community include alpine sweetgrass (*Heirochloe alpine*), alpine azalea *(Loiseleuria procumbens*), and least willow (*Salix rotundifolia*).

Two wetland determination points were established at the Dime Repeater site. The first determination point, located in the drier northern portion of the site, had a thick fibrous organic layer (10-inch histic epipedon) but was not saturated at the time of the survey. For site hydrology, it did meet the requirement of two or more secondary indicators. Vegetation met the criteria as hydrophytic and the site was considered a palustrine scrub-shrub wetland (PSS1B). The second point was located in the southern portion of the site in an area of a small drainage and near standing water. Vegetation at this point passed the dominance test for hydrophytic vegetation and contained primary indicators for both hydric soil and wetlands hydrology. The soil consisted of very fine-grain, saturated silty sand which oozed up into the soil pit from the area adjacent to the hole. This portion of the site was classified as a palustrine scrub-shrub/emergent persistent saturated (PSS1/EM1B).

3.1.3 Talik Repeater

The proposed Talik Repeater site is located at the 2,025-foot elevation on the Talik ridge at the northern extent of the Nulato Hills, 46 miles north by northeast of Norton Bay. The site is on a tabletop plateau (slope approximately 2 percent) with extensive patterned ground of stone circles and stripes, indicative of areas subjected to cryoturbation. The site is characterized by relatively uniform distribution of these barren areas and patches of dwarf shrub tundra vegetation. There are no streams or other waterbodies in the vicinity of this site.

The northern portion of the site consists of low rocky outcrops interspersed with dwarf ericaceous shrub tundra. The shrub stratum primarily consists of crowberry, bog blueberry, alpine azalea and bearberry. The herb stratum consists primarily of the grass, narrow false oats (*Trisetum spicatum*), Bigelow's sedge, black oxytrope (*Oxytropus nigrescens*), lingonberry and folious and fruiticose lichen. Other minor species include one-flowered cinquefoil (*Potentilla uniflora*), monk's hood, arctic wormwood (*Artemesia arctica*), alpine azalea, Fries' pussytoes (*Antenaria friesiana*) and hairbells (*Campanula lasiocarpa*). This community covers approximately half of the area.

From north to south, the vegetation community in the southern portion of the site gradually changes from an ericaceous dwarf shrub to a Dryas dwarf shrub tundra community, strongly dominated by mountain avens, similar to the community described under the Ungalik River Repeater site.

One determination point was sampled in a representative area in the northern portion of the site to determine if it supported jurisdictional wetlands. The survey found no hydric soil or wetland hydrology indicators present. Therefore, this site does not meet the USACE criteria for wetlands.

3.1.4 Harvey Repeater

The proposed Harvey Repeater site is located on a tall, flat-topped peak in the Selawik Hills. The site is approximately 75 miles southeast of Kotzebue and 12 miles east of Eschscholtz Bay. This site is the highest of the six proposed repeater sites with an elevation of approximately 2,400 feet. There are no streams or other waterbodies in the vicinity of this site.

The antenna site is located in the center of a relatively flat homogenous of open stone groupings and circles (patterned ground) separated by narrow patches of prostrate Dryas dwarf shrub/ lichen tundra. The microrelief of this sites ranges to approximately 16 inches, likely from extensive cryoturbation. Mountain avens makes up approximately 30 percent of the vegetative cover with the remaining portion comprised by approximately 40 percent lichen and exposed rocks. Other minor species include least willow (*Salix rotundata*), pin cushion plant, Fries pussytoes, narrow false oats, black oxytope, Bigelow's sedge, common woodrush (*Luzula multiflora*) and field horsetail (*Equisetum arvense*).

One wetland determination point was established. USACE criteria were not met for any of the three wetland parameters.

3.1.5 Baldwin Peninsula Repeater

The proposed Baldwin Peninsula Repeater site is located along the eastern side of the Baldwin Peninsula, approximately 36 miles southwest of Kotzebue and approximately 500 feet from the bluffs overlooking Sewelik Lake. The elevation of this site is approximately 150 feet. The terrain is generally flat with a very slight rise in elevation to the west. There are no waterbodies in the vicinity of this proposed repeater site.

Vegetation at the site is a relatively uniform mixed shrub sedge tussock tundra community consisting of a thick dwarf shrub layer with scattered cottongrass and sedge tussocks and a layer of sphagnum moss over a majority of site. The shrub layer consists primarily of Labrador tea, dwarf birch, lingonberry, bog blueberry, bearberry, and scattered low to tall alder shrubs (10 feet). The herbaceous component consists of tussocks of sheathed cottongrass (*Eriophorum vaginatum*), tussock-forming Bigelow's sedge, and cloudberry. The soil in the test pit was a thick sphagnum and sedge peat.

One wetland determination point was established and it was determined that this site classifies as a palustrine scrub-shrub/emergent persistent saturated wetland (PSS1/EMIB). Vegetation passes the dominance test for hydrophytic vegetation, a thick histosol layer underlies the vegetation meeting the criteria for hydric soil criteria and saturation was present to the surface, meeting the criteria for wetland hydrology. Stunted alders (<10 feet tall) are scattered throughout the area.

3.1.6 Kotzebue Community Tower KIC Site

The proposed Kotzebue Community Tower on Kikiktagruk Inupiat Corporation (KIC Site) lands was not visited during the 2012 field survey. Aerial photographs and the close vicinity to the Kotzebue Community Tower USAF site indicate that this site could also have dwarf shrub/ tussock tundra type vegetation and the whole vicinity could meet USACE criteria for wetlands. The NWI database classifies the area as PEM1/SS1B.

3.1.7 Kotzebue Community Tower USAF Site

The proposed USAF Site is located on the Kotzebue road system approximately four miles south of Kotzebue and 500 feet south of the Radar Station. The site is less than 1 mile from Kotzebue Sound located to the west. The elevation of the site is approximately 125 feet. There is an intermittent stream just north of the site between the tower location and the Radar Station, but the site topography slope is to the south and away from this water course. There are some small open areas between the site and the road as a result of thermokarst (old vehicle tracks).

The proposed site is found within dwarf sedge tussock tundra consisting primarily of shrubs including crowberry, dwarf birch, and bearberry and herbs including sheathed cottongrass and Bigelow's sedge. Shrub species include Labrador tea, crowberry, and lingonberry. The sedge tussock tundra at the tower location gradually grades into a low shrub community of diamondleaf willow to the east by the road. The drainage way to the north supports a taller willow community of grayleaf willow (*Salix glauca*), feltleaf willow (*S. alexensis*) and diamondleaf willow. The areas of thermokarst with standing water support stands of tall cottongrass (*Eriophorum angustifolium*).

One wetlands determination point was established in a representative area of the site and the site met the USACE criteria for a wetland. The hydrophytic vegetation criteria were met. The soils were fibrous peat down to permafrost (12 inches) with a small (4 inch) layer of silt near the surface and classified as a histosol. The water table was determined to be just above the permafrost at 12 inches. The area was classified as a palustrine scrub-shrub/emergent persistent/ saturated wetland (PSS1/EM1B), which is consistent with NWI mapping.

3.1.8 Invasive Plant Species

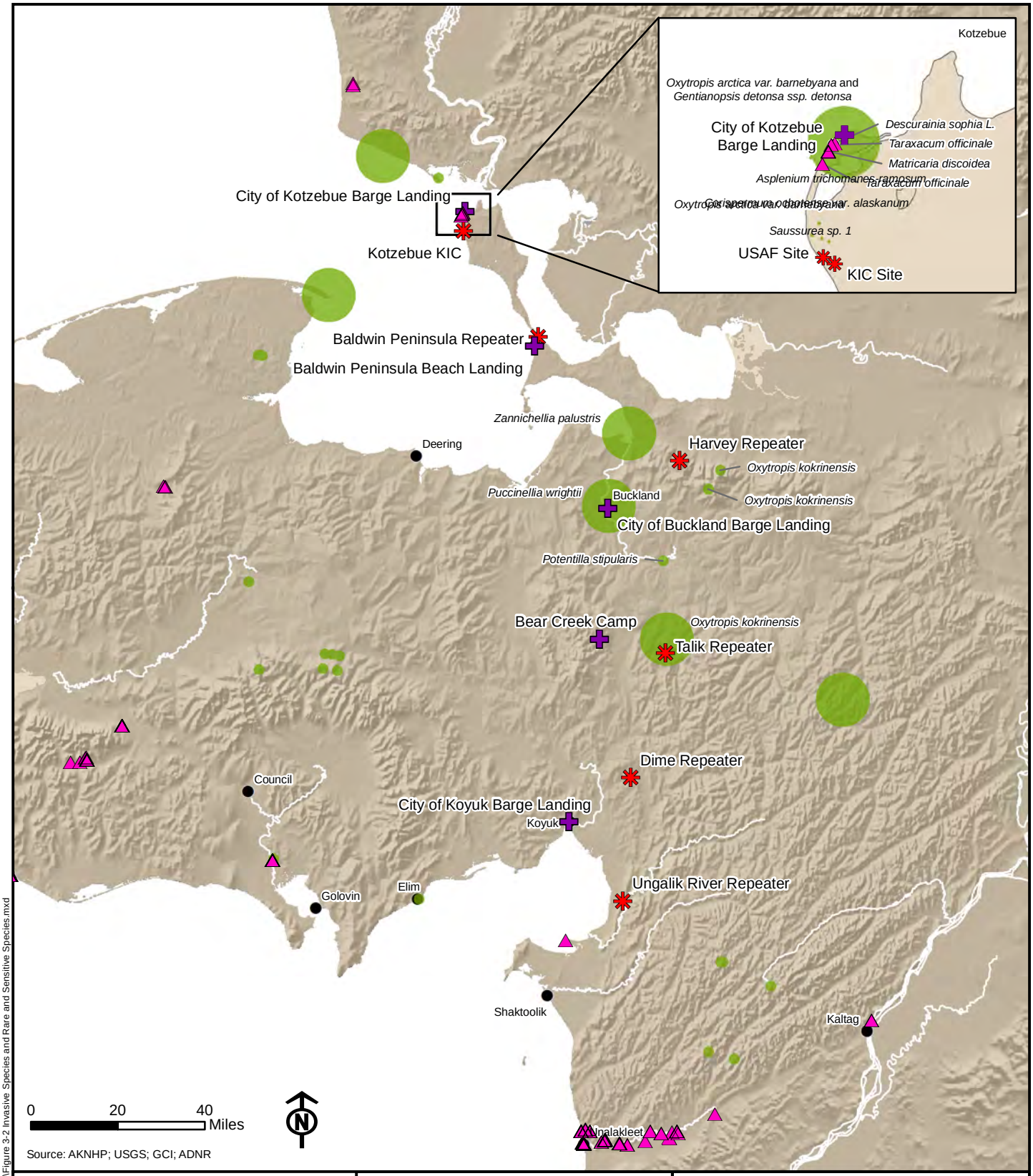
No invasive plant species were observed at the surveyed repeater sites during the July 2012 field surveys. However, invasive plant species have been documented in the project area (Figure 3-2). According to the Alaska Exotic Plants Information Clearinghouse (AKEPIC), several invasive plant species have been documented at/near the City of Kotzebue Barge Landing, which would be used as a staging area for either of the proposed Kotzebue repeater sites (AKNHP 2012). Invasive plants documented near the City of Kotzebue Barge Landing include the herb sophia (*Descurainia sophia*), pineapple weed (*Matricaria discoidea*), and the common dandelion (*Taraxacum officinale*). The AKEPIC database does not indicate any invasive plant species at any of the other support sites or the proposed repeater sites.

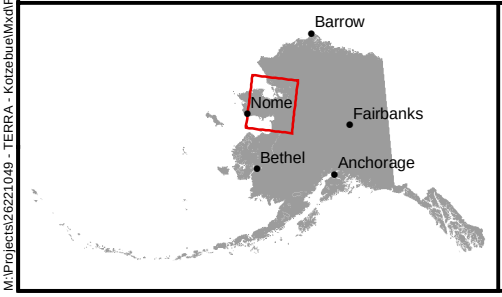
3.1.9 Rare and Sensitive Plant Species

No rare and/or sensitive plant species were observed at the surveyed repeater sites during the July 2012 field surveys. However, the Alaska Natural Heritage Program (AKNHP) has documented 40 rare and sensitive plant species in the project area from Unalakleet to Kotzebue,

with one species found in the vicinity of the proposed Talik repeater site (Figure 3-2 (AKNHP 2012). Kokrines oxytrope (*Oxytropis kokrinensis*) is present in the vicinity of the Talik repeater although this species was not observed during the July 2012 visit to the site (URS 2012).

Additionally, three species have been documented in the vicinity of two of the barge landing areas. Wright's Arctic grass (*Puccinellia wrightii*) has been documented in the vicinity of the City of Buckland Barge Landing and sheared gentian (*Gentianopsis detonsa ssp. detonsa*) and Barneby's locoweed (*Oxytropis arctica var. barnebyana*) have been documented in the vicinity of the City of Kotzebue Barge Landing. These sites were not visited during the field surveys.





Legend

- Repeater Location
- Helicopter Support Site
- Rare and Sensitive Plant Area
- Documented Invasive Plant Sighting

TERRA-Northwest Phase III Environmental Assessment

Figure 3-2:
Invasive Species and
Rare and Sensitive Species

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3.2 Terrestrial Mammals

3.2.1 Caribou

Caribou (*Rangifer tarandus*) from the Western Arctic Caribou Herd (WACH) could occur throughout the project area at different times of year, but do not calve there. The WACH has a range that extends over 140,000 square miles (363,000 square kilometers) of northwestern Alaska from the Arctic Coastal Plain to the Seward Peninsula. The current population is estimated at 325,000 (WACH Working Group 2012).

The project area lies at the southern extent of the range, with the majority of the area classified as winter range (Figure 3-3). The four hilltop repeater sites and some of the staging areas lie within the winter range of the WACH, so caribou may be present from late fall to early spring. The Talik repeater is within the BLM Nulato hills Area of Critical Environmental Concern (ACEC). This ACEC was identified as a critical winter range for the WACH in the *Kobuk-Seward Peninsula RMP* (BLM 2008). In addition, the Baldwin Peninsula area is classified as a migration area, with the potential for caribou to be present during both the spring and fall migration periods (WACH Working Group 2003). In most years since the mid-1980s, at least half of the herd wintered in the eastern third of the Seward Peninsula and in the Nulato Hills as far south as the Unalakleet River drainage. Since 1996, the Western Arctic Herd has expanded its winter range westward on the Seward Peninsula (WACH Working Group 2003).

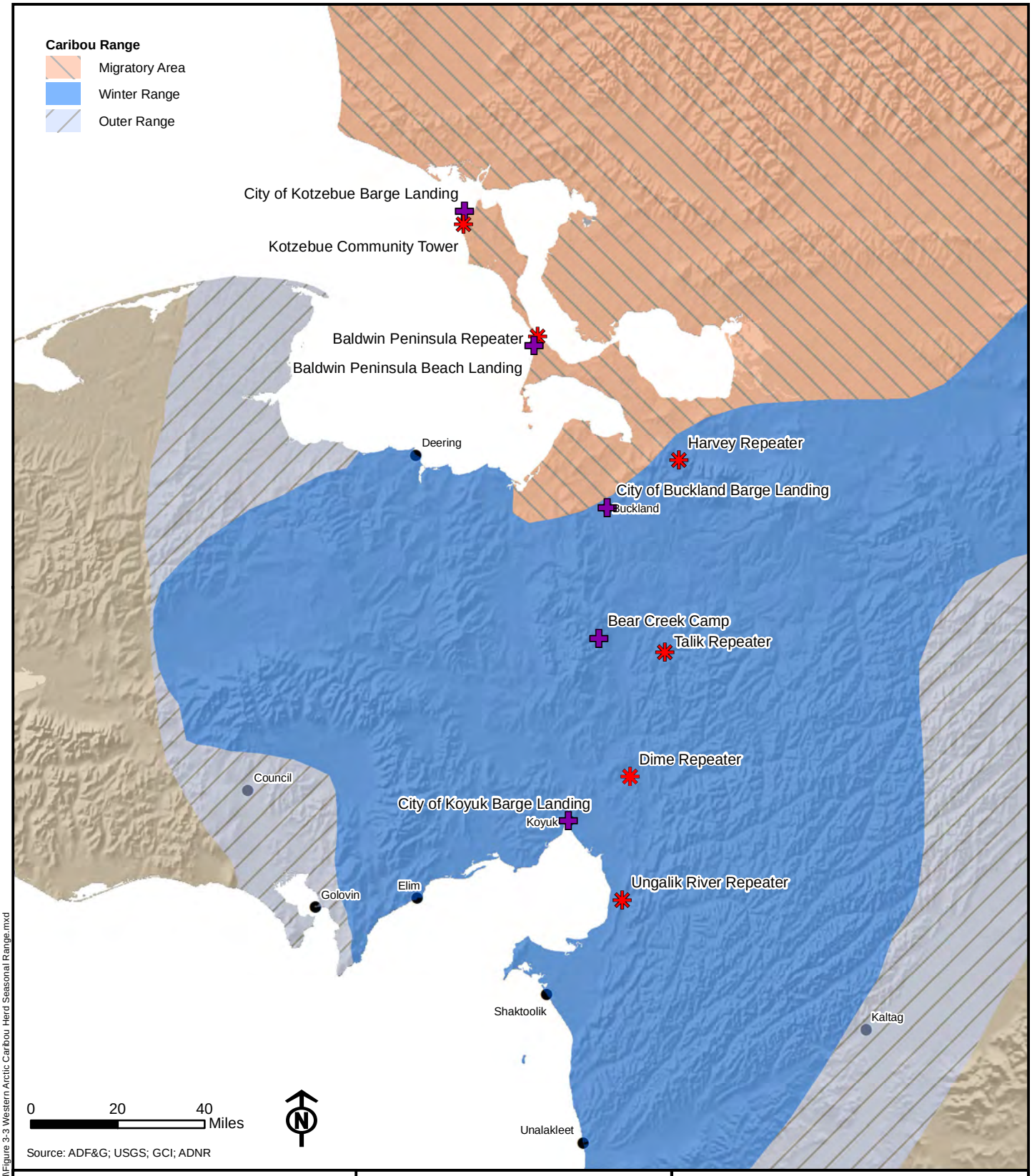
3.2.2 Reindeer

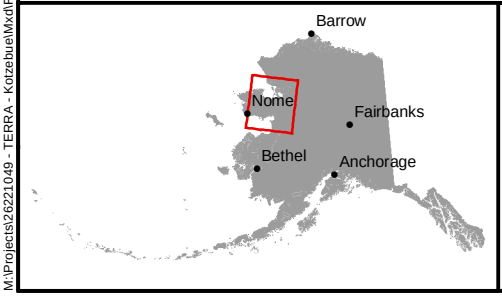
Domesticated caribou, reindeer *(Rangifer tarandus tarandus)*, have been herded on the Seward Peninsula since 1891, when they were imported from Russia as a means for Alaska Natives to produce a predictable food supply (Stern et al. 1980). However, there are currently no viable reindeer herds in the project area (Dau 2012). Many of the herders have lost reindeer to the Western Arctic Caribou Herd; the reindeer join the caribou herd as it moves into the area in the fall and then out in the spring (Fosdick 2012).

The Seward Peninsula is divided into 16 ranges, or reindeer herder grazing allotments (Fosdick 2012). The hilltop repeater sites are located in the Hadley and Henry grazing allotments, close to the eastern boundary of the Seward Peninsula Reindeer Permit Area. Reindeer may use ridgetops such as the repeater sites for insect relief in the summer (Gorn 2012a). The two Baldwin Peninsula repeater sites are located in the Walker allotment. Although there are no reindeer herds currently in the project area, the grazing allotments still exist and may be used in the future (Dau 2012).

3.2.3 Moose

While moose (*Alces alces*) may be present in low densities throughout the project area, they are more commonly seen on the Baldwin Peninsula near Kotzebue (Dau 2012). Moose are not known to use hilltops in the project area, but may transit over them (Gorn 2012a). BLM staff has observed that moose may calve in riparian areas throughout the project area, but there are no known migration routes in the project area (Seppi 2012).





Legend

Repeater Location

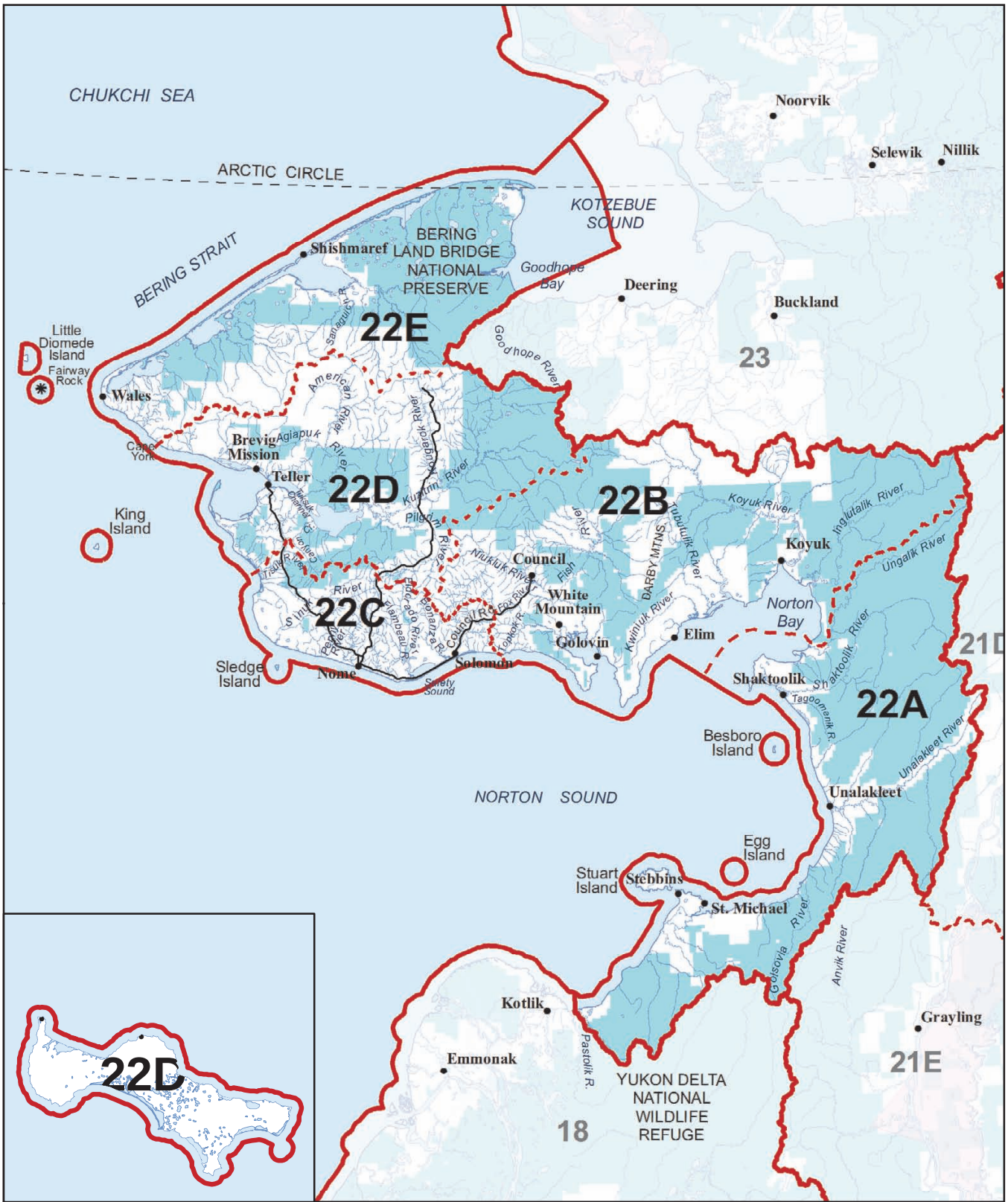
Helicopter Support Site

TERRA-Northwest Phase III Environmental Assessment

Figure 3-3:
Western Arctic Caribou Herd Seasonal Range

Jan 2013

M:\Projects\26221049 - TERRA - Kotzebue\Mxd\Figure 3-3 Western Arctic Caribou Herd Seasonal Range.mxd



Unit 22

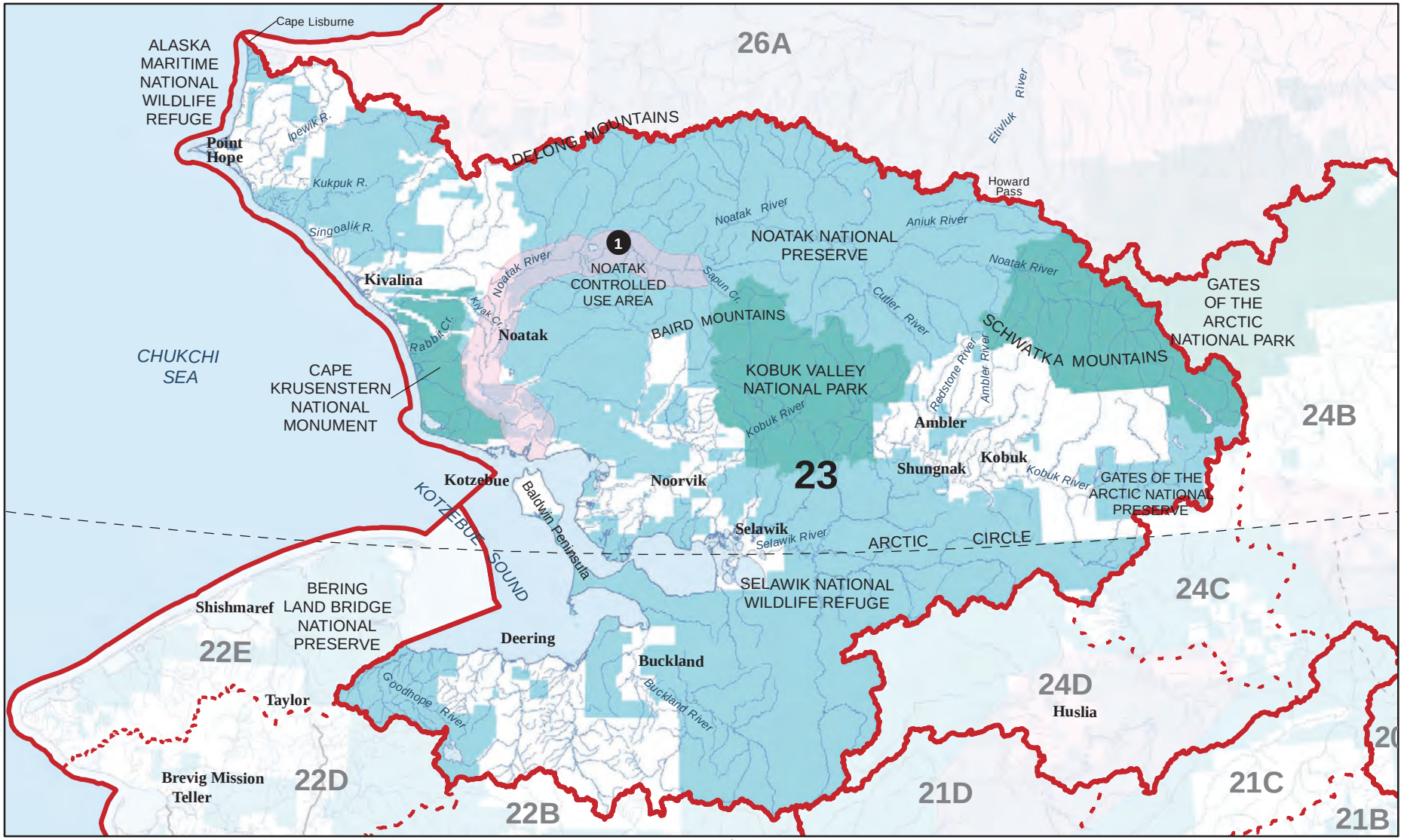
Nome

Region 5

0 12.5 25 50 Miles

Game Management Units / Special Management Areas

- Closed Areas
- Controlled Use Areas
- Management Areas
- State Refuges, Sanctuaries, & Critical Habitat Areas
- Other State Lands
- National Parks
- National Preserves & Other Federal Lands
- Unit Boundary
- Subunit Boundary
- City Boundary
- Military Boundary
- Military Closure
- Tangle Lakes Archaeological District
- Roads
- Railroads
- Trails



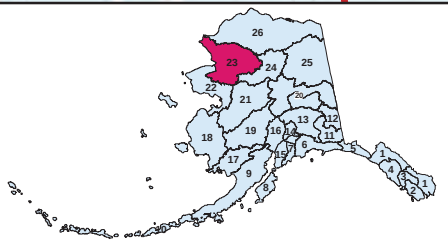
Unit 23

Kotzebue Sound-Chukchi Sea-Arctic Ocean

Region 5

N

0 25 50 100 Miles



Game Management Units / Special Management Areas

- Closed Areas
- Controlled Use Areas
- Management Areas
- State Refuges, Sanctuaries, & Critical Habitat Areas
- Other State Lands
- National Parks
- National Preserves & Other Federal Lands
- Unit Boundary
- Subunit Boundary
- City Boundary
- Military Boundary
- Military Closure
- Tangle Lakes Archaeological District
- Roads
- Railroads
- Trails

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3.2.4 Brown and Black Bears

Brown bears (*Ursus arctos*) occur throughout most of Alaska and are widely distributed throughout the project area. Habitat for the brown bear is more a product of prey availability rather than a specific assemblage of vegetation and/or terrain features. Consequently, brown bears are seasonally aggregated around sites with abundant prey. Prey species of brown bear primarily include caribou and moose calves during the spring and salmon during the summer (BLM 2008; ADFG 2008a).

Brown bear den sites in Alaska vary greatly. They may be natural caves, excavated at the bases of large-diameter trees (Schoen et al. 1994) or above treeline on a sparsely vegetated hillside (Miller 1990). The hilltop landscapes near the repeater sites could be used by brown bear for den sites, although use of areas at the actual repeater sites for denning is unlikely. Brown bears occur in all habitats throughout the entire project area and vicinity. During the cultural resources survey in August 2012 a brown bear was seen at the Talik Repeater site, and tracks were observed at the Ungalik River Repeater site (NLUR 2012).

Black bears (*Ursus americanus*) are not known to occur on the Seward Peninsula; very few likely occur in the project area (ADFG 2008b, Dau 2012).

3.2.5 Wolf

Gray wolves (*Canis lupus*) can occur throughout the project area, distributed according to prey species availability. Moose and caribou comprise primary prey for the wolf. During the summer, wolves rely on small mammals for food (ADFG 2008c). During late fall, winter, and spring, prey species include large ungulates and their newborn calves (BLM 2008).

Wolf numbers in the project area have fluctuated over the past century as a result of availability of prey species, predator control programs, and bounties intended to protect reindeer. In the 1960s, abolishment of predator control programs allowed wolf numbers to generally increase and expand their range across the Seward Peninsula. By 1980, 100 wolves were estimated to occur in GMU 22, however, inventory surveys have not been conducted, so quantitative data is lacking on wolf populations in GMU 22. Sightings have increased since then, and populations are thought to be higher (ADFG 2009a). Wolf populations and distribution within GMU 22, in particular, are influenced according to seasonal abundance of wintering caribou.

3.2.6 Muskoxen

Muskox (*Ovibos moschatus*) can occur throughout the project area. Groups are known to occur at the base of the Chamisso Peninsula (Dau 2012) approximately 10 miles south of the Baldwin Peninsula Repeater site, and another in the Nulato Hills, approximately 5 miles east of the Talik, Dime, and Ungalik River repeater sites (Dau 2012, Gorn 2012b). Since 2007 the ADFG has noted an eastward emigration of muskox on the Seward Peninsula.

The population had been growing for the last 40 years but is now in decline, with mortality rates high and recruitment rates low (Gorn 2012b). The 2010 Seward Peninsula muskox census estimates 2,616 animals in the ‘core count area’,and 2,903 animals in the ‘expanded count area’ (ADFG 2011).

Seward Peninsula and Nulato Hills (GMU 22 and Southwest 23): In 1970, 36 muskoxen were reintroduced to the southern portion of the Seward Peninsula from the population on Nunivak Island. In 1981, an additional 35 muskox were introduced. Muskox have extended their range to suitable habitat throughout the Seward Peninsula and as far east as Ruby on the Yukon River, and northeast into GMU 23. The population has been increasing since 2000. A 2007 census count in Unit 22 indicated 2,688 muskoxen, an increase since 2005, when 2,387 were counted. The total harvest, including subsistence, registration and drawing hunts, for 2007-08 season was 123 muskox.

Western Brooks Range and Kotzebue Sound (GMU 23): The two muskox populations that inhabit this area are products of translocations from the Nunivak herd. Animals in the Southwestern portion of GMU 23, between the Goodhope and Buckland rivers, are the product of the introductions mentioned in the preceding section, in 1970 and 1981. In addition, 36 muskoxen were moved to Cape Thompson from the Nunivak herd in 1970, and 34 more were released there in 1977. From 1970 until 1998 the Cape Thompson population grew about eight percent a year, and since 1998, the population has probably been stable at about 350 animals.

The Dime and Ungalik River Repeater sites are in GMU 22B (Figure 3-4) where the 2010 census found 364 muskox west of the Darby Mountains and 56 muskox east of the Darby Mountains (ADFG 2011).

The Talik, Harvey, and Baldwin Peninsula Repeater sites are in GMU 23 (Figure 3-5). The census counted 175 muskoxen in the southwest part of GMU 23, and 120 muskoxen in the southeast part of GMU 23 and in GMU 24 (ADFG 2011).

Muskoxen were observed in the project area during the 2012 biological field studies; a small herd of seven muskox and three separate bulls in another group were found in the vicinity of the Ungalik River Repeater site (URS 2012).

Muskoxen are gregarious, typically occurring in groups of up to 75 animals, but can also occur in groups of 5 to 15, which are often comprised of 1 dominant bull among females and subadults. Muskoxen are energetically conservative in their movements and have a high fidelity to geographic regions (Reynolds et al 2002). Reynolds (1998) found that daily movements were limited to 3.1 miles (5 km) or less per day. During the summer, Reynolds (1998) found that the minimum size of core areas was four times larger than in winter or the calving season. These greater summer movements are likely related to peaking of plant biomass, taking advantage of high-quality forage (Chapin 1983). In winter, forage availability and quality is low, so muskoxen conserve energy by reducing their movements and activity, including home range size, and remain in habitats where forage is not covered with deep snow (Reynolds et al. 2002).

3.2.7 Furbearers and Small Mammals

Furbearers found in the project area include beaver (*Castor canadensis*), red fox (*Vulpes vulpes)*, Arctic fox (*Alopex lagopus)*, lynx (*Lynx canadensis*) mink (*Mustela vision*), muskrat (*Ondatra zibethicus*), river otter (*Lutra canadensis*), and wolverine (*Gulo gulo*). Small mammals present include arctic ground squirrels (*Spermophilus parryii*), snowshoe hares (*L. americanus*), and microtines (lemmings and voles). Two BLM sensitive species, the Alaska hare (*Lepus othus*) and Alaska tiny shrew (*Sorex yukonicus*) may also occur in the project area.

Wolverines occur in the project area and may use repeater sites during transit (Gorn 2012a). This species is opportunistic, feeding on carrion, and small and medium-sized animals such as voles, squirrels, snowshoe hares, and birds (ADFG 2008d).

The Arctic fox is found in treeless coastal areas. This species is omnivorous, and will feed on berries, eggs, and carrion. In summer, Arctic foxes feed primarily on small mammals, including lemmings and tundra voles as well as seabirds. The red fox, on the other hand, inhabits broken country, extensive lowland marshes, crisscrossed hills, draws, and occasionally tundra. Both these species could occasionally occur in the project area.

Survey inventories have not been conducted and most furbearer harvests go unreported; as a result quantitative information is not available, however, observations and trapper survey information indicates that furbearer populations in the project area are relatively stable (Gorn 2012a).

3.3 Birds

The project area supports an abundance of bird species, most of which are present only during the summer months (late April–early October) when suitable habitats and food are available to support breeding activities. Many sensitive species could occur in the project vicinity, including some species listed under the Endangered Species Act (see Section 3.4) and BLM-sensitive species (see Table 3.4-1).

The habitat in the project area provides nesting, staging, and molting area for many of these bird species, with 180 bird species documented on the Selawik National Wildlife Refuge (USFWS 1996). The tundra breeding-bird community is dominated by waterbirds, particularly the waterfowl (geese, ducks, and swans) and shorebirds species that are the primary nesting species in the wetlands, ponds, and lakes in the project area (ADOT 2011).

Birds in Alaska's Northwest Region are described in UAA's Alaska Regional Profiles (UAA 2012) as follows.

> The breeding population of about 234,000 ducks within the Selawik-Kobuk-Baldwin Peninsula area averages about 44 ducks per square mile and is composed mainly of northern pintail (*Anas acuta*), American wigeon (*Anas americana*), and greater scaup (*Aythya marila*). Tens of thousands of white-fronted geese (*Anser albifrons*) nest in the region. Tundra swans (*Cygnus columbianus*) can be found throughout the region, nesting near lakes in the interior basins, along rivers, and adjacent to coastal lagoons. Numerous other species of ducks, loons, shorebirds, and sandhill cranes nest in or near freshwater areas in the subregion. Large lakes are also used by molting waterfowl.
>
> In the Norton Sound Subregion the most extensive and productive freshwater bird habitat is the lake-studded coastal plain on the north side of the Seward Peninsula. Other less extensive units occur near Norton Sound and in smaller river drainages. Bird densities in these habitats are somewhat higher than in Kotzebue Sound Subregion, and about 230,000 ducks, mainly northern pintails, scaup, long-tailed ducks (*Clangula hyemalis*), and scoters (*Aythya* spp), nest in the subregion. Tundra swans, Canada geese (*Branta canadensis*) and white-fronted geese, loons, cranes, and shorebirds are abundant in the freshwater habitats of the subregion.

There are several seabird colonies in the vicinity of the proposed helicopter routes across Kotzebue Sound. The USFWS's North Pacific Seabird Database (USFWS 2012a) shows seabird colonies on the Choris Peninsula on the southern end of the Baldwin Peninsula and nearby Chamisso and Puffin Islands. Approximately 25,000 seabirds nest on Puffin Island, while approximately 3,000 seabirds breed on Chamisso Island. The seabird populations on Puffin Island are comprised of common murres *(Uria aalge)*, thick-billed murres *(Uria lomvia)*, horned puffins *(Fratercula corniculata)*, and large numbers of black-legged kittiwakes *(Rissa tridactyla)*. Horned puffins are the primary species found on Chamisso Island. There are two Aleutian tern (*Serna aleutica*) colonies in the area, one near Koyuk at the mouth of the Koyuk River, and one near the Kotzebue Airport. A site survey for the Kotzebue Wind Farm (USDOE 1998) reported that most migratory bird movements are to the east in the Kobuk River Delta within the Selewik National Wildlife Refuge and farther offshore for spring movements of seaducks and Brant (*Branta bernicla nigricans*), and that no major shorebird staging areas or migration corridors have been documented near the windfarm project site (approximately 4.5 miles south of Kotzebue, 0.5 miles from the coast at an elevation of 50 feet).

Between July 29 and August 2, 2012, URS biologists evaluated breeding bird habitat at the six repeater sites with the primary focus on evaluating nesting habitats for Kittlitz's murrelet (*Brachyramphus brevirostris*), a candidate species under the Endangered Species Act. The proposed repeater sites on the hilltops have the potential to be suitable nesting habitat (unvegetated scree slopes, rock ledges) for this species. Potential nesting habitats at each site were documented with photographs. The biologists spent 1 to 3 hours at each site conducting wetland, vegetation, and wildlife surveys. The proposed tower sites and surrounding areas were walked and photographed. The weather was generally sunny, with some low clouds and intermittent rain and light winds.

Raptors are generally uncommon in the Kotzebue area (USDOE 1998), but may be more plentiful at the hilltop repeater sites. The only common species is the northern harrier (*Circus cyaneus*), a summer resident that breeds in the area. Other breeders could include short-eared owl (*Asio flammeus*) and golden eagle (*Aquila chrysaetos*). A golden eagle was observed near the Ungalik River Repeater site during the August 2012 biological field survey (URS 2012). Other species that could potentially be seen in the project area during spring and fall migration include the rough-legged hawk (*Buteo lagopus*), merlin (*Falco columbarius*), and gyrfalcon (*Falco rusticolus*). Snowy owls (*Bubo scandiacus*) are uncommon winter residents in this region, but migrate in higher numbers during winters when populations of their main prey species (lemmings) undergo population crashes. Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act which prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald or golden eagles, including their parts, nests, or eggs.

The six repeater sites are located in dwarf shrub tundra and tussock tundra habitat (URS 2012). Four of them (Ungalik River, Dime, Talik, and Harvey repeaters) are located on hilltops; the other two (Baldwin and KIC) are on the Baldwin Peninsula. The following site descriptions and bird observations are summarized from the biological field study report (URS 2012). Each biological site visit was brief, lasting only a few hours and occurred July 29 through August 2, 2012 when breeding birds would not be present.

3.3.1 Hilltop Sites

The higher elevation of these four sites limits the bird use to those adapted to alpine areas. Birds were not observed at every site, however species known to occur in similar habitat in the region include willow (*Lagopus lagopus*), and rock ptarmigan (*Lagopus muta*), American golden plover (*Pluvialis dominica*), common snipe (*Gallinago gallinago*), glaucous gull (*Larus hyperboreus*), white-crowned sparrow (*Zonotrichia leucophrys*), fox sparrow (*Passerella iliaca*), American tree sparrow (*Spizella arborea*), golden eagle (*Aquila chrysaetos*), and northern harrier (*Circus cyaneus*).

Ungalik River Repeater

One mature golden eagle (*Aquila chrysaetos*) was seen perched on the rocky outcrop near the ridge and flew away as the helicopter approached. A survey of the ridge and rocky outcrops near the site was conducted to see if there was an active nest nearby but none was found. There were a few rock ledges that have been used as raptor perches over time as evident from the orange lichen (*Caloplaca* spp.) below the ledge, which is typically associated with guano deposited while the raptor is using the roost or nest site.

Dime Repeater

No birds were observed during the brief site survey, but ptarmigan droppings were documented.

Talik Repeater

A small flock of five rock ptarmigan was flushed from a rocky area near the southern extent of the site. No other birds were seen during the brief site survey, but ptarmigan droppings observed.

Harvey Repeater

No birds or sign were observed during the brief site survey.

3.3.2 250 Foot Tower Sites

These three sites are in wetlands at lower elevation close to the coast. Birds known to occur in similar habitat in the region include willow and rock ptarmigan, Lapland longspur (*Calcarius lapponicus*), American golden plover, common snipe, glaucous gull, yellow wagtail (*Motacilla flava*), greater white-fronted and Canada goose (*Branta canadensis*), and northern harrier.

Baldwin Peninsula Repeater

No birds were seen during the brief site survey. Ptarmigan dropping were observed.

Kotzebue Community Tower (USAF Site or KIC Site)

There are two possible sites for the community tower in Kotzebue; the KIC Site on private land and the USAF site on BLM land. The sites are located approximately 2,400 feet apart in similar habitat within a mile of the coast. Bird species known to occur in this area include greater white-fronted and Canada goose, green-winged teal (*Anas crecca*), long-tailed duck (*Clangula hyemalis*), pectoral sandpiper (*Calidris melanotos*), mew gull (*Larus canus*), long-tailed and parasitic jaegers (*Stercorarius langicaudus and Stercorarius parasiticus*), savannah sparrow (*Passerculus sandwichensis*, and American pipit (*Anthus rubescens*).

Coastal birds were heard and observed at the USAF site during the 2012 survey, including two Pacific loons (*Gavia pacifica*), two whimbrels (*Numenius phaeopus*), and two glaucous gulls. These birds appeared to be flying between Kotzebue Sound and inland lakes or other waterbodies to the east. The only terrestrial bird seen at the site during the survey was a Lapland longspur.

3.3.3 Staging Areas

Staging areas at Koyuk, Buckland, and Kotzebue would occur in previously disturbed barge landing sites where bird habitat is minimal. Staging sites at Bear Creek Camp and the Baldwin Peninsula beach staging area have not been previously disturbed and are likely to currently support bird use.

3.3.4 Evaluation of Nesting Habitat

The habitat for Kittlitz's murrelets at the proposed repeater sites ranges from marginal to suitable, with better habitat at the higher elevation rocky outcrop, talus and scree slopes at the proposed Talik and Harvey Repeater sites. Nesting habitat is more likely on the side slopes than

the relatively flat tops of these hills where the repeaters would be constructed. Nesting habitat for other birds may exist at all sites to some degree, especially the lower elevations sites. Species using these areas for nesting were not determined because the 2012 survey was conducted past the nesting period for most species. For the mountaintop sites, species known to nest in the area in similar habitat include willow (*Lagopus lagopus*) and rock ptarmigan, golden eagles, northern wheatear (*Oenanthe oenanthe*), short-eared owl (*Asio flammeus*), and common and hoary redpolls (*Carduelis flammea, C. hornemanni*). Species known to nest at the Baldwin Peninsula sites include ducks, geese, tundra swans, northern harrier, sandhill crane (*Grus Canadensis*), and shorebirds.

Table 3.3-1 lists the BLM sensitive bird species that are potentially within or migrating through the project area. Birds listed under the Endangered Species Act are discussed in Section 3.6.7.

Table 3.3-1 BLM Sensitive Avian Species Potentially in the Project Vicinity (BLM 2010)

Common Name	Scientific Name	Occurrence in Project Area*
Emperor goose	*Chen canagica*	Accidental
Golden eagle	*Aquila chrysaetos*	Breeder
Short-eared owl	*Asio flammeus*	Breeder
Kittlitz's murrelet	*Brachyramphus brevirostris*	Breeder
Red knot	*Calidris canutus*	Migrant
Bering Sea rock sandpiper	*Calidris ptilocnemis tschuktschor*	Migrant
Olive-sided flycatcher	*Contopus cooperi*	Migrant or possibly breeder
Trumpeter swan	*Cygnus buccinator*	Vagrant
Blackpoll warbler	*Dendroica striata*	Breeder
Rusty blackbird	*Euphagus carolinus*	Breeder
Yellow-billed loon	*Gavia adamsii*	Breeds on the Baldwin Peninsula
Bristle-thighed curlew	*Numenius tahitensis*	Breeds on central Seward Peninsula
McKay's bunting	*Plectrophenax hyperboreus*	Winter

* Sources: USFWS 2012b Selawik National Wildlife Refuge Bird Checklist, ADFG 2012b, and USFWS 2006.

3.4 Threatened and Endangered Species

Listed and candidate species, as designated under the ESA, with the potential to be affected by the proposed project are shown in Table 3.4-1.

The species accounts below describe how and when ESA species may potentially use the habitat in the project area. Only information relevant to the discussion of potential impacts is included. Full species descriptions and life histories are available on the USFWS Alaska Endangered Species website. Figure 3-6 shows the critical habitat in the project area and the range of selected species.

Table 3.4-1 ESA-Listed Species Potentially Present in Project Vicinity

Common Name	Scientific Name	Status	Habitat Use
Spectacled eider	*Somateria fischeri*	Threatened	Migrating only, critical habitat for molting south of project area in Norton Sound
Steller's eider	*Polysticta stelleri*	Threatened	Migrating only
Polar bear	*Ursus maritimus*	Threatened	Rare, transient on the Baldwin Peninsula
Yellow-billed loon*	*Gavia adamsii*	Candidate	Rare breeder, potential nesting habitat on Baldwin Peninsula
Kittilitz's murrelet*	*Brachyramphus brevirostris*	Candidate	Rare breeder, potential nesting habitat at hilltop repeater sites

Note: Yellow-billed loon and Kittilitz's murrelet were were not included in the informal consultation with the USFWS because they are not currenly listed under the Endangered Species Act.

3.4.1 Spectacled Eider

Spectacled eider (*Somateria fischeri*) nest on the Yukon-Kuskokwim Delta to the south of Kotzebue, but they are not known to commonly migrate through the Kotzebue area or use the Baldwin Peninsula (USFWS 1996). While breeding spectacled eiders were formerly common in small patches of suitable habitat in northwestern Alaska from Norton Sound to Kotzebue Sound (Nelson 1887; Bent 1925; Bailey 1948), they now are rare or absent (Kessel 1989).

Critical habitat was designated for molting in Norton Sound and Ledyard Bay; for nesting on the Yukon-Kuskokwim Delta; and for wintering south of St. Lawrence Island Figure 3-6. No critical habitat occurs in the project area.

Spectacled eiders historically nested along the coast of Alaska from the Nushagak Peninsula to Barrow and the Yukon, current breeding distribution is restricted to the Yukon-Kuskokwim Delta and the north coast of Alaska (BLM 2008a). Spectacled eiders migrate between wintering habitats and breeding grounds along the Bering and Chukchi shorelines. Molting areas include the eastern portion of Norton Sound and Ledyard Bay, and wintering occurs in the central Bering Sea south and southwest of St. Lawrence Island. Telemetry data suggests that Norton Sound is primarily used by molting females and most males migrate to Russia to molt (Sexson 2012). When moving between nesting and molting areas, spectacled eiders travel along the coast up to 36 miles (60 km) offshore (Petersen et al. 1999).

3.4.2 Steller's Eider

Steller's eiders likely occur in the project area only as a migrant or rare summer visitor (BLM 2006). The Alaska population of the Steller's eider breeds along the Arctic Coastal Plain, with a small subset breeding on the Yukon-Kuskokwim Delta, and overwintering in coastal areas of the Alaska Peninsula (USFWS 2011). Critical habitat for the Alaska breeding population of the Steller's eider includes breeding habitat on the Yukon-Kuskokwim Delta and in the marine waters of Southwest Alaska (See Figure 3.6); no critical habitat occurs in the project vicinity.

While Steller's eiders nest in the terrestrial environment, they spend the majority of the year in shallow, near-shore marine waters (USFWS 2002). After breeding, Steller's eiders leave for molting areas between late July and late October, at which point the birds remain flightless for approximately three weeks. Prior to spring migration, the eiders stage in estuaries and small bays before continuing northward to their nesting grounds (USFWS 2011). There is no estimate of the number of Steller's eiders using eastern Norton Sound (Sexson 2012).

3.4.3 Polar Bear

Although polar bear sighting are infrequent in the project area (Dau 2012, ADOT 2011), they may occur as transient visitors, mainly on the Baldwin Peninsula, which was originally designated as barrier island critical habitat. Kotzebue and the entire Baldwin Peninsula have since been removed from critical habitat.

Polar bears that may occur in the project area belong to the Chukchi/Bering Sea stock, which is widely distributed on pack ice in the Chukchi Sea, northern Bering Sea, and adjacent coastal areas in Alaska and Russia. The range extends to the northeast near the Colville Delta in the central Beaufort Sea and to the west near Chauniskaya Bay in the Eastern Siberian Sea. The southern boundary is determined by the annual extent of pack ice (Amstrup et al. 2005; Garner et al. 1990). Sea ice is their primary habitat upon which they depend for most life functions, including hunting and feeding, breeding and denning, traveling, and resting (Stirling and Derocher 1993). Distribution and movements are intricately tied to seasonal sea ice dynamics and the polar bears range is limited to areas covered in sea ice for much of the year (Stirling et al. 1999).

Some bears may make extensive north-south migrations with the seasonal movements of the pack ice. In winter, bears can be found as far south as St. Lawrence Island and occasionally as far south as the Yukon-Kuskokwim Delta. In summer, the bears are most abundant around the edge of the pack ice in the Chukchi Sea and Arctic Ocean. Ringed seals are the primary prey of polar bears (USFWS 2006).

3.4.4 Yellow-Billed Loon

Portions of the project area lie within the known breeding range of the yellow-billed loon (Earnst 2004). This species is described as a rare breeder on the Selawik National Wildlife Refuge (USFWS 2012b). Yellow-billed loons could occur in the project vicinity during spring, summer, and fall, especially on the Baldwin Peninsula and other areas close to the coast or lakes.

In western Alaska yellow-billed loons are found breeding primarily along the coastal fringe of the Seward Peninsula on Selawik National Wildlife Refuge, Cape Krusenstern National Monument and Bering Land Bridge National Preserve, and on scattered small parcels of BLM and Alaska Native-owned lands (USFWS 2006). Earnst (2004) reports that 61 yellow-billed

loons were observed during a 1992-1993 survey of Seward Peninsula coastal wetlands, from the north edge of the Yukon Delta to the Baldwin Peninsula in Kotzebue Sound.

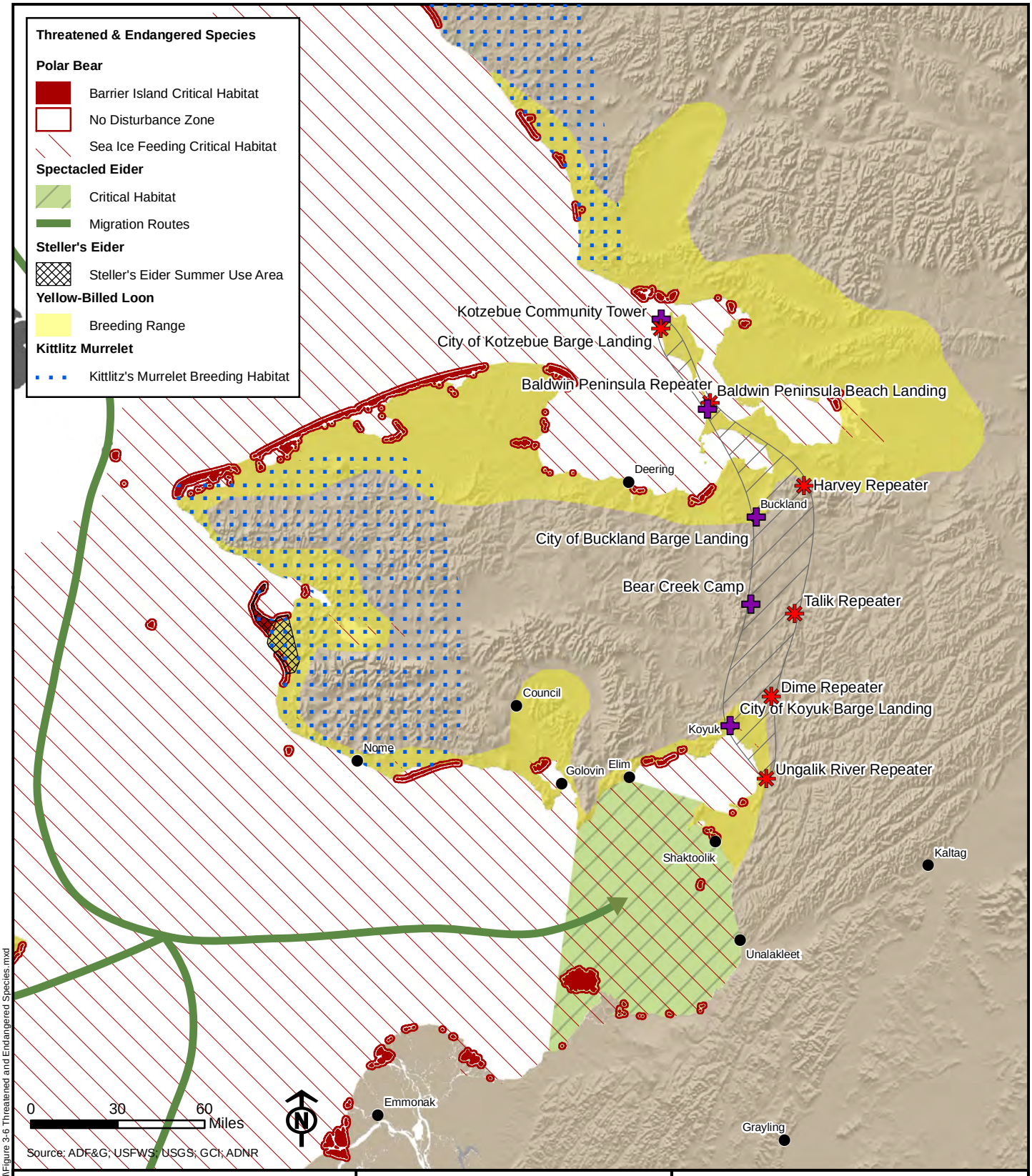
Yellow-billed loons nest near freshwater lakes in the Arctic tundra of northern Alaska, northwestern Alaska (including Norton Sound), St. Lawrence Island, and in Canada and Russia. The loons nest exclusively in coastal and inland low-lying tundra with large, permanent, vegetated, fish-bearing lakes. Non-breeding habitat includes large rivers, and nearshore marine environments. Breeding begins in late May, and nests are located typically at the shoreline on islands or points of land. Loons dive for small fish, but also feed on aquatic vegetation, insects, mollusks, and frogs (ADFG 2008a).

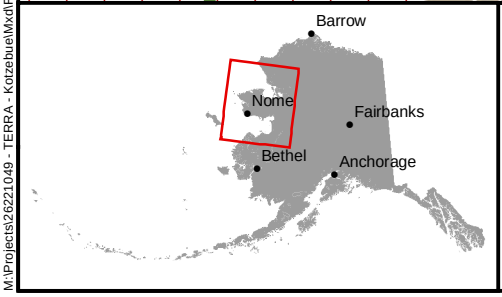
3.4.5 Kittlitz's Murrelet

Kittlitz's murrelet, a rare seabird that nests in alpine terrain, are year-round residents along the Alaska coast from Point Lay in the Arctic and south to LeConte Bay in Southeast Alaska. Kittlitz's murrelets are known to nest on stable, unvegetated scree slopes or steep rocky slopes or, more rarely, small crevices in cliff faces, especially when these sites are near the coast (Day et al. 1999).

Less than a dozen Kittlitz's murrelets nests have been found in northern Alaska (Day et al. 2011). Nests have been found on the Seward Peninsula and likely occur as far north as the Cape Lisburne area (Day et al. 2011). Although no nests have been documented on the eastern portion of the Seward Peninsula, or in the immediate area surrounding the proposed repeater sites, suitable nesting habitat is found in the area from the Nulato Hills north to the Wainwright area (Day et al. 2011).

In the summer of 2012, URS biologists evaluated the six repeater sites for possible nesting habitat for Kittlitz's murrelets. The four proposed repeater sites on the eastern Seward Peninsula are in alpine tundra habitats on hill tops, which may be suitable for Kittlitz's murrelet nesting. The two sites on the Baldwin Peninsula are located in low elevation, moist tundra, which is not a suitable nesting habitat for Kittlitz's murrelets.





Legend

- Repeater Location
- Helicopter Support Site
- Helicopter Corridor during Construction

TERRA-Northwest Phase III Environmental Assessment

Figure 3-6:
Threatened and Endangered Species

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3.5 Socioeconomics

For socioeconomic resources, the geographic scope for the proposed project area includes communities that would receive broadband service or serve as staging areas for project construction and operations. From south to north they include: Shaktoolik, Koyuk, Buckland, and Kotzebue. There are no residents in the immediate vicinity of the proposed Ungalik River, Dime, Talik, Harvey, and Baldwin Peninsula repeater sites. The following discussion focuses on population, employment, income, and characteristics of the affected communities.

3.5.1 Regional Demographics and Economy

The communities within the project area are organized regionally in a number of ways by language and culture, Alaska Native regional corporations and non-profit tribal associations, healthcare providers, and school districts. Kotzebue and Nome are regional population hubs that provide support transportation, government services, organizational headquarters, and freight distribution. Most communities in the project area are small and the trade and service sectors are not well-developed. The regional economy depends on the governmental sector (employment and funding for programs and infrastructure), utilities and trade, commercial fisheries, mining, and the visitor industry (ADCCED 2012).

The population of the affected communities is 4,266 residents, distributed in the hub of Kotzebue, along with three smaller communities. Kotzebue accounts for 75.6 percent of the regional population, followed by Buckland at 10.2 percent. Alaska Natives make up the majority of the regional population at 78.7 percent, although in Kotzebue, the ethnic composition is slightly less, with Alaska Natives making up 73.6 percent of the population. The regional population is young, in terms of a relatively low median age, particularly in the smaller communities, where the median is age 19.9 years in Buckland and 27.2 years in Kotzebue, compared to the Alaska median age of 34 (ADCCED 2012).

Other socioeconomic characteristics include low median family income, and high unemployment rates in the cash economy (Table 3.5-1). Family incomes are generally lower in the smaller villages, ranging from $25,000 in Koyuk to $53,333 in Shaktoolik. Households in Kotzebue have larger median incomes, at $66,250, which is closer to the Alaska average of $76,962. Unemployment rates and poverty rates are more severe in the smaller villages, ranging as high as 41 percent unemployment in Buckland and 57.6 percent of families below the poverty level in Koyuk. Kotzebue shows 20.7 percent unemployment and 15.3 percent of families below the poverty level, compared to Alaska rates of 7.7 percent unemployment and 7.2 percent of families below the poverty level (ADCCED 2012).

The regional economy is dominated by state and local governments as the major employers in the project area. The subsistence (non-cash) economy is also of critical importance for every community in the project area. Additionally, communities in the project area have limited mechanisms to capture tax revenue from many economic activities, such as construction of new infrastructure (ADCCED 2012).

Table 3.5-1 Demographic and Socioeconomic Characteristics

	Shaktoolik	Koyuk	Buckland	Kotzebue	Project Area Total	State of Alaska	United States
Population	258	347	437	3,224	4,266	722,190	311 million
Percent Alaska Native	96.0%	88.9%	95.4%	73.6%	78.7%	16.8%	1.2%[c]
Median Age	25.8	21.4	19.9	27.2	-	34.0	37.2
Unemployment Rate	17.1%	33.0%	41.0%	20.7%	-	7.7%	8.4%
Median Family Income	$53,333	$25,000	$43,472	$66,250	-	$76,962	$60,609
Poverty Rate	23.4%	57.6%	19.5%	15.3%	-	7.2%	13.8%

Source: ADCCED 2012

3.5.2 Community Profiles

The following section provides a brief overview for each community including economic drivers and major employers.

Shaktoolik

Shaktoolik is located on the east shore of Norton Sound, 33 miles north of Unalakleet. Shaktoolik was the first Malemiut Eskimo settlement on Norton Sound. It was originally located 6 miles up the Shaktoolik River, but moved to the mouth of the river in 1933 (ADCCED 2012).

Shaktoolik's economy is based on subsistence with limited employment in local government/school (Bering Strait School District, Shaktoolik IRA Council) and commercial fishing (ADLWD 2012). Commercial fishing permits were held by 42 residents in 2010 (ADCCED 2012).

Koyuk

Koyuk is a traditional Unalit and Malemiut Eskimo village located at the mouth of the Koyuk River, at the northeastern end of Norton Bay on the Seward Peninsula, 90 miles northeast of Nome. Traces of human habitation that are 6,000 to 8,000 years old can be found in the region. Around 1900, the present town site, where supplies could easily be lightered to shore, began to be populated as gold and coal were mined upriver (ADCCED 2012).

The Koyuk economy is heavily dependent on subsistence activities, supplemented by limited part-time jobs (e.g., 10 residents held commercial fishing permits in 2010) (ADCCED 2012). The largest employer is local government, including the Bering Strait School District, City of Koyuk, and Bering Strait Regional Housing Authority (ADCCED 2012).

