Appendix E1 – Management Plan

NANA Regional Broadband Network Project

Monitoring and Management Plan

NANA Regional Corporation, Inc. (NT23TBC0290014)

NANA Region Middle Mile Fiber Optic Project

Northwest Arctic Borough, Alaska

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1 Introduction

This Monitoring and Management Plan (MMP) has been prepared for the NANA Regional Broadband Network Project, which proposes to connect the communities in the Northwest Arctic Borough to an approximately 660 mile fiber optic cable (FOC) route. The FOC construction would include ground-laid directly FOC (as depicted in Figure 1), aerial installations on existing utility poles, river crossings using direct lay, aerial, or horizontal directional drilling (HDD), and a submarine installation across Hotham Inlet within Kotzebue Sound.

Figure 2 provides an example of a similar installation on the North Slope, one year after placement (in July 2023). This illustrates the minimum level of disturbance that is proposed by the project.

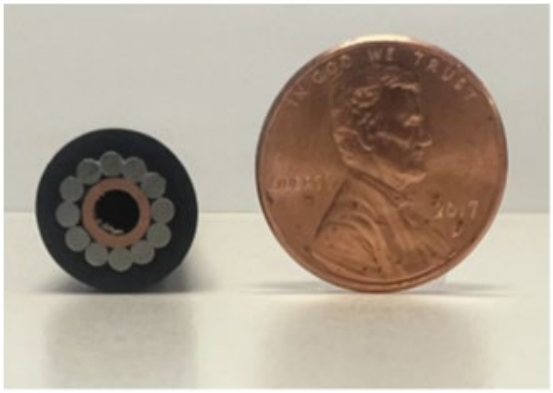

Figure 1: Fiber optic cable.

Figure 2. Photos of the ASTAC Ground Laid Fiber on the North Slope, one year after placement (July 2023).

NANA is committed to restoring ground disturbances to their pre-construction conditions, performing ongoing monitoring, and ensuring that fish and wildlife are not harmed from this project.

The MMP includes a(n):

- Erosion and Sediment Control Plan,

- Vegetation Management Plan,
- Invasive Species Management Plan,
- Post-Monitoring Plan, and
- Wildlife Monitoring, Interaction, and Avoidance Plan.

2 Erosion and Sediment Control Plan

The majority of the project does not involve soil disturbance, as FOC is being laid over the ground. Soil disturbance is anticipated during trenching outside of villages and some streambank excavation (where overhanging banks make it necessary for stable cable placement). The installation of fiber optic cable through trenching, particularly near waterbody approaches, presents a heightened risk of soil disturbance, erosion, and sedimentation that can impact both terrestrial and aquatic environments.

NANA is committed to preventing soil loss, protecting water quality, and maintaining ecological integrity of the project area during and after construction. The project has been designed to disturb less than 1 acre of soil, to avoid erosion and sediment threats to the greatest extent possible.

This plan identifies best management practices (BMPs) and control measures to ensure compliance with regulatory requirements and short and long-term protection of the natural environment.

2.1 Avoidance and Mitigation

The project has been carefully designed with avoidance and mitigation strategies to minimize adverse impacts to the environment while providing a sustainable, long-term broadband network. Stream crossings present a significant construction challenge, which necessitates careful route planning and the adoption of construction methods that minimize impact to the aquatic environment. The following avoidance strategies have been implemented into project planning:

2.1.1 Avoidance

- The chosen route was comprehensively designed to minimize the number of stream crossings to the greatest extent possible.
- With the majority of construction occurring during the winter, the construction impacts on fish and their habitats are greatly reduced. Over 97% of the streams and rivers and 100% of the lakes and ponds along the route shall be crossed with LGPVs in the winter months when adequate snow and ice cover allows for adequate protection of the underlying vegetation.
- Construction methods at large river crossings, such as aerial crossings and horizontal directional drilling (HDD), eliminate direct impacts to waterbodies.

As this project covers an expansive area of the Northwest Arctic Borough, complete avoidance of waterbodies is not possible or practicable. The following mitigation measures have been developed to reduce environmental damage from project construction activities and infrastructure:

2.1.2 Mitigation

For the successful implementation of this fiber optic cable project, thoughtful and environmentally responsible construction methods shall be prioritized to minimize the risk of erosion and sedimentation. Recognizing the potential environmental impacts associated with ground disturbance, the project shall employ BMPs designed to preserve soil stability, protect water resources, and maintain ecological balance. Revegetation of disturbed areas shall be performed with guidance from ADF&G's "Streambank Revegetation and Protection: A Guide for Alaska" (2005) and Alaska Department of Natural Resource's "A Revegetation Manual for Alaska" (Wright 2008). The primary revegetation technique shall be assisted natural revegetation (Wright 2008).

Additional measures include:

