3.17 VISUAL RESOURCES

The Donlin Gold Project includes a variety of landscape character types, ranging from remote and undisturbed, to industrial sites (the Mine Site and the oil and gas facilities at the beginning of the pipeline), and small, remote communities. This section describes the regulatory setting and summarizes the existing visual resource conditions. The methodology and findings for visual impacts are provided in subsequent sections.

The EIS Analysis Area for the assessment of existing conditions for visual resources included the following:

- Lands located within a 15-mile radius of the Mine Site and Pipeline corridor, with emphasis on the modeled viewshed;
- Lands located within 2.5 miles of the Kuskokwim River, extending from Crooked Creek to Bethel; and
- Common flight paths between Anchorage, McGrath, Aniak, and Bethel, and routes associated with the Iditarod National Historic Trail.

A 15-mile radius was used in order to understand the larger landscape context of the Donlin Gold Project, and was refined based on the results of viewshed models to focus on those areas where landscape character could be directly affected by project components.

SYNOPSIS

Focusing on each project component (Mine Site, Transportation Corridor, and Pipeline), this section describes existing visual resources and evaluates project impacts. Applicable visual resource management frameworks vary depending on the land management of each geographic area. Visual resource impact analysis procedures used by the BLM are generally followed throughout visual analysis, including viewshed modeling, visual contrast analysis, and identification of Key Observation Points. In addition to visual characteristics of the landscape and the Donlin Gold Project, visual resources analysis considers the sensitivity of viewers to visual change within a given landscape.

This analysis is supported by a set of photographic simulations created for 12 of 25 Key Observation Points to provide an illustration of estimated project effects on visual resources. These simulations also provide a way to visualize components of the Donlin Gold Project as they would appear in the landscape.

EXISTING CONDITION SUMMARY

Viewshed refers to the area that can theoretically be seen from a given vantage point. The viewshed is established through GIS-based analysis; using “average viewer” with an eye level of 5.5 feet. Key Observation Points are established within identified project viewsheds from which anticipated visual contrast is assessed.

Visual contrast describes the degree to which elements within a landscape stand out from one another. Visual contrast is classified as: none, weak, moderate, or strong. Visual contrast can change seasonally. For example, a brushed right-of-way (ROW)

through low vegetation might have weak contrast in summer and none in winter, when both cut and uncut vegetation are covered by snow. A ROW through a spruce forest might have moderate contrast in the summer and strong contrast in the winter, when the cleared portion is white with snow while the trees are still quite dark.

Key Observation Points represent 25 common and/or sensitive views in the EIS Analysis Area. Analysis for each of these sites, including 12 for which photosimulations were developed, gives specific information on visual resources and expected impacts. Taken together, they give an overall sense of visual resources and effects of the Donlin Gold Project.

EXPECTED EFFECTS SUMMARY

Alternative 1 - No Action

This alternative would not affect visual resources in the area. No changes are expected beyond those that have already resulted from the exploration and baseline studies work.

Alternative 2 - Donlin Gold's Proposed Action

Visual changes within the Mine Site would introduce strong visual contrast against the existing landscape. When viewed from ground-based locations, these changes would be largely limited to the vicinity of the Mine Site and last through the Operations Phase of the mine. Some alterations to landforms would persist beyond the estimated life of the project and after Closure. In terms of context, no sensitive viewers (such as a community for whom a particular view is culturally or spiritually important) were identified in the viewshed of the proposed mine site. Due to topography, the visibility of changes in the Mine Site area from ground-based viewer locations would generally be limited to a three to five mile range due to the area's rugged terrain.

Under Alternative 2, the Transportation Corridor would create changes in landscape character along the Kuskokwim River, from barge traffic and from the Angyaruaq (Jungjuk) Port site that would extend through the life of the project. The Port would be demobilized at Closure, but a basic barge landing facility and access road would remain at this site in perpetuity. Views of the proposed airstrip, which would also remain in perpetuity, would be mostly limited to ridgetops west of the Mine Site. Villages located along the Kuskokwim River and the river channel were characterized by viewers with potentially high visual sensitivity. For a photosimulation of the Angyaruaq (Jungjuk) Port site, see Figure 3.17-18.

Visual effects from the Pipeline would be greatest in the following instances and locations: during intensive but temporary construction activities, especially in high activity areas such as locations where Horizontal Direction Drilling would be used for river under-crossings; in forested areas due to strong visual contrast of the cleared ROW against the existing forest; and, where the ROW parallels, co-occupies, or crosses the Iditarod National Historic Trail (INHT). Apart from the INHT, the affected area is not recognized in an existing land management plan for its scenic value. A photosimulation of the Pipeline ROW crossing the Kuskokwim River can be seen in Figure 3.17-20. Figure 3.17-21 to Figure 3.17-25 show photosimulations of the ROW as it traverses other landscapes.

OTHER ALTERNATIVES - This section discusses differences of note between Alternative 2 and the following alternatives, but does not include a comprehensive

discussion of each alternative's impacts if they are the same as or similar to Alternative 2 impacts.

Alternative 3A - LNG Powered Trucks and Alternative 3B - Diesel Pipeline

Alternative 3 (Reduced Diesel Barging) would reduce annual barge traffic on the Kuskokwim River during Operations from 122 under Alternative 2 to 83 for Alternative 3A, and 64 under 3B, reducing visual effects of barge travel proportionally.

Alternative 4 - Birch Tree Crossing (BTC) Port

Alternative 4 would shift the location of the visual impact of the Port, and would shorten the distance traveled by river by 75 miles, avoiding the disturbance of barge traffic through the narrow segment of the Kuskokwim River in front of the communities of Aniak, Chuathbaluk, and Napaimute. These differences are not considered to alter the impact levels on visual resources.

Alternative 6A - Dalzell Gorge Route

Alternative 6A would increase the extent of 1,000-foot proximity to the INHT from 29.4 miles and increase collocation to 14.3 miles compared to Alternative 2. This would effectively triple the distance of the affected segment of the INHT. Overall visual impact mechanism is considered similar to that described under Alternative 2.

3.17.1 REGULATORY ENVIRONMENT

Key guidance on analysis of visual impacts is found in BLM policies, outlined below. In addition, NEPA (42 USC 4371) and the Federal Land Policy Management Act (FLPMA) require impacts assessment, and visual impact assessments are an integral part of compliance. These federal laws are described in Chapter 1. Though state and local planning documents contain planning goals that pertain to scenery management, no regulations or policies exist. Consequently, this section focuses on the BLM guidance, which applies to BLM-managed lands, and not to private or state lands.

Bureau of Land Management, Land Use Planning Handbook: The handbook (BLM 2005a) states that visual resource management 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 visual resource management objectives established in the land use plan.

Bureau of Land Management – Visual Resource Management System: Visual resources on BLM-administered lands are managed under the Visual Resource Management (VRM) System (BLM 1986b). The system provides the framework by which to manage visual values by classifying all BLM-administered lands into one of four visual resource management classes. Classification of lands occurs during the Resource Management Plan (RMP) development process by considering the relative visual value of lands within the context of other resource and land management needs. Visual values are established through the VRI process which classifies scenery based on the assessment of three components: scenic quality, visual sensitivity, and distance zones. Each visual resource management class is defined by a specific management

objective that describes the acceptable level of change to visual resources. Change in the resource is measured though implementation of the contrast rating procedure and by assessing shifts in VRI values. The visual resource management class objectives are defined as follows:

- Class I – Preserve the existing landscape character. This objective is assigned to areas with special designations such as national wilderness areas and the wild sections of national wild and scenic rivers;
- Class II – Retain the existing landscape character. The level of change to the existing landscape should be low;
- Class III – Partially retain the existing landscape character. The level of change to the characteristic landscape should be moderate; and,
- Class IV – Allow major modification of the existing landscape character that minimizes visual impacts to the extent possible.

The approximately 1,650.6 acres of BLM-administered lands crossed by the Pipeline ROW are managed under interim guidance as VRM Class III.

3.17.1.1 METHODS FOR ESTABLISHING BASELINE CONDITIONS

Baseline visual resource conditions were established by: 1) implementing a viewshed analysis; 2) completing a regulatory review to establish areas where visual resources are managed by federal, state, or local planning documents; and, 3) assessing visual resource attributes, potential viewer groups, and visual distance zones (visibility) within the analysis area.

The viewshed analysis is a GIS-based tool to identify locations where a project feature could potentially be visible. It indicates areas where visual resources could be affected by that project component. The results of the analysis are used to refine the analysis area; both identifying specific viewer locations within that area and confirming whether those areas are managed for the protection of visual resources.

The viewshed analysis determines potential project visibility based on the relationship between topography, height of project components, average eye height of the viewer, and height of vegetation. Additional information on the viewshed analysis method found in Section 3.17.3.1.1, along with results of that analysis, is presented in the sections that follow.

The regulatory review included federal, state and local planning documents for planning areas with a geographic nexus to the Project Area. The review focused on identifying specific regulations or planning objectives pertaining to visual resources or scenery management.

Visual resource attributes were assessed by first dividing the analysis area into geographic units defined by prevailing physiography (Wahrhaftig 1969), then assessing landscape character in each geographic unit (see Figure 3.17-1 for an example from the Kuskokwim Mountains Physiographic Province). Landscape character attributes were described in terms of the basic elements of form, line, color, and texture of prevailing landform, water, vegetation, and cultural modification. This approach was applied across the analysis area to ensure that baseline data in visual resources was collected consistently across all jurisdictions. Where applicable, the Natural (Scenic) Inventory of the INHT Seward to Nome Route (BLM 1982) was incorporated into baseline data. This scenic quality data describes scenic quality from the perspective of an individual traveling on the INHT from Seward to Nome (i.e., directional), and does not address

scenic attributes of the planning area as a whole. VRI data are not available for the Bering Sea-Western Interior planning area (BLM 2015c). No scenic quality assessment per BLM Manual H-8410-1 (Visual Resource Inventory) was completed as part of this assessment. Landscape character attributes were assessed at representative analysis locations established on BLM-administered and non-BLM lands across the EIS Analysis Area, and through aerial observations made from helicopter.

Viewer groups were identified through review of scoping comments and review of analyses for recreation, cultural resources, and subsistence. These sources were used to understand how specific locations within the analysis area are used, and the types of viewer groups that may be associated with those uses. Characteristics of identified viewer groups, such as seasonality of use, amount of use, and predominant viewer activity were considered in this inventory. No assumption of visual sensitivity was made for viewer groups located in areas outside of BLM-administered lands. Instead, the context of viewer locations was determined by if the landscape is recognized for its scenic value (Table 3.17-1).

Viewer exposure and potential project visibility was assessed, in part, by classifying relative distance from travel routes or observation points into three distance zones: foreground-middle ground (three to five miles), background (five to 15 miles), and seldom seen (areas located beyond 15 miles or areas hidden from view) (BLM 1986b). Common travel routes included the Kuskokwim River, routes associated with the INHT (including common flight paths), and common flight paths between Anchorage and Aniak.

3.17.2 AFFECTED ENVIRONMENT

The EIS Analysis Area included diverse physiography of southwest Alaska, including: Yukon-Kuskokwim (Y-K) Coastal Lowlands, Kuskokwim Mountains, the Nushagak-Big River Hills, the Tanana Kuskokwim Lowland, the Alaska Range, and the upper Matanuska River Valley (see Figure 3.1-1, Geology, for a project location map). Landscape character attributes for portions of the analysis area that intersect these broad areas are described below.

3.17.2.1 MINE SITE

The Mine Site is located in the Kuskokwim Mountains physiographic province (Wahrhaftig 1969) (Table 3.17-1). Though the Mine Site is located on lands owned by The Kuskokwim Corporation and Calista Corporation, the visual resource analysis area for the project also includes lands owned and administered by the State of Alaska and BLM. The landscape within the Kuskokwim Mountains physiographic province is characterized by low to moderate topographic relief, with elevations ranging from 500 to 1,500 feet (150 to 460 meters) above sea level. The landscape is large in scale, with views from ridge tops largely panoramic; however more enclosure is in drainages and low elevation areas. Topography is dominated by numerous rounded hills that appear as consistent and well-defined by the converging lines of drainages. Vegetation on hilltops is dominated by short alpine tundra with areas of exposed rock. Patches of black spruce, tamarack, alder, and birch are limited as much of these stands appear charred and void of foliage due to extensive tracts of wildfire damage (Figure 3.17-1).

Areas characterized by more contiguous mixed spruce and aspen forest exist in the eastern portion of the unit. Deciduous trees are concentrated in drainages, adding contrast and distinction to these features. The George River, East Fork George River, and Moose Creek are

evident as distinct, broad, U-shaped river valleys characterized by the vivid green and soft texture of muskeg and the stippled texture of black spruce forest. These lowland areas are small in scale and enclosed. A communication tower is located west of the Kuskokwim River. Overall, the landscape appears natural and intact. However, in the vicinity of the proposed mine site, evidence of cultural modification is evident due to existing infrastructure including a network of two-track trails, mine camp facilities, and the airstrip (Figure 3.17-2). Landscape absorption, the capacity for incorporating visual change, is considered high due to varied topography and natural variability in vegetation types.

Viewer groups in this area are limited to individuals engaged in widely dispersed subsistence or recreation activities, and exposure is low due to remoteness of area and lack of access and infrastructure (Section 3.16.2.2.1, Recreation). For example, in 2011 and 2012, the region cumulatively received less than four percent of the state's visitor volume annually (McDowell Group 2013; LKEDC 2006; LKEDC 2012). No permanent habitations are located within approximately 9 miles of the Mine Site (ARCADIS 2012f). Small-scale mining operations exist within the EIS Analysis Area (Section 3.15, Land Ownership, Management, and Use). The Mine Site is located in the seldom seen distance zone. Due to the topography of the area, the Mine Site would not be visible from any inhabited place, the Kuskokwim River, or the navigable parts of its tributaries.

3.17.2.2 TRANSPORTATION CORRIDOR

The Transportation Corridor is located in three physiographic provinces: the Aleutian Islands (fuel and cargo facilities in Dutch Harbor; a connected action), Kuskokwim Mountains (mine access road), and Y-K Coastal Lowland (river transportation and Port). The proposed facilities in Dutch Harbor would be situated amidst an active commercial hub, containing marine facilities and docks to support fuel, heavy freight, light cargo, and small boats. The mine access road would extend from the Angyaruaq (Jungjuk) Port (or Birch Tree Crossing [BTC] Port) on the Kuskokwim River to the Mine Site. The corridor passes through the Kuskokwim Mountains physiographic province, where the landscape is characterized by the varied topography and vegetation previously described for the Mine Site component (Section 3.17.2.1, Visual Resources). Where the corridor approaches the Kuskokwim River, topography is broad and flat, and vegetation is dense and contiguous.

The Transportation Corridor and activities include portions of the Kuskokwim River located within the Kuskokwim Mountain and Yukon Kuskokwim Coastal Lowland physiographic provinces. The portion of the Kuskokwim River affected by the Donlin Gold Project and located in the Kuskokwim Mountains physiographic region includes the river corridor from approximately from the Holokuk River, upriver to the village of Crooked Creek, (while the province boundary is located further upriver near Sleetmute) (Wahrhaftig 1969). The landscape is characterized by the broad, flat river channel, and the more contiguous, steep and proximate mountains and rock formations that border the river channel. This river segment is bordered by the Kuskokwim Mountains.