Buckland

Buckland is an Inupiat Eskimo village located on the west bank of the Buckland River, about 75 miles southeast of Kotzebue. The residents have moved the community from one site to another along the river at least five times in recent history.

Residents depend on a subsistence lifestyle for most food sources and subsistence activities are an important focus of the economy (ADCCED 2012). Beyond subsistence, employment is primarily with local government (Northwest Arctic Borough School District, City of Buckland, and Maniilaq Health Services) and local stores (ADCCED 2012).

Kotzebue

The City of Kotzebue is the largest community in the project area and serves as the supply, service, and transportation center of the Northwest Arctic region. The site has been occupied by Inupiat Eskimos for over 600 years and was the hub of Arctic trading routes prior to European contact, due to its coastal location and nearby rivers. Kotzebue has developed relatively rapidly since the turn of the century, with economic activities and services expanding significantly after an air force base and White Alice Communications System were constructed (ADCCED 2012).

As the service and transportation center for villages in the Northwest Arctic region, Kotzebue has a healthy cash economy, a growing private sector, and a stable public sector. The private sector provides the majority of employment for Kotzebue residents, including year-round opportunities in retail services, transportation, mining, and other businesses. In 2010, 115 residents held commercial fishing permits (ADCCED 2012). The top employers in Kotzebue are in the government sector, including the Maniilaq Health Services, the Northwest Arctic School District, Maniilaq Association, and City of Kotzebue (ADLWD 2012).

Access to Cellular and Internet Service

All project area villages except Kotzebue use Wireless Internet Service Provider, a public wireless network service or "Fixed Point to Multipoint Wireless service," with speeds up to 256 kilobytes per second (kbps)-download/56 kbps-upload. In Kotzebue, OTZ Telephone Cooperative Inc. provides DSL Internet service at speed up to 1.5Mbps-download/256 kbps-upload. GCI currently provides uneven cellular service surrounding Koyuk and Shaktoolik; however, a new cellular repeater would be installed within Shaktoolik in 2013.

The average internet cost per month per household is $50 plus any over-usage cap fees. There are other fees associated with residential internet service including customer premises, equipment, and installation (Fleming 2011).

3.6 Subsistence

Subsistence in Alaska is the traditional way of life through which rural communities, most of which are majority Alaska Native, secure a significant portion of their food through hunting, trapping, and fishing. While serving as a vital source of food, the subsistence livelihood is also essential to maintaining the social organizations and traditional beliefs and culture of a community – harvest techniques, cooperative labor, and sharing practices serve as unifying elements.

The following sections summarize land-based subsistence harvest patterns for the communities of Buckland, Kotzebue, Koyuk, and Shaktoolik within the affected area. Although the communities also rely on fish, waterfowl and marine mammals, these harvest practices are unlikely to be affected by the proposed action or alternatives. Thus, the descriptions emphasize the land-based hunting activities. It is important to note that the lack of data for a community is not an indication of a lack of importance.

3.6.1 Subsistence Harvest Practices and Use Areas

Communities within the project area often utilize large portions of the project area to harvest land mammals for subsistence uses. The communities of Buckland, Kotzebue, Koyuk, and Shaktoolik are known to utilize large portions of the project area to harvest moose and caribou. It is important to note that birds represent a favored subsistence resource, including geese, ducks, ptarmigan, grouse, and snowy owls and waterfowl are an important source of food in the spring and egg gathering (Bering Straits CRSA 2011). Gathering of tundra plants in the summer months included harvests of greens such as Eskimo potato, willow lavender wild celery, and roots. Late summer berry picking of blueberries, cranberries, salmonberries and whortleberries are another source of subsistence foods (Bering Straits CRSA 2011).

Buckland

Seasonal and subsistence use areas for Buckland overlap with those of nearby Kotzebue (Magdanz et al. 2010). The area of the lower Buckland River and the associated riparian wetlands have been identified as in important resource use area for subsistence activities in the spring and fall when waterfowl are hunted. Sealing and berry picking occurs in this area during the summer months (NWAB 2006). Fishing for chum salmon occurs from the mouth of the Buckland River to the West fork and east into the lower reaches of the Fish River (NWAB 2006). The floodplains of the Buckland River are also considered an important area for moose hunting.

Over two thirds (68.5 percent of Buckland households) participate in the land-based subsistence harvest activities, based on the community baseline study conducted by ADFG Division of Subsistence in 2009 (ADFG 2009b). The highest rates of participation are for caribou, at 66 percent of households, followed by small land mammals at 25.7 percent of households. Moose and muskoxen are also harvested, by a smaller percentage of households. Small land mammal harvest included beaver, red fox, lynx, marten wolf and wolverine.

Kotzebue

Seasonal and subsistence use areas for Kotzebue overlap with the use areas of neighboring communities of Kivalina, Noatak, Kiana, Noorvik, and Buckland (Magdanz et al. 2010). A discussion of the seasonal harvest activities of Kotzebue and specific harvest areas follows.

Most harvest in the winter months consists of land resources including caribou, furbearers and wood gathering. Saffron cod and smelt fishing can occur in front of Kotzebue itself. During January caribou can be found over the ice from Sisualik toward Kobuk Lake and sometimes directly away from the coast toward the southern shore of Kotzebue Sound (Whiting et al. 2011). Arctic foxes have been observed offshore with the forming pack ice and red foxes are hunted along the shorefast ice. Hunting for caribou and furbearers occurs away from the coast. Marine mammals and marine and terrestrial fishing are important subsistence resources harvested but these harvests are unlikely to be impacted by the proposed project and therefore not described in detail in this EA.

Findings of a three year study conducted by the Native Village of Kotzebue from 2002 to 2004 indicated that estimated total harvested varied from 1,401,325 pounds in 2002, to 892,782 pounds in 2003 and 1,022,847 pounds in 2004 with a total of 227 households surveyed (Whiting 2006). Household harvests averaged 5,031 edible pounds in 2002, 2,996 pounds in 2003, and 3,237 pounds in 2004. Five species accounted for nearly 90 percent of the harvest in the three study years, namely caribou, sheefish, bearded seal, chum salmon and moose as the main harvest species (Whiting 2006). Caribou were the most widely harvested species, since they were taken by 69 percent to 85 percent of the households. More recent data has indicated that levels of harvest in the Kotzebue area are consistent with earlier surveys. The three main harvested species included caribou, sheefish, and bearded seal (Braund 2009, Magdanz et al. 2010) Other major harvested species include chum salmon, moose, spotted seal, and Dolly Varden char. The composition of subsistence harvests in Kotzebue is considered to have remained relatively steady, with caribou, bearded seal, and sheefish among the top harvested species before and after the development and operation of nearby Red Dog Mine. The composition of the subsistence harvests of Kotzebue are similar to comprehensive subsistence harvest information from seven nearby communities (based on 97 surveys) in the Kotzebue Sound area where caribou comprises 30 percent of the subsistence foods harvested (Magdanz et al. 2010).

Koyuk

Koyuk is a community located at the mouth of the Koyuk River at the northeastern end of Norton Bay and residents maintain a subsistence lifestyle harvesting marine and terrestrial resources. The Koyuk River drainage, where it flows from Kuzitrin Lake to Norton Bay, is an important area of subsistence use where fish harvest for salmon, whitefish, smelt, grayling, Arctic char, and tomcod occurs by residents. Land mammals harvested in the Koyuk River valley include moose, caribou, bear and beaver and waterfowl (Bearing Straits CRSA 2011).

Subsistence harvest participation based on the community baseline study conducted by ADFG Division of Subsistence in 2010 demonstrates that approximately 48 percent of households engaged in some subsistence resources, with 46 percent taking caribou, and smaller percentage of households taking moose (23 percent) and small land mammals (5 percent) (ADFG 2010). Small land mammal harvest included beaver, red fox, lynx, marten wolf and wolverine.

Additional subsistence foods harvested include fish, waterfowl and tundra vegetation (greens) (Bearing Straits CRSA 2011).

Shaktoolik

Shaktoolik is located on the eastern shore of Norton Sound with subsistence harvest and use areas that support marine and terrestrial harvest activities. The area of Island Point to Beeson Slough including Cape Denbigh (located within the Alaska National Maritime Refuge) has been noted to be an important area of subsistence activities for Shaktoolik where local residents of Shaktoolik and Unalakleet are known to harvest fish (salmon and herring), shellfish (crabs and clams), waterfowl, eggs, and pick berries (Bearing Straits CRSA 2011).

Subsistence harvest participation for Shaktoolik based on the community baseline study conducted by ADFG Division of Subsistence in 2009 demonstrates that approximately 50.9 percent of households are engaged in harvesting large and small land mammals (ADFG 2009b). The primary large land mammals harvested were caribou and moose. Small land mammal harvest included beaver, lynx, marten wolf and wolverine. Residents of Shaktoolik also harvest fish, crab, beluga whale, seal, rabbit, geese, cranes, ducks, ptarmigan, berries, greens and roots as primary food sources (Bearing Straits CRSA 2011).

3.7 Recreation

This section provides an overview of use patterns associated with recreation and special use activities within the proposed project area. The predominant land uses include subsistence and recreational uses. Subsistence uses such as hunting, fishing, and gathering may appear similar to recreational activities, but because they have different purposes, legal rights and privileges, they are discussed separately and in greater detail in Section 3.6. With the remoteness of the project area, access is difficult and opportunities for recreation, although they do exist, are infrequent and cover a vast area. Recreation activities include snowmachining, dog mushing, hunting, fishing, wildlife viewing, camping, and hiking.

BLM issues Special Recreation Permits for activities involving commercial recreation, competitive events, vending, use of special areas, and organized group activities on federal lands. Special Use permits issued by the BLM in the project area include six permits for big game guided hunting. (Sparks 2012; Kowalczyk 2012).

The project would occur on lands within Game Management Units 22 and 23 where ADF&G regulates the seasons, licenses, and bag limits for sport fishing and hunting activities. Big game hunting in the area includes Dall sheep, moose, caribou, bear and muskoxen (ADFG 2012a).

3.8 Lands with Wilderness Characteristics

3.8.1 Introduction

The section summarizes the results of the Lands with Wilderness Characteristics (LWC) inventories completed for BLM-administered lands that may be affected by the proposed project.

3.8.2 Regulatory Framework

Section 201 of the Federal Land Policy and Management Act (FLPMA) requires the BLM to maintain an inventory of all public lands and their resources and other values which includes wilderness characteristics and to consider this information when making subsequent project-level decisions. BLM Manual 6310 directs the effects of a project be analyzed prior to permitting a right-of-way application. The LWC inventory – regardless of the outcome -- shall not, of itself, change or prevent change of the management or use of the lands (BLM 2011a).

Because no LWC inventory was completed as part of the Resource Management Plan (RMP) development for the Kobuk-Seward RMP (BLM 2008), an inventory was completed for parcels potentially affected by the proposed project as part of this EA.

3.8.3 Lands with Wilderness Characteristics

The criteria for wilderness characteristics pertain to three broad categories: Size, Naturalness, and Outstanding Opportunities for Solitude or Primitive and Unconfined Type of Recreation. Each of these criteria must be achieved in order to be considered or designated LWC. Supplemental values are further assessed if all other criteria are met. The criteria for each are described in BLM Manual 6310 (BLM 2012b), and are summarized as follows:

Size – The following criteria are required to be met in order for lands to be eligible as LWC:

- Roadless area with over 5,000 acres of contiguous BLM lands;
- Roadless areas of less than 5,000 acres of contiguous BLM lands where such lands border designated wilderness, BLM Wilderness Study Areas, USFWS areas proposed for wilderness designation, USFS Wilderness Study Areas or areas of Recommended Wilderness, and, National Park Service (NPS) areas recommended or proposed for designation;
- The area is of sufficient size as to make practicable its preservation and use in an unimpaired condition; or,
- Any roadless island of the public lands.

Naturalness – The area must appear "Primarily affected by the forces of nature," and any work of human beings must be "substantially unnoticeable." "Substantially unnoticeable" should support the appearance of "apparent naturalness." For the purpose of this analysis, apparent naturalness is defined by the following parameters of viewshed and soundscape:

- Human-made features appear congruent with the existing visual character of the area (i.e., trails, trail signs, bridges);
- Visual contrast of disturbances to landscape features and/or man-made structures (including night time lighting) is NONE to LOW per BLM (1986a).

- Soundscape is characterized as natural, and is not influenced by the human-induced actions or facilities (average 30 decibel, A-weighted [dBA]) per NPS 2006).

Outstanding Opportunities for Solitude or Primitive and Unconfined Type of Recreation – The area provides opportunities to avoid the sights, sounds, and evidence of other people in the area. The area provides opportunities for primitive and unconfined recreation (either a diversity of primitive recreation experiences, or outstanding opportunities for one type). An area only has to possess outstanding opportunities for solitude *or* for primitive and unconfined recreation, not both. Nor does it have to have outstanding opportunities on every acre.

Supplemental Values – If criteria for size, naturalness, and outstanding opportunities are met, it is determined and documented whether or not the area contains ecological, geological, or other features of scientific, educational, scenic, or historical value. However, supplemental values are not required for an area to be identified as LWC.

3.8.4 Lands with Wilderness Characteristics – Inventory

Inventories of LWC were completed for all BLM-administered lands by the Central Yukon Field Office and the Anchorage District Office (Appendix E). The results of these inventories are summarized in Table 3.8-1, below:

Table 3.8-1 Lands with Wilderness Characteristics Inventory Results Summary

CRITERIA	Nulato Hills	Ungalik River	Baldwin Peninsula
Size	YES -- Total BLM Inventory Acreage includes 4,915,380 acres.	YES -- Total BLM Inventory Acreage includes 1,354,000 acres.	YES – The total BLM Inventory Acreage includes 464,689 acres.
Naturalness	YES -- The entire unit appears to be primarily affected by the forces of nature. The area is pristine and human activity or impacts are substantially unnoticeable.	YES -- The entire unit appears to be primarily affected by the forces of nature. The area is pristine and human activity or impacts are substantially unnoticeable.	YES -- The inventory unit is primarily natural with little or no evidence of human activity beyond subsistence hunting and fishing. Travel for subsistence activities and between villages in the region is typically by waterways in summer and snowmachines in winter.
Outstanding Opportunities for Solitude	YES -- The opportunity for solitude is outstanding. There are no villages or other human developments within the unit. This is a vast and isolated area with difficult access. Access in summer is only by small aircraft or boat. Access in winter is by air, snowmachine or dog team. There are few visitors. A visitor in this unit would likely have no or very infrequent encounters with other people.	YES -- There are no year-round connected communities in the region and nearly all travel into the area and among communities is by air. One established winter route passes through the inventory area that is used for individual or group dog-sledding or snowmachine activities and two BLM-authorized commercial big game guide-outfitters operate within the area. Neither of these activities has established base or spike camps.	YES -- The large size of the unit and its remoteness from urban areas have protected it from the pressures of public use and provide outstanding opportunities for solitude.

CRITERIA	Nulato Hills	Ungalik River	Baldwin Peninsula
Outstanding Opportunities for Primitive and Unconfined Type of Recreation	YES -- The Nulato Hills Unit possesses outstanding opportunities for primitive and unconfined recreation including backpacking, river floating, hunting, fishing and other activities associated with primitive, unconfined settings. The unit's remote and isolated characteristics have protected the area from the pressures of public use.	YES -- There are numerous recreational and backcountry opportunities available in the area including: hunting, fishing, dog sledding, snow machining, geologic features, and camping. The overall size, remoteness and lack of any developments in the inventory area provide users with outstanding opportunities for primitive and unconfined recreation.	YES -- The Baldwin Peninsula Unit in general possesses opportunities for dispersed types of recreational activities. The Selawik Hills and Buckland and Kauk Rivers provide outstanding opportunities for activities associated with primitive, unconfined settings such as backpacking, river floating, dog mushing, hunting, and fishing.
Supplemental Values	YES -- There are six designated Areas of Critical Environmental Concern (ACECs) encompassed by this wilderness inventory unit. They protect the following resources: spawning habitat for salmon and sheefish, crucial peregrine falcon habitat, and core winter range for the Western Arctic Caribou Herd.	YES -- Subsistence species are clearly recognized by natural resource managers in this area to be of major importance where hunting, gathering, and the general dependence on natural resources continues for most residents in the region.	YES – The area is within the migratory range of the Western Arctic Caribou Herd and provides essential habitat or anadromous fish, the yellow-billed loon (listed as a candidate for the Threatened and Endangered Species List), Harlequin duck, blackpoll warbler, and olive-sided flycatcher (all BLM-sensitive species).

3.9 Noise

The proposed repeater sites are located in remote wilderness areas. Ambient noise levels in these areas are defined by natural noise sources such as wind, wildlife, flowing streams, etc. and are typically low, while ambient noise levels in the vicinity of nearby population centers are influenced by man-made (anthropogenic) noise sources and are higher than ambient noise levels in undeveloped wilderness areas. The following sections provide information on acoustics and noise measurement, relevant laws, ordinances, regulations, and standards related to environmental noise, and the existing noise environment in the vicinity of the proposed project.

3.9.1 Acoustics

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and interferes with or disrupts normal activities. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to typical environmental noise exposure levels is annoyance. The responses of individuals to similar noise events are diverse and influenced by many factors including the type of noise, the perceived importance of the noise, its appropriateness to the setting, the time of day, and the type of activity during which the noise occurs, and noise sensitivity of the individual. The standard unit of sound measurement is the decibel (dB).

Although A-weighted decibels (dBA) may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most ambient environmental noise includes a mixture of noise from nearby and distant sources that creates an ebb and flow of sound, including some identifiable sources, plus a relatively steady background noise in which no particular source is identifiable. A single descriptor called the equivalent sound level (L_{eq}) is used to describe sound that is either constant or changing in level over a period of time. L_{eq} is the energy-mean dBA during a measured time interval. It is the "equivalent" constant sound level that would have to be produced by a given constant source to equal the acoustic energy contained in the fluctuating or time-varying sound level measured during the interval. The L_{eq} is the "base" metric used to establish other measures of environmental noise such as the Day-Night Sound Level (L_{dn})**.**

The Day-Night Sound Level or L_{dn} represents the "time-weighted" average sound level for a 24-hour day, and is calculated from the L_{eq} by adding a 10 dB penalty to sounds that occur during the night period (10:00 p.m. to 7:00 a.m.). The L_{dn} is the descriptor of choice for nearly all federal, state, and local agencies throughout the United States to define acceptable land use compatibility with respect to noise.

Because of the time-of-day penalties associated with the L_{dn} descriptor, the L_{dn} dBA value for a continuously operating sound source during a 24-hour period would be numerically greater than the dBA value of the 24-hour L_{eq}. Thus, for a continuously operating noise source producing a constant noise level operating for periods of 24 hours or more, the L_{dn} would be 6 dB higher than the L_{eq} value. Typical sound levels of familiar settings are depicted in Figure 3-7 and include the approximate decibel levels of commonly known sound sources (NPS 2008). The range of audible sound levels for humans is generally considered from 0 to 130 dBA. It should be noted that the decibels are logarithmic and a difference of 10 dBs is perceived as a doubling or halving of

loudness. Sound sources in Figure 3.7 that have no associated distance listed are indicative of typical referenced environments.

Figure 3-7: Approximate Decibel Levels of Commonly Known Sound Sources

dBA	Perception	Outdoor Sounds	Indoor Sounds
130	Painful		
120	Intolerable	Jet aircraft at 50 ft.	Oxygen torch
110	Uncomfortable	Turbo-prop at 50 ft.	Rock Band
100		Jet fly over at 1,000 ft.	Blood-curdling scream
90	Very noisy	Lawn mower/nearby Thunder	Hair dryer
80		Diesel truck 50 mph at 50 ft.	Food blender
70	Noisy	2-stoke snowmobile 30 mph at 50 ft.	Vacuum cleaner
60		4-stroke snowmobile 30 mph at 50 ft.	Conversation
50	Moderate	Croaking raven flyover at 100 ft.	Office
40		Snake River at 100 ft.	Living room
30	Quiet	Summer backcountry	Quiet bedroom
20	Very quiet	Winter backcountry	Recording studio
10	Barely audible	Below Standard noise floor	
0	Limit of audibility	Quiet winter wilderness	

3.9.2 Applicable Laws, Ordinances, Regulations, and Standards

There are a number of laws and guidelines at the federal level that direct the consideration of a broad range of noise issues, including the Noise Control Act of 1972 and EPA recommendations regarding environmental noise levels.

3.9.3 Existing Noise Conditions

Five proposed repeater sites would be located on lands managed by BLM and one additional tower would be located on private lands as part of the project. Ambient noise levels vary throughout the project area that would be used for project equipment staging, construction, and operation. Noise levels vary based on population density, distance to nearby traffic (trucks, snowmachines, 4-wheelers, off-road vehicles, aircraft flight patterns, nearby wildlife (e.g., passing waterfowl), natural features (water), weather, and other various conditions. The five proposed repeater sites and the Baldwin Peninsula beach staging area, all of which are on federally-managed lands, are located in undeveloped areas where the only sources of noise would be expected to occur from natural sources or occasional aircraft, snowmachines, or all-terrain vehicles. The proposed community tower in Kotzebue and the staging areas in Koyuk and Buckland are located on private lands. Since a majority of the lands around the staging areas and repeater sites are scarcely populated, low ambient noise levels can be expected throughout much of the project area. No empirical data are available to definitively document ambient noise levels at the site affected by the project, however, given the remote character of the landscape and

expected low ambient noise levels, the effect of this data gap would be minimal. In an Environmental Impact Statement (EIS) prepared by BLM (2002), it is stated that typical ambient noise levels in sparsely populated rural areas can range from 15 dBA to 45 dBA equivalent sound level (L_{eq}) (21 dBA to 51 dBA day-night sound level ($L_{dn]}$) (BLM 2002). These measures take into account changes in sound levels over a 24-hour period, and not just minimum or maximum sound levels. Other research has provided empirical measures of sound levels in remote backcountry locations, including 30 dBA in summer backcountry and 20 dBA in winter backcountry (NPS 2008), as shown in Figure 3-7.

3.10 Visual Resources

3.10.1 Introduction

The analysis area for visual resources was defined by a 15-mi.-radius surrounding the five repeater sites under review: Ungalik River, Dime, Talik, Harvey, Baldwin Peninsula and the proposed Kotzebue community tower (KIC or Air Force Site). The analysis area also included portions of the Iditarod historic-primary route located within the Kaltag to Nome segment of the Iditarod National Historic Trail (NHT).

Regulatory Setting

Regulation and management of visual resources within the analysis area is directed by the federal laws identified in Section 1.1 including NEPA and FLPMA. The BLM's visual resource management (VRM) policy identifies a basic stewardship responsibility to identify and protect visual values on all BLM lands. This policy is described in the Land Use Planning Handbook (BLM 2005) and VRM System (BLM 1986a), described below.

- ***Land Use Planning Handbook*** – the BLM Land Use Planning Handbook (BLM 2005) states that VRM classes shall be designated for all BLM land based on consideration of visual resource inventory (VRI) data and management considerations for other land uses. Resource use and management activities shall be managed according to the VRM objectives established in the land use plan.
- ***VRM System*** – visual resources on BLM-administered lands are managed per the VRM System (BLM 1986a). The VRM System is composed of three parts: The VRI, planning for VRM through assignment of VRM Classes, and Plan implementation/project analyses using the Visual Resource Contrast Rating System. The VRM Classes provide the regulatory standards for visual resources, and are defined as follows:
    - **Class I Objective** – to preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention.
    - **Class II Objective** – to retain the existing character of the landscape. The level of change to the characteristic landscape should be low.
    - **Class III Objective** – to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate.
    - **Class IV Objective** – to provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.

  The VRM designations for portions of the proposed project located on BLM-administered lands are provided in the Kobuk-Seward Resource Management Plan (RMP) (BLM 2008). Designations are provided in Table 3.10-1.

Table 3.10-1 Visual Resource Management Class Data for lands located within the Analysis Area for Visual Resources.

Repeater	Location	VRM Class
Ungalik River Repeater	T.9S R.10W. Sec28,33	II
Dime Repeater	T.4S R.10W. Sec33,34	IV
Talik Repeater	T.1N. R.9W. Sec4	IV
Harvey Repeater	T.9N. R.9W. Sec21	IV
Baldwin Peninsula Repeater	T.13N. R.15W. Sec14	III
Kotzebue Community Tower	T.17 N. R. 18W. Sec 27	III

- ***National Landscape Conservation System (NLCS)*** – as noted in Section 1.2.3, the NLCS was established under the *Omnibus Public Land Management Act of 2009*. The act protects public lands characterized by outstanding cultural, ecological, and scientific importance. The Iditarod NHT is designated as a unit of the NLCS. BLM policy requires management to protect the values for which NLCS lands were designated. If consistent with such protection, appropriate multiple uses may be allowed. The act requires inventorying each unit of the NLCS. Lands should be managed to VRM Class I or II standards throughout the unit in order to preserve the existing character of the natural and cultural landscape.
- ***The Iditarod NHT Comprehensive Management Plan (CMP) (BLM 1986b) –*** Section 1.2.3 provided a summary of the establishing legislation and management plan for the Iditarod NHT. No VRM objectives are provided in the Iditarod NHT CMP.

3.10.2 Landscape Character and Viewer Groups

The proposed project is located in the Seward Peninsula physiographic province (Wahrhaftig 1965). Existing visual resources of the area are described in terms of the visual resource inventory (VRI) value of the analysis area, and descriptors of the existing landscape character. The VRI value describes the relative value of scenic resources based on the interrelationship between scenic quality, visual sensitivity, and visual distance zones (Table 3.10-2).

The resulting VRI classes are defined below:

- **Class I** – assigned to all special areas where the current management situation requires maintaining a natural environment essentially unaltered by man, such as Wilderness Areas or Wilderness Study Areas.
- **Class II** – highest visual value assigned through the inventory process and based on the combination of Scenic Quality, Visual Sensitivity Levels, and Distance Zones.
- **Class III** – moderate visual value based on the combination of Scenic Quality, Visual Sensitivity Levels, and Distance Zones.
- **Class IV** – low visual value based on the combination of Scenic Quality, Visual Sensitivity Levels, and Distance Zones.

Table 3.10-2 Visual Resource Inventory Class Designations

		Visual Sensitivity Levels						
		High			Medium			Low
Special Areas		I	I	I	I	I	I	I
Scenic Quality	A	**II**	**II**	**II**	**II**	**II**	**II**	**II**
	B	**II**	III	III / IIV*	III	IV	IV	IV
	C	**IV**	**IV**	**IV**	**IV**	**IV**	**IV**	**IV**
		f/m	B	s/s	f/m	b	s/s	s/s
		Distance Zones						
Fm/ = Foreground/Middleground b = Background s/s = Seldom Seen								

The VRI classes for portions of the proposed project located on BLM-administered lands are provided in the Kobuk-Seward Draft RMP/EIS (BLM 2006). Designations are provided in Table 3.10-3, below. No component data (i.e., scenic quality, visual sensitivity, and visual distance zone) are available from this VRI. Consequently, information on attributes of scenic quality, visual distance zones, and visual sensitivity assigned to the analysis area is restricted to what can be inferred from Table 3.10-2-, above (Visual Resource Inventory Class Designations).

Table 3.10-3 Visual Resource Inventory (VRI) Data for lands located within the Analysis Area for Visual Resources.

Repeater	VRI Class	Possible Scenic Quality Score	Possible Visual Sensitivity Score	Possible Visual Distance Zones
Ungalik River Repeater	II	A, B	High, Medium, Low	Fm, b, s/s
Dime Repeater	IV	B, C	High, Medium, Low	Fm, b, s/s
Talik Repeater	IV	B, C	High, Medium, Low	Fm, b, s/s
Harvey Repeater	IV	B, C	High, Medium, Low	Fm, b, s/s
Baldwin Peninsula Repeater	IV	B, C	High, Medium, Low	Fm, b, s/s
Kotzebue Community Tower	IV	B, C	High, Medium, Low	Fm, b, s/s

Additional VRI data are available for the portion of the Iditarod NHT that passes through the analysis area of the Ungalik River Repeater: Norton Sound Scenic Quality Rating Units (SQRUs) 02 and 03. These data are provided in the Iditarod National Historic Trail Comprehensive Management Plan (BLM 1986b), and pertain to the 1,000 foot corridor surrounding the trail. Both SQRUs were ranked as having Class C scenery.

Landscape character is defined as the overall impression created by an area's unique combination of features, such as land, vegetation, water, and existing structures (cultural modification). The project area is located in two distinct physiographic areas of the Seward Peninsula: the Nulato Hills and the Baldwin Peninsula. Images of landscape character surrounding each repeater site are provided in Figure 3-8.

The Ungalik, Dime, Talik and Harvey repeaters are located within the Nulato Hills, and are roughly distributed in a north/south alignment across lands located between Koyuk to the south, and Buckland, to the north. The Nulato Hills are characterized by expansive areas of rolling hills and plateaus surrounding rugged mountainous uplands drained by numerous clear-water rivers. Exposed grey colored, angular and jagged rocks are common on hill tops and mountain peaks. Vegetation includes the pale brown to olive low-lying tundra, which contrast the vibrant green and more amorphous parches of shrub cover, or vegetation lining drainages. Higher elevations and drainages are stippled with the darker green and vertical lines of spruce trees that contrast surrounding vegetation. Vegetation appears soft against the exposed rock of the hill tops and mountain peaks. Late fall, winter, and spring months are typically characterized by contiguous white snowpack. Lowland areas are dominated by the extensive drainage networks of the Buckland River, draining to the north, and the Koyuk River, to the south. No existing structures are present in the analysis areas for any repeaters located in the Nulato Hills.

The Ungalik River and Harvey Repeaters are distinct from other proposed repeater sites in the Nulato Hills in their proximity to the open waters of Norton Bay / Norton Sound and Selawik Lake / Kotzebue Sound, respectively. The viewsheds of these repeaters include expansive views across coastal lowland areas to adjacent waterbodies. These landscapes are characterized by numerous thaw lakes and wetlands that are clustered near the river mouths, and adjacent to lowland areas along the shoreline.

Viewer groups within the Nulato Hills are limited. No villages or other human developments are within the unit. This is a vast and isolated area with difficult access. Access in summer is only by small aircraft or boat. Access in winter is by air, snowmachine or dog team (See Appendix E, Lands with Wilderness Characteristics Inventory). For all sites, potential viewer groups could include: (1) individuals engaged in subsistence activities; (2) recreationists engaged in activities such as snow machining, dog mushing, hunting, fishing, wildlife viewing, camping, hiking; and (3) commercial reindeer grazing. Due to the remoteness of the project area, and difficulty in access, such viewers are considered rare (Section 3.7 Recreation). Viewer groups associated with the Kotzebue Community Tower (KIC or USAF site) would include residents of the nearby City of Kotzebue.

The Baldwin Peninsula Repeater and Kotzebue Community Towers (KIC or USAF site) would be located on the Baldwin Peninsula, a narrow landform located between Kotzebue Sound and Hothom Inlet. The Baldwin Peninsula Repeater is located in the center of the landform, where the existing topography is constricted to a narrow area measuring less than 1 mile across. Topography is flat, and is bordered on both sides by steep rocky cliffs that extend to the water. The terrain is patterned with irregular polygons formed from freezing/thawing of the terrain. Views from this site are extensive and panoramic, and are largely dominated by the surrounding water forms of Kotzebue Sound and the distant Chukchi Sea. No existing structures are present at the Baldwin Peninsula site. The USAF site would be located on undeveloped wetlands, adjacent to a radar site approximately 3 miles south of the City of Kotzebue by road. Although not adjacent to infrastructure, the USAF Site is in viewing distance from telecommunication

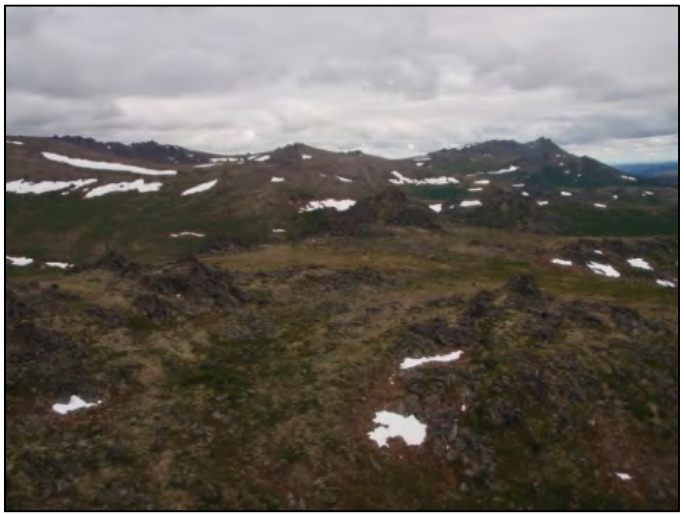
infrastructure, windmills, the City and the dump (see Figure 2-5 for illustration of proximity of the KIC Site to build features of the City of Kotzebue). Existing topography is characterized as rolling. Like the Baldwin Peninsula Site located to the southeast, views are expansive and panoramic. Despite visible structures, roads, and infrastructure of the City of Kotzebue, views are dominated by Kotzebue Sound and the Chukchi Sea. The KIC Site is located approximately 2,400 feet southeast of the USAF site.

Viewer groups within the Baldwin Peninsula are limited to marine travelers, snowmachine travelers, or air traveler flying overhead in route to the City of Kotzebue. Residential and commercial viewers are more common in areas located within and around the City of Kotzebue.

Figure 3-8: Images of Landscape Character Surrounding Repeater Sites

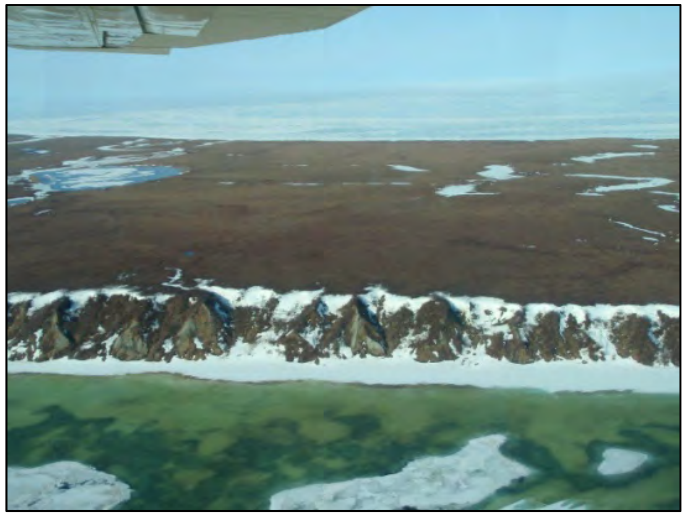
Talik Repeater Site - Viewshed Repeater site

Dime Repeater Site - Contrast in vegetation color and texture site



Ungalik River Repeater - Exposed rock present in landforms

Harvey Repeater Site - View to the north



Baldwin Peninsula Site - Note steep cliffs that border western edge of peninsula

Characteristic patterns in landforms of the project area resulting from freeze/thaw activity

USAF & KIC Sites – Typical terrain, looking towards the City of Kotzebue, but this image is north of the road of the proposed Kotzebue Community Tower Site

3.11 Cultural Resources

The following sections examine known historic properties and paleontological resources in the vicinity of proposed TNW III Project repeater locations included in Project Alternatives 2 and 3. Section 106 of the National Historic Preservation Act requires BLM to consult with the Alaska State Historic Preservation Officer (SHPO) to analyze and address potential effects on historic properties (also known as "cultural resources") prior to making the decision to grant rights-of-way for the components of the project located on federally managed lands.

The cultural resources discussed below are listed on the Alaska Heritage Resources Survey (AHRS) database maintained by the Alaska Office of History and Archeology (OHA). Detailed information on these sites is provided in the restricted distribution cultural resources survey report on file with the BLM (NLUR 2012).

3.11.1 Ungalik River Repeater Site

No previous archaeological investigations are known to have been conducted in the vicinity of the Ungalik River Repeater area of potential effect (APE). A section of the Iditarod National Historic Trail (NHT) (NOB-00058) is located approximately two miles from the Ungalik River Repeater. Although the Iditarod NHT has not been determined eligible for listing on the National Register of Historic Places [NRHP], this EA treats sites and features identified by the OHA as having an association with the INHT as eligible for listing on the NRHP under Criteria A for their association with the Alaskan gold rush period between 1880 and 1920, and Criteria D for their ability to yield information important to prehistory and history.

No new cultural resources were identified during NLUR's 2012 aerial/pedestrian survey and limited subsurface testing of the Ungalik River Repeater APE.

3.11.2 Dime Repeater Site

No previous archaeological investigations are known to have been conducted in the vicinity of the Dime Repeater APE. There are no known AHRS sites located within three miles of the proposed Dime Repeater tower center point. No new cultural resources were identified during NLUR's 2012 aerial/pedestrian survey and limited subsurface testing of the Dime Repeater APE.

3.11.3 Talik Repeater Site

No previous archaeological investigations are known to have been conducted in the vicinity of the Talik Repeater APE. There are no known AHRS sites located within three miles of the proposed Talik Repeater tower center point. No new cultural resources were identified during NLUR's 2012 aerial/pedestrian survey and limited subsurface testing of the Talik Repeater APE.

3.11.4 Harvey Repeater Site

No previous archaeological investigations are known to have been conducted in the vicinity of the Harvey Repeater APE. There are no known AHRS sites located within three miles of the proposed Harvey Repeater tower center point. No new cultural resources were identified during NLUR's 2012 aerial/pedestrian survey and limited subsurface testing of the Harvey Repeater APE.

3.11.5 Baldwin Peninsula Repeater Site

A pedestrian survey and limited subsurface testing were conducted at the Baldwin Peninsula site. There is one previously recorded AHRS site (SLK-00142) within three miles of the site. It was surveyed by BIA archaeologists in 1988 and 2011. During the 1988 BIA survey, the remains of a modern cabin or tent platform were located. This feature was relocated in 2011 but it was described as sliding down a steep bluff towards the beach. Both BIA surveys also recorded a three strand barbed wire fence, which was attributed to the Lomen Company, a major producer of reindeer meat in Alaska between 1914 and 1937. Oral history states that there was an Alaska Native portage between Kotzebue Sound and the Hotham Inlet as well as a graveyard in the area of SLK-00142, but the location information was not specific and the BIA surveys found no physical evidence for either claim (Pratt 2012 as cited in NLUR 2012). The site has not been subjected to a formal determination of eligibility for listing on the NRHP.

No new cultural resources were identified during NLUR's 2012 aerial/pedestrian survey and limited subsurface testing of the Baldwin Peninsula Repeater APE.

3.11.6 Baldwin Peninsula Beach Landing Area and Ice Road

The Baldwin Peninsula Beach Landing Area on Kotzebue Sound and the 2.6 mile Ice Road connecting it to the Baldwin Peninsula Repeater site where not identified prior to the 2012 cultural resources survey. Both the Landing Area and the Ice Road route are located within the cultural resources literature review study area for the Baldwin Peninsula Repeater (see above). There are no additional AHRS sites within three miles of either location. A cultural resources survey will be carried out on the Baldwin Peninsula Beach Landing Area and Ice Road, the BLM will review the survey results, and the SHPO will be asked to concur with any BLM recommendations, prior to the granting of a BLM right-of-way and the commencement of construction.

3.11.7 USAF Repeater Site (Kotzebue Community Tower Alternative 3)

The proposed USAF Repeater Site is located on federal land withdrawn for use by the U.S. Air Force. This site was not surveyed during the 2012 field season. At 250 feet tall, the proposed USAF Repeater tower would be visible from the community of Kotzebue.

There are 33 AHRS sites within three miles of the USAF Repeater site. The site itself is located within the boundaries of the Kotzebue White Alice Communication System (WACS) station, Historic District (KTZ-00037). The WACS Historic District has been determined eligible for listing on the NRHP but all but one of the 23 contributing elements of the District were mitigated and demolished in the late 1990s. As a result, the WACS Historic District and the 22 demolished sites no longer retain the integrity required to be listed on the NRHP.

The surviving Kotzebue Radome Tower (KTZ-00190) is individually eligible for listing on the NRHP under Criterion A. Two other sites associated with Air Force activities, the Kotzebue LRRS Road System (KTZ-00231) and the LRRS Gravel Pad System (KTZ-00232) have also been determined eligible for listing on the NRHP under Criterion A and Criterion C. The USAF Repeater APE overlaps a portion of the Kotzebue LRRS Road System (KTZ-00231).

There are eight AHRS sites within three miles of the Air Force Repeater Site that are not directly associated with US military activities. Of these, two (Intermediate Kotzebue (KTZ-00030) and the Kotzebue Archaeological District (KTZ-00036)) are eligible for listing on the NRHP under

Criterion D. These historic properties are located in the village of Kotzebue, two to three miles from the Air Force Repeater site. The five remaining sites have not been subjected to a formal determination of eligibility.

There are 30 NRHP-eligible AHRS sites within three miles of the proposed KIC Site tower center point. The Kotzebue Archaeological District (KTZ-00036) is eligible for listing on the NRHP under Criterion D. It is located in the village of Kotzebue and includes Historic Kotzebue (KTZ-00001), Intermediate Kotzebue (KTZ-00030), and Old Kotzebue (KTZ-00031) as contributing elements.

If the USAF Repeater becomes the selected alternative, a cultural resources survey will be carried out at the site and access road, the BLM will review the survey results, and the SHPO will be asked to concur with any BLM recommendations, prior to the granting of a BLM right-of-way and the commencement of construction.

3.11.8 KIC Repeater Site (Kotzebue Community Tower Alternative 2)

The KIC Site is located on Kikiktargruk Inupiat Corporation land. The proposed tower would be-250 feet tall and visible from the community of Kotzeube. The KIC Site is only 2,400 feet from the USAF Site, off the same wind farm access road. The list of AHRS sites and NRHP-eligible sites within three miles of the KIC site are the same as those identified for the USAF Site. No previous archaeological pedestrian surveys are known to have been conducted within the APE for the KIC site.

If the KIC Site becomes the selected alternative, a cultural resources survey will be carried out on the site and the BLM will review the survey results. The SHPO will be asked to concur with any BLM recommendations, prior to the granting of rights-of-way at the BLM sites.

3.11.9 Summary of Findings

The NRHP-eligible Iditarod National Historic Trail passes two miles west of the Ungalik River Repeater. A single US Coast and Geodetic Survey marker and associated tripod remains were recorded within the Dime Repeater APE. There are no known NRHP eligible cultural resources within three miles of the Talik, Harvey and Baldwin Peninsula Repeater locations. The Baldwin Peninsula Beach Landing Area and Ice Road were not surveyed in 2012. There are five NRHP eligible AHRS sites within three miles of USAF site, which was not surveyed in 2012. All of the above sites are located on federally managed lands (NLUR 2012).

There are seven NRHP eligible AHRS sites within three miles of the KIC Site, which is located on land owned by the KIC. The KIC Site was not surveyed in 2012.

3.11.10Traditional Cultural Properties

Traditional Cultural Properties (TCPs) are properties whose significance is derived from the role the property plays in a community's historically rooted beliefs, customs, and practices. Such sites are often hard to recognize and their presence may not come to light through archaeological, historical or architectural surveys. The existence and significance of TCPs are often only ascertainable through interviews with knowledgeable people in the area or through other ethnographic research (NPS 1998).

No formally designated TCPs were identified in the vicinity of the proposed TNW III Project during the cultural resources literature review. However, each of the sites surveyed are in areas that have been inhabited and utilized by Alaska Native peoples for thousands of years. To date, tribes invited into government-to-government consultation by the BLM have not identified any TCPs within the proposed project area. Tribes may still identify TCPs as a part of the continuing government-to-government consultation related to this project.

3.11.11Paleontological Sites

No Paleontological resources were identified within or near the proposed TNW III Project sites during the cultural resources literature review or 2012 fieldwork.

3.12 Soils

Across the project area three separate surficial geologic units occur at the repeater sites. At the Ungalik, Dime, Talik, and Harvey repeater sites are located on exposed mountain ridges, the predominant unconsolidated material is undifferentiated coarse to fine grained alluvium and slope deposits. These deposits are associated with moderate to steep-sloped mountains and hills with faulted and folded Cretaceous age bedrock exposures largely restricted to upper slopes and crestlines (Karlstrom et al. 1964). The Baldwin Peninsula Repeater site is located on glacial end moraine deposits of a pre-Wisconsin age glacial advance. The glacial deposits are remnants of highly modified moraines and associated drift. During the Wisconsin glacial period, glaciers from the Brooks Range advanced into the upper valley of the Kobuk River but did not advance farther (Wahrhaftig 1965). The Kotzebue KIC and USAF repeater sites are located on coastal deposits of modern beaches, sand bars, delta, and spits (Karlstom et al. 1964).

3.12.1 Ungalik River Repeater Site Soils

The Ungalik River Repeater site is located west of the Ungalik River at the top of a ridge at an elevation of 1,015 feet above mean sea level). At the proposed repeater site the bedrock consists of Cretaceous-age sedimentary rocks (Patton et al. 2009). The sedimentary rocks at the repeater site consist of marginal shelf and slope deposits of carbonate-clast conglomerate, sandstone, and shale.

In September 2012, Golder Associates conducted a geotechnical site investigation in support of the TNW III Project. The site investigations included advancing three exploratory borings to depths of 13, 23 and 29 ft below ground surface (bgs) and four test pits to depths of 5.5 (2), 6, and 8 ft bgs. Groundwater was encountered during advancement of two of the exploratory borings at a depth of 7 ft bgs. A thin surface root mat underlain by organic silt and weathered and fractured siltstone bedrock was reported from 1 to 9 ft bgs. Competent shale rich silstone bedrock was reported from 9 ft. to 29 ft bgs. Frost fractured and weathered bedrock was encountered in the boreholes at depth of 5 to 9 ft bgs (Golder Associates 2012a).

Soils within Ungalik River repeater site area are classified as *Pergelic Cryumbrepts – Histic Pergelic Cryaquepts*, very gravelly, hilly to steep association. *Histic Pergelic Cryaquepts* are poorly drained soils on lower hillsides and steep north-facing slopes of the Nulato Hills. They formed in glacial till or colluvium deposits under a cover of sedges, mosses, and low shrubs. The soils have a thick peaty surface mat of organic matter underlain by gray, very gravelly loam or sandy loam (National Cooperative Soil Survey 1979).

3.12.2 Dime Repeater Site Soils

The Dime Repeater site is located approximately seven miles east of the Koyuk River in the southeastern half of the USGS Candle (A-4) 15-minute topographic quadrangle at an approximate elevation of 827-feet above msl. At the proposed Dime Repeater site, the same sedimentary rock unit as that mapped at the Ungalik River Repeater site is identified by Patton et al. (2009) as occurring at the Dime Repeater location. The sedimentary rocks at the repeater site consist of marginal shelf and slope deposits of carbonate-clast conglomerate, sandstone, and shale.

In September 2012, Golder Associates conducted a geotechnical site investigation in support of the TNW III Project. The site is relatively flat with spongy, wet, tussock-rich tundra surface vegetation around the proposed repeater area. The site investigation included advancing two exploratory borings to depths of 14 and 34 ft bgs, and two test pits to depths of 5.5 and 6 ft bgs. Groundwater was encountered at 3 to 4 ft bgs in both the borings and test pits. Moist to wet thin organic mat underlain by intermixed frost fractured sandstone rubble boulders with silt infilling was reported from 0.5 to 12 ft bgs in the borings and 0.5 to 6 ft bgs in the test pits. Moderately weathered, slightly fractured sandstone bedrock was reported from 12 to 13 ft that was underlain by competent slightly weathered and fractured, gray colored sandstone bedrock from 13 ft to the total depth of each boring (Golder Associates 2012b).

Soils within the Dime Repeater site are classified as *Histic Pergelic Cryaquepts*- loamy, nearly level to rolling hills land association of the Norton Sound lowlands. *Histic Pergelic Cryaquepts*- consist of poorly-drained loams and silt loams soils formed in valleys and on long foot slopes (National Cooperative Soil Survey 1979).

3.12.3 Talik Repeater Site Soils

The Talik Repeater site is located east of the West Fork of the Buckland River in the southeastern corner of the USGS Candle (C-4) 15-minute topographic quadrangle at an approximate elevation of 2,025-feet above msl. At the proposed repeater site, Early Cretaceous-age volcanic and volcaniclastic rocks of the Koyukuk lithotectonic terrane are exposed at the surface (Patton et al. 2009). The volcanic rocks include andesite and basalt lava flows and the volcaniclastic rocks include tuffaceous agglomerate and conglomerate.

In September 2012, Golder Associates conducted a geotechnical site investigation in support of the TNW III Project. The site is relatively flat with cobbles and surface boulders scattered across the spongy, tussock-rich tundra surface vegetation around the proposed repeater area. The site investigation included advancing two exploratory borings to depths of 22.5 and 30 ft bgs, and two test pits to depths of 6.5 and 7 ft bgs. Groundwater was encountered at 5 ft bgs in one of the borings and 6 ft bgs in both test pits. A moist, 2-inch thick organic mat was underlain by a light-brown colored frost fractured metamorphosed conglomerate rubble with silt infilling that was encountered to a depth of 8 ft bgs in the borings and 6 ft bgs in the test pits. The conglomerate rubble was underlain by slightly weathered and fractured competent metaconglomerate bedrock from 8 ft to the total depth of each boring (Golder Associates 2012c).

Soils within Talik Repeater site area are classified as *Pergelic Cryumbrepts – Histic Pergelic Cryaquepts*, very gravelly, hilly to steep association similar to the Ungalik repeater site. *Histic Pergelic Cryaquepts* are poorly drained soils on lower hillsides and steep north-facing slopes of Talik Ridge. They formed in glacial till or colluvium deposits under a cover of sedges, mosses, and low shrubs. The soils have a thick peaty surface mat of organic matter underlain by gray, very gravelly loam or sandy loam (National Cooperative Soil Survey 1979).

3.12.4 Harvey Repeater Site Soils

The Harvey Repeater site is located east of the Buckland River and south of the Kauk River in the southeast quadrant of the northeastern corner of the USGS Selawik (A-4) 15-minute topographic quadrangle at an approximate elevation of 2,407-feet above msl in the northern Selawik Hills. At the proposed repeater site, Early Cretaceous-age plutonic rocks are exposed at

the surface. The plutonic rocks include syenite, monzonite, and nepheline syenite (Patton et al. 2009).

In September 2012, Golder Associates conducted a geotechnical site investigation in support of the TNW III Project. The site is relatively flat with cobbles and surface boulders scattered across the tundra surface vegetation around the proposed repeater area. The site investigation included advancing two exploratory borings to depths of 25.5 and 33.5 ft bgs, and three test pits to depths of 5.5 (2) and 10.5 ft bgs. Groundwater was encountered at 5 to 5.5 ft bgs in both the borings and test pits. A moist, 2-inch thick organic mat was underlain by a brown-colored frost fractured gneiss rubble with silt infilling that was encountered to a depth of 5.5 ft bgs in the borings and test pits. The fractured gneiss rubble was underlain by slightly weathered and fractured competent quartz rich gneiss bedrock from 5.5 ft to the total depth of each boring and one test pit (Golder Associates 2012d).

Soils within Harvey Repeater site area are classified as *Pergelic Cryumbrepts – Histic Pergelic Cryaquepts*, very gravelly, hilly to steep association similar to the Ungalik River and Talik repeater sites. *Histic Pergelic Cryaquepts* are poorly drained soils on lower hillsides and steep north-facing slopes of the Selawik Hills. They formed in glacial till or colluvium deposits under a cover of sedges, mosses, and low shrubs. The soils have a thick peaty surface mat of organic matter underlain by gray, very gravelly loam or sandy loam (National Cooperative Soil Survey 1979).

3.12.5 Baldwin Peninsula Repeater Site Soils

The Baldwin Peninsula Repeater site is located on the narrow strip of land making up the Baldwin Peninsula that separates the Hotham Inlet and Kotzebue Sound in the southwest quadrant of the USGS Selawik (C-6) 15-minute topographic quadrangle at an approximate elevation of 100-feet above msl. At the proposed repeater site, Pleistocene-age glacial surficial deposits are exposed at the surface. The unconsolidated sediments include glacial and glaciolacustrine deposits (Patton et al. 2009).

In September 2012, Golder Associates conducted a geotechnical site investigation in support of the TNW III Project. The site is relatively flat with tundra and tussock surface vegetation around the proposed repeater area. The site investigation included advancing two exploratory borings to a depth of 51 feet bgs. Groundwater was not encountered during advancement of the borings. A frozen, dark brown organic silt was encountered from 0.5 to 3 feet bgs. The dark brown organic silt was underlain by a frozen, gray colored silt with visible ice at 18 feet bgs in both borings, to the total depth of each boring (Golder Associates 2012e).

Soils within repeater site area are classified as *Histic Pergelic Cryaquepts*, loamy, nearly level to rolling hills and coastal plains and deltas land association. *Histic Pergelic Cryaquepts* are poorly drained soils on broad plains. They formed in deep silty alluvial sediment. The soils have a thick peaty surface mat of organic matter underlain by dark gray, silt loam commonly streaked with frost-churned organic material (National Cooperative Soil Survey 1979).

3.12.6 Kotzebue Community Tower KIC Site Soils (Alternative 2)

The Kotzebue Community Tower KIC Site is located near the tip of the Baldwin Peninsula on the east shore of Kotzebue Sound in the east central half of the USGS Kotzebue (D-2) 15-minute topographic quadrangle at an approximate elevation of 100-feet above msl. The proposed tower

site is located in the northern half of the northeast quadrant of Section 22, Township 17 North, Range 18 West of the Kateel River Meridian. At the proposed tower site, Pleistocene-age glacial surficial deposits are exposed at the surface. The unconsolidated sediments include glacial and glaciolacustrine deposits (Patton et al. 2009).

Golder Associates conducted a geotechnical site investigation in support of the TNW III Project at a location off the Ted Stevens Highway, about a mile from the proposed KIC Site. The Golder site is relatively flat with tundra and tussock surface vegetation. The site investigation included advancing one exploratory boring to a depth of 51.5 feet bgs. Groundwater was not encountered during advancement of the boring. A dark brown organic silt was encountered from 0.5 to 3 feet bgs. The dark brown organic silt was underlain by a frozen gray colored, silt with visible ice at 13 feet bgs that continued to the total depth of the boring (Golder Associates 2012f).

Soils within tower site area are classified as *Histic Pergelic Cryaquepts*, loamy, nearly level to rolling hills and coastal plains and deltas land association similar to the Baldwin Peninsula tower site. *Histic Pergelic Cryaquepts* are poorly drained soils on broad plains. They formed in deep silty alluvial sediment. The soils have a thick peaty surface mat of organic matter underlain by dark gray, silt loam commonly streaked with frost-churned organic material (National Cooperative Soil Survey 1979).

3.12.7 Kotzebue Community Tower USAF Site Soils (Alternative 3)

At the proposed Kotzebue Community Tower USAF site, Pleistocene-age glacial surficial deposits are exposed at the surface. The unconsolidated sediments include glacial and glaciolacustrine deposits (Patton et al. 2009). Golder Associates did not conduct a geotechnical site investigation.

Soils within tower site area are classified as *Histic Pergelic Cryaquepts*, loamy, nearly level to rolling hills and coastal plains and deltas land association similar to the Baldwin Peninsula and Kotzebue South tower sites. *Histic Pergelic Cryaquepts* are poorly drained soils on broad plains. They formed in deep silty alluvial sediment. The soils have a thick peaty surface mat of organic matter underlain by dark gray, silt loam commonly streaked with frost-churned organic material (National Cooperative Soil Survey 1979).

3.13 Hazardous Materials

Items such as batteries, gasoline, and diesel fuel need to be properly managed in both their use and disposal. Though not common in remote areas, these items are used in project area communities and are also found occasionally in campsites, emergency response camps and equipment, or recreation vehicles (snowmachines). The area is remote and encountering existing hazardous materials during construction is not likely.

The hazardous materials and facilities that would be employed in implementation of the TNW III Project are described in Section 2.2. Once built, these repeater sites would be un-manned and resupply would occur once per year under normal planned operations. Each of the repeaters on BLM-managed lands would require the use of batteries and diesel fuel for continued operations. Annual refueling operations at each of the remote repeater sites would involve helicopter transportation of 7,000 gallons of diesel fuel in an estimated 14 loads (500 gallons per load) over a period of 2 to 3 days (Unicom 2012).

To address the risk of hazardous spills, extensive spill prevention elements are included in the project's construction, operation, and facilities design (see Table 2-3). For each repeater site, the fuel tanks and piping are designed with spill detection and containment features aimed at preventing and minimizing the release of hazardous materials into the surrounding environment. Other project design features and required operating procedures that reduce environmental impacts and minimize the risk of hazardous material releases are summarized in Table 2-11. These include the preparation of Spill Prevention, Control, and Countermeasure (SPCC) plans for each site, which would provide detailed mandatory standards and procedures to prevent and respond to any release. The plans would include procedures for containment of stored fuels, procedures and temporary containment for refueling equipment, transferring fuels, and moving fuels to and from storage locations. Spill response materials would be stored on site.

During construction, each site would require six 55-gallon drums (four of diesel and two of gas) with integrated containment and covers to prevent rain/fuel mixing and overflow. Two 300-gallon fuel bladders would also be in place, one for aviation jet-A fuel, and one for low sulfur #1 diesel fuel. The fuel bladders would be stored in temporary containment dams (Unicom 2012). During construction and operations, fuel and other hazardous materials would be transported to the microwave repeater sites using helicopters (Section 2.2). Unforeseen helicopter accidents could result in hazardous material release and pose a potential spill risk. During the operations phase of the project, the 48-hour backup power supply would generate electricity using lead-calcium batteries containing battery acid, which involves a spill incident risk.

4.0 Environmental Consequences

This chapter evaluates the potential effects or impacts of the proposed action, no action, and action alternatives on the resources presented in Chapter 3.

4.1 Introduction to Impact Factors and Ratings Structure

The direct, indirect, and cumulative impacts are described for each resource and by project phase (construction, operation, and decommissioning) where applicable. The impacts on each resource are based on the intensity, duration, extent, and context of the impact. The impact criteria used to evaluate impacts *to each resource* are presented at the beginning of each Proposed Action (Alternative 2) section. The ratings are defined for each resource, but they follow the structure below:

Impact Factor	Rating		
Intensity – the magnitude of change in the resource condition	Low	Medium	High
Duration – how long would a change last	Temporary	Long-term	Permanent
Extent – the geographic area that would be affected	Local	Regional	Extended
Context – rare or protected resources that would be affected	Common	Important	Unique

4.1.1 Cumulative Impacts Methodology

Cumulative impacts are the result of the proposed action or alternatives added to or interactive with effects of other past, present, and reasonably foreseeable future actions (RFFAs). Cumulative impacts were assessed by considering the summary of direct and indirect impacts with impacts that have occurred in the past, are currently occurring, or are proposed in the future within the project area.

Direct and indirect impacts are combined to describe the contribution of those impacts to cumulative impacts on each resource. Below are general definitions for the contribution to cumulative impacts.

Negligible: Impacts are generally extremely low in intensity (often they cannot be measured or observed), are temporary, and do not affect unique resources.

Minor: Impacts tend to be low intensity or of short duration, although common resources may have more intense, longer-term impacts.

Moderate: Impacts can be of any intensity or duration, although common resources are affected by higher intensity, longer impacts while unique resources are affected by medium or low intensity, shorter-duration impacts.

Major: Impacts are generally medium or high intensity, long-term or permanent in duration, and affect important or unique resources.

The following sections provide the relevant past, present and reasonably foreseeable future actions for the project area.

Past Actions

The recent history of the region is reflected in the rise of many regional governmental institutions and organizations, including the Alaska Native regional corporations formed under the Alaska Native Claims Settlement Act and non-profit tribal associations, Alaska Native healthcare providers, and state-sponsored school districts. Nome and Kotzebue are regional population hubs that provide support transportation, government services, organizational headquarters, and freight distribution. Most communities in the project area are small and the trade and service sectors are not well-developed. The regional economy depends on the governmental sector (employment and funding for programs and infrastructure), utilities and trade, commercial fisheries, mining, and the visitor industry.

As described in the Socioeconomics discussion, Section 3.5, the region is remote from the larger population centers of Alaska. Local communities are not connected by roads; therefore the region relies on aircraft year-round or snowmachine for winter inter-village travel. RCA Alascom installed satellite-based telecommunication systems throughout the region in the late 1970s. Earth-stations and satellite dishes brought telephone and television services to most regional communities.

Present Actions

The current dynamics of population and economy in the project area include stable or slightly declining population levels and expenditures in the public sector, including the federal, state, and local government employment and project spending, with the partial exception of the significant investment by the Alaska Department of Transportation in the Shore Avenue Rehabilitation and Erosion Protection project in Kotzebue. In private sector activities, Kotzebue is a regional population hub that provides transportation, freight distribution, and commercial services. While the Norton Sound area participates in commercial fisheries, the northern region, defined as the North Slope Borough, Northwest Arctic Borough, and the City of Nome, has the smallest workforce numbers in fisheries in the state (Alaska Department of Labor and Workforce Development [ADLWD] 2010a). The mining sector, while historically important for the Seward Peninsula, is not currently a large employer, as exploration involves a small workforce (ADLWD 2010b), and no major mines are currently in production within the project area.

In the telecommunication sector, GCI and its subsidiary UUI, completed the first construction season of the TERRA-NW Phase I and II Projects in 2012 to provide broadband Internet across northwest Alaska. At completion, the TERRA-NW Phase I and II Projects would extend broadband Internet to Nome and communities in the Norton Sound region (GCI 2013).

Reasonably Foreseeable Future Actions

For this analysis, RFFAs are those actions that are likely or reasonably certain to occur. Often, they are based on publicly available documents such as existing plans or budgets, permit applications, or announcements. Potential actions which are considered speculative or are not likely to occur are not considered an RFFA.

Communication RFFAs

In the telecommunication sector, Unicom has developed the TERRA project with the intent to create a broadband ring connecting to an existing fiber-optic cable along the Dalton Highway (see Figure 4-1). The recently completed TERRA-SW Project links Anchorage to Homer and Southwestern Alaska; connecting to the DeltaNet system in the Yukon-Kuskokwim Delta; and then to the TERRA-NW Phase I Project linking Grayling to Nome. The long-term vision for the TERRA Project includes plans approximately 26 additional community towers sites and 22 remote repeaters tower sites. These towers would connect, via Ambler, to an existing fiber-optic cable along the Dalton Highway and then back to Anchorage, enabling redundancy or backup in the fiber-optic network. Extending north along the coast, a series of community and repeater towers are also planned to connect Barrow and the northern coastal communities to fiber-optic service. This service would continue to Prudhoe Bay and the existing fiber-optic cable network, thus enabling an additional level of network redundancy. These phases of the TERRA Project have not secured funding and are only in the planning stages of development. However, they are discussed in terms of their contribution to cumulative impacts because of the tower site footprints, helicopter-based construction, and diesel-powered energy generation (all the same features as Phase III sites).