- Utilize BMPs to mitigate the potential impact to the environment, including (DOT&PF 2021):
    - BMP-10.01 Fiber Rolls for Erosion and Sediment Control
    - BMP-18.00 Rolled Erosion Control for Slopes
    - BMP-20.00 Silt Fence
    - BMP-38.00 Vegetation Buffer
    - BMP-40.00 Cold Weather Stabilization
- HDD
    - Selecting the HDD method for large river crossings allows for the installation of cables beneath streams and rivers without disturbing the waterbody itself.
    - This technique minimizes sediment disturbance and preserves aquatic habitat. HDD involves first installing silt fencing, rolled erosion control, and/or fiber rolls as appropriate to prevent sediment migration from the drilling site.
    - Then the process shall be started by drilling a pilot hole along a pre-determined, curved path starting from an entry point on one riverbank to an exit point on the opposite bank. The pilot hole shall then be incrementally enlarged using reaming tools to accommodate the installation of the pipeline or utility conduit. Drilling fluid, typically a bentonite-water mixture, shall be used to stabilize the borehole, lubricate the drill bit, and transport cuttings to the surface. Following the completion of the borehole, the 2 in. conduit and FOC shall be pulled through the hole and secured. On both sides of the river, 15-20 ft. of conduit shall extend from the borehole openings to serve as a transition to ground-level installation, providing protection for the cable and mitigating potential damage from freeze-thaw cycles. The ends of these pipes shall be sealed and watertight.
    - All slurry and wastewater that is generated during the drilling process that cannot be discharged under permits shall be containerized, transported off site, and disposed of at a permitted waste facility.
- Aerial Installation
    - Aerial installation shall be used to deploy the cable above several large rivers, to avoid trenching. This method is described in the Plan of Development.
- Trenching
    - Trenches shall be excavated approximately 2 ft. x 2 ft., but may vary with the terrain, and the cable shall be laid directly into the trench. Native vegetation shall be salvaged and left on-site to the greatest extent possible to prevent erosion of the surrounding area. At least 1-2 feet of root material shall be harvested when vegetative mats are temporarily removed. Side cast material shall be temporarily placed (i.e., less than 1 week) adjacent to the trench and then backfilled and recontoured to the original pre-existing conditions.
- The majority of construction shall occur during the winter, avoiding sensitive fish life stages. The limited amount of summer construction at rivers shall occur outside of important fish timing windows designated by Alaska Department of Fish & Game (ADF&G) and U.S. Fish and Wildlife Service (USFWS). HDD installations are proposed to occur from June-August

2026. The one ground-lay fiber crossing occurring during the summer at Kugruk Estuary is proposed to occur in July 2026 and does not involve any trenching.

- During summer construction, personnel shall avoid walking on riparian habitat to the greatest extent possible.
- All exposed or disturbed waterways and vegetated areas within the construction corridor shall be returned to pre-existing contours.
- Tundra sod and vegetative mats shall be replaced in disturbed areas.
- Disturbed areas shall be restored to their natural contours and drainage by filling excavations.
    - Summer seeding and revegetation activities may include:
        - Stabilizing slopes with a combination of seed and mulch. See the Invasive Species Management Plan for further information on seed mixes (Section 4).
        - Ensuring that disturbed areas are reestablished according to methods outlined in the Post-Monitoring Plan (Section 5).

2.2 Monitoring

Post-construction monitoring activities are a critical component of successful revegetation efforts following construction, ensuring that disturbed areas recover effectively and sustainably over time. Long-term success depends on verifying that vegetation is establishing as intended, invasive species are controlled, and soil stability is maintained. Monitoring allows for the early identification of issues such as poor germination, erosion, or inadequate species diversity, enabling timely corrective actions.

No permanent or post-construction BMPs shall be installed as part of the project.

Details on monitoring activities can be found in the Post-Monitoring Plan in Section 5.

3 Vegetation Management Plan

This project involves laying fiber optic cable across over 600 miles of Arctic tundra and wetlands. In order to protect this sensitive and important landscape, the majority of construction shall occur during the winter months, significantly alleviating vegetation disturbance by taking advantage of frozen ground conditions and dormant plant life. When soils are frozen, the risk of soil compaction, rutting, and erosion is greatly reduced, helping to preserve root systems and minimize long-term damage to existing vegetation. Additionally, since most native plants are dormant in winter, the likelihood of disrupting growth cycles or causing irreversible harm is lower compared to construction during the growing season. By strategically scheduling work during this period, NANA can reduce the project's environmental footprint and support more effective post-construction restoration.

3.1 Avoidance and Mitigation

Avoidance and mitigation considerations have been central to the planning of this project to reduce potential damage to sensitive vegetation, including Arctic tundra and wetland ecosystems. These environments are particularly vulnerable to disturbance due to their slow recovery rates and ecological importance. Construction techniques have been designed to limit ground disturbance. The following avoidance and mitigation considerations have been adopted during project planning:

3.1.1 Avoidance

- The optimal route has been designed to avoid boreal forests, wetlands, and waterbodies to the greatest extent possible.

3.1.2 Mitigation

- The vast majority of construction activities shall occur during the winter months when snow cover/ground conditions are sufficient for off-road winter travel. Alaska Department of Natural Resources (ADNR) guidelines for minimum snow cover, frost layer, and ground temperature requirements shall be met. These conditions are expected to include a minimum of 6-9 in. of snow cover and a soil temperature of 5°C at a depth of 30 cm. for overland travel.
- Low-ground pressure-vehicles (LGPVs) shall be utilized throughout construction. In winter, LGPVs shall either be tracked or on skids.
- Infrastructure has been chosen to minimize footprint size, including installing single post aerial crossings and minimizing the size of the beach manholes used in subsea construction

3.2 Construction Methods

The project's construction methods have been designed to be low-impact and supportive of natural vegetation regrowth. Revegetation and/or seeding is not currently anticipated, because the existing vegetation mat is expected to be salvaged and used to provide vegetation regrowth. Any necessary revegetation or seeding of disturbed areas shall be performed with guidance from ADF&G's "Streambank Revegetation and Protection: A Guide for Alaska" (2005) and Alaska Department of Natural Resource's "A Revegetation Manual for Alaska" (Wright 2008). NANA recognizes the

importance of minimizing impacts to the area's vegetation and shall implement the following construction techniques:

- Fiber optic cable shall be laid on the ground in a serpentine (wavy) pattern to provide slack which shall prevent impacts of temperature expansion and contraction and to promote cable settling. The serpentine pattern shall also help to prevent entanglement of birds, caribou, and other wildlife.
- During winter ground-lay, vegetation that is incompatible with laying operations and protruding above the snow surface shall be cut back using a mulcher to the level of the snow surface.
    - Vegetation requiring clearing shall primarily consist of woody shrubs with the potential to be taller than the required minimum snow cover, including willows (*Salix* sp.), dwarf birch (*Betula nana*), and alder (*Alnus* species).
    - Plant roots shall remain intact.
    - Cutting shall be as limited as possible and restricted to the 30 ft. construction corridor.
    - Mulch and cuttings shall be placed in the general vicinity of where the vegetation was removed.
- During HDD activities, material shall not be stockpiled in a wetland or where the stockpile could cause sedimentation into a wetland or dam water, causing flooding of a wetland area. Personnel shall avoid setting up drilling equipment in a wetland.
- Hazardous materials, such as chemicals, fuels, and lubricating oils, shall not be stored in wetlands. Any equipment maintenance activities shall be performed further than 100 ft. away from any wetland areas to avoid spills or contamination.
- Disturbed areas shall be restored as progressively and quickly as possible to pre-construction use. If necessary, vegetation cover using native and certified seed mixes and seed dispersal, management, and maintenance processes shall be implemented.