The portion of the Kuskokwim River affected by the Donlin Gold Project and located in the Y-K Coastal Lowlands physiographic region includes the river corridor from approximately from Holokuk River to the river mouth (Wahrhaftig 1969). Several noteworthy landforms exist adjacent to the river, including the Russian Mountains and Owhat Cliffs (Figure 3.17-3). Scenic integrity is high and the landscape appears natural.

Note winding channel of Crooked Creek in foreground of image.

Data Sources: URS (2013)

DONLIN GOLD PROJECT EIS

LANDSCAPE CHARACTER OF THE KUSKOKWIM MOUNTAINS PHYSIOGRAPHIC PROVINCE

JUNE 2017 FIGURE 3.17-1

Data Sources: URS (2013)

DONLIN GOLD PROJECT EIS

EXISTING INFRASTRUCTURE OF THE DONLIN MINE CAMP

JUNE 2017

FIGURE 3.17-2

Villages and remote residences and fish camps are present along the river. Villages appear as distinct nodes characterized by the presence of structures in upland areas and boats lining the shoreline. Increased activity is often evident in these locations (Figure 3.17-4). Landscape absorption, which describes the ability of the landscape to accept physical alternations without visual character changes, is considered moderate. This is due to limited visibility from river channel, varied topography and vegetation, and narrow field of view from villages due to bends in the river.

This portion of the EIS Analysis Area includes the Kuskokwim River as it flows through the external boundary of the Yukon Delta National Wildlife Refuge (i.e., downriver from about Aniak). The landscape character is dominated by the broad, flat Kuskokwim River. The river appears broad, flat and curvilinear. The riverbank is generally low relief, steep and vertical, descending sharply to a flat shoreline dominated by grey/brown gavel and cobble. The landscape varies from highly enclosed due to riparian vegetation (black spruce, balsam poplar) and cutbanks, to broad and panoramic, with views extending across the vast, flat wetland/tundra complex. In the upriver portion of the province, mountains are visible in the background (Figure 3.17-5). These landforms appear as discrete, dome-shaped to flat-topped landforms that rise steeply from the flat topography in the foreground, providing enclosure to the landscape that appears otherwise large in scale. Downriver of Lower Kalskag, topography is characterized by the broad, flat, delta (Figure 3.17-6). Despite flat topography, the landscape often appears enclosed due to the steep cutbank of the river and associated riparian vegetation.

Villages and seasonal camps are present along the river. Air traffic is common in the vicinity of Aniak. Bethel serves as a transportation and shipping hub for the river, and is the largest and most urbanized of the communities in this area (ARCADIS, 2012f). A communication tower, gravel quarry, and associated roads are visible in mountains surrounding Upper and Lower Kalskag. Though evident, these features do not dominate views, and the landscape appears natural. Landscape absorption is considered moderate due to limited visibility from the river channel due to enclosure created by riverbanks. Though views extend for greater distances from home sites located at higher elevations above the waterline, a narrow field of view remains due to bends in the river.

Viewer groups along the Kuskokwim River include residents, individuals engaged in subsistence hunting, fishing, and gathering; recreationists engaged in hunting and fishing; local small boat travelers; and commercial boat or barge operators. Year round residential villages have a combined population of 9,140 residents (see Table 3.18-2). Activity is concentrated around communities during the fishing season, particularly in the Bethel area between Napakiak and Akiachak, as this area corresponds to the densest human population along the river. Lodge accommodations offering local hunting and fishing guide services exist in Crooked Creek, Red Devil, and Sleetmute. The in-river barge season extends from ice-out to freeze-up, generally corresponding to the period between early June and early October (ARCADIS 2013a). Concern for preservation of visual resource values has been expressed by communities along the river (Feyereisen 2013b). Scenic integrity was identified as important for potential development of sustainable tourism (LKEDC 2006). Additional sensitivities to maintaining intact landscape character could exist for the Yukon Delta National Wildlife Refuge, though management standards are not explicit for visual resources. The Transportation Corridor is located in the foreground/middle ground distance zone (river), and background/seldom seen (mine access road).

Owhat Cliffs on the Kuskokwim River, downriver of the confluence of the Owhat and Kuskokwim Rivers.

Data Sources: URS (2013)

DONLIN GOLD PROJECT EIS

OWHAT CLIFFS ON
THE KUSKOKWIM RIVER

JUNE 2017 FIGURE 3.17-3

Barge unloading at the Village of Chuathbaluk on the Kuskokwim River.

Data Sources: URS (2013)

DONLIN GOLD PROJECT EIS

BARGE UNLOADING AT
THE VILLAGE OF CHUATHBALUK

JUNE 2017 FIGURE 3.17-4

Kuskokwim physiographic province as viewed from the Kuskokwim River at Crow Village.

Data Sources: URS (2013)

DONLIN GOLD PROJECT EIS

TYPICAL LANDFORMS OF THE UPRIVER PORTION OF THE YUKON-KUSKOKWIM COASTAL LOWLANDS

JUNE 2017 FIGURE 3.17-5

Characteristically flat topography of the lower Yukon-Kuskokwim Coastal Lowlands physiographic province. View is directed downriver from the Village of Lower Kalskag.

Data Sources: URS (2013)

DONLIN GOLD PROJECT EIS

CHARACTERISTICALLY FLAT TOPOGRAPHY OF THE LOWER YUKON-KUSKOKWIM COASTAL LOWLANDS

JUNE 2017 FIGURE 3.17-6

3.17.2.3 PIPELINE

The Pipeline traverses the Kuskokwim Mountains, Holitna Lowland, Nushagak-Big River Hills, Tanana Kuskokwim Lowland, Alaska Range, and the upper Matanuska Valley physiographic regions. Though characterized by diverse physiography, scenic integrity along the majority of the Pipeline route is very high, appearing natural with no human-made large landscape modifications (e.g., linear transmission lines, logging areas, and maintained road systems) between Pipeline MP 7 and MP 316. With the exception of the Farewell and Puntilla airstrips, there are no linear or geo-rectangular vegetation clearings, installations, transmission lines, or transportation systems evident in this landscape setting. The natural vegetation in most of the area is unmodified.

The Kuskokwim Mountains physiographic unit encompasses the Mine Site and is described in Section 3.17.2.1, Visual Resources. The Pipeline ROW crosses the diverse topography of the Kuskokwim Mountains, generally following ridgelines where vegetation is dominated by low-growing tundra. Within this physiography, the Pipeline ROW crosses Moose Creek, the George River and the East Fork George River; two tributaries to the Kuskokwim River located east of the Mine Site. These tributaries appear distinct in the larger landscape due to their broad valleys and distinct curvilinear lines created by the river channel and associated riparian vegetation (Figure 3.17-7).

The Holitna Lowland physiographic region includes the river corridor from approximately from the Village of Sleetmute, upriver to Devil's Elbow (Wahrhaftig 1969). This unit is characterized by broad, rounded topography and dense, contiguous mixed-deciduous forest that extends to water's edge (Figure 3.17-8). Exposed cobble on river banks is common. The river channel appears broad, flat, and more channelized than lower river segments. Scenic integrity is high, and the landscape appears natural. Landscape absorption is considered low to moderate. The viewshed of the river is variable, based largely on height of riverbank and density of vegetation. Villages are characterized by a narrow field of view due to bends in the river.

The Nushagak-Big River Hills physiographic province is characterized by rounded, shallow, flat-topped ridges and broad hills. Vegetation is characterized by widely spaced and short spruce trees and extensive areas of aspen-dominated forest. Open meadows are common, appearing as irregular shaped clearings often associated with meandering creeks or sloughs. No villages or communities exist in this unit and the landscape appears natural.

The Tanana Kuskokwim Lowland physiographic province is dominated by broad, gently sloping topography that descends northwest from the Alaska Range toward the Kuskokwim River (Figure 3.17-9). Vegetation ranges from dense spruce to open, irregular-shaped meadows dominated by shrub and tundra vegetation. Networks of small lakes are apparent due to the contrast in the flat reflective surface against the surrounding greens and browns of upland tundra vegetation. Numerous broad, flat, braided river channels drain to the Kuskokwim River. River banks are variable ranging from broad to steep upland forest and are typically densely vegetated. Views to the southwest are dominated by the steep, rugged peaks of the Alaska Range (Figure 3.17-10). Views to the northwest are large in scale and panoramic extending across the broad lowlands. Isolated, dome-shaped landforms provide localized areas where views are enclosed. Two-track trails are evident in drainages and upland areas. No villages or communities exist in this unit and the landscape appears natural.

The George River basin, a tributary to the Kuskokwim River. View is directed west across river .

Data Sources: URS (2013)

DONLIN GOLD PROJECT EIS

THE GEORGE RIVER BASIN

JUNE 2017 FIGURE 3.17-7

The Kuskokwim River, approximately ¼ mile downriver of Devil's Corner at location of proposed ROW crossing.

Data Sources: URS (2013)

DONLIN GOLD PROJECT EIS

KUSKOKWIM RIVER
¼-MILE DOWNRIVER
OF DEVIL'S CORNER

JUNE 2017 FIGURE 3.17-8

Tanana Kuskokwim Lowland physiographic province at the location of the proposed right-of-way. View is directed to the northeast, from an upland location approximately 5 miles from the Big River. Note foothills of the Alaska Range in right side of image.

Data Sources: URS (2013)

DONLIN GOLD PROJECT EIS

TANANA KUSKOKWIM LOWLAND PHYSIOGRAPHIC PROVINCE

JUNE 2017 FIGURE 3.17-9

The Big River at the location of the proposed right-of-way.

Data Sources: URS (2013)

DONLIN GOLD PROJECT EIS

BIG RIVER AT THE LOCATION OF THE PROPOSED ROW

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FIGURE 3.17-10

Across the Alaska Range physiographic province, landscape character is dominated by the extensive rugged and jagged mountains and the broad, U-shaped river valleys. The landscape is large in scale and enclosed by ridgelines. Broad river valleys cut through the rugged terrain, and are often marked by sinuous river drainages or lakes. Examples of this physiographic province are displayed in Figure 3.17-11, which shows the South Fork of the Kuskokwim and the northern edge of the Alaska Range, and Figure 3.17-12 which shows the Happy River valley, located in the Alaska Range southeast of Rainy Pass.

Lower elevation slopes and valleys range from open tundra to areas of dense, contiguous spruce-dominated forest (Figure 3.17-13). Lodges and cabins exist in this unit, though these structures are remote and less dominant than the scale of the landscape. The upper Matanuska Valley physiographic province is characterized by the broad wetland complexes and braided river channel of river valleys of the Skwentna, Yentna, and Susitna rivers. Beluga Mountain, Little Susitna Mountain, and Mount Susitna appear as discrete, dome-shaped landforms that rise for the broad lowlands (Figure 3.17-14). Development is more common, consisting of widely scattered lodges and private cabins near the mouth of the Talachulitna River and along Shell Lake (ARCADIS 2013a). Industrial activity is concentrated in the vicinity of the terminus, characterized by road networks, oil and gas pads, pipelines and processing facilities, a power plant, and associated electrical transmission lines (ARCADIS 2013a).

Viewer groups across the Pipeline corridor are varied. In the Tanana-Kuskokwim Lowlands, viewer groups primarily consist of individuals engaged in subsistence and/or recreational hunting and fishing. Guided recreation is common on the Big River, Talachulitna River, and Skwentna River (ARCADIS 2013a). In the Alaska Range and Susitna Lowlands, primary viewers include users of the INHT, including recreationists and tourists. Predominant use of the trail on the south side of the Alaska Range is during the winter months when the trail is used for Iditarod Trail Sled Dog Race, the Northern Lights 300, the Knik 200, the Junior Iditarod Sled Dog Race, the Iron Dog snowmachine race, and the Iditarod Invitational (Nordic skiers, mountain bikers, snowshoers, and runners).The INHT Comprehensive Management Plan (BLM 1982) identifies "significant viewpoints" at Happy River/Skwentna River confluence, Rainy Pass, Dalzell Gorge, and Rohn Roadhouse areas, and identifies Kohlsaat Peak north of the Rainy Pass Lodge, Pyramid Mountain, Mount Susitna and Beluga Mountain as "important landmark features" (BLM 1982). The Talachulitna River is a designated State Recreation River (ADNR 1991).

Viewer groups may also include commercial and small-craft air travelers. The Kuskokwim River region is currently served by commercial air services from Anchorage to McGrath, Aniak, and Bethel. Local air service operators provide flights from these regional hubs to smaller villages along the river and throughout the region, including strips established adjacent to mining areas and lodges. There is a state-owned airstrip in Skwentna. Fly-in guide services and river boat guides provide the most common access for outdoor recreation enthusiasts. Small aircraft also provide flightseeing, logistic and visual support for multiple organized events associated the INHT.

For the purpose of this analysis, visual distance zones were established using commonly traveled routes within the EIS Analysis Area, including routes associated with the INHT, the Kuskokwim River, and established flight paths.

The South Fork of the Kuskokwim the northern edge of the Alaska Range.

Data Sources: URS (2013)

DONLIN GOLD PROJECT EIS

SOUTH FORK KUSKOKWIM RIVER

JUNE 2017 FIGURE 3.17-11

Happy River valley, located in the Alaska Range southeast of Rainy Pass. Note broad, flat valley floor and incised river canyon.

Data Sources: URS (2013)

DONLIN GOLD PROJECT EIS

HAPPY RIVER VALLEY

JUNE 2017 FIGURE 3.17-12

Dense, contiguous spruce forest located east of Happy River, north of Skwentna.

Data Sources: URS (2013)

DONLIN GOLD PROJECT EIS

SPRUCE FOREST
EAST OF HAPPY RIVER

JUNE 2017

FIGURE 3.17-13

Open wetland meadows of the upper Matanuska Valley, northeast of Beluga Mountain. Note trail marker for the Iditarod National Historic Trail.

Data Sources: URS (2013)

DONLIN GOLD PROJECT EIS

WETLAND MEADOWS OF UPPER MATANUSKA VALLEY

JUNE 2017

FIGURE 3.17-14

3.17.2.3.1 IDITAROD NATIONAL HISTORIC TRAIL

The Iditarod National Historic Trail Comprehensive Management Plan describes "visual and perceptual" aspects of the INHT by identifying visually significant segments according to criteria relating to the degree of naturalness (BLM 1982). Visually significant segments were identified by classifying trail segments by physiographic region, and then subdividing those segments into discrete Scenic Quality Rating Units (SQRUs) based on physiographic integrity and shared scenic quality attributes. Scenic quality was assessed in each SQRU by ranking seven key factors: landform, vegetation, water, color, influence of adjacent scenery, scarcity, and cultural modification. Resulting scenic quality classes are defines as follows (BLM 1982):

- Class A: Areas that "combine the most outstanding characteristics of each rating factor";
- Class B: Areas in which there is a combination of some outstanding features and some that are fairly common to the physiographic region; and,
- Class C: Areas in which the features are fairly common to the physiographic region.

In addition to ranking scenic quality, this inventory also identifies view areas, Significant Viewpoints, and important landmark features that contribute to the character of each SQRU segment. Significant Viewpoints are identified at: the Happy River / Skwentna River confluence, Rainy Pass, Dalzell Gorge, and Rohn Roadhouse. Important landmark features are identified at Kohlsaat Peak north of the Rainy Pass Lodge, Pyramid Mountain, Mount Susitna and Beluga Mountain (BLM 1982).