Other telecommunication service providers have developed proposals for projects to expand rural broadband service. The Kodiak Kenai Cable Company has developed a proposal for a fiber-optic cable service called the Northern Fiber Optic Link. This proposal has not secured funding, but is designed to extend submarine fiber-optic cables from Kodiak Island to the Aleutian Islands, Western Alaska, and the Arctic (Southwest Alaska Municipal Conference 2010).

The TNW III microwave repeater towers would be candidates for additional antenna systems, including meteorological stations, cellular service, and similar remote systems. The installation of these options would be reviewed under separate permit applications. The applicant is aware of the potential for these add-on features and has designed the facilities to accommodate them, if new permits are approved. These actions would not change the footprint or design of the facilities. Methods used to install these features cannot be forecasted at this time. It is unknown whether or not each additional antenna would be installed separately or if the permit stipulations would require them to be bundled and installed during annual maintenance, thereby mitigating potential impacts from additional helicopter flights. As no additional components are proposed or funded currently, they must be characterized as speculative rather than as RFFAs.

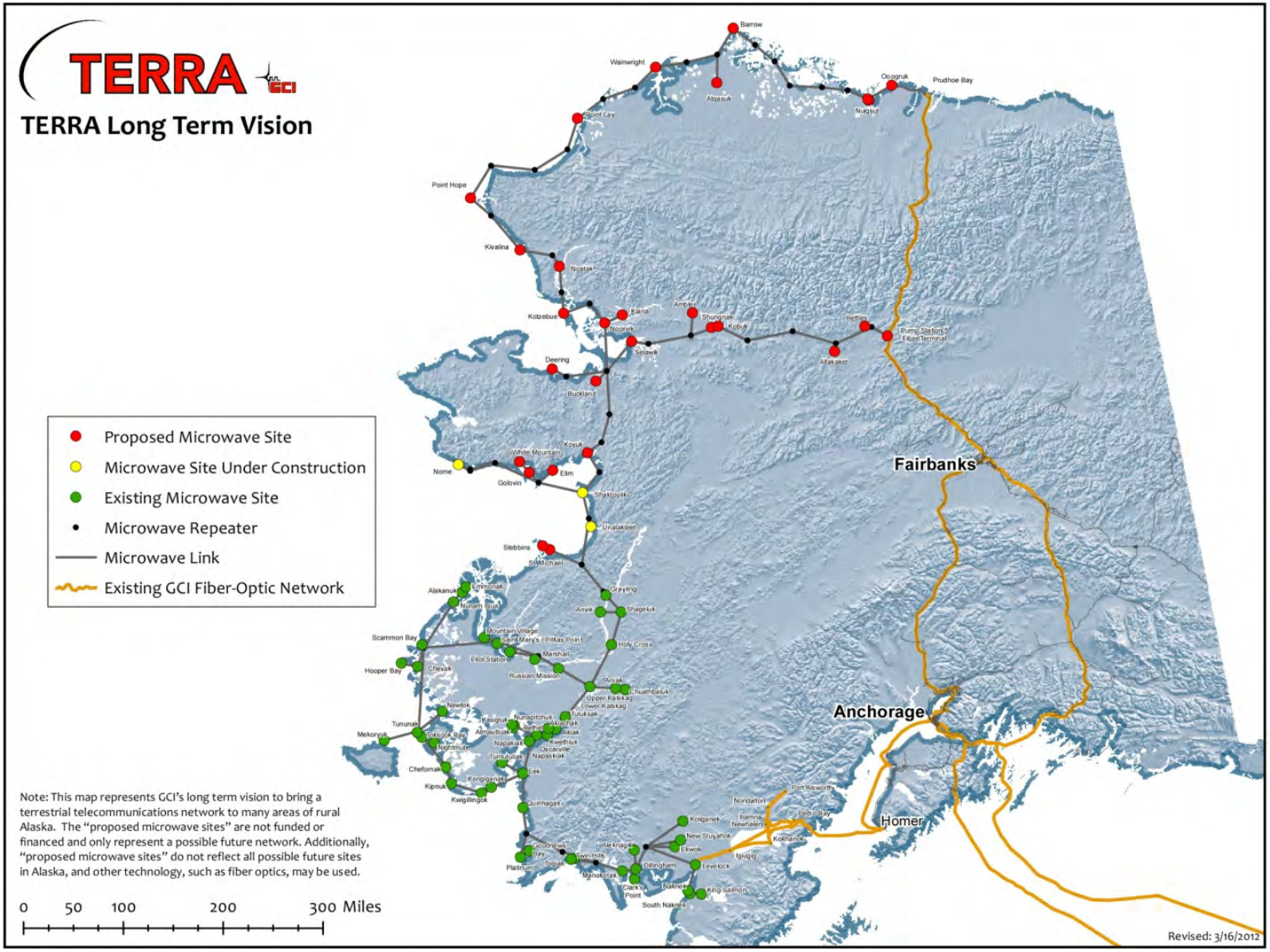
Other RFFAs

The Alaska Department of Transportation is conducting planning activities to establish a road from the Dalton Highway to the Ambler area in an effort to develop mining resources in the region. Upon reaching Ambler, the road would be extended to a deep-water port on either the Chukchi Sea coast (Red Dog Port Site or a new site to be constructed 10 miles south of Kotzebue), or a site in Norton Sound linked to the Nome road system at Council. If the deep-water port is located 10 miles south of Kotzebue, the access road would follow the Baldwin Peninsula. If the road is linked to the Nome road system, the new route could cross the Buckland drainage. Either proposed route would cross through the project area, but it still speculative in nature.

To promote and encourage economic development, the Northwest Arctic Borough Economic Development commission has initiated a series of programs aimed at increasing energy productions and efficiency within the region. These programs include: NWAB Energy Project (wind generator in Kotzebue); Wind/Diesel feasibility report for Deering, Buckland, and Noorvik; installation of TED energy smart meters, and a feasibility study for Cosmos Hills Hydro Project for the Upper Kobuk River (NWAB 2013). The Norton Sound Economic Development Corporation (NSEDC), as regional organizations implementing the Bering Sea community development quota, supports an array of fisheries-related training and development projects, including a monetary distribution to each member community for local projects (NSEDC 2010).

The mining sector has a long history and potential for future growth in the project area. The Seward Peninsula/Kotzebue region is endowed with both base and precious metal mineral deposits that have attracted prospectors over the past 100 years. From the placer and lode tin and iron prospects of the western Seward Peninsula, to the most northerly known sandstone-hosted uranium prospect of the Death Valley basin northeast of Golovin, the region has a strong history connected to mining. Today, most mineral exploration activity in the region focuses on silver and gold precious metal and molybdenum and copper base metal deposits.

Figure 4-1: TERRA Long Term Vision for Cumulative Impacts Analysis



4.2 Wetlands and Vegetation

This section includes direct and indirect impacts to wetlands and vegetation, including invasive species and rare and sensitive species. Potential impacts to wetlands and vegetation resulting from fuel or other hazardous materials spills are discussed in Section 4.14.

4.2.1 Alternative 1 – No Action

Under Alternative 1, no development would occur and there would be no direct or indirect impacts to wetlands or vegetation, or rare and sensitive species, including the spread of invasive species. No staging areas would be used for off-loading equipment from barges and subsequent ferrying of equipment and supplies by helicopter to the sites. With no direct or indirect impacts to wetlands or vegetation under Alternative 1, there would be no contribution to cumulative impacts to these resources.

4.2.2 Alternative 2 – Five Towers on BLM Land (Proposed Action)

Direct and Indirect Impacts

Potential impacts to wetlands and vegetation/invasive plants/rare and sensitive plant species were measured by assessing the magnitude (intensity), duration, geographic extent, and context of anticipated impacts using specific impact criteria. The impact criteria used to assess each indicator are described in Table 4.2-1, below:

Table 4.2-2 Impact Criteria for Impacts to Wetlands and Vegetation Systems

Impact Component		Impacts Summary	
Magnitude or Intensity	**High**: Changes to vegetation system functions are measurable and noticeable; impacts may cease ecosystem functions or impair values	**Medium**: Changes to vegetation system functions and values may measurable or noticeable. Impacts may diminish ecosystem functions or impair values.	**Low**: Changes to vegetation system functions and values may not be measurable or noticeable.
Duration	**Permanent**: Vegetation system functions and values would be lost or altered and would not be anticipated to return to previous function after decommission.	**Long-term**: Vegetation system functions would be reduced throughout the life of the project but could return to pre-activity function and value at some time after decommission.	**Temporary**: Vegetation system functions and values would be reduced, but not longer than the span of the project construction and would be expected to return to pre-activity function and value at the completion of the activity.
Geographic Extent	**Extended**: Affects vegetation resources beyond the EA project area.	**Regional**: Affects extensive vegetation systems; impacts extend beyond a local area, potentially throughout the project area.	**Local**: Affects small-scale vegetated areas only within the project area.
Context	**Unique**: Affects vegetation of very high quality or resources with national or international importance.	**Important**: Affects impaired or depleted vegetation or resources with local or regional importance.	**Common**: Affects vegetation typical of the area and comparable areas.

Construction

Direct impacts to wetlands are anticipated on BLM-managed lands at the Dime Repeater and Baldwin Peninsula Repeater sites. Because of the small total area of wetlands affected, the entire

project is expected to qualify under a U.S. Army Corps of Engineer's Nationwide Permit. Direct impacts to vegetation are anticipated at all proposed sites on BLM lands. For both wetlands and vegetation, direct impacts of a temporary duration include disturbance related to foundation pile construction, module placement, multiple helicopter landing zones (required for safety purposes), construction camp installation, and all associated staging areas necessary for tower construction. Vegetation impacts are reduced during the construction of foundation pilings at Baldwin Peninsula because it would occur in winter.

For BLM-managed lands, all temporary-duration direct impacts would be confined to the temporary construction lease footprint, which totals 25.8 acres (5.16 acres per five sites). See Table 2-4 for details on acreage of land affected during the project phases. Dime Repeater is not completely covered by wetlands so it may be possible to avoid some of the wetlands at this site.

Direct impacts would be confined to the lease footprint, which would include permanent structure pilings, temporary structure placement, and helicopter landing areas. Impacts from construction of tower sites and associated infrastructure are considered long-term for wetlands and vegetation because the effects would last for the life of the project, but wetlands and vegetation would likely return after the facilities have been removed because the hydrology and soils' character would not be permanently damaged.

All direct impacts to wetlands and vegetation associated with construction of the proposed action are anticipated to be of high intensity where excavation occurs, but affecting a very small area (local in extent). The wetlands throughout the Baldwin Peninsula are valued for subsistence use such as berry picking and waterfowl hunting (Bishop 2012). However, foundation construction would occur in winter so the disturbance to wetlands and vegetation would be less than the long-term operations lease. Yet, considered in the context of millions of acres of wetlands in the vicinity of the five tower sites, the impacted area represents less than one percent of BLM-managed wetlands.

Direct impacts are not expected on known rare and sensitive species in the project area. Permit stipulations would be used to ensure documented species including kokrines oxytrope (*Oxytropis kokrinensis*), found in the vicinity of Talik Repeater (AKNHP 2012), are avoided or saved for replanting at a later date. Rare and sensitive species including sheared gentian (*Gentianopsis detonsa ssp. detonsa*), Barneby's locoweed (*Oxytropis arctica var. barnebyana*), and Wright's arctic grass (*Puccinellia wrightii*) documented near the City of Buckland Barge Landing and City of Kotzebue Barge Landing would not be affected by the proposed action because all activities would occur on previously disturbed land. Nonetheless, permit stipulations may be used to minimize risks to rare and sensitive species.

Damaged vegetation may increase the risk of soil erosion. Almost all sub-Arctic and alpine tundra plants are perennials with seedlings that grow very slowly, with most early growth concentrated in the roots. Re-vegetation that provides surface erosion control and natural visual quality can take decades in sub-Arctic/alpine environments such as the Ungalik River, Talik and Harvey repeater sites. Following construction, the disturbed areas would be restored to the original contour of the land, with any salvaged organic material placed at the surface. Site-specific seed mixes would be used for re-vegetation, to reduce the potential for soil erosion and invasive plant establishment.

Soil disturbance and the use off-site equipment and materials may increase the risk of introducing invasive species. Considering the remoteness of the project area, invasive species

occurrences are generally limited to areas of human disturbance and new construction sites (Bishop 2012). Project design features to prevent the introduction or spread of invasive species (see Table 2-11) include thoroughly washing and cleaning all materials, and construction equipment before transportation to the project sites to reduce the risk of introducing invasive species. Taking precautionary steps from critical control points is key to reducing the risk of a new infestation. Early detection and rapid response to any introduced invasive species would help control and quickly address potential damage to a site if an invasive species becomes established. Rocky soils, a short growing season, and windy conditions make growing conditions at the tower sites difficult for plants to establish themselves; however, these conditions do not preclude the introduction of invasive species.

Indirect impacts to wetlands and vegetation include construction of the KIC Site on private land; a 14,000 square foot gravel pad would be constructed off of the access road to the wind farm. The total affected footprint under Alternative 2 is 26.1 acres (25.8 for five BLM sites and 0.32 acres for the gravel pad at the privately-owned KIC Site). This is a high intensity impact, but affecting a very small area (local in extent) and a small percentage of total wetlands in the area.

Operations

Direct effects associated with operations include low-intensity disturbance to wetlands and vegetation from helicopter landings and work on-site. These direct effects would be of a temporary nature, as minimal vegetation crushing or soil disturbance is anticipated to occur, and vegetation may recover between trips. Modification of vegetation would be confined to a maximum 3,500 square feet or 0.08 acres per site (0.08 acres x 6 sites = 0.4 acres) in which the tower, the power and communication equipment shelters, and the fuel tanks would be located (see Figures 2-2 and 2-3). This is a relatively small footprint of vegetation that is common to the area.

Indirect effects associated with operations include the connected action at the Kotzebue Community Tower KIC Site on non-federal lands, potential introduction of invasive species, and potential degradation to rare and sensitive species. As discussed for construction above, site visits carry the potential to introduce invasive plant species. During operations, the potential for introduction is reduced as no ground-disturbance is planned, and only one piece of equipment (helicopter) would be on site. As discussed under construction, proper wash-down procedures before the helicopters travel to the remote tower sites, and ongoing monitoring and response, would be required in order to mitigate the risk. Annual monitoring of the vegetation throughout the project area for the life of the permit would help mitigate potential adverse impacts from non-native invasive species using the early detection and rapid response approach to any new occurrences or infestations observed. Given the requirements for washing equipment prior to site visits and annual monitoring for invasive species, it is reasonable to assume that any invasive species would be detected and rapidly responded to, prior to spreading to an extent that they would affect ecosystem services. Thus, a low intensity impact is likely.

Decommissioning

The microwave repeater sites would be decommissioned at the end of the life of the facility by removing all fuel and batteries from the site along with all aboveground structures. Direct and indirect effects associated with decommissioning are presumed to be similar to those during construction, as heavy equipment, ground-disturbance, and staging areas on non-federal lands

would be required. However, after the structures are removed, the ground would be regraded to match the site contours and replanted according to the Reclamation Plan.

Cumulative Impacts

Past, present, and future actions that have affected and may continue to affect wetlands and vegetation in the project area are predominantly areas adjacent to population centers and infrastructure, such as roads, ports/harbors, trails, small airstrips, scientific research facilities, and private property development.

Future community tower sites (22) associated with the TERRA vision are likely to occur on previously disturbed land while the majority of remote repeater sites (26) would be on mountains without wetlands. A total of 26.1 acres (0.69 acres/site at the five remote sites and 0.32 acres at the KIC Site) would be affected by the long-term footprint of these facilities, but it is unknown how many of those acres would be wetland or vegetated. Therefore, while the leased areas represent maximum footprints, the actual amount of wetlands or vegetation disturbed may be much less.

Climate change is anticipated to have an effect on wetlands and vegetation in the future. Studies indicate that an increase in shrub abundance in tundra areas and changes in the forest-tundra boundary are likely (Strum et al. 2001; Lloyd and Fastie 2003). Somewhat counterintuitive, these changes may minimize the effect of the proposed action on wetlands as areas that are now wetlands may not be so in the future. Thus, the impacted amount of wetlands by the proposed action would decrease. However, while the project area is likely to be sensitive to climate change, the degree and response remains largely unknown. The contribution of the project to cumulative impacts on wetlands and vegetation would be minor because while the impact can be measured, the resources are common and the extent of the impact is local.

Summary

For the construction, operation, and decommissioning phases of the preferred alternative, direct impacts to wetlands and vegetation are anticipated to be of low to high intensity (temporary compression and fill) and would not extend beyond the 26.1 acres directly affected (local extent). The impact would be long-term to permanent in duration, considering the slow regrowth of affected vegetation. The direct impact would affect 0.16 acres of common wetlands, considering the large amount of similar wetland types, and common to unique vegetation resources considering the possibility of uprooting rare or sensitive species in the Talik Repeater area. Indirect effects associated with construction of the preferred alternative include the same levels of effect at construction sites for the Kotzebue Community Tower KIC Site on non-federal lands (0.32 acres).

4.2.3 Alternative 3 – Six Towers on BLM Land

Direct and Indirect Impacts

Both direct and indirect effects to wetlands and vegetation associated with the construction, operations, and decommissioning of Alternative 3 would be similar to those described for Alternative 2 (see Table 4.2-3). Alternative 3 would replace the Kotzebue Community Tower KIC Site with the USAF site. The Kotzebue Community Tower KIC Site is on private land

while the USAF site is on BLM-managed land. Both sites contain wetlands and would have similar vegetation.

Table 4.2-3 Vegetation and Wetlands Impact Summary

	Alternative 1	Alternative 2	Alternative 3
Direct Impacts to Wetlands	None.	Temporary direct impact from construction ROW: 10.3 acres at two sites (5.16 acres at Dime and Baldwin Peninsula) Long-term direct impact from operations ROW: 0.2 acres (0.08 acres at Dime and Baldwin Peninsula) Fill: 0.32 acres at KIC Site (indirect impact on private land)	Same except activities and fill would occur on BLM-managed lands
Direct Impacts to Vegetation	None.	Temporary direct impact from construction ROW: 25.8 acres (5.16 acres for five sites) Long-term potential impact from operations footprint: 0.40 acres (0.08 acres for five sites) Fill: 0.32 acres at KIC Site (indirect impact on private land)	Same except impacts would be all on BLM-managed lands

Cumulative Impacts

The cumulative impact of Alternative 3 to vegetation and wetlands would be similar to those of Alternative 2. The footprint size would be approximately the same, but all of the impacts would be on BLM-managed lands. The contribution of Alternative 3 to cumulative effects on vegetation and wetlands would be minor because while the impact to the vegetation is measurable and could impact wetland function at the USAF Site. The resources are common or typical for the area, and the impact would affect only small-scale vegetated areas only within the project area.

Summary

For both the construction and decommissioning phases of Alternative 3, direct impacts to wetlands and vegetation are anticipated to similar to Alternative 2 except there would be one more tower constructed on federal instead of private land.

4.3 Terrestrial Mammals

4.3.1 Alternative 1 – No Action

Under the Alternative 1, no development would occur so there would be no direct or indirect impacts terrestrial mammals. With no direct or indirect impacts to terrestrial mammals under Alternative 1, there would be no contribution to cumulative impacts on these resources.

4.3.2 Alternative 2 – Five Towers on BLM Land (Proposed Action)

Direct and Indirect Impacts

Alternative 2 would impact terrestrial mammals through habitat loss, behavioral disturbance, or injury/mortality from increased human presence. Potential impacts to terrestrial wildlife were measured by assessing the magnitude (intensity), duration, geographic extent, and context of anticipated impacts using specific impact criteria. The impact criteria used to assess each indicator are described in Tables 4.3-1, 4.3-2, and 4.3-3.

Table 4.3-1 Impact Criteria for Impacts to Wildlife Habitat Alterations (Footprint)

Impact Component	Effects Summary		
Magnitude or Intensity	**High**: Acute or obvious changes in habitat, making it unsuitable for wildlife use	**Medium**: A noticeable change in habitat character, but it retains some value for wildlife use.	**Low**: Changes in habitat may not be measurable or noticeable.
Duration	**Permanent**: Chronic effects; habitat would not be anticipated to return to previous levels.	**Long-term**: Habitat would be reduced for the life of the project and would return to pre-activity levels at some time after that.	**Temporary**: Habitat would be reduced temporarily but not longer than 1 year and would be expected to return to pre-activity levels.
Geographic Extent	**Extended**: Affects habitat beyond the region or project area.	**Regional**: Affects habitat beyond a local area, potentially throughout the project area.	**Local**: Habitat impacts limited geographically; limited to vicinity of the project footprint.
Context	**Unique**: Habitat protected by legislation and the portion of the resource affected fills a unique ecosystem role within the locality or region.	**Important**: Affects depleted habitat within the locality or region or habitat protected by legislation.	**Common**: Affects usual or ordinary habitat in the project area; habitat is not depleted in the locality or protected by legislation.

Table 4.3-2 Impact Criteria for Impacts to Wildlife Behavior (Due to Noise)

Impact Component	Impacts Summary		
Magnitude or Intensity	**High**: Acute or obvious/abrupt change in behavior due to project activity; animals depart from the project area.	**Medium**: Noticeable change in behavior due to project activity; animals move away from immediate vicinity of disturbance	**Low**: Changes in behavior due to project activity may not be noticeable; animals remain in the vicinity of the towers.

Impact Component	Impacts Summary		
Duration	**Permanent**: Change in behavior patterns even after decommissioning; behavior not expected to return to previous patterns.	**Long-term**: Behavior patterns altered for the life of the project and would return to pre-activity levels at some time after operation ends (20 years).	**Temporary**: Behavior patterns altered temporarily, not longer than the span of project construction (2 years) and would be expected to return to pre-activity during operation.
Geographic Extent	**Extended**: Affects wildlife beyond the region or project area.	**Regional**: Affects wildlife beyond a local area, potentially throughout the project area.	**Local**: Behavioral impacts limited geographically; limited to vicinity of the project footprint.
Context	**Unique**: Species protected by legislation and/or the portion of the species affected fills a unique ecosystem role within the locality or region.	**Important**: Affects depleted species throughout the region or species protected by legislation.	**Common**: Affects usual or ordinary species in the project area; species is not depleted in the locality or protected by legislation.

Table 4.3-3 Impact Criteria for Effects on Wildlife Injury or Mortality

Impact Component	Effects Summary		
Magnitude or Intensity	**High:** Number of injuries or mortalities high enough to affect local or regional population levels.	**Medium:** Number of injuries or mortalities high enough to be measureable.	**Low:** Possibility of injuries or mortalities exists, but any occurrence is only to a few individuals, and would not be measureable at the local population level.
Duration	**Permanent:** The risk of injury or mortality remains even if the project is removed.	**Long-term:** The risk of injury or mortality would return to pre-activity levels after the actions causing it were to cease.	**Temporary:** The risk of injury or mortality would be short-term, during project construction only and would be expected to return to pre-activity levels in less than 1 year.
Geographic Extent	**Extended:** Affects wildlife beyond the region or project area.	**Regional:** Affects wildlife beyond a local area, potentially throughout the project area	**Local:** Impacts limited geographically; limited to the vicinity of the project footprint.
Context	**Unique:** Affected species protected by legislation and the portion of the resource affected fills a unique ecosystem role within the locality or region.	**Important:** Affects species depleted within the locality or region or species protected by legislation.	**Common:** Affects usual or ordinary species in the project area; species is not depleted in the locality or protected by legislation.

Construction

Direct impacts to terrestrial mammals resulting from construction of the proposed action would occur on BLM-managed lands at the five tower sites and staging areas in Kotzebue, Buckland, Koyuk, and at beach landing site on the Baldwin Peninsula.

Indirect impacts to terrestrial mammals would occur from the connected action and the construction of a sixth tower on private land near Kotzebue (KIC Site).

Habitat Loss

Construction of the five tower sites would temporarily disturb a total of 25.75 acres (5.15 at each site) under the construction leases, and permanently disturb 3.45 acres (0.69 acres at each site) through facility installation and helipads under the long-term leases. Terrestrial mammal habitat at the hilltop tower sites includes general habitat for moose, muskoxen, wolves and brown bears; habitat for some furbearers and small mammals; and winter foraging habitat for caribou. The habitat at the Baldwin Peninsula sites includes winter range and migration corridor for caribou and general habitat for moose, muskoxen, furbearers and small mammals. The habitat at all the tower sites is generally common and abundant, and loss of habitat is minimal compared to the amount of existing habitat in the area.

Behavioral Disturbance

Construction at the tower sites would result in noise and visual disturbance from construction equipment such as generators and air compressors, helicopter operations, and human activity. Construction at ridge top sites is scheduled to occur between June and October, during the reproductive and rearing season for most terrestrial wildlife species. Caribou are known to occur in the project area from late fall to early spring only, thus are not likely to be affected by the construction. The Talik tower site is located in the Nulato Hills ACEC, which is core winter habitat for the WACH. Re-fueling and maintenance would also be done outside the winter months, so behavioral disturbance of caribou is not expected.

The tower sites would be accessed during construction by helicopters using support sites at Kotzebue, Baldwin Peninsula Beach Landing, Buckland, Bear Creek Camp and Koyuk. Flights would occur between these sites and the tower sites, resulting in a flight corridor approximately 20 miles wide along the base of the Seward Peninsula and along the length of the Baldwin Peninsula (Figure 2-1).

The staging areas are generally located in previously disturbed habitats near existing ports. Therefore, it is unlikely that terrestrial mammals would be affected at staging/landing areas. However, the temporary barge landing/staging area for the Baldwin Peninsula tower is located in an undisturbed area.

Noise and activity, although temporary, would occur in otherwise quiet and remote areas. Noise from construction could temporarily displace wildlife, and could result in disturbance of wildlife. Muskoxen, arctic ground squirrels, and brown bears or wolves may be in the exposed ridge top habitat of the project area, but other large mammals such as black bear and moose would likely occur in the more densely vegetated habitats associated within the valleys and riparian habitats of the project area. Most caribou would not be in the project area during the construction period, as calving grounds are located outside of the project area, but a few transient non-breeders may be present.

At the barge landing/staging area on the Baldwin Peninsula, disturbance to terrestrial mammals from construction noise and human activity during off-loading of the tower equipment would likely be of medium intensity. Construction noise disturbance would be of temporary duration (i.e., during the five month construction period), local extent, and affecting resources that are common in context.

Habitats within the helicopter flight paths include deciduous riparian shrub; wet, moist, and dry tundra; boreal forest; intertidal flats; and open marine waters. These habitats are potentially inhabited by small mammals, furbearers and large mammals that would be foraging, breeding, or rearing young during this time period.

Wildlife disturbed by helicopter noise generally show signs of stress, ranging from mild annoyance to severe stress, which could contribute to panic and escape behavior. These responses could lead to temporary displacement from preferred habitat; accidental injury; effect on reproduction such as separation of adults from young and disrupted parental attendance; and energy losses that could affect food intake, growth, rearing, migration, and reproduction (NPS 1994; Radle 2007).

Studies show that moose react to overflights at altitudes less than 600 ft. by running, trotting, or discontinuing an activity. Reaction frequency is inversely related to the overflight altitude (McCourt et al. 1974). Moose are also known to increase their home range sizes substantially during helicopter disturbance, but return to normal size within one week after the disturbance (Andersen et al. 1996). Muskoxen reactions vary depending, in part, on the overflight altitude, distance of the helicopter landing, terrain, and climate. Sex, group size and content, and number of calves/group are also factors. Muskoxen are sensitive to helicopters that approach them or make any change in flight path or power setting (Dau 2012). To reduce impacts to wildlife, helicopters would be restricted to an altitude of 1,500 feet above ground level and avoid approaching within 1,500 feet of wildlife.

Injury/Mortality

Predators, such as bears and wolves, could be killed in defense of life or property from encounters with site workers. To minimize the chances of such takings, attractants such as food and food waste would be stored in bear-proof containers. All camp and construction debris would be contained in drums or large, commercial trash bags and would be removed from the site periodically. The trash bags would be used for dry debris (plastic, wood pieces, etc.) and would be secured from the wind with cargo nets while awaiting transport. These measures would deter wildlife such as bears from accessing garbage or food at the tower sites (although attraction may still occur) and would also minimize dangerous interactions or ingestion that could injure or kill wildlife. Bears are known to chew on exposed cables, putting them at risk of electrocution (Dau 2012). There would be no exposed cables at the tower sites, as all would be placed in conduit. Increased potential for mortality associated with human presence on the site would be of low intensity as the possibility of injuries or mortalities exists, but any occurrence is only to a few individuals, and would not in be measureable at the local population level. The duration would be temporary during project construction. The extent would be local and limited to the vicinity of the project footprint.

Operations

The physical presence of the towers and noise of the generators could result in avoidance of habitat by terrestrial mammals, but habitat within the project area is generally abundant and common throughout the Seward Peninsula and Baldwin Peninsula. Caribou wintering at the hilltop sites or migrating through the Baldwin Peninsula would likely only avoid the tower sites when there was activity (maintenance) occurring. Given that the sites are discreet points,

dispersed within a large area, impacts from avoidance of their physical presence are likely to be low intensity, long-term in duration, and local in extent to a generally common resource.

Generator noise would be constant during the operation phase, and thus a long-term effect. Because the noise would be constant, any impact to wildlife could result in long-term displacement from the immediate area of the tower. However, there may be some level of habituation to the noise. Therefore, impacts from generator noise would be low in intensity with changes in behavior due to project activity not being noticeable; and animals remaining in the vicinity of the sites. The duration could be long-term as behavior patterns may become altered for the life of the project and would return to pre-activity levels at some time after operation ends (20 years). The extent would be local with impacts limited to vicinity of the project footprint. The resources affected would be common as they are considered usual or ordinary resources in the project area and are not depleted in the locality or protected by legislation.

The tower sites would be visited twice per year for maintenance, using helicopters for access. In addition, annual helicopter-supported refueling operations for the generators would require 14 round-trip flights per site each June or July. Wildlife may be temporarily displaced and may exhibit physiological and behavioral responses similar to helicopter noise impacts described in the construction section, but would be short-term in duration. Maier et al. (1998) noted that ungulates tend to respond more strongly to overflights by helicopters than those by light or jet aircraft, although Calef et al. (1976) detected the opposite, however, the frequency and duration of these visits would be limited enough that impacts would be low intensity with changes in behavior due to project activity not being noticeable; and animals remaining in the vicinity of the sites and temporary in duration expected to return to pre-activity levels after the helicopters leave the area. The impact is localized in extent and limited to the repeater site and helicopter overflight corridor. Common resources would be affected and are considered usual or ordinary resources in the project area and are not depleted in the locality or protected by legislation.

Attraction of scavenging wildlife such as bears, foxes, and ravens would not occur because food and garbage would not be stored on location following the construction period, and human presence would be minimal.

Decommissioning

Decommissioning impacts to terrestrial mammals would be similar to construction, including those such as noise from helicopters at sites and along flight paths, and visual disturbance.

Cumulative Impacts

Past and present actions that have affected terrestrial mammals in the project area are recreational hunting, subsistence activities, mining, and the introduction of non-native plant species. The region has had and may continue to experience some industrial growth outside of the community hubs (mining), although most future projects would be considered speculative due to a lack of secured funding.

Recreational and visitor growth has also been on a recent upward trend, and some non-industrial capital projects are expected to occur in the near future. Future TERRA Backbone sites and community towers in surrounding communities could impact terrestrial mammals through habitat loss, behavioral disturbance, and injury/mortality from interactions with construction or

maintenance workers. The level of impact will depend on site location and tower design, but is expected to be similar to the impact level described above.

The proposed road from the Dalton Hwy to the Ambler area is speculative, but could cross through the project area, affecting terrestrial mammals through habitat loss and behavioral disturbance caused by both construction and long-term use of the road.

Climate change may also be a factor causing changes for terrestrial mammals in the region. However the effect of climate change on terrestrial mammals in the region in the future is unknown, as described below by the US Global Change Research Program (2003):

> Potential climate change impacts on Alaska's wildlife both direct and indirect -- through changes in their habitats and food sources -- are likely to be both positive and negative, although all impacts are speculative at this time due to uncertainties in climate change projections.
>
> Local weather records show that the growing season in Alaska has lengthened by more than 14 days since 1950. A longer growing season could or could not benefit wildlife, and could be particularly detrimental to those whose migration patterns would not allow them access to vegetation during its most nutrient-rich stage. Moreover, changes in temperature can impact the type of vegetation that grows in this region. For example, Nome is now surrounded by tundra that depends on cool summer days, but its number of warmer summer days is increasing and approaching the threshold that would foster tall shrub and tree development. Should its vegetation change, wildlife that depends on traditional tundra vegetation could be impacted. Shifts in the composition of tundra vegetation could decrease nutrition available for caribou and reindeer, and invasion of tundra by boreal or mixed forest is likely to curtail the range of caribou and muskoxen.

The Kotzebue Sound area has experienced and may continue to experience some industrial growth (mining), although most future projects are speculative and dependent on many factors (e.g., economic conditions, price of gold, government funding).

Alternative 2 would make a minor contribution to cumulative impacts to terrestrial mammals because the effects would be generally low in magnitude across numerous localized spots.

Summary

Under Alternative 2, impacts to terrestrial mammals vary depending on location, timing, and activity. Impacts would be of low to medium intensity because changes may be noticeable but they are not expected to result in population-level effects. The duration of impacts is limited to temporary (two seasons of construction) and long-term (20-year life of project), and are not expected to persist if the towers were removed. The geographic extent of impacts would generally be limited to the immediate vicinity of the project activity, but could extend to the region if migratory species are affected. Habitat disturbance would occur on 25.75 acres during construction, and on 3.45 acres for the life of the project. The context of impacts is common because impacts to rare or sensitive species are not considered in this section.

4.3.3 Alternative 3 – Six Towers on BLM Land

Direct and Indirect Impacts

Both direct and indirect effects to terrestrial mammals associated with the construction, operations, and decommissioning of Alternative 3 would be very similar to those described for Alternative 2. The difference between alternatives lies in the location of the sixth tower near Kotzebue. Under Alternative 3, the sixth tower would be located on BLM land, and is thus considered a direct rather than indirect impact. The site is located approximately 4 miles south of Kotzebue near a USAF site approximately 0.5 miles from the coast on undisturbed wetland habitat. For comparison, under Alternative 2 the sixth tower (analyzed as an indirect impact) would be located at the Kotzebue Community Tower KIC Site approximately 5 miles south of Kotzebue and also 0.5 miles from the coast on undisturbed wetland habitat. The two sites are approximately 0.5 miles apart. There is little difference between the two sites in terms of the terrestrial mammals that may use the habitats. Either location could affect terrestrial mammals through behavioral disturbance, habitat loss, or injury/mortality. The difference in the location of the sixth tower site would not change the level of magnitude, duration, extent, or context of the impacts.

Alternative 3 is expected to have no indirect impacts on terrestrial mammals.

Cumulative Impacts

Cumulative impacts associated with Alternative 3 would be similar to cumulative impacts associated with Alternative 2. The contribution of Alternative 3 to cumulative impacts to terrestrial mammals in the region would be minor.

Summary

Under Alternative 3, impacts to terrestrial mammals would be similar to those under Alternative 2. There would be one more tower constructed on federal instead of private land, but this would not represent a measurable change in impact to behavioral disturbance, habitat loss, or injury/mortality.

4.4 Birds

This section describes the project's impacts to birds in general, including sensitive species. Impacts on bird species listed as candidate, threatened, or endangered under the Endangered Species Act are described in Section 4.5.

4.4.1 Alternative 1 – No Action

Under the Alternative 1, no development would occur and there would be no direct or indirect impacts to birds or bird habitat. With no direct or indirect impacts to birds or bird habitat under Alternative 1, there would be no contribution to cumulative impacts on these resources.

4.4.2 Alternative 2 – Five Towers on BLM Land (Proposed Action)

Direct and Indirect Impacts

Alternative 2 would impact birds through habitat loss, behavioral disturbance, and injury/mortality of birds colliding with the towers or helicopters. Potential impacts to birds were measured by assessing the magnitude (intensity), duration, geographic extent, and context of anticipated impacts using specific impact criteria. The impact criteria used to assess each indicator are described in Tables 4.3-1, 4.3-2, and 4.3-3.

Construction

Direct and indirect impacts to birds resulting from construction of the proposed action are anticipated on BLM-managed lands at the five tower sites. Additional indirect impacts to birds are anticipated on non-federal land connected to the proposed action. Connected actions on non-federal lands associated with this alternative include one additional tower site near Kotzebue (KIC Site), and staging areas in Kotzebue, Buckland, Bear Creek Camp, Koyuk, and a beach landing site on the Baldwin Peninsula (see Table 2-1).

Habitat Loss

Construction of the five tower sites would temporarily disturb a total of 25.75 acres (5.15 at each site) under the construction leases, and permanently disturb 3.45 acres (0.69 acres at each site) through facility installation under the long-term leases. Bird habitat within the project area may be used for nesting and/or foraging for a number of species, including waterbirds on the Baldwin Peninsula sites and Kittlitz's murrelet (*Brachyramphus brevirostris*), ptarmigan (*Lagous muta* and *Lagopus lagopus*), Lapland longspur, and golden eagle (*Aquila chrisaetos*), at the hilltop sites (URS 2012). Due to the abundance of similar habitat adjacent to these sites, the loss of a small amount of habitat would have minimal effect on birds.

Behavioral Disturbance

Construction at the tower sites would result in noise and visual disturbance from equipment, helicopter operations, and human activity. These disturbances could displace birds, potentially resulting in abandonment of breeding or nesting activities. Construction is scheduled to occur between June and October, during the nesting season for migratory birds in the region (May 20-July 20 for the Seward Peninsula and June 1-July 31 for the northern region).

The repeater sites would be accessed during construction by helicopters using support sites at Kotzebue, Buckland, Bear Creek Camp and Koyuk. Flights would occur between these sites and the tower sites, resulting in a flight corridor approximately 20 miles wide along the neck of the Seward Peninsula and along the length of the Baldwin Peninsula (Figure 2-1). To reduce impacts to birds and other wildlife, helicopters would travel at an altitude of 1,500 feet and would avoid approaching within 1,500 feet of wildlife.

Flight paths originate at staging areas in nearby towns and continue to the repeater sites directly. Habitats within the helicopter flight paths include riparian shrub; wet, moist, and dry tundra; boreal forest; rocky outcrops; estuarine intertidal flats; and open marine waters. These habitats are potentially used by passerines and other birds that would be breeding or rearing young during this time period. Response to helicopter noise ultimately depends upon the species and individuals of a population, and responses may be greater in remote areas that are typically quiet (beyond staging areas). Potential noise disturbance from helicopters may cause stress, ranging from mild annoyance to severe stress, which could contribute to panic and escape behavior. These responses could lead to accidental injury; reproductive losses such as nest flushing, separation of adults from their young, disrupted parental attendance; and energy losses that could affect food intake, growth, rearing, migration, and reproduction (NPS 1994). The high number of helicopter trips over the construction period could lead to habitat avoidance and abandonment, and increased potential for collisions between helicopters and birds. Habitat avoidance during construction would be a temporary impact, as construction would be completed during one season. Given the range of reactions, the magnitude of effect may range from low to medium and would occur in a localized area.

The impacts of helicopter disturbance would be more acute in the vicinity of the staging areas because helicopters would be closer to the ground when landing and taking off. During construction about 60 flights per site are planned to mobilize, conduct crew rotations, and commission the site. Bird habitats affected at the staging areas of Kotzebue, the Baldwin Peninsula beach site, Buckland, and Koyuk include scrub-shrub, estuarine, and marine/shoreline.

In the Selawik-Kobuk-Baldwin Peninsula area there is a breeding population of 234,000 ducks and tens of thousands of white-fronted geese. In addition, thousands of seabirds nest in colonies on the southern end of the Baldwin Peninsula. The response of these waterbirds to helicopter noise may include flying, diving, or swimming away from the noise. The high energy requirements of waterbirds during the molting season, particularly fall staging in preparation for long-distance migrations, may not be met if these birds continuously expend energy to avoid aircraft (NPS 1994).

Construction staging would be done at previously disturbed sites at Koyuk and Buckland, and a previously undisturbed beach on the Baldwin Peninsula. Towers sites would be pre-assembled at the staging areas. Noise associated with pre-assembling the towers is expected to be lower level than the noise associated with helicopter landings and take-offs, but would likely be consistent and nearly constant. Birds would likely maintain distance from the activities, resulting in habitat displacement for the duration of construction rather than numerous energy expenditures described above. The Baldwin Peninsula beach site would be used for staging in the fall and then overland transport to the tower site in the winter. Migrating birds could be affected by the disturbance of beach habitat during the fall, and wintering birds such as common raven and ptarmigan may be disturbed during the overland transport and tower construction.

Operations

During the operation of the remote repeaters, scheduled maintenance occurs twice a year in June or July and September in addition to any emergency maintenance trips. Over the twenty year life of the facility, the batteries would be replaced once and the generators would be replaced every 5-7 years. Refueling would be required once a year; 500-gallon "Fuel Easy" fuel bladders are transported using a medium-lift helicopter for a total of 14 round trips (to refill 7,000 gallons). This effort would take about 2-3 days during each June or July.

During the operations period, the proposed maintenance and refueling flights would occur four to five days per site per year. Taking the five microwave repeater sites together, during the operations period, a total of 90 flights would take place over a period of 12 to 15 days each year. Maintenance and refueling flights would originate from Koyuk for the Ungalik River and Dime tower site, Buckland for the Harvey and Talik tower sites, and from Kotzebue for the Baldwin Peninsula tower site. Each trip would transport 500 gallons of diesel fuel, and would take the safest direct route to the tower sites.

Habitat Loss

The operations phase footprint for the five tower sites together, with excavation areas and permanent project structures, would be 3.45 acres on BLM-managed land (0.69 acres per tower site). This area would no longer be available as potential bird habitat. Although this would be a long-term duration (20 years), there is an abundance of undisturbed similar habitat throughout the area; therefore the localized effect is considered low intensity. The magnitude of habitat alteration would be medium because the change in habitat at the tower sites would cause the habitat to be less desirable for bird use. The duration of impact would be temporary (construction footprint) and long-term (operation footprint). The extent would be localized since it's limited to the project footprint. The context would be common to important because the species affected may include both common and sensitive species.

Behavioral Disturbance

Noise from the generators would be constant during operation. If birds avoid the sound the result would be long-term displacement around each site. Some individuals may become habituated to the noise and remain within the sound's impact area. Therefore, impacts from generator noise would be low in intensity with changes in behavior due to project activity would not be noticeable; and birds would be expected to remain in the vicinity of the sites. The duration could be long-term as behavior patterns may become altered for the life of the project. The extent would be local with impacts limited to vicinity of the project footprint. The resources affected would be common and would affect usual or ordinary resources in the project area. There would be a potential for some sensitive species that are depleted in the project area to become affected.

Refueling operations would occur during June or July, so birds would be temporarily displaced by helicopter noise or directly impacted through bird/helicopter collisions. However, the frequency, duration, and seasonal timing of these visits would be limited.

Wildlife species which would not normally occur at the tower sites could be attracted to them once towers are built, potentially impacting other species in the area. For example, increased predation opportunities may be created for raptors, including ravens that may perch on the towers for hunting. These individuals could potentially compete with other birds or prey upon their eggs or their young.

The potential for attracting predators such as bears, foxes, and ravens that might also prey on birds would be minimized because food and garbage would not be stored on location following the construction period, and human presence would be minimal.

Birds such as ravens, golden eagles, and snow buntings could attempt to build nests on the towers. If a nest is discovered before eggs have been laid, the nest will be removed to avoid future conflicts. Maintenance workers will document all wildlife and signs of wildlife observed as part of their site visit checklist. This information will be submitted to the BLM in the annual report. The magnitude of impact, either beneficial or adverse, would be low because only individual pairs would be affected, the duration would be temporary/intermittent (during the nesting season(s) they choose to nest there), and context common.

The magnitude of behavioral disturbance impact could be temporarily high during construction as birds avoid the noise and increased human presence at the towers sites and staging areas. During operation, the magnitude of behavioral disturbance would be low because noticeable changes are not expected to occur. The duration of behavioral disturbance would be temporary during construction and long-term during the operation. The geographic extent could be local or regional because both resident and migrating birds could be affected. The context would be common to important because both common and sensitive species could be affected.

Injury/Mortality

The presence of the towers could kill or injure birds from collisions, especially during low visibility situations such at night or during bad weather. Four of the five towers would be located on hilltops at elevations ranging from 827 to 2,400 feet. The towers would be 60-80 feet high. The fifth tower (250 feet tall) would be located on the Baldwin Peninsula at an elevation of 150 feet. A sixth tower (250 feet tall) is on non-BLM land (KIC Site). None of the towers would have guy wires. Only the two tall towers would have lighting. These towers would be lighted per FAA regulations with red and white non-blinking lights at the top of the tower. The immediate trajectories of migrating birds are species-specific and depend on varying environmental factors (e.g., wind, weather, visual cues, others). Although no project-specific bird migration studies have been conducted, a site survey for the Kotzebue Wind Farm (USDOE 1998), located on the north end of the Baldwin Peninsula, reported that most migratory bird movements are to the east in the Kobuk River Delta and farther offshore for spring movements of seaducks and brant, and that no major shorebird staging areas or migration corridors have been documented near the wind farm project site. Some birds could encounter the towers when their flight paths intersect (e.g., birds flying to the coast from breeding areas in the highlands of the Seward Peninsula) with the proposed sites. The ridgelines and associated towers would not represent a barrier for migrating birds, but could pose a strike hazard. Studies show that large numbers of migrating birds fly over the crests of ridges and passes rather than following mountain fronts, and migrants flying near ridges and in passes may be flying at lower elevations than broad-front migration (Kerlinger 1995).

Some birds may be migrating in a trajectory aligned with the tower sites, but the expected rate of collisions is unknown because flight pattern field work specific to the tower sites has not been conducted. Studies elsewhere show that most migrants fly at elevations much higher than the proposed tower heights of 60 feet (hilltop sites) and 250 feet (Baldwin Peninsula sites) (Longcore et al. 2008; Able 1970; Bellrose 1971; and Mabee et al. 2006), with notable exceptions, for example, eiders have a tendency to fly directly and low over the water (McDaffery et. al. 1999; and Day et. Al. 2003) and tend to follow the shoreline (Day et. al. 2003). Additionally, birds that are nesting near the tower sites and other non-migrants would be flying much lower to the ground. Mabee and Cooper (2004) found that only 2 to 15 percent of migrants flew below 300 feet (91 meters) above ground level during clear weather, but inclement weather is common at the sites, and higher winds and lower cloud layers or fog may contribute to lower altitude flights and increase the risk of mortality (Able 1970; and Erickson et. al. 2005). Local breeders or birds foraging on the hilltops or on the Baldwin Peninsula are more likely to be at risk than migrants, with the greatest risk during periods of poor visibility or inclement weather. Migrating passerines may be more at risk of colliding with structures at night because these birds tend to migrate at lower altitudes than do other groups of migratory birds (e.g., lower than waterfowl or shorebirds) (Kerlinger 1995).

Because guy wires would not be used, the potential for collisions would be reduced substantially relative to most towers (Longcore et al. 2008). Towers that cause the most collision problems are tall (especially those exceeding 1,000 ft.), illuminated, guyed, near wetlands, in migration corridors, and with a history of inclement weather (Manville 2005). Longcore (2012) reports that bird mortality at towers less than 197 feet (60 meters) contribute negligibly to overall annual bird mortality, however noting that single-night mortality events with several hundred identified dead birds at unlit towers less than 197 feet (60 meters) tall have been reported, often related to lighting at adjacent infrastructure.

Although some of the tower sites are near or in wetlands, and there is frequent inclement weather in the project area, relatively few collisions are anticipated due to the low height of most of the towers and lack of guy wires on all towers. Potential impacts to birds would most likely be limited to the occasional individual colliding with a tower; these isolated collisions are not expected to affect local or regional population levels. The risk of collision is expected to be higher at the Baldwin Peninsula sites compared to the hilltop sites, both because the towers are higher and more birds are expected in the vicinity. A BLM permit stipulation would require Unicom to apply to the FAA for a waiver to allow use of blinking lights rather than steady-on lights on the tower on BLM land (Baldwin Peninsula). If blinking lights are used they could reduce the risk of bird strikes (Patterson 2012).

The magnitude of injury/mortality impacts is expected to be low to medium because while individual birds may be affected, the number of birds impacted is not expected to affect local or regional population levels. As described in Table 2-11 (Project Design Features), during annual refueling and maintenance visits, any carcasses found would be documented in the field report. The duration of this impact would be long-term (for the 20-year life of the project), and the geographic extent could be local or regional because both resident and migrating birds could be affected. The context would be common to important because both common and sensitive species could be affected.

Decommissioning

Decommissioning of the site at the end of the lease or the replacement of the technology would entail the reverse of the installation process, though within a shorter timeframe. The remaining fuel would be pumped out of the tanks and backhauled with the rest of the facilities. Once down to the foundation level, the grout in the pile foundations would be broken-up to approximately six inches below grade. The ground would be re-graded and recommended fertilization or replanting of native species would occur.

Impacts to birds from decommissioning activities would be similar to construction, including those such as noise from helicopters, visual disturbances.

Under Alternative 2 there would be indirect impacts to birds from the construction and operation of one additional tower on non-federal land. The Kotzebue Community Tower KIC Site would be located on private land approximately five miles south of Kotzebue on undisturbed wetland habitat near a road.

The effects of this connected action on birds would be the same types (habitat loss, behavioral disturbance, and chance of injury/mortality) and levels of impacts as at the five tower sites on BLM land (see Figure 2-5 for location).

Cumulative Impacts

The reasonably foreseeable future TERRA Backbone and community tower sites would produce similar impacts to those discussed for Phase III; the construction and operation of remote towers approximately every 50 miles up the Kobuk River, towards the Dalton Highway. Increased broadband speed and reliability could increase general economic activity, but it is not known whether this would generate jobs in the commercial sector or contribute to population growth (therefore additional construction activities). Visitor and residential growth may contribute to an increase in air traffic and development, increased recreation use, and increased hunting pressure resulting in greater disturbance to current bird resources in remote areas. These towers could impact birds through habitat loss, behavioral disturbance, and injury/mortality from collisions with the towers. The level of impact would depend on site location and tower design. Reasonably foreseeable future actions in the project vicinity are described in Section 4.1.1.

The road to the Ambler area, if it connects to the Nome road system would cross the Buckland drainage. Either route would cross through the project area, affecting birds through habitat loss and behavioral disturbance caused by both construction and long-term use of the road. Upgrades to the Kotzebue Airport and the Kotzebue to Cape Blossom Road would also affect birds through habitat loss and behavioral disturbance. The Kotzebue Sound area has and may continue to experience some industrial growth (mining), although most future projects are speculative and dependent on many factors (e.g., economic conditions, price of gold, government funding).

Climate change may also be a factor causing changes for birds in the region. However, what effect climate change would have on birds in the region in the future is unknown, as described in Section 4.3.2.

Alternative 2 would make a minor contribution to cumulative impacts to birds because the effects would be generally low magnitude and localized.

Summary

Under Alternative 2, impacts to birds would vary depending on location, timing, and activity. Impacts would be of low to medium intensity because while changes may be noticeable they are not expected to result in population-level effects. The duration of the impact would be limited to temporary (construction) and long-term (life of project), and are not expected to persist if the towers were removed. The geographic extent of impacts would generally be limited to the immediate vicinity of the project activity, but could extend to the region if migratory species are affected. The context of impacts can range from common to important because sensitive species could occur all sites.

4.4.3 Alternative 3 – Six Towers on BLM Land

Direct and Indirect Impacts

Direct impacts to birds associated with the construction, operations, and decommissioning of Alternative 3 would be very similar to those described under Alternative 2. The difference lies in the sixth tower near Kotzebue. Under Alternative 3, the sixth tower would be located on BLM land and is thus considered a direct rather than indirect impact. The site is located approximately 4.5 miles south of Kotzebue near a USAF site approximately 0.5 miles from the coast on undisturbed wetland habitat. For comparison, under Alternative 2 the sixth tower would be located at the KIC Site also 0.5 miles from the coast on undisturbed wetland. There would be little difference between the two sites in the bird species that may be affected by behavioral disturbance, habitat loss, or injury/mortality. The difference in the location of the sixth tower site would not change the level of magnitude, duration, extent, or context of the impacts.

Alternative 3 is expected to have no indirect impacts on birds.

Cumulative Impacts

The contribution to cumulative impacts associated with Alternative 3 would be similar to those of Alternative 2, and would be considered minor.

Summary

Under Alternative 3 the impacts to birds would be similar to those described under Alternative 2. The difference in the location of the sixth tower site would not change the level of magnitude, duration, extent, or context of impacts.

4.5 Threatened and Endangered Species

As discussed in Section 3.4, spectacled and Steller's eiders, Kittlitz's murrelet, yellow-billed loon, and polar bears occur in the project area and may be impacted by the project. Consultation with the USFWS regarding impacts to these species is on-going.

4.5.1 Alternative 1 – No Action

Under the Alternative 1, no development would occur so there would be no direct or indirect impacts threatened and endangered species. With no direct or indirect impacts to threatened and endangered species under Alternative 1, there would be no contribution to cumulative impacts on these resources.

4.5.2 Alternative 2 – Five Towers on BLM Land (Proposed Action)

Alternative 2 could impact threatened and endangered species through habitat loss, behavioral disturbance, or injury/mortality from increased human presence. Potential impacts to threatened and endangered species were measured by assessing the magnitude (intensity), duration, geographic extent, and context of anticipated impacts using specific impact criteria. The impact criteria used to assess each indicator are described in Tables 4.3-1, 4.3-2, and 4.3-3. Due to similarities in the potential impacts, the two eiders are discussed together, as are Kittlitz's murrelet and yellow-billed loon; polar bears are discussed separately.

<u>Spectacled and Steller's Eiders</u>

Direct and Indirect Impacts

Direct impacts to spectacled or Steller's eiders resulting from construction or operation of the proposed action could occur on BLM-managed lands at the five tower sites and staging areas in Kotzebue, Buckland, Koyuk, and at the beach landing site on the Baldwin Peninsula. Potential adverse effects to listed eiders could occur through disturbance in nearshore habitats adjacent to coastal tower sites and staging areas and during helicopter overflights and through collisions with towers. The mitigation measure, to apply to the FAA for blinking lights on the 250-foot towers, may reduce the potential for collisions. Indirect impacts to spectacled or Steller's eiders could occur from the connected action and the construction of a sixth tower on private land near Kotzebue (a 250-foot tower).

Habitat Loss

Construction of the five tower sites would temporarily disturb a total of 25.75 acres (5.15 at each site) under the construction leases, and permanently disturb 3.45 acres (0.69 acres at each site) through facility installation under the long-term leases.

Spectacled and Steller's eiders may occasionally use the habitat within the project area for migration only. Due to the abundance of similar habitat adjacent to these sites, the loss of a small amount of migration habitat would have little or no effect on these species.

Behavioral Disturbance

Construction and operations at the tower sites would result in noise and visual disturbance from equipment, helicopter access, and human activity. This noise and activity would occur in an

otherwise quiet and remote area. The tower sites would be accessed during construction by helicopters using support sites at Kotzebue, Baldwin Peninsula Beach Landing, Buckland, and Koyuk. Flights would occur between these sites and the tower sites, resulting in a flight corridor approximately 20 miles wide along the neck of the Seward Peninsula and along the length of the Baldwin Peninsula (Figure 2-1). To reduce impacts to birds and other wildlife, helicopters would travel at an altitude of 1,500 feet.

Construction is scheduled to occur between June and October, during the nesting season for birds in the region. Since both eiders nest elsewhere, they are not expected to be in the project area during most of the construction period.

Migrating eiders in nearshore habitats are expected to move away from onshore disturbances. Eiders in nearshore habitats and those in further offshore in Norton or Kotzebue Sound, including molting eiders, would probably experience only temporary and limited to disturbances from helicopter overflights at an altitude 1,500 ft. Thus, it is expected that any adverse effects to listed eiders from disturbance would be non-detectable.

Injury/Mortality

The presence of the towers could kill or injure eiders from collisions, especially during low visibility situations such at night or during bad weather. Four of the five towers would be located on hilltops at elevations ranging from 827 to 2,400 feet. The towers would be 60-80 feet high. Neither of the eider species would be migrating in the vicinity of the hilltop towers. The fifth tower (250 feet tall) would be located on the Baldwin Peninsula at an elevation of 150 feet. This site would be lighted per FAA regulations with red and white lights at the top of the tower. Because this tower would pose the greatest risk of collision for eiders, a BLM permit stipulation will require that Unicom apply to the FAA for a waiver to allow use of blinking rather than steady lights.

Either eider species could encounter the tower if their flight paths intersect (e.g., birds flying along the coast from wintering to breeding areas) with the proposed sites. The expected rate of collisions is unknown because flight pattern field work specific to the tower sites has not been conducted. However, eiders are known to fly directly and low over the water (McDaffery et. al. 1999; and Day et. al 2003) and tend to follow the shoreline (Day et. al. 2003).

Migrating eiders tend to fly low (less than 10 meters; Johnson and Richardson 1982), which would make them vulnerable to collisions with the proposed towers under low light or inclement weather conditions. However, most eiders in the project vicinity migrate offshore rather than flying overland. See Figure 3-6 for flight path of spectacled eider. Potential impacts to either eider species from collisions, if any, would likely be limited to the occasional individual colliding with a tower; these isolated collisions are not expected to affect local or regional population levels. Unicom uses field reports to capture the presense of any wildlife and mortalities; bird mortality could be captured during maintenance or refueling operations

The magnitude of injury/mortality impacts is expected to be low to medium because while individual birds may be affected, the number of individuals impacted is not expected to affect local or regional population levels. Therefore the chance of a collision or disturbance causing "take" of a listed eider is considered discountable. The duration of this impact would be long-term (for the 20-year life of the project), and the geographic extent could be local or regional

because migrating eiders could be affected. The context is important because both eiders are ESA-listed.

Cumulative Impacts

Past and present actions affecting spectacled and Steller's eiders in the project area include recreational hunting, subsistence activities, and mining. The region has had and may continue to experience some industrial growth (mining), although most future projects would be considered speculative due to a lack of secured funding. Recreational and visitor growth has also been on a recent upward trend, and some non-industrial capital projects are expected to occur in the near future. Introducing and/or upgrading broadband communications in the area could lead to a rise in economic activity. More detail about reasonably foreseeable future actions in the project vicinity (described in Section 4.1.1) contribute to habitat loss, behavioral disturbance, and injury/mortality.

Climate change may also be a factor causing changes for birds in the region. However, what effect climate change would have on birds in the region in the future is unknown, as described in Section 4.3.2.

Alternative 2 would have a minor contribution to cumulative impacts to spectacled and Steller's eiders birds because the resource is unique in context while its impacts are long-term in duration, generally low in magnitude, and localized.

Summary

Under Alternative 2, impacts to spectacled or Steller's eider are unlikely to occur. If they did (an individual collided with a tower or was disturbed during migration), the impact would be of low intensity because while changes would be noticeable they are not expected to result in population-level effects. The duration of impacts is limited to temporary (construction) and long-term (life of project), and is not expected to persist if the towers were removed. The geographic extent of impacts would generally be limited to the immediate vicinity of the project activity, but could extend to the region since eiders are migratory. The context of impacts is important because both species are ESA-listed.

Polar Bear

Direct and Indirect Impacts

While polar bears occur very rarely in the project area, if present, they could be affected by the construction and operation of the proposed action on BLM-managed lands at the two tower sites and beach landing site on the Baldwin Peninsula. Unicom workers and subcontractors would be trained using the USFWS Polar Bear Interactioin Guidelines (Appendix C). Polar bears are not expected to occur in the rest of the project area.

Indirect impacts to polar bears could occur from the connected action; the construction of a sixth tower on private land near Kotzebue. The same interaction guidelines would apply.

Habitat Loss

The construction and operation of the two towers on the Baldwin Peninsula would not be expected to adversely affect polar bear habitat because it would not reduce the availability or

accessibility of polar bear prey species and would not render the habitat unsuitable for use by polar bears. While the construction, maintenance, or refueling activities may temporarily (length of the activity) disturb any polar bears present, they would likely return after the disturbance ceases. The long-term loss of a small amount of habitat at each repeater site is not expected to have a noticeable effect on polar bears. The long-term (life of the project) presence of the towers is not expected to appreciably diminish the value of the habitat for polar bears.

The long-term loss of a small amount of habitat at the two tower sites on the Baldwin Peninsula is not expected to have a noticeable effect on polar bears.

Behavioral Disturbance

The tower sites would be visited twice per year for maintenance, using helicopters for access. In addition, annual helicopter-supported refueling operations for the generators would require 14 round-trip flights per site each June or July.

Any polar bears on the Baldwin Peninsula or on sea ice within the helicopter flight corridor, would likely experience only minor disturbance limited in intensity and duration from construction-related activities or tower maintenance. They may avoid the tower sites when there was activity (maintenance) occurring or when disturbed by helicopter overflights.

Generator noise would be constant during the operation phase, and thus a long-term in duration. Because the noise would be constant, any impact to polar bears could result in long-term displacement from the immediate area of the tower though this would be local in extent and affect an important resource. However, some level of habituation to the noise would be expected.

Injury/Mortality

Polar bears could be killed in defense of life or property if they encounter humans in the project area. Construction and maintenance personnel would be required to follow the USFWS's Polar Bear Interaction Guidelines to avoid and minimize the result of such encounters.

To minimize the chances of encounters, attractants such as food and food waste would be stored in bear-proof containers. All camp and construction debris would be contained in drums or large, commercial trash bags and would be removed from the site periodically. The trash bags would be used for dry debris (plastic, wood pieces, etc.) and would be secured from the wind with cargo nets while awaiting transport. These measures would deter polar bears from accessing garbage or food at the tower sites (although attraction may still occur) and would also minimize dangerous interactions or ingestion that could injure or kill them.

Subsistence hunters may use the area more as a result of landmarks and lighting, thereby resulting in increased takes of polar bears. However, this harvest is regulated by the State to prevent overexploitation, so no adverse impacts are expected.

The increased potential for polar bear mortality associated with human presence in the project area would be of moderate intensity with the number of injuries or mortalities high enough to be measureable, temporary to long-term duration (length of the project), local extent and limited to the footprint of the site, and would affect an important resource that is protected by legislation.

Cumulative Impacts

Past and present actions that have affected polar bears in the project area are recreational hunting, subsistence activities, and mining. The region has and may continue to experience some industrial growth (mining), although most future projects would be considered speculative. Recreational and visitor growth has also been on a recent upward trend, and some non-industrial capital projects are expected to occur in the near future. Introducing and/or upgrading broadband communications in the area could lead to a rise in economic activity and the potential for cellular service around new towers.

Visitor and residential growth may contribute to an increase in air traffic and development, increased recreation use, and increased hunting pressure resulting in greater disturbance to polar bears. The level of impact would depend on site location and tower design, but is expected to be similar to the impact level described above.

The proposed road from the Dalton Hwy to the Ambler area is speculative, but could cross through the project area, affecting polar bears through habitat loss and behavioral disturbance caused by both construction and long-term use of the road.