3.3 Monitoring

Post-construction monitoring shall be a critical component of determining this project's success. Monitoring shall allow for the early identification of any issues with vegetation regrowth. The approach shall not only support regulatory compliance but also help achieve long-term ecological restoration goals and land-use functionality. Detailed monitoring details can be viewed in the Post-Monitoring Plan (Section 5).

4 Invasive Species Management Plan

There are several ways in which invasive species and weeds have the potential to be introduced to the project area during construction and maintenance activities. Primarily these methods are from introduction by construction equipment or marine vessels and through the use of seeds and vegetation during restoration activities.

NANA is committed to ensuring that no invasive species or weeds are introduced to the project area and shall follow guidelines outlined in the Bureau of Land Management plans. For example, the Kobuk-Seward Peninsula Approved Resource Management Plan (BLM 2008) management goal K-2(3) is to: *Use integrated pest management practices to control or eradicate noxious and invasive species.* NANA shall follow this by implementing the following measures:

4.1 Construction Equipment

To prevent the introduction, or spread, of non-native, invasive plant species or weeds in the Northwest Arctic Borough, Cruz Construction, Inc. has implemented the following plan. This is a procedure used by Cruz for all projects, regardless of the location.

This procedure is designed to ensure that all equipment is properly maintained, inspected for leaks and serviceability, cleaned of all organic material, and prepared appropriately for remote service.

- Cruz' equipment maintenance staff shall bring all pieces of equipment into their heated indoor shop in Deadhorse.
- The equipment shall receive complete steam cleaning. This provides a means of close inspection for leaks and also removes any direct and foreign debris from the internal and external surfaces that may have accumulated during prior use. This cleaning assures that no material from potential invasive species is transported from site to site and facilitates a comprehensive maintenance inspection. The Cruz wash bay uses a containment system for the collection of the wastewater, and the wastewater is sent to North Slope Borough Service Area 10 for treatment and disposal.
- A Cruz mechanic shall conduct a full mechanical inspection of the equipment, including the checking of hydraulic lines and gaskets for hydrocarbon leaks.
- A Cruz mechanic shall repair any mechanical deficiencies found during the inspection.
- After all aspects of the inspection are met, the equipment is staged for transportation to the work site.

4.2 Marine and Freshwater Vessels

Barges and tugboats shall be utilized in the construction phase of the project for the subsea cable lay across Hotham Inlet and to transport directional drilling equipment and personnel up project area rivers. The introduction of invasive species through vessels poses a significant threat to coastal and marine ecosystems. These species are often transported unintentionally via ballast water discharge, hull fouling, and other vessel-related pathways, where they can outcompete native organisms, disrupt ecological balance, and cause economic harm to fisheries and coastal infrastructure. The U.S. Coast Guard enforces national standards for ballast water and biofouling in

Alaska. NANA is committed to minimizing the spread of invasive species from vessels and the project shall adhere to the following BMPs:

- Vessels used in marine and freshwater shall follow the principles of Clean, Drain, Dry:
    - Clean – Inspect and clean off plants, animals, and mud from clothing, vessels, and equipment including waders, footwear, ropes, anchors, and field gear before leaving water access. Use the local water source initially to help remove heavy deposits. Remove plant fragments and scrub off any visible material with a stiff brush.
    - Drain – all water from watercraft, motor, and bilge before leaving water access. All ballast water shall be from a municipal water supply.
    - Dry – equipment, vessels, and gear before moving between waterbodies. Dispose of unwanted materials in the trash; do not dump them in the water or on land.
- Refer to the Alaska Region's Guidelines for Preventing the Spread of Aquatic Invasive Species (fws.gov/media/aquatic-invasive-species-prevention-guidelines-pdf) for more information.
- Biofouling shall be managed through BMPs such as applying antifouling hull paint and rigorous cleaning.
- Vertebrate invasive species can be transported in vessels as stowaways. Free-roaming rats and/or mice shall be eradicated whenever detected so that they are not inadvertently relocated elsewhere. Live rats/mice should never be released. Trash and food shall be stored appropriately to reduce attraction. Other tips for prevention and control are available in ADF&G's State Invasive Rodent Plan (adfg.alaska.gov/static/species/nonnative/invasive/pdfs/invasive_rodent_plan.pdf).

4.3 Revegetation and Seeding

If the restoration phase of the project requires revegetation or reseeding where land has been disturbed, these efforts can inadvertently introduce invasive plant species that outcompete native vegetation, degrade habitat quality, and disrupt local ecosystems. NANA is committed to implementing best practices and adhering to ecological restoration guidelines to support biodiversity and long-term ecosystem health without unintentionally spreading invasive species. These best practices include:

- Minimizing soil disturbance and reseeding were appropriate to reduce the likelihood of weed establishment.
- Seed mixes shall be locally sourced with native vegetation species.
- Seed stock shall be free from weeds and other contaminants.
- Disturbed areas requiring revegetation shall be performed with guidance from "A Revegetation Manual for Alaska" (Wright 2008).
- Stipulations per BLM Alaska Instruction Memorandum No. 2025-013 Invasive Plant Prevention and Management shall be implemented on BLM-administered lands, including:
    - The use of certified weed-free fill material (if unavailable, then an alternative source shall be approved by an Authorized Officer).
    - The use of Alaska-grown straw (if necessary for revegetation).