The operational Pipeline ROW crosses eight SQRUs located within the Alaska Range and Susitna Lowlands physiographic provinces. Character-defining features and integrity are described below in north to south order.

SQRU AR-06 is located in the northern portion of the Alaska Range. Scenic quality within this unit was ranked as Class A. Dominant scenic attributes of this unit are the distinct change in setting as views from the expansive, rugged, and incised Alaska Range transitions to the broad, flat, and panoramic qualities of the Tanana-Kuskokwim Lowlands. Scenic quality attributes are experienced in a directional manner, as this trail segment, approximately 5 miles in length, heads northward across the lowland. Two scenic resources are identified in the INHT CMP (BLM, 1982): 1) Egypt Mountain, identified as an important landmark feature, and 2) the valley walls of the Alaska Range, identified as a view area. The Pipeline ROW would cross this unit once at the southern portion of the unit, as the trail emerges from the Alaska Range and enters the Tanana-Kuskokwim Lowlands.

SQRU AR-2 is located in the Happy River Valley, south of Kohlsaat Peak, and Rainy Pass Creek south of Rainy Pass. Scenic quality is ranked as Class A. Dominant visual elements in this segment include the expansive, uninterrupted views from the trail due to lack of vegetation along the trail. The rugged landforms to the east of Pass Creek are identified as an important landmark feature, and the valley walls of the Alaska Range are identified as a view area (BLM 1982).

SQRU AR-1 is located in the Happy River Valley between Destin Peak and Puntilla Mountain. Scenic quality is ranked as Class A. This unit includes dominant visual elements of steep jagged mountains of the Alaska Range, and the expansive views and vistas where the INHT crosses higher elevation terraces. The valley walls of the Alaska Range are identified as a view area (BLM 1982).

SQRU SL-08 is located south of McDoel and Columbia peaks and extending from approximately Finger Lake to the Happy River. Dominant visual attributes include the Happy River to the south, terraced landforms of upland areas, and the edge-break provided by both vegetation and landform in the southern portion of the unit. Scenic quality is ranked as Class A. The unit is described as a "well-defined visual corridor directed toward the pass, with mountains providing continuous visual landmarks on either side" (BLM 1982). The confluence of the Happy and Skwentna River is identified as a significant viewpoint, and surrounding higher elevation valley walls are identified as view areas (BLM 1982).

SQRU SL-07 is located north of the Skwentna River, extending from roughly the confluence with the Talachulitna River to south of McDoel Peak, and is typical of the foothills of the Alaska Range. Though several lakes (Shell Lake, Onestone Lake) are within one mile of the trail, these features are seldom seen due to the spruce-poplar and lowland/upland spruce-hardwood forests. Dickason Mountain, located to the southwest, is identified as a view area, particularly the Shell Hills to the north. Scenic quality is ranked as Class B.

SQRU SL-06 is located at the intersection of the INHT and the Skwentna River. Similar to the Susitna River crossing, the intersection of the INHT and the Skwentna River provides "significant relief from the vast homogenous forests of the Susitna Lowlands" (BLM, 1982). Scenic quality is ranked as Class A. No important landmark features or significant viewpoints are identified in the INHT CMP (BLM 1982).

SQRU SL-05 is located in the Upper Matanuska Valley physiographic province east of Mount Susitna and Beluga Mountain, and is homogenous with little visual interest or diversity. Scenic quality was ranked as Class C. Beluga Mountain is identified as both a viewing area and an important landmark feature (BLM 1982). Cultural modification was identified as a contributing factor to the reduction of scenic quality in this unit. Though located outside this SQRU, both Mount Susitna and Beluga Mountain and their foothills are identified as important landmark features (BLM 1982).

SQRU SL-04 is located in the Upper Matanuska Valley physiographic province, east of Mount Susitna where the trail crosses the Susitna River, where scenic quality attributes contribute most to the setting. These include the openness of views experienced in this segment compared to surrounding areas where viewer extent is limited by forest. Though located outside of this unit, Mount Susitna and its foothills are identified as both a view area and an important landmark feature (BLM, 1982). Scenic quality is ranked as Class A.

3.17.2.4 CLIMATE CHANGE

Visual resources in the EIS Analysis Area have been and will continue to be influenced by climate-related changes in vegetation and the physical environment. Climate modeling predicts a shift in vegetation community types in Alaska, resulting from fire regime changes, drier landscapes with a higher proportion of shrubs and trees than tundra vegetation types, and areas of subsidence that may fill with water and drain adjacent wetlands. These shifts may be evident in some locations, and may change the visual landscape over time. Vegetation changes would be variable as most of the EIS Analysis Area is in areas of discontinuous, sporadic, or isolated permafrost. Ground subsidence and erosion from warming permafrost are visually observable phenomena related to climate change that may affect the visual landscape in localized areas (Section 3.26.3.4.1, Climate Change).

3.17.3 ENVIRONMENTAL CONSEQUENCES

This section addresses direct and indirect effects expected to result from Construction, Operations, and Closure of the Donlin Gold Project under all proposed alternatives, including the No Action Alternative. The Donlin Gold Project would operate using common features and environmental protection measures described in Section 2.3.2, Descriptions of Alternatives. Table 3.17-1 provides the impact methodology framework applied to assessing direct or indirect impacts to visual resources based on four factors of intensity or magnitude, duration, extent or scope, and context (40 CFR 1508.27, described in Section 3.0, Approach and Methodology).

For the visual analysis area, the indicators used to measure potential impacts to visual resources include:

- Change in character attributes of landscapes and villages, based on expected visual contrast, scale dominance, viewer exposure, and geographic extent of contrast.
- Conformance with the Interim VRM Class III objective based on level of visual contrast expected to result from the proposed action.
- Change in integrity of view areas, significant viewpoints, and/or important landmark features identified in the INHT Comprehensive Management Plan (BLM 1982) based on magnitude and geographic extent of expected impacts.
- Additional qualitative indicators include the expected level of change to the existing landscape aesthetic such as lighting, movement, activity (measured in terms of change in vehicular traffic and amount of people), or naturalness.

The impact ratings are based on the factors presented Table 3.17-1.

- The magnitude of impacts to visual resources, measured by the level of visual contrast created by the Donlin Gold Project. Magnitude was also informed by the scale of contrasting features relative to the existing landscape, and the anticipated exposure of viewers to these features. Levels of contrast are defined 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.
- The duration of impacts, measured by the anticipated temporal extent of impacts.
- The geographic extent or scope of impacts, measured by the degree to which the affected area includes immediate foreground (<3 miles), foreground-middleground (3-5 miles), background views (15 miles), or seldom seen (beyond 15 miles) distance zones.
- The context of the impact, measured by the estimated sensitivity of viewers, applicable legislative protection of visual resources, and the potential for impacts to alter the human experience of the landscape.

For BLM-administered lands, construction-related impacts are not discussed in the context of conformance to VRM objectives, as this land use standard applies to long-term or permanent

impacts. Note that no assessment of change to VRI values on BLM-administered lands was completed as these data were not available.

Table 3.17-1: Impact Methodology for Visual Resources

Magnitude or Intensity	Project components result in low to no visual contrast against the existing landscape. Viewer duration is prolonged or transient, and experienced from foreground-middleground or background distance zones.	Project components result in moderate to strong visual contrast against the existing landscape, viewer duration is prolonged or transient, and views are experienced from foreground-middleground or background distance zones.	Project components result in strong visual contrast against the existing landscape, viewer duration is prolonged, and views are experienced from foreground-middleground distance zones.
Duration	Changes to landscape character would last only for the duration of the Construction Phase (up to 4 years).	Changes to landscape character would extend through the life of the Project	Changes to landscape character would last longer than the estimated life of the Project and after Closure.
Extent or Scope	The extent or scope of the affected area would not extend beyond the foreground-middleground distance zone (3-5 miles).	The extent or scope of the affected area would extend to the background distance zone (15 miles).	The extent or scope of the affected area would extend beyond the background distance zone (15 miles).
Context	Visual resources of the affected area in a landscape that is not recognized for its scenic value.	Visual resource area may be recognized for its scenic quality, visual resources are not protected by existing legislation.	Visual resources within the affected area may be protected by management standards or existing legislation.

3.17.3.1 METHODS

3.17.3.1.1 VIEWSHED ANALYSIS

Potential project visibility was determined by implementing a GIS-based viewshed analysis based on the relationship between topography, vegetation, project features, and average eye height of the viewer. The resulting "seen area," or viewshed, represents the area where project components could theoretically be seen; however, it does not represent actual detectability of these features. Input parameters were defined by eye level of 5.5 feet and vegetation height per the National Land Cover Dataset (EPA 2001b). The viewshed was based on the project configuration as presented in Alternative 2. The estimated geographic extent of views for the Mine Site, including the Angyaruaq (Jungjuk) Port site, the airstrip, and the mine access road, is shown in Figure 3.17-15. For the Pipeline operational ROW, the estimated geographic extent of views is shown in Figure 3.17-16A through Figure 3.17-16E. The theoretical extent of views from the villages located between Lower Kalskag and Napaimute was also calculated using the viewshed analysis procedures (Figure 3.17-17A through Figure 3.17-17E). This analysis was performed to understand the geographic extent and duration of potential views of transiting river barges from villages on the Kuskokwim.

3.17.3.1.2 KEY OBSERVATION POINTS

The impact analysis was informed by information on landscape character attributes and anticipated change collected from 25 Key Observation Points (KOPs) representing common and/or sensitive views. Emphasis was placed on villages along the Kuskokwim River between Crooked Creek and Lower Kalskag, the INHT, and upland areas located on BLM-administered lands. The KOPs represented several landscape analysis factors including distance from the Donlin Gold Project, viewer exposure (transient, stationary, or prolonged), predominant angle of observation, dominant use (i.e., recreation or travel), and average travel speed at which the project components could be viewed.

Locations of KOPs, associated physiographic province, applicable analysis factor, and target project components are described in Table 3.17-2.

Table 3.17-2: Summary of Key Observation Points used to Assess Visual Resources along the Pipeline ROW

KOP Name(s)	Physiography	Analysis Factors	Project Component Assessed
Village of Crooked Creek	Middle Kuskokwim River	Foreground / middleground views; at grade / inferior (lower elevation) viewer position	Mine Site; Construction-related barge traffic (except Alternative 4)
Villages Napaimute; Chuathbaluk; Aniak; Upper Kalskag	Middle Kuskokwim River	Foreground view; at grade / superior (higher elevation) viewer position	Barge traffic
Lower Kalskag	Lower Kuskokwim River	Foreground view; at grade / superior viewer position	Impacts to landscape character from project-induced barge traffic
Angyaruaq (Jungjuk) Port	Middle Kuskokwim River	Foreground view; viewer position at grade from river	Port site and mine access road (Alternative 2); Devil's Elbow, a culturally important location on the River
Birch Creek Crossing	Lower Kuskokwim River	Foreground view; viewer position at grade from river	Port site and mine access road (Alternative 4)
Big River; Windy Fork; George River; East Fork George River	Tanana Kuskokwim Lowland	Foreground / middleground; viewer position at grade from river	Pipeline
Kuskokwim River Crossing - at ROW	Lower Kuskokwim River	Foreground views; viewer position at grade from river	Pipeline
Windy Fork	Tanana Kuskokwim Lowland	Foreground views; viewer position at grade from river	Pipeline
Big River - Upland	Tanana Kuskokwim Lowland	Foreground / middleground and Background Views; superior viewer position	Pipeline
Farewell Station Airstrip	Tanana Kuskokwim Lowland	Foreground / middleground Views; viewer position at grade from airstrip	Pipeline
North Fork Kuskokwim; INHT1;	Tanana Kuskokwim	Foreground / middleground and Background Views; viewer	Pipeline

Table 3.17-2: Summary of Key Observation Points used to Assess Visual Resources along the Pipeline ROW

KOP Name(s)	Physiography	Analysis Factors	Project Component Assessed
INHT2; INHT3; INHT4; INHT5	Lowland	position at grade, superior, and from air	
Rainy Pass	Alaska Range	Foreground / middleground Views; superior viewer position	Pipeline
Dalzell Gorge	Alaska Range	Foreground / middleground Views; superior viewer position	Pipeline
Mount Susitna	Lower Matanuska River Valley	Foreground / middleground Views; superior viewer position	Pipeline