Climate change is another factor that has been and would continue to affect polar bears in the project area. Climate change is the primary reason polar bears were listed, as it is causing a melting of sea ice, the polar bear's primary habitat. Possibly because of climate change, terrestrial coastal areas are experiencing increasing use by polar bears for longer durations during the fall open-water period (the season when there is a minimum amount of ice present, which occurs during the period from when the sea ice melts and retreats during the summer, to the beginning of freeze-up during the fall) (Schliebe et al. 2008).

Alternative 2 would make a negligible to minor contribution to cumulative impacts to polar bears because the effects would be generally low magnitude and localized.

Summary

Under Alternative 2, impacts to polar bears are unlikely to occur because the species so seldom occurs in the project area. If impacts did occur (i.e., an individual was disturbed or killed), the impact would be of moderate intensity because while changes would be noticeable they are not expected to result in population-level effects. The duration of impacts would be limited to temporary (construction) and long-term (life of project), and is not expected to persist if the towers were removed. The geographic extent of impacts would generally be limited to the immediate vicinity of the project activity. The context of impacts is important because polar bears are ESA-listed.

Kittlitz's Murrelet and Yellow-billed Loon

Direct and Indirect Impacts

Direct impacts to Kittlitz's murrelets or yellow-billed loons resulting from construction of the proposed action could occur on BLM-managed lands at the five tower sites and staging areas in Kotzebue, Buckland, Koyuk, and at the beach landing site on the Baldwin Peninsula. Potential adverse effects to these species could occur through disturbance in nearshore habitats adjacent to coastal tower sites and staging areas and during helicopter overflights and through collisions with towers.

Indirect impacts to Kittlitz's murrelets or yellow-billed loons could occur from the connected action and the construction of a sixth tower on private land near Kotzebue.

Habitat Loss

Although both Kittlitz's murrelets and yellow-billed loon could nest in the project area since there is suitable habitat, the abundance of both species is described in the Selawik National Wildlife Refuge bird list (USFWS 2012) as rare – occurring regularly in the region but in very small numbers. The loss of a small amount of potential nesting habitat from construction and operations would not be expected to be a noticeable effect. Any individuals displaced from affected habitat would be expected to move to adjacent similar undisturbed habitat.

If nesting in the vicinity of construction activities is prevented prior to construction there would be no direct impacts to breeding birds.

Behavioral Disturbance

Kittlitz's murrelets and yellow-billed loons may experience minor and temporary disturbances from increased human presence and helicopter overflights. The expected response would be for the birds to move away from the disturbance.

Injury/Mortality

The general discussion of avian-tower collisions in Section 4.4 describes that the expected risk of birds colliding with towers would be low. Because both species occur only in small numbers in the project area, the chance of either of these species colliding with the towers is very small, thus adverse effects from collisions would not be expected to occur.

Cumulative Impacts

The contribution of the proposed project to cumulative impacts to these species are similar to those of spectacled and Steller's eider; negligible to minor.

Summary

Under Alternative 2, impacts to Kittlitz's murrelet and yellow-billed loon are unlikely to occur because these species rarely occur in the project area. If impacts did occur, they would be of low intensity because while changes would be noticeable they are not expected to result in population-level effects. The duration of impacts is limited to temporary (construction) and long-term (life of project), and are not expected to persist if the towers were removed. The geographic extent of impacts would generally be limited to the immediate vicinity of the project activity. The context of impacts is important because these species are candidates for listing under the ESA.

4.5.3 Alternative 3 – Six Towers on BLM Land

<u>Direct and Indirect Impacts</u>

Both direct and indirect effects to all the listed and candidate species associated with the construction, operations, and decommissioning of Alternative 3 would be very similar to those described for Alternative 2. The difference between alternatives lies in the location of the sixth tower near Kotzebue. Under Alternative 3 the sixth tower would be located on BLM land, and is

thus considered a direct rather than indirect impact. The site is located approximately 4.5 miles south of Kotzebue near a USAF site approximately 0.5 miles from the coast on undisturbed wetland habitat. For comparison, under Alternative 2 the sixth tower (analyzed as an indirect impact) would be located at the KIC Site approximately five miles south of Kotzebue and also 0.5 miles from the coast on undisturbed wetland habitat. The two sites are approximately 0.5 miles apart. There is little difference between the two sites in terms of the listed and candidate that may use the habitats. Either location could affect the five listed and candidate species through behavioral disturbance, habitat loss, or injury/mortality. The difference in the location of the sixth tower site would not change the level of magnitude, duration, extent, or context of the impacts.

Alternative 3 is expected to have no indirect impacts on listed or candidate species.

Cumulative Impacts

Cumulative impacts to all five of the listed or candidate species associated with Alternative 3 would be similar to cumulative impacts associated with Alternative 2. The contribution of Alternative 3 to cumulative impacts to listed or candidate species in the region would be negligible to minor.

Summary

Under Alternative 3, the magnitude of impacts to all ESA-listed or candidate species would be low because changes to habitat, behavior or injury/mortality, if they occur, may be noticeable, but would not be expected to result in population-level effects. The impacts associated with operations are long-term but not expected to persist if the towers were removed. The geographic extent of impacts would generally be limited to the immediate vicinity of the project activity, but could extend to the region if migratory species (eiders) are affected. The context of impacts is important because the species are ESA-listed or candidate.

4.6 Socioeconomics

4.6.1 Alternative 1 – No Action Alternative

Direct and Indirect Impacts

Under Alternative 1 (No Action Alternative) there would be no construction or operation of the five microwave repeaters towers on BLM-managed land. The connected action of installation of one microwave tower on private lands would not be implemented. Telecommunications and Internet connectivity in the area would continue with existing technology. There would be no change to the non-cash (subsistence) economy of the effected communities, and there would be no change to existing economic activities occurring at the cities of Koyuk, Kotzebue or Buckland. There would be some opportunity cost because there would be no short-term employment opportunities and no revenue from construction generated.

Socioeconomic impacts resulting from implementation of Alternative 1 may be seen as a continuation of current conditions, without addressing the need for modernization in broadband infrastructure.

Cumulative Impacts

No new impacts attributable to future phases of the TERRA Project would result and baseline conditions would continue. Alternative 1 would not contribute to cumulative socioeconomic conditions or economic development activities in the region. The effects of climate change would have no impact on socioeconomics and socioeconomic impacts would not likely contribute to climate change.

Summary

The need for improved telecommunications infrastructure and service would not be addressed, and no new impacts would be generated under the implementation of Alternative 1. Alternative 1 would perpetuate the existing conditions and would not contribute to cumulative impacts to socioeconomic conditions.

4.6.2 Alternative 2 – Five Towers on BLM Land (Proposed Action)

Direct and Indirect Impacts

Potential impacts to socioeconomic indicators were measured by assessing the magnitude (intensity), duration, geographic extent, and context of anticipated impacts using specific impact criteria. The impact criteria used to assess each indicator are described in Table 4.6-1.

Implementation of Alternative 2 would strengthen the telecommunications infrastructure of the region, with the potential for long-term improvements to the region's economy, population, income, and businesses. Health services relying on telemedicine and education programs relying on distance education would see improved services and efficiencies due to the increased speeds and decreased latency of the new broadband service. Government agencies, businesses, and local residents would also experience improvements in telecommunications as well as receive new services that use high-speed broadband Internet.

Table 4.6-1 Impact Criteria for Impacts to Socioeconomics

Impact Component		Effects Summary	
Magnitude or Intensity	**High**: Acute or obvious changes in resource character, making it unsuitable for wildlife use	**Medium**: A noticeable change in habitat character, but it retains some value for wildlife use.	**Low**: Changes in resource character may not be measurable or noticeable.
Duration	**Permanent**: Chronic effects; resource would not be anticipated to return to previous levels.	**Long-term**: Resource would be reduced for the life of the project and would return to pre-activity levels at some time after that.	**Temporary**: Resource would be reduced temporarily but not longer than 1 year and would be expected to return to pre-activity levels.
Geographic Extent	**Extended**: Affects resources beyond the region or project area.	**Regional**: Affects resources beyond a local area, potentially throughout the project area.	**Local**: Impacts limited geographically; limited to vicinity of the project footprint.
Context	**Unique**: Resources protected by legislation and the portion of the resource affected fills a unique ecosystem role within the locality or region.	**Important**: Affects depleted resources within the locality or region or resources protected by legislation.	**Common**: Affects usual or ordinary resources in the project area; resource is not depleted in the locality or protected by legislation.

Construction

Direct impacts to employment and income would be modest during construction for the towers because the total workforce required would be small. Unicom would contract the construction work out to firms that have worked in rural villages previously and would train local laborers who can operate equipment and support the project. Therefore, new employment opportunities may go to specialized engineers from Nome or outside of the project area during construction, but general labor employment opportunities could be created locally during construction and maintenance. During the TERRA-NW Phase I Project, Unicom hired two full-time workers at the Otter Creek site and occasionally more as needed. Unicom also spent approximately $60,000 on use of Bering Air helicopter support during construction activities (Markley 2012).

Indirect economic impacts during construction include a small increase in the sale of local goods and services, such as lodging and restaurants at the staging and tower site communities of Koyuk, Buckland, and Kotzebue. The short-term nature of the project would not result in a demographic change for any of the communities. There are more tower sites in Phase III, extending over two years of construction, and therefore local spending would expectedly increase.

Operations

During the operations phase, local employment would be minimal. There would likely be one or two part-time employees that serve as local contacts in the communities. Unicom spent approximately $250,000 in 2012 on the use of Egli Air Haul (based out of King Salmon) for maintenance at the TERRA-SW project sites (Markley 2012). Unicom's subcontractor may utilize local hire, but the amount is not known during the writing of this EA. With only a few helicopter flights and worker days per year for maintenance and the purchase of fuel, any direct and indirect socioeconomic impacts to the local communities would be small.

Cumulative Impacts

While most communities in the project area are experiencing modest population growth, larger economic forces are straining local households. These dynamics include rising energy costs and reduction of government funding for the public sector infrastructure and services. Future infrastructure activities in the project region may include additional expansion projects for rural broadband service. However, these are at the proposal stage, and do not have secure funding. The implementation of Alternative 2 could lay foundations for economic growth in the region, particularly when seen in the context of a future build-out to include additional community towers along the northern coast of Alaska. By improving connections among villages and the larger economy via broadband access, health, education, and governmental services would be improved and business opportunities would extend beyond the region. The constraints on public and private business functions related to remote locations would be reduced. Presumably, by the time the towers are demobilized after approximately 20 years, new technology would be available to continue the service and benefits thereof.

These effects could eventually increase employment, revenue generation, and internet capability for business and social services by five to ten percent, and therefore Alternative 2 would make a medium-intensity effect on the cumulative impacts in the project area. The changes in social indicators would persist after demobilization of the towers and so would be permanent. This project is only a small phase of proposed towers ranging beyond the region and therefore the contribution to cumulative effects would be extended. The populations that would be impacted are predominantly a minority, Alaska Natives, and generally low income so the context would be unique. Alternative 2 would not contribute to changes in population trends in the region. Overall, the project would have a major beneficial contribution on socioeconomic indicators.

The effects of climate change would have no impact on socioeconomics during the life of the project, and socioeconomic impacts would not likely contribute to climate change.

Summary

Under Alternative 2, the construction phase, low in intensity impacts would directly increase local employment and spending, although it would be less than a five percent increase in employment, revenue generation, tourism levels. During the 20-year lifespan of the project, the changes in social indicators would be slight; there would be higher changes during the construction period that would last only during the construction seasons. Therefore duration of impacts would be temporary. Effects would be felt in only three communities: Buckland, Koyuk and Kotzebue, and so the extent of impact would be regional. The context of the impacts would be unique, as the communities affected would be minority and low-income.

4.6.3 Alternative 3 – Six Towers on BLM Land

Direct and Indirect Impacts

The construction and operation of Alternative 3 would have similar impacts on socioeconomic conditions as those identified under Alternative 2, since the only difference is that the Kotzebue Community Tower USAF site would substitute for the KIC location. The amount of employment related to the maintenance of Alternative 3 would be the same as that described in Alternative 2, a slight beneficial contribution to economic development in the region.

Cumulative Impacts

Past, ongoing, and future actions associated with Alternative 3 are the same as those described for Alternative 2. The contribution to cumulative effects would be the same as Alternative 2: medium intensity due to an increase of five to ten percent in employment, revenue generation, or internet capability; permanent duration because changes in social indicators would persist after demobilization of the towers; extended geographic extent because the effects would reach outside the region; and unique context since the communities affected are predominantly low-income and a minority group. The project would have a major beneficial contribution to cumulative impacts to socioeconomic indicators.

Summary

The socioeconomic impacts of Alternative 3 would be the same is those in described in Alternative 2: the construction phase would directly increase local employment and spending, although it would be less than a five percent increase in employment, revenue generation, tourism levels. Thus, the intensity of impacts would be considered low. During the 20-year lifespan of the project, the changes in social indicators would be slight; there would be higher changes during the construction period that would last only during the construction seasons. Therefore, duration of impacts would be temporary. Effects would be felt in only three communities: Buckland, Koyuk and Kotzebue, so the extent of impact would be regional. The context of the impacts would be unique, as the communities affected would be minority and low-income.

4.7 Subsistence

4.7.1 Alternative 1 – No Action Alternative

Under the Alternative 1, no development would occur so there would be no direct or indirect impacts to subsistence. With no direct or indirect effects to subsistence under Alternative 1, there would be no contribution to cumulative impacts on subsistence resources.

4.7.2 Alternative 2 – Five Towers on BLM Land (Proposed Action)

Direct and Indirect Impacts

Potential impacts to subsistence were measured by assessing the magnitude (intensity), duration, geographic extent, and context of anticipated impacts using specific impact criteria. The impact criteria used to assess each indicator are described in Table 4.7-1, below:

Table 4.7-1 Impact Criteria for Impacts to Subsistence

Impact Component	Effects Summary		
Magnitude or Intensity	**High**: Year round change in subsistence use patterns.	**Medium**: Seasonal change In subsistence use patterns.	**Low**: Shift within seasonal Subsistence use patterns.
Duration	**Permanent**: Changes in use patterns would occur longer than 5 years or persist after actions that caused the impacts ceased.	**Long-term**: Changes in use patterns for greater than 1 year to less than 5 years.	**Temporary**: Changes in use patterns for less than 1 year or the duration of project construction.
Geographic Extent	**Extended**: Effects realized throughout the EA project area and may extend beyond the EA project area.	**Regional**: Effects realized by 2 or more communities.	**Local**: Effects realized by a single community.
Context	**Unique**: Affects subsistence resources, access, or harvest and sharing practices beyond the region.	**Important**: Affects subsistence resources, access, or harvest and sharing practices within the region.	**Common**: Affects only locally abundant subsistence resources or little changes in harvest and sharing practices.

Under Alternative 2 construction activities could impact terrestrial mammals and waterfowl that are subsistence resources through habitat loss, behavioral disturbance, or injury/mortality from increased human presence (Section 4.3 and 4.4). The helicopter transit corridors could result in disturbance impacts of medium intensity, affecting subsistence use patterns for only a short duration. Helicopter noise impacts would be more intense at the four construction staging areas, and some of these areas are adjacent to important habitats for seabirds, shorebirds, and waterfowl. In general, the analysis of impacts to the biological environment concluded that summary impacts would be long-term in duration, based on low intensity (i.e., noticeable, but without a major alteration to resource availability), local in extent, and affecting resources that are common in context. Similar impacts would be anticipated to occur to subsistence uses from construction activities.

When the repeaters at Ungalik River, Dime, Talik, Harvey and the Baldwin Peninsula sites are operational there is likelihood that helicopter noise may impact the areas adjacent to these repeater sites and in the helicopter flight paths. This disturbance would be limited to the estimated 15 to 20 days per year of helicopter refueling (14 trips per year) and maintenance

flights (four trips per year) for these five repeater sites. Helicopter refueling would occur 2 to 3 days per year per site. As a mitigation measure, helicopter-supported refueling would occur during the early summer months to minimize impacts on fall hunting, fishing, and gathering activities. This would also reduce impacts to subsistence users during the late spring and late summer period. The KIC Repeater would be refueled using the road and vehicle traffic would not be expected to impact subsistence harvest activities.

Subsistence resources (caribou, bear, and musk oxen) could be attracted to the presence of the completed facilities. Subsistence users could be attracted to the repeater sites that are located nearer to the communities such as the KIC Repeater near Kotzebue and the Baldwin Peninsula Repeater site as the sites would provide increased communication and reception. The potential for increased hunting and/or of subsistence resources at these sites would exist as a result of construction and operation but would be unlikely to impact harvest levels and result in any enduring change in the abundance of resources. It is unlikely that subsistence resources and hunters would be attracted to the four other repeater sites, because these are located in more remote areas that are less frequently used for subsistence activities.

During decommissioning, when facilities are removed to bare ground, the disturbance from removal activities and helicopters would be similar to that of the construction period. As a result, direct and indirect impacts from the operation and decommissioning phases of Alternative 2 would be of low intensity with a shift in resources for a season, localized and limited to the areas surrounding the repeater sites. The impacts would be temporary in duration lasting the length of the decommissioning activity, and affect resources that are common in context and locally abundant for harvest.

With regard to increased competition for subsistence resources, the proposed project would use helicopters to transport materials, equipment, and personnel to the construction sites. The scale of the proposed project would be such that a small workforce, including local hires as possible, would be expected to complete construction during a single season. This project would not be expected to bring a new permanent workforce to the region. For these reasons, the proposed project would not be expected to increase competition for subsistence resources in the project area.

Cumulative Impacts

Past and present actions that have affected subsistence resources in the project area include recreational hunting, subsistence activities, and mining. The region has and may continue to experience some industrial growth (mining), although most future projects would be considered speculative due to a lack of secured funding. Recreational and visitor growth has also been on a recent upward trend, and some non-industrial capital projects are expected to occur in the near future. Introducing and/or upgrading broadband communications in the area could lead to a rise in economic activity. Reasonably foreseeable future actions in the project vicinity are described in Section 4.1.1.

Climate change may also be a factor causing changes for marine and terrestrial mammals in the region that are subsistence resources. Alternative 2 would have a minor contribution to cumulative impacts to subsistence harvest and resources mammals as the effects would be generally low magnitude and localized in extent.

Summary

Under Alternative 2, impacts to subsistence resources would vary depending on location, timing, and activity. Impacts would be considered of low intensity because while changes may be noticeable during construction, these impacts are unlikely to result in population-level effects that would noticeably change subsistence resources or resulting harvest levels. The duration of the direct impact would be long-term and not expected to persist if the towers were eventually removed. The geographic extent of impacts would generally be local, limited to the immediate vicinity of the project activity. The context of impacts would be common and would only affect locally abundant subsistence resources and is unlikely to change harvest and sharing practices.

4.7.3 Alternative 3 – Six Towers on BLM Land

Direct and Indirect Impacts

Both direct and indirect effects to subsistence associated with the construction, operations, and decommissioning of Alternative 3 would be very similar to those described for Alternative 2. The difference between alternatives lies in the location of the sixth tower near Kotzebue. This repeater site is located approximately 4.5 miles south of Kotzebue at the Kotzebue Community Tower USAF site approximately 0.5 mile from the coast on undisturbed wetland habitat. For comparison, under Alternative 2 the sixth tower (analyzed as an indirect impact) would be located at the KIC Site approximately five miles south of Kotzebue and also 0.5 miles from the coast on undisturbed wetland habitat. The two sites are approximately 2,400 feet apart. There is little difference between the two sites in terms of the subsistence harvest that occurs in this area. Either location could affect terrestrial mammals that are subsistence resources through behavioral disturbance, habitat loss, or injury/mortality but would be unlikely to result in less harvest of subsistence resources. The difference in the location of the sixth tower site would not change the level of magnitude, duration, extent, or context of the impacts from those associated with Alternative 2.

Alternative 3 is expected to have no indirect impact on subsistence.

Cumulative Impacts

Cumulative impacts associated with Alternative 3 would be similar to cumulative impacts associated with Alternative 2. The contribution of Alternative 3 to cumulative impacts to subsistence harvests in the region would be minor.

Summary

Impacts would be considered of low intensity because while changes may be noticeable during construction, these impacts are unlikely to result in population-level effects that would noticeably change subsistence resources or resulting harvest levels. The duration of impacts are long-term in duration (life of project), although not expected to persist beyond the life of the project if the towers were removed. The geographic extent of impacts would generally be limited to the immediate vicinity of the project activity and would be local in extent. The impacts would affect resources that are common in context, and would only affect locally abundant subsistence resources and are unlikely to change harvest and sharing practices.

4.8 Recreation

4.8.1 Alternative 1 – No Action Alternative

Under implementation of Alternative 1, land use for recreation would remain the same. There would be no direct or indirect impacts to recreation access, settings, or uses. Alternative 1 would have no direct or indirect impacts to recreation, and therefore would not contribute to the cumulative impacts to these resources.

4.8.2 Alternative 2 – Five Microwave Towers on BLM Land (Proposed Action)

Potential impacts to recreation were measured by assessing the magnitude (intensity), duration, geographic extent, and context of anticipated impacts using specific impact criteria. The impact criteria used to assess each indicator are described in Table 4.8-1, below:

Table 4.8-1 Impact Criteria for Impacts to Recreation

Impact Component	Effects Summary		
Magnitude or Intensity	**High**: Changes to setting would have highly noticeable influence on the visitor's experience.	**Medium**: Changes to setting would be clearly detectable to the visitor.	**Low**: Changes setting would be slightly (if at all) detectable by the visitor.
Duration	**Permanent**: Permanent changes to setting would occur.	**Long-term**: Changes to the setting would extend greater beyond project construction.	**Temporary**: Changes to setting would last less than the duration of project construction (2 years).
Geographic Extent	**Extended**: Effects would extend throughout the project area.	**Regional**: Effects would extend through a large portion of the project area.	**Local**: Effects would occur at site-specific locations within the project area.
Context	**Unique**: The lands in question are protected by legislation and managed for recreation characteristics.	**Important**: The lands in question are not protected by legislation but are managed for recreation characteristics.	**Common**: The lands in question are not protected by legislation and are not managed for recreation characteristics.

Direct and Indirect Impacts

Construction

Direct and indirect impacts of Alternative 2 on recreation would include displacement from the immediate sites of the construction activity at the five sites. Noise disturbance may also affect recreation along the helicopter transit routes during the construction period.

Indirect disturbance in the vicinity of the construction staging areas would not conflict with BLM authorized recreation activities. The temporary period of staging activities, particularly helicopter use to move equipment, supplies, and personnel, would be expected to result in little physical displacement of existing recreation, but the presence of helicopters and their associated noise would be noticeable. This may cause commercial guides and outfitters, and individuals to avoid the affected areas during the construction season, a temporary displacement of activities. With notification about helicopter transit routes and period of activity, recreationists can adjust activities to avoid displacement (BLM 2012). The connected action of the Kotzebue Community Tower KIC Site construction at one location on private land would result in less impact at this

community tower, since no helicopter transportation support would be required at this site within the community of Kotzebue.

Because of displacement, the impacts of construction on recreation would be medium in intensity, with changes to the setting clearly detectable to visitors. The impact would be only during the construction seasons, therefore duration would be temporary. The effects of the helicopter flights would extend to the vicinity of the proposed tower sites and the flight paths, and therefore the extent of impacts would be regional. The lands are managed by the BLM for recreation among other uses, and so the context of the resources affected is common.

Operations

Following construction, direct and indirect impacts would be limited to activities associated with operating, maintaining, and refueling the five tower sites. In addition, the connected action of operation of additional tower on private land would have comparable indirect effects to those on BLM-managed lands. The installed infrastructure would remain for the life of the project, 20 years, and would result in little direct displacement of other land uses, due to the small acreage affected. The noise and visual disturbance from operating the towers would include noise from generators, and visual effects within sight of the towers. A full discussion of visual and noise impacts are found in Sections 4.10. and 4.11, respectively.

Generator noise from the repeater tower sites would be expected to dissipate to very low levels (20 dBA) at a distance of 4,590 ft. from the sites during winter. Thus, any existing land uses may be affected in approximately a 1-mi. radius, or 3.14 sq. mi. As such, the generator noise during operations would not likely be detectible at the BLM-permitted outfitter camps. Helicopters supporting fuel deliveries and maintenance activities would operate intermittently during the summer, and flights would occur over short periods of time. Although helicopter activities may temporarily displace recreational users and hunting and fishing outfitters, they are not expected to have an adverse impact on hunting or fishing activities in the area.

The implementation of Alternative 2 would strengthen telecommunications infrastructure and provide emergency shelter at the tower sites. The towers would serve as visual cues to benefit residents traveling between communities, outfitters engaged in remote hunting/fishing activities, and other recreationists. For this reason, impact intensity on recreation would be medium; the changes to the setting would be clearly noticeable. Extent would be regional, as the effects would extend through a large portion of the project area. The impacts are expected to last the lifespan of the project, 20 years, and so would be long-term. The BLM lands are managed for multiple uses, including recreation, so the affected resource would be common.

Cumulative Impacts

Past, present, and future actions that have had and would continue to have impacts to recreation in the proposed project area include ongoing capital improvement projects, generally in the immediate vicinity of the communities of Norton and Kotzebue Sounds. The project expands the TERRA-NW Project to Kotzebue Sound. By doing so, it would contribute to improved telecommunications and associated enhancements in search and rescue and emergency response efforts throughout the region with potential benefits to outfitters and recreationists using the project area. The overall contribution to cumulative effects would be moderate, lasting over 20 years, ranging throughout the project area; effects would be considered beneficial.

Over the next twenty years, Alternative 2 would not effect or contribute to climate change, but climate change could have numerous effects to recreation. Just a few examples include: a change in the distribution of wildlife that hunters seek, change in water temperature and precipitation that could alter the kind and abundance of fish that anglers pursue, and more extreme weather events in changes in the lengths of seasons that could affect when and how often people visit the area. The effects of climate change would have no impact on recreation during the life of the project, and recreation activities would not likely contribute to climate change.

Summary

In summary, the direct and indirect impacts of Alternative 2 on recreation would be of medium intensity, due to displacement of recreational uses and noise disturbance in small areas during construction and increased search and rescue resources during operations. The noise disturbance associated with annual helicopter refueling trips would be intermittent, limited to 2-3 days per site for the life of the project, causing temporary displacement. These impacts would be long-term lasting the life of the project. The beneficial effects of improved emergency capabilities would be of regional extent, affecting a large portion of the project area. The recreation patterns affected would generally be considered resources that are common in context.

4.8.3 Alternative 3 – Six Towers on BLM Land

Direct and Indirect Impacts

Direct and indirect impacts of Alternative 3 on recreation activities would be the same as Alternative 2 since the number of the repeater sites are the same, although the location of the last site is changed. Construction and operation of the Kotzebue Community Tower USAF site would result in the same impacts as Alternative 2. The Kotzebue Community Tower USAF site would not result in impacts to recreation.

Cumulative Impacts

The contribution of Alternative 3 to recreation activities in the project area would be similar to those described under Alternative 2 with a moderate beneficial contribution to cumulative effects in recreation. Although the Kotzebue Community Tower USAF Site is a short distance from the KIC Site and is land managed by BLM, the incremental effect of completing and extending the telecommunications system in the area would be the same.

Alternative 3 would not contribute to climate change and climate change has the potential to contribution toa change in recreation activities and participation.

Summary

The impact summary for Alternative 3 would be the same as Alternative 2.

4.9 Lands with Wilderness Characteristics

Per requirements of the BLM Manual 6310, the effects of a project on BLM-managed Lands with Wilderness Characteristics (LWC) must be analyzed. For an inventory of these lands, see Appendix E. As described in Section 3.8, wilderness characteristics criteria pertain to three broad categories: Size, Naturalness, and Outstanding Opportunities for Solitude or Primitive and Unconfined Type of Recreation. Supplemental values are further assessed if all other criteria are met. The following sections summarize the analysis performed to determine if the three LWC criteria would be affected by the project.

4.9.1 Impact Analysis Methodology

The analysis area included three LWC inventory areas (see Figure 4-2):

- Nulato Hills (4,915,380 acres)
- Ungalik River (1,345,000 acres)
- Baldwin Peninsula (464,689 acres)

Impact Criteria

Indicators were used to measure potential impacts to visual resources and noise that could result from the project and subsequently affect LWCs. The three criteria for LWC defined in Section 3.8: Size, Apparent Naturalness, and Outstanding Opportunities for Solitude or Primitive and Unconfined Type of Recreation were used as the indicators for potential impacts. Potential impacts to LWC based on the three indicators were measured by assessing the magnitude (intensity), duration, geographic extent, and context of anticipated impacts using specific impact criteria. The impact criteria used to assess each indicator are described in Table 4.9-1, below:

Table 4.9-1 Impact Criteria for Lands with Wilderness Characteristics

Impact Component		Effects Summary	
Magnitude or Intensity	**High –** Attributes of apparent naturalness[1] are altered or eliminated and outstanding opportunities for solitude or primitive and unconfined recreation are no longer available. Changes to LWC are such that the area no longer appears to be in a natural condition.	**Medium –** At least one attribute of apparent naturalness[1] is altered or eliminated, and/or outstanding opportunities for solitude or primitive and unconfined recreation are no longer available. Though all necessary criteria for LWC are no longer met, the area appears to be in a natural condition.	**Low –** All attributes of apparent naturalness[1] are maintained and outstanding opportunities for solitude or primitive and unconfined recreation remain available. All necessary criteria for LWC are met, and the area appears to be in a natural condition.
Duration	**Permanent –** Permanent elimination of attributes of apparent naturalness[1] and outstanding opportunities for solitude or primitive and unconfined recreation would occur.	**Long-term –** Changes to attributes of apparent naturalness[1] and outstanding opportunities for solitude or primitive and unconfined recreation would return to pre-activity levels within 1-5 years after actions causing impacts were to cease.	**Temporary –** Changes to attributes of apparent naturalness[1] and outstanding opportunities for solitude or primitive and unconfined recreation would not occur or would last less than 1 year, or for the duration of project construction.

Impact Component		Effects Summary	
Geographic Extent	**Extended –** The combined geographic extent of the right-of-way plus the affected area[2] would reduce LWC to a geographic area measuring less than 5,000 acres.	**Regional –** Not Applicable.	**Local –** The combined geographic extent of the right-of-way plus the affected area[2] would not impair the BLM's ability to designate in a future land use planning action all or part of the remaining LWC lands as Wild Lands.
Context	**Unique –** The combined geographic extent of LWC inventory areas and designated or proposed wilderness[3] measures </=200,000 acres within the Planning Area[4] – AND/OR – the affected LWC inventory area contains supplemental values that are unique at a state or national level.	**Important --** The combined geographic extent of LWC inventory areas and designated or proposed wilderness[3] measures >200,000 acres and </=500,000 acres within the Planning Area[4] – AND/OR – the affected LWC inventory area contains supplemental values that are unique at a state or national level.	**Common --** The combined geographic extent of LWC inventory areas and designated or proposed wilderness[3] measures >500,000 acres within the Planning Area[4] – AND - the affected LWC inventory area does not contain supplemental values that are unique at a state or national level.

[1] Apparent naturalness is defined by BLM Manual 6310 (BLM 2012) "refers to whether or not an area looks natural to the average visitor who is not familiar with the biological composition of natural ecosystems versus human-affected ecosystems." For the purposes of this analysis, the following criteria was developed for apparent naturalness, : (1) Human-made features appear congruent with the existing visual character of the area (i.e., trails, trail signs, bridges); (2) Visual contrast of disturbances to landscape features and/or man-made structures (including night time lighting) is NONE to LOW; and (3) Soundscape is characterized as natural (i.e, ≤ 20dBA for operations and ≤ 45 dBA for helicopters), and is not influenced by the human-induced actions or facilities.

[2] Affected area is defined as the geographic extent of impacts to any attribute of apparent naturalness and/or outstanding opportunities for solitude or primitive and unconfined recreation.

[3] Includes BLM Wilderness Study Areas, USFWS areas proposed for wilderness designation, USFS Wilderness Study Areas or areas of Recommended Wilderness, or NPS areas Recommended or Proposed for designation.

[4] Planning Area, for this analysis, is defined as the BLM Anchorage Field Office and Central Yukon Field Office.

Assumptions

Assumptions used in this analysis are described below:

- Visual Impacts - Impacts to the viewshed during the operational phase are not expected to extend beyond a distance of 3 miles within the Nulato Hills and Ungalik River inventory areas and five miles within the Baldwin Peninsula inventory area. These assumptions are based on photo simulations completed for the TERRA-NW project (BLM 2012a) and Gateway West project (BLM 2011b), which indicated weak visual contrast at these distances (see Section 4.11 Visual Resources).
- Noise Impacts - The geographic extent of impacts to soundscape are based on noise modeling completed for the TERRA-NW project (BLM 2012a). Areas affected by operational noise impacts are assumed to have noise levels greater than 20 dBA (winter wilderness noise level) resulting from operations equipment, or within a 4,590-feet radius of the microwave repeater site. Areas affected by helicopter flyovers are assumed to have noise levels greater than 45 dBA (between quiet and moderate noise level), or within 3-miles of the flight path or a 5-mile radius from the microwave repeater site. The noise

threshold for helicopter flyovers is higher since the frequency would be low – a total of 90 flights over a period of 12 to 15 days each year for all sites combined.

4.9.2 Alternative 1 – No Action Alternative

Under Alternative 1, no direct or indirect impacts to LWC are expected to result from either construction or operations. Broadband internet would continue to be delivered by local companies via satellite. Use of satellite technology would not result in visual or audible impacts to LWC criteria of apparent naturalness, nor would lighting be visible. Because no on-the-ground footprint would exist, no reduction in the size of LWC would occur.

Under Alternative 1 there would be no direct or indirect construction or operational impacts to LWC; therefore, the implementation of Alternative 1 would not contribute to cumulative effects to LWC.

4.9.3 Alternatives 2 and 3

Direct and Indirect Impacts

Impacts to LWC from Alternative 2 and 3 would be the same, since they both would place four microwave repeaters within LWC and one microwave repeater outside of LWC. The affected area surrounding community towers proposed under Alternative 2 and 3 would not overlap any inventory area, and therefore would not contribute to potential impacts to LWC. Impacts to LWC for both action alternatives are summarized in Table 4.9-2 below, followed by the impact discussion that is the same for Alternatives 2 and 3.

Table 4.9-2 Summary of Operational Impacts to Land with Wilderness Characteristics for Alternatives 2 & 3

LWC Inventory Area	Total Inventory Area (Acres)	Total Right of Way Area (Acres)	Naturalness (Total Acres of Affected Viewshed)	Naturalness (% Acres Affected)	Opportunities for Solitude	Opportunities for Primitive and Unconfined Recreation	Total Acres LWC Remaining
Nulato Hills	4,915,380	1.38	11,294	0.2%	Yes	Yes	4,904,086
Ungalik River	1,354,000	1.38	4,926	0.4%	Yes	Yes	1,349,074
Baldwin Peninsula	464,689	0.69	29,314	6.3%	Yes	Yes	435,375[4]

[1]Affected viewshed defined as a 3 mile radius surrounding each tower site except the Baldwin site which is 5-miles.
[2]Affected soundscape defined by the distance at which sound attenuates to 20 dBA, except for helicopters which is defined as 45 dBA.
[3]Affected area is defined as the geographic extent of impacts to any attribute of apparent naturalness and/or outstanding opportunities for solitude or primitive and unconfined recreation.
[4] Because the portions of LWC directly affected by the Baldwin Peninsula repeater bisects the Baldwin Peninsula LWC inventory area, this inventory area would be split into two discrete geographic areas measuring 24,482 acres and 410,893 acres.

Construction

Construction impacts would occur, however these impacts would be temporary and would not affect the LWC eligibility of any specific areas. Construction impacts would be of high intensity and localized, characterized by increased noise levels within a radius of approximately 6,700-feet of each microwave repeater construction site and up to five miles on either side of the helicopter flight paths (See Section 4.10 Noise). Visual impacts during construction for the hilltop sites (Ungalik River, Dime, Talik, and Harvey Repeaters) would occur from additional equipment stored at the barge landings in the cities of Koyuk and Buckland; common flight paths used for air transit of construction material from staging sites to tower sites.

Visual impacts during construction for the Baldwin Peninsula repeater site would occur from the equipment stored at the staging area during winter months at the beach landing; overland transportation of construction equipment to the Baldwin Peninsula Repeater Site during winter months; and equipment and vehicles stored at the repeater site during construction.

Impacts to visual resources at hilltop sites are considered low intensity, and localized to within three miles of the hilltop sites. Impacts to visual resources at Baldwin Peninsula sites are considered medium intensity and localized to within five miles (See Section 4.11 Visual Resources).

Although the temporary impacts would not affect the eligibility or status of the LWCs, indirect effects could result should recreationists avoid areas with views of construction-related actions. For the Baldwin site, the impact findings would be the same, with the exception of magnitude which would be moderate for the Baldwin site due to overland transport of the construction equipment which would compromise opportunities for primitive and unconfined recreation.

Operations

Operation of the proposed project would result in impacts to LWC; however, the combined geographic extent of the rights-of-way, plus the affected area would not impair the BLM's ability to designate in a future land use planning action all or part of the remaining LWC lands as Wild Lands by reducing this land base below 5,000 contiguous acres.

Operational impacts are discussed below by LWC Inventory Area.

Nulato Hills Inventory Area

Alternative 2 and 3 would place approximately 1.38 acres of right-of-way within the Nulato Hills Inventory Area. In addition, the visual character of the landscape would be affected over approximately 11,294 acres, including an affected area for soundscape. This 11,294-acre area of the Nulato Hills Inventory Area would no longer meet the criteria of apparent naturalness. The remaining area eligible for LWC would measure 4,904,086 acres.

Ungalik River Inventory Area

Alternative 2 and 3 would place approximately 1.38 acres of right-of-way within the Ungalik Inventory Area. In addition, the visual character of the landscape would be affected over approximately 4,926 acres, including an affected area for soundscape. This 4,926-acre area of the Ungalik River Inventory Area would no longer meet the criteria of apparent naturalness. The remaining area eligible for LWC would measure 1,349,074 acres.

Baldwin Peninsula Area

Alternative 2 and 3 would place approximately 0.69 acres of right-of-way within the Baldwin Peninsula Inventory Area. Visual character of the landscape would be affected over approximately 29,314 acres, including the affected area for soundscape. This 29,314-acre area would no longer meet the criteria of apparent naturalness. As shown on Figure 4-2, the impact area for visual resources and noise would create two distinct parcels by separating the northernmost portion of the Baldwin Peninsula (24,482 acres), from the remainder to the south (410,893 acres). Although the parcels would no longer be contiguous, they would both still meet the three LWC criteria of size (>5,000 acres), "apparent naturalness," and outstanding opportunities for solitude or primitive and unconfined recreation; therefore both would still be eligible as LWC.

Decommissioning

When the site is decommissioned all physically visible structures would be removed and the noise and visual impacts to other land uses during decommissioning would be similar to those of the construction period. When the site decommissioning is completed, all physically visible structures would be removed.

Cumulative Effects

The analysis of the project's contribution to cumulative effects includes construction and operation of the TERRA Backbone System, including 26 community tower sites and 22 remote microwave tower sites, and impacts of climate change on LWC.

Construction and operation of community towers and microwave repeaters affect LWC primarily through visual and noise effects that could compromise an area's apparent naturalness. Since these sites are typically small in comparison, the majority of the LWC remains geographically contiguous and maintains the three required LWC criteria. The community towers and microwave repeater sites assessed as part of the cumulative effects analysis would be spread out; consequently, it is not expected that two or more sites could be seen or heard from any one position within the LWC areas. Thus, the sites would be distributed sufficiently throughout the LWC areas such that their LWC eligibility or an individual's experience within any of the LWC areas would not be compromised.

Potential effects to LWC resulting from the project and climate change would be related to impacts on visual resources. As mentioned in Section 4.11 Visual Resources, climate change could affect the characteristic landscape through changes in seasonality and distribution of snow cover, vegetation communities, and thaw lakes. Potentially, these effects could result in increased or decreased visual contrast of the project, or changes in noise attenuation, both of which could collectively affect apparent naturalness of the affected area. However, due to the relative small size of each site, the small number of sites compared to the size of the LWC areas, and distribution of sites within the region, the project's contribution to cumulative effects, even when taking climate change into consideration, would still be minor.

Summary

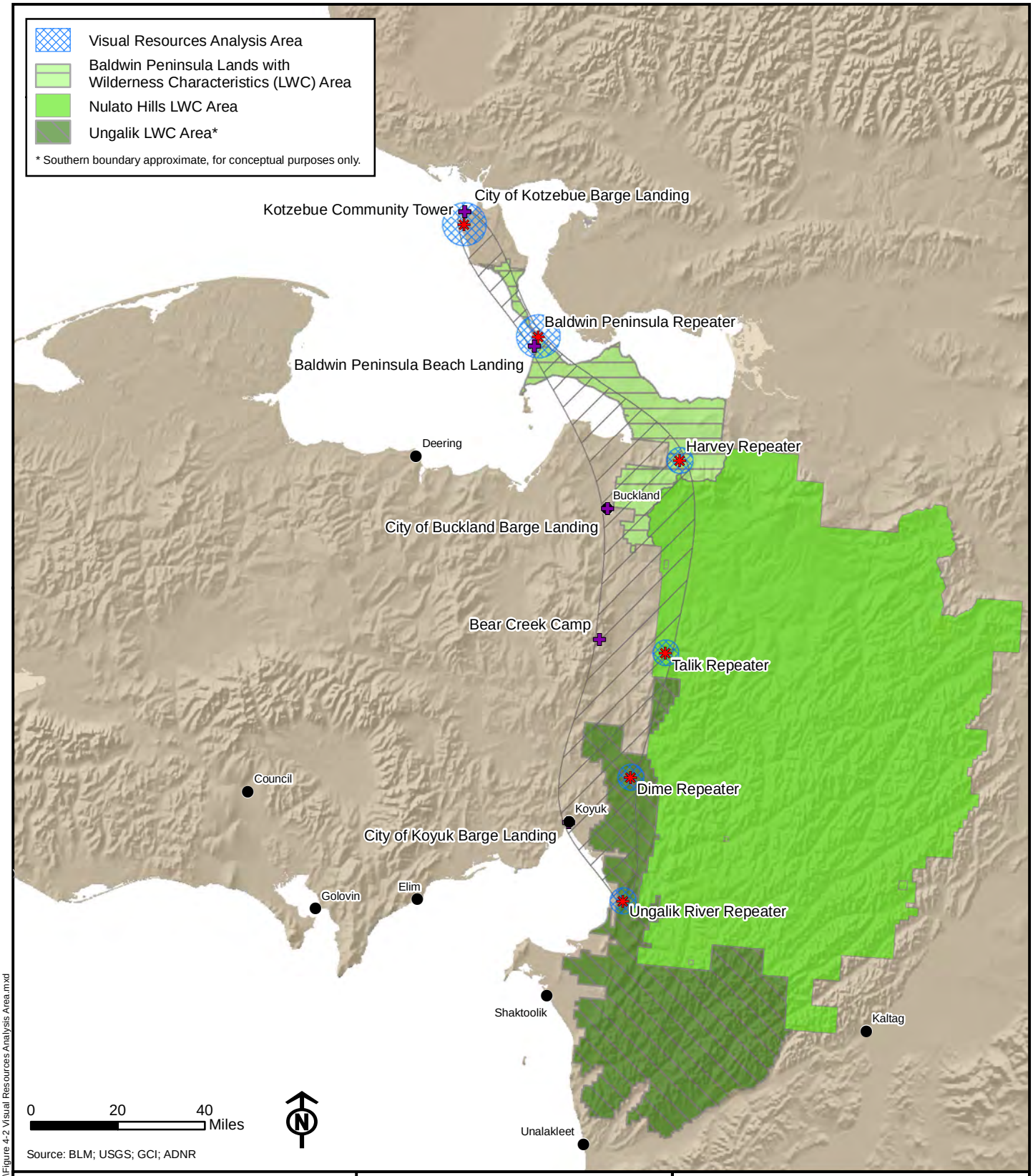
The impacts to LWC are similar for all three inventory areas, and the impact criteria analysis is summarized as follows collectively for all areas.

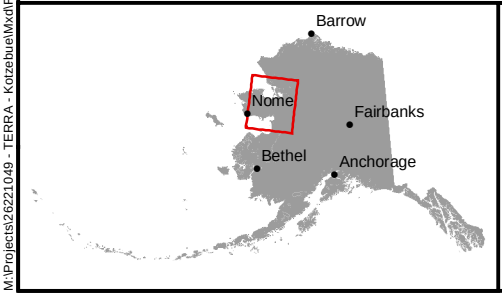
No new access points would be introduced into any LWC, so solitude and primitive experiences would be maintained. Although some areas within each LWC would no longer have attributes of apparent naturalness, these areas are small compared to the much larger geographic area for which those are maintained and the impact would therefore be considered of low intensity.

The duration of the impact would be considered permanent, as the apparent naturalness of the sites would likely continue to be affected after the project ceases. The areas within each LWC outside of the areas affected by the project would retain all LWC criteria and would not impair BLM's ability to designate in a future land use planning action for all or part of the remaining LWC lands as Wild Lands. Therefore, the geographic extent would be local.

The geographic extent of each LWC inventory area, and designated or proposed wilderness, measures >500,000 acres and is abundant in the project area. Although supplemental values exist in each of the three LWC inventory areas, there would be no effect to resources that are considered unique at a state or national level. Thus, the context of the resources would be common.

The contribution to cumulative impacts on LWC would be minor, due to the relative small size of the proposed developments and the small number of sites within the region.





Legend

- Repeater Location
- Helicopter Support Site
- Helicopter Corridor during Construction

TERRA-Northwest Phase III Environmental Assessment

Figure 4-2:
Visual Resources Analysis Area

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4.10 Noise

4.10.1 Alternative 1 – No Action Alternative

Under the No Action Alternative, there would be no direct or indirect effects to the acoustic environment as there would no generation of noise associated with any flight, construction, or operational activities. With no direct or indirect impacts on the ambient noise environment within any of these communities under Alternative 1, there would be no contribution to cumulative impacts to this resource.

4.10.2 Alternative 2 – Alternative 2 – Five Towers on BLM Land (Proposed Action)

Potential impacts to the acoustic environment were measured by assessing the magnitude (intensity), duration, geographic extent, and context of anticipated impacts using specific impact criteria. The impact criteria used to assess each indicator are described in Table 4.10-1, below:

Table 4.10-1 Impact Criteria for Effects from Noise

Impact Component		Effects Summary	
Magnitude or Intensity	**High:** Noise levels >70 dBA Ldn for mobile noise sources or >70 dBA Leq for stationary noise sources	**Medium**: Noise levels >50 - 70 dBA Ldn for mobile noise sources / 50 - 70 dBA Leq for stationary noise sources	**Low**: Noise levels < 50 dBA Ldn for mobile noise sources / < 50 dBA Leq for stationary noise sources
Duration	**Permanent**: Changes in noise persist after tower decommission (>20 years).	**Long-term**: Changes in noise extend for the 20 year operating period.	**Temporary**: Changes in noise last less than the project construction period (2 years).
Geographic Extent	**Extended**: Effects would extend throughout the project area.	**Regional**: Effects would extend through a large portion of the project area.	**Local**: Effects would occur at site-specific locations within the project area.
Context	**Unique**: Soundscape protected by legislation (wilderness) and the portion of the soundscape affected fills a unique role within the locality or region.	**Important**: Affects depleted soundscape within the locality or region or soundscape protected by legislation.	**Common**: Affects usual or ordinary soundscape in the project area; soundscape is not depleted in the locality or protected by legislation.

<u>Direct and Indirect Impacts</u>

Construction

There would be four sources of noise associated with Alternative 2: 1) helicopter flights to and from both of the tower sites for construction and site maintenance; 2) overland transport of equipment to the Baldwin Peninsula repeater site; 3) localized noise from construction equipment during site set up; 4) localized noise from diesel generators used to power the tower sites during normal operation.

For the mountaintop repeater sites, helicopter flights would originate from a staging area in Koyuk for the Ungalik River and Dime repeater tower sites, and from a staging area in Buckland for the Talik and Harvey repeater sites. Helicopter flights for the Baldwin Peninsula repeater site would originate from a staging area in Kotzebue. There would be approximately 100 to 104 helicopter flights to each of the repeater sites during the construction period. A Hughes 500-E or Robinson R-44 helicopter would be used for crew transport and light freight. A Bell UH-1H

Huey helicopter would be used for medium-lifts and initial material supply transportation to the sites. The Bell UH-1H Huey helicopter is known for the low frequency rumble which is due to blade slap against the air, and it is predominantly heard when the helicopter is approaching. An Erikson Air Crane would be used for the transport of shelters and fuel tanks from the project staging areas; however, it would not be needed for the Baldwin Peninsula repeater site. The estimated number of helicopter trips per site for construction and annual maintenance and refueling is outlined in Table 2-6 and the anticipated flight corridors are shown in Figure 2-1.

The loudest areas of helicopter noise would occur at the staging/departure sites and at the tower sites because the helicopters would be at lower altitudes and operations at these locations may require extended periods of hover. Of these trips, approximately 60 trips would utilize a Bell UH-1H helicopter to and from the staging sites, 4 trips would utilize an Erikson Air Crane helicopter to and from the staging area (except for the Baldwin Peninsula repeater site), and 30 to 40 trips would utilize a Hughes 500-E or Robinson R-44 helicopter to and from nearby communities. Helicopters would travel at an enroute altitude of 1,500 ft. (450 m). With a total of 100 to 104 flights projected for each site during construction phases, the average number of flights during the cumulative construction period (240 days) would be less than one flight every two days.

The distances to the 45 dBA maximum sound level (L_{max}) noise contour were estimated along the individual flight tracks, staging/departure areas, and five repeater sites using modeling conducted for TERRA-NW EA (BLM 2012). The maximum noise levels generated by each of the three helicopter types for a single event to and from the microwave repeater sites were used for noise modeling purposes. The helicopter noise modeling results for the projected operations along the flight tracks generated approximate distances to the 45 dBA L_{max} noise contour that ranged from 2 to 3 miles from the flight path. Helicopter noise modeling results for the projected operations near staging/departure sites and microwave repeater sites generated approximate distances to the 45 dBA L_{max} noise contour that ranged from 2 to 5 mi. Noise generated by project helicopter operations would propagate over greater distances over water.

Overland transport of equipment to the Baldwin Peninsula repeater site would involve the use of a crane (Kobelco CK 1000 Series II), a dozer (CAT D-6 R), loader (CAT 966), skid steer (CAT 299C), excavator (CAT 330), mixer truck, and Tucker Sno-Cat. On-site construction of the mountaintop repeater sites would involve the use of a small backhoe (CAT 303), an air compressor, two portable generators, a jackhammer, and various electrically and pneumatically driven power tools. The equipment and tools used at all sites are expected to generate a substantial level of localized noise as each tower site is constructed. The sound levels would be higher than the existing ambient levels at each site; however, these noises would be temporary. These levels would attenuate to a noise level of 60 dBA L_{eq} at a distance of 820 ft., and would attenuate to a level of 45 dBA L_{eq} at a distance of 4,612 ft.

Under implementation of Alternative 2, there would be direct and indirect impacts to the soundscape at the repeater sites, as well as direct and indirect impacts at the staging areas in Koyuk, Buckland, and Kotzebue. During the construction phases, the effects near the repeater sites and staging areas are expected to be of high intensity, temporary in duration, local in extent, and affecting resources that are common in context. The maximum noise levels at the tower sites or the staging sites would be approximately 90 dBA L_{max} and occur during an individual helicopter landing or departure; however, frequency of helicopter flights, particularly for the louder heavy- and medium-lift helicopters would be concentrated during June to early July, with

an additional period from February to April for the Baldwin Peninsula repeater site. Construction activities for the remote mountaintop repeater sites and the overland transport of equipment to the Baldwin Peninsula repeater site are expected to be temporary and less than noise levels generated from helicopter flights. The duration of the construction activities would be limited to 240 days over the course of two summers for the mountaintop repeater sites and a similar length winter and summer season for the Baldwin Peninsula site; therefore the duration would be temporary.

Operations

During normal operations at each of the tower sites, a power source is required for operation of the repeaters. The microwave repeaters for the sites have been designed to utilize two 9 kW diesel generators. One generator would be used as a primary power source and the other would be used as a backup. These generators would be the dominant noise source at each of the repeater sites during normal operation. The Isuzu D1703-M diesel generators proposed for each site are expected to generate a noise level of 78 dBA L_{eq} at a distance of 23 ft. These generators would use hospital-grade silencers (GTE Industries 201-5102) which would be expected to decrease the levels of noise. These levels would attenuate to a noise level of 60 dBA L_{eq} at a distance of 183 ft., and would attenuate to a level of 45 dBA L_{eq} at a distance of 1,027 ft.

The generators at each site are expected to consume approximately 7,000 gallons of diesel fuel per year, and each site would be serviced to replenish the fuel supply. It is anticipated that 14 round-trip flights of a Bell UH-1H helicopter each year would be required to deliver the fuel, and it is anticipated that this effort would take four to five days per site. Maintenance flights are expected to take place once a year, with four trips per site and using a Hughes 500-E or Robinson-44 helicopter. The maximum noise levels from the individual helicopter operations expected to occur during typical site maintenance would be the same as the maximum noise levels presented for construction.

To reduce potential noise impacts, helicopter-supported refueling would occur during June-July to minimize impacts on hunting, fishing and recreation activities. In this case, the intensity would be low to medium, but the duration would be increased to intermittent and long-term as the flights would occur during the 20-year life of the project. Also during normal operations, the generators at each repeater site would be operating on a continuous basis from the site. The intensity would be expected to be low but the duration would be long-term.

Decommissioning

Decommissioning impacts would be expected to be similar to construction activities.

Cumulative Impacts

All of the ongoing activities within the region establish a baseline acoustic environment that has remained relatively unchanged in the recent decade. Fixed-wing aircraft flights occur daily throughout the project area. As a result, residents are somewhat acclimated to noise from flight events. Four community tower sites in surrounding communities are planned for future TERRA phases but have not yet been funded. These community tower sites, in combination with the remaining TERRA backbone – 26 community tower sites and 22 remote microwave tower sites - are not expected to have a substantial impact on the cumulative long-term regional noise environment. Any possible major projects, such as the “Road to Nome,” are still in the

conceptual stages and cannot be classified as RFFAs. For a community that currently experiences daily flights within the environment, this project would not result in an increased contribution to the existing and reasonably foreseeable future noise environment. The project components under direct review in this EA are not expected to result in an increased contribution to cumulative effects for noise in the project area.

Summary

Helicopter over flights and landings would cause a degree of disturbance, but the effect would be temporary in nature. The helicopter flights would be dispersed over multiple flight paths and the aircraft are required to fly at or above 1,500 ft., which would lessen the magnitude of sound at ground level and thereby minimize noise impacts. By conducting helicopter-supported refueling activities during a seasonal window that avoids the time of year when recreation users are most active, the impacts from noise would be considerably reduced. Impacts from noise associated with the generators at the tower sites are of low intensity as noise levels would be less than 50 dBA Ldn for mobile noise sources and less than 50 dBA Leq for stationary noise sources. The geographic extent would be local confined to a small area as impacts would occur at site-specific locations within the project area. The duration of the impact would be long-term with changes in noise more intense during the project construction period (2 years), but limited to refueling and maintenance trips for the 20-year life of the project. The context of the impact would be common because the soundscape is not depleted in the locality and project-generated noise would affect an ordinary soundscape.

4.10.3 Alternative 3 – Six Towers on BLM Land

Under Alternative 3, the Kotzebue Community Tower KIC Site would be replaced by the Kotzebue Community Tower USAF site. The direct and indirect noise impacts of the construction and operations for all other sites would be the same as those in Alternative 2. The contribution to cumulative effects to the acoustic environment for Alternative 3 would also be the same as Alternative 2.

4.11 Visual Resources

4.11.1 Analysis Area for Visual Resources

The analysis area for visual resources was defined as follows:

- Five-mile radius surrounding the seven sites under review: Ungalik River, Dime, Talik, Harvey, and Baldwin Peninsula repeaters and the Kotzebue Community Tower sites. A 5 mile radius was selected based on the outcome of previous analyses completed for the TERRA NW Environmental Assessment (EA), in which a weak visual contrast between project features (i.e., towers and associated project components) and the natural landscape was identified at a distance of 3 miles (BLM 2012). This radius is expected to be sufficient for the taller towers located on Baldwin Peninsula, as similar studies completed for large scale electrical transmission towers measuring up to 180 feet in height has demonstrated weak visual contrast at this distance (BLM 2011);
- Portions of the Iditarod NHT located within the Norton Sound physiographic area of the Kaltag to Nome segment of the Iditarod NHT (BLM 1982) located within the viewshed of the Ungalik River Repeater;
- A 5-mile radius surrounding the barge landings / staging areas located at the cities of Koyuk and Buckland and the Baldwin Peninsula Beach Landing;
- A 5-mile radius surrounding the proposed road connecting the Baldwin Peninsula Beach Landing Beach Landing to the Baldwin Peninsula Repeater;
- A 3-mile radius surrounding the anticipated flight path used for construction and maintenance activities.

Under both action alternatives, the proposed project would be operated using a 60 ft. towers at the Ungalik River, Dime, Talik, and Harvey Repeaters (herein, the “hilltop sites”), and a 250 ft. tower at the Baldwin Peninsula Repeater and the two Kotzebue Community Towers (herein, the Baldwin Peninsula sites). The impact analysis includes all project components described in Section 2.2 and Section 2.3.

Methods

Impact Criteria

Impacts to visual resources were assessed in terms of magnitude (intensity), duration, geographic extent, and context. Specific impact criteria for visual resources are described below in Table 4. 111. Methods used to evaluate potential impacts included the contrast rating procedure (BLM 1986a), the visual resources inventory analysis, and a determination of conformance with VRM objectives.

Visual Contrast Rating: Visual contrast rating addressed Indicator #1. Visual contrast was defined per BLM (1986a), as follows:

- *None* The element contrast is not visible or perceived.
- *Weak* The element contrast can be seen but does not attract attention.

- *Moderate* The element contrast begins to attract attention and begins to dominate the characteristic landscape.
- *Strong* The element contrast demands attention, would not be overlooked, and is dominant in the landscape.

Visual Resource Inventory Analysis: The Visual Resource Inventory (VRI) analysis presented in this section addressed Indicator #2. Expected change in scenic quality was evaluated by comparing scenic quality classifications expected during operation of the proposed project to original ratings provided in the Kobuk-Seward Draft RMP and EIS (BLM 2006) and the Iditarod NHT CMP (BLM, 1986b).

Conformance with Visual Resource Management Objectives: The assessment of consistency with existing land use plans addressed Indicator #3: Consistency with goals and objectives contained in the Kobuk-Seward RMP (BLM 1986). This analysis pertained only to those towers located on BLM-administered lands, as actions proposed on private lands, as actions proposed on private lands are not subject to Visual Resource Management (VRM) standards. Conformance with the existing VRM class was based on the correspondence of expected contrast with the designated VRM class, and pertains only to long-term, operations-related conditions.

Table 4.11-1 Impact Criteria for Visual Resources.

Impact Component		Effects Summary	
Magnitude or Intensity	**High –** Project components result in high visual contrast[1] against the existing landscape; viewer duration is prolonged; and views are experienced from foreground-middleground distance zones[1].	**Medium –** Project components result in moderate to high visual contrast[1] against the existing landscape; viewer duration is prolonged or transient; and views are experienced from foreground-middleground or background distance zones[1].	**Low –** Project components result in low to no visual contrast[1] against the existing landscape; viewer duration is prolonged or transient; and experienced from foreground-middleground or background distance zones[1].
Duration	**Permanent –** Changes to landscape character would last longer than the estimated life of the project.	**Long-term –** Changes to landscape character would extend for greater than 1 year, up to the life of the project.	**Temporary –** Changes to landscape character would last less than 1 year or for the duration of project construction.
Geographic Extent	**Extended –** The geographic extent of the affected area would not extend beyond the background distance zone (15 miles) and VRI scores for affected SQRU(s) would be altered.	**Regional –** The geographic extent of the affected area would not extend to the background distance zone (15 miles) and/or VRI scores for affected SQRU(s) would be altered.	**Local –** The geographic extent of the affected area would not extend beyond the foreground-middleground distance zone (3-5 miles); key factor used to rank scenic quality in affected SQRU(s) could be changed; however no change to VRI values for affected SQRUs would result.
Context	**Unique –** The affected area is ranked as VRI Class I, and/or is managed by VRM Class I Objectives, or other legislation aimed at the protection of visual resources.	**Important –** The affected area is ranked as VRI Class II (high visual value) or III (moderate visual value), and/or is managed by VRM Class II or III Objectives.	**Common –**The affected area is ranked as VRI Class IV (low visual value), and/or is managed by VRM Class III or IV Objectives.

The visual resources impact analysis was completed using photo simulations and related data on visibility, visual contrast, and scale dominance collected for the TERRA-NW EA (BLM 2012a).

The following assumptions were derived from this work and applied to the impact analysis for the proposed project:

- Visual contrast is perceived as weak at a distance of 3 miles. for a 60 ft. repeater tower, and distance of five miles for a 250 ft. repeater tower;
- Topography contributes to the level of perceived contrast, as portions of the tower – and all auxiliary structures – could be wholly or partially shielded by existing terrain. Likewise, variable topography could limit the duration of view of the proposed structures, as viewers would move in and out of the viewshed of the structure; and,
- Associated structures would be painted matte gray in color where views of the project would be experienced primarily during summer months
- Associated structures painted white/off-white where views of the project would be experienced primarily during periods of contiguous snow cover (i.e., from the Iditarod NHT).

4.11.2 Alternative 1 – No Action

Under the No Action Alternative, Broadband Internet would continue to be delivered by local companies via satellite. Satellite technology would not be visible from ground-based viewpoint or aircraft, and no night lighting would be detectable. Consequently, impacts to visual resources would not result from implementation of the No Action Alternative.

4.11.3 Alternative 2 –Five Towers on BLM Land (Proposed Action)

Alternative 2 includes the construction and operation of five microwave repeater sites proposed on BLM-administered land. The project would be constructed and operated at all hill top sites using microwave repeaters measuring 60 feet in height. Two repeaters measuring 250’ in height would be constructed on the Baldwin Peninsula, with one located on BLM-administered lands and one located on private land. These towers would require aircraft avoidance lighting.

<u>Direct and Indirect Impacts</u>

Construction

Construction of the proposed towers would result in temporary direct impacts to visual resources. Direct effects would result from construction-related actions occurring at: (1) staging areas, (2) along air- or ground-transport routes, and (3) tower sites. Indirect effects from all construction activities could include a change in perception by resident, or individuals engaged in subsistence activities or recreation within the analysis area. Such viewer groups are considered to have moderate to high visual sensitivity, and consequently could select against areas where construction activities are detectable. Direct effects of construction-related actions are discussed below, and summarized in Table 4.11-2.

Staging Areas

At staging areas located at the communities of Koyuk and Buckland, direct effects would be of low intensity, resulting from none-weak visual contrast introduced by stockpiling of materials and increased activity on land and movement overhead as a result of air transport of materials and personnel. Perceived weak visual contrast is expected to be localized (i.e., within 3-5 miles)

due to the presence of existing community infrastructure in the area. Visual contrast would be apparent but would not attract attention. Though no VRI or VRM designation is applied to the area, the affected resource is considered common due to its location within the communities of Koyuk and Buckland whose landscape character includes existing infrastructure.