- Any other fill or gravel shall be weed-free where feasible and available.

5 Post-Monitoring Plan

Following construction of the FOC installation, a post-monitoring plan shall be instituted to ensure proper cable alignment, site stability, and successful ecological recovery. Focal areas of the post-monitoring plan include waterbody crossings and locations where ground disturbing activities occurred. These plans focus on assessing soil settlement, erosion control, and the re-establishment of native vegetation to confirm that disturbed areas are returning to their pre-construction condition. Monitoring also helps identify any areas where revegetation efforts may be failing or where further intervention is needed to prevent long-term environmental degradation. Through effective adaptive management techniques, post-monitoring ensures regulatory compliance, supports environmental stewardship, and protects the integrity of both the fiber optic infrastructure and the surrounding landscape.

5.1 Schedule

The majority of the project construction shall occur in the winter months between January and April 2026. Winter construction includes deploying over 600 miles of FOC through the ground-lay method, crossing 730 streams and 59 lakes through the ground-lay method, and 18 aerial crossings at large rivers (e.g., Kugaruk River, Wulik River, and Singauruk Creek).

Inspections of the winter ground-lay, waterbody crossings, and cable seating shall occur between July – August 2026.

The summer construction activities include subsea construction at Hotham Inlet (June-July 2026), HDD crossings at 16 large rivers (June-August 2026), and a ground-lay crossing at Kugruk Estuary (July 2026).

Inspections of the summer construction portion shall occur in summer 2027 (after the first growing season following construction).

5.2 Inspection of Winter Ground-Lay Segments

Following winter construction activities, a crew shall return in the summer to ensure the cable is properly seated on the tundra, within waterbody crossings, and to ensure all construction materials and debris have been cleared from the area. Inspections shall be performed by helicopter flyovers, while paying particular attention to waterbody crossings and shrubby-vegetated areas to ensure that the anchors and cable are seated securely to the ground and substrate. Where significant anomalies are observed, the helicopter shall land so cable realignment can be performed by the inspectors.

5.2.1 Terrestrial Ground-Lay Inspections

- Along the entire route, the cable shall be evaluated for proper seating on the ground.
- Where cable is suspended within woody shrubs (because snow melt happens to place cable on top of shrubs that were not identifiable in the winter), the helicopter shall land (outside of wetlands and sensitive riparian areas) so that cable adjustments to place it on the ground can occur by hand.
- Inspections shall ensure that the cable remains in a line and does not curl up (to avoid wildlife entanglements).

- The winter travel route across wetlands and sensitive habitat shall be closely evaluated for any damage or relic trails.

5.3 Waterbody Ground-Lay Inspections

- Helicopter flyovers shall particularly focus on waterbody crossings to verify that the cable has ascended the streambed and is not risking wildlife entanglement or streambank integrity.
- A helicopter shall land wherever streambank trenching occurred for a robust visual inspection to ensure recovery of the revegetated streambank and to assess that the potentially impacted watercourse is functioning properly.
- Post-construction waterbody surveys shall consider the impacted area within 50 feet of the ordinary high-water mark, including visual inspections of:
    - scour,
    - head cuts,
    - knickpoints,
    - erosional rills or gullies,
    - bank slumping, and
    - sediment deposition.

5.4 Aerial Crossing Inspections

- The foundation for wooden pole placement shall be approximately 2 ft x 2 x ft area. Inspections shall evaluate vegetative regrowth of the disturbed area and assess the potential for additional monitoring after the first year.
- The area around the guy wire anchor shall be inspected to ensure proper vegetative cover.
- The pole shall also be evaluated to assess its overall condition and to verify the strength of the foundation. Any signs of instability, such as loose or wet soil, shall be documented and reinforced, if necessary.

5.5 Inspection of Summer Construction Segments

Inspections of the summer construction areas shall occur after the following summer after the first growing season. Helicopter-assisted inspections shall focus on the areas of ground disturbance.

5.5.1 Horizontal Directional Drilling Inspections

- Evaluate the areas around the HDD boreholes for construction impact to native vegetation.
- Check the streambanks for integrity and any damage due to construction activities.

5.5.2 Hotham Inlet Subsea Crossing

- Evaluate the area surrounding the beach man holes for vegetation regrowth.
- Check trenched areas above and below mean lower low water for stability and vegetative regrowth.
- Ensure that the cable remains buried in trenched segments.

5.5.3 Kugruk Estuary Crossing

- Evaluate the banks for stability.
- Ensure the cable is buried within the bed sediments.

5.6 Monitoring Protocol

Monitoring surveys to assess vegetation conditions and progress toward performance standards shall be conducted once following the first growing season or until performance standards are achieved, or sooner if agency botanists concur that no further monitoring or corrective actions are necessary. A Monitoring Form capturing the same information on the Pre-Construction and Post-Construction forms shall be completed.

Reference sites that were unimpacted by construction disturbance shall be chosen to compare the restoration sites and help to evaluate the restoration outcomes. The following metrics shall be used to define success of restoration activities.

Resource	Initial Performance Standard	Final Performance Standard
Vegetation	Minimum of 25-50 percent vegetation cover during initial inspection.	If minimum cover is not met during the initial inspection, then the site shall be revisited annually until there is at least 75 percent vegetation cover relative to pre-construction conditions.
Invasive Plants	No increase in percentage cover of plants listed as highly or moderately invasive compared to pre-construction conditions. See Carlson et al. 2008	Invasive plant cover in restored areas shall be less than or equal to invasive plant cover of neighboring undisturbed areas. Percent increase is relative to baseline conditions established in reference plots.
Wetlands/Sensitive Communities	Minimum of 25-50 percent vegetation cover during initial inspection.	Provide 1:1 replacement for wetlands and sensitive natural communities relative to baseline conditions.
Hydrologic Channels	Impacted waterbody inspections shall be performed to check the following: The channel is functioning properly. Restored channel bed/bank does not have any visible scour, head cuts, knickpoints, erosional rills or gullies, bank slumping or sediment deposition.	There is proper channel function, streambank integrity remains intact, the cable remains buried.