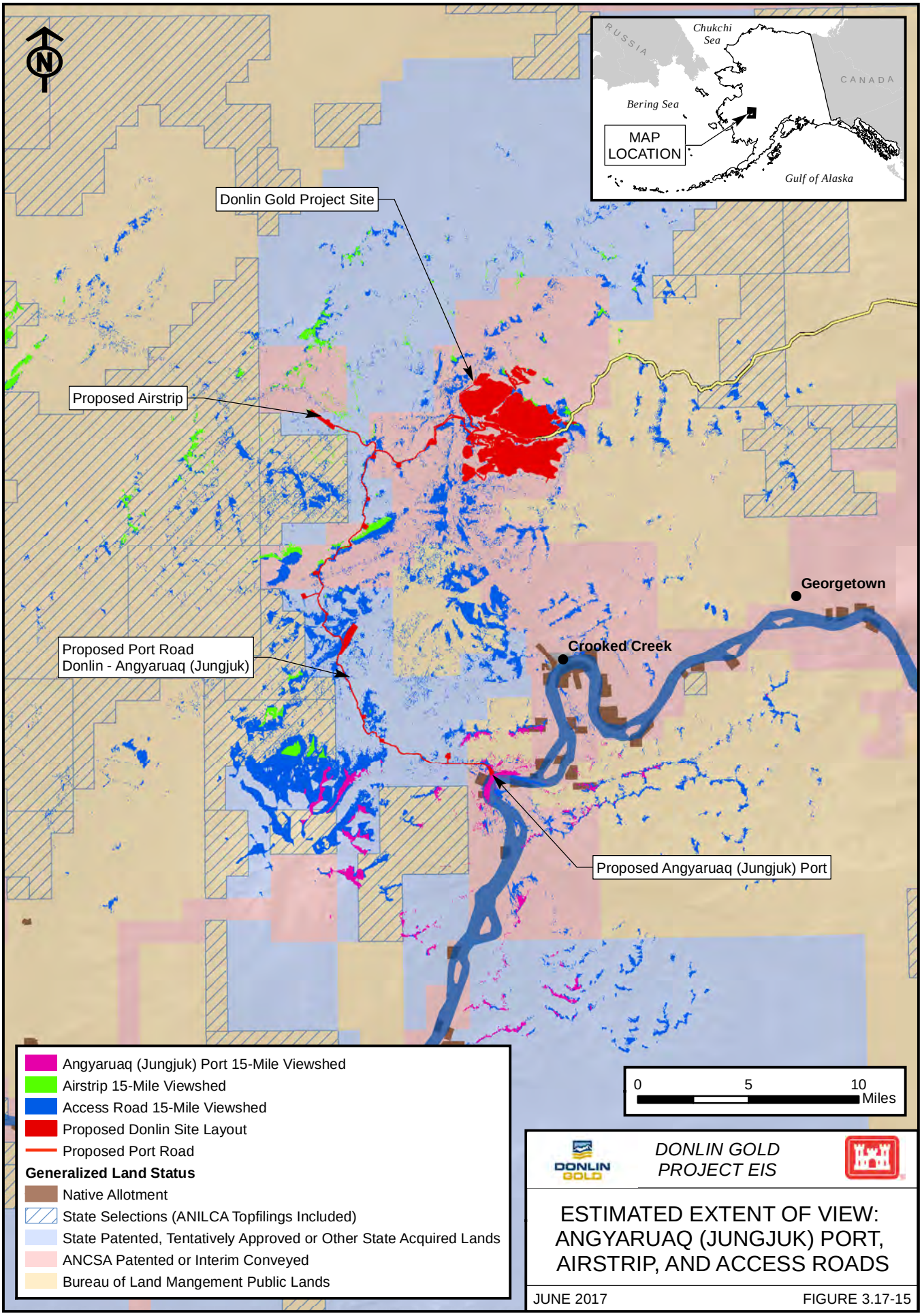
Source: ARCADIS 2013a

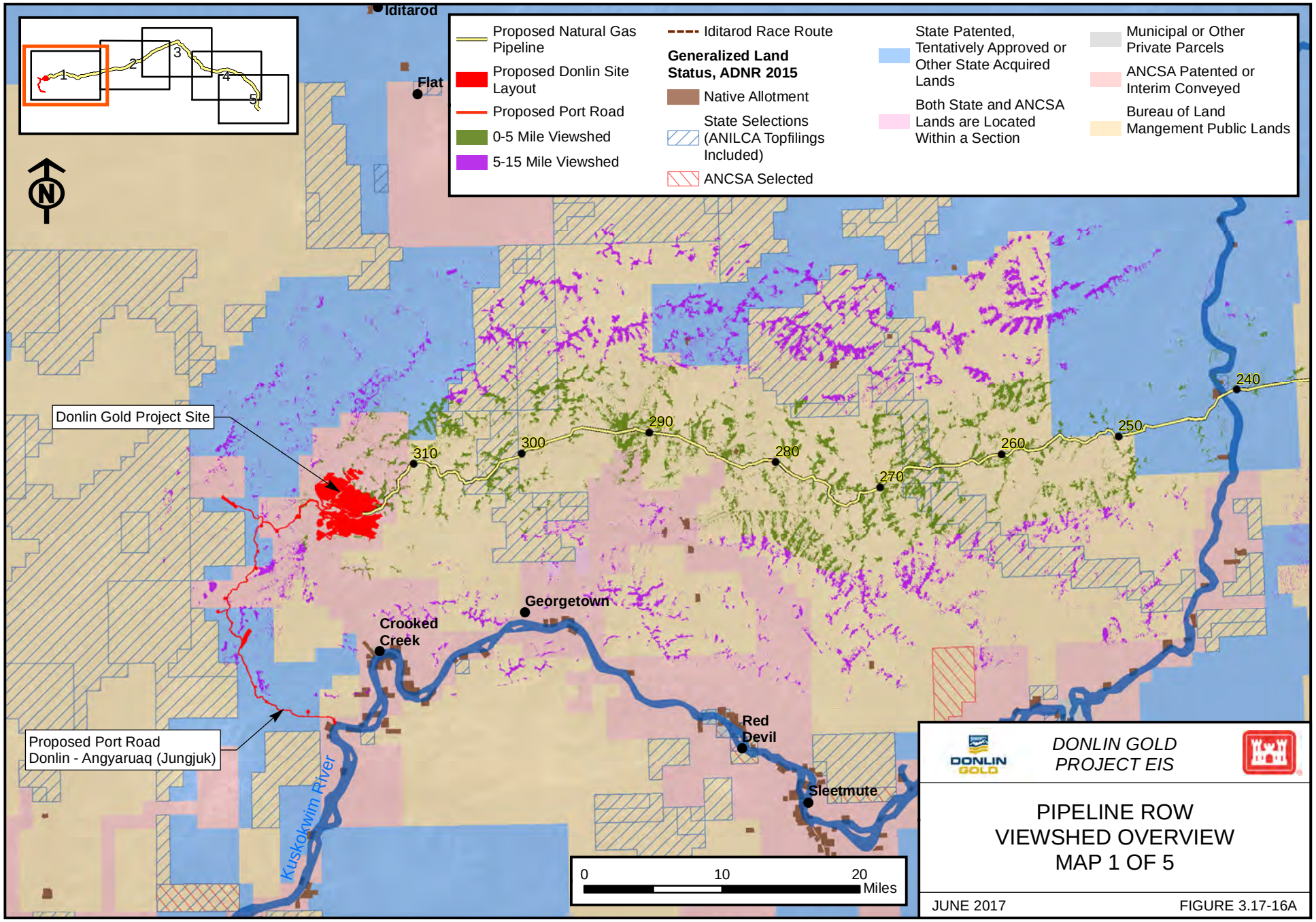
3.17.3.1.3 PHOTOSIMULATIONS

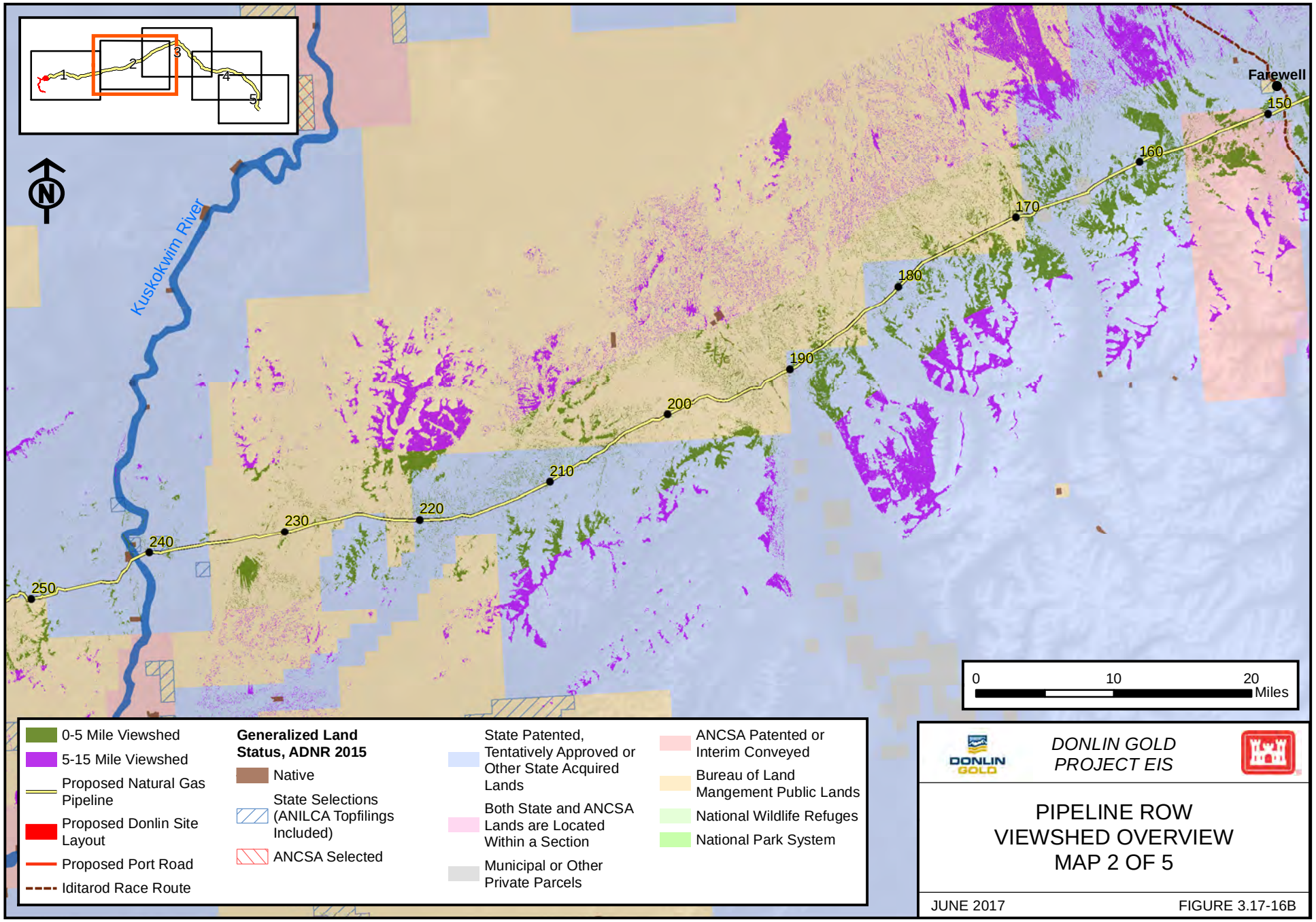
To support the visual resource impact analysis, and disclose expected visibility of project components from various vantage points, photographic simulations were prepared for eight vantage points. Simulations were produced by rendering project components using 3D computer models, and super-imposing these images onto photographs taken at KOPs. Project components were depicted under operational conditions, including a Pipeline ROW width of 50 feet and assumed revegetation following 15 years. Model parameters account for environmental factors such as viewing angle and light conditions, thereby resulting in a virtual representation of the appearance of the Donlin Gold Project. Photosimulations were prepared for the following KOPs:

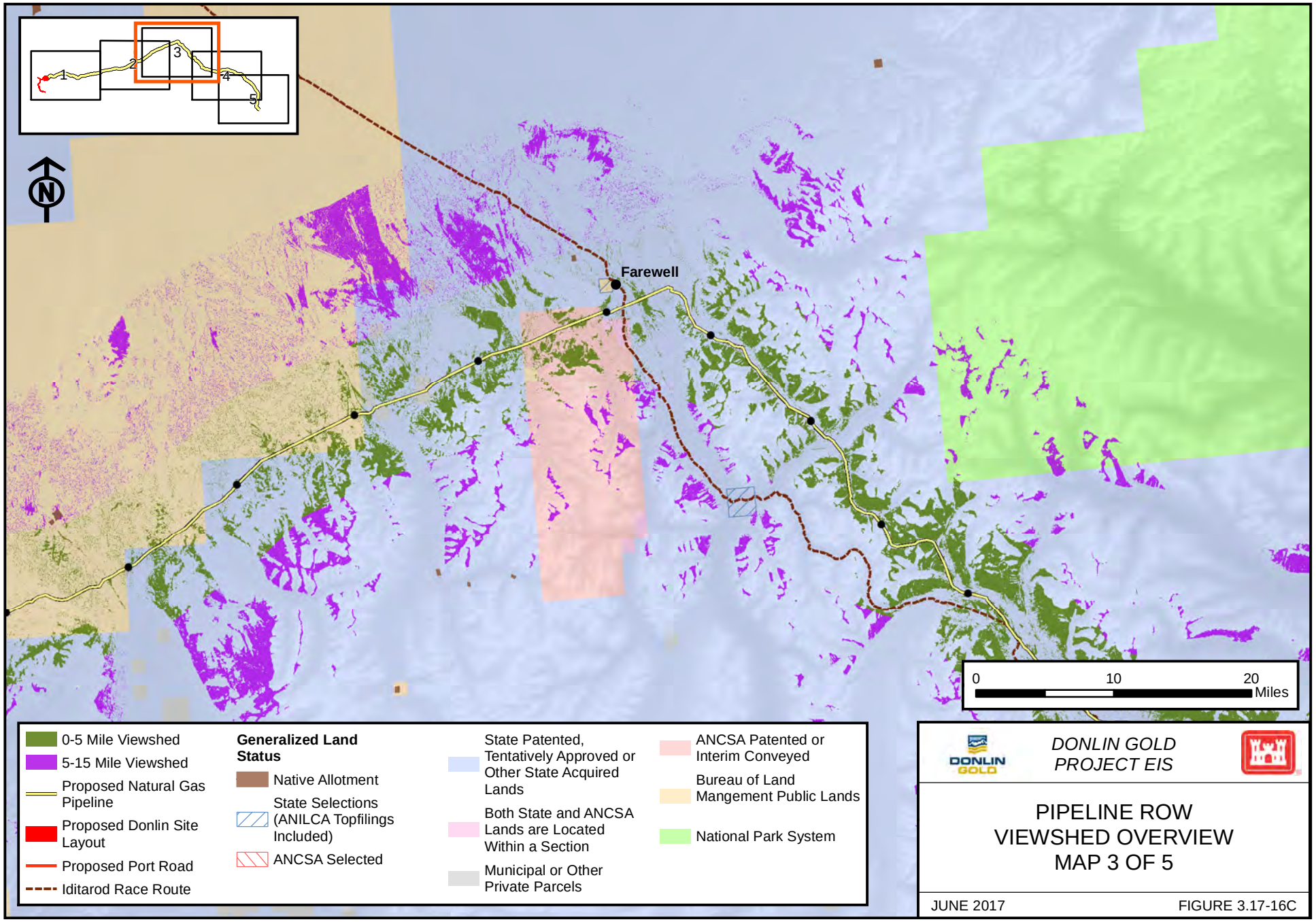
- Angyaruaq (Jungjuk) Port (Figure 3.17-18)
- East Fork George River (Figure 3.17-19)
- Kuskokwim River near Devil's Elbow where the pipeline ROW would cross (Figure 3.17-20).
- Big River Uplands (Figure 3.17-21)
- Farewell Station Airstrip (Figure 3.17-22)
- Alaska Range – Happy Valley (Figure 3.17-23A and Figure 3.17-23B)
- Dalzell Gorge (Figure 3.17-24)
- Mount Susitna (Figure 3.17-25)

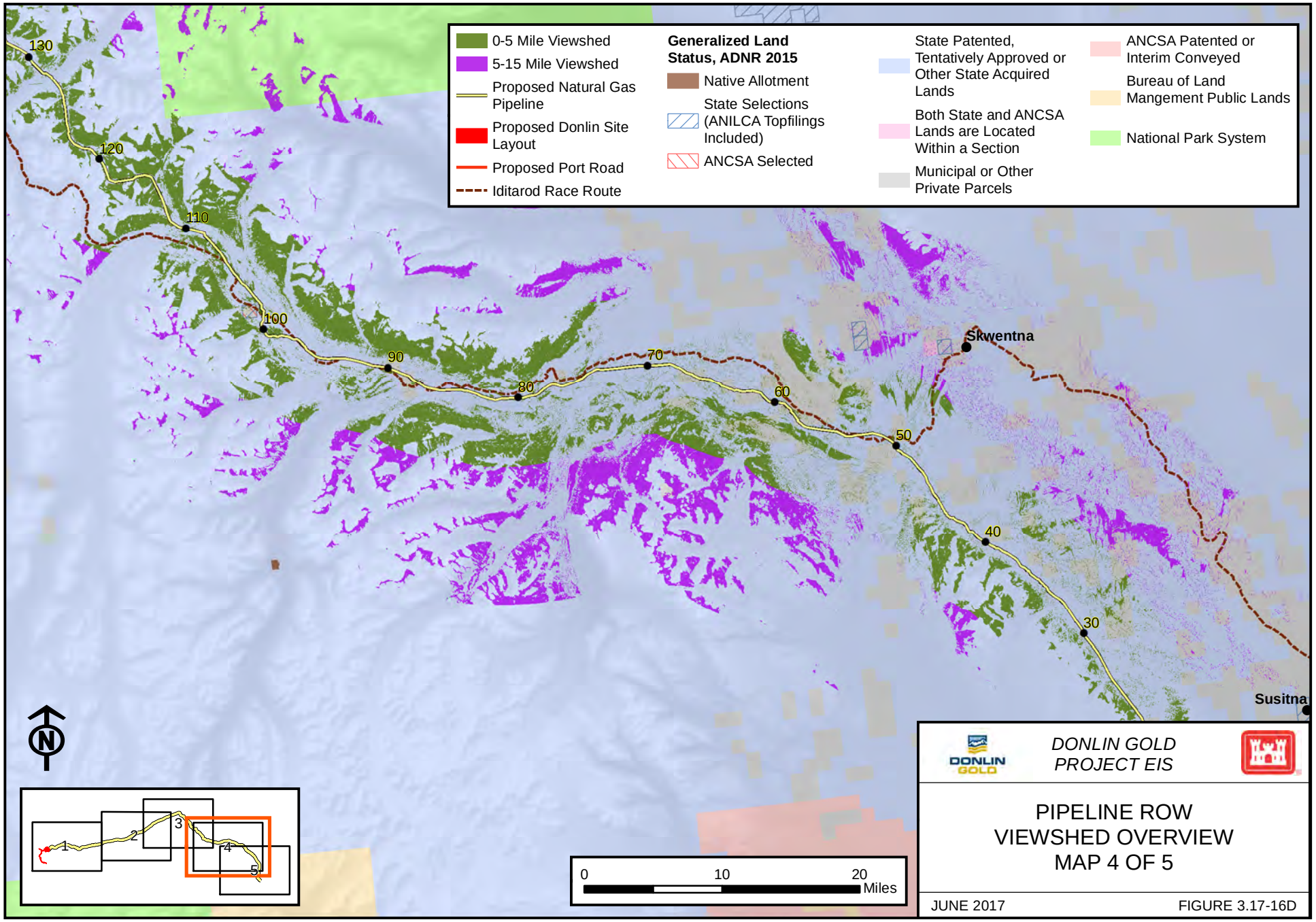
Due to the high quality of the simulations rendered, the sizes of the files make them difficult to include here in original format. The figures below are lower resolution but applicable for this analysis. The high-resolution figures are available for download on the EIS website: DonlinGoldEIS.com.