At the Baldwin Peninsula beach staging area, direct impacts from construction are expected to be of medium intensity, resulting from moderate visual contrast of construction-related material, machinery, crane, and vehicles against the otherwise natural landscape. Medium intensity impacts would be localized, and restricted to the foreground-middleground distance zone (3-5 miles). Direct impacts would be experience by marine travelers, and overland travelers engaged in subsistence or recreation. The affected resource is considered common as indicated by the VRI Class IV designation and VRM Class III Objective. Views of staging areas from offshore locations would be limited, as all staging activities are planned for the fall season. Visual contrast would begin to attract attention and could begin to dominate the characteristic landscape.

Air or Ground Transport Routes

Direct impacts of air-transport of construction materials to hilltop sites in expected to be of low intensity, resulting in weak visual contrast when viewed from on-ground locations. Visual contrast would be localized, as helicopters are only expected to be visible to viewers situated within 3-5 miles of the flight path. Views would be intermittent and temporary, and are not expected to dominate views. Direct impacts of air-transport of construction materials would primarily affect common resources; however important resources would also be affected where air transport was directed to the Ungalik River Repeater (VRI Class II/VRM Class II). A refueling and resupply/staging point and mid-route emergency stopping point would be located at the Bear Creek Camp located approximately 20 miles due west of the Talik Repeater. Direct impacts to visual resources resulting from varied components of the camp (sleeping and cooking tents and 12 55-gallon fuel drums) would be of low intensity, characterized by weak visual contrast beyond the foreground-middleground distance zone (3-5 miles). Impacts would be temporary, and would affect common resources, as defined by VRI and VRM Class IV designations.

Direct impacts of overland transport of construction-related materials from the Baldwin Peninsula Beach staging area to the Baldwin Peninsula repeater site would result in no-weak visual contrast when viewed from offshore locations, land-based locations situated at grade, or aerial vantage points, as views of vehicles would be intermittent and temporary, and would not dominate views. Any direct impacts would be localized, and affecting a common resource as indicated by the VRI Class IV and VRM Class III designations.

Indirect impacts would be temporary with changes to landscape character would last less than 1 year or for the duration of project construction and localized as no changes to VRI values for affected SQRUs would result.

Repeater Sites

Direct impacts from construction of microwave towers on hilltop and Baldwin Peninsula sites is expected to be of low intensity and localized, resulting in weak visual contrast when viewed from locations beyond 3 and 5 miles, respectively. Visual contrast is expected to result from increased movement, and contrast in color and form of equipment against the natural

environment. At hilltop sites, direct effects expected to result from construction would occur during snow-free summer months, and may indirectly result in avoidance of the area by local outfitters and recreational travelers. Conversely, winter or spring recreational users on the Iditarod race route, where it passes within the viewshed of the Ungalik River Repeater, would not be affected by construction-related actions. Impacts would be temporary, and would affect common resources.

Direct effects expected to result from construction of the proposed Baldwin Peninsula Repeater and would occur during late winter months, thereby minimizing views of construction-related activities by marine travelers. Individuals engaged in subsistence or recreation from the nearby City of Kotzebue may be temporarily exposed to moderate visual contrast if situated within five miles of the proposed repeater site. The affected resources at the Baldwin Peninsula are considered common, as indicated by VRI Class IV and VRM Class III designation.

Indirect effects resulting from construction of the Kotzebue Community Tower (KIC Site) would result in similar impacts as that described for the Baldwin Peninsula Repeater. The affected resource is considered common, as indicated by the VRI Class IV and VRM Class III.

Table 4.11-2 Summary of Construction-Related Impacts to Visual Resources

Construction-Related Action	Relevant Repeater Sites	VRI of Affected Area	VRM of Affected Area	Magnitude (Intensity)	Duration	Geographic Extent	Context
Staging - Koyuk and Buckland	Hilltop	N/A[1]	N/A[1]	low	temporary	localized	important
Staging – Baldwin Peninsula Beach	Baldwin Peninsula	IV	III	moderate	temporary	localized	common
Air Transport	Hilltop	II and IV	II, III, and IV	low	temporary	localized	common / important
Ground Transport	Baldwin Peninsula	IV	III	low	temporary	localized	common
Repeater Sites	Hilltop	II and IV	II, III, and IV	low	temporary	localized	common
	Baldwin Peninsula	IV	III	low	temporary	localized	common

[1] N/A = Not Applicable as site is not located on BLM-administered lands

Operation

Operations-related impacts resulting from the proposed hilltop and Baldwin Peninsula repeater sites would differ due to the geographic location, type of tower constructed, and potential exposure to sensitive viewers. For all sites, potential viewer groups could include: (1) individuals engaged in subsistence activities; (2) recreators engaged in activities such as snow machining, dog mushing, hunting, fishing, wildlife viewing, camping, hiking; and (3) commercial reindeer grazing. Due to the remoteness of the project area, and difficulty in access, recreation use level would be considered low (Section 4.8- Recreation). Viewer groups associated with the Kotzebue Community Tower (KIC and Air Force sites) would include residents of the nearby City of Kotzebue.

Visual Contrast

The proposed towers and auxiliary structures at all sites are characterized by distinct vertical/diagonal lines and smooth texture that would contrast the existing landscape to varying degrees based on the location of the viewer (distance and vantage point). For hilltop sites where proposed towers measures 60 ft., direct impacts to visual resources would be of medium intensity and localized, characterized by moderate-strong visual contrast in form, line, and texture when viewed from locations within 3 miles (BLM 2012). For the taller, 250 ft. towers proposed for the Baldwin Peninsula site and KIC Site, direct impacts would be of moderate to high intensity and localized, characterized by moderate-strong visual contrast in form, line, color, and texture extending to a distance of approximately five miles. This estimation is based on perceived contrast of similar lattice-style transmission towers viewed at this distance (BLM 2011). Visual contrast in color from these two proposed structures would be greater due to the red/white paint and/or night lighting that would be required. Direct impacts resulting from all repeater sites would be long-term, extending for the duration of the project. Direct impacts from all repeater sites, with the exception of the Ungalik River Repeater site, would affect common resources, as specified by the ranking as VRI Class IV, and management by VRM Class III and IV objectives. Direct impacts resulting from the Ungalik River Repeater would affect important resources, as defined by a ranking of VRI Class II, and management by VRM Class II objectives.

The proposed Ungalik River Repeater tower would be located approximately two miles from the Iditarod NHT at its closest point. Consequently, moderate visual contrast in form, line, and texture could be perceived from this location. Weak visual contrast in color is expected, particularly if auxiliary structures are painted with non-reflective white paint. The perceived contrast could be further minimized by the potential visual absorption provided by the expansive scale of the characteristic landscape relative to the tower structure.

Indirect impacts to visual resources in the project area are expected to result from the connected action of the KIC Tower located on private land on the Baldwin Peninsula. The proposed tower would measure 250 ft., and consequently would introduce moderate visual contrast in form, line, color and texture when viewed from the nearby City of Kotzebue. Moderate visual contrast could extend to a distance of approximately five miles). Visual contrast in color from the proposed structure would be greater as red/white paint and/or night lighting would be required.

VRI Analysis – All tower sites, with the exception of the Ungalik River Repeater site, is classified as VRI Class IV. The Ungalik River Repeater site is classified as VRI Class II. Because no component data on scenic quality, visual sensitivity, and visual distance zones are available, no VRI analysis was completed for this planning area.

Scenic quality data are available for the portion of the Iditarod NHT located within the analysis area for the Ungalik River Repeater. The SQRUs pertaining to this area were ranked as having Class C scenic quality (BLM 1982). Based on the contrast rating determination, operation of the proposed project would not change the Scenic Quality Classification for the NS-02, NS-03, and NS-04 SQRUs. Though weak-moderate visual contrast would be observed for approximately 10 miles of the IDHT, such impacts would be of low intensity, and would not reduce the existing scenic quality score below the designated classification of C (BLM 1982). The proposed project would not affect any “Significant Viewpoint” located along the Iditarod NHT. The Iditarod NHT is considered a unique resource due to this trail’s management designation of VRM Class I within the 1,000 foot corridor surrounding the trail.

Conformance with VRM Objectives: Based on the analysis of contrast, including additional landscape analysis factors of viewer duration, angle of observation, and landscape scale, the proposed project was determined to conform with existing VRM objectives. Rationale for each determination is provided in Table 4.11-3.

Table 4.11-3 Determination of Conformance with VRM Objectives

Repeater	VRM Class	Objective	Meet VRM (Y/N)	Rationale
Ungalik River	II	Retain the existing character of the landscape. The level of change to the characteristic landscape should be low.	Y	The localized impacts to visual resources would not result in a change to the characteristic landscape.
Dime	III	Partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate.	Y	The localized impacts to visual resources would not result in a change to the characteristic landscape.
Talik	IV	Provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.	Y	The localized impacts to visual resources would not result in a change to the characteristic landscape. .
Harvey	IV	Provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.	Y	The localized impacts to visual resources would not result in a change to the characteristic landscape.
Baldwin Peninsula	III	Partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate.	Y	The medium intensity action, though localized, could result in a moderate change to the characteristic landscape.

Decommissioning

Decommissioning of the proposed towers is expected to result in moderate, short-term direct effects to visual resources. Direct effects would likely result from the level of activity at each project site, and the increased movement overhead as a result of air transport of materials and personnel. Moderate temporary indirect effects may result from changes in perception of the landscape character of the viewshed areas, as recreational visitors, or individuals engaged in subsistence may avoid areas where impacts could be detected.

Cumulative Impacts

The communities of the analysis area are considered a part of the existing characteristic landscape. Likewise, the Iditarod race route, visible due to depression and scarring of the ground plane, is considered part of the characteristic landscape. Reasonably foreseeable future actions (RFFAs) include construction and operation of the TERRA Backbone System (including 26 community tower sites and 22 remote microwave tower sites) and impacts of climate change on visual resources.

The proposed project is expected to result in overall long-term, weak to moderate intensity impacts to visual resources; however, impacts are expected to be localized and primarily affecting common resources. Important and unique resources surrounding the Ungalik River Repeater could be affected. Collectively, direct and indirect effects of the proposed project are expected to result in minor-moderate effects to visual resources. Identified RFFAs pertaining to the expansion of the TERRA Backbone are expected to result in similar low intensity and localized impacts, although the context of such impacts is not currently known. Climate change could change the spatial and temporal distribution of snowpack and nearshore ice, vegetation communities, and thaw lakes- all of which would impact landscape character of the project area. It is possible that changes in landscape character attributes, including form, line, color, and texture of vegetation, snowpack and water, could increase visual contrast of the proposed structure if color changes were apparent in the landscape. Although impacts of the proposed project would extend 20 years (i.e., long-term), the overall contribution of the proposed action to cumulative effects to visual resources is expected to be minor. Should RFFAs affect the unique resource of the Iditarod NHT, the contribution of the proposed project to those cumulative effects would still be minor due to the limited geographic extent of direct and indirect impacts.

Summary

Impacts to visual resources are consistent with existing VRM objectives defined in the Kobuk-Seward RMP (BLM 2008). The impacts to visual resource and relevant impact criteria analysis are summarized as follows:

Visual contrast is primarily ranked as low. However, moderate visual contrast may result from 250 foot towers located on Baldwin Peninsula, and the Ungalik River Repeater as viewed from the Iditarod NHT. The intensity of the impact would be considered low to moderate. Project components would result in low to no visual contrast against the existing landscape but may be moderate where visual contrast against the existing landscape; viewer duration is prolonged or transient; and views are experienced from foreground-middleground or background distance zones.

Impacts would persist through the life of the project and the duration would be considered long term with changes to landscape character would extending for greater than 1 year, through the life of the project.

The geographic extent of impacts is not expected to extend beyond 3 miles for all hilltop sites, and beyond five miles for all Baldwin Peninsula sites and would be considered local. Key factors used to rank scenic quality in affected SQRU(s) of the Iditarod NHT would be reduced; however no change to VRI values for affected SQRUs would result.

With the exception of the affected area surrounding the Ungalik River Repeater all sites are considered common in context, as they are ranked as VRI Class IV (low visual value) and managed by VRM Class III or IV objectives. All hilltop sites, with the exception of the Ungalik River Repeater site, are managed by VRM IV objectives, providing for management activities requiring major modification of the existing character of the landscape and allowing high level of change to the characteristic landscape. The Baldwin Peninsula sites are managed by VRM Class III objectives, allowing for a moderate level of change to the characteristic landscape. The Ungalik River Repeater site is considered important in context, as lands are ranked as VRI Class II (high visual value), and managed by VRM Class II Objectives, allowing for a low change to

the characteristic landscape. The portion of the Iditarod NHT affected by the Ungalik River Repeater is considered unique, as defined by the ranking of VRI class II (high visual value), and management by VRM Class I class objectives.

The contribution to cumulative impacts on visual resources would be minor due to the limited geographic extent of direct and indirect impacts.

4.11.4 Alternative 3 – Six Towers on BLM Land

Direct and Indirect Impacts

Construction

Construction of the proposed towers would result in temporary direct and indirect impacts to visual resources at the Ungalik River, Dime, Talik, Harvey, and Baldwin Peninsula repeater sites that are similar to those discussed for Alternative 2. Direct effects expected to result from construction of the Kotzebue Community Tower (Air Force Site) would also be similar to those discussed for the Kotzebue Community Tower (KIC Site).

Operation

Operation of the proposed towers would result in direct and indirect impacts to visual resources at the Ungalik River, Dime, Talik, Harvey, and Baldwin Peninsula Repeater sites that are similar to those discussed for Alternative 2. Direct effects expected to result from operation of the Kotzebue Community Tower USAF site would also be similar to those discussed for the Kotzebue Community Tower KIC Site; however, visual contrast resulting from the vertical line of the tower would be similar to vertical lines of the existing wind turbines. Localized impacts to visual resources would also be further minimized due to the presence existing modifications resulting from the adjacent radar, dump, and above ground utility lines.

The proposed USAF site is ranked as VRI Class IV, and managed by VRM Class III Objectives. The proposed project would conform to VRM Class III objectives as the existing character of the landscape would be retained, and the level of change to the characteristic landscape would be moderate.

Decommissioning

Decommissioning of the proposed towers is expected to result in moderate, short-term direct effects to visual resources. Direct effects would likely result from the level of activity at each project site, and the increased movement overhead as a result of air transport of materials and personnel. Moderate temporary indirect effects may result from changes in perception of the landscape character of the viewshed areas, as recreational visitors, or individuals engaged in subsistence may avoid areas where impacts could be detected.

Cumulative Impacts

Cumulative impacts would be similar to those described in Alternative 2.

Summary

The effects of Alternative 3 would be similar to those described in Alternative 2.

4.12 Cultural Resources

Section 106 of the National Historic Preservation Act and its implementing regulations (Title 36 Code of Federal Regulations Part 800) establish three possible findings of effect for an undertaking: **no historic properties effected**, **no adverse effect** and **adverse effect** (see Table 4.12-1 for details). An initial finding of **no historic properties effected** or **no adverse effect** will generally end the section 106 process for an undertaking. A finding of **adverse effect** will trigger mitigation (such as avoidance, education, additional research or excavation) intended to offset the undertaking's effect on historic properties eligible for listing on the National Register of Historic Places (NRHP).

Table 4.12-1 Possible Findings and Criteria for Determining Effects on Cultural Resources

No Historic Properties Effected	No Adverse Effect	Adverse Effect
A finding of **no historic properties effected** can be made when no historic properties are found or no effects on historic properties are found from an undertaking.	A finding of **no adverse effect** can be reached when an undertaking's effects do not meet the criteria of an adverse effect or when an undertaking is modified or conditions are imposed to ensure consistency with the Secretary's standards for the treatment of historic properties (36 CFR part 68) and applicable guidelines, to avoid adverse effects.	An **adverse effect** is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

Note: This information is taken from the guidelines for the assessment of adverse effect for the Section 106 process, 36 CFR Part 800 Subpart B, 800.5 (a)(1), (b) and 800.4 (d)(1).

4.12.1 Alternative 1 – No Action Alternative

Direct and Indirect Effects of Alternative 1 on Federal Lands

The implementation of Alternative 1 would have no direct or indirect effect on cultural resources, TCPs, or paleontological sites within the project area. It is recommended that the selection of Alternative 1 would result in a finding of "**No Historic Properties Effected**". The BLM, as the federal lead agency, will consult with the Alaska State Historic Preservation Officer regarding this recommendation.

4.12.2 Alternative 2 –Five Towers on BLM Land and One Connected Action

Direct and Indirect Effects of Alternative 2 on Federal Lands

Ungalik River Repeater Site

No new cultural resources were identified during the pedestrian survey and subsurface testing at the Ungalik River Repeater Site.

Construction, operation and decommissioning of the Ungalik River Repeater would have an indirect visual effect on the National Register of Historic Places (NRHP) eligible Iditarod National Historic Trail, which passes two miles west of the site. As currently designed, the unlighted 55 foot tower would be located below the crest of the hill, which would break up its silhouette (particularly from the north and northwest) and limit its visibility from the Iditarod National Historic Trail.

Using the criteria established under Section 106 of the NHPA, it is recommended that construction, operation and decommissioning of the Ungalik River Repeater would have no direct effect on cultural resources eligible for listing on the NRHP and that the indirect visual effect caused by the construction and operation of the Ungalik River Repeater on the NRHP eligible Iditarod National Historic Trail would not constitute an "Adverse Effect" (NLUR 2012). BLM will consult with SHPO regarding this recommendation.

Dime Repeater Site

No NRHP eligible cultural resources were identified during the cultural resources literature review for the proposed Dime Repeater. A single US Coast and Geodetic Survey marker and associated tripod remains were recorded within the Dime Repeater APE during the 2012 cultural resources survey. Using the criteria established by Section 106 of the NHPA and its implementing regulations, it is recommended that these features are not eligible for listing on the NRHP and that the construction, operation and decommissioning of the Dime Repeater would have no direct or indirect effect on cultural resources eligible for listing on the NRHP (NLUR 2012). BLM will consult with SHPO regarding these recommendations.

Talik Repeater Site

No NRHP eligible cultural resources were identified during the cultural resources literature review and survey of the Talik Repeater site. Using the criteria established under Section 106 of the NHPA and its implementing regulations, it is recommended that construction, operation and decommissioning of the Talik Repeater would have no direct or indirect effect on cultural resources eligible for listing on the NRHP (NLUR 2012). BLM will consult with SHPO regarding this recommendation.

Harvey Repeater Site

No NRHP eligible cultural resources were identified during the cultural resources literature review and survey of the Harvey Repeater site. Using the criteria established under Section 106 of the NHPA and its implementing regulations, it is recommended that construction, operation and decommissioning of the Harvey Repeater would have no direct or indirect effect on cultural resources eligible for listing on the NRHP (NLUR 2012). BLM will consult with SHPO regarding this recommendation.

Baldwin Peninsula Repeater Site

No NRHP eligible cultural resources were identified during the cultural resources literature review and survey of the Baldwin Peninsula Repeater site. Using the criteria established under Section 106 of the NHPA and its implementing regulations, it is recommended that construction, operation and decommissioning of the Baldwin Hills Repeater would have no direct or indirect effect on cultural resources eligible for listing on the NRHP (NLUR 2012). BLM will consult with SHPO regarding this recommendation.

Baldwin Peninsula Beach Landing Area and Ice Road

The cultural resources literature review identified no cultural resources eligible for listing on the NRHP in the vicinity of the Baldwin Peninsula Repeater Site Beach Landing Area and Ice Road. The Baldwin Peninsula Repeater Site Beach Landing Area and Ice Road were not surveyed during the 2012 cultural resources survey.

To complete the Section 106 process, an archeological survey will be conducted to assess potential direct and indirect effects caused by the construction, operation, and decommissioning of the Baldwin Peninsula Repeater Site Beach Landing Area and Ice Road on known and unknown cultural resources in the vicinity. Cultural resources fieldwork will be guided by ROPs and stipulations attached to the BLM permits, if these are approved for the proposed action. Upon completion of this assessment, the SHPO will be asked to provide a formal determination of effect for this phase of the project before the BLM grants a right-of-way for this site.

Direct and Indirect Effects of Alternative 2 on the Connected Action

KIC Site (Kotzebue Community Tower Alternative 2)

The KIC Site is located on Kikiktargruk Inupiat Corporation [KIC] land. The proposed KIC Site was not surveyed during the 2012 cultural resources survey.

There are no known cultural resources within the KIC Repeater APE. The cultural resources literature review revealed 33 Alaska Heritage Recourses Survey [AHRS] sites within three miles of the KIC Repeater tower center point. The KIC Repeater APE is located south of the Kotzebue White Alice Communication System [WACS] station, Historic District (KTZ-00037). The WACS Historic District was determined eligible for listing on the NRHP in 1988, but all but one of the 23 contributing elements of the District were mitigated and demolished in the late 1990s. As a result, the WACS Historic District and the 22 demolished sites no longer retain the integrity required to be listed on the NRHP.

The surviving Kotzebue Radome Tower (KTZ-00190) is still individually eligible for listing on the NRHP under Criterion A. Two other sites associated with Air Force activities, the Kotzebue Long Range Radar Site [LRRS] Road System (KTZ-00231) and the LRRS Gravel Pad System (KTZ-00232) have also been determined eligible for listing on the NRHP under Criterion A and Criterion C.

There are eight AHRS sites within three miles of the KIC Repeater Site that are not directly associated with US military activities. Of these, two (Intermediate Kotzebue (KTZ-00030) and the Kotzebue Archaeological District (KTZ-00036)) have been determined eligible for listing on the NRHP under Criterion D. These historic properties are located in the village of Kotzebue, two to three miles from the KIC Repeater site. The five remaining sites have not been subjected to a formal determination of eligibility.

Construction of the KIC Repeater would have an indirect visual effect on five sites eligible for listing on the NRHP. Using the criteria established by Section 106 of the NHPA and its implementing regulations, the contract archaeologist from NLUR recommended that this effect would not rise to the level of an "**Adverse Effect**" as defined in 800.5 of 36 Code of Federal Regulations Part 800 (NLUR, 2012).

To complete the Section 106 process, an archeological survey will be conducted to assess potential direct and indirect effects caused by the construction, operation, and decommissioning

of the site on known and unknown cultural resources in the vicinity. This process will be guided by ROPs outlined in Table 2-11 and stipulations attached to the BLM permits, if these are approved for the proposed action. Upon completion of this assessment, the SHPO will be asked to provide a formal determination of effect for this phase of the project before the BLM grants rights-of-way for the BLM sites associated with the project.

Since the KIC Site is 2,200 feet from the USAF, the summary of potentially affect individual sites shown in Table 4.12-2 would be the same for Alternative 2.

Table 4.12-2 is a summary of potentially affected individual repeater sites for Alternative 2. No traditional cultural properties or paleontological sites were identified in the project vicinity (NLUR 2012).

Table 4.12-2 Summary of Cultural Resource Findings by Location for Alternative 2

Site Name	Cultural Resources Identified in 2012	Cultural Resources Within 3 Miles	National Register-Eligible Sites Within 3 Miles	Predicted Effect on Sites Eligible for Listing on National Register	Adverse Effect?
Ungalik River Repeater*	None	One	One	Indirect visual effect on one NRHP eligible cultural resource	No
Dime Repeater*	None	None	None	None	No
Talik Repeater*	None	None	None	None	No
Harvey Repeater*	None	None	None	None	No
Baldwin Peninsula Repeater*	None	None	None	None	No
Baldwin Peninsula Beach Landing Area & Ice Road*	N/A	None	None	TBD	TBD
KIC Repeater	N/A	33	5	Indirect visual effect on 5 eligible cultural resources. Direct effects TBD.	TBD

*Federally managed lands. TBD= to be determined.

Cumulative Effects

This section considers the extent to which the proposed action, connected actions, and alternatives would make additive or synergistic contributions to cumulative effects on cultural resources in the project area. The overall footprint of the proposed project is small (about 26 acres) and is spread over a large area, and therefore the project will have an extremely small cumulative effect in the region.

The construction phase of Alternative 2 would have no direct effect on known cultural resources at the five proposed tower sites on BLM-managed lands (Ungalik River, Dime, Talik, Harvey, and Baldwin Peninsula). No NRHP eligible cultural resources were identified within the direct APE of these sites during the cultural resources literature review or survey. Construction of the Ungalik Repeater would have an indirect visual effect on the NRHP eligible Iditarod National Historic Trail, but it is recommended that this would not rise to the level of an Adverse Effect.

The Construction phase would have a temporary indirect visual effect on cultural resources in the vicinity of all the sites on BLM-managed lands, due to the presence of construction equipment, personnel and helicopter traffic.

The Baldwin Peninsula Repeater Site Beach Landing Area and Ice Road were subjected to a cultural resources literature review but not surveyed in 2012. No NRHP eligible cultural resources were identified within three miles of these sites during the literature review. Before ground-disturbing activities commence at these sites, an archeological survey will be conducted of the barge landing area and ice road. After this survey and analysis is completed, the BLM will ask the SHPO for a formal determination of effect on this phase of the Project before granting a right-of-way.

Since the Baldwin Peninsula Repeater Site, Beach Landing Area and Ice Road's sole function is to transport equipment and material to the Baldwin Peninsula Repeater Site during construction, their effect will be limited to the construction phase of the project.

The connected action, consisting of the KIC Site located on Kikiktargruk Inupiat Corporation land, was subjected to a cultural resources literature review but was not surveyed in 2012. Before ground-disturbing activities commence, an archeological survey will be conducted at this site. After this survey and analysis is completed, the BLM will ask the SHPO for a formal determination of effect for the KIC Site before granting a right-of-way.

To insure the protection of cultural resources, procedures will be established concerning inadvertent discovery of cultural resources during all phases of the project and will be included as a stipulation in the right-of-way grant.

The operation of all the tower sites would introduce no new direct cumulative effects to known cultural resources in the project area. There would be a slight indirect visual effect caused by helicopter transportation to and from the sites. Procedures will be established concerning inadvertent discovery of cultural resources during all phases of the project.

During the decommissioning phase, which could occur before the 20 year lease is complete or after the lease is renewed, all project structures and equipment will be removed. This would re-introduce the potential for direct or indirect effects similar to those experienced during the construction phase. Since all construction sites will have been surveyed prior to construction, decommissioning activities will be planned and carried out so as to avoid damage to known archeological resources. Procedures will be established concerning inadvertent discovery of cultural resources during all phases of the project.

If TERRA-NW facilities remain in operation for 50 years, they will be potentially eligible for listing on the NRHP. In this case, a NRHP eligibility evaluation will be completed prior to decommissioning.

Summary

Based upon the current level of analysis for the five project sites surveyed in 2012, no direct or indirect adverse effects are anticipated on cultural resources eligible for listing on the NRHP.

Additional surveys and determinations of effect will be completed for the Baldwin Peninsula Beach Landing Area and Ice Road as well as the KIC Site prior to the commencement of construction at these sites.

4.12.3 Alternative 3 – Six Towers on BLM Land

Direct and Indirect Effects of Actions on Federal Lands

Alternative 3 incorporates all of the elements of Alternative 2 except the KIC Site which is replaced by the U.S. Air Force [USAF] Site (see below). See Alternative 2 (section 4.1.2) for information on direct and indirect effects of the Project on the Ungalik, Dime, Talik, Harvey and Baldwin Peninsula Repeaters as well as the Baldwin Peninsula Repeater Beach Landing Area and Ice Road.

USAF Site (Kotzebue Community Tower Alternative 3)

The proposed USAF Site is located on federal land reserved for use by the USAF. The site was not surveyed during the 2012 field season.

The cultural resources literature review revealed 33 Alaska Heritage Recourses Survey [AHRS] sites within three miles of the USAF Repeater tower center point. The USAF Repeater APE is located within the Kotzebue White Alice Communication System [WACS] station, Historic District (KTZ-00037). The WACS Historic District was determined eligible for listing on the NRHP in 1988, but all but one of the 23 contributing elements of the District were mitigated and demolished in the late 1990s. As a result, the WACS Historic District and the 22 demolished sites no longer retain the integrity required to be listed on the NRHP.

The surviving Kotzebue Radome Tower (KTZ-00190) is still individually eligible for listing on the NRHP under Criterion A. Two other sites associated with Air Force activities, the Kotzebue Long Range Radar Site [LRRS] Road System (KTZ-00231) and the LRRS Gravel Pad System (KTZ-00232) have also been determined eligible for listing on the NRHP under Criterion A and Criterion C. The USAF Repeater APE includes a portion of the Kotzebue LRRS Road System (KTZ-00231) and is adjacent to the LRRS Gravel Pad System (KTZ-00232).

There are eight AHRS sites within three miles of the Air Force Repeater Site that are not directly associated with US military activities. Of these, two (Intermediate Kotzebue (KTZ-00030) and the Kotzebue Archaeological District (KTZ-00036)) have been determined eligible for listing on the NRHP under Criterion D. These historic properties are located in the village of Kotzebue, two to three miles from the Air Force Repeater site. The five remaining sites have not been subjected to a formal determination of eligibility.

Construction of the USAF Repeater would have an indirect visual effect on five sites eligible for listing on the NRHP. Using the criteria established by Section 106 of the NHPA and its implementing regulations, the contract archaeologist from NLUR recommended that this effect would not rise to the level of an "**Adverse Effect**" as defined in 800.5 of 36 Code of Federal Regulations Part 800 (NLUR, 2012).

The cultural resources literature review indicated that the WACS Historic District (KTZ-00037), of which the USAF Repeater is a part has been the subject of extensive historical and archaeological research (NLUR 2012). As such, a survey and subsurface testing of the USAF Repeater APE is unlikely to reveal significant undiscovered cultural resources. However, if the USAF Repeater becomes the selected alternative, an archeological survey will be conducted to complete the Section 106 process for the site. The goal of this survey will be to assess direct and indirect effects caused by the construction, operation, and decommissioning of the USAF Repeater on known and unknown cultural resources in the vicinity. Upon completion of this

assessment, the SHPO will be asked provide a formal determination of effect for this phase of the project before the granting of a BLM right-of-way. This process will be guided by ROPs and stipulations attached to the BLM permits, if these are approved for the proposed action.

Table 4.12-3 is a summary of potentially affected individual repeater sites for Alternative 3. No traditional cultural properties or paleontological sites were identified in the project vicinity (NLUR 2012).

Table 4.12-3 Summary of Cultural Resource Findings by Location, Alternative 3

Site Name	Cultural Resources Identified in 2012	Cultural Resources Within 3 Miles	National Register-Eligible Sites Within 3 Miles	Predicted Effect on Sites Eligible for Listing on National Register	Adverse Effect?
Ungalik River Repeater*	None	One	One	Indirect visual effect on one NRHP eligible cultural resource	No
Dime Repeater*	None	None	None	None	No
Talik Repeater*	None	None	None	None	No
Harvey Repeater*	None	None	None	None	No
Baldwin Peninsula Repeater*	None	None	None	None	No
Baldwin Peninsula Beach Landing Area & Ice Road*	N/A	None	None	TBD	TBD
USAF Site* (Kotzebue Community Tower)	N/A	33	5	Indirect visual effect on 5 NRHP eligible cultural resources. Direct effects TBD.	TBD

* Federally managed lands. TBD= to be determined.

Cumulative Effects

This section considers the extent to which the proposed action, connected actions, and alternatives would make additive or synergistic contributions to cumulative effects on cultural resources in the project area. The overall footprint of the proposed project is small (almost 26 acres plus the area associated with the barge landing and ice road) and is spread over a large area, and therefore the project will have an extremely small cumulative effect in the region.

The Construction phase of Alternative 2 would have no direct effect on known cultural resources at the five proposed tower sites on BLM-managed lands (Ungalik, Dime, Talik, Harvey, and Baldwin Peninsula). No NRHP eligible cultural resources were identified within the direct APE of these sites during the cultural resources literature review or survey. Construction of the Ungalik Repeater would have an indirect visual effect on the NRHP eligible INHT, but would not rise to the level of an Adverse Effect. The Construction phase would have a temporary indirect visual effect on cultural resources in the vicinity of all the sites on BLM-managed lands, due to the presence of construction equipment, personnel and helicopter traffic.

The Baldwin Peninsula Repeater Site Beach Landing Area and Ice Road were subjected to a cultural resources literature review but not surveyed in 2012. No NRHP eligible cultural resources were identified within three miles of these sites during the literature review. Before

ground-disturbing activities commence at these sites, an archeological survey will be conducted of the barge landing area and ice road. After this survey and analysis is completed, the BLM will ask the SHPO for a formal determination of effect on this phase of the Project.

Since the Baldwin Peninsula Repeater Site, Beach Landing Area and Ice Road's sole function is to transport equipment and material to the Baldwin Peninsula Repeater Site during construction, their effect will be limited to the construction phase of the project.

The USAF Site Kotzebue Community Tower was subjected to a cultural resources literature review but was not surveyed in 2012. Before ground-disturbing activities commence, an archeological survey will be conducted at this site. After this survey and analysis is completed, the BLM will ask the SHPO for a formal determination of effect for the USAF Site Kotzebue Community Tower before the granting of a right-of-way for this phase of the project.

To insure the protection of cultural resources, procedures will be established concerning inadvertent discovery of cultural resources during all phases of the project.

The operation of all the tower sites would introduce no new direct cumulative effects to known cultural resources in the project area. There would be a slight indirect visual effect caused by helicopter transportation to and from the sites. Procedures will be established concerning inadvertent discovery of cultural resources during all phases of the project.

During the decommissioning phase, all project structures and equipment will be removed. This would re-introduce the potential for direct or indirect effects similar to those experienced during the construction phase. Since all construction sites will have been surveyed prior to construction, decommissioning activities will be planned and carried out so as to avoid damage to known archeological resources. Procedures will be established concerning inadvertent discovery of cultural resources during all phases of the project.

If the TERRA-NW facilities remain in operation for 50 years, they will be potentially eligible for listing on the NRHP. In this case, a NRHP eligibility evaluation will be completed prior to decommissioning.

Summary

Based upon the current level of analysis for the five project sites surveyed in 2012, no direct or indirect adverse effects are anticipated on cultural resources eligible for listing on the NRHP.

Additional surveys and determinations of effect will be completed for the Baldwin Peninsula Beach Landing Area and Ice Road as well as the USAF Site Kotzebue Community Tower prior to the commencement of construction at these sites.

4.13 Soils

4.13.1 Alternative 1 – No Action Alternative

Under the Alternative 1, no development would occur so there would be no direct or indirect impacts to soils and no contribution to the cumulative impact of soils.

4.13.2 Alternative 2 – Five Towers on BLM Land (Proposed Action)

Direct and Indirect Impacts

Potential impacts to soils were measured by assessing the magnitude (intensity), duration, geographic extent, and context of anticipated impacts using specific impact criteria. The impact criteria used to assess each indicator are described in Table 4.13-1, below:

Table 4.13-1 Impact Criteria for Effects to Soils

Impact Component		Effects Summary	
Magnitude or Intensity	**High**: Acute or obvious changes to soils.	**Medium**: Noticeable changes to soils.	**Low**: Changes to soils may not be measurable or noticeable.
Duration	**Permanent**: Chronic effects; soil character within the footprint would not be anticipated to return.	**Long-term**: Soil footprint would be removed through the life of the project (20 years) and would return to pre-activity character at some time after completion of the project.	**Temporary**: Soil footprint would be removed only during construction of the project (2 years) and would be expected to return to pre-activity quality at the completion of the activity.
Geographic Extent	**Extended**: Affects soil resources greater than the sum project footprint.	**Regional**: Affects soil resources beyond the project footprint.	**Local**: Soil resource impacts limited geographically to the project footprint.
Context	**Unique**: Affects rare or unique soils or habitat protected by legislation.	**Important**: Affects soils that are depleted within the project area.	**Common**: Affects soils that are usual or ordinary for that region.

Construction

Implementation of proposed action would disturb a total of less than 36.0 acres of shallow subsurface soil for six tower sites. Of that total, 4.8 acres would be affected by project excavation and installation of facilities, with 23.6 acres affected by the helicopter landing areas at Ungalik River, Dime, Talik and Harvey repeater sites. Direct impacts on soils as a result of the proposed action would be of high intensity in a small, localized area and would include excavation, grading, and compaction, and direct loss of soil cover by exposure in the area of the new facilities, and exposure of soils to localized runoff and erosion.

Operations and Decommissioning

Direct impacts from the initial project activities would be highest during construction, but would be reduced in the period following the installation, during annual refueling, and operation and maintenance activities. Direct impact from construction activities and disturbance of vegetation would expose new soil and rock and may cause soil erosion due to potential channelization of

runoff. Re-vegetation is extremely slow in cold environments so the impact is of long duration, possibly the life of the project. The disturbance impacts would be repeated with decommissioning.

Indirect impacts on soils would occur at non-federal sites under this action, and would include excavation, grading and compaction however these impacts would be similar to direct impacts at federal tower sites. Other indirect impacts occurring at all sites would be considered minor. Examples of other indirect impacts at all federal and non-federal sites could be the subsequent or longer-term alteration of permafrost characteristics in the local areas following construction of the towers. Direct and indirect impacts at the staging area on Baldwin Peninsula in the form of erosion from soil and vegetation disturbance, would be highest during construction, but would be reduced in the period following the installation and during annual refueling, and operation and maintenance activities.

Cumulative Impacts

Actions that may have impacted soils at the mountain top tower sites include past, present, and future helicopter-supported resource exploration activities involving drilling rig placement, operation, fueling, and demobilization. Present activities also include drilled soil exploration boring advancements conducted in support of the TNW III Project in September 2012. Cumulative impacts related to these activities include the mobilization of equipment, fuel, and supplies, advancement of exploratory borings, and erosion of soil due to potential channelization of runoff.

The implementation of the proposed action could directly result in disturbance of ground cover on up to 36 acres of regionally common soils for the six sites. The area subject to excavation for installing project components would total 4.8 acres or 28.4 acres if the helicopter landing areas are included. The contribution of 22 remote repeater towers associated with future TERRA phases could contribute an additional 248 acres of soil disturbance during construction and 33 acres during operations. Given the vast expanses of federally owned lands in the TERRA project area, the contribution to cumulative effects for soils is negligible. Several of these proposed future towers may be installed on state and private lands, still representing a small footprint, widely dispersed across a large area.

Summary

Topsoil removal/excavation and facility installation would result in direct and indirect impacts to soils that would be high in intensity resulting in obvious changes to soils and permanent in duration as the soil character within the footprint would not be anticipated to return. The impact to soil resources would be localized in extent to the project footprint. This affected resource would be considered common in context and ordinary throughout the region. The permanent direct impact to soils at the five BLM owned land tower sites would fall within the excavation area for a total of 4.0 acres. The indirect impacts to soils at the one tower site on non-federal lands would amount to 0.8 acres.

4.13.3 Alternative 3 – Six Towers on BLM Land

Direct and Indirect Impacts

Construction

Direct impacts on soils as a result of Alternative 3 would be of high intensity in a small, localized area and would include excavation, grading, and compaction, and direct loss of soil cover by exposure in the area of the new facilities, and exposure of soils to localized runoff and erosion. Direct impacts on soils as a result of Alternative3 would be similar to those described under Alternative 2. There would be no indirect impacts to soils under this alternative.

Operations and Decommissioning

Under Alternative 3, direct impacts from the initial project activities would be highest during construction, but would be reduced in the period following the installation, during annual refueling, and operation and maintenance activities. Disturbance impacts similar to construction would be repeated with decommissioning. Indirect impacts could be the subsequent or longer-term alteration of permafrost characteristics in the local areas following construction of the tower sites, if those areas contain permafrost. These indirect impacts would be high in intensity resulting in obvious changes to soils and permanent in duration as the soil character within the footprint would not be anticipated to return. The impact to soil resources would be localized in extent to the project footprint. This affected resource would be considered common in context and ordinary throughout the region.

Cumulative Impacts

Cumulative impacts to soils under Alternative 3 would be similar to those described in Alternative 2 and would be consider minor.

Summary

Topsoil removal/excavation and facility installation would result in direct and indirect impacts to soils that would be high in intensity, permanent in duration, but would be localized in extent and affect resources that are common in context. The permanent direct impact to soils at the federal tower sites would fall within the excavation area for a total of 4.8 acres. The impact would be high in intensity resulting in obvious changes to soils and permanent in duration as the soil character within the footprint would not be anticipated to return. The impact to soil resources would be localized in extent to the project footprint. This affected resource would be considered common in context and ordinary throughout the region. The summary impact to soils would be minor.

4.14 Hazardous Materials

4.14.1 Alternative 1 – No Action Alternative

Under Alternative 1, the microwave towers would not be built or installed; thus there would be no direct or indirect impacts to environmental resources from potential releases of hazardous materials. With no direct or indirect impacts under Alternative 1 there would be no contribution to cumulative impacts from potential releases of hazardous materials.

4.14.2 Alternative 2 – Five Towers on BLM Land (Proposed Action)

Direct and Indirect Impacts

Potential impacts from potential releases of hazardous materials were measured by assessing the magnitude (intensity), duration, geographic extent, and context of anticipated impacts using specific impact criteria. The impact criteria used to assess each indicator are described in Table 4.14-1, below:

Table 4.14-1 Impact Criteria for Hazardous Materials

Impact Component		Effects Summary	
Probability of Occurrence	**High**: Spill risk exists at a high probability (> 50%)	**Moderate**: Spill risk exists at a moderate probability (< 50% - >5%)	**Low**: Spill risk exists, but at an extremely low probability (< 5%).
Magnitude or Intensity	**High**: Changes to resource function would be measurable and noticeable; functions may cease or impair values.	**Medium**: Changes to resource function may be measurable or noticeable; impacts may diminish function or impair values.	**Low**: Changes to resource system functions and values would not be measurable or noticeable.
Duration	**Permanent**: Impacts to resources would be chronic and extend beyond life of the project (> 20 years).	**Long-term**: Impacts to resources may occur during the life of the project (20 years) but not extend beyond decommission.	**Temporary**: Impacts to resources may occur during project construction (2 years).
Geographic Extent	**Extended**: Affects resources beyond the region or project area.	**Regional**: Affects resources beyond the project footprint, potentially throughout the project area.	**Local**: Impacts limited to the project footprint.
Context	**Unique**: Affects unique resources or resources protected by legislation.	**Important**: Affects depleted resources within the locality or region.	**Common**: Affects usual or ordinary resources.

For project activities under Alternative 2, the primary hazardous material risk comes from the use of various fuels for generators, equipment, and helicopter activities. The quantity of fuel required for construction would be limited to six 55-gallon drums (four for diesel and two for gas) and two 300-gallon fuel bladders, one for aviation jet-A fuel and one for low sulfur #1 diesel fuel. During operations, two double walled 4,500-gallon bulk fuel tanks would store 9,000 gallons of diesel fuel, with 14 annual refueling flights using a 500-gallon fuel bladder.

A formal calculation of hazardous materials spill risk probabilities was not feasible, so instead a scenario-based analysis is offered. Three spill scenarios are analyzed below to demonstrate a range of impacts from a hazardous material release.

Scenario 1 – Release of 4,500 Gallons of Fuel on Site

The hazardous material scenario that presents the greatest potential impact to environmental resources is a catastrophic rupture or slow leak of a 4,500-gallon fuel tank during operations at a tower site with wetlands (e.g. Baldwin Peninsula). The probably of occurrence for this event is considered low (< 5% change of occurrence) given the use of best management practices and design elements such as double walled tanks, overfill shutoff valves, spill containment, and leak detection sensors and alarms. All of these elements greatly minimize the risk of a spill and the volume that would escape into the environment.

If this release were to occur, the intensity of the impact to those resources affected would be high, with measureable impairment of ecological function. Fuel would coat plants and be absorbed into the soil throughout the affected area, potentially several acres, and it is likely that wetland vegetation would be impacted. Regrowth would begin within two seasons and vegetation would slowly recover over the life of the project. Because the volume of fuel is limited and the cleanup would remove any thick concentrations of fuel, impacts to wildlife and fish would be expected to affect individual animals and not have population-level effects. It is unlikely that the spill would impact threatened or endangered species, therefore the spill would affect resources that are important to common in nature.

In summary, the probability of occurrence for this release is low given established procedures and design features of the project. Impact of such a spill and associated response actions would be high in intensity for those areas affected, but local in extent given the limited amount of fuel. Impacts to resources would be long-term to temporary in duration given clean-up activities. If wetlands are affected, this scenario would affect important resources, otherwise only common resources would be impacted.

Scenario 2 – Release of 500 Gallons of Fuel During Refueling Operations

Another potential hazardous materials spill scenario would involve the unlikely event of a dropped sling-load (500 gallons) of fuel during a refueling helicopter flight. The probably of occurrence for this event is considered low (< 5% change of occurrence) given the use of best management practices and the low U.S. helicopter accident rate (Section 3.13.2).

Under this scenario, the resulting spill could affect uplands, wetlands (including ponds and lakes with little current), or streams and rivers. The intensity of such a spill would be medium; with potential changes to resource function and potential diminish ecological function and values. Fuel spilled on land would be absorbed into the soil and not be available for contact or ingestion, while fuel in wetlands and waterways would disperse and minimize the duration the fuel would remain in one location. Because the volume of fuel is limited, impacts are expected to be local in extent. There is potential for this scenario to impact important resources such as wetlands.

In summary, the probability of occurrence for this release is low given the use of best management practices and the low helicopter accident rate. Impact of this scenario would be medium in intensity for those areas affected by the spill, but local in extent given the limited amount of fuel. As noted, impacts to resources would be temporary in duration due to the removal and natural dispersion of fuel from affect resources, which would be important to common depending on the resources affected.

Scenario 3 – Release of 55 Gallons or Less During Construction Activities

The final scenario is the release of 55 gallons or less of fuel during construction activities. This would include the rupture and loss of a 55 gallon drum of fuel, which are stored on site for generator and equipment refueling. Best management practices and design elements, such as temporary containment and proper storage, would make the probability of this spill low (< 5% chance of occurrence) and minimize the volume that escapes into the environment. To date, there have been no reported incidences during previous TERRA projects (Gill 2012). Furthermore, these areas would be easy to access and cleanup actions could be initiated quickly. With the limited amount of fuel, the extent of impacts to resources in this scenario would be contained to a localized area of less than an acre. For the affected area, the intensity of impacts to resources would be low to medium, with no changes to resource system functions beyond the two year construction window. In the event that wetlands surrounding a site are affected, this scenario would impact an important resource; however, it is likely such a release would only affect common resources.

Cumulative Impacts

Past, ongoing, and RFFAs that would contribute impacts to cumulative effects in the project area are discussed in Section 4.1.1. Past and present actions have not resulted in any known spills of hazardous materials in the vicinity of the tower sites on BLM-managed lands. There is a low probability of a spill occurring at the sites. However, if a spill occurred there would be a minor contribution to the cumulative impact depending on the amount of fuel spilled.

The effects of climate change would have no impact on hazardous materials or the probability for spills during the life of the project. If a spill were to occur, clean up response would limit the long-term effects to the environment, and would not affect climate change.

Summary

This section presented three scenarios for hazardous materials releases to impact resources. The scenario with the greatest risk to resources would be the rupture of a 4,500-gallon fuel tank during operations at a site with wetlands. In this scenario, the probability of occurrence is low given established procedures and design features of the project. The intensity of impact impacts to wetlands, wildlife, and fish would be high due to the measurable loss of ecological function with the affected area. However, the extent of the spill would be local due to the limited amount of fuel held within the tank. Impacts to resources would be reduced with clean-up and removal of contaminated materials, but impacts would be long-term to temporary in duration as the impacted site recovers. The habitats and wildlife affected in these scenarios would be important resources.

4.14.3 Alternative 3 – Six Towers on BLM Land

Direct and Indirect Impacts

Under Alternative 3, the direct effects for construction would be the same as in Alternative 2, with the greatest risk to resources for the release of hazardous materials occurring in the scenarios outlined above. As stated prior, the probability of these scenarios occurring is low; however, if the scenario with the greatest risks were to occur it would be high in intensity for those resources affected, but local in extent given the limited amount of fuel. Impacts to

resources would be temporary to long-term in duration and affect common to important resources.

The indirect effects would be the same as in Alternative 2, with the exception of the Kotzebue Community Tower USAF site. In an area that has been intensely developed in the past such as this, there is a high likelihood of past contamination. A Phase I ESA would likely be required and any contaminated sites would need to be cleaned up prior to project installation.

Cumulative Impacts

The cumulative impacts under Alternative 3 would be similar to those for Alternative 2. The proposed towers are planned for remote, sparsely populated, undeveloped areas. A spill would have a low risk of occurrence and would have a minor contribution to cumulative impact.

The effects of climate change would have no impact on hazardous substances during the life of the project. If a spill were to occur, clean up response would limit the long-term effects to the environment, and would not affect climate change.

Summary

The effects under Alternative 3 would be the same as Alternative 2.

5.0 Consultation and Coordination

BLM is the lead agency in the development of this EA. Participation in public scoping and the identification of issues is described in Section 1.3. Alaska Native Tribal Consultation was initiated with the use of letters to Tribes. There was no request for government to government consultation.

BLM has provided information to and invited comments from communities and organizations potentially affected by the proposed action. Federal, State and local governments were contacted as were Alaska Native Corporations and Regional Tribal organizations. Land owners, visitor industry stakeholders, and Non-Governmental Organizations were also contacted, using a mailing list, developed by URS for this EA.

BLM conducted an informal consultation with USFWS regarding Threatened and Endangered Species. The results can be found in Appendix. Section 106 Consultation was initiated with the release of this EIS. This EA will be available for public review and comment for a minimum of 30 days. Following the public review period, public comments will be reviewed by the agencies.

A final decision by the BLM State Directors Office may come in the form of a Finding of No Significant Impact (FONSI), which would take into account any new information and public comment, and select an alternative to implement. If a Finding of No Significant Impact is approved, it would be sent to those individuals and organizations that commented during the public review period.

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6.0 References

Able, K. P. 1970. A radar study of the altitude of nocturnal passerine migration. Bird-Banding 41:282–290.

Alaska Department of Commerce, Community and Economic Development (ADCCED). 2012. Division of Community and Regional Affairs. Alaska Community Database Online, Community Information Summaries- Buckland, Kotzebue, Koyuk, and Shaktoolik. Alaska. http://www.commerce.state.ak.us/dca/commdb/CIS.cfm. Accessed December 2012.

Alaska Department of Fish and Game (ADFG). 2008a. Brown Bear. Alaska Wildlife Notebook Series available at: http://www.adfg.alaska.gov/static/education/wns/brown_bear.pdf.

---. 2008b. Black Bear (*Ursus americanus*) Species Profile http://www.adfg.alaska.gov/static/education/wns/black_bear.pdf

---. 2008c. Wolf. Alaska Wildlife Notebook Series available at: http://www.adfg.alaska.gov/static/education/wns/wolf.pdf.

---. 2008d. Alaska Species of Concern, various species. Available online at: http://www.adfg.state.ak.us/special/esa/species_concern.php.

---. 2009a. Wolf management report of survey-inventory activities 1 July 2005-30 June 2008. P. Harper, editor. Juneau, Alaska.

---. 2009b. Community Subsistence Harvest Data for Buckland, 2009 and Shaktoolik, 2009. Accessed at http://www.adfg.alaska.gov/sb/CSIS/index.cfm?ADFG=harvInfo.harvestCommSelComm January 3, 2013.

---. 2010. Community Subsistence Harvest Data for Koyuk, 2010. Accessed at http://www.adfg.alaska.gov/sb/CSIS/index.cfm?ADFG=harvInfo.harvestCommSelComm January 3, 2013.

---. 2011. Muskox Management Report of survey-inventory activities 1 July 2008-30 June 2010.

---. 2012a. Hunting Maps by Game Management Unit (GMU). http://www.adfg.alaska.gov/index.cfm?adfg=huntingmaps.bygmu. Accessed December 2012.

---. 2012b. Alaska Birder's Birds - Bristle-thighed Curlew.

Alaska Department of Labor and Workforce Development (ADLWD), 2009. Alaska Industry Forecast 2008-2018. Alaska Economic Trends

---. 2010a. Employment in the Seafood Industry: Alaska regions saw mix of losses and gains in 2009. Alaska Economic Trends. November.

---. 2010b. Alaska's Mining Industry: From a golden past to a polymetallic future. Alaska Economic Trends. October.

2011a. Alaska Local and Regional Information (ALARI), Research and Analysis Section. Accessed September 25, 2011 from http://live.laborstats.alaska.gov/alari/details.cfm for

the following villages/communities: Buckland, Kotzebue, Koyuk, and Shaktoolik. Accessed December, 2012.

---. 2011b. Employment Forecast for 2011: Alaska's regional and statewide outlook. Alaska Economic Trends. January.

Alaska Department of Transportation (ADOT) 2011. Kotzebue to Cape Blossom Road – Reconnaissance Study. Environmental Reports. State Project No. 76884. February 2011.

Anchorage Daily News (ADN). 2010. Plane Crashes are Sadly all too Common in Alaska. http://www.aolnews.com/2010/08/12/plane-crashes-are-sadly-all-too-common-in-alaska/ Accessed December 17, 2012.

Alaska Natural Heritage Program. 2012. Alaska Exotic Plants Information Clearinghouse (AKEPIC) University of Alaska. Online: http://aknhp.uaa.alaska.edu/botany/akepic/

Andersen, R., Linnell, J.D.C., and R. Langvatn. 1996. Short term behavioral and physiological response of moose *Alces alces* to military disturbance in Norway. Biological Conservation 77, 169–176.

Bellrose, F.C. 1971. The distribution of nocturnal migrants in the air space. Auk 88:397–424.

Bering Straits Coastal Resource Service Area (CRSA), 2011. Bering Straits Coastal Resource Service Area Coastal Management Plan. Final Plan Amendment, January 2011. Prepared by Glenn Gray and Associates and Sandy Harbanuk and Associates. 2011.

Bishop, L. 2012. Natural Resource Specialist, BLM Anchorage Field Office. Personal communication. Anchorage, Alaska. December 17, 2012

BLM (United States Department of Interior, Bureau of Land Management). 1986a. Manual 8400 The Visual Resource Management System (H-8410)

---. 1986b. The Iditarod National Historic Trail Comprehensive Management Plan

---. 2002. Final Environmental Impact Statement, Renewal of the Federal Grant for the Trans-Alaska Pipeline System Right-of-way. BLM/AK/PT-03/005+2880+990. November 2002.

---. 2005. United States Department of Interior, Bureau of Land Management Land Use Planning Handbook (H-1601-1).

---. 2006. The Kobuk-Seward Peninsula Draft Resource Management Plan

---. 2008. Kobuk-Seward Peninsula Approved Resource Management Plan. U. S. Department of the Interior Bureau of Land Management. Record of Decision and Approved Resource Management Plan

---. 2010. Sensitive Animal and Plant List. Available online: http://www.blm.gov/pgdata/etc/medialib/blm/ak/aktest/ims.Par.52256.File.dat/im_ak_2010_018a1.pdf

---. 2011a. Requirement to Conduct and Maintain Inventory Information for Wilderness Characteristics and to Consider Lands with Wilderness Characteristics in Land Use Plans (Instructional Memorandum No. 2011-154).

---. 2011b. Gateway West Draft Environmental Impact Statement. Available at: http://www.wy.blm.gov/nepa/cfodocs/gateway_west/draft_eis.html. Accessed 31, December, 2012.

---. 2012a. TERRA-Northwest Broadband Telecommunications Project Environmental Assessment. March 2012.

---. 2012b. Conducting Wilderness Characteristics Inventory on BLM Lands (Manual 6310).

Braund S.R. and Associates. 2009. Appendix D – Subsistence In: U.S. EPA 2009 Red Dog Mine Extension Aqqaluk Project Final EIS. Prepared by Tetra Tech. October 2009.

Calef, G. W., DeBock, E. A., and G.M. Lortie. 1976. The reaction of barren-ground caribou to aircraft. Arctic, 29:201-212.

Carruthers, D.R., R.D. Jakimchuk, and S.H. Ferguson. 1984. The Relationship between the Central Arctic Caribou Herd and the Trans-Alaska Pipeline. Anchorage, AK: Alyeska Pipeline Company, 207 pp

Dau, J. 2012. Alaska Department of Fish and Game. Personal communication with M. Shepherd, URS December 20, 2012.

Day, R. H., J. R. Rose, R. J. Ritchie, J. E. Shook, and B. A. Cooper. 2003. Collision Potential of Eiders and Other Birds Near a Proposed Windfarm at St. Lawrence Island, October – November 2002. Prepared for Ecological Services, USFWS, and the Alaska Industrial and Development Authority – Alaska Energy Authority by Alaska Biological Research, Inc. March 2003.

Erickson, W. P., G. D. Johnson, and D. P. Young Jr. 2005. A Summary of Comparison of Bird Mortality from Anthropogenic Causes with an Emphasis on Collisions. USDA Forest Service General Technical Report PSW-GTR-191. 2005.

Fay, F.H., and T.J. Cade. 1959. An ecological analysis of the avifauna of St. Lawrence Island Alaska. University of California Press, Berkeley, CA. 149 p.

Ferrians, O.J. 1965. Permafrost Map of Alaska, U.S. Geological Survey Miscellaneous Geological Investigations Map I-445

Fleming, B. 2011. Unicom, Inc. Personal communication with K. Varner Wetzel. Planner. URS. September 29, 2011.

Fosdick, R. 2012. Reindeer Herder's Association. Personal communication with Maria Shepherd, URS December 27, 2012.

GCI. 2013. TERRA Project Overview Website. Retrieved January 7, 2013 from http://terra.gci.com/project-overview

Golder Associates, 2012a. Geotechnical Data Report, TERRA Northwest Communication Tower, Ungalik Repeater Site, Alaska, prepared for Unicom/GCI, November 5, 2012, 19 pages.

---. 2012b. Geotechnical Data Report, TERRA Northwest Communication Tower, Dime Repeater Site, Alaska, prepared for Unicom/GCI, November 5, 2012, 15 pages.

---. 2012c. Geotechnical Data Report, TERRA Northwest Communication Tower, Talik Repeater Site, Alaska, prepared for Unicom/GCI, November 5, 2012, 14 pages.

---. 2012d. Geotechnical Data Report, TERRA Northwest Communication Tower, Harvey Repeater Site, Alaska, prepared for Unicom/GCI, November 5, 2012, 16 pages.

---. 2012e. Geotechnical Data Report, TERRA Northwest Communication Tower, Baldwin Peninsula Repeater Site, Alaska, prepared for Unicom/GCI, November 5, 2012, 17 pages.

---. 2012f. Geotechnical Data Report, TERRA Northwest Communication Tower, Kotzebue South Alternate Repeater Site, Alaska, prepared for Unicom/GCI, November 5, 2012, 16 pages.

Gorn, T. 2012a. Alaska Department of Fish and Game. Personal communication. J. Brekken of OASIS. February 13, 2012 as cited in BLM 2012a.

---. 2012b. Alaska Department of Fish and Game. Personal communication with M. Shepherd, URS December 2012.

International Helicopter Safety Team (IHST). 2006. International Helicopter Safety Team Certification/Maintenance Workshop U.S./Europe International Aviation Safety Conference June 6-8, 2006 Portland, Oregon

Johnson, S.R. and W.J. Richardson, 1982. Waterbird migration near the Yukon and Alaskan coast of the Beaufort Sea.II. Moult migration of seaducks in summer. Arctic 35: 291–301.

Karlstrom, T.N.V., Coulter, H.W., Fernald, A.T., Williams, J.R., Hopkins, D.M., Péwé, T.L., Drewes, H., Muller, E.H., and W.H. Condon. 1964. Surficial Geology of Alaska, U.S. Geological Survey Miscellaneous Geological Investigation Map I-357.

Kerlinger, P. 1995. How birds migrate. Stackpole, Mechanicsburg, Pennsylvania, USA.

Kowalczyk, J. 2012. BLM. Personal communication with J. Evans, URS December 17, 2012.

Lloyd, A. and C. Fastie. Recent Changes in Treeline Forest Distribution and Structure in Interior Alaska. Ecoscience. 10. May 15, 2003.

Longcore, T., Rich, C. and S.A. Gauthreaux, Jr. 2008. Height, Guy Wires, and Steady-burning Lights Increase Hazard of Communication Towers to Nocturnal Migrants: A Review and Meta-Analysis."

Longcore, T., Rich, C., Mineau, P., McDonald, B., Bert, D.G., Sullivan, L.M., Mutrie, E., Gauthreaux, S.A., Jr., Avery, K.L., Crawford, R.L., Manville II, A.M., Travis, E.R., and Drake, D. 2012. An Estimate of Avian mortality at Communication Towers in the United States and Canada.

Mabee, T. J., and B. A. Cooper. 2004. Nocturnal bird migration in northeastern Oregon and southeastern Washington. Northwestern Naturalist 85:39–47."

Mabee, T. J., B. A. Cooper, J. H. Plissner, and D. P. Young. 2006. Nocturnal bird migration over an Appalachian ridge at a proposed wind power project. Wildlife Society Bulletin 34:682–690."

Magdanz, J.S., Braem , N.S., Robbins, B.C,. and D.S Koster. 2010. Subsistence harvests in Northwest Alaska, Kivalina and Noatak, 2007. ADFG, Division of Subsistence. Tech. Paper No. 354, Kotzebue.

Maier, J. A. K., Murphy, S. M., White, R. G., and M.D. Smith. 1998: Responses of caribou to overflights by low-altitude jet aircraft. J. Wildl. Manage. 62, 752-766.

Manville, A. M. 2005. Bird Strikes and Electrocutions at Power Lines, Communication Towers, and Wind Turbines: State of the Art and State of the Science – Next Steps Toward Mitigation. USDA Forest Service General Technical Report PSW-GTR_191. 2005.

Markely, R. 2012. Unicom, Inc. Personal communication with K. Varner Wetzel and J. Evans December 19, 2012.

McCourt, K. H., Feist, J. D., Doll, D., and J.J. Russell. 1974. Disturbance studies of caribou and other mammals in the Yukon and Alaska, 1972 (Arctic Gas Biological Report Series, Volume 5): Canadian Arctic Gas Study Ltd. and Alaskan Arctic Gas Study Company.

McDaffery, B. J., M. L. Wege, and C. A. Nicolai. 1999. Spring Migration of Spectacled Eiders at Cape Romanzof, Alaska. USFWS. Western Birds 30:167-173, 1999.

Miller, S.D. 1990. Denning ecology of brown bears in Southcentral Alaska and comparisons with a sympatric black bear population. Bears: Their Biology and Management 8:279-287.

National Cooperative Soil Survey, 1979. Exploratory Soil Survey of Alaska, U.S. Department of Agriculture, Soil Conservation Service, February 1979, 213 pages.

National Transportation Safety Board (NTSB). 2011. Aviation. Accident Database & Synopses. http://www.ntsb.gov/aviationquery/index.aspx/ Accessed December 17, 2012.

National Park Service (NPS). 1994. Report to Congress: Report on Effects of Aircraft Overflights on the National Park System. National Park Service. September 12, 1994.