5.6.1 Adaptive Management Strategy

A crucial component of the Post-Monitoring Plan lies within the adaptive management strategy, in which a flexible, iterative approach shall address environmental and infrastructure performance challenges that may arise post-construction. This strategy begins with a clearly defined monitoring protocol, such as ensuring successful revegetation, maintaining soil stability, and protecting water

quality, and uses ongoing monitoring data to assess whether those objectives are being met. If issues are detected, such as unexpected erosion, poor vegetation recovery, or trench subsidence, the strategy allows for timely modifications to mitigation measures, such as re-seeding, enhancing erosion control, or revising maintenance schedules. By incorporating feedback loops, stakeholder input, and scientific data, adaptive management enables continuous improvement and ensures that both environmental and project goals are achieved efficiently and sustainably over time.

Throughout the life of the project, the development and implementation of additional protection measures or corrective actions may be required. If fires, droughts, floods, extreme heat, or other stochastic events/unanticipated circumstances impact revegetation and restoration efforts, the impacted site shall revegetate in parallel with the damage sustained by the surrounding vegetation community.

Adaptive management shall use monitoring data on a site-specific basis to assess whether revegetation/restoration activities are on track to meet performance criteria. If revegetated areas do not meet performance standards, NANA shall attempt to expediently ascertain and address the source of the problem. Sites not meeting the performance standards, and corrective actions taken shall be documented in the Monitoring Report. Additional seeding, removal of invasive plant species, and additional application of weed-control measures may be implemented as corrective actions. Implementation of supplemental actions shall be based on the general revegetation recruitment trend, site-specific conditions, and climatic factors. Consideration of supplemental actions shall be based on the causal factors contributing to mortality, slow growth, or poor recruitment, as best can be determined.

The Monitoring Report shall include failures to meet the year's performance standard benchmarks summarized in the Monitoring Protocol, likely causal factors of the shortfalls, and prescribed corrective actions. If needed, consultation shall occur with the area landowners and appropriate agencies to help facilitate a complete site recovery.

5.6.2 Monitoring Reports

Monitoring reports shall be prepared and submitted to the required agencies as dictated by permit requirements. The reports shall provide determinations of revegetation and restoration suitability for each impact area, summarize revegetation and restoration for each applicable impact area, provide data on performance standards and success criteria, and detail any corrective actions necessary to close out sites. Information and data in each Monitoring Report shall include pre-construction, post-construction, and monitoring forms for each impact area, initial data, maintenance activities, additional surveying and monitoring data, and status of revegetated/restored sites.

Once the final success criteria have been achieved for a given impact area, monitoring shall not be further conducted in that area and data collection at that area shall not be included in subsequent monitoring reports after revegetation/restoration is listed as complete and the site is closed out.

6 Wildlife Monitoring, Interaction, and Avoidance Plan

The construction and maintenance phases of this project have the potential to overlap human activities with wildlife habitat, including the habitat of some threatened and endangered species. This plan outlines the mitigation efforts by the project to avoid, monitor, and report interactions with mammal and bird species.

6.1 Bears

Portions of the construction activities and field operations shall occur within polar bear and brown bear habitat; and crews have the potential to encounter a bear during construction activities and associated field work. Therefore, NANA has developed this plan to:

- Prevent or minimize the potential for human-bear interactions
- Prevent bears from associating humans and facilities with food
- Protect field personnel and bears
- Understand controls to prevent interaction
- Implement observation and reporting procedures

6.1.1 Polar Bear and Brown Bear Interaction Plan

NANA has prepared and shall implement a polar bear and brown bear interaction plan to minimize conflicts between humans and bears, including measures to:

- Minimize the attraction of bears to operational use areas.
- Organize the layout of construction and operational use areas to minimize human/bear interactions.
- Warn personnel of bears near or in the construction areas and the proper procedures to take.
- If authorized, deter bears from interactions with project workers to maintain a safe work environment.
- Provide contingencies in the event bears do not leave the site or cannot be deterred by authorized personnel.
- Discuss proper storage and disposal of materials that may be toxic to bears.
- Provide a systematic record of bears within and adjacent to the construction area.

Although NANA developed this plan for bear interactions, it also helps to prevent worker interactions with other wildlife. NANA field personnel shall comply with all applicable local, state, and federal codes, statutes, and regulations including the Marine Mammal Protection Act of 1972 (MMPA) (16 United States Code [USC] 1361-1407) and the Endangered Species Act of 1973 (ESA) (16 USC 1531-1544).

6.1.2 Bears and Impacts of Human Activity

Human activity may attract wildlife. The biggest attractants for wildlife are associated with food, waste-handling practices, food-associated byproducts, dumpsters and other waste disposal facilities. Bears, in particular, can learn to associate humans and facilities with food. Bears

throughout Alaska have passed this human-food association through generations – sows teaching cubs.

Proper food and waste management practices are critical for preventing conditioning of all wildlife, and particularly bears, to associate human activity with food. When female bears and their cubs emerge from dens (April/May), they start looking for food. Extra care is necessary to properly store and dispose of food waste to prevent bear attraction and their entry into work areas at these times. Bears shall generally avoid human activities if they are not attracted by food and waste.

6.1.3 General Policies and Mitigation

All field personnel shall be trained to adhere to several general procedures that deter wildlife species from entering work areas and potentially interacting with personnel. These procedures are necessary for the safety of both personnel and wildlife. The construction supervisor or field crew chief shall maintain a file of wildlife observation forms that shall be submitted to the appropriate agency (NSB, Alaska Department of Fish & Game [ADF&G], or United States Fish and Wildlife Service [USFWS]), if required.