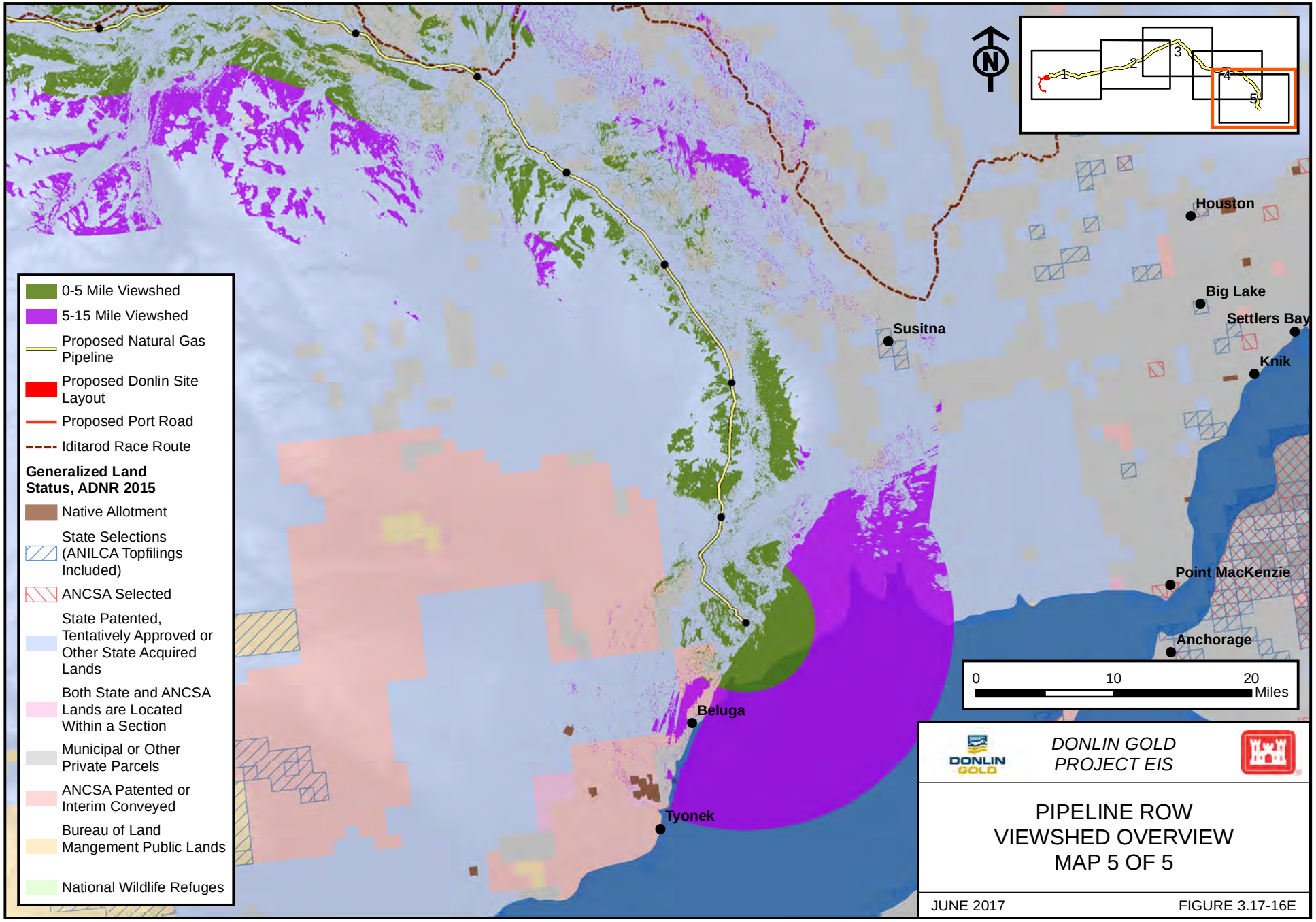

Donlin Gold Project Site
Proposed Airstrip
Proposed Port Road
Donlin - Angyaruaq (Jungjuk)
Proposed Angyaruaq (Jungjuk) Port
Georgetown
Crooked Creek
MAP LOCATION
Chukchi Sea
Bering Sea
Gulf of Alaska
RUSSIA
CANADA
Angyaruaq (Jungjuk) Port 15-Mile Viewshed
Airstrip 15-Mile Viewshed
Access Road 15-Mile Viewshed
Proposed Donlin Site Layout
Proposed Port Road
Generalized Land Status
Native Allotment
State Selections (ANILCA Topfilings Included)
State Patented, Tentatively Approved or Other State Acquired Lands
ANCSA Patented or Interim Conveyed
Bureau of Land Mangement Public Lands
0
5
10
Miles
DONLIN GOLD
DONLIN GOLD PROJECT EIS
ESTIMATED EXTENT OF VIEW: ANGYARUAQ (JUNGJUK) PORT, AIRSTRIP, AND ACCESS ROADS
JUNE 2017
FIGURE 3.17-15

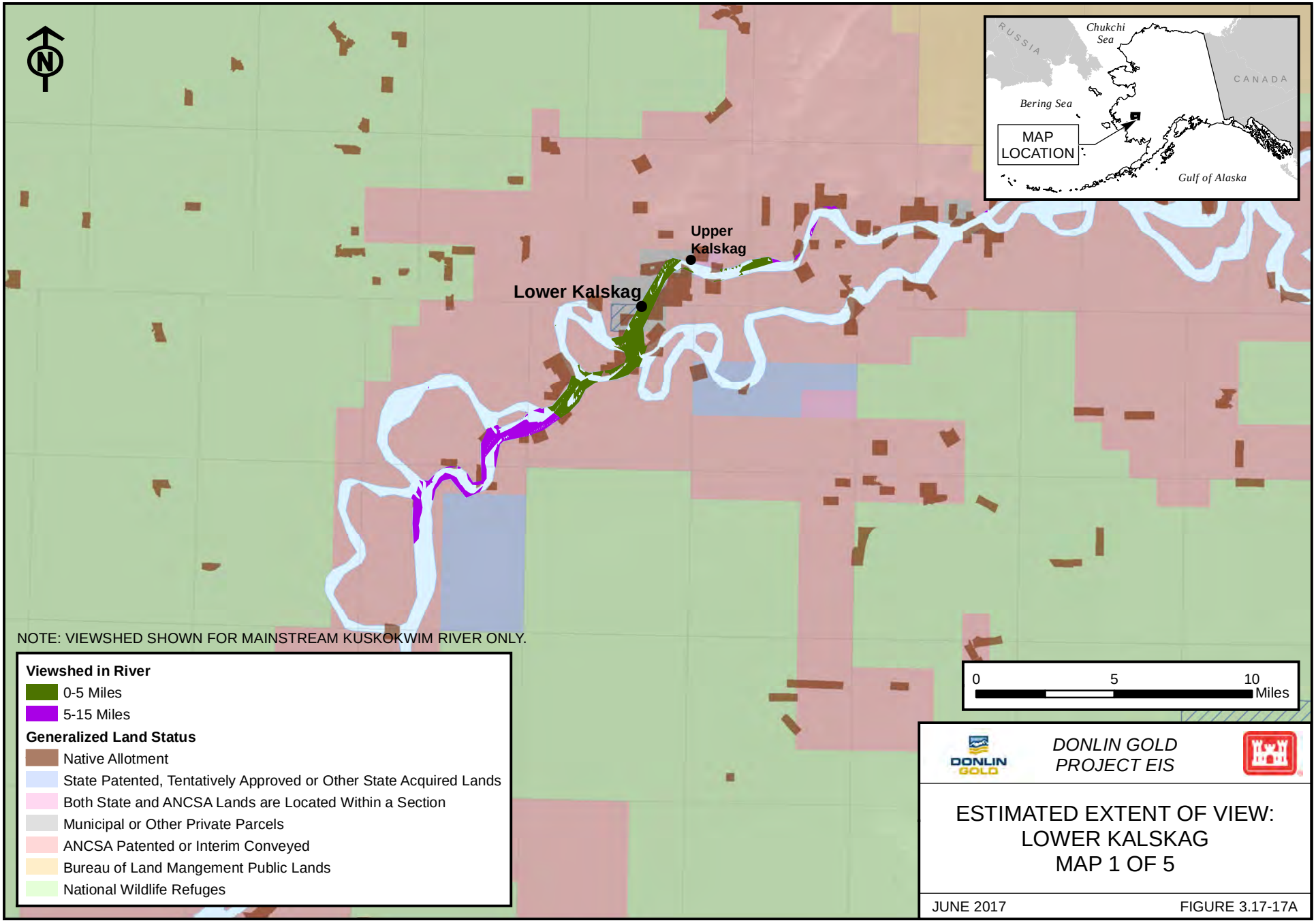

Iditarod
Flat
Proposed Natural Gas Pipeline
Proposed Donlin Site Layout
Proposed Port Road
0-5 Mile Viewshed
5-15 Mile Viewshed
Iditarod Race Route
Generalized Land Status, ADNR 2015
Native Allotment
State Selections (ANILCA Topfilings Included)
ANCSA Selected
State Patented, Tentatively Approved or Other State Acquired Lands
Both State and ANCSA Lands are Located Within a Section
Municipal or Other Private Parcels
ANCSA Patented or Interim Conveyed
Bureau of Land Mangement Public Lands
1
2
3
4
5
N
Donlin Gold Project Site
Proposed Port Road
Donlin - Angyaruaq (Jungjuk)
310
300
290
280
270
260
250
240
Georgetown
Crooked Creek
Red Devil
Sleetmute
Kuskokwim River
0
10
20
Miles
DONLIN GOLD
DONLIN GOLD PROJECT EIS
PIPELINE ROW
VIEWSHED OVERVIEW
MAP 1 OF 5
JUNE 2017
FIGURE 3.17-16A

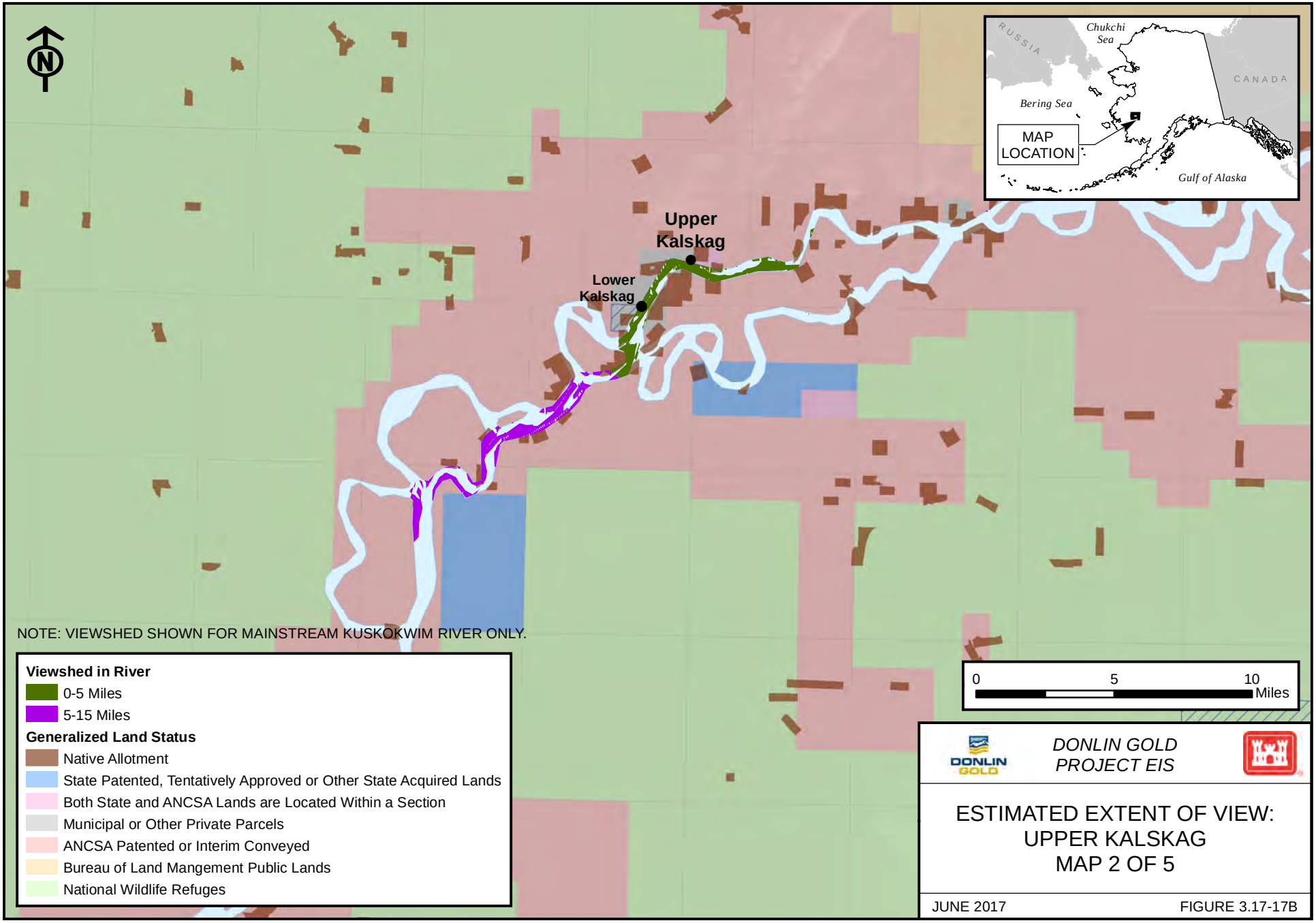

1
2
3
4
5
N
Kuskokwim River
Farewell
150
160
170
180
190
200
210
220
230
240
250
0
10
20
Miles
0-5 Mile Viewshed
5-15 Mile Viewshed
Proposed Natural Gas Pipeline
Proposed Donlin Site Layout
Proposed Port Road
Iditarod Race Route
Generalized Land Status, ADNR 2015
Native
State Selections (ANILCA Topfilings Included)
ANCSA Selected
State Patented, Tentatively Approved or Other State Acquired Lands
Both State and ANCSA Lands are Located Within a Section
Municipal or Other Private Parcels
ANCSA Patented or Interim Conveyed
Bureau of Land Mangement Public Lands
National Wildlife Refuges
National Park System
DONLIN GOLD
DONLIN GOLD PROJECT EIS
PIPELINE ROW VIEWSHED OVERVIEW MAP 2 OF 5
JUNE 2017
FIGURE 3.17-16B