---. 1998. National Register Bulletin: Guidelines for Evaluating and Documenting Traditional Cultural Properties. Washington, DC: National Park Service, 1998. Available at: http://www.nps.gov/history/nr/publications/bulletins/nrb38/

---. 2006. Natural Soundscape Monitoring in Yellowstone National Park: December 2005-March 2006. Prepared by Shan Burson, Grand Teton National Park, Division of Science and Resource Management, Grand Teton National Park Soundscape Program Report No. 200601.

---. 2008. Natural Soundscape Monitoring in Yellowstone Park, December 2006 – March 2007. Prepared by Shan Burson, Yellowstone National Park, Yellowstone Center for Resources.

Norton Sound Economic Development Corporation (NSEDC). 2010. 2010 Annual Report. 40 p. Available online at http://www.nsedc.com/. Accessed on January 15, 2013.

Northern Land Use Research, Inc. (NLUR). 2012. Cultural Resources Survey of Six Sites Associated with the TNW III to Kotzebue Project. Prepared for URS Corporation, Anchorage, AK by Morgan Blanchard, PhD., Northern Land Use Research, Inc. December 2012.

Nowacki, G., P. Spencer, T. Brock, M. Fleming, and T. Jorgenson. 2001. Ecoregions of Alaska and Neighboring Territories. U.S. Geological Survey Miscellaneous Investigations Series 1 Map.

Northwest Arctic Borough (NWAB). 2006 Northwest Arctic Borough Coastal Management Plans. Prepared by Glen Gray and Associates.

---. 2013. Economic Development: Energy. Retrieved January 9, 2013 from: http://www.nwabor.org/energy.html

Oasis Environmental. 2011. TERRA-NW Bird Habitat Evaluation and Wetlands Investigation Field Report for Environmental Assessment. October 3, 2011.

Patterson, James W., 2012. Evaluation of New Obstruction Lighting Techniques to Reduce Avian Fatalities. U.S. Department of Transportation, Federal Aviation Administration Technical Note. DOT/FAA/TC-TN12/9. May.

Patton, W.W. Jr., Wilson, F.H., Labay, K.A., and N. Shew. 2009. Geologic Map of the Yukon-Koyukuk Basin, Alaska, U.S. Geological Survey Scientific Investigations Map 2909.

Radle, Autumn Lyn. 2007. The Effect Of Noise On Wildlife: A Literature Review. World Forum for Acoustic Ecology. Available online at http://wfae.proscenia.net/library/articles/radle_effect_noise_wildlife.pdf Accessed January 15, 2013.

Reynolds, P. E. 1998. Seasonal distribution, activity and habitat use of muskoxen in northeastern Alaska. Chapter 2 in Ecology of a reestablished population of muskoxen in northeastern Alaska. Dissertation, University of Alaska, Fairbanks, Alaska, USA.

Reynolds, P. E., Wilson, K. J., D.R. Klein, 2002. Muskoxen. in D. C. Douglas, P. E. Reynolds, and E. B. Rhode, editors. Arctic Refuge coastal plain terrestrial wildlife research summaries. U. S. Geological Survey, Biological Resources Division, Biological Science Report USGS/BRD/BSR-2002-0001.

Schliebe, S., K. D. Rode, J. S. Gleason, J. Wilder, K. Proffitt, T. Evans, and S. Miller. 2008. Effects of sea ice extent and food availability on spatial and temporal distribution of polar bears during the fall open-water period in the Southern Beaufort Sea. Polar Biology. DOI 10.1007/s00300-008-0439-7.

Schoen, J.W, R.W. Flynn, L.H. Suring, K. Titus, and L.R. Beier. 1994. Habitat-Capability model for brown bear in Southeast Alaska. International Conference on Bear Research and Management 9(1):327-337.

Seppi, B. 2012. Bureau of Land Management. Personal communication with M. Shepherd, URS December 20, 2012.

Sexson, Matt. 2012. Personal communication with J. Brekken of OASIS. February 13, 2012 as cited in BLM 2012a.

Southwest Alaska Municipal Conference, 2010. Southwest Alaska Broadband Strategy "Planning for Opportunity" Draft. October 6, 2010.

Sparks, T. 2012. BLM. Personal communication with J. Evans. December 19, 2012.

Stern R.O., E.L. Arobio, L.L. Naylor, and W.C. Thomas. 1980. Eskimos, Reindeer, and Land. University of Alaska Fairbanks School of Natural Resources and Agricultural Sciences Agricultural and Forestry Experimental Station.

Strum, M., Racine, C. , and K. Tape. Increasing Shrub Abundance in the Arctic. Nature. 411. May 31, 2001.

UAA (University of Alaska, Anchorage). 2012. Alaska Regional Profiles, Northwest Region – Freshwater, pp. 169-171.

Unicom, Inc. 2012. TERRA Northwest Phase III – Form 299 Long Term Lease Application Resubmission.

URS. 2012. Vegetation and Wildlife Evaluation Field Study Report: TNW III Kotzebue Broadband Telecommunications Project.

U.S. Army Corps of Engineers (USACE). 1987. Corps of Engineers Wetland Delineation Manual. Environmental Laboratory Department of the Army Waterways Experiment Station, U.S. Corps of Engineers. January.

---. 2007. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0). Engineer Research and Development Center. U.S. Corps of Engineers. September.

USDOE (United States Department of Energy) 1998. Environmental Assessment. Kotzebue Wind Installation Project. Kotzebue, Alaska. May 1998.

U.S. Fish and Wildlife Service (USFWS). 2002. Steller's Eider Recovery Plan. Fairbanks, Alaska.

USFWS. 2006. Conservation Agreement for the Yellow-billed Loon (*Gavia Adamsii*).

---. 2011. TERRA SW Broad Band Telecommunications Project. Environmental Assessment. April 2011. Prepared by URS, Anchorage, AK. 436pp.

---. 2012a. North Pacific Seabird Database. Available online: http://axiom.seabirds.net/maps/north-pacific-seabirds/

---. 2012b. Selawik National Wildlife Refuge. Birds. Available online: http://www.fws.gov/uploadedFiles/Region_7/NWRS/Zone_2/Selawik/PDF/birds.pdf

U.S. Global Change Research Program 2003. US National Assessment of the Potential Consequences of Climate Variability and Change. Educational Resources Regional Paper: Alaska

Wahrhaftig, C. 1965. Physiographic Divisions of Alaska, U.S. Geological Survey Professional Paper 482.

Western Arctic Caribou Herd Working Group. 2003. Western Arctic Caribou Herd Cooperative Management Plan. Nome, Alaska. 33 pp.

Whiting, A. 2006. Native Village of Kotzebue Harvest Survey Program 2002, 2003, 2004. Results of three consecutive years of cooperating with Qikiqtagrugmiut to understand their annual catch of selected fish and wildlife. Prepared by Alex Whiting – Environmental Specialist, Native Village of Kotzebue. 22 p.

Whiting A, Griffith D, Jewett S, Clough L, Ambrose W, and J. Johnson . 2011. Combining Inupiaq and Scientific Knowledge: Ecology in Northern Kotzebue Sound, Alaska . Alaska Sea Grant, University of Alaska Fairbanks, SG-ED-72, Fairbanks. 71 pp.

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APPENDIX A

Cultural Resources Survey of Sites Associated with the TERRA-NW Phase III to Kotzebue Project

Report prepared for:
URS Corporation
700 G Street, Suite 500
Anchorage, AK 99501

Report prepared by:
Morgan Blanchard, Ph.D., R.P.A.

BLM ARPA Permit AA-093328

Northern Land Use Research, Inc.
Burr Neely, M.A., R.P.A.
Principal Investigator
234 Front Street
Fairbanks, Alaska 99701

December 2012

RESTRICTED DATA NOTICE

The locations of cultural resources given in this report are provided to facilitate environmental and engineering planning efforts only. Under the provisions of the Archaeological Resources Protection Act and the National Historic Preservation Act, site location information is restricted in distribution; disclosure of such information is exempt from requests under Federal and State freedom of information laws. This report is not a public document. It is intended for release to URS Corporation, UNICOM, GCI, the Bureau of Land Management, the Alaska State Historic Preservation Office, the NANA Corporation, the Kikiktagruk Inupiat Corporation, the Native Village of Kotzebue and any other appropriate Alaska Native corporations or entities.

This report contains confidential cultural resource site locations. It may be viewed by persons with authorized access by contacting the BLM Archaeologist Jenny H. Blanchard at (907) 267-1246.

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APPENDIX B
Unicom Plan of Development

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TO: James Fincher/Tom Sparks **PAGES** (Including Cover): 35

COMPANY: BLM AFO **DATE: 11/20/12**

REFERENCE: TERRA Northwest Phase III – Form 299 Long Term Lease Application

WE ARE FORWARDING: __X____ ATTACHED _____ UNDER SEPARATE COVER VIA _____

TRANSMITTED BY: _____ MAIL X_____ COURIER
_____ FAX _____ OTHER

COPIES	DESCRIPTION
	TERRA Northwest Phase III – Form 299 Long Term Lease Application Resubmission

MESSAGE:
James, Tom,

As requested I am resubmitting the TERRA Northwest Phase III – Form 299 Long Term Lease Application modified to include the 6th TNW Phase III site. This site was initially thought to be on Air Force property, but further investigation determined the site was controlled by the BLM. We are considering this site as an alternate site in the event the KIC site in Kotzebue turns out to be unsuitable for a microwave installation. This application should replace the long term lease application submitted on August 30th, 2012.

Chris Gill
TNW/Unicom Project Manager
907-227-93512

COPY: _File_____ **FROM:** _____

_____ _____

STANDARD FORM 299 (05/2009)
Prescribed by DOI/USDA/DOT
P.L. 96-487 and Federal
Register Notice 5-22-95

APPLICATION FOR TRANSPORTATION AND UTILITY SYSTEMS AND FACILITIES ON FEDERAL LANDS

FORM APPROVED
OMB Control Number: 0596-0082
Expiration Date: 10/31/2012

FOR AGENCY USE ONLY

Application Number

Date Filed

NOTE: Before completing and filing the application, the applicant should completely review this package and schedule a preapplication meeting with representatives of the agency responsible for processing the application. Each agency may have specific and unique requirements to be met in preparing and processing the application. Many times, with the help of the agency representative, the application can be completed at the preapplication meeting.

1. Name and address of applicant (*include zip code*)	2. Name, title, and address of authorized agent if different from item 1 (*include zip code*)	3. Telephone (area code)
Unicom Inc. Jimmy Sipes, Vice Pres. & General Manager 2550 Denali Street, Suite 1000 Anchorage, AK 99503	Chris Gill GCI, Director PM & Implementation 2550 Denali Street, Suite 1000 Anchorage, AK 99503	Applicant (907) 868-5557 Authorized Agent (907) 868-7098

4. As applicant are you? *(check one)*

a. ☐ Individual
b. ☒ Corporation*
c. ☐ Partnership/Association*
d. ☐ State Government/State Agency
e. ☐ Local Government
f. ☐ Federal Agency

** If checked, complete supplemental page*

5. Specify what application is for: *(check one)*

a. ☒ New authorization
b. ☐ Renewing existing authorization No.
c. ☐ Amend existing authorization No.
d. ☐ Assign existing authorization No.
e. ☐ Existing use for which no authorization has been received *
f. ☐ Other*

** If checked, provide details under item 7*

6. If an individual, or partnership are you a citizen(s) of the United States? ☐ Yes ☐ No

7. Project description (describe in detail): (a) Type of system or facility, *(e.g., canal, pipeline, road);* (b) related structures and facilities; (c) physical specifications *(Length, width, grading, etc.)*; (d) term of years needed: (e) time of year of use or operation; (f) Volume or amount of product to be transported; (g) duration and timing of construction; and (h) temporary work areas needed for construction *(Attach additional sheets, if additional space is needed.)*

This application is for a right of way grant for 6 microwave repeater tower sites on federal lands. Following is info on each site: 1.) Ungalik River Repeater - N 64 41' 12.0", W 160 40' 48.1" in Sec. 21 & 28, T9S, R10W, KRM; 2.) Dime Repeater - N 65 05' 48.9", W 160 42' 54.9" in Sec. 33, T4S, R10W, KRM; 3.) Talik Repeater - N 65 31' 13.8", W 160 32' 23.5" in Sec. 4, T1N, R9W, KRM; 4.) Harvey Repeater - N 66 09' 38.5", W 160 34' 47.7" in Sec. 21, T9N, R9W, KRM; 5.) Baldwin Peninsula Repeater - N 66 31' 14.9", W 161 50' 52.4" in Sec. 14, T13N, R15W, KRM; 6.) Kotzebue South ALTERNATE Repeater - N 66 50' 31.8", W 162 35' 25.8" in Section 27, T17N, R18W, KRM (Lot 1, USS 10393). (b) Details on structures and facilities that are proposed for each site are included in the "Microwave Repeater Development Plan". (c) A 100' x 300' area (30,000 square feet) is required for each site. (d) A 50 year term right of way grant is requested for each site. (e) The project will be in operation at each site throughout the entire year. (f) 1 Gigabits per second (Gbps) of bandwith will be processed through the microwave repeater tower proposed for each site. (g) Construction activities are currently planned to occur between May 2013 and October 2014 at each site. (h) See "Microwave Repeater Development Plan".

8. Attach a map covering area and show location of project proposal

9. State or Local government approval: ☐ Attached ☐ Applied for ☒ Not Required

10. Nonreturnable application fee: ☒ Attached ☐ Not required

11. Does project cross international boundary or affect international waterways? ☐ Yes ☒ No *(if "yes," indicate on map)*

12. Give statement of your technical and financial capability to construct, operate, maintain, and terminate system for which authorization is being requested.

Unicom, Inc. is an indirect, wholly-owned subsidiary of General Communication, Inc., a publicly traded company on the NASDAQ exchange, providing telecommunications services in Alaska since 1979. Financial information filed with the U.S. Securities and Exchange Commission regarding the GCI family of companies may be found at the "About GCI" icon, under the "For Investors" tab, at the following link: http://www.gci.com/about/for-investors.

13a. Describe other reasonable alternative routes and modes considered.

See "Form 299 Attachment".

b. Why were these alternatives not selected?

See "Form 299 Attachment".

c. Give explanation as t o why it is necessary to cross Federal Lands.

See answers to 13(a) and 13(b) in "Form 299 Attachment".

14. List authorizations and pending applications filed for similar projects which may provide information to the authorizing agency. *(Specify number, date, code, or name)*

AA-092972 (Otter Creek geotech). AA-092971 & AA-092971A (Otter Creek ROW). Private corporation documents requested on Page 4 are on file with BLM under these applications. AA-093309 (geotech for Ungalik River, Dime, Talik, Harvey, and Baldwin Peninsula).

15. Provide statement of need for project, including the economic feasibility and items such as: (a) cost of proposal (construction, operation, and maintenance); (b) estimated cost of next best alternative; and (c) expected public benefits.

See "Form 299 Attachment".

16. Describe probable effects on the population in the area, including the social and economic aspects, and the rural lifestyles.

See answer to 15(c) in the "Form 299 Attachment".

17. Describe likely environmental effects that the proposed project will have on: (a) air quality; (b) visual impact; (c) surface and ground water quality and quantity; (d) the control or structural change on any stream or other body of water; (e) existing noise levels; and (f) the surface of the land, including vegetation, permafrost, soil, and soil stability.

See "Form 299 Attachment".

18. Describe the probable effects that the proposed project will have on (a) populations of fish, plantlife, wildlife, and marine life, including threatened and endangered species; and (b) marine mammals, including hunting, capturing, collecting, or killing these animals.

See "Form 299 Attachment".

19. State whether any hazardous material, as defined in this paragraph, will be used, produced, transported or stored on or within the right-of-way or any of the right-of-way facilities, or used in the construction, operation, maintenance or termination of the right-of-way or any of its facilities. "Hazardous material" means any substance, pollutant or contaminant that is listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq., and its regulations. The definition of hazardous substances under CERCLA includes any "hazardous waste" as defined in the Resource Conservation and Recovery Act of 1976 (RCRA), as amended, 42 U.S.C. 6901 et seq., and its regulations. The term hazardous materials also includes any nuclear or byproduct material as defined by the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq. The term does not include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under CERCIA Section 101(14), 42 U.S.C. 9601(14), nor does the term include natural gas.

See "Microwave Repeater Development Plan".

20. Name all the Department(s)/Agency(ies) where this application is being filed.

BLM is the only agency that this application is being filed with.

I HEREBY CERTIFY, That I am of legal age and authorized to do business in the State and that I have personally examined the information contained in the application and believe that the information submitted is correct to the best of my knowledge.

Signature of Applicant	Date
	11-14-2012

Title 18, U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious, or fraudulent statements or representations as to any matter within its jurisdiction.

GENERAL INFORMATION
ALASKA NATIONAL INTEREST LANDS

This application will be used when applying for a right-of-way, permit, license, lease, or certificate for the use of Federal lands which lie within conservation system units and National Recreation or Conservation Areas as defined in the Alaska National Interest lands Conservation Act. Conservation system units include the National Park System, National Wildlife Refuge System, National Wild and Scenic Rivers System, National Trails System, National Wilderness Preservation System, and National Forest Monuments.

Transportation and utility systems and facility uses for which the application may be used are:

1. Canals, ditches, flumes, laterals, pipes, pipelines, tunnels, and other systems for the transportation of water.

2. Pipelines and other systems for the transportation of liquids other than water, including oil, natural gas, synthetic liquid and gaseous fuels, and any refined product produced therefrom.

3. Pipelines, slurry and emulsion systems, and conveyor belts for transportation of solid materials.

4. Systems for the transmission and distribution of electric energy.

5. Systems for transmission or reception of radio, television, telephone, telegraph, and other electronic signals, and other means of communications.

6. Improved right-of-way for snow machines, air cushion vehicles, and all-terrain vehicles.

7. Roads, highways, railroads, tunnels, tramways, airports, landing strips, docks, and other systems of general transportation.

This application must be filed simultaneously with each Federal department or agency requiring authorization to establish and operate your proposal.

In Alaska, the following agencies will help the applicant file an application and identify the other agencies the applicant should contact and possibly file with:

Department of Agriculture
Regional Forester, Forest Service (USFS)
Federal Office Building,
P.O. Box 21628
Juneau, Alaska 99802-1628
Telephone: (907) 586-7847 *(or a local Forest Service Office)*

Department of the Interior
Bureau of Indian Affairs (BIA)
Juneau Area Office
Federal Building Annex
9109 Mendenhall Mall Road, Suite 5
Juneau, Alaska 99802
Telephone: (907) 586-7177

Department of the Interior
Bureau of Land Management
222 West 7th Avenue
P.O. Box 13
Anchorage, Alaska 99513-7599
Telephone: (907) 271-5477 (or a local BLM Office)

U.S. Fish & Wildlife Service (FWS)
Office of the Regional Director
1011 East Tudor Road
Anchorage, Alaska 99503
Telephone: (907) 786-3440

National Park Service (NPA)
Alaska Regional Office, 2225
Gambell St., Rm. 107
Anchorage, Alaska 99502-2892
Telephone: (907) 786-3440

Note - Filings with any Interior agency may be filed with any office noted above or with the Office of the Secretary of the Interior, Regional Environmental Office, P.O. Box 120, 1675 C Street, Anchorage, Alaska 9513.

Department of Transportation
Federal Aviation Administration
Alaska Region AAL-4, 222 West 7th Ave., Box 14
Anchorage, Alaska 99513-7587
Telephone: (907) 271-5285

NOTE - The Department of Transportation has established the above central filing point for agencies within that Department. Affected agencies are: Federal Aviation Administration (FAA), Coast Guard (USCG), Federal Highway Administration (FHWA), Federal Railroad Administration (FRA).

OTHER THAN ALASKA NATIONAL INTEREST LANDS

Use of this form is not limited to National Interest Conservation Lands of Alaska.

Individual department/agencies may authorize the use of this form by applicants for transportation and utility systems and facilities on other Federal lands outside those areas described above.

For proposals located outside of Alaska, applications will be filed at the local agency office or at a location specified by the responsible Federal agency.

SPECIFIC INSTRUCTIONS
(Items not listed are self-explanatory)

7 Attach preliminary site and facility construction plans. The responsible agency will provide instructions whenever specific plans are required.

8 Generally, the map must show the section(s), township(s), and range(s) within which the project is to be located. Show the proposed location of the project on the map as accurately as possible. Some agencies require detailed survey maps. The responsible agency will provide additional instructions.

9 , 10, and 12 The responsible agency will provide additional instructions.

13 Providing information on alternate routes and modes in as much detail as possible, discussing why certain routes or modes were rejected and why it is necessary to cross Federal lands will assist the agency(ies) in processing your application and reaching a final decision. Include only reasonable alternate routes and modes as related to current technology and economics.

14 The responsible agency will provide instructions.

15 Generally, a simple statement of the purpose of the proposal will be sufficient. However, major proposals located in critical or sensitive areas may require a full analysis with additional specific information. The responsible agency will provide additional instructions.

16 through 19 Providing this information is as much detail as possible will assist the Federal agency(ies) in processing the application and reaching a decision. When completing these items, you should use a sound judgment in furnishing relevant information. For example, if the project is not near a stream or other body of water, do not address this subject. The responsible agency will provide additional instructions.

Application must be signed by the applicant or applicant's authorized representative.

EFFECT OF NOT PROVIDING INFORMATION: Disclosure of the information is voluntary. If all the information is not provided, the application may be rejected.

DATA COLLECTION STATEMENT

The Federal agencies collect this information from applicants requesting right-of-way, permit, license, lease, or certification for the use of Federal lands. The Federal agencies use this information to evaluate the applicant's proposal. The public is obligated to submit this form if they wish to obtain permission to use Federal lands.

SUPPLEMENTAL		
NOTE: The responsible agency(ies) will provide instructions	CHECK APPROPRIATE BLOCK	
I - PRIVATE CORPORATIONS	ATTACHED	FILED*
a. Articles of Incorporation	☐	☒
b. Corporation Bylaws	☐	☒
c. A certification from the State showing the corporation is in good standing and is entitled to operate within the State	☐	☒
d Copy of resolution authorizing filing	☐	☒
e. The name and address of each shareholder owning 3 percent or more of the shares, together with the number and percentage of any class of voting shares of the entity which such shareholder is authorized to vote and the name and address of each affiliate of the entity together with, in the case of an affiliate controlled by the entity, the number of shares and the percentage of any class of voting stock of that affiliate owned, directly or indirectly, by that entity, and in the case of an affiliate which controls that entity, the number of shares and the percentage of any class of voting stock of that entity owned, directly or indirectly, by the affiliate.	☐	☒
f. If application is for an oil or gas pipeline, describe any related right- of-way or temporary use permit applications, and identify previous applications.	☐	☐
g. If application is for an oil and gas pipeline, identify all Federal lands by agency impacted by proposal.	☐	☐
II - PUBLIC CORPORATIONS		
a. Copy of law forming corporation	☐	☐
b. Proof of organization	☐	☐
c. Copy of Bylaws	☐	☐
d. Copy of resolution authorizing filing	☐	☐
e. If application is for an oil or gas pipeline, provide information required by item "I - f" and "I - g" above.	☐	☐
III - PARTNERSHIP OR OTHER UNINCORPORATED ENTITY		
a. Articles of association, if any	☐	☐
b. If one partner is authorized to sign, resolution authorizing action is	☐	☐
c. Name and address of each participant, partner, association, or other	☐	☐
d. If application is for an oil or gas pipeline, provide information required by item "I - f" and "I - g" above.	☐	☐

*If the required information is already filed with the agency processing this application and is current, check block entitled "Filed." Provide the file identification information *(e.g., number, date, code, name)*. If not on file or current, attach the requested information.

NOTICES

Note: This applies to the Department of Agriculture/Forest Service (FS)

This information is needed by the Forest Service to evaluate the requests to use National Forest System lands and manage those lands to protect natural resources, administer the use, and ensure public health and safety. This information is required to obtain or retain a benefit. The authority for that requirement is provided by the Organic Act of 1897 and the Federal Land Policy and Management Act of 1976, which authorize the secretary of Agriculture to promulgate rules and regulations for authorizing and managing National Forest System lands. These statutes, along with the Term Permit Act, National Forest Ski Area Permit Act, Granger-Thye Act, Mineral Leasing Act, Alaska Term Permit Act, Act of September 3, 1954, Wilderness Act, National Forest Roads and Trails Act, Act of November 16, 1973, Archeological Resources Protection Act, and Alaska National Interest Lands Conservation Act, authorize the Secretary of Agriculture to issue authorizations or the use and occupancy of National Forest System lands. The Secretary of Agriculture's regulations at 36 CFR Part 251, Subpart B, establish procedures for issuing those authorizations.

BURDEN AND NONDISCRIMINATION STATEMENTS

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596-0082. The time required to complete this information collection is estimated to average 8 hours hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720- 2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call toll free (866) 632-9992 (voice). TDD users can contact USDA through local relay or the Federal relay at (800) 877-8339 (TDD) or (866) 377-8642 (relay voice). USDA is an equal opportunity provider and employer.

The Privacy Act of 1974 (5 U.S.C. 552a) and the Freedom of Information Act (5 U.S.C. 552) govern the confidentiality to be provided for information received by the Forest Service.

APPLICATION FOR TRANSPORTATION AND

UTILITY SYSTEMS AND FACILITIES

ON FEDERAL LANDS

FORM 299 ATTACHMENT

SUPPLEMENTAL 1(e) The name and address of each shareholder owning 3 percent or more of the shares, together with the number and percentage of any class of voting shares of the entity which such shareholder is authorized to vote and the name and address of each affiliate of the entity together with, in the case of an affiliate controlled by the entity, the number of shares and the percentage of any class of voting stock of that affiliate owned, directly or indirectly, by that entity, and in the case of an affiliate which controls that entity, the number of shares and the percentage of any class of voting stock of that entity owned, directly or indirectly, by the affiliate.

GCI Communication Corp. holds 100% of Unicom, Inc.'s 41,000 outstanding voting shares.

13(a). Describe other reasonable alternative routes and modes considered.

In order to improve the reliability and quality of communications services in northwest Alaska communities, Unicom, Inc. ("Unicom") is upgrading its communications network in this area. The upgrade will result in the provision of high-speed broadband internet service to multiple communities in northwest Alaska.

To upgrade communications services in this area, Unicom is currently extending its existing DeltaNet Microwave System (which serves multiple communities in southwest Alaska, and is part of a broadband network that connects to the global fiber optic backbone in Anchorage) to Shaktoolik in 2012 and to Nome in 2013. The next phase in the project will be to extend the network further north, all the way to Kotzebue.

To extend the network to Kotzebue, Unicom plans to install six microwave repeater towers that will carry microwave signals from Shaktoolik to Kotzebue (see attached project map). These proposed microwave repeater towers will give Unicom the ability to extend the broadband network to the communities of Koyuk, Buckland, Selawik, and Noorvik in the future. All six of these proposed new repeaters are located on federal lands, two in areas managed by BLM's Anchorage Field Office and four in areas managed by BLM's Central Yukon Field Office:

1.) Ungalik River Repeater – located at N 64˚ 41' 12.0", W 160˚ 40' 48.1" in Sections 21 and 28, T9S, R10W, KRM.
2.) Dime Repeater – located at N 65˚ 05' 48.9", W 160˚ 42' 54.9" in Section 33, T4S, R10W, KRM.
3.) Talik Repeater – located at N 65˚ 31' 13.8", W 160˚ 32' 23.5" in Section 4, T1N, R9W, KRM.

4.) Harvey Repeater – located at N 66˚ 09’ 38.5”, W 160˚ 34’ 47.7” in Section 21, T9N, R9W, KRM.
5.) Baldwin Peninsula Repeater – located at N 66˚ 31’ 14.9”, W 161˚ 50’ 52.4” in Section 14, T13N, R15W, KRM.
6.) Kotzebue South ALTERNATE Repeater – located at N 66˚ 50’ 31.8”, W 162˚ 35’ 25.8” in Section 27, T17N, R18W, KRM (Lot 1, USS 10393).

Below is discussion on the alternative routes that were considered.

Submarine (Alt. #1)- After the broadband network is extended to Nome in 2013, the northern extent of the network will include communities on the northern and eastern coast of Norton Sound. Alternative #1 for extension of the network to Kotzebue is undersea fiber optic cable installation in Norton Sound, the Bering Strait, and Kotzebue Sound.

Fiber Optic (Alt. #2)- Alternative #2 for extension of the network is terrestrial fiber optic cable installation that would connect the network all the way to Kotzebue.

Microwave (Alt. #3)- Alternative #3 for extension of the network is installation of a network of microwave towers. Alternative #3 is the alternative that has been selected by Unicom. This alternative includes new microwave repeater towers on federal lands, as described above.

(b) Why were these alternatives not selected?

Submarine (Alt. #1)- Alternative #1 was rejected due to cost of construction/maintenance, operational concerns, and the extent of submarine cable that would need to be installed within the Alaska Maritime National Wildlife Refuge. Regarding operational concerns, community ports along Norton Sound and Kotzebue Sound have ice cover for a significant portion of the year that would prevent access to the submarine cable in the event of an outage. In addition, habitat closures were another operational factor in the decision to reject this alternative. Spectacled Eiders use offshore areas in Norton Sound as molting grounds between July and October, so Unicom would have limited access to this area during these months.

Fiber Optic (Alt. #2)- Alternative #2 was rejected due to cost of construction/maintenance and project impacts. Alternative #2 would require the installation of fiber optic cable across over 200 miles of remote and difficult terrain. Installation of a terrestrial fiber route across such a remote area would be much more costly to construct and maintain than Alternatives #1 & #3, and would impact significantly more lands than Alternatives #1 & #3 (including impacts on federal lands that the fiber route would need to cross).

Microwave (Alt. #3)- Due to the difficulties with Alternatives #1 & #2 that are discussed above, Unicom has selected a network of microwave towers as the most feasible alternative for connecting the broadband network to Kotzebue.

When developing the proposed route for the microwave tower network, Unicom also considered tower locations on non-federal lands that would avoid the need for the 6 repeaters on federal lands. Given that the quality of microwave signals diminishes as the distance between towers increases, towers on the network need to be located no more than approximately 30+ miles apart. And given the high terrain in this area of Alaska, towers on the network need to be located at high elevations to ensure a clear "line of sight" to other towers on the network. Of lands between Shaktoolik and Kotzebue that are within an appropriate distance interval, are at a sufficient elevation, and provide the most direct and efficient path – all are owned by the federal government.

15. Provide statement of need for project, including the economic feasibility and items such as: (a) cost of proposal (construction, operation, and maintenance): (b) estimated cost of next best alternative; and (c) expected public benefits.

(a) The cost of the project is estimated at $26.5 million.

(b) Other alternatives are not physically or economically feasible for the reasons stated above.

(c) Public benefits of the project include reliable global connectivity for the rural communities that will be served by this project now and in the future. This area of Alaska is without the benefit of a road system. Inter-community transportation is limited to airplanes, boats, and snowmobiles. As a result, residents rely on telecommunications for basic commerce and essential public services such as health care and education. Today, the region is linked to the internet backbone primarily by satellite networks. Although satellite service currently plays a crucial role in providing telecom services in rural Alaska, its high cost is a barrier to expanding broadband internet service to all end-users and it has limited usefulness in providing next-generation internet, computer, telemedicine, and distance learning applications.

Modern, high-capacity, high-speed, low delay connectivity is critical to ensure the long-term viability of rural Alaskan communities and to facilitate economic development in a manner that allows residents to remain in their traditional communities and maintain traditional lifestyles. Broadband internet service is an ideal vehicle to remove location-based obstacles to participation in the global economy and to encourage the development of small and home-based businesses.

17. Describe likely environmental effects that the proposed project will have on : (a) air quality; (b) visual impact; (c) surface and ground water quality and quantity; (d) the control or structural change on any stream or other body of water; (e) existing noise levels; and (f) the surface of the land, including vegetation, permafrost, soil, and soil stability.

(a) Each repeater will have two routine monitoring inspections per year, one in the spring and the other in the fall, with an additional two to four repair trips anticipated per year. Maintenance of generators will take place during the two routine monitoring inspections. Fueling will occur once each year over a four to five day period. Although the impacts to air quality will be

minimal, there will be diesel exhaust and noise from a ten kilowatt diesel generator operating year round at each site.

(b) Following construction and cleanup, reclamation will be completed at each site. Disturbed surfaces will be restored to the original contour of the land surface to the extent determined by BLM. Appropriate site-specific seed mixes will be used where conditions vary. Salvaged native plants will be used for re-vegetation, if appropriate, along with seeding using BLM-recommended seed mixes. Seed will be broadcast as directed by BLM.

The proposed repeaters are in remote locations, but will be visible to those accessing the areas due to the repeaters' "line of sight" requirements.

(c) The proposed repeaters will require secure foundations and will avoid wetlands and groundwater to the greatest extent possible.

(d) Not applicable.

(e) Operation of ten kilowatt diesel generators at each site will increase noise levels at the sites, but will not have a significant impact on noise levels in the areas.

(f) Installation of the repeaters will alter the surface of the land in areas where improvements are placed. As discussed under Question 17(b) above, land reclamation will occur in all other areas after construction and cleanup.

18. Describe the probable effects that the proposed project will have on (a) populations of fish, plantlife, wildlife and marine life including threatened and endangered species, and (b) marine mammals, including hunting, capturing, collecting or killing these animals.

(a) Construction activities will pose minimal impacts on populations of fish, plantlife, wildlife and marine life, including threatened and endangered species. Construction activities will not require vegetation clearing and will thus avoid the "migratory bird windows".

(b) Not applicable.

Unicom, Inc. – TERRA Northwest Project
Phase 3
Microwave Repeater Development Plan

The TERRA Northwest Project, Phase 3, requires the installation of six microwave repeater sites. These sites include 4 mountain top microwave repeater sites (Ungalik, Dime, Talik and Harvey), one repeater site on the Baldwin Peninsula, and one site on the outskirts of Kotzebue. Phase 3 construction is currently planned to begin in May 2013 and end 18 months later in December 2014. Five of the proposed primary repeater sites are located on federal lands, two in areas managed by BLM's Anchorage Field Office (Ungalik River Repeater and Dime Repeater) and three in areas managed by BLM's Central Yukon Field Office (Talik Repeater, Harvey Repeater, and Baldwin Peninsula Repeater). The sixth site is located on KIC property not controlled by the BLM. Unicom is also investigating the Kotzebue "Air Force/BLM" site in Kotzebue as an alternative site in the event the KIC site turns out to be unsuitable for a microwave installation. This alternate site is located on BLM property currently occupied by the United States Air Force. The following Plan of Development (along with the attached site maps, site plans, and details) describes the installation of a typical microwave repeater facility. This document contains the following sections:

- Part 1 – Site components and fuel requirements
- Part 2 – Construction description
- Part 3 – Operations description

Part 1 – Site Components and Fuel Requirements

Site Requirements: A typical vicinity map is attached which details the overall construction right of way (ROW) necessary for the communications facilities, and a larger ROW necessary for construction. The larger construction area is required to allow for safe helicopter landings from any direction as dictated by variations in wind direction. This larger area will also allow for landing in different areas to minimize the impact on ground vegetation. The sites in consideration are all larger, open areas without significant topographic variations in the immediate build area. Each site requires the following components:

1) Lattice type towers: towers are free standing and do NOT require guy wires. The towers will be galvanized (steel grey).

Site	Tower Height	FAA Lighting
Ungalik Repeater	55 ft	No
Dime Repeater	55 ft	No
Talik Repeater	70 ft	No

Harvey Repeater	70 ft	No
Baldwin Repeater	250 ft	Yes
KIC Site (or the Kotzebue Air Force/BLM Alternate Site)	250 ft	Yes

Microwave Antennas will be 8' or 10' diameter Ultra-High performance microwave style (manufactured by Andrews). It is anticipated the antenna covers will be grey or white. Each site requires four antennas for repeater communications. It is also likey four 94.5 inch tall by 5.1 inch wide directional cellular antennas will be installed on the towers. The antennas will be mounted as pairs on two separate legs of the tower.

2) 10' x 30' Communications Equipment shelters (prefabricated): the shelters will be mounted on foundation piers approximately 2 foot high as dictated by the local terrain, metal exterior, 10' tall and neutral grey in color. Each shelter will contain flooded lead-calcium batteries (C&D, series LCT-1680 or equivalent) for 48 hours of emergency power.
3) 10' x 20' Power Module shelters (prefabricated): the shelters will also be mounted on foundation piers and will be 10' tall. They will be metal sided and painted neutral grey. The shelters will contain two (2) Isuzu 23 HP 3 cylinder Diesel model 3CEL engines , with Marathon Magna Plus 17.5 KW generators(model 282CSL1504) (or similar equipment) and each will be outfitted with a hospital grade silencer (GTE Industries 201-5102 or equivalent). Drip pans will be in place beneath the engine units themselves. Additionally, the floor will have welded seams and a raised rim providing 100% containment and the power module foundation itself will be installed such that the floor will be sloped, and any spills to the shelter will flow to the exhaust side of the shelter where leak detection sensors are located to provide early warnings of leaks.
4) 2 – Greer 4500 gallon fuel tanks (total 9000 gallons of ultra-low sulfur #1 diesel per site): The two tanks are specified as double wall for leak containment. They will feature:
    a. Steel Tank Institute design outer wall leak containment and leak detection sumps at each end of the tanks.
    b. Overfill shut-off valve
    c. Overfill spill containment
    d. Overfill alarm audible to the operator.
    e. Leak detection sensor in the sump.
    f. Low/high level alarm sensor within the tank.
    g. Remote alarm reporting system that will report to off-site operators.
5) Piping between the tanks and the equipment shelter will feature the following:

a. All piping will be above ground.
b. All piping will be spill-contained, double wall piping.
c. Piping will be sloped towards the equipment shelter.
d. Any leaked fuel will be collected in a containment sump of the outdoor bulk fuel tanks.
e. A liquid sensor within the sump will transmit an alarm to off-site operators.

6) Spill response materials will be kept on site to support maintenance operations. These will include (at a minimum) sorbent pads, boom, granular sorbent, and disposal drum.
7) A detailed Spill Prevention Control & Countermeasures (SPCC) plan will be developed, submitted and approved prior to operational fueling of the tanks.

Part 2 - Construction

Project Schedule: Construction will begin on the four mountain top sites when they are mostly snow-free and barges begin spring operations. This is expected to occur in the May to early June timeframe of 2013. Foundations and towers will be constructed at these sites during the summer of 2013. Construction of the Kotzebue Site will also occur in summer of 2013. The Baldwin Peninsula site will be constructed in the winter of 2013/2014 when the ground is frozen and snow/ice roads can be utilized for site access. Final construction will occur at all sites in the spring and summer of 2014. The following is the anticipated timetable for construction and commissioning:

- June-July 2013: Mobilization of materials and equipment to staging areas in Kotzebue, Koyuk and Buckland.
- June 2013: Camp construction at Ungalik, Dime, Talik, and Harvey mountain top repeaters.
- July 2013 – Heavy lift transport of fuel tanks and heavy construction equipment to the mountain top sites (coincides with the TERRA NW Phase II heavy lift operations in the Nome region.)
- June – September 2013: Installation of foundations, towers, and fuel tanks at the four mountain top sites and in Kotzebue.
- September 2013 – Staging of equipment and materials near the Baldwin Peninsula site (via barge from Kotzebue) so the equipment can be transported overland to the site when the tundra is frozen in the winter.
- March – August 2014: Installation of foundations, towers, shelters and fuel tanks at the Baldwin Peninsula and Kotzebue sites.
- June – October 2014: Completion of all sites. Turn up of radios, environmental, power and fuel systems.

- July 2014 – Heavy lift Helicopter operations to set shelters. Demobilization of heavy construction equipment.
- August – December 2014: Final testing and commissioning. Final punch list and acceptance.

Equipment List:

Baldwin Peninsula Site

- Hughes 500-E and Robinson R44 helicopters: crew transport and light freight. Helicopters may also be used for tower erection support if weather permits.
- Kobelco CK1000 Series II (190' boom + 60' jib) Crane
- Texoma Hi-Way Drill
- CAT D-6 R Dozer
- CAT 966 Loader (bucket & forks)
- CAT 299C Skid Steer
- CAT 330 Excavator
- Advanced Mixer Truck (for Slurry)
- 5000 gal Insulated H2O tank
- Tucker Sno-Cat
- Pick-Up Truck w/Mat-tracks
- Crane Mats
- Trailers w/ skids or tracks
- 20 to 40 KW Generator(s)
- Frost fighters/Space heaters
- 15x20 Weather Port Tent Structure
- 500 gal Fuel Tank(s)
- Snow Machines
- Bell UH-1H "Huey" helicopter: used for medium sized lifts during construction. The UH-1H may also be used for tower erection support if weather permits. This helicopter will also be used when camps are taken down upon completion.
- Boeing Chinook 234 or Erikson Sky Crane S-64: heavy lift, twin rotor helicopter may be used for the summer transport and setting of shelters and fuel tanks if logistics do not allow winter setting of these structures with the crane.
- Miscellaneous hand tools.

Mountain Top Sites

- Mini Backhoe – CAT 303 or equivalent: used for site excavation, drilling and material handling. In addition, capstan winches can be attached to the excavator to support tower erection.
- 225 CFM air compressor: used for leveling of competent rock (with jackhammer attachment) as well as drilling of rock anchor holes.
- Diesel generators(s): 2kW - 25 kW portable generators will be used for camp and tool power.
- Hughes 500-E and Robinson R44 helicopters: crew transport and light freight. Helicopters may also be used for tower erection support if weather permits.
- Bell UH-1H "Huey" helicopter: used for medium sized lifts and initial material / supply transportation to the sites (including tower steel). The UH-1H may also be used for tower erection support if weather permits. This helicopter will also be used when camps are taken down upon completion.
- Boeing Chinook 234 or Erikson Sky Crane S-64: heavy lift, twin rotor helicopter will be used for the transport of both shelters, fuel tanks and batteries from staging areas noted below.
- Miscellaneous hand tools.

Mobilization: Site equipment will be transported by barge to staging areas in July 2013 and again in July 2014. It is anticipated materials and equipment will be staged in Koyuk, Kotzebue, and Buckland. The existing barge landings at Koyuk and Kotzebue will be utilized for unloading of materials in the communities.

Baldwin Peninsula site materials will be transported via barge from Kotzebue to a beach staging area in the fall of 2013. The location of the beach landing will be approximately 66°29'16.49"N, 161°52'6.29"W. After the ground has frozen these materials and equipment will be transported overland to the site for construction in the Spring of 2014. A map of the planned access route is attached to this Plan of Development.

Materials for the mountain top sites will be moved via helicopter out of the staging areas to the mountain top sites. It is anticipated Ungalik and Dime Repeater sites materials will be staged in Koyuk at the city's barge landing. Talik and Harvey repeater sites materials will be barged into Buckland and staged at the city's barge landing.

- Note: Approximately 60 flights are expected per site for the UH-1H during the each construction season. Paths will be as straight line as possible between staging areas and sites. Exceptions will be made as necessary to avoid overflying cabins and hunting camps.

- Heavy lift helicopter operations will occur during the 2013 and 2014 construction seasons. In 2013, the heavy lift will transport drilling equipment, fuel tanks and fuel for use during construction, and tower and foundation materials to the mountain top sites. In 2014, heavy lift helicopters will transport shelters and other remaining items that exceed the medium lift helicopters capacities to the sites.

Note: Helicopter flights are planned to land in designated areas attached but pilot discretion may dictate a landing outside of the designated areas if weather or other safety related conditions dictate such landing. In addition, direct flights between sites will be required for personnel with small tools and equipment packages throughout the project duration.

Invasive Species mitigation: All vehicles and transport equipment used in access, construction, maintenance and operations of the project will be thoroughly cleaned prior to moving equipment and gear across or onto BLM -managed lands. Washing and/or brushing equipment and gear to remove material that can contain weed seeds or other propagates will help to ensure it is being transported weed and seed free across or onto BLM-managed lands. High pressure washing will be performed where required to treat the insides of bumpers, wheel wells, undercarriages, inside belly plates, excavating blades, buckets, tracks, rollers, drills buckets, shovels, any digging tools, etc., to remove potential weeds, seeds, and soil carrying weed propagules and vegetative material. All gear, tool bags and accessories will be free of all plant debris, mud and materials that can be the source of non-native invasive plants and pathogens.

Camp construction and operation: Crews will be housed on site in heavy tent structures as indicated on the attached site plans. Plywood platforms will be constructed under each tent to protect the ground and level the tent. Tents will be secured from high winds using gabion baskets (weight) and "duck bill" anchors. Camps will require the following:

- Crew strength of up to nine construction personnel (at maximum levels). Normal construction operations are expected to require fewer personnel and commissioning activities (August – September) will generally require 2 – 3 construction workers plus a camp cook.
- Fuel (noted in detail below).
- Portable heating.
- Cooking facilities: electric hot plates, microwave oven, conventional oven.
- Chest freezers.
- Food containers (with dry goods, canned goods, etc.).
    - 55 gallon drums will be employed to contain food waste and deter wildlife from gaining access. Drums will be transported off site for disposal in approved locations and carried back empty.
- Fresh water drums.

- Portable sanitary facility (toilet): toilets will be an electric powered flameless incinerator provided by Incinolet.
- Camp and construction waste will be contained in drums or large, commercial trash bags. Gray water will be released in a designated location at the camp facility, while ensuring no surface erosion takes place. A consumables incinerator (Elastic Smart Ash Mini Incinerator or equivalent) will be used to reduce trash volume and reduce the number of trips needed to remove trash from camp. It will also help to keep the area clean and reduce potential wildlife attractions to the camp area. Use of the incinerator along with on site disposal of grey water will help eliminate the need of roughly 15-20 helicopter trips per site to back haul trash and gray water.
- Non burnable trash will be removed from the site periodically. Trash bags will be will be secured from the wind with cargo nets or waste drums while awaiting transport.

Crew rotation and re-supply will be accomplished by the 500-E or equivalent helicopter as needed. It is estimated that approx. 30-40 flights with the 500-E will be required for camp and crew at each location. Flights will occur during the June to September construction season in 2013.

- No pets, no alcohol, no burning, no hunting / fishing and no 4-wheeler (ATV) or any motorized vehicles outside of the permitted (staked) area will be allowed.
- Crews will have firearms as a last resort for protection from wildlife. First line of defense consists of air horns and bear mace.
    - Site representative(s) will have Bear Avoidance and Hazing training.
    - There will be at least one firearm (shotgun) on site loaded with buckshot or slugs.
    - There will be no bear fencing.
- All operational and construction activities will be performed within the areas marked on each site map, respectively.

<u>Camp Fuel:</u> Unicom, Inc. (and its contractors) will be transporting fuel to the sites during construction by means of flyable 300 gallon fuel bladders and fuel drums. These will be transported from the staging areas to sites via helicopter. The drum storage units will have integrated containment and are covered to prevent rain/fuel mixing and overflow.

Fuel to be used for construction needs will be stored in 55 gallon drums (4 diesel and 2 gas) within a containment area and covered for protection from the weather. The two long term 4500 gallon double walled fuel tanks will also be transported to each of the mountain top sites during the 2013 construction season. One of these two tanks one each site will be used for temporary bulk storage of Jet-A fuel to support helicopter operations. At the Baldwin peninsula site, the two 4500 gallon double walled tanks will be staged at the beach landing site (above the high

water mark). One of these tanks will be used for helicopter fuel storage during construction. Until placement on permanent foundations, the tanks will be set on crane mats on timber foundations. In the event Unicoms contractor is unable to transport the 4500 gallon diesel tanks to the sites in the summer of 2013, helicopter fuel will instead be stored in temporary storage and containment bladders.

- Note: Fuel consumption is expected to average approx. 20 gallons of diesel and 10 gallons LL-100 of unleaded per day. Consequently, these sites will require refueling during construction approx. every 15 days (average). Peak construction will be higher, with consumption tailing off significantly as the site is commissioned.
    - Cumulative estimated consumption is approx. ≤ 2,000 gallons of diesel and ≤ 700 gallons of LL-100 during construction and commissioning.
    - Refueling will be accomplished with either the 500-E or the UH-1H using 55 gallon drums and 300 gallon bladders respectfully. The full drums will be set on "duck pond" containment next to the empty drums that they are to replace. The empty drums will be removed from containment and the replacements will be set in place. The empty drums will then be hauled off site.
- A site-specific Spill Prevention, Control & Countermeasures (SPCC) plan will be generated for each site. The plans will be generated and approved prior to mobilization to a site. The plans will include:
    - Procedures and facilities for containment for stored fuels specific to that site.
    - Procedures and temporary containment for refueling of equipment, transfer of fuels to and from the site, and movement of fuels between storage locations on the site.
    - Spill response materials to be kept on the site to include (at a minimum) sorbent pads, boom, granular sorbent, and spilled material containers.

<u>Foundation installation:</u>

Towers, shelters, and fuel tanks at the Baldwin Peninsula site and Kotzebue site will be installed on driven piles.

The mountain top tower, power module, communications shelter and fuel tanks will require two different types of foundation installation:

- Tower foundations will consist of a rock-anchor and welded pile extension system. See attached detail.
    - Excavation will take place at each individual tower leg location. Excavation is expected to consist of approximately a 6'x 6' sloped

opening down to competent bedrock. Bedrock will be blown clean with forced air, and four 3" diameter holes will be drilled into the rock at each tower leg, for a total of 16 drilled rock anchors. The bedrock surface will be leveled with a grout or concrete pad that will provide the platform for the tower leg extension. The leg extension will arrive pre-fabricated, with only one bevel cut to be made to achieve final elevation. Rock anchors will then be grouted, tensioned, and locked off. Once subsurface construction is complete, the excavated holes will be backfilled with the native materials that were extracted (saving as much of the organic mat as possible for the final coverage).

- Shelter and tank foundations will be "micropile" types. See attached detail.
    - First, the 3 ½" steel pipes will be installed vertically through the top soil. Once stabilized, the hole for the #9 rebar will be drilled and the rebar will be inserted into the hole. Finally, the entire assembly will be filled with structural grout and the piling will be leveled for the buildings and tanks.
- The ground ring (as indicated on the attached site plans) will be installed shortly after the foundations and it will be installed approx. 6" below grade for grounding / bonding of all structures.

Note: Excavation and significant ground disturbance is expected throughout the immediate installation area from the ground ring as indicated on the attached site plans. Indirect disturbance will occur outside of the immediate installation area (foot traffic, staging of materials, etc.) After construction is complete the ground will be re-graded back to original grade and recommended fertilization or replanting, if any, of native species and/or vegetation will be done as required.

<u>Structure installation:</u>

Baldwin Peninsula Site and the Kotzebue Site:

- The shelters, fuel tanks and tower will be erected utilizing the on-site cranes. If this cannot be executed due to unforeseen logistical issues, the backup plan will be to set the fuel tanks and shelters using the heavy lift helicopter.

Mountain Top Repeater Sites:

- The shelters and the fuel tanks will be prefabricated and installed directly onto the foundations using the heavy lift helicopter.
    - Once the heavy lift leaves the area, on site personnel will bolt or weld the structure skids to the foundation piers.

- The tower will be erected on site using winches, gin poles and the 500-E helicopter if the weather allows.
    - The gin pole and winch will be used to stand the legs of the tower using the small backhoe-dozer as the winch base with a pulley at the top of the structure (after the first leg is set on the foundation). The legs and structural sections will be manipulated into place by hand.
    - The antennas will be installed in a similar fashion (i.e. a pulley will be placed on the top of the tower and a rope pulled by the winch will pull the antenna up to installation level).

Due to the long distances between sites and staging areas, short term, intermediate refueling areas will be set up between the staging areas and the sites. This will allow the heavy lift helicopter to land and refuel during the transport of shelters and fuel tanks to the sites.

Bear Creek Camp (65°32'38.19"N , 161° 4'29.30"W) will utilized as a refueling and resupply/staging point. The site will provide a safe place to stop mid-route if helicopters cannot reach their intended locations. This location will require a small camp of one to two people with sleeping and cooking tents, incinerator toilet and consumables incinerator. The team will assist the helicopter pilots with rigging loads and refueling. A fuel depot consisting of (3 ea.) 55 gallon drums of AvGas, JetA, diesel fuel, and gasoline will be staged at this location. This will allow the camp to resupply the mountain top camps with the fuel needed during the start of construction.

The camp will be erected in the summer of 2013 left in place throughout the winter, unoccupied and without food. Crews will then return again in 2014 to finish the construction of all the sites and demobilize the camp and materials in late summer of 2014.

As a contingency plan to allow for completion of the project in the event issues arise with use of heavy lift helicopters, overland winter routes will be investigated. This would allow Unicoms construction contractor to haul all materials and equipment to the sites overland from staging areas to the sites in the winter when the ground is frozen.

After the structures are in place, field installation of fuel piping, waveguide connection (between antennas and the communications shelter), and the electrical connection between the power module and the communications shelter will occur. Contractor will transport battery cells “wet” to the mountain sites. The cells will be unpackaged and lifted directly into the shelter from the containment area.

<u>Site Commissioning:</u> Commissioning will consist of power system start-up and testing, radio testing and antenna alignment between sites and communications system testing.

- For planning purposes, it is expected that each site will have approx. 2 weeks of commissioning activity with the majority of the activity contained within the shelters and on the tower (for antenna alignment).
    - Note: This activity will use site generated power intermittently as the systems are brought on line.
- These activities require the use of the 500-E or the R-44 helicopter, to transport technicians and their equipment to and from each site. Technical crews may fly in and out each day. In addition, direct flights between sites will be required for personnel with small tools and equipment packages.

Part 3 – Operations

Site maintenance: The sites will be un-manned with scheduled maintenance visits expected twice a year (in the July and in the September) in addition to any emergency maintenance trips. During those visits, the generator lubricant and coolant systems will be inspected and any additional fluids required will be flown in and pumped into the storage tanks located in the power shelter. Over the life of the facility, it is expected that batteries will be replaced once and that both generators will be replaced every five to seven years.

Refueling: The fuel tanks will be filled up once per year. It is expected that a 500 gallon fuel container will be employed for that purpose ("Fuel Easy" system or equivalent). The system contains a fuel bladder housed in a protective spherical shell for rigidity. Unicom, Inc. assumes that the generators will consume approx. 7000 gallons of diesel fuel during a one year period. This equates to approx. 14 round trip helicopter flights (using a Bell UH1B helicopter) and it is expected that the re-fueling effort will last 2-3 days per site during the month of June or July. An intermediate site may be set up between remotes sites and staging areas to allow for refueling of the fuel transport helicopter. For refueling:

- The Fuel Easy bladder system will be set directly onto secondary containment ("duck ponds") and additional (temporary) containment will be erected between the fuel bladder and the main refueling aperture on the tank. This second containment pond will mitigate the impact of any fuel that may spill as the nozzle nears the tank aperture.
- Spill prevention, control, and countermeasures (SPCC) plans that are specific to each site will be developed and approved prior to operational fueling of the tanks. These will include a detailed description of procedures to be followed and equipment to be used. Refueling efforts will likely be based out of Koyuk, Kotzebue, or Buckland.
    - In the site specific SPCC Plan, contingency and emergency clean-up procedures will be detailed for events as significant as a bladder dropped from a helicopter to a relatively minor release while fueling on the ground.

Site Monitoring and protection: Leak detection is installed in the fuel tanks, fuel piping, and the power module. Battery status will be visually inspected on every technician's visit as well as monitored remotely via webcam. A fire alarm control system with FM-200 fire suppression agent is employed in both the power module and communications module. These systems are continuously monitored as a function of Unicom, Inc.'s network management, and system status updates (alerts in particular) are routed to human monitors in real time, 24 hours a day.

Decommissioning: Removal of the site will essentially be the reverse of the installation process noted above though with a shorter timeframe. The same equipment and crew facilities would also be required.

- Remaining fuel would be pumped out of the tanks, into containers, and removed from the site via helicopter. Batteries would be removed from the site via helicopter. The cells will remain filled at the time of removal.
- Connections between modules and towers would be removed (with fuel containment underneath the equipment for the supply piping removal). Antennas would be taken down and waveguide runs would be removed from the tower and coiled up.
- Welds for the tanks and shelters would be broken / cut and the equipment would be removed with the heavy lift helicopter. The tower would be taken down piece by piece and removed via helicopter.
- Once down to the foundation level, the grout in the pile foundations would be broken up (to a level 6" below grade) and the pilings and caissons themselves would be cut off approx. 6" below grade.
    - Note: this approach leaves the majority of the foundation itself below grade but it is the minimum disturbance to any re-growth that would occur over the life of the facility. However, final reclamation will be coordinated with the appropriate authority having jurisdiction to determine what, if any, elements of the foundation will be left in place as future land management decisions might require the full removal of all foundation items.
    - As above, after the removal is complete, the ground will be re-graded back to original grade and recommended fertilization or replanting, if any, of native species and/or vegetation will be done.