6.1.3.1 Food Handling and Food Waste Management

Proper food handling and food waste management is imperative. NANA shall implement the following measures in order to minimize interaction with bears:

- Personnel shall not feed wildlife. Any personnel observed doing so shall be subject to disciplinary action.
- When possible, personnel shall not eat outside of buildings or vehicles.
- Personnel shall discard food waste only in designated receptacles.
- Personnel shall remove food waste from the field and shall not place it in dumpsters or receptacles that are not secure from wildlife access.
- Personnel shall contact the construction supervisor or field crew chief if any improperly managed food waste is observed or for answers to questions on refuse management.

6.1.3.2 Handling Non-Food Materials and Non-Food Waste

Non-food materials (e.g., plastic, rubber, motor oil, and chemicals such as antifreeze) can be attractive to some wildlife species. If these materials are not handled properly, they can increase the likelihood of wildlife encounters. Proper waste handling procedures shall include the following:

- Personnel shall store potentially harmful materials in secure containers (e.g., 55-gallon steel drums) or inside secure equipment.
- Storage containers shall be inspected periodically to ensure they are secure, in good condition, and no spills have occurred.
- All waste shall be disposed of properly.
- Personnel shall contact the construction supervisor or the field crew chief if any improperly managed non-food materials or waste is observed or for answers to questions on waste management.

6.1.3.3 Infrastructure Design and Maintenance

Infrastructure can potentially provide nesting structure for wildlife.

6.1.3.4 Stressed or Injured Bears

If field personnel observe a bear or other wildlife that is stressed or injured, they shall maintain a safe distance from the animal, shall not approach it, and shall not attempt to provide assistance in any form. Injured bears can be aggressive. All field personnel must immediately notify the construction supervisor or the field crew chief with observation details, such as the species, location of the animal, and type of injury or problem.

The construction supervisor or field crew chief shall contact the appropriate agency immediately, either the ADF&G (Kotzebue Office, (907) 442-3420) or the USFWS (Northern Alaska Field Office, (907) 456-0203), and work with that agency to take necessary action. The presence of a potentially dangerous predatory species may require agency supervision before any action can be taken.

6.1.4 Brown Bears

Brown bears (*Ursus arctos*), commonly referred to as grizzly bears occur throughout Alaska, are present in small populations in and around the project area. Therefore, a possibility exists that project activities at certain times of the year may encounter a brown bear.

Typically, brown bears are active in the summer and occupy dens during late fall (October or November), throughout winter, and into early spring (April). All occupy winter dens; pregnant females enter dens earlier and emerge later with their cubs. Males and non-pregnant females hibernate for a shorter duration. Den destruction or abandonment can cause mortality since a bear that has been displaced from its den may not be able to dig a new den in frozen ground. Additionally, the next spring's cubs could also be lost if a replacement den is not found quickly.

6.1.4.1 Early Detection and Avoidance

To minimize the potential for human-bear interactions, field personnel shall follow early detection and avoidance procedures. Activities related to the field operations that may attract brown bears include field staff handling of food and waste. Even when garbage and other non-natural foods are not available, brown bears are curious about their surroundings and shall investigate camps, vehicles, and buildings. Darkness, vegetation cover, blind corners, noise, wind, precipitation, fog, and other conditions may make it difficult to see or hear a bear. All project personnel should remain alert for the presence of bears while in the field and at camp facilities. Personnel shall take the following precautions during construction activities and field operations:

- Manage all potential bear attractants, particularly food, waste, and chemicals, in accordance with waste management and chemical storage policies.
- Be especially alert when weather prevents good visibility. Make a lot of noise before walking into an area with poor visibility.
- Use the buddy system when working outdoors and, if necessary, designate a "Bear Watch" to regularly inspect surroundings and scan for bears.
- Coordinate with others, if present, working in the area to assure each other's actions are compatible with providing protection from and avoidance of bears.
- Maintain visual or radio contact with other team members when working outdoors to receive any brown bear sighting alerts.
- Report all brown bear sightings to the construction supervisor, crew chief or the project manager.

- Delay field operations if bears, or other wildlife, are encountered along the project route during construction activities.

6.1.4.2 Interaction and Response

If field personnel observe a bear in the project area, they shall follow the precautions:

- Depending on the distance between the bear and activities, personnel may need to retreat to vehicles, equipment emergency shelter, or temporary buildings for safety.
- Personnel must never approach or crowd a bear. Each bear is unique in its comfort level with humans, the more distance between personnel and the bear, the better for conflict avoidance.
- If a bear is encountered at a close distance, personnel are to remain calm. Attacks are rare. Most bears are interested only in protecting food, cubs, or their "personal space". Once the threat is removed, they shall move on. Personnel are reminded of the following:
    - **Identify Yourself:** Let the bear know you are human. Talk to the bear in a normal voice. Wave your arms. Help the bear recognize you. If a bear cannot tell what you are, it may come closer or stand on its hind legs to get a better look or smell. A standing bear is usually curious, not threatening. You may try to back away slowly diagonally, but if the bear follows, stop and hold your ground.
    - **Don't Run:** You cannot outrun a bear. They have been clocked at speeds up to 35 miles per hour (mph), and like dogs, they shall chase fleeing animals.
    - **If the Bear Moves Toward You:** Stand your ground and talk calmly. Monitor the bear's movement. If you move away, you may indicate to the bear that you are prey, and it may follow you.
    - **If a Bear Charges:** Stand your ground. Bears often make bluff charges, sometimes to within 10 feet of their adversary without making contact. Continue waving your arms and talking to the bear. If the bear gets too close, raise your voice and be more aggressive. Make noise but never imitate bear sounds or make a high-pitched squeal. Use bear deterrent spray if within range.
    - **If Attacked:** If a deliberately approaching bear makes contact, it may be a predatory attack. Fight back vigorously. Permitted brown bear hazing may be conducted at any time when the bear is perceived to be too close for personal safety. Vehicles shall not be used to herd bears away from work locations.