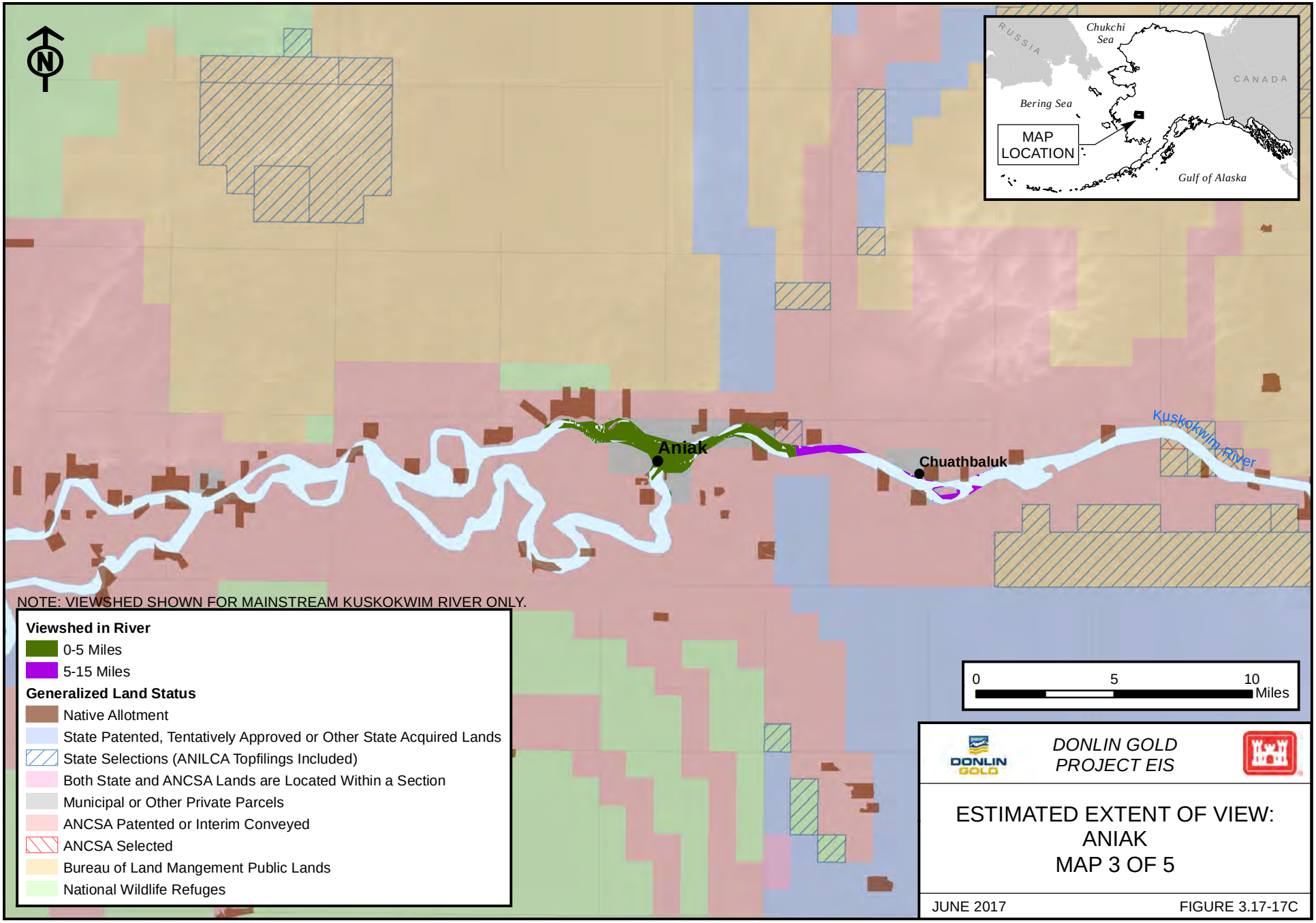

1
2
3
4
5
N
Farewell
0
10
20
Miles
0-5 Mile Viewshed
5-15 Mile Viewshed
Proposed Natural Gas Pipeline
Proposed Donlin Site Layout
Proposed Port Road
Iditarod Race Route
Generalized Land Status
Native Allotment
State Selections (ANILCA Topfilings Included)
ANCSA Selected
State Patented, Tentatively Approved or Other State Acquired Lands
Both State and ANCSA Lands are Located Within a Section
Municipal or Other Private Parcels
ANCSA Patented or Interim Conveyed
Bureau of Land Mangement Public Lands
National Park System
DONLIN GOLD
DONLIN GOLD PROJECT EIS
PIPELINE ROW VIEWSHED OVERVIEW MAP 3 OF 5
JUNE 2017
FIGURE 3.17-16C

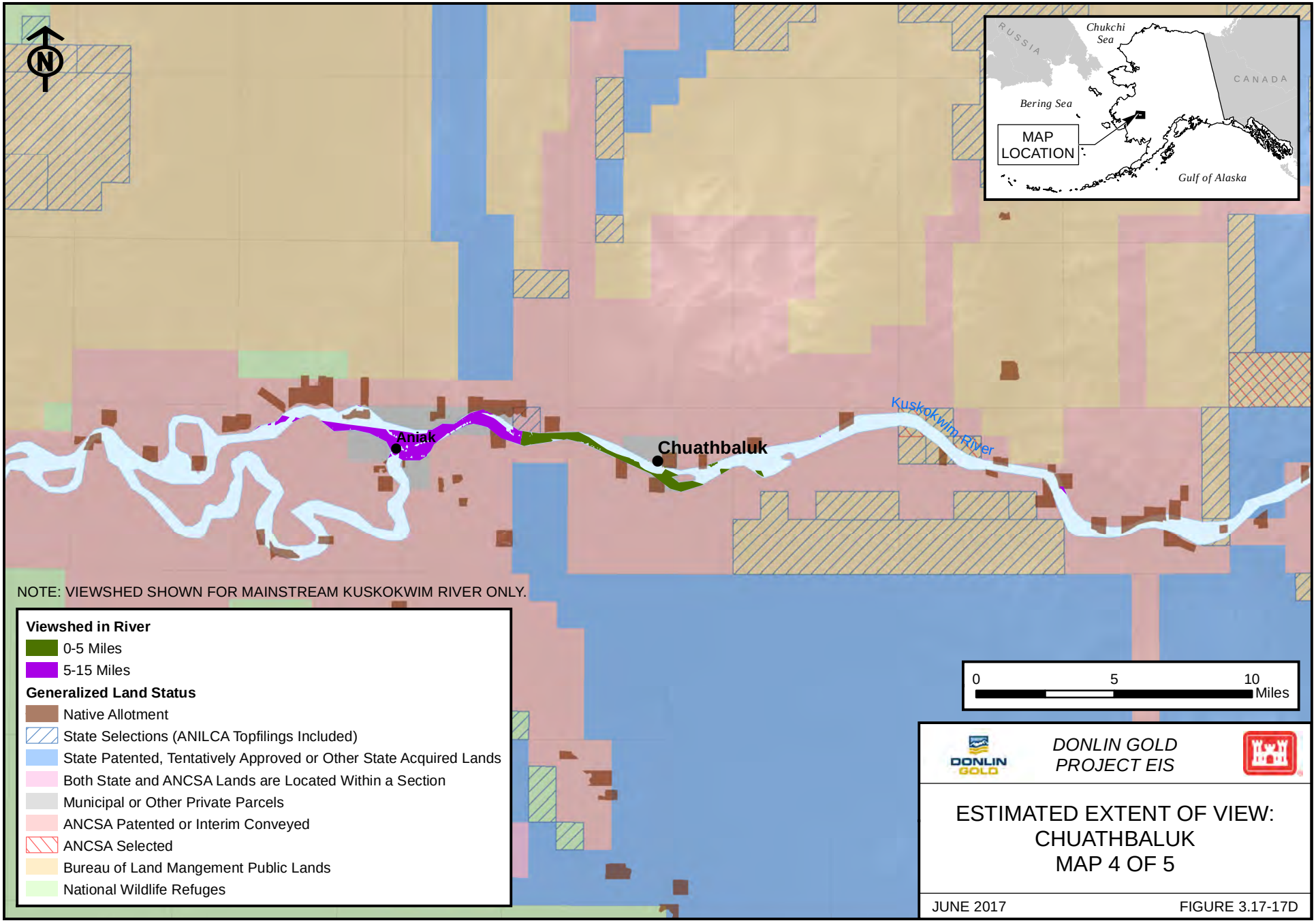

0-5 Mile Viewshed
5-15 Mile Viewshed
Proposed Natural Gas Pipeline
Proposed Donlin Site Layout
Proposed Port Road
Iditarod Race Route
Generalized Land Status, ADNR 2015
Native Allotment
State Selections (ANILCA Topfilings Included)
ANCSA Selected
State Patented, Tentatively Approved or Other State Acquired Lands
Both State and ANCSA Lands are Located Within a Section
Municipal or Other Private Parcels
ANCSA Patented or Interim Conveyed
Bureau of Land Mangement Public Lands
National Park System
130
120
110
100
90
80
70
60
50
40
30
Skwentna
Susitna
N
1
2
3
4
5
0
10
20
Miles
DONLIN GOLD
DONLIN GOLD PROJECT EIS
PIPELINE ROW
VIEWSHED OVERVIEW
MAP 4 OF 5
JUNE 2017
FIGURE 3.17-16D

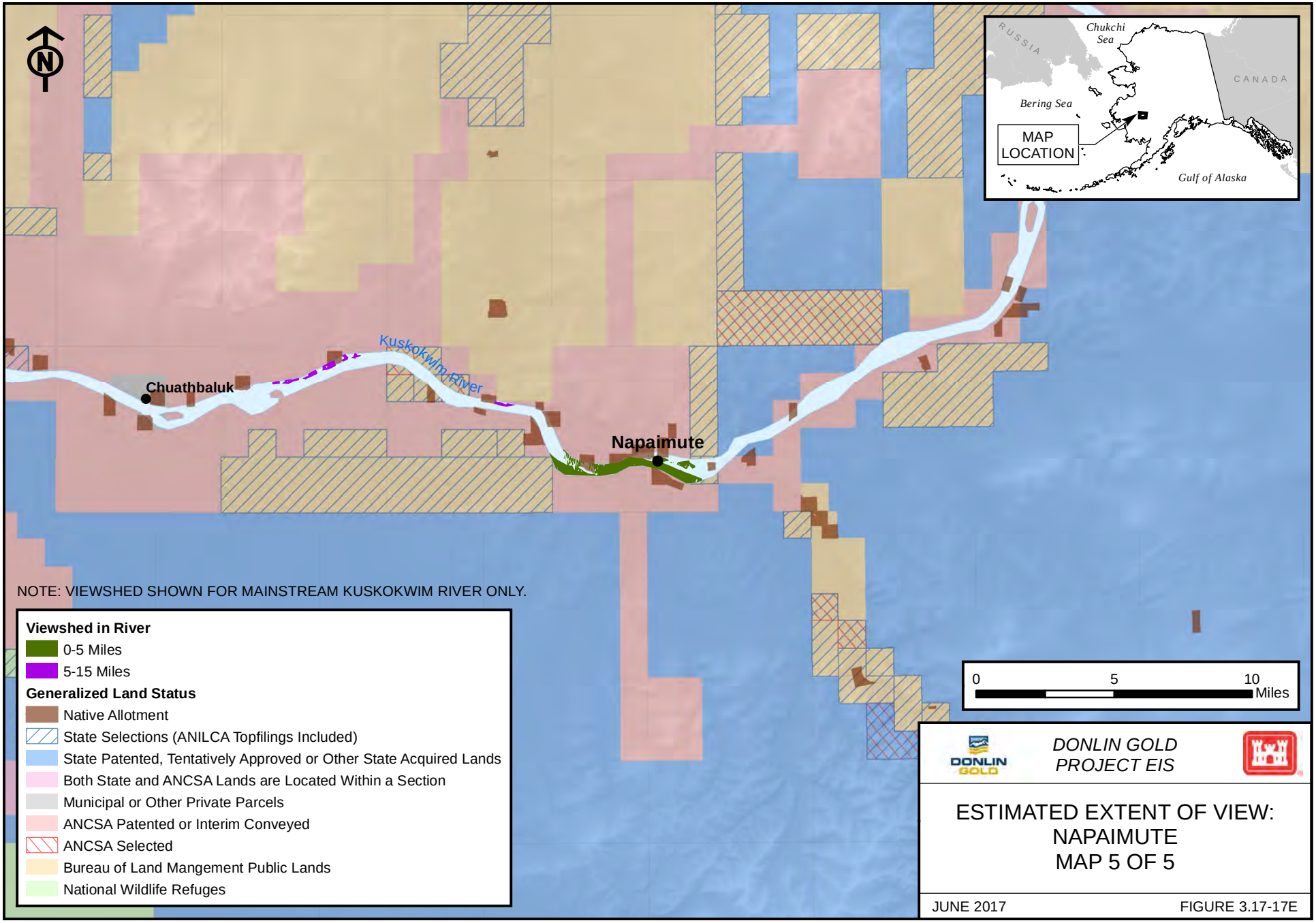

0-5 Mile Viewshed
5-15 Mile Viewshed
Proposed Natural Gas Pipeline
Proposed Donlin Site Layout
Proposed Port Road
Iditarod Race Route
Generalized Land Status, ADNR 2015
Native Allotment
State Selections (ANILCA Topfilings Included)
ANCSA Selected
State Patented, Tentatively Approved or Other State Acquired Lands
Both State and ANCSA Lands are Located Within a Section
Municipal or Other Private Parcels
ANCSA Patented or Interim Conveyed
Bureau of Land Mangement Public Lands
National Wildlife Refuges
N
1
2
3
4
5
Houston
Big Lake
Settlers Bay
Susitna
Knik
Point MacKenzie
Anchorage
Beluga
Tyonek
0
10
20
Miles
DONLIN GOLD
DONLIN GOLD PROJECT EIS
PIPELINE ROW VIEWSHED OVERVIEW MAP 5 OF 5
JUNE 2017
FIGURE 3.17-16E


Upper Kalskag
Lower Kalskag
RUSSIA
Chukchi Sea
CANADA
Bering Sea
MAP LOCATION
Gulf of Alaska
NOTE: VIEWSHED SHOWN FOR MAINSTREAM KUSKOKWIM RIVER ONLY.
Viewshed in River
0-5 Miles
5-15 Miles
Generalized Land Status
Native Allotment
State Patented, Tentatively Approved or Other State Acquired Lands
Both State and ANCSA Lands are Located Within a Section
Municipal or Other Private Parcels
ANCSA Patented or Interim Conveyed
Bureau of Land Mangement Public Lands
National Wildlife Refuges
0
5
10
Miles
DONLIN GOLD
DONLIN GOLD PROJECT EIS
ESTIMATED EXTENT OF VIEW:
LOWER KALSKAG
MAP 1 OF 5
JUNE 2017
FIGURE 3.17-17A