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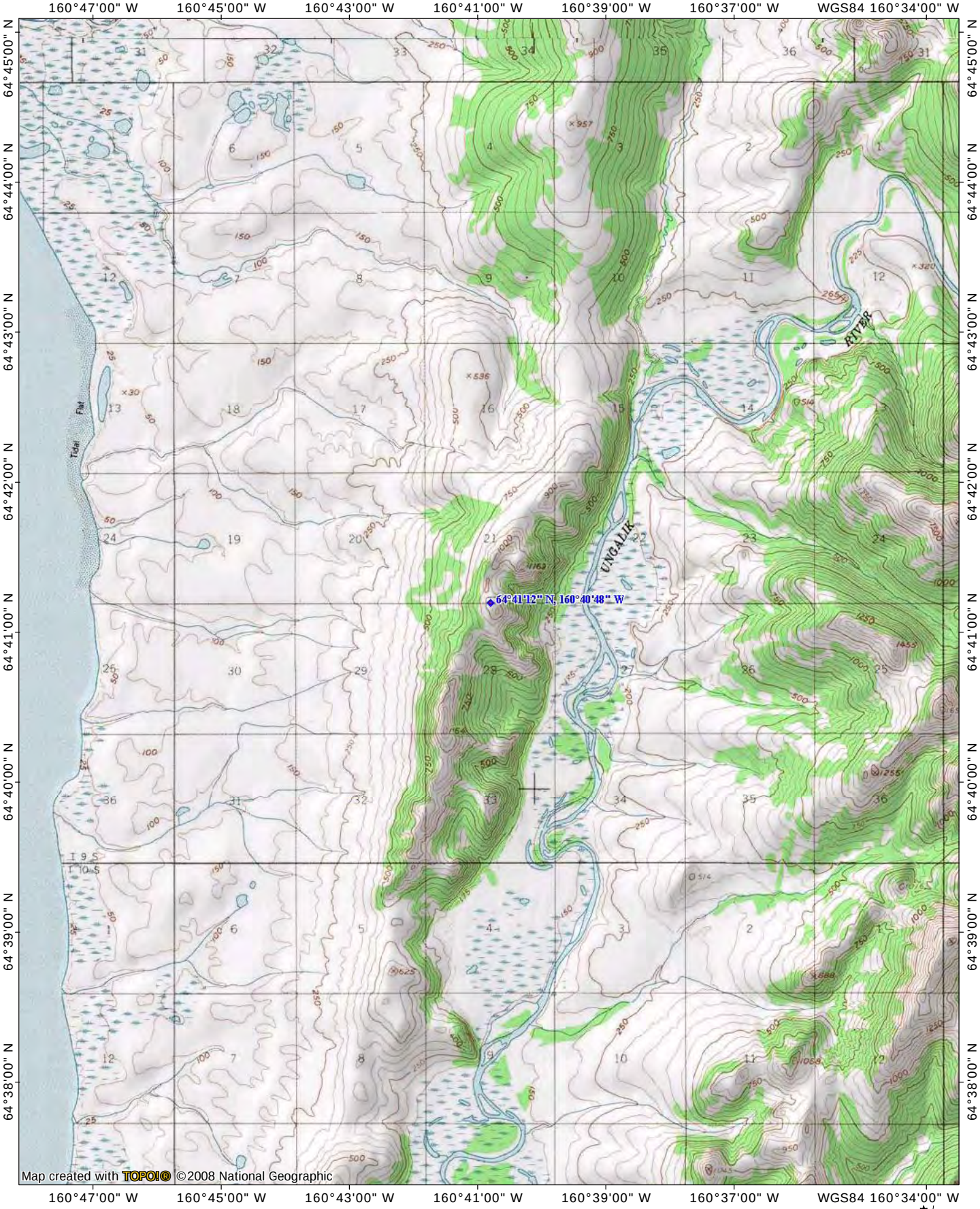

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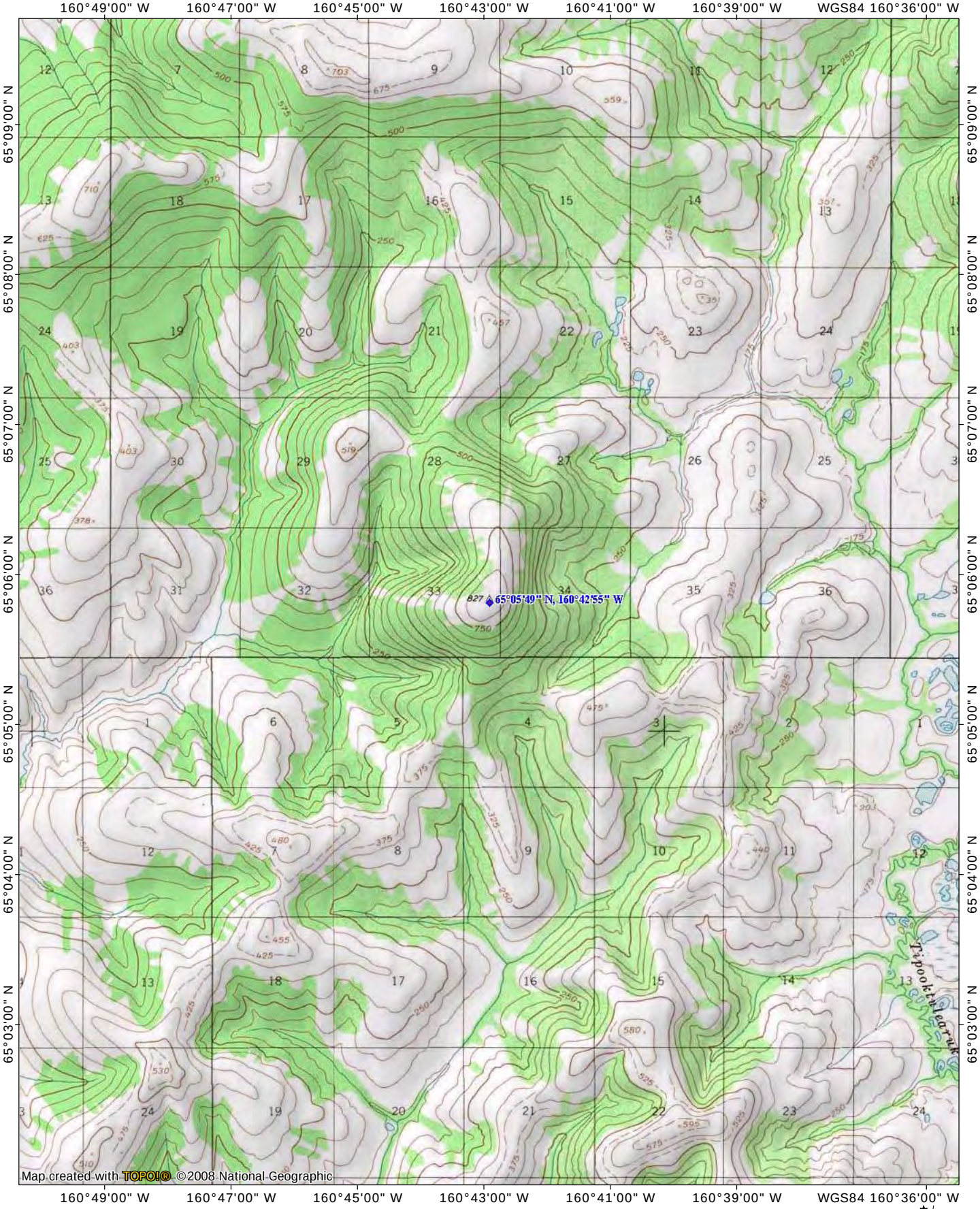

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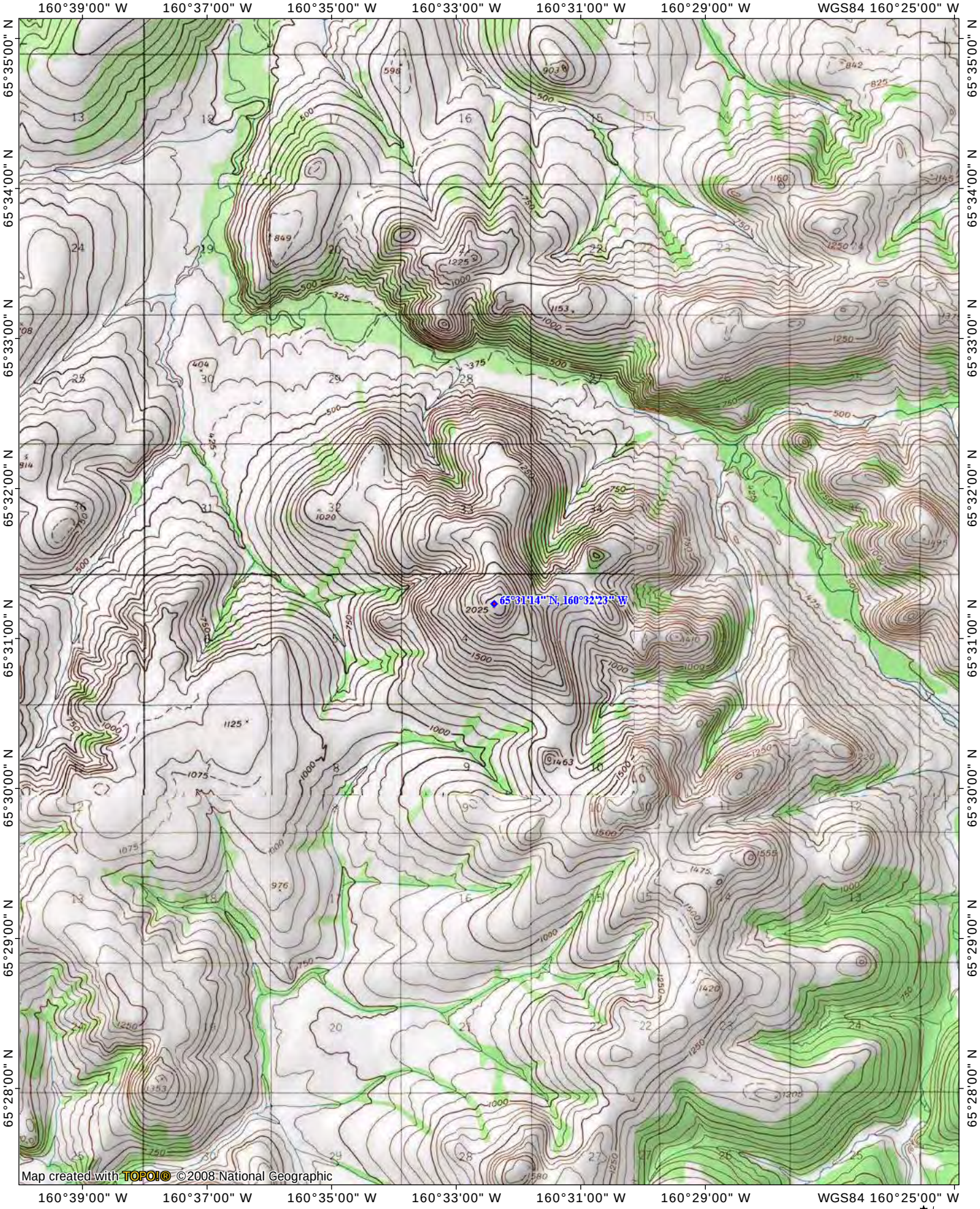

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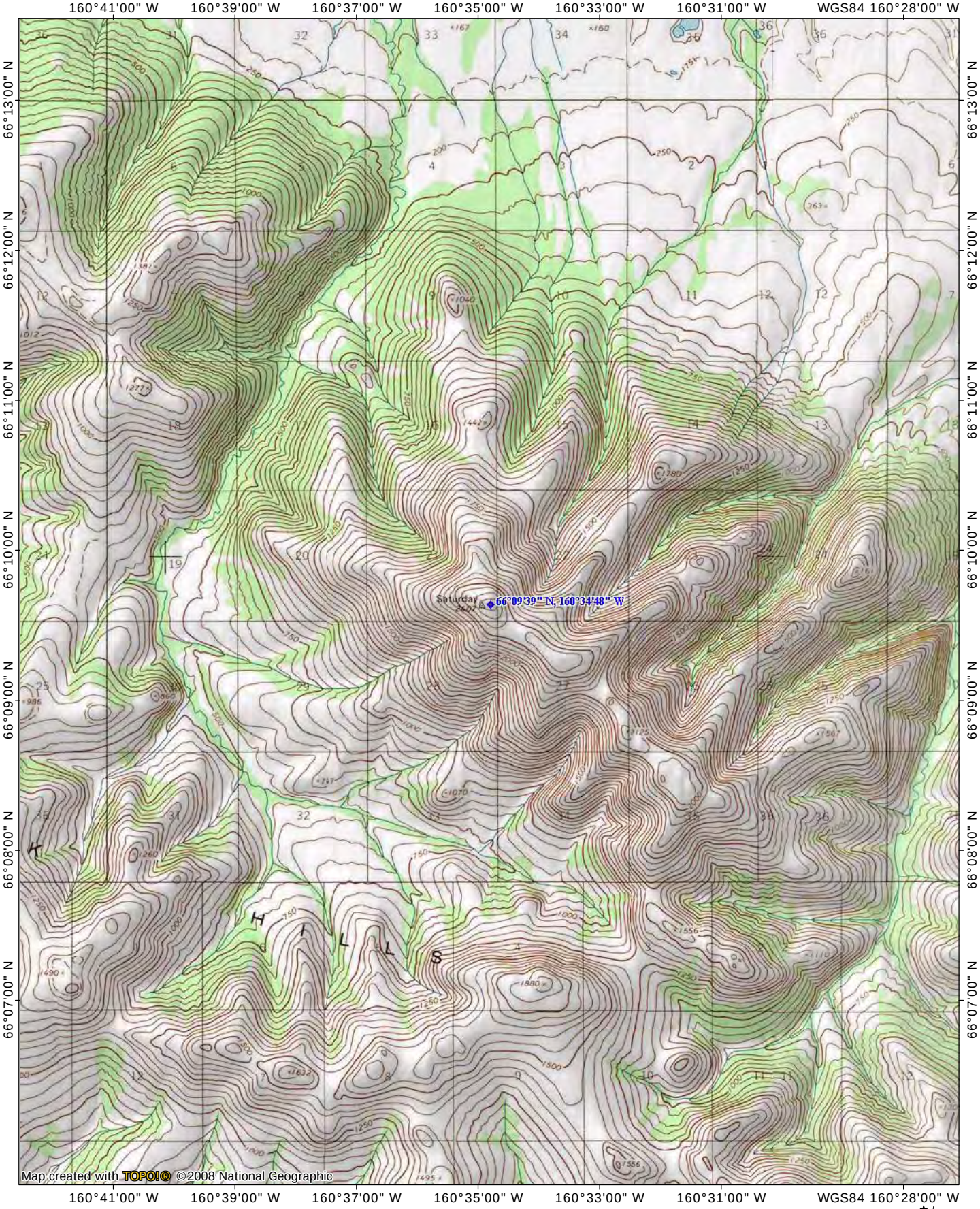

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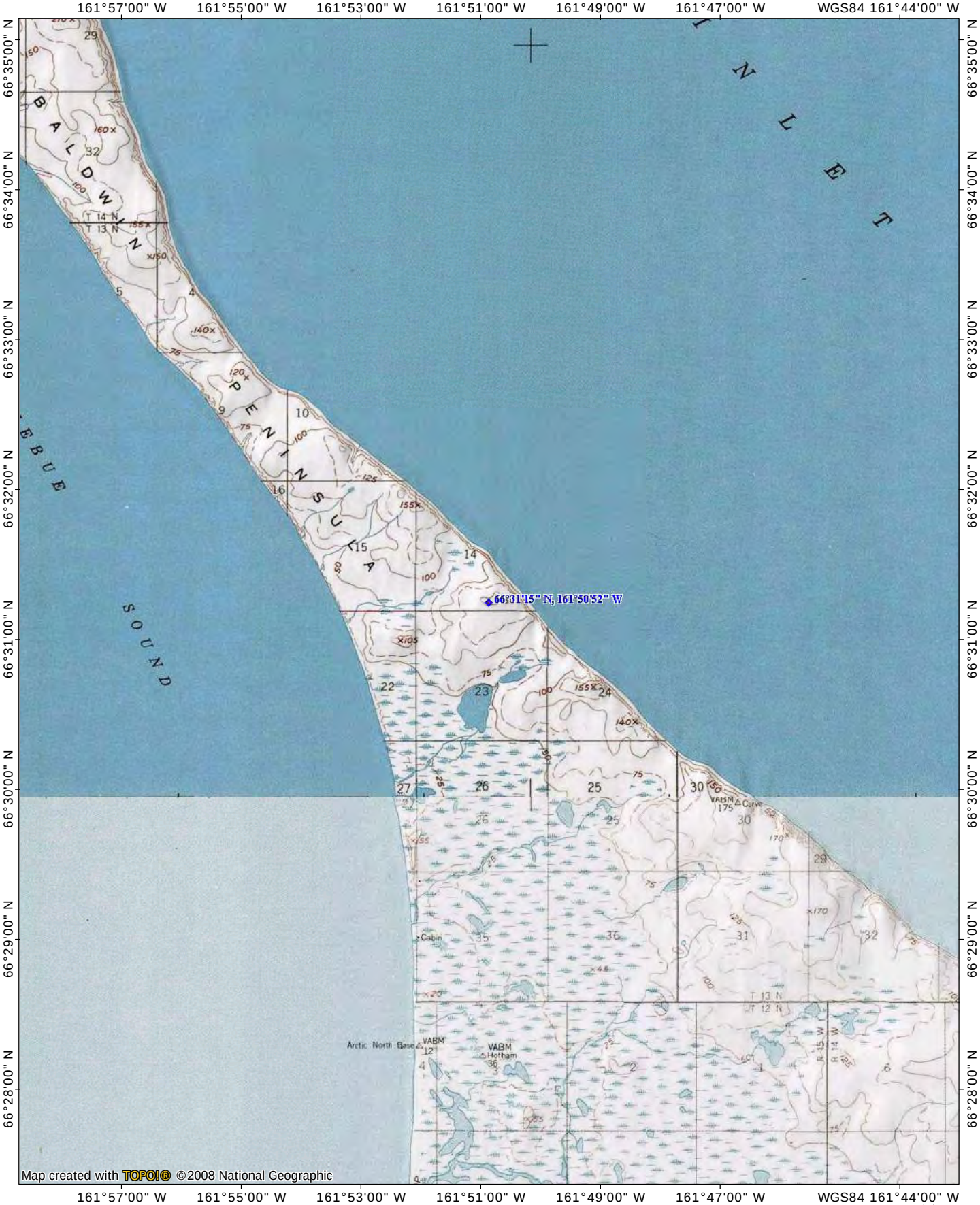

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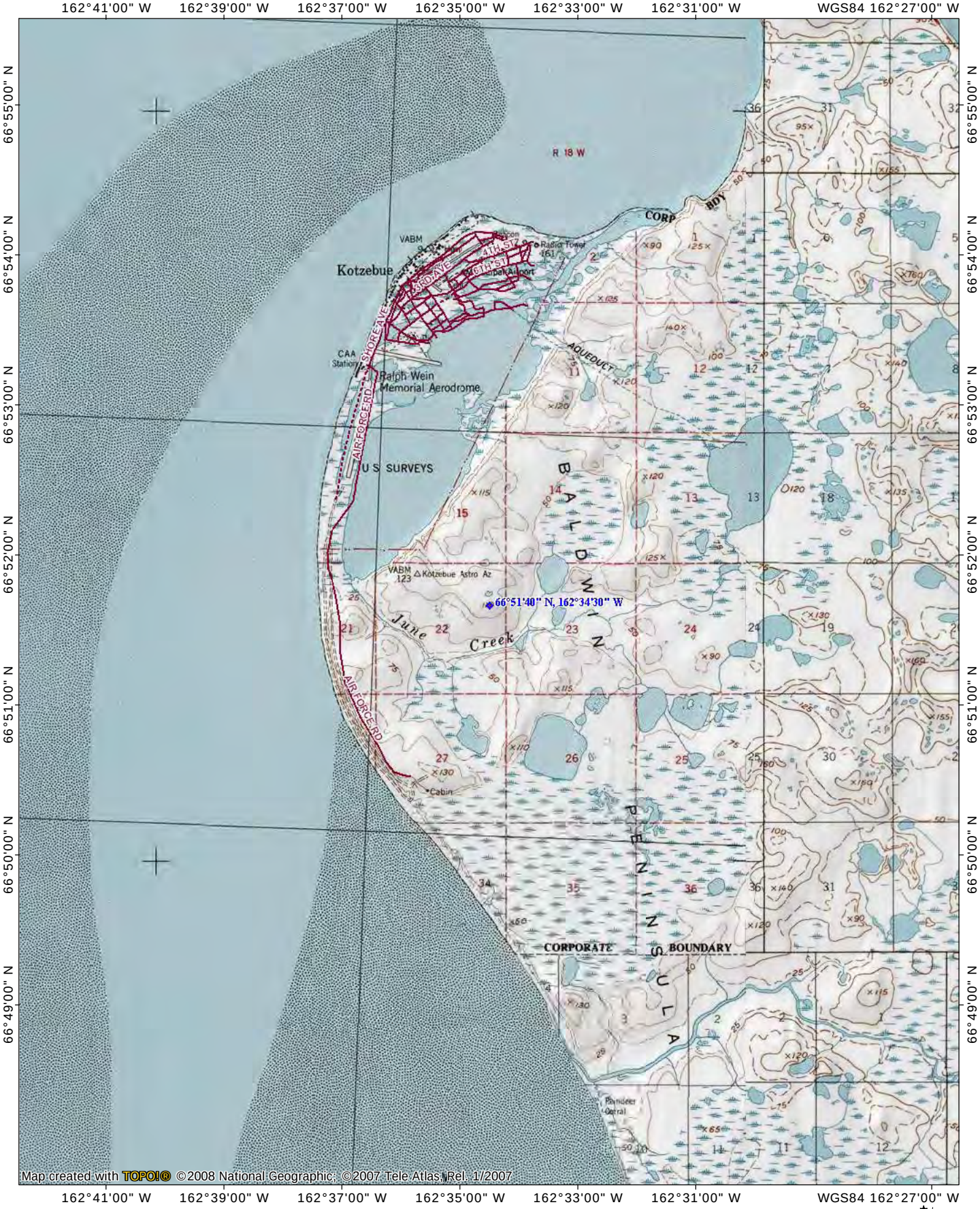

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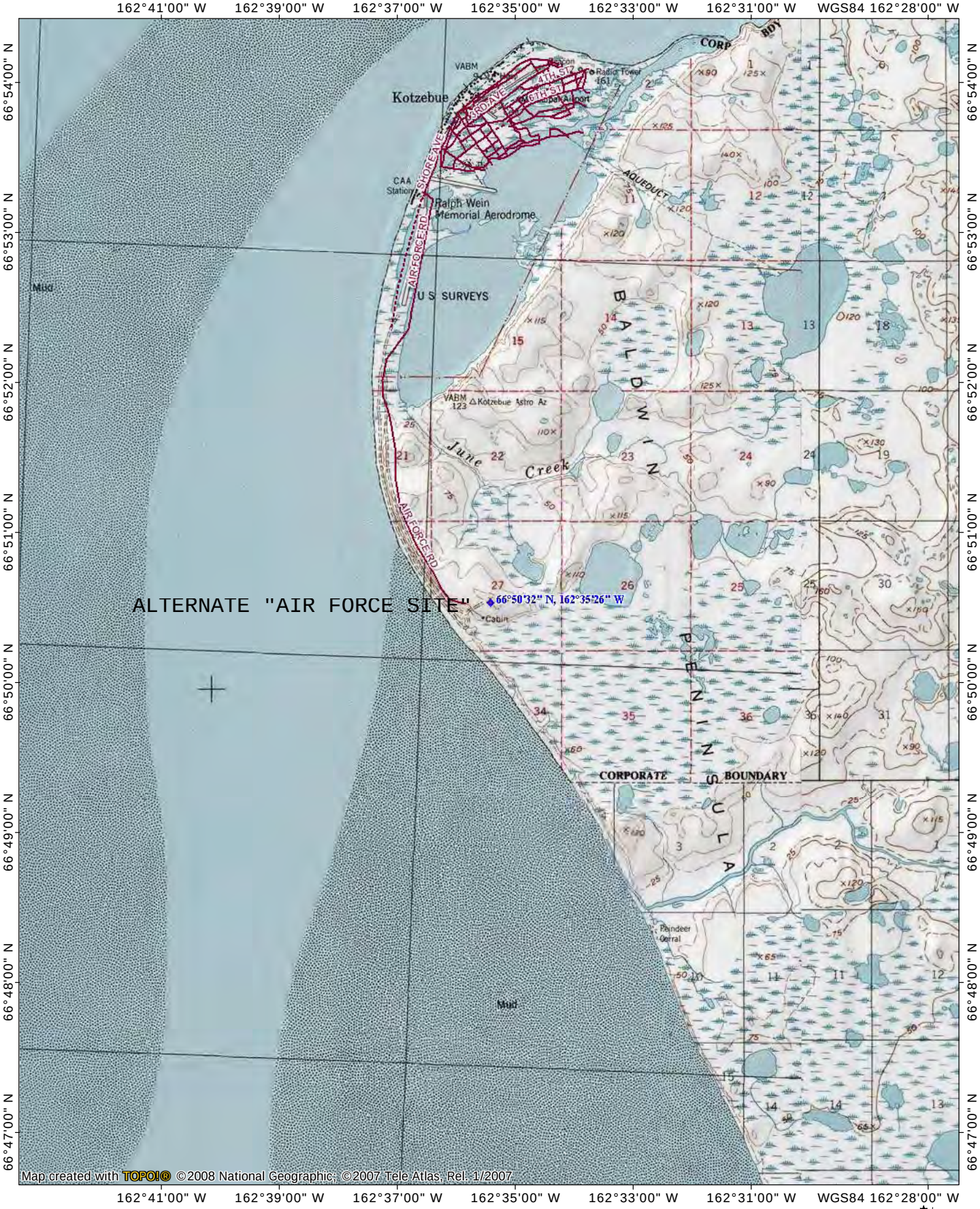

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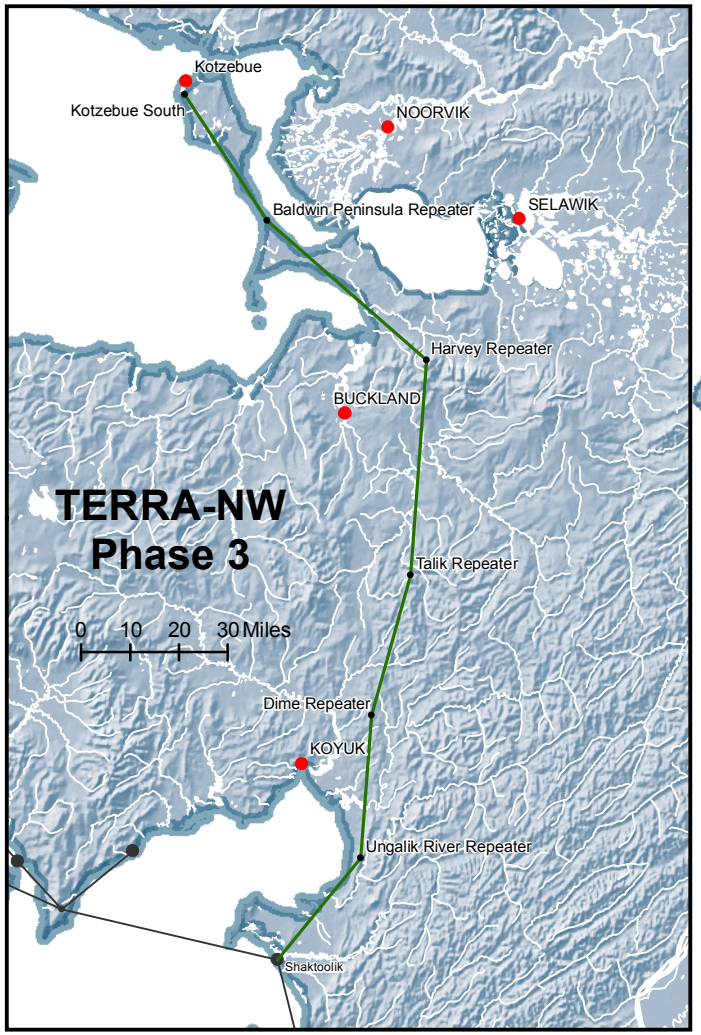
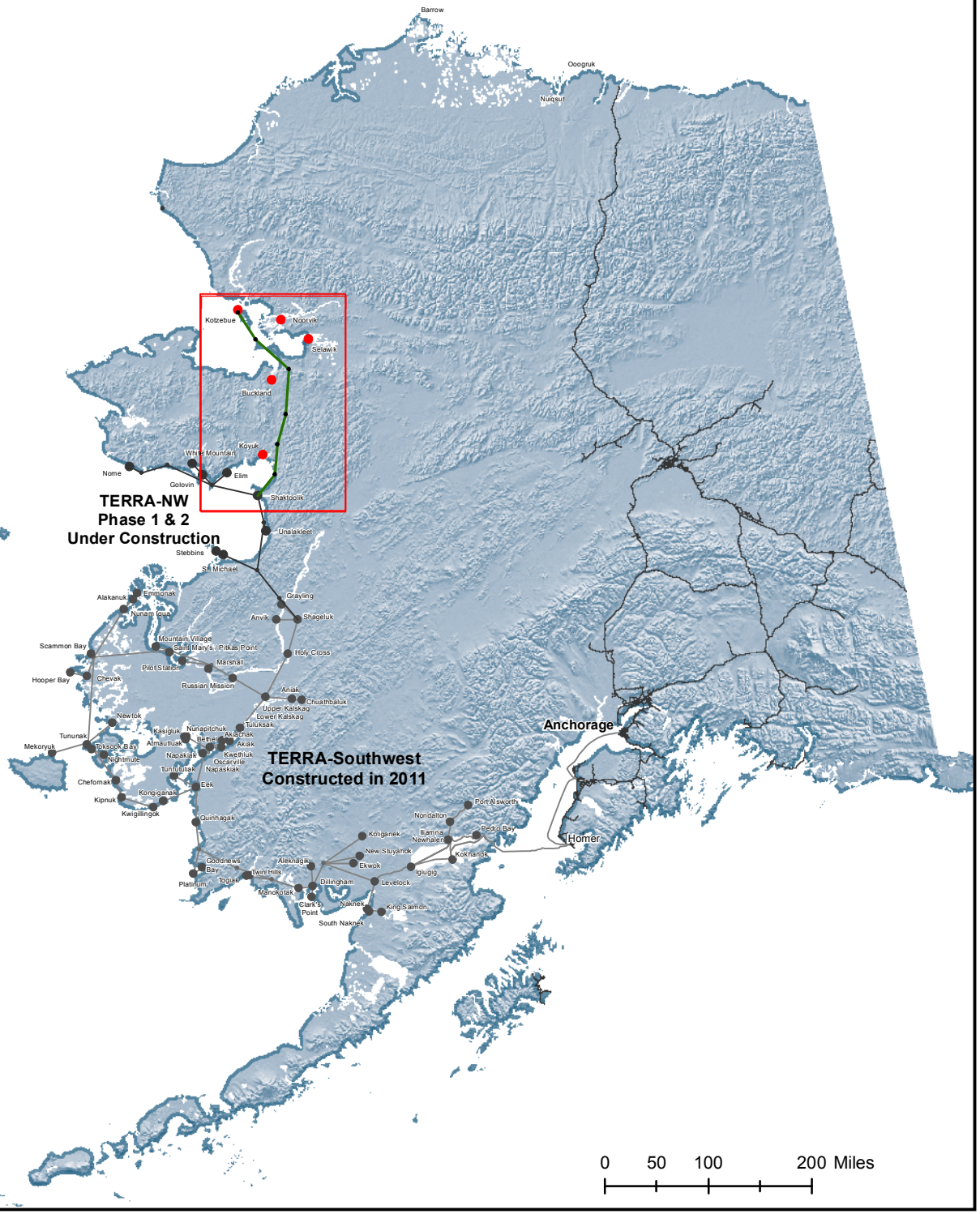
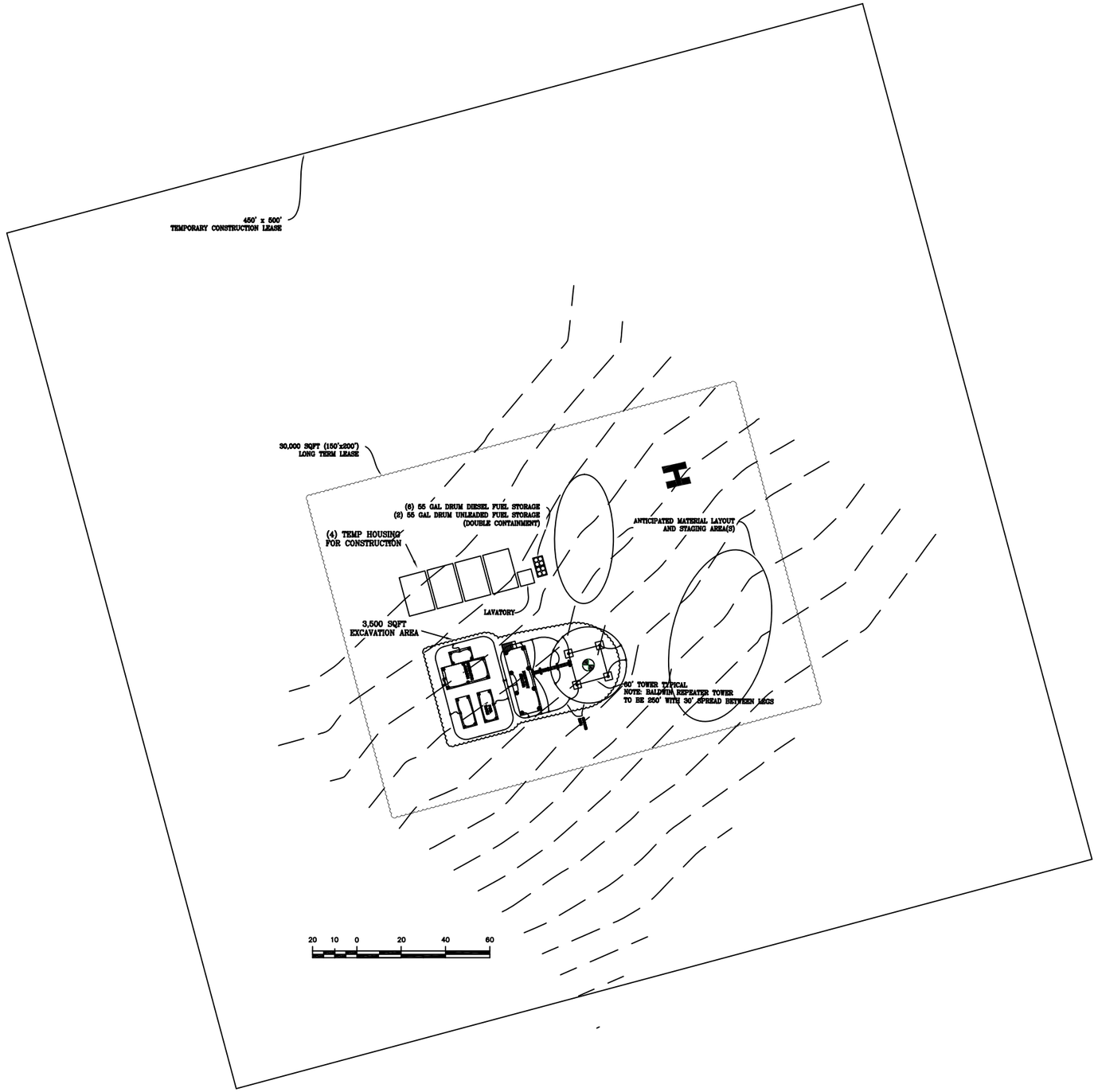
Baldwin Peninsula Planned Access Route

TERRA


Kotzebue
Kotzebue South
NOORVIK
Baldwin Peninsula Repeater
SELAWIK
Harvey Repeater
BUCKLAND
TERRA-NW
Phase 3
Talik Repeater
0 10 20 30 Miles
Dime Repeater
KOYUK
Ungalik River Repeater
Shaktoolik


Barrow
Ooogruk
Nuiqsut
Kotzebue
Noorvik
Selawik
Buckland
Koyuk
White Mountain
Elim
Golovin
Nome
Shaktoolik
TERRA-NW
Phase 1 & 2
Under Construction
Unalakleet
Stebbins
St Michael
Grayling
Anvik
Shageluk
Alakanuk
Emmonak
Nunam Iqua
Mountain Village
Scammon Bay
Saint Mary's / Pitkas Point
Holy Cross
Pilot Station
Marshall
Hooper Bay
Chevak
Russian Mission
Aniak
Chuathbaluk
Upper Kalskag
Lower Kalskag
Newtok
Tuluksak
Kasigluk
Nunapitchuk
Akiachak
Tununak
Bethel
Akiak
Mekoryuk
Toksook Bay
Atmautluak
Kwethluk
Nightmute
Napakiak
Oscarville
Tuntutuliak
Napaskiak
TERRA-Southwest
Constructed in 2011
Chefornak
Eek
Kongiganak
Kipnuk
Kwigillingok
Quinhagak
Anchorage
Port Alsworth
Nondalton
Iliamna
Newhalen
Kokhanok
Kokhanok
Homer
Koliganek
New Stuyahok
Ekwok
Aleknagik
Dillingham
Iguigig
Levelock
Goodnews Bay
Platinum
Togiak
Twin Hills
Manokotak
Clark's Point
Naknek
King Salmon
South Naknek
0 50 100 200 Miles



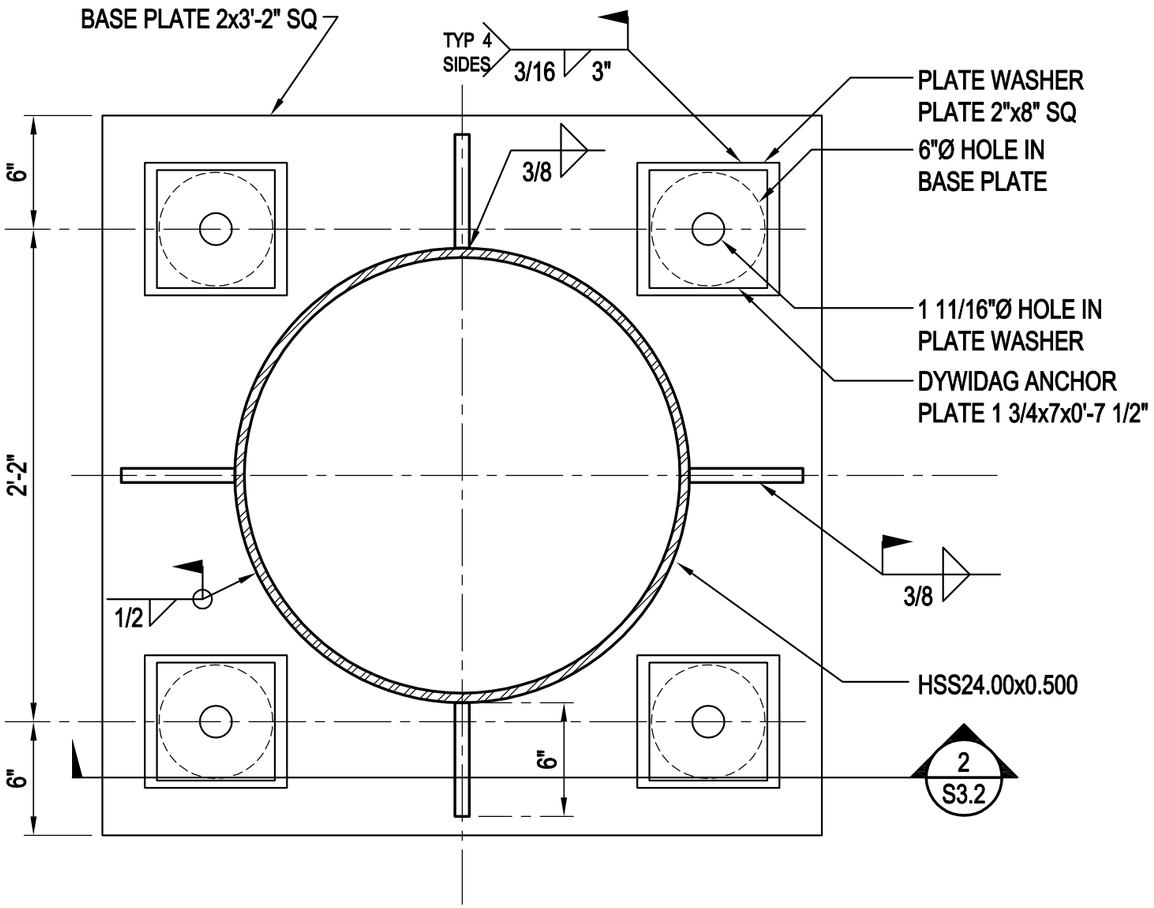
TERRA GCI UUI

TYPICAL PHASE III SITE PLAN

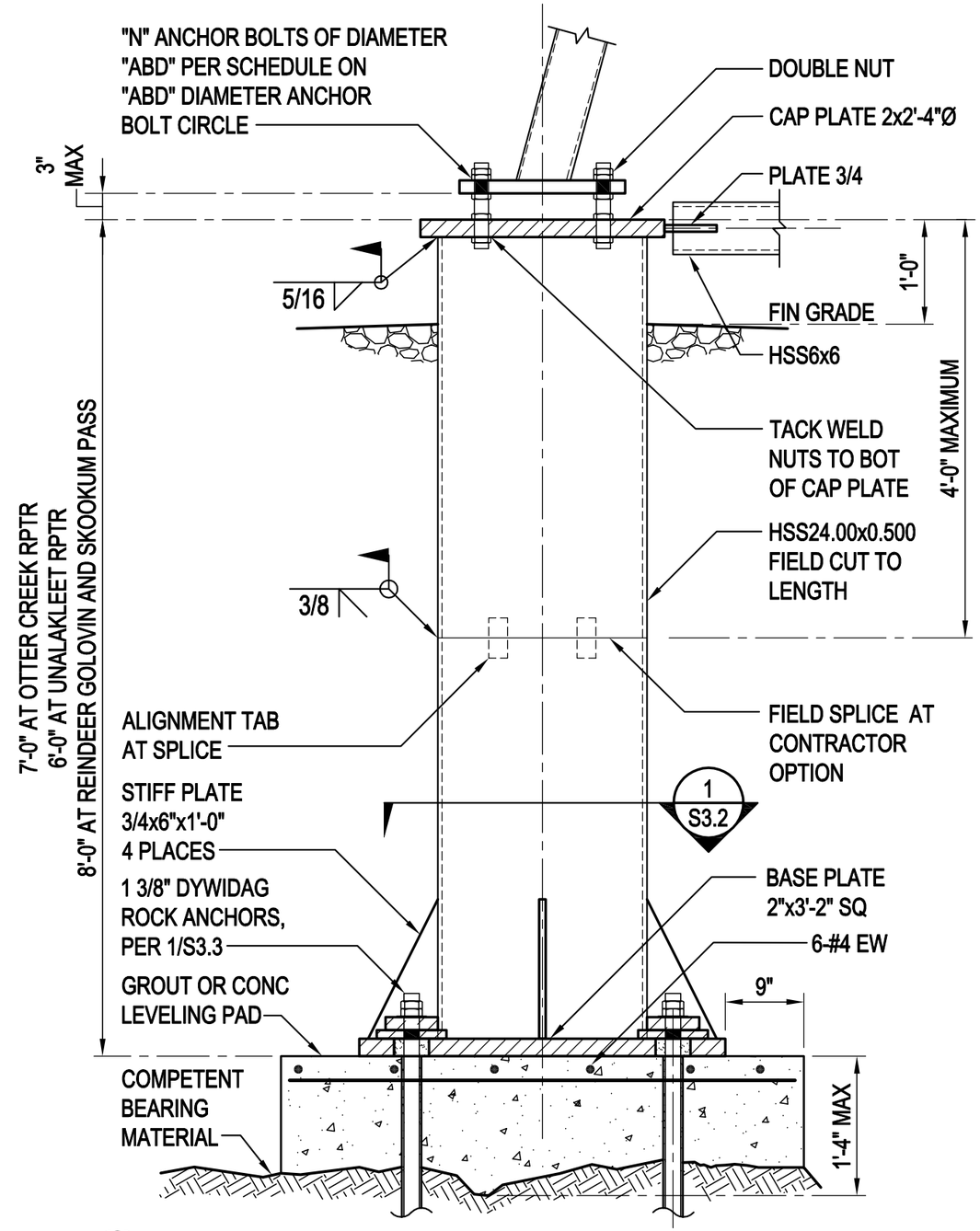
SCALE: 1"=30' FORMATTED: 11"x17"

DRAFTED BY: T.WEIST	DATE: 07/13/2012
DESIGNER/PROJECT ENGINEER: C. GILL	

REVISION	DATE



1 BASE PLATE PLAN
SCALE: 1 1/2" = 1'-0"



2 PIER ELEVATION
SCALE: 3/4" = 1'-0"

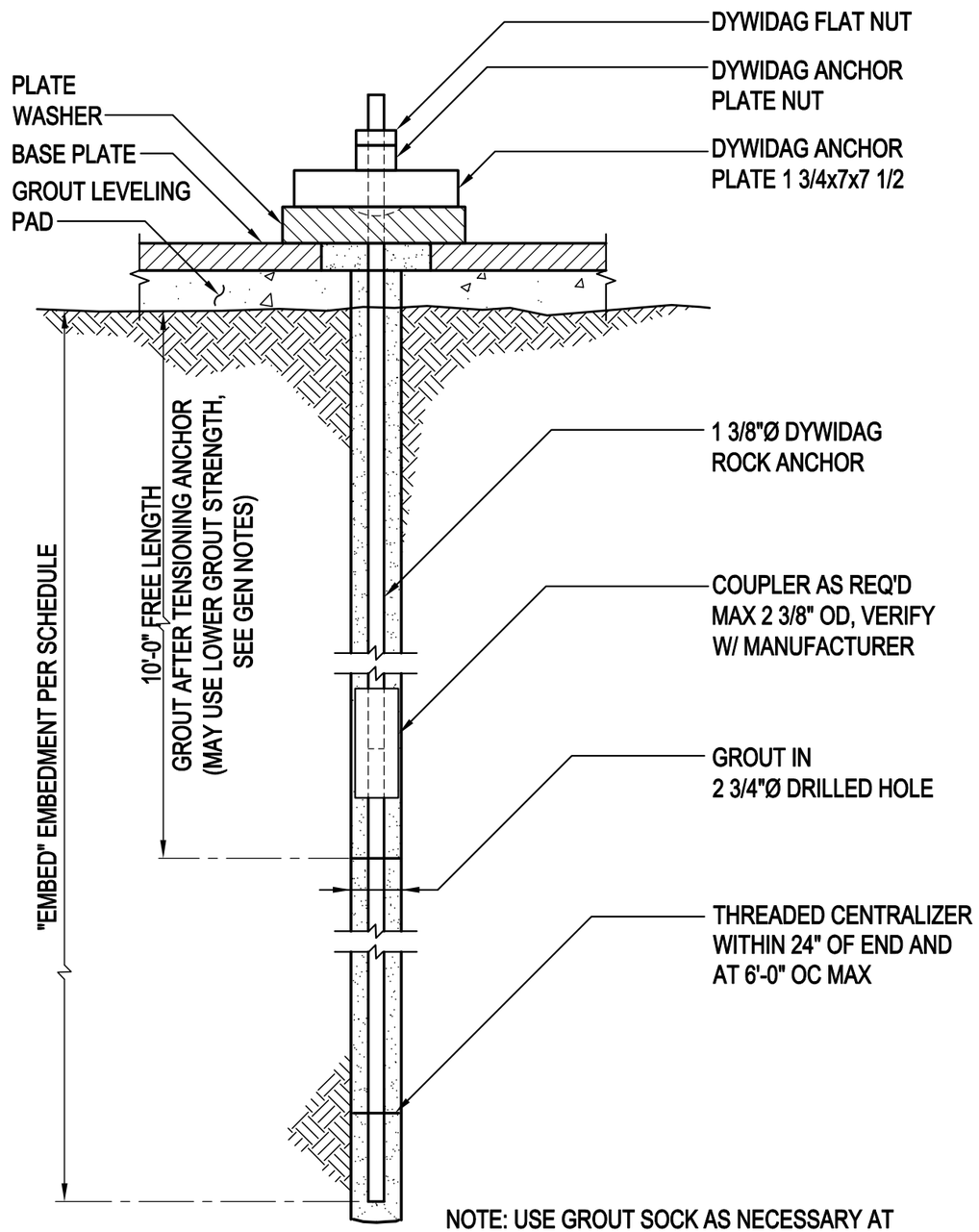
BBFM Engineers Inc.
510 L Street, Suite 200
Anchorage, AK 99501-1949
Phone: (907) 274-2236 Fax: 274-2520

TERRA NORTHWEST
ALASKA

Drawn	Date
JWC	10-31-11
Checked	Job No.
TJF	211128

Sheet Contents
TYPE 3 FOUNDATION
BASTE PLATE PLAN
PIER ELEVATION

Drawing No.
S3.2



NOTE: USE GROUT SOCK AS NECESSARY AT CONTRACTOR'S OPTION.

1 ROCK ANCHOR DETAIL
SCALE: 1 1/2" = 1'-0"

BBFM Engineers Inc.
510 L Street, Suite 200
Anchorage, AK 99501-1949
Phone: (907) 274-2236 Fax: 274-2520

TERRA NORTHWEST
ALASKA

Drawn	Date
JWC	10-31-11
Checked	Job No.
TJF	211128

Sheet Contents
TYP 3 FOUNDATION ROCK ANCHOR DETAIL

Drawing No.
S3.3

APPENDIX C

USFWS Section 7 Threatened and/or Endangered Species Consultation Letter and Polar Bear Interaction Guidelines

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United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Fairbanks Fish and Wildlife Field Office
101 12th Avenue, Room 110
Fairbanks, Alaska 99701

January 23, 2013

Bruce Seppi
Wildlife Biologist
Bureau of Land Management
Anchorage Field Office
4700 BLM Road
Anchorage, Alaska 99507

Re: TERRA Northwest Broadband Telecommunications Project – Phase III

Dear Mr. Seppi:

Thank you for requesting consultation on endangered and threatened species pursuant to Section 7 of the Endangered Species Act of 1973, as amended (ESA). Based on your December 18, 2012 e-mail and the project's draft environmental assessment (EA), we understand the Bureau of Land Management (BLM) is considering an application from Unicom, Incorporated to construct, operate, maintain and decommission six remote microwave repeaters with associated equipment as part of the TERRA Northwest (TERRA-NW) Broadband Telecommunications Project.

Three species listed as threatened under the ESA occur in the project area: spectacled eiders (*Somateria fischeri*), Alaska-breeding Steller's eiders (*Polysticta stelleri*), and polar bears (*Ursus maritimus*). Proposed activities may also occur in spectacled eider critical habitat Unit 3 (Norton Sound; Figure 2) and in barrier island habitat used by polar bears (Figure 3).

THE PROPOSED ACTION

The TERRA-NW Project will extend broadband Internet service from Shaktoolik to Kotzebue, Alaska (Figure 1; 2-1 in the draft EA). Under the current proposal, the project would have multiple stages, but only 2013 and 2014 construction activities are currently planned, funded, and proposed for permits.

This consultation will consider potential effects to listed species and their designated critical habitat associated with implementation of the following actions as defined in the Terra-NW draft EA:

- Five proposed microwave repeaters on BLM-managed lands (Ungalik River, Dime, Talik, Harvey, and Baldwin Peninsula repeater sites; Figure 1)
- One proposed community tower located on Kikiktagruk Inupiat Corporation (KIC) land in Kotzebue (Figure 1).

Construction of 5 repeater towers would occur between June and September in 2013 and 2014 following the general schedule:

- June to early July – mobilization
- June – construct camp
- Late June to September – install foundation, towers, and fuel tanks
- July – transport prefabricated shelters, heavy construction equipment, and fuel tanks to the site
- June to July – install antenna, battery, and fuel piping; fuel transportation and tank filling; initial site startup
- August to September – install communications equipment; site and link commissioning (between sites); clearing, cleanup, and remediation/revegetation of staging areas.

Construction of the Baldwin Peninsula repeater would follow a modified schedule:

- September 2013 – material staging on a western peninsula beach
- February 2014 – ground transportation of materials to eastern peninsula
- March to April 2014 – foundation and tower construction
- May to July 2014 – install prefabricated shelter, fuel tanks, and demobilize staging area
- August to September 2014 – install battery and fuel piping; fuel transportation and tank filling; initial site startup; install communications equipment; site and link (between sites) commissioning; clearing, cleanup, and remediation/revegetation of staging yards.

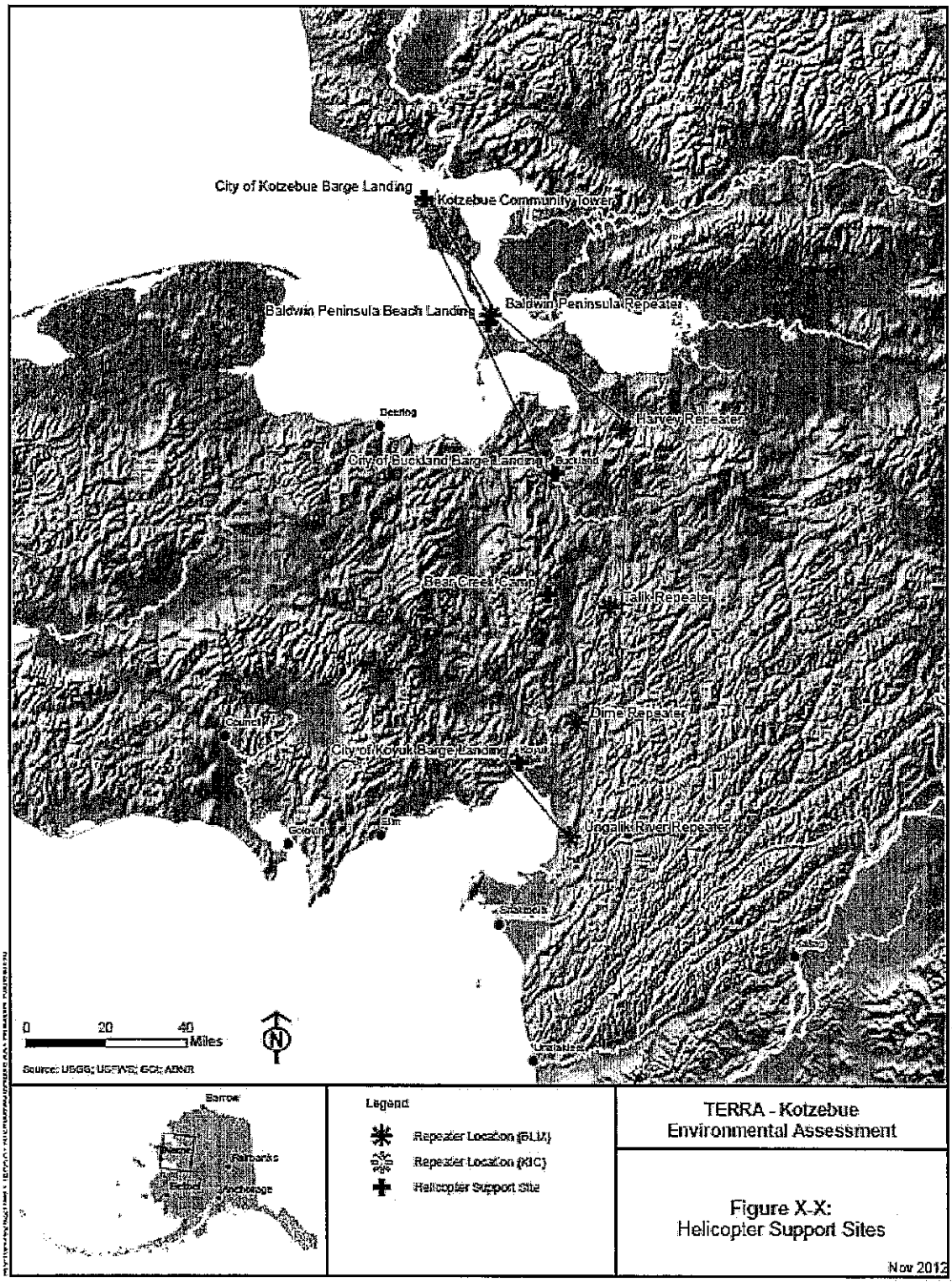


Figure 1. Proposed Terra-NW repeater and community towers, helicopter support sites, and helicopter transit corridors between Shaktoolik and Kotzebue, Alaska on the eastern Seward Peninsula.

Each tower site would have a temporary footprint of 5.15 acres (0.021 km^2) during construction and a long-term footprint of 0.69 acres (0.003 km^2). The proposed KIC tower would require a 1,200 ft^2 (111.5 m^2) access road from the existing Kotzebue infrastructure. Primary project facilities at the each microwave repeater site include the tower and antennas, a power module shelter, a communication equipment shelter, and fuel tanks. Four towers would be 60–80 ft (18.3–24.4 m) in height, free-standing (no guy wires), and unlighted. The Baldwin Peninsula and Kotzebue Community Towers would be 250 ft (76.2 m), free-standing, and may be lighted as per FAA regulations.

Helicopter support would be used for construction, annual maintenance, and refueling at remote sites. Helicopters would travel at an altitude of 1,500 ft (457 m) and use established flight paths from staging areas and nearby villages. The BLM estimates approximately 122 construction helicopter trips would be required, including 4 heavy-lift trips, for each of the five remote sites on Federal lands. Approximately four maintenance and 14 refueling trips per site would also be required annually during operations

Short-term construction activities at each site would include installation of heavy tent structures, cooking facilities, 55-gallon drums to contain food, freshwater, and gray water, six 55-gallon drums and two 300-gallon bladders for fuel, a portable toilet, and trash bags. Construction activities would also require heavy equipment (a CAT 303 or equivalent excavator), air compressors, and diesel generators. Generators would provide power for the construction camp and, post-construction, would run continuously to power operations of the facility. These generators would be equipped with hospital grade silencers. Long-term structures and equipment at repeater sites would include the tower, microwave and cellular antennas, prefabricated equipment and power module shelters, two 9,000 gallon diesel fuel tanks, piping between tanks and shelters, and a spill response kit. A Spill Prevention Control and Countermeasure Plan would be required to address risks associated with hazardous materials storage, fuel transportation, and transfers.

Helicopter support and construction staging areas would be located in Koyuk, Shaktoolik, Bear Creek Camp, Buckland, and a western beach on the Baldwin Peninsula (Figure 1). The staging area for the KIC tower would be located at Bering Air in Kotzebue. Equipment and personnel would be staged at these locations prior to helicopter transportation to construction sites.

ACTION AREA

The action area includes the six proposed repeater sites and associated staging and support areas on the eastern Seward Peninsula between Shaktoolik and Kotzebue, Alaska. Additionally, the action area includes the helicopter corridors between villages, repeater sites, and staging/support areas.

EFFECTS OF THE ACTION ON LISTED SPECIES

Project effects on listed eiders

Spectacled and Alaska-breeding Steller's eiders migrate through coastal waters in western Alaska, but are not known to nest within the action area on the Seward Peninsula. From August through October, Norton Sound is the principal molting and staging area for female spectacled eiders nesting on the Yukon-Kuskokwim Delta (Petersen et al. 1999). Satellite telemetry data suggests most spectacled eiders concentrate approximately 6–25 miles (10–40 km) offshore in northeastern Norton Sound near Shaktoolik (USGS, unpublished data; Figure 2). We anticipate large concentrations of spectacled eiders would only occur in this area; however, individuals and smaller groups of both eider species may also be present in the nearshore waters of Norton Sound during spring and fall migration.

Listed eiders in the action area could be disturbed by activity at staging areas, from helicopter overflights, and through collisions with towers. We anticipate migrating eiders in the nearshore environment would move to a perceived safe distance from onshore disturbance. Given the 1,500 ft altitude of helicopter flights, eiders would likely experience only occasional and temporary disturbances from these operations. Therefore, we expect project effects to listed eiders from disturbance would be insignificant.

Migrating eiders tend to fly low (≤ 10 m; Johnson and Richardson 1982), which makes them vulnerable to collisions with the proposed towers, especially in low light or inclement weather. However, we expect most eiders would migrate offshore rather than fly overland. Furthermore, the proposed towers would lack guy wires and most would be unlighted, which reduces collision risk. Because listed eiders are not expected to migrate overland in large numbers and towers would not be guyed, we anticipate collisions of listed eiders with the proposed towers would be uncommon. Therefore, we expect collisions resulting from the proposed action would be insignificant to listed eiders.

Project effects on spectacled eider critical habitat

A portion of Norton Sound was designated spectacled eider critical habitat because it is one of four principal molting and staging areas for the species (Figure 2; 66 FR 9146). The primary constituent elements[1] (PCEs) of the Norton Sound Critical Habitat Unit (NSCHU) are marine waters greater than 16.4 ft (5 m) and less than or equal to 82 ft (25 m) in depth at mean lower low water, with associated marine aquatic flora and fauna in the water column, and the underlying benthic community. Helicopter operations in Shaktoolik could overlap the NSCHU. However, because project activities in the NSCHU would be limited to overflights, we do not anticipate adverse effects to the physical or biological features of the unit. Therefore, we expect effects of the proposed activities on spectacled eider critical habitat would be insignificant.

[1] Primary constituent elements are those physical and biological features of the habitat that are important to the survival and reproduction of the listed species.

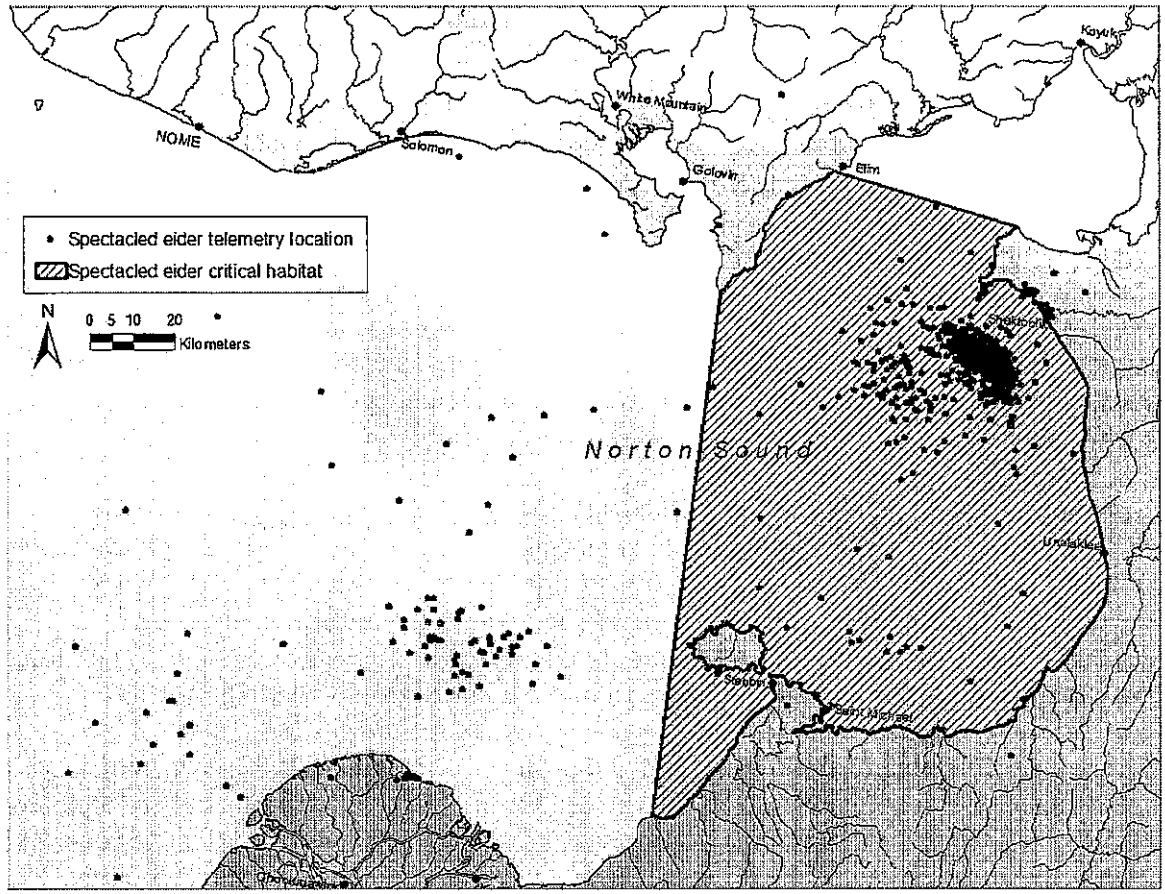


Figure 2. Spectacled eider telemetry locations relative to designated critical habitat in Norton Sound (U.S. Geological Survey, unpublished data).

Project effects on polar bears

On May 15, 2008, the polar bear (*Ursus maritimus*) was listed as threatened (73 FR 28212). Polar bear density in the action area is extremely low and we expect polar bears would rarely occur on the eastern Seward Peninsula between Kotzebue and Norton sounds. However, transient bears could potentially enter the action area and be disturbed by the presence of humans, equipment noise, or helicopter operations. Nevertheless, we expect these disturbances would be minor and temporary because polar bears would most likely respond by departing the area. Furthermore, in the event that personnel encounter polar bears during project activities, they would follow the attached Polar Bear Interaction Guidelines. Finally, disturbances from helicopter operations are anticipated to be minor and temporary due to the 1,500 ft minimum altitude flight restriction. Because of (1) the very low probability of encountering a polar bear; (2) the fact that behavioral effects from disturbance would be minor and temporary; and (3) mitigation measures are included in the Interaction Guidelines to minimize potential impacts in the event that a polar bear is encountered, we expect effects of the proposed action on polar bears would be insignificant.

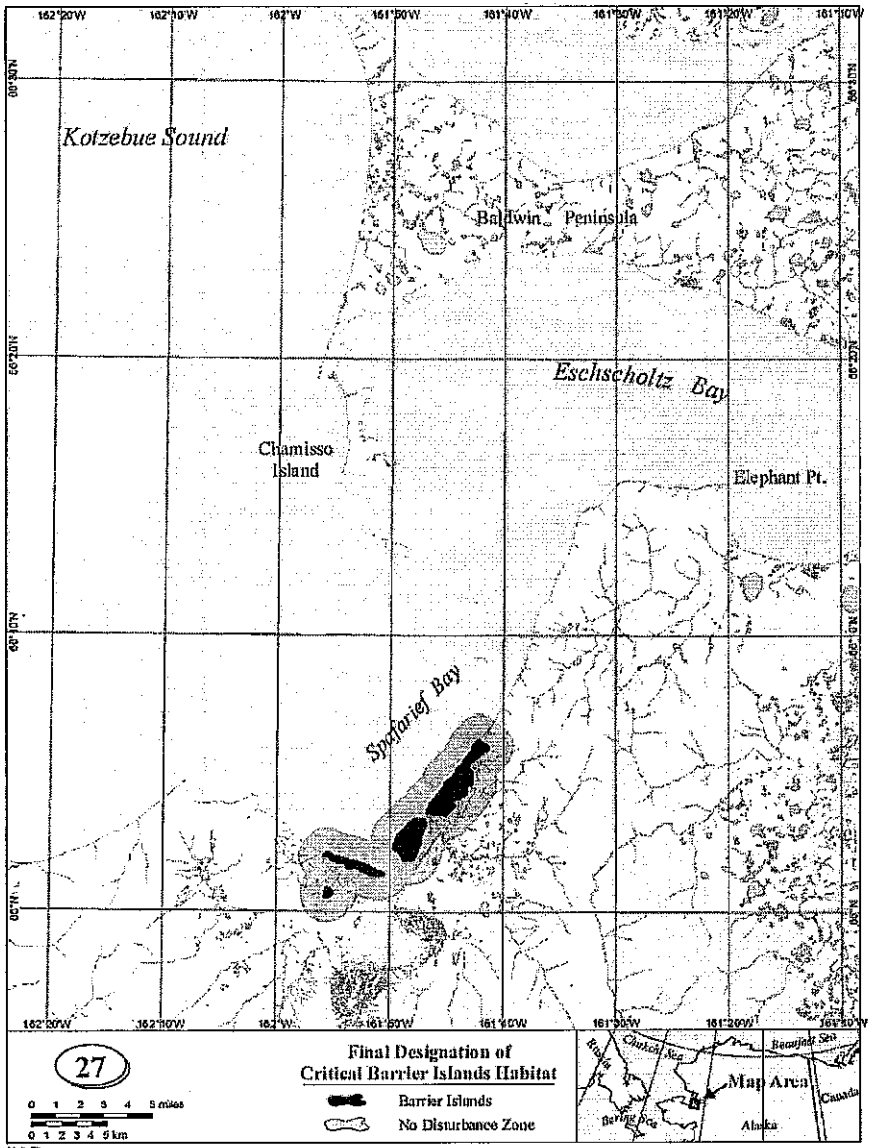
Project effects on polar bear critical habitat

On October 29, 2009, the Service proposed critical habitat for polar bears (74 FR56058). A final rule designating three critical habitat units for polar bears was issued on December 7, 2010 (75 FR 76086). These units were identified as (1) Sea-ice Habitat ; (2); Terrestrial Denning Habitat; and (3) Barrier Island Habitat. On January 11, 2013, the U.S. District Court for the District of Alaska issued a decision vacating and remanding the final rule to the Service in *Alaska Oil and Gas Association et al. v. Salazar et al* (D. Alaska)(3:11-cv-00025-RRB). Decisions regarding the District Court's order are currently pending, and the scope and description of a final critical habitat designation for polar bears are unresolved. Nevertheless, prior to the District Court's decision, the Service conducted an analysis of the potential effects of this proposed action on the barrier island critical habitat unit set forth in the 2010 vacated rule. For advisory purposes, we are providing that analysis in this consultation. We note this analysis may ultimately need to be revised and consultation reinitiated to reflect changes that may be made in a final critical habitat designation.