6.1.4.3 Monitoring and Reporting

Construction and field personnel shall likely be the primary source of brown bear sighting information. If a worker observes a bear or fresh bear sign (e.g., tracks or scat) in or near the project area, they must first ensure their own safety by returning to a secure location, if necessary. Then they shall report the sighting to the construction supervisor or the crew chief. Personnel should never remain in an exposed position in order to view or photograph a bear.

When a bear sighting is reported, workers in the area shall be contacted immediately and directed to move to a secure location. Secure areas may include the project equipment, vehicles, or buildings (although few buildings exist within the project area). If only a vehicle is available, personnel should drive at least 50 yards from the bear and observe the bear with the vehicle engine running.

While the bear is in the vicinity, a state of alert shall be imposed. The alert shall consist of voice communication that provides specific information on the location of the bear, instructions on where to move to for safety, and other evacuation instructions. Only when the construction supervisor or the field crew chief determines the bear is no longer present in the work area shall the alert be lifted.

The field crew chief shall verify the brown bear sighting and complete a Brown Bear Reporting Form. Wildlife encounters can be reported at https://www.adfg.alaska.gov/index.cfm?adfg=reportwildlifeencounter.main.

6.1.5 Polar Bears

Polar bears (*Ursus maritimus*) are considered Arctic marine mammals and are protected from hunting or harassment under the MMPA. They are also designated as a threatened species under the ESA. Polar bears are excellent swimmers and can run up to 25 mph. Because of their size, speed, and curious nature, any encounter with a polar bear is potentially dangerous. During the summer months, polar bears normally hunt seals for food far out on the pack ice. As winter approaches, newly formed ice bridges may bring them closer to land. Only pregnant females use dens during the winter months, and they emerge with their cubs in March. Polar bears are coastal animals, and in their natural setting they eat only meat, mostly seals. However, in areas with human activity, they may be attracted to plastic, rubber, motor oil, and chemicals such as antifreeze. Bears may visit work sites because of curiosity or food odor, but their visits shall be transitory if they are not rewarded with food. The likelihood of a polar bear encounter in the project area is low. Field operations are scheduled during winter months, but not along the coast. Polar bears have been documented far inland, but this is a rare occurrence.

6.1.5.1 Early Detection and Avoidance

Polar bear early detection and avoidance procedures are similar to those for brown bears. Polar bears are attracted to food and waste. They are also curious creatures that may investigate camp sites, vehicles, and buildings simply because of their curiosity. The polar bear's white fur makes it exceptionally difficult to see when there is snow cover. Darkness, blind corners, noise, wind, precipitation, and fog shall also add to the difficulty of seeing or hearing a polar bear. All field personnel must be alert to the possibility that a polar bear may enter the project area, and all personnel shall follow the general early detection and avoidance precautions presented for brown bears in Section 1.4.1.

6.1.5.2 Interaction and Response

Polar bear hazing shall be done or approved by the field crew chief only after consultation with the USFWS or in the event of a life threating situation and the USFWS cannot be reached. Vehicles shall not be used to herd bears away from work locations.

6.1.5.3 Monitoring and Reporting

Reporting a polar bear sighting shall differ slightly from the required reporting for brown bear. When a polar bear is sighted, the construction supervisor or field crew chief shall verify the sighting and must complete a Polar Bear Sighting Report. A copy of the completed report shall be retained at the NANA Anchorage office, and a copy shall be sent to the USFWS Northern Field Office. As a courtesy, NANA shall send a copy to ADF&G in Kotzebue. The field crew shall report any polar bear observations to the USFWS (907-456-0203) within 24 hours.

6.1.6 Training and Meetings

All personnel working on the project construction or on the associated field programs shall receive environmental orientation before beginning work. This orientation shall cover the information included in this plan and shall reinforce the importance of proper waste handling and food management to minimize human-wildlife interactions. Additionally, contractors shall disseminate information specific to human- wildlife interactions in the form of environmental alerts and updates, safety bulletins, and safety meeting briefings during construction activities and field operations. The project manager shall be responsible for maintaining completed copies of specific human-wildlife interaction forms on site and routing forms as necessary to ADF&G or USFWS. Blank copies of all applicable forms are provided as appendices.

6.1.7 Risk Locations and Situations

The following are lists of locations, situations and activities where bear encounter risks may be higher and where attention to mitigating risks is essential. Possible bear encounter locations include:

- Near water courses
- Access roads
- Camp facilities
- Food consumption areas
- “Blind” areas at camps that are obscured by facilities, equipment, or other obstacles

At-risk bear encounter situations and activities include:

- Survey work
- Solid waste handling and disposal
- Inexperienced crews
- Dark/unlighted and visually obscured areas

6.2 Birds

There is the potential for interactions with birds to occur throughout the construction and field operations of the project, including with seabirds and raptors. Additionally, two species of birds, Spectacled eider (*Somateria fischeri*) and Steller’s eider (*Polysticta stelleri*), are listed species under USFWS jurisdiction and protected by the Endangered Species Act (ESA). Bald and Golden Eagles are protected under USFWS jurisdiction under the Bald and Golden Eagle Protection Act. Migratory birds are protected under the Migratory Bird Treaty Act.

NANA has developed this plan to prevent or minimize bird interactions with project construction and infrastructure. The following mitigation and minimization procedures shall be implemented:

- In order to reduce the possibility of bird collisions, aerial installation of fiber optic lines in this project has been minimized.
- Where aerial installation does occur, bird flight diverter deterrent devices shall be installed that are durable and visible to reduce collision risk.