Upper Kalskag
Lower Kalskag
RUSSIA
Chukchi Sea
CANADA
Bering Sea
MAP LOCATION
Gulf of Alaska
NOTE: VIEWSHED SHOWN FOR MAINSTREAM KUSKOKWIM RIVER ONLY.
Viewshed in River
0-5 Miles
5-15 Miles
Generalized Land Status
Native Allotment
State Patented, Tentatively Approved or Other State Acquired Lands
Both State and ANCSA Lands are Located Within a Section
Municipal or Other Private Parcels
ANCSA Patented or Interim Conveyed
Bureau of Land Mangement Public Lands
National Wildlife Refuges
0
5
10
Miles
DONLIN GOLD
DONLIN GOLD PROJECT EIS
ESTIMATED EXTENT OF VIEW:
UPPER KALSKAG
MAP 2 OF 5
JUNE 2017
FIGURE 3.17-17B


N
RUSSIA
Chukchi Sea
CANADA
Bering Sea
MAP LOCATION
Gulf of Alaska
Aniak
Chuathbaluk
Kuskokwim River
NOTE: VIEWSHED SHOWN FOR MAINSTREAM KUSKOKWIM RIVER ONLY.
Viewshed in River
0-5 Miles
5-15 Miles
Generalized Land Status
Native Allotment
State Patented, Tentatively Approved or Other State Acquired Lands
State Selections (ANILCA Topfilings Included)
Both State and ANCSA Lands are Located Within a Section
Municipal or Other Private Parcels
ANCSA Patented or Interim Conveyed
ANCSA Selected
Bureau of Land Mangement Public Lands
National Wildlife Refuges
0
5
10
Miles
DONLIN GOLD
DONLIN GOLD PROJECT EIS
ESTIMATED EXTENT OF VIEW:
ANIAK
MAP 3 OF 5
JUNE 2017
FIGURE 3.17-17C


N
RUSSIA
Chukchi Sea
CANADA
Bering Sea
MAP LOCATION
Gulf of Alaska
Aniak
Chuathbaluk
Kuskokwim River
NOTE: VIEWSHED SHOWN FOR MAINSTREAM KUSKOKWIM RIVER ONLY.
Viewshed in River
0-5 Miles
5-15 Miles
Generalized Land Status
Native Allotment
State Selections (ANILCA Topfilings Included)
State Patented, Tentatively Approved or Other State Acquired Lands
Both State and ANCSA Lands are Located Within a Section
Municipal or Other Private Parcels
ANCSA Patented or Interim Conveyed
ANCSA Selected
Bureau of Land Mangement Public Lands
National Wildlife Refuges
0
5
10
Miles
DONLIN GOLD
DONLIN GOLD PROJECT EIS
ESTIMATED EXTENT OF VIEW:
CHUATHBALUK
MAP 4 OF 5
JUNE 2017
FIGURE 3.17-17D


N
RUSSIA
Chukchi Sea
CANADA
Bering Sea
MAP LOCATION
Gulf of Alaska
Kuskokwim River
Chuathbaluk
Napaimute
NOTE: VIEWSHED SHOWN FOR MAINSTREAM KUSKOKWIM RIVER ONLY.
Viewshed in River
0-5 Miles
5-15 Miles
Generalized Land Status
Native Allotment
State Selections (ANILCA Topfilings Included)
State Patented, Tentatively Approved or Other State Acquired Lands
Both State and ANCSA Lands are Located Within a Section
Municipal or Other Private Parcels
ANCSA Patented or Interim Conveyed
ANCSA Selected
Bureau of Land Mangement Public Lands
National Wildlife Refuges
0
5
10
Miles
DONLIN GOLD
DONLIN GOLD PROJECT EIS
ESTIMATED EXTENT OF VIEW:
NAPAIMUTE
MAP 5 OF 5
JUNE 2017
FIGURE 3.17-17E

3.17.3.1.4 BLM CONTRAST RATING PROCEDURE

The BLM Contrast Rating Procedure was used to determine visual contrast that could result from the Construction and Operations of the Donlin Gold Project based on photosimulations depicting project features. This method assumes that the extent to which the Donlin Gold Project results in adverse effects to visual resources is a function of the visual contrast between the project features and the existing landscape character (BLM 1986b). This assessment focused on two components that influence visual contrast: object visual characteristics and viewshed limiting factors.

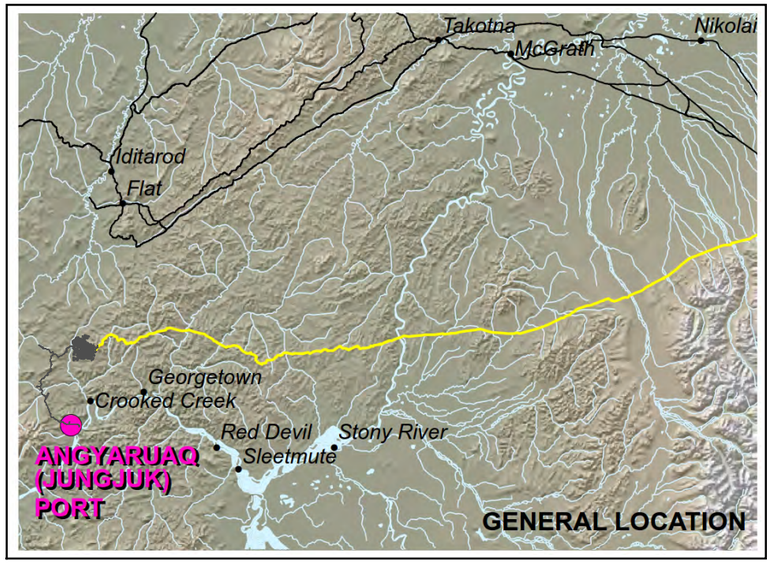
- Object Visual Characteristics – The object's visual characteristics pertain to the size and scale of the object, its form and line (geometry), surface color, and texture relative to the surrounding environment. The motion of the object is also considered in this assessment. Scale dominance for the Donlin Gold Project was described as "not visually evident," "visually subordinate," "visually evident," and "dominant."
- Viewshed Limiting Factors – Viewshed limiting factors pertain to attributes of the viewer that affect perception of visual contrast. For example, viewer engagement or experience, viewer motion, distance, and viewing geometry influence perception of visual contrast.

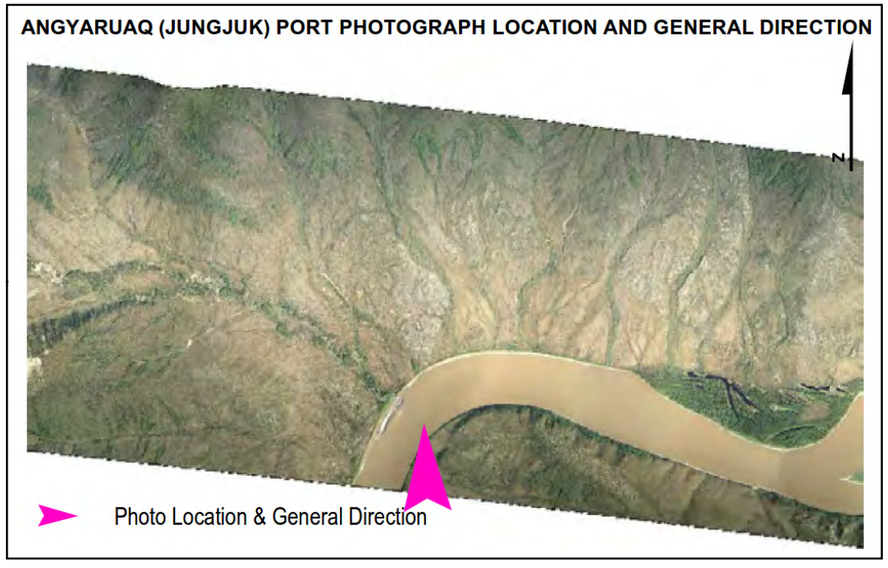
3.17.3.1.5 ANALYSIS OF VEGETATION STRUCTURE

The intensity and geographic extent of impacts to visual resources expected to result from vegetation clearing in the Pipeline ROW and construction areas is largely dependent on the predominant vegetation structure in the vicinity of cleared areas. Where adjacent vegetation is characterized by closed forests or tall trees with contiguous cover, visual contrast of cleared areas against the surrounding landscape is expected to be moderate to strong as ROW edges would appear bold and discrete. Where vegetation is characterized by short, patchy, or irregular vegetation structure, visual contrast is expected to be minimized as the lines created by ROW edges would appear broken or irregular, thereby blending with the irregular lines and patchiness of surrounding vegetation. Where landscapes are characterized by open forests or a mosaic of vegetation types, visual contrast was assumed to be weak to moderate.

To address this relationship, detailed vegetation community data were reclassified to indicate basic vegetation or landscape structure type: open forest, closed forest, woodland forest, low vegetation, bare ground, and open water. Potential Construction or Operations-related impacts were then assessed against this landscape classification to develop a broad understanding of how potential impacts to visual resources could manifest across the extent of the proposed and alternative Pipeline alignments.

Site-specific and seasonal factors could influence intensity and geographic extent of local impacts. Site specific factors in this analysis included extent of landscape enclosure, degree to which the action would be included in the view, and scale dominance. Seasonal influence was also considered: yellow and red colors of early seral vegetation or shrubs in the construction or operational ROW could contrast surrounding evergreen vegetation at a moderate to strong level during the fall, and contiguous white of snow cover in the alignment could result in strong visual contrast surrounding vegetation in winter.





Note:
The photo simulation on which the analysis was based includes a larger horizontal and vertical field of view. Photo simulation field of view and resolution have been reduced in this figure for display in this document. Photo simulations representing true field of view can be found at: www.DonlinGoldEIS.com
Data Source: ARCADIS 2012f

DONLIN GOLD

DONLIN GOLD PROJECT EIS

SIMULATION OF THE ANGYARUAQ (JUNGJUK) PROPOSED PORT SITE

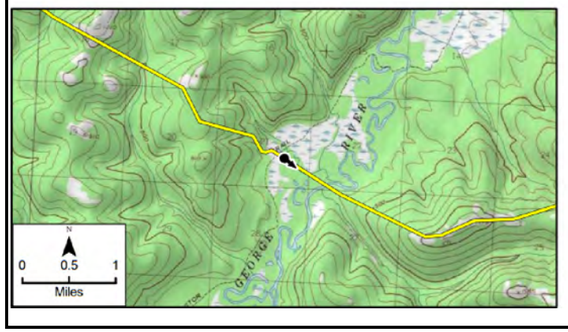
JUNE 2017

FIGURE 3.17-18

Existing conditions

Simulation

This image has been scaled to fit on 11x17 paper, and therefore should be used for illustrative purposed only. To view this simulation at an accurate scale, images should be printed on a 36x56 size paper, and viewed at approximately 2 feet



Legend

- Viewpoint Location
- Proposed Gasline Route

Photographic Information
View directed southeast across the George River

Time of photograph:	6:04 PM
Date of photograph:	9-21-13
Weather condition:	Partly Cloudy
Viewing direction:	Southeast
Latitude:	62° 3' 57.038" N
Longitude:	157° 20' 52.721" W
Lighting condition:	Sidelight

DONLIN GOLD

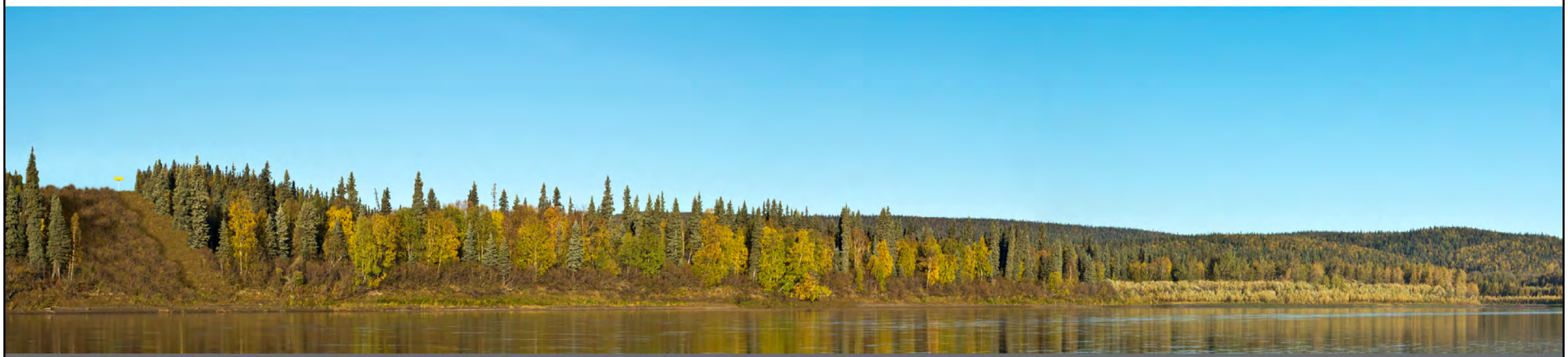
DONLIN GOLD PROJECT EIS

SIMULATION OF THE PROPOSED OPERATIONAL ROW WHERE IT CROSSES THE GEORGE RIVER VALLEY

JUNE 2017

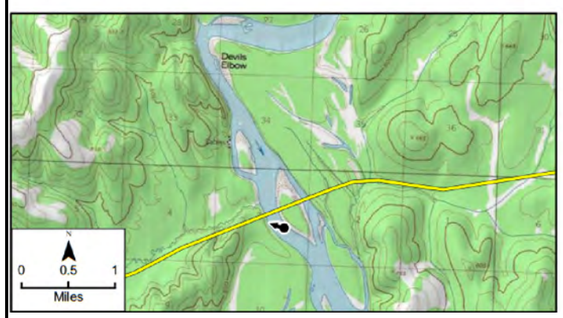
FIGURE 3.17-19

Existing conditions



Simulation

This image has been scaled to fit on 11x17 paper, and therefore should be used for illustrative purposed only. To view this simulation at an accurate scale, images should be printed on a 36x56 size paper, and viewed at approximately 2 feet



Legend

- Viewpoint Location
- Proposed Gasline Route

Photographic Information
View directed upriver toward Devils Elbow

Time of photograph:	9:43 AM
Date of photograph:	9-22-13
Weather condition:	Cloudy
Viewing direction:	Northwest
Latitude:	62° 6' 36.938" N
Longitude:	156° 12' 58.050" W
Lighting condition:	Sidelight

DONLIN GOLD

DONLIN GOLD PROJECT EIS

SIMULATION OF THE PROPOSED OPERATIONAL ROW WHERE IT CROSSES THE KUSKOKWIM RIVER (NEAR DEVIL'S ELBOW)