Barrier islands within Kotzebue and Norton Sounds were included in the barrier island polar bear critical habitat unit (Figure 3; 75 FR 76086). The PCE of the barrier island critical Habitat Unit was defined as barrier island habitat used for denning, refuge from human disturbance, and movements along the coast to access maternal den and optimal feeding habitat, including all barrier islands along the Alaska coast and their associated spits, within the range of the polar bear in the United States, and the water, ice, and terrestrial habitat within 1 mi (1.6 km) of these islands (no-disturbance zone). A disturbance may adversely affect critical habitat if it persists or affects the critical habitat's conservation role.

Although none of the proposed towers occur within barrier island habitat, helicopter operations based in Shaktoolik or flights in Norton and Kotzebue Sounds may occur over some barrier islands and cause disturbance. However, because disturbances would be limited to temporary, occasional aircraft noise during two construction seasons, we would not expect this level of disturbance to appreciably affect the capability of barrier islands to support polar bears. Therefore, we expect project effects on barrier islands would be insignificant.

(A)



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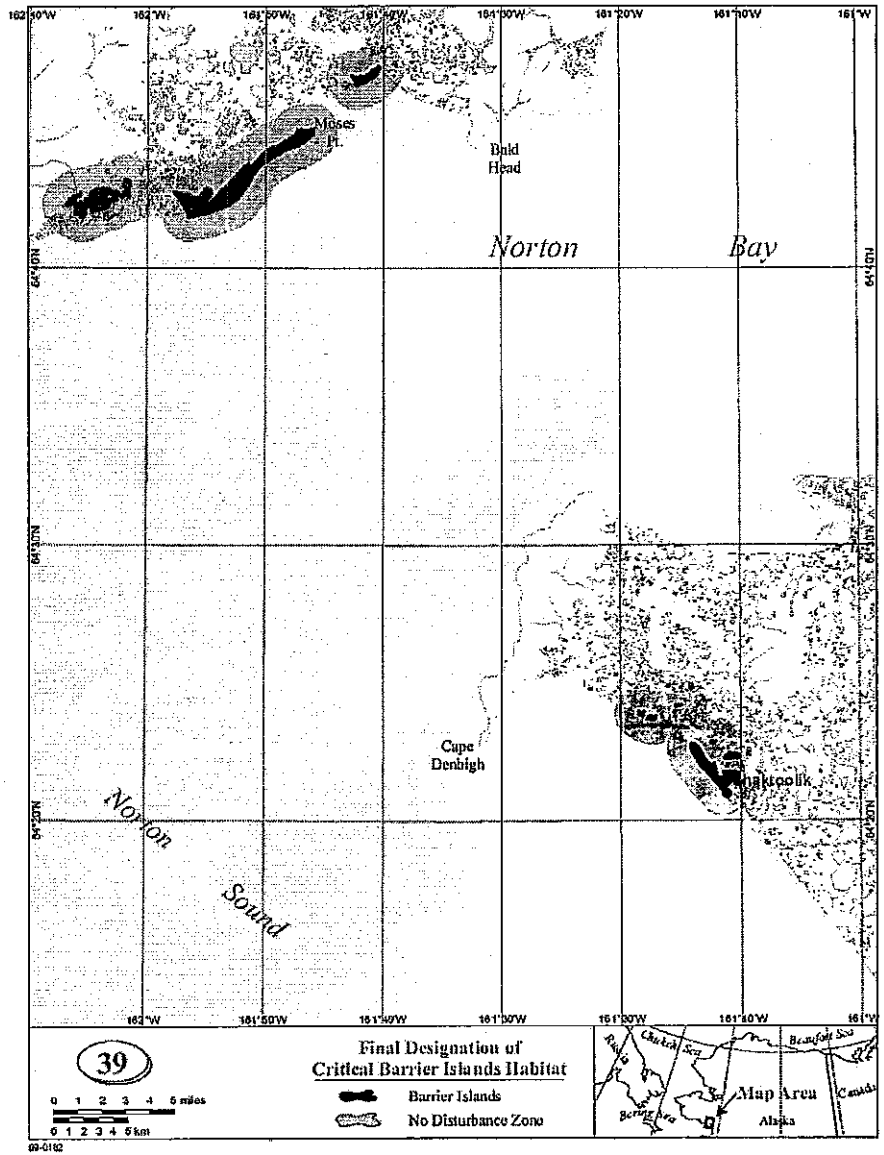

Figure 3. Polar bear barrier island habitat included in the action area (A) in Kotzebue Sound and (B) near Shaktoolik, Alaska in Norton Sound.

CONCLUSION

The proposed action could temporarily disturb or create a collision risk for listed eiders, however due to the low likelihood of overland migrations and the use of free-standing towers we expect the effects of disturbance and collisions to be insignificant. Therefore the Service concludes that the proposed action is not likely to adversely affect listed eiders. The proposed action could also temporarily disturb polar bears in the project area; however, due to low densities of this species and minimization measures in place, we expect the effects of disturbance to be insignificant and conclude the proposed action is not likely to adversely affect polar bears. Therefore the Service concludes that the proposed action is not likely to adversely affect listed eiders or polar bears. Furthermore, the Service concludes that the proposed action is not likely to adversely affect designated critical habitat for spectacled eiders. Preparation of a Biological Assessment or further consultation under section 7 of the ESA is not necessary at this time. Thank you for the opportunity to comment on this project. If you need further assistance, please contact Kaithryn Ott at (907) 456-0277.

Sincerely,

Ted Swem

Ted Swem
Branch Supervisor
Endangered Species

Literature Cited

Johnson, R. and W. Richardson. 1982. Waterbird migration near the Yukon and Alaska coast of the Beaufort Sea: II. Molt migration of seaducks in summer. Arctic 35:291–301.

Petersen, M.R., W.W. Larned, and D.C. Douglas. 1999. At-sea distribution of spectacled eiders: a 120-year-old mystery resolved. The Auk 116(4):1009–1020.

POLAR BEAR INTERACTION GUIDELINES

These Polar Bear Interaction Guidelines (Guidelines) were developed to ensure that activities are conducted in a manner that avoids conflicts between humans and polar bears. Polar bears are protected under the Marine Mammal Protection Act (MMPA), and were listed as a threatened species under the Endangered Species Act (ESA) in 2008. The MMPA and ESA both prohibit the "take" of polar bears without authorization. Take includes disturbance/harassment, as well as physical injury and killing of individuals.

In addition to sea ice, polar bears use marine waters and lands in northern Alaska for resting, feeding, denning, and seasonal movements. They are most likely to be encountered within 25 miles of the coastline, especially along barrier islands during July-October. Polar bears may also be encountered farther inland, especially females during the denning period (October-April). Polar bears may react differently to noise and human presence. The general methods for minimizing human-bear conflicts are to: 1) avoid detection and close encounters; 2) minimize attractants; and 3) recognize and respond appropriately to polar bear behaviors. These Guidelines provide information for avoiding conflicts with polar bears during air, land, or water-based activities.

Unusual sightings or questions/concerns can be referred to: Susanne Miller or Craig Perham, Marine Mammals Management Office (MMM Office), 1-800-362-5148; or to Sarah Conn (907) 456-0499 of the Fairbanks Fish & Wildlife Field Office (FFWFO).

When operating aircraft:

- If a polar bear(s) is encountered, divert flight path to a minimum of 2,000 feet above ground level or ½ mile horizontal distance away from observed bear(s) whenever possible.

When traveling on land or water:

- Avoid surprising a bear. Be vigilant—especially on barrier islands, in river drainages, along bluff habitat, near whale or other marine mammal carcasses, or in the vicinity of fresh tracks.

- Between October and April special care is needed to avoid disturbance of denning bears. If activities are to take place in that time period the MMM Office should be contacted to determine if any additional mitigation is required. In general, activities are not permitted within one mile of known den sites.

- Avoid carrying bear attractants (such as strongly scented snacks, fish, meat, or dog food) while away from camp; if you must carry attractants away from camp, store foods in air-tight containers or bags to minimize odor transmission until you return them to "bear-resistant" containers.*

- If a polar bear(s) is encountered, remain calm and avoid making sudden movements. Stay downwind if possible to avoid allowing the bear to smell you.

Do not approach polar bears. Allow bears to continue what they were doing before you encountered them. Slowly leave the vicinity if you see signs that you've been detected. Be aware that safe viewing distances will vary with each bear and individual situation. Remember that the closer you are to the animal, the more likely you are to disturb it.

- If a bear detects you, observe its behavior and react appropriately. Polar bears that stop what they are doing to turn their head or sniff the air in your direction have likely become aware of your presence. These animals may exhibit various behaviors:

  - *Curious* polar bears typically move slowly, stopping frequently to sniff the air, moving their heads around to catch a scent, or holding their heads high with ears forward. They may also stand up.

  - *A threatened or agitated* polar bear may huff, snap its jaws together, stare at you (or the object of threat) and lower its head to below shoulder level, pressing its ears back and swaying from side to side. These are signals for you to begin immediate withdrawal by backing away from the bear. If this behavior is ignored, the polar bear may charge. Threatened animals may also retreat.

  - In rare instances you may encounter a *predatory* bear. It may sneak or crawl up on an object it considers prey. It may also approach in a straight line at constant speed without exhibiting curious or threatened behavior. This behavior suggests the bear is about to attack. Standing your ground, grouping together, shouting, and waving your hands may halt the bear's approach.

- If a polar bear approaches and you are in the bear's path—or between a mother and her cubs—get out of the way (without running). If the animal continues to approach, stand your ground. Gather people together in a group and/or hold a jacket over your head to look bigger. Shout or make noise to discourage the approach.

- If a single polar bear attacks, defend yourself by using any deterrents available. If the attack is by a surprised female defending her cubs, remove yourself as a threat to the cubs.

When camping:

- Avoid camping or lingering in bear high-use areas such as river drainages, coastal bluffs and barrier islands.

- Store food and other attractants in "bear-resistant" containers*. Consider the use of an electric fence as additional protection. Do not allow the bear to receive food as a reward in your camp. A food-rewarded bear is likely to become a problem bear for you or someone else in the future.

- Maintain a clean camp. Plan carefully to: minimize excess food; fly unnecessary attractants out on a regular basis (i.e. garbage, animal carcasses, excess anti-freeze or petroleum products); locate latrines at least ¼ mile from camp; and wash kitchen equipment after every use.

- If a polar bear approaches you in camp, defend your space by gathering people into a large group, making noise and waving jackets or tarps. Continue to discourage the bear until it moves off. Have people watch the surrounding area in case it returns later, keeping in mind that polar bears are known to be more active at night. Additional measures to protect your camp, such as electric fences or motion sensors can be used.

Harassment of polar bears is not permissible, unless such taking (as defined under the MMPA) is imminently necessary in defense of life, and such taking is reported to FWS within 48 hours.

*Containers must be approved and certified by the Interagency Grizzly Bear Committee as "bear-resistant." Information about certified containers can be found at http://www.igbconline.org/html/container.html.

Polar Bear Deterrence Guidelines

The U.S. Fish and Wildlife Service (Service) announced final deterrence guidelines that may be safely used to deter a polar bear without seriously injuring or causing the death of the animal. The deterrence guidelines, which take effect November 5, 2010, are voluntary and are intended to reduce occurrences of interactions between bears and humans in manners safe for both. They provide clear guidance for minimizing incidental encounters with polar bears, but will not change the legal status quo for any activities in Alaska.

The deterrence guidelines include 2 levels:

(1) Passive deterrence measures – these are measures intended to prevent polar bears from gaining access to property or people. They include:

(i) Rigid fencing and other fixed barriers such as gates and fence skirting.
(ii) Bear exclusion cages, which provide a protective shelter for people.
(iii) Bear-proof garbage containers to exclude bears from accessing garbage as a food.

(2) Preventive deterrence measures – these are measures intended to dissuade a polar bear from initiating an interaction with property or people. These include:

(i) Acoustic devices that create an auditory disturbance.
(ii) Vehicle or boat deterrence, e.g. patrolling the periphery of an area.

In finalizing these guidelines the Service is mindful of the inherent risks to humans associated with the act of deterring a large carnivore such as the polar bear, as well the Marine Mammal Protection Act's (MMPA) intent that acceptable acts of deterrence are those that safely deter but do not result in death or serious injury. Therefore, these guidelines are benign in nature. While some parties may believe they do not go far enough, we do not believe more active deterrence measures are appropriate for these guidelines.

Independent of these deterrence guidelines, and under separate provisions of the MMPA, the Service does authorize active hazing measures that may be taken to stop bear activity patterns or to remove an individual animal from areas of human populations or work environs. In addition, the lethal taking of a polar bear in defense of life (but not property) is an exempted action under the MMPA. These deterrence guidelines serve to complement such authorized activities and not supersede them.

Note: The preceding guidelines are provided on the USFWS Alaska Region Marine Mammals Management web site,
http://alaska.fws.gov/fisheries/mmm/polarbear/det_guidelines.htm.
The entire Federal Register Notice (final rule) can be accessed at
http://alaska.fws.gov/fisheries/mmm/polarbear/pdf/federal_register_notice_final_rule.pdf

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APPENDIX D

(Draft) Section 810 Subsistence Evaluation and Findings

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Draft Compliance with ANILCA §810

NEPA Document No.: DOI-BLM-AK-A010-2012-0036-EA

Applicant: Unicom Incorporated

Evaluation by: Merben R. Cebrian

1. Evaluation and Finding of Alternative 1: The No Action Alternative

1.A. Effect of Alternative 1 on subsistence uses and needs:

Fisheries: This alternative proposes to continue current management practices under the 2008 Kobuk-Seward Peninsula Resource Management Plan. Current practices are considered adequate to meet subsistence needs. Therefore, this alternative will have no significant effect on subsistence uses and needs.

Wildlife: This alternative proposes to continue current management practices under the 2008 Kobuk-Seward Peninsula Resource Management Plan. Current practices are considered adequate to meet subsistence needs. Therefore, this alternative will have no significant effect on subsistence uses and needs.

Other resources: The No Action Alternative will not significantly affect other harvestable resources such as berries, willows, firewood, and spruce roots. Current practices are considered adequate to meet subsistence needs. Therefore, this alternative will have no significant effect on subsistence uses and needs.

1.B. Availability of other lands, if any, for the purposes sought to be achieved:

Other lands are available for the purposes sought to be achieved. However, there are no other lands considered by the applicant for the intended purposes.

1.C. Other alternatives, if any, which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes:

The only alternative that would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes is to not allow or permit any activities that conflict with subsistence uses. However, such an alternative is not viable because the BLM manages public lands for multiple uses.

1.D. Finding:

Under Alternative 1, management of BLM lands in the Seward Peninsula would continue under the 2008 Kobuk-Seward Peninsula Resource Management Plan. Management actions will not result in a significant reduction in subsistence uses. Access to subsistence resources will not be hampered. There is no reasonably foreseeable significant decrease in the abundance of harvestable resources and in the distribution of harvestable resources due to this alternative.

2. Evaluation and Finding of Alternative 2 (the Proposed Action)

2.A. Effect of Alternative 2 on subsistence uses and needs:

Fisheries: The proposed five repeater towers consists of four towers on mountain tops and one tower in the Baldwin Peninsula that is located on a high bluff away from water. During construction as well as for the life of these towers' operations, access to fish resource will not be hampered. Therefore, this alternative will not have a significant effect on subsistence uses and needs.

Wildlife: The BLM intends to determine whether to grant the applicant authorization to construct and to operate five microwave repeater towers on BLM-managed lands in the Seward Peninsula. Four towers are on mountain tops and one tower is in the Baldwin Peninsula that is located on a high bluff away from water.

The proposed action occurs partly within federal subsistence hunting areas. Large mammals such as moose and caribou occur in the area. The construction of these five microwave repeater towers has a footprint of approximately 5.16 acres. Activity on this relatively small patch of land may temporarily displace large mammals from the vicinity of the activity, especially during construction when equipment and personnel are supported by helicopter transport of up to 140 trips to the construction site. Large equipment that will also be on site during construction may temporarily displace game from the immediate area. However, the relatively small footprint, with construction season of short duration, and with a small human presence during the life of the towers' operation, the proposed action will not have a significant effect on subsistence uses and needs.

Hunting of small game and upland birds will not be significantly restricted by the proposed action. Trapping of furbearers will not be significantly restricted by the proposed action since this activity is usually conducted via snowmachine that requires adequate snow cover.

Other resources:

The proposed action will not significantly affect other harvestable resources such as berries, willows, firewood, and spruce roots. Proposed actions that mitigate litter and human waste

disposal, fire rings, and campsite impacts will likely be beneficial to the habitat by minimizing habitat fragmentation.

2.B. Availability of other lands, if any, for the purposes sought to be achieved:

Other lands are available for the purposes of the applicant. However, no other lands were considered by the applicant for the intended purposes, except for those analyzed in the different alternatives.

2.C. Other alternatives, if any, which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes:

The only other alternative that would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes is to not allow or permit any activities that conflict with subsistence uses. However, such an alternative is not viable because the BLM manages public lands for multiple uses.

2.D. Finding:

Alternative 2 (Proposed Action) will not significantly restrict subsistence uses. Access to subsistence resources will not be hampered by the proposed activity. There is no reasonably foreseeable significant decrease in the abundance of harvestable resources and in the distribution of harvestable resources due to the proposed action.

3. Evaluation and Finding of Alternative 3

3.A. Effect of Alternative 3 on subsistence uses and needs:

Fisheries: The proposed six repeater towers consists of four towers on mountain tops, one tower in the Baldwin Peninsula that is located on a high bluff away from water, and one tower in the US Air Force site approximately two miles south of Kotzebue. During construction as well as for the life of these towers' operations, access to fish resource will not be hampered. Therefore, this alternative will not have a significant effect on subsistence uses and needs.

Wildlife: This alternative includes an additional tower at a US Air Force site in Kotzebue. However, the effects to subsistence uses and needs are similar to those for Alternative 2. Therefore, this alternative will not have a significant effect on subsistence uses and needs.

Other resources: Same as Alternative 2.

3.B. Availability of other lands, if any, for the purposes sought to be achieved:

Other lands are available for the purposes of the applicant. However, no other lands were considered by the applicant for the intended purposes, except for those analyzed in the different alternatives.

3.C. Other alternatives, if any, which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes:

The only other alternative that would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes is to not allow or permit any activities that conflict with subsistence uses. However, such an alternative is not viable because the BLM manages public lands for multiple uses.

3.D. Finding:

Alternative 3 will not significantly restrict subsistence uses. Access to subsistence resources will not be hampered by the proposed activity. There is no reasonably foreseeable significant decrease in the abundance of harvestable resources and in the distribution of harvestable resources due to the proposed action.

APPENDIX E

Land with Wilderness Characteristics Inventory Results: Nulato Hills, Ungalik River, and Balwin Peninsula Inventory Areas

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Form 2

Current Conditions: Presence or Absence of Wilderness Characteristics

Area Name: Nulato Hills-v2

Total BLM Inventory Acreage: 4,915,380

Area Unique Identifiers

- CYFO-Nulato Hills-v2 - 001

Is the area of sufficient size? (If the area meets one of the exceptions to the size criterion, check Yes and describe the exception in the space provided below), Note: If "No" is checked the area does not have wilderness characteristics; check NA for the remaining questions below.

Yes X No _____

Description (describe the boundaries of the area--wilderness inventory roads, property lines, etc.):

This inventory unit combines three earlier inventories: Nulato Hills, Kateel-Gisasa, and Tagagawik-Kateel Uplands with contiguous BLM-managed lands not previously inventoried.

The Nulato Hills-v2 unit contains almost 5,000,000 acres of contiguous BLM-managed lands. The unit is bordered on the north by Selawik National Wildlife Refuge. The east boundary is the Koyukuk National Wildlife Refuge and borders the Congressionally-designated Koyukuk Wilderness. The southeast boundary is defined by Native-conveyed lands bordering the Yukon River. The western boundary includes a portion of HUC 1905020307 (Upper Buckland River), state-conveyed land, and the Anchorage Field Office boundary, which also forms the south boundary of the unit. The entire area is roadless. There are no developed trails.

Does the area appear to be natural? Note: If "No" is checked the area does not have wilderness characteristics; check NA for the remaining questions below.

Yes X No _____ N/A _____

Description (include land ownership, location, topography, vegetation, and summary of major human uses/activities):

This unit is in northwest Alaska, east of the Seward Peninsula and west of Koyukuk National Wildlife Refuge and the Yukon River. The Arctic Circle is approximately 25 miles north of the northern boundary. The unit is entirely within the BLM's Central Yukon Field Area but includes 189,000 acres of State-selected lands and 13,000 acres of Native-selected lands.

The dominant physical characteristics include a vast region of rolling hills and plateaus surrounding rugged mountainous uplands drained by numerous clear-water rivers. The Selawik Hills dominate the northwestern portion of the unit with one peak reaching 3,268 feet. Peaks in the Nulato Hills to the south are in the 2,000 to 3,000 foot range, with a few reaching almost

4,000 feet. The Continental Divide separates the Tagagwik River, Buckland River and other rivers which flow into Kotzebue Sound, from the Box River, Inglutalik River, Gisasa River and other rivers which flow into the Yukon River or Norton Sound.

There are extensive areas of moist or dry upland tundra, often dominated by tussock cottongrass. Forests of spruce and birch trees and tall shrubs grow along the river valleys and closer to the Yukon River. Wildfires periodically sweep through the area. Thaw lakes and other permafrost features such as polygonal ground are common in lowland areas, especially between the Nulato Hills and Selawik Hills. Large treeless areas with low tundra vegetation provide panoramic views of the surroundings even on low and moderately hilly terrain. Large animals that inhabit the area include caribou, moose, grizzly bears and black bears. The rivers provide spawning habitat for salmon and sheefish, both critical subsistence resources for villages in the region.

Less than 20 miles from Kotzebue Sound is the village of Buckland (population 437 in 2011), which is approximately nine miles west of the border of this unit although only one mile from the nearest BLM-managed land. Near the southeast boundary the villages of Kaltag (population 205), Nulato (population 275) and Koyukuk (population 97) lie on the Yukon River. Kaltag is approximately seven miles, Nulato about eight miles, and Koyukuk about 11 miles, respectively, from the nearest boundary of this unit. All of these communities are subsistence-oriented and obtain resources from the land nearby. These include salmon and other fish, caribou, moose and other animals, and wild berries and other plants. In summer the rivers are main transportation routes and in winter snowmachines are used extensively for subsistence activities and inter-village travel. There are no federal mining claims in the unit.

The unit's remote and isolated nature has protected the area from the pressures of public use. Most visitors who travel to this area must fly to a regional hub such as Galena or Kotzebue and then charter small aircraft capable of landing on remote, unmaintained airstrips or on dry ridges and gravel bars. Visitors can also travel by river, either upstream from one of the villages or possibly, by flying into a remote area and floating out. The primary recreational use is most likely hunting for big game animals. A small number of commercial hunting guides have permits to operate in this unit. The permits include stipulations that restrict permanent structures and require adherence to Leave No Trace backcountry guidelines.

The entire unit appears to be primarily affected by the forces of nature. The area is pristine and human activity or impacts are substantially unnoticeable.

Does the area (or the remainder of the area if a portion has been excluded due to unnaturalness and the remainder is of sufficient size) have outstanding opportunities for solitude?

Yes X No _____ N/A _____

Description (describe the area's outstanding opportunities for solitude):

The opportunity for solitude is outstanding. There are no villages or other human developments

within the unit. This is a vast and isolated area with difficult access. Access in summer is only by small aircraft or boat. Access in winter is by air, snowmachine or dog team. There are few visitors. A visitor in this unit would likely have no or very infrequent encounters with other people.

Does the area (or the remainder of the area if a portion has been excluded due to unnaturalness and the remainder is of sufficient size) have outstanding opportunities for primitive and unconfined recreation? Note: If "No" is checked for both 3 and 4 the area does not have wilderness characteristics; check "N/A" for question 5.

Yes X No _____ N/A _____

Description (describe the area's outstanding opportunities for primitive and unconfined recreation):

The Nulato Hillls-v2 Unit possesses outstanding opportunities for primitive and unconfined recreation including backpacking, river floating, hunting, fishing and other activities associated with primitive, unconfined settings. The unit's remote and isolated characteristics have protected the area from the pressures of public use.

Does the area have supplemental values (ecological, geological, or other features of scientific, educational, scenic or historical value)?

Yes X No N/A

Description:

There are six designated Areas of Critical Environmental Concern (ACECs) encompassed by this wilderness inventory unit:

- Nulato Hills, to protect core winter range for the Western Arctic Caribou Herd and crucial peregrine falcon habitat,
- Shaktoolik River, for salmon and sheefish spawning habitat,
- Ungalik River, for salmon and sheefish spawning habitat,
- Inglutalik River, for salmon and sheefish spawning habitat,
- Kateel River, for salmon and sheefish spawning habitat,
- Gisasa River, for salmon and sheefish spawning habitat

The unit also includes the Box River Treeline Research Natural Area, designated for its natural scientific features, including vegetation complexes of the western tree limit in Alaska, upland winter habitat for caribou, and permafrost-related features such as collapsing ice wedges and solifluction.

Populations of a BLM-sensitive plant species, Bering dwarf primrose (*Douglasia beringensis*) have been documented in the Nulato Hills on acidic substrates in fine to coarse alpine screeslopes. Another BLM-sensitive species, stipulated cinquefoil (*Potentilla stipularis*) has been documented on the West Fork of the Buckland River. It grows on moist, vegetated flood plains or low river banks, in grassy meadows on riparian terraces or in moist *Dryas*-heath tundra adjacent to lakeshores or alpine creeks.
The unit contains habitat for several BLM-sensitive bird species, including gray-cheeked thrush, olive-sided flycatcher, blackpoll warbler, Arctic peregrine falcon, red-throated loon, and Harlequin duck.

Check one:

__**X**__ The area, or a portion of the area, has wilderness characteristics and is identified as lands with wilderness characteristics.
____ The area does not have wilderness characteristics.

Prepared by:

Name: Lisa Shon Jodwalis
Title: Park Ranger - Interpretation
Date: 12/21/2012

Reviewed by:

Name: Nichelle Jacobson
Title: Central Yukon Field Manager
Date:

References:

- BLM Manual 6310-Conducting Wilderness Characteristics Inventory on BLM Lands, which directs offices to conduct and maintain inventories regarding the presence or absence of wilderness characteristics
- USGS topographic maps (Kateel River, Candle, Norton Bay and Selawik); GIS data
- Aerial survey of the Nulato Hills conducted in June 2012. Photos are archived on the BLM Fairbanks District Office public drive: CYFO\Nulato Hills photos_June 2012
- Personal communication with other Central Yukon Field Office specialists
- BLM, 1986. Proposed Resource Management Plan – Final Environmental Impact Statement for the Central Yukon Planning Area.
- BLM, 2007. Kobuk-Seward Peninsula Proposed Resource Management Plan and Final Environmental Impact Statement.
- Koyukuk National Wildlife Refuge website: http://www.fws.gov/refuges/profiles/index.cfm?id=75615

Photos:

Nulato Hills

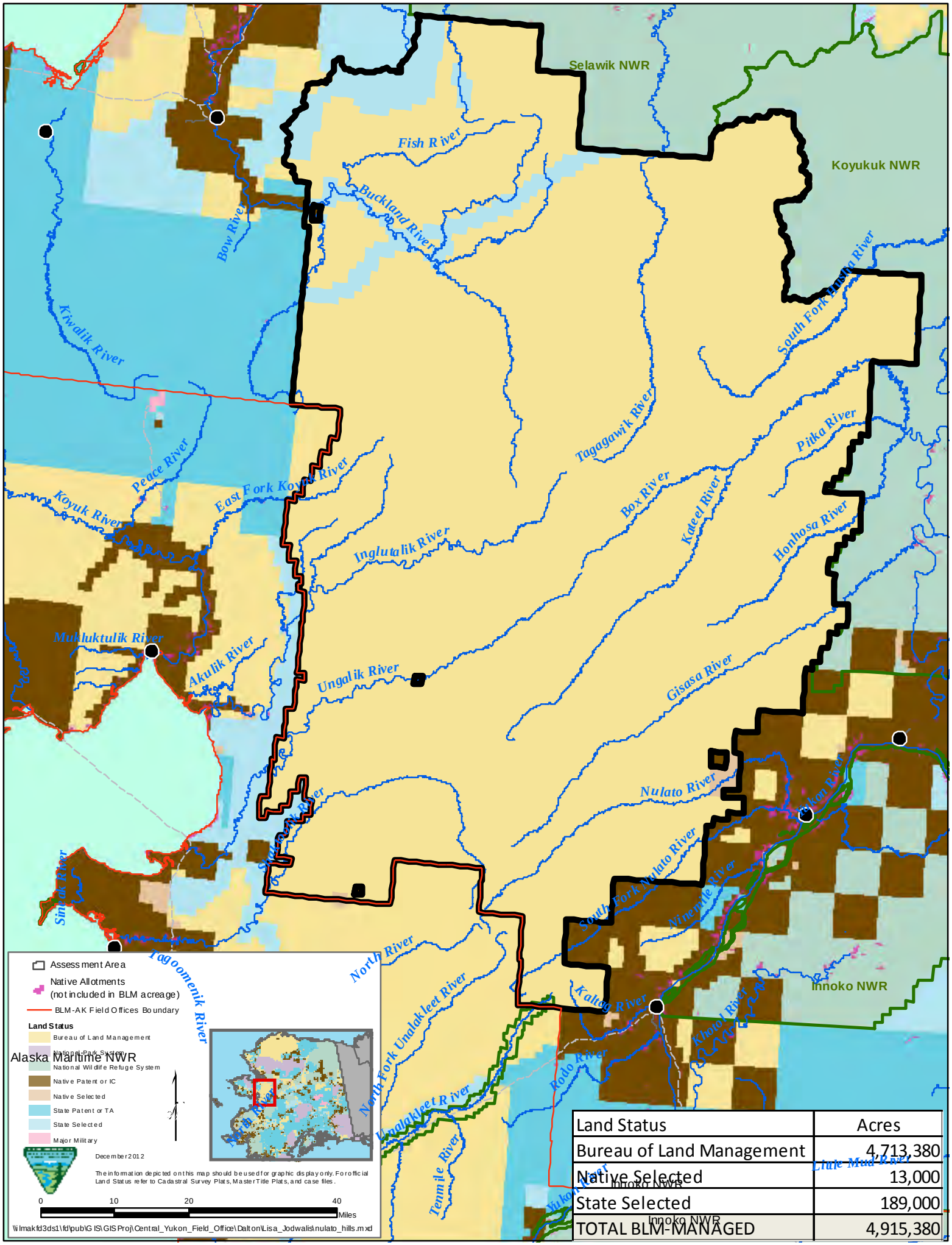
Tagagawik River

Sedge tussocks after a fire, between Tagagawik River and Buckland

Buckland River

Hills southeast of Buckland

Ice wedge polygons east of Buckland



Land Status	Acres
Bureau of Land Management	4,713,380
Native Selected	13,000
State Selected	189,000
TOTAL BLM-MANAGED	4,915,380

Lands with Wilderness Characteristics (Anchorage Field Office Ungalik Area)

Introduction

Washington Office Instruction Memorandum No. 2011-154, directs offices to continue to conduct and maintain inventories regarding the presence or absence of wilderness characteristics, and to consider identified lands with wilderness characteristics in land use plans and when analyzing projects under the National Environmental Policy Act (NEPA). This instruction memorandum (IM) contains current Bureau of Land Management (BLM) guidance and general procedures for conducting wilderness characteristics inventories under Section 201 of the Federal Land Policy and Management Act of 1976 (FLPMA). Managing the wilderness resource is part of the BLM's multiple use mission. Lands with wilderness characteristics provide a range of uses and benefits in addition to their value as settings for solitude or primitive and unconfined recreation.

The first step in the Lands with Wilderness Characteristics (LWC) process is to inventory the lands to determine which areas have wilderness characteristics. This narrative outlines the methods used and the results of an inventory for the Ungalik area within the boundary of the Anchorage Field Office (AFO). The following are only relevant to inventory of public lands to assess their wilderness characteristics and should not be confused with managing of lands with wilderness characteristics.

Methodology

All public lands, including State and Native-selected lands, addressed in the inventory area of the proposed action were inventoried for wilderness characteristics. The inventory evaluated wilderness characteristics as discussed in Section 2(c) of the Wilderness Act of 1964 (16 U.S.C. 1131) and incorporated into the Federal Land Policy and Management Act (43 U.S.C. 1701 *et seq*.).

The criteria for determining wilderness characteristics are established by the IM indicated above. To be identified during the inventory process as having wilderness characteristics, lands must:

- Be a roadless area with over 5,000 acres of contiguous BLM lands;
- Be roadless of less than 5,000 acres of contiguous BLM lands where any of the following apply:

  -They are contiguous with lands which have been formally determined to have wilderness or potential wilderness values, or any Federal lands managed for the protection of wilderness characteristics. Such lands include: designated Wilderness, BLM Wilderness Study Areas, U.S. Fish and Wildlife Service area Proposed for Wilderness designation, U.S. Forest Service (FS) Wilderness Study Areas or areas of Recommended Wilderness, and National Park Service (NPS) areas Recommended or Proposed for Designation.

  -It is demonstrated that the area is sufficient size as to make practicable its preservation and use in an unimproved condition.

-Any roadless island on the public lands.

- Generally appear to have been affected primarily by the forces of nature, and any work of human beings must be substantially unnoticeable, and;
- Have outstanding opportunities for solitude or a primitive and unconfined type of recreation.

Within this inventory boundary, lands were not buffered or setback from the physical edge of the imprint of man or any unnatural portions of the area. Land with wilderness characteristics may immediately abut land whose own character precludes wilderness characteristics. For example, land immediately adjacent to a road may be classified during inventory as possessing wilderness characteristics. The fact that the sight or sound of the road may detract from the wilderness experience on adjacent lands does not, in and of itself, render those lands as not possessing wilderness characteristics.

As long as the wilderness characteristics criteria listed above are met, the following facilities, activities and uses consistent with the Alaska National Interest Lands Conservation Act (ANILCA) may occur on lands having wilderness characteristics: public use cabins; administrative sites and visitor facilities; temporary facilities and equipment for hunting, fishing, and camping; airplane use and landings; and motorboat, snowmobile, and all-terrain motor vehicle use. The critical question to consider is not whether these facilities, activities or uses exist in the relevant tract, but whether they singly or in combination with other factors have altered the character of the land from one that "generally appears to have been affected primarily by the forces of nature" and precludes the land from having "outstanding opportunities for solitude and/or a primitive and unconfined type of recreation." In general, substantial active or remnant evidence of mining or oil and gas extraction facilities, above-ground pipelines or power lines, intensive recreational developments, and similar intrusions on the land may render such lands as inappropriate for identification in the inventory stage as having wilderness characteristics. The inventory process utilized in-house expertise from staff specialists as well as existing land use planning information (Kobuk-Seward Peninsula Resource Management Plan, 2008) to assess whether or not specific lands possess wilderness characteristics.

Current Conditions: Presence or Absence of Wilderness Characteristics

Area Unique Identifier: AFO Ungalik area Acreage: 1,354,000 acres

1) Is the area of sufficient size? Yes

Description: The inventory area is significantly more than 5,000 contiguous roadless acres of BLM land (Map 1). This area is bounded on the north by State owned land, to the west by Native owned lands, to the south by the Unalakleet Wild & Scenic River and the Unalakleet River Watershed ACEC, and to the east by BLM lands administered by the Central Yukon Field Office. The inventory area consist of over 1.3 million acres of BLM unencumbered and encumbered (State and Native selected) lands within the vicinity of the Ungalik River area. Current State selection priority rankings within the immediate area of the Shaktoolik River area is listed as priority 5 and selections within the Ungalik River area are priority 14, with no

imminent land conveyance actions. Even if all selected lands were to be conveyed, the remaining BLM lands, in total, would far exceed 5,000 acres. There are a few Native allotments located within this inventory area. There are no recorded Federal mining claims or State mining claims located within the inventory area boundary. There are also no BLM-managed wilderness areas or wilderness study areas within the inventory area.

2) Does the area appear natural? Yes

Description: The inventory area is a contiguous/un-fragmented parcel of BLM land. The area is highly natural in appearance, having been primarily affected by the forces of nature, and contains no observed substantially noticeable evidence of people's work. There are no roads or developed trails within or adjacent to the area. One established winter route passes through several sections of the western edge of the inventory area consisting of a connecting route that is included within the Iditarod National Historic Trail system. This winter route is not maintained but is signed at the BLM-managed Foothills Public Shelter Cabin (see attached Map 1). This route is only traveled during winter months when there's adequate snow cover for snowmachines, dog sleds, winter mountain bike riders, and skiers. Trail tripod markers, consisting of native spruce poles, can be observed sporadically along this Iditarod Trail connecting route. There are no other human-made features observed within the area nor does the inventory area contain any native villages or town sites. Overall, this inventory area retains its primitive character.

3) Does the area have outstanding opportunities for solitude? Yes

Description: The nearest active airstrip or airport that a visitor to the inventory area may be affected by is located 6 miles away in Unalakleet. There are no year-round road connected communities in the region. Nearly all travel into the area and among communities is by air. Fuel, food, and supplies are delivered by barge or airplane. The previously mentioned winter route is used primarily by individual or group dog sledding activities and snowmachine use. There are two BLM-authorized commercial big game guide-outfitters currently authorized to operate within the inventory area, neither of which have established base or spike camps with any permanent structures or facilities. Other short-term permitted use occurs briefly in the winter along the Iditarod Trail connecting route. There are no other permitted activities or man-made developments on BLM lands within the inventory area.

4) Does the area have outstanding opportunities for primitive and unconfined recreation? Yes

Description: The landscape within the area is very remote and primitive, consisting of low lying hills and the Darby Mountains ranging from 350 feet to almost 3,000 feet high, with several rivers containing a variety of fish. Though seasonal weather patterns consist of short cool, wet summers and long cold winters, backcountry recreational and outdoor opportunities include: hunting, fishing, dog sledding, snow machining, geologic features, and camping. There are several species of animals and fish in the region that are recreationally valuable and are sought after by visitors interested in sport hunting and fishing. The Kobuk Seward Peninsula Management Plan (RMP) approved in September of 2008 established the inventory area as an Extensive Recreation Management Area (ERMA). Visitor use is subject to Recreation Opportunity Spectrum (ROS) system analysis and is subject to social and visitor use contact limitations of 5-7 encounters/day

and 7-10 people per group. The established Visual Resource Management classes for this area are rated as Class II, III, and IV[1]. The overall size, remoteness and lack of any developments in the inventory area provide users with outstanding opportunities for primitive and unconfined recreation.

5) Does the area have supplemental values (ecological, geological, or other features of scientific, educational, scenic or historical value)? Yes

Description: Subsistence species are clearly recognized by natural resource managers in this area to be of major importance where hunting, gathering, and the general dependence on natural resources continues for most residents in the region.

CONCLUSION: The area has wilderness characteristics and is identified as Land with Wilderness Characteristics (LWC).

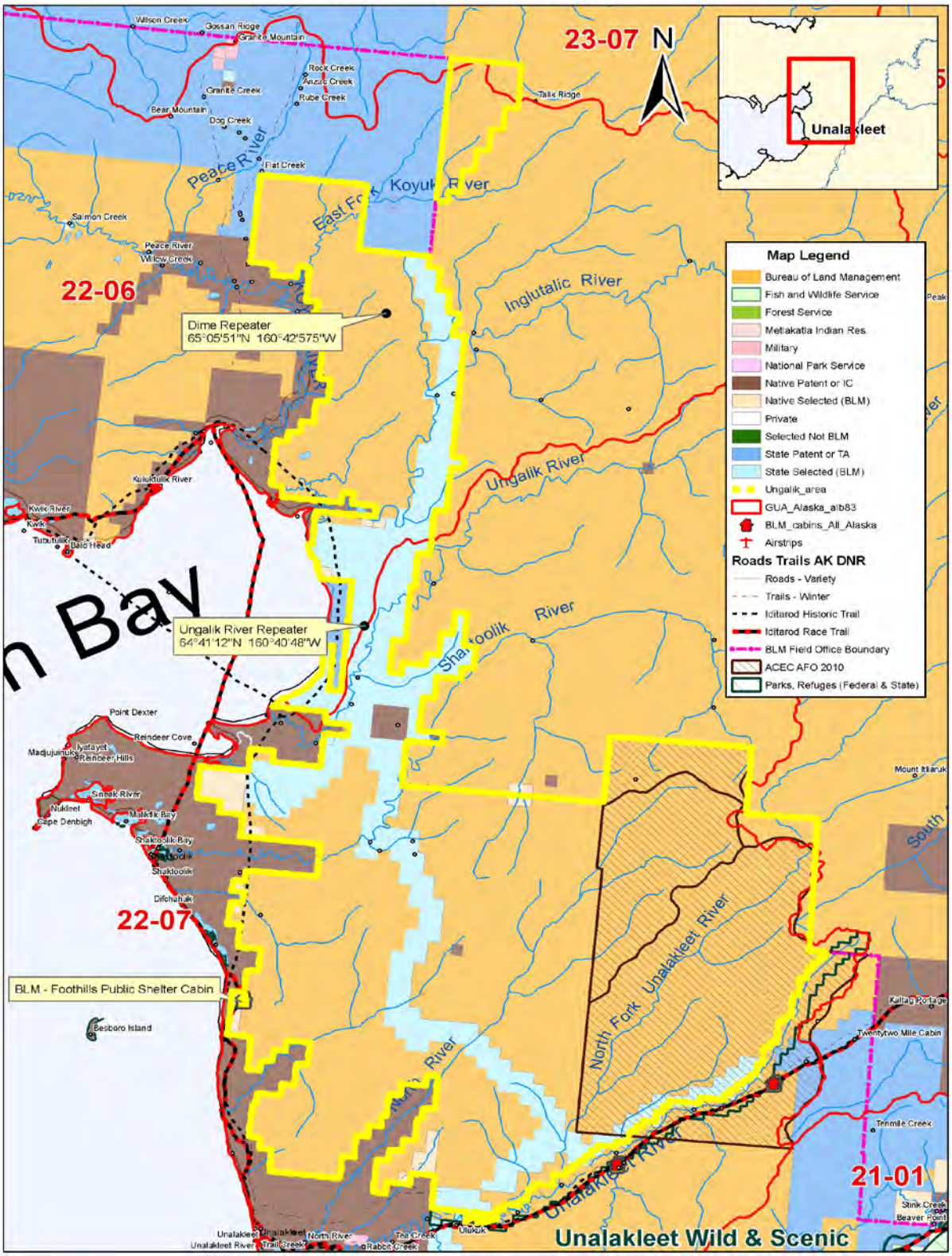
Jeff Kowalczyk	12/31/12
Name	Date

/s/

Signature

[1] Kobuk-Seward Peninsula Record of Decision and Approved Management Plan, September 2008.

Map 1 - AFO Ungalik Area



Disclaimer: The information displayed on this map should be used for graphic display only. For official land status information, refer to Cadastral Survey plats, Master Title Plats and land status case-files.

Form 2

Current Conditions: Presence or Absence of Wilderness Characteristics

Area Name: Baldwin Peninsula

Total BLM Inventory Acreage: 464,689 acres

Area Unique Identifiers

- CYFO-Baldwin Peninsula-001

Is the area of sufficient size? (If the area meets one of the exceptions to the size criterion, check Yes and describe the exception in the space provided below), Note: If "No" is checked the area does not have wilderness characteristics; check NA for the remaining questions below.

Yes **X** No _____

Description (describe the boundaries of the area--wilderness inventory roads, property lines, etc.):

The area includes the portion of BLM-managed lands on the Baldwin Peninsula and west of LWC inventory unit CYFO-Nulato Hills-v2-001. The unit is bordered on the west-northwest by Native-conveyed lands around the village of Kotzebue, on the east by Selawik National Wildlife Refuge, on the east-southeast by a portion of HUC 1905020307 (Upper Buckland River), on the south by state-conveyed land and on the southwest by Native-conveyed lands around the village of Buckland. The entire area is roadless. There are no developed trails. The unit is not adjacent to any lands currently in the national wilderness preservation system or managed specifically for wilderness characteristics.

Does the area appear to be natural? Note: If "No" is checked the area does not have wilderness characteristics; check NA for the remaining questions below.

Yes **X** No _____ N/A _____

Description (include land ownership, location, topography, vegetation, and summary of major human uses/activities):

The unit is within the westernmost region of BLM's Central Yukon Field Area, extending to Kotzebue Sound. The dominant physical characteristics include the Selawik Hills in the eastern portion of the unit, an area of rolling hills and plateaus surrounding rugged mountain peaks reaching 3,268 feet. Waters on the north side of the Selawik Hills drain into the Kauk River and those on the south side drain into the Buckland River. The Baldwin Peninsula itself is characterized by low hills up to about 300 feet, numerous small lakes and extensive wetlands.

The Baldwin Peninsula supports primarily tussock sedge/dwarf shrub tundra and moist herbaceous shrub tundra. Thaw lakes and other permafrost features such as polygonal ground are common in lowland areas. East of the peninsula there are extensive areas of tall and low shrub tundra, often dominated by tussock cottongrass. Patches of spruce and birch trees and

tall shrubs grow on drier sites closer to the Selawik Hills. Large treeless areas with low tundra vegetation provide panoramic views of the surroundings even on low and moderately hilly terrain. Large animals that inhabit the area include caribou, moose, musk oxen, grizzly bears and black bears. The rivers provide spawning habitat for salmon and sheefish.

The village of Buckland (population 437 in 2011) is southwest of the unit, approximately one mile from the nearest BLM-managed land. The town of Kotzebue (population 3,224 in 2011) is located at the far western end of the Baldwin Peninsula about 12 miles northwest of the unit. Access to Kotzebue from outside the region is by air and Kotzebue serves as a regional hub. Access to Buckland is by single or twin-engine aircraft, generally from Kotzebue. There are numerous Native Allotments along the Buckland River north of Buckland and in scattered locations along the coast of the Baldwin Peninsula.

Both communities rely heavily on terrestrial and marine resources for subsistence. Caribou, salmon and sheefish are particularly critical subsistence resource for villages in the region.

The inventory unit is primarily natural with little or no evidence of human activity beyond subsistence hunting and fishing. Travel for subsistence activities and between villages in the region is typically by waterways in summer and snowmachines in winter.

Does the area (or the remainder of the area if a portion has been excluded due to unnaturalness and the remainder is of sufficient size) have outstanding opportunities for solitude?

Yes **X** No _____ N/A _____

Description (describe the area's outstanding opportunities for solitude):

The large size of the unit and its remoteness from urban areas have protected it from the pressures of public use and provide outstanding opportunities for solitude.

Does the area (or the remainder of the area if a portion has been excluded due to unnaturalness and the remainder is of sufficient size) have outstanding opportunities for primitive and unconfined recreation? Note: If "No" is checked for both 3 and 4 the area does not have wilderness characteristics; check "N/A" for question 5.

Yes X No _____ N/A _____

Description (describe the area's outstanding opportunities for primitive and unconfined recreation):

The Baldwin Peninsula Unit in general possesses opportunities for dispersed types of recreational activities. The Selawik Hills and Buckland and Kauk Rivers provide outstanding opportunities for activities associated with primitive, unconfined settings such as backpacking, river floating, dog mushing, hunting, and fishing.

Does the area have supplemental values (ecological, geological, or other features of scientific, educational, scenic or historical value)?

Yes ____**X**_____ No _____ N/A _____

Description:

The Baldwin Peninsula is within the migratory range of the Western Arctic Caribou Herd and the rest of this unit provides important winter habitat. The Alaska Department of Fish and Game lists the Buckland River as having essential habitat for migration, spawning and rearing by anadromous fish. The area provides habitat for yellow-billed loon, which has been listed as a candidate for the Threatened and Endangered Species list, as well as Harlequin duck, blackpoll warbler and olive-sided flycatcher which are listed as BLM-sensitive species.

Check one:

X The area, or a portion of the area, has wilderness characteristics and is identified as lands with wilderness characteristics.

_____ The area does not have wilderness characteristics.

References:

- BLM Manual 6310-Conducting Wilderness Characteristics Inventory on BLM Lands, which directs offices to conduct and maintain inventories regarding the presence or absence of wilderness characteristics
- USGS topographic maps (Selawik, Candle); GIS data
- Personal communication with other Central Yukon Field Office specialists
- BLM, 2007. Kobuk-Seward Peninsula Proposed Resource Management Plan and Final Environmental Impact Statement.
- Selawik National Wildlife Refuge http://www.fws.gov/refuge/selawik/

Prepared by:

Name: Lisa Shon Jodwalis
Title: Park Ranger - Interpretation
Date: 1/2/2013

Reviewed by:

Name: Nichelle Jacobson
Title: Central Yukon Field Manager
Date:

References

- BLM Manual 6310-Conducting Wilderness Characteristics Inventory on BLM Lands, which directs offices to conduct and maintain inventories regarding the presence or absence of wilderness characteristics
- USGS topographic maps (Selawik, Kotzebue) and GIS data
- Personal communication with other Central Yukon Field Office specialists
- BLM, 2007. Kobuk-Seward Peninsula Proposed Resource Management Plan and Final Environmental Impact Statement.
- Google Earth

Summary of Analysis*

Area Unique Identifier: CYFO-Baldwin Hills-001

Summary
Results of analysis:
This inventory includes 464,689 acres of BLM-managed lands, which exceeds the 5,000 acre minimum size requirement. The area is roadless and appears primarily affected by the forces of nature. Human-made features are substantially unnoticeable. It offers outstanding opportunities for solitude and for primitive, unconfined recreation, and has supplemental values for wildlife and scientific research. Therefore it is identified as lands with wilderness characteristics.

1. Does the area meet any of the size requirements? **_X_** Yes ___ No

2. Does the area appear to be natural? **_X_** Yes ___ No ___ N/A

3. Does the area offer outstanding opportunities for solitude or a primitive and unconfined type of recreation? **_X__** Yes ___ No ___ N/A

4. Does the area have supplemental values? **_X__** Yes ___ No ___ N/A

Check one:

_X__ The area, or a portion of the area, has wilderness characteristics and is identified as lands with wilderness characteristics.

___ The area does not have wilderness characteristics.

Prepared by: Lisa Shon Jodwalis, Park Ranger – Interpretation

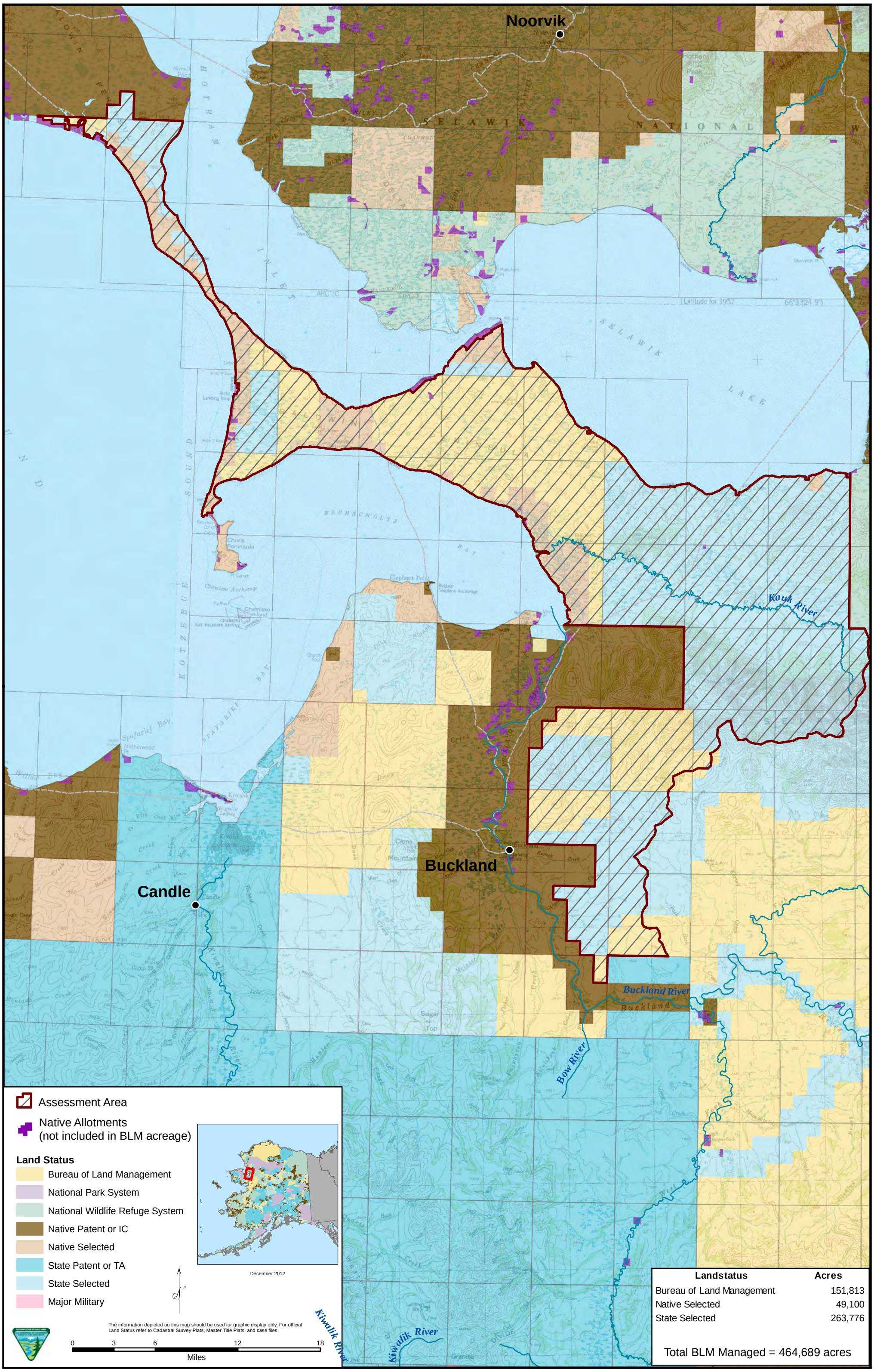
Date: 2 January 2013

Reviewed by (District or Field Manager):

Name: _____ Title: _____

Date: _____

* This form documents information that constitutes an inventory finding on wilderness characteristics. It does not represent a formal land use allocation or a final agency decision subject to administrative remedies under either 43 CFR parts 4 or 1610.5-3.


Noorvik
Buckland
Candle
Kauk River
Buckland River
Bow River
Kiwalik River
SELAWIK NATIONAL
ESCHSCHOLTZ BAY
KOTZEBUE SOUND
BALDWIN PENINSULA
SELAWIK LAKE
Assessment Area
Native Allotments
(not included in BLM acreage)
Land Status
Bureau of Land Management
National Park System
National Wildlife Refuge System
Native Patent or IC
Native Selected
State Patent or TA
State Selected
Major Military
December 2012
The information depicted on this map should be used for graphic display only. For official Land Status refer to Cadastral Survey Plats, Master Title Plats, and case files.
0 3 6 12 18
Miles
Landstatus Acres
Bureau of Land Management 151,813
Native Selected 49,100
State Selected 263,776
Total BLM Managed = 464,689 acres

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APPENDIX F
Essential Fish Habitat Determination

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Essential Fish Habitat Determination

Type of Action: Communication Leases
Applicant: Unicom, Inc.
Serial Number: AA-93345, AA-93345A through AA-93345F
NEPA document: DOI-BLM-AK-A010-2012-0036-EA
Location: Ungalik River, Baldwin and Seward Peninsulas, Alaska
Date: 02/28/13

EFH DETERMINATION

BLM has received an application for a right of way/land use authorization to construct, operate, and maintain six remote microwave repeaters with associated equipment as part of a project to improve broadband internet services for communities in the Norton Sound and Northwest Arctic regions of Alaska. The proposed action lies within the general range of Arctic grayling (*Thymallus arcticus),* Dolly Varden (*Salvelinus malma*), arctic char (*Salvelinus alpinus*), sheefish (*Stenodus leucichthys)* and other whitefish (Coregonid spp.); with burbot (*Lota lota*) and Northern Pike (*Esox luciens*) occasionally present (ADF&G 1978). Pacific salmon present in nearby streams include Chinook salmon (*Oncorhynchus tshawytscha*), Coho salmon (O. kisutch), chum salmon (*O. keta*), and pink salmon (*O. gorbuscha*). Sockeye salmon (O. nerka) may be incidentally present. The National Marine Fisheries Service (NMFS) recognizes fresh waters cataloged as being used by salmon under AS 41.14.870 (*Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes*) as essential fish habitat (EFH).

Drainages surrounding the communications sites are listed with the State of Alaska as important for the spawning, rearing, or migration of anadromous fish (ADF&G 2008), the closest being the Ungalik River (anadromous stream #333-40-10700), located approximately 1 mile from that terra site.

<u>EFH Finding</u>: Based on the findings that the closest salmon species catalogued by the State of Alaska are at least one mile distant from the nearest proposed communication site, and that spill response kits and containment protocols are in place to deal with possible fuel leaks, it is anticipated that the proposed action will not have any lasting deleterious effects on salmon or their habitat. Accordingly, the proposed action is assigned the EFH determination: *No adverse effect.* EFH consultation with NMFS is not required.

Dave Parker
Fish Biologist
Central Yukon Field Office

References

State of Alaska, Alaska Department of Fish and Game. 1978. Alaska's Fisheries Atlas. Volume 2. Edited by R. McLean and K. Delaney. Alaska Department of Fish and Game.

State of Alaska, Alaska Department of Fish and Game. 2008. An Atlas to the Catalog of Waters Important for Spawning, Rearing, or Migration of Anadromous Fishes, Resource Management Region V. Alaska Department of Fish and Game, Habitat and Restoration Division.

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APPENDIX G

Threatened and/or Endangered Species Evaluation

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United States Department of Interior
Bureau of Land Management
Anchorage Field Office

Threatened and/or Endangered Species Evaluation

Casefile Number: AA-93345, AA-93345A through AA-93345F

NEPA Document Number: DOI-BLM-AK-A010-2012-0036-EA

Proposed Action: Issue right-of-ways to construct, operate, and maintain six remote microwave repeaters with associated equipment as part of a project to improve broadband internet services for communities in the Norton Sound and Northwest Arctic regions of Alaska.

Location of Proposed Action: Five tower sites (all within the Kateel River Meridian [KRM]) are on BLM-managed lands at the following locations:

- **Ungalik River Repeater site**, located approximately 28 miles northeast of Shaktoolik, 22 miles southeast of Koyuk – Township (T.) 9 South (S.), Range (R.) 10 West (W.), KRM Sec. 21 and 28;
- **Dime Repeater site**, located approximately 17 miles northeast of Koyuk – T.4S., R.10W., KRM 3;
- **Talik Repeater site**, located approximately 44 miles northeast of Koyuk, 35 miles southeast of Buckland – T.1 North (N.), R.9W., KRM Sec. 4;
- **Harvey Repeater site**, located approximately 20 miles northeast of Buckland, 12 miles east of the coast – T.9N., R.9W., KRM Sec. 21
- **Baldwin Peninsula Repeater site**, located approximately 33 miles southeast of Kotzebue, 42 miles northwest of Buckland – T.13N., R.15W., KRM Sec.14

A sixth proposed tower site is a community tower located on private land in the village of Kotzebue, and is owned by Kikiktagruk Inupiat Corporation known as the **KIC Site**.

Description of Proposed Action: The Bureau of Land Management (BLM) is considering an application from Unicom, Incorporated (Unicom) for a 20 year right-of-way for a communication site lease to construct, operate, and maintain six remote microwave repeaters with associated equipment as part of a project to improve broadband internet services for communities in the Norton Sound and Northwest Arctic regions of Alaska. The application includes the construction of five microwave repeater towers on public land managed by BLM and one tower located near Kotzebue. The towers would be constructed on higher elevation sites, with access by helicopter for construction material and personnel. The Baldwin Peninsula site will be accessed by barge with tracked equipment. Construction will take place during the summer of 2013, and winter 2014. Access for refueling and maintenance of each site will be by helicopter. During the operation of the remote repeaters, scheduled maintenance occurs twice a year in July and September in addition to any emergency maintenance trips. Over the twenty year life of the facility, the batteries will be replaced once and the generators will be replaced

every 5-7 years with the use of a medium-left helicopter. Refueling is required once a year; 500-gallon "Fuel Easy" fuel bladders are transported using a medium-lift helicopter for a total of 14 round trips (to refill 7,000 gallons). Refueling will take 2-3 days during June or July.

No Action Alternative: Under the No Action Alternative, BLM would not grant the requested rights-of-way. The existing telecommunications and satellite internet service would continue or Unicom would have to seek other alternatives to providing broadband service not involving federal public lands. Satellite-based service may continue for the foreseeable future, incurring higher delays in connectivity and lower reliability.

Informal consultation with U. S. fish and Wildlife Service

The impact of the proposed action and alternatives on threatened and endangered plants and animals and their habitats has been evaluated in accordance with the Endangered Species Act of 1973, as amended. The impacts of the project on following listed species have been evaluated by the FWS.

Three species listed as threatened under the ESA occur in the project area: spectacled eiders (Somateria fischeri), Alaska-breeding Steller's eiders (Polysticta stelleri), and polar bears (Ursus maritimus). Proposed activities may also occur in spectacled eider critical habitat Unit 3 (Norton Sound) and in barrier island habitat used by polar bears.

Based on currently available information, the proposed action would not affect any threatened or endangered species or their habitats. Therefore, no further consultation with the U. S. Fish and Wildlife Service is considered necessary pursuant to Section 7 of the Act and no further consultation will be undertaken.

The proposed action could temporarily disturb or create a collision risk for listed eiders, however due to the low likelihood of overland migrations and the use of free-standing towers we expect the effects of disturbance and collisions to be insignificant. Therefore the Service concludes that the proposed action is not likely to adversely affect listed eiders.

The proposed action could also temporarily disturb polar bears in the project area; however, due to low densities of this species and minimization measures in place, we expect the effects of disturbance to be insignificant and conclude the proposed action is not likely to adversely affect polar bears. Therefore the Service concludes that the proposed action is not likely to adversely affect listed eiders or polar bears.

Furthermore, the Service concludes that the proposed action is not likely to adversely affect designated critical habitat for spectacled eiders. Preparation of a Biological Assessment or further consultation under section 7 of the ESA is not necessary at this time.

Bruce E. Seppi

Bruce E. Seppi, Examining Wildlife Biologist

March 12th 2013

Date