- The majority of the project construction shall occur during the winter season, greatly reducing the risk of disturbing birds from surface construction.
- If an active nest is encountered at any time, including before or after the local recommended avoidance times, it shall be left undisturbed.
- To the maximum extent practicable, construction activities shall be limited to the time between dawn and dusk to avoid the illumination of adjacent habitat areas.
- If necessary to light at night, lights shall be angled downward to reduce potential for collisions with vessels, equipment, and gear.
- For the subsea installation, cable routing avoids listed eider concentration areas to reduce potential behavioral and disturbance effects.
- Post-construction helicopter surveys and concurrent fiber optic line refinement shall occur outside of the bird nesting window (which is between May 1 -July 31, according to USFWS).

Additional considerations specific to the listed threatened and endangered species in the area include:

- If construction activities occur outside of the time window specified by USFWS, the applicant shall notify USFWS of the situation at least 60 days prior to the end of the specified time window to allow for reinitiation of consultation.
- Consistent with AS 46.06.080, trash shall be disposed of in accordance with state law. All closed loops (e.g., packing straps, rings, bands) shall be cut prior to disposal.
- All vessels involved in dredging, screeding, and underwater excavating operations, including survey vessels, shall transit at velocities ≤10 knots.
- Fill material shall consist of rock fill that is free of fine sediments to the extent practical or shall come from on-site dredged material.
- Fill material shall be obtained from local sources or shall be free of non-native marine and terrestrial vegetation species.
- Vessel operators shall:
    - Maintain a watch for marine mammals at all times while underway.
    - Stay at least 91 meters (300 feet) away from listed marine mammals.
    - Travel at less than 5 knots when within 274 meters (900 feet) of a polar bear.
    - Reduce vessel speed to 10 knots or less when weather conditions reduce visibility to 1.6 km (1 mile) or less.
    - Vessels shall not allow lines to remain in the water unless both ends are under tension and affixed to vessels or gear.
- Project-specific barges shall travel at 12 knots or less.
- Vessels used in construction shall not discharge materials (i.e., trash or other debris) into the ocean that may attract seabirds.

6.3 Caribou and Big Game

Interaction with large mammals, such as caribou, moose, and muskox, can potentially occur during the project's construction and maintenance phases. The following avoidance and minimization procedures shall be implemented:

- On-the-ground construction or maintenance activities shall be ceased if large wildlife is observed in the area. Particularly, activities shall not interfere with traditional migration or normal grazing patterns.
- Extra precautions shall be taken to avoid activities that interfere with the fall caribou migration (August-December), winter grazing, and spring migration (April-May).
    - During the fall migration, which coincides with breeding season and possible hunting pressure from humans and predators, caribou may be more reactive to stimulus. Avoidance of disrupting caribou movement during this time shall include an emphasis on allowing the undisturbed passage of the first caribou ("lead caribou") moving through an area, as these individuals set preferred pathways for subsequent caribou movements through the area.
- If moose or muskox are observed moving through the construction area, activities must cease until the animals are more than 300-ft. from project equipment and infrastructure.
- While helicopters must prioritize safety and compliance with Federal Aviation regulations, pilots shall also attempt to minimize disturbing caribou and other wildlife by:
    - Maintaining an adequate distance (based on altitude and lateral distance) from known animal locations;
    - Limiting the number of trips or flights per day during fall when caribou are present, as practical;
    - Avoiding landing in proximity to caribou during migration; or
    - Temporarily suspending transport operations.

6.4 Foxes and Rabies

- Rabies is present in Arctic foxes and red foxes of the region. Since foxes are opportunistic foragers, feeding foxes is strictly prohibited as it increases the risk that people shall be bitten and exposed to rabies.
- Unusual fox behavior includes any of the following:
    - Demonstrating no fear of humans
    - Staggering, tremors, or uncoordinated movements
    - Nipping or biting at themselves or random objects
    - Acting seemingly unaware or blind
    - Acting lethargic or reluctant to move
- If a fox is behaving sick/abnormal but has not bitten anyone, inform the Construction Manager and contact ADF&G.
- Under the Alaska Public Health Regulations, reports of foxes that have bitten or potentially exposed a person to rabies must be made immediately to the Department of Health and Social Services (DHSS) Section of Epidemiology (907) 269-8000, 1-800-418- 0054 in Anchorage, AK.
    - On the direction from the DHSS, carcasses of canids (foxes, wolves, coyotes) that have bitten a person may be shipped to the Alaska State Virology Lab with the forms found under Appendix C at http://dhss.alaska.gov/dph/Epi/id/Pages/rabies/default.aspx or to ADF&G.

- Canids that have bitten someone should not be shot in the head since a negative confirmation shall be impossible. When canids that are found dead or were killed after exhibiting signs of illness or strange behavior but no human exposure to saliva/brain tissues, contact Dr. Kimberlee Beckmen at ADF&G (907-328-8354; email: dfg.dwc.vet@alaska.gov). Carcass submission forms for found dead wildlife are found at: www.adfg.alaska.gov/index.cfm?adfg=disease.main. Please do not freeze carcasses; keep them chilled until directed on shipping or disposal.

6.5 Wildlife is Accidentally Killed or Injured

- The construction manager shall initiate an incident report if caribou, muskox, moose, bear, wolf, sheep, birds, or fish are accidentally killed by construction activities.
- The following agencies shall immediately be notified:
  - ADF&G in Kotzebue at 907-442-3420 for accidental wildlife deaths.
  - ADF&G Habitat in Fairbanks at 907-459-7282
  - The Alaska Wildlife Trooper – Kotzebue Office at 907-442-3241 for accidental moose, caribou, muskox, Dall sheep, brown and black bear, and wolf deaths. Troopers may be notified of other animal deaths at the discretion of the Construction Manager.
  - USFWS in Fairbanks at 907-456-0203 shall be notified of accidental deaths of a caribou, migratory bird, or threatened or endangered species.
  - Notification is not required for small mammal species, such as ground squirrels or rabbits.
- If an animal is killed, but the carcass may be salvageable, the construction manager shall contact the NANA staff to determine if nearby villages want the carcass.
- To avoid the transmission of diseases, disposable gloves must be used when handling carcasses.

7 References

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