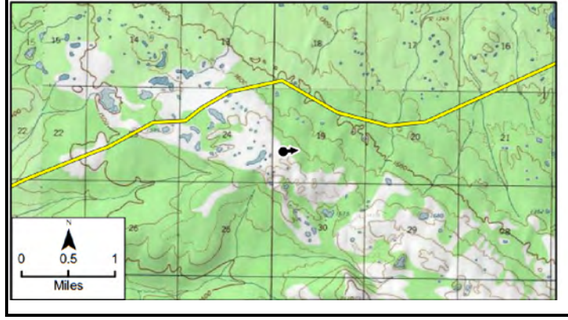
JUNE 2017

FIGURE 3.17-20

Existing conditions

Simulation

This image has been scaled to fit on 11x17 paper, and therefore should be used for illustrative purposed only. To view this simulation at an accurate scale, images should be printed on a 36x56 size paper, and viewed at approximately 2 feet



Legend

- Viewpoint Location
- Proposed Gasline Route

Photographic Information
View directed east toward Big River

Time of photograph:	10:46 AM
Date of photograph:	9-22-13
Weather condition:	Clear
Viewing direction:	East
Latitude:	62° 14' 22.955" N
Longitude:	154° 55' 19.353" W
Lighting condition:	Sidelight

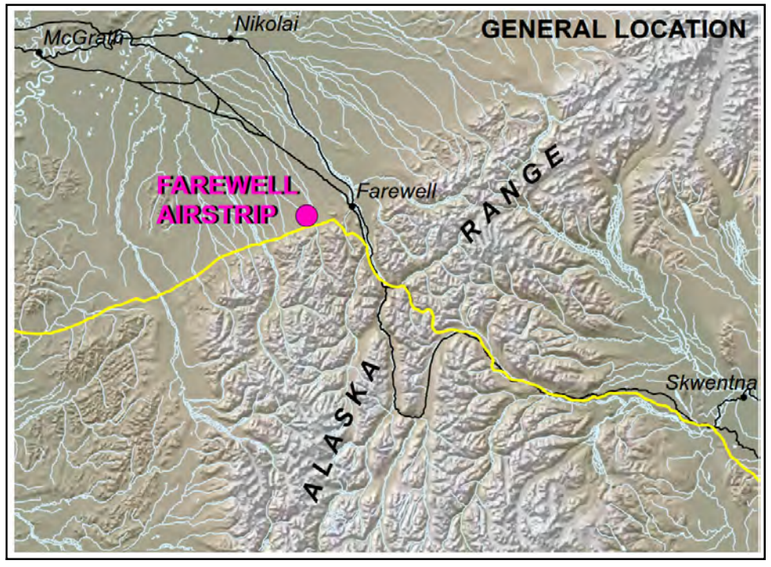
DONLIN GOLD

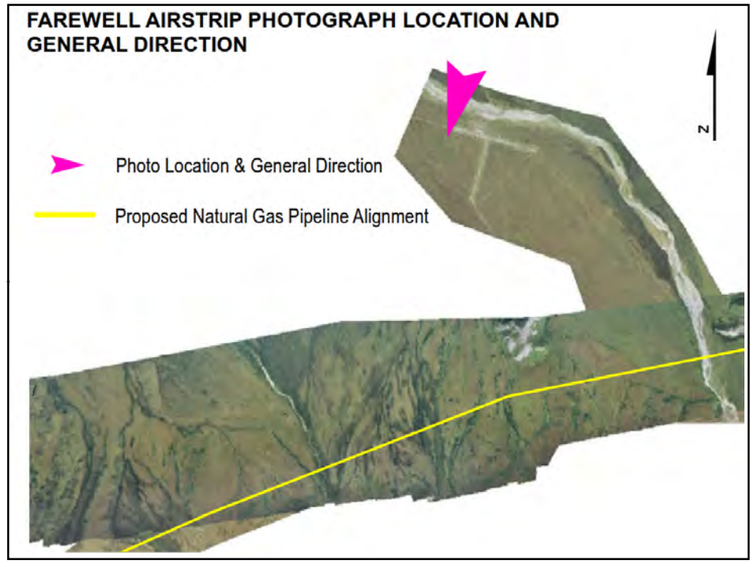
DONLIN GOLD PROJECT EIS

SIMULATION OF THE PROPOSED OPERATIONAL ROW WHERE IT CROSSES THE NUSHAGAK-BIG RIVER HILLS PHYSIOGRAPHIC PROVINCE (BIG RIVER)

JUNE 2017

FIGURE 3.17-21





Note:
The photo simulation on which the analysis was based includes a larger horizontal and vertical field of view. Field of view and resolution have been reduced in this figure. Photo simulations representing true field of view can be found at: www.DonlinGoldEIS.com
Data Source: ARCADIS 2012f

DONLIN GOLD

DONLIN GOLD PROJECT EIS

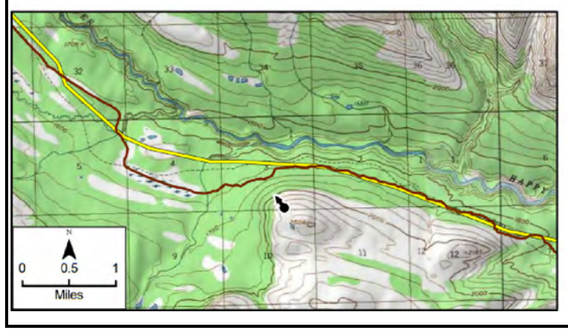
SIMULATION OF THE PROPOSED OPERATIONAL ROW WHERE IT CROSSES THE TANANA-KUSKOKWIM LOWLANDS PHYSIOGRAPHIC PROVINCE (FAREWELL AIRSTRIP)

JUNE 2017 FIGURE 3.17-22

Existing conditions

Simulation

This image has been scaled to fit on 11x17 paper, and therefore should be used for illustrative purposed only. To view this simulation at an accurate scale, images should be printed on a 36x56 size paper, and viewed at approximately 2 feet



Legend

- Viewpoint Location
- Iditarod National Historic Trail (Modern Race Route)
- Proposed Gasline Route

Photographic Information
View direct northwest across Happy River Valley and Iditarod National Historic Trail

Time of photograph:	2:50 PM
Date of photograph:	9-22-13
Weather condition:	Partly Cloudy
Viewing direction:	Northwest
Latitude:	62° 1' 6.18" N
Longitude:	152° 32' 57.09" W
Lighting condition:	Sidelight

DONLIN GOLD

DONLIN GOLD PROJECT EIS

SIMULATION OF THE PROPOSED OPERATIONAL ROW WHERE IT CROSSES THE ALASKA RANGE PHYSIOGRAPHIC PROVINCE (HAPPY VALLEY – ELEVATED VANTAGE POINT)

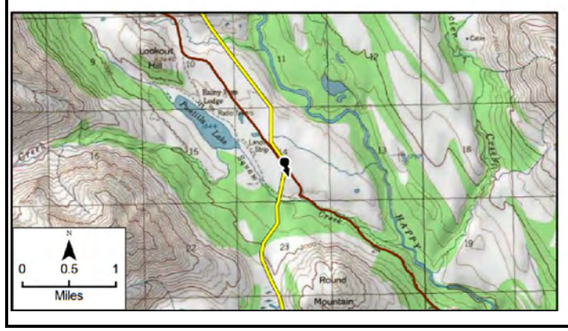
JUNE 2017

FIGURE 3.17-23A

Existing conditions

Simulation

This image has been scaled to fit on 11x17 paper, and therefore should be used for illustrative purposed only. To view this simulation at an accurate scale, images should be printed on a 36x56 size paper, and viewed at approximately 2 feet



Legend

- Viewpoint Location
- Iditarod National Historic Trail (Modern Race Route)
- Proposed Gasline Route

Photographic Information
View directed south from the Iditarod National Historic Trail

Time of photograph:	1:51 PM
Date of photograph:	9-22-13
Weather condition:	Partly Cloudy
Viewing direction:	Southeast
Latitude:	62° 4' 55.20" N
Longitude:	152° 42' 23.52" W
Lighting condition:	Sidelight

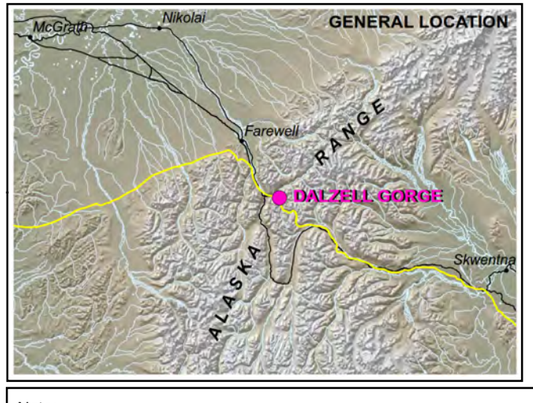
DONLIN GOLD

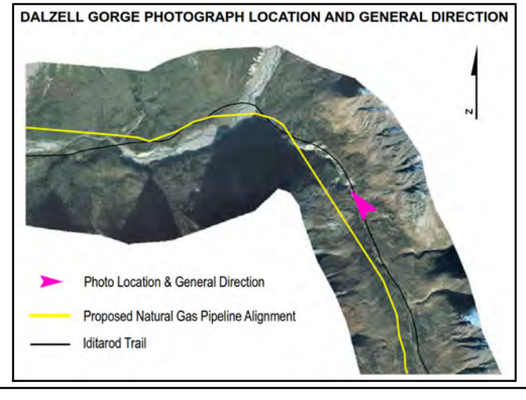
DONLIN GOLD PROJECT EIS

SIMULATION OF THE PROPOSED OPERATIONAL ROW WHERE IT CROSSES THE ALASKA RANGE PHYSIOGRAPHIC PROVINCE (HAPPY VALLEY – AT GRADE VANTAGE POINT)

JUNE 2017

FIGURE 3.17-23B





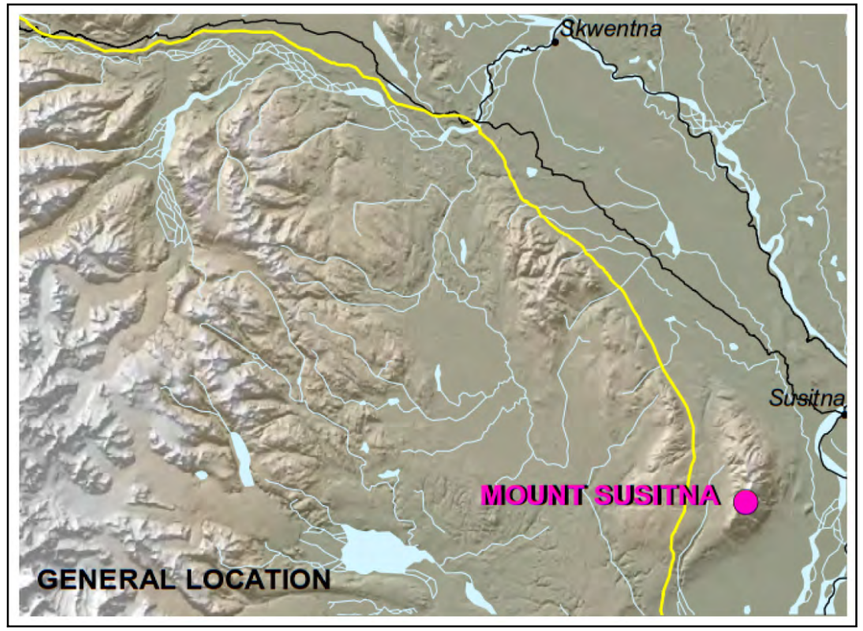
Note:
The photo simulation on which the analysis was based includes a larger horizontal and vertical field of view. Field of view and resolution have been reduced in this figure. Photo simulations representing true field of view can be found at: www.DonlinGoldEIS.com
Data Source: ARCADIS 2012f

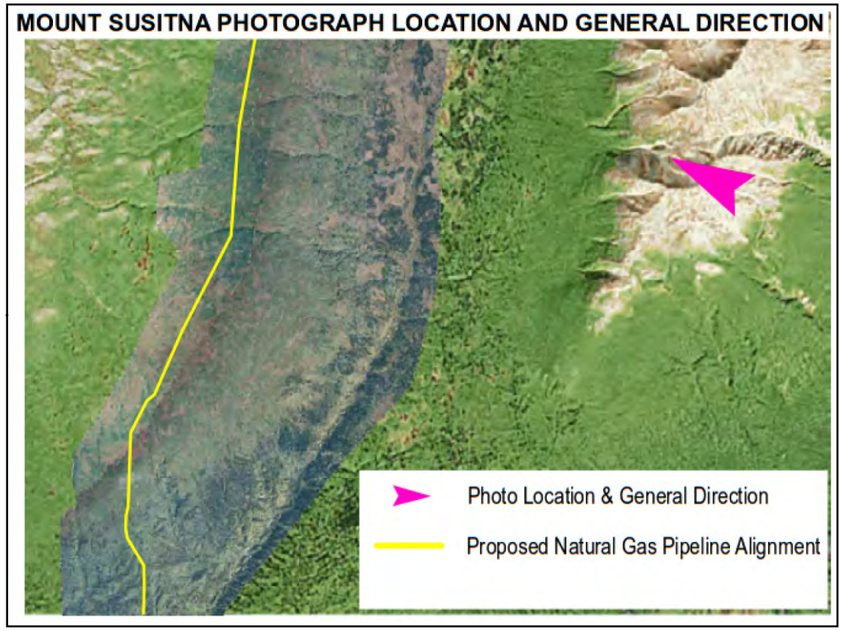
DONLIN GOLD PROJECT EIS

SIMULATION OF THE PROPOSED OPERATIONAL ROW WHERE IT CROSSES THE ALASKA RANGE PHYSIOGRAPHIC PROVINCE VIA DALZELL GORGE

JUNE 2017

FIGURE 3.17-24





Note:
The photo simulation on which the analysis was based includes a larger horizontal and vertical field of view. Field of view and resolution have been reduced in this figure. Photo simulations representing true field of view can be found at: www.DonlinGoldEIS.com
Data Source: ARCADIS 2012f

DONLIN GOLD

DONLIN GOLD PROJECT EIS

SIMULATION OF THE PROPOSED OPERATIONAL ROW WHERE IT CROSSES THE UPPER MATANUSKA VALLEY PHYSIOGRAPHIC PROVINCE (MOUNT SUSITNA)

JUNE 2017

FIGURE 3.17-25

3.17.3.1.6 IMPACTS TO BLM-IDENTIFIED VISUAL RESOURCE VALUES ON THE IDITAROD NATIONAL HISTROIC TRAIL

For scenic quality along the INHT, the results of the contrast rating were used to understand potential impacts, including key factors evaluated for scenic quality, view areas and important landmarks documented in the Natural (Scenic) Inventory of the INHT Seward to Nome Route (BLM 1982). This analysis focuses on the modern race route; potential impacts to setting and integrity of the historic route are provided in Section 3.20.3.3.3, Cultural Resources.

For BLM-administered land, a plan conformance determination was completed by comparing the results of the contrast rating procedure and impact assessment with interim VRM objectives for BLM-administered lands crossed by the Project. This analysis only addressed the portions of the Donlin Gold Project located on BLM-administered lands, as actions proposed on lands administered by the State, Native Corporations, and private lands are not subject to VRM standards. Only long-term, operations-related impacts will be considered in this conformance determination.

No analysis was completed to assess impacts on inventoried values on BLM-administered lands to compare scenic quality, visual sensitivity, and visual distance zone classifications under operational conditions of the Donlin Gold Project as no baseline visual resource inventory was available to affected portions of the BSWI planning area.

3.17.3.2 ALTERNATIVE 1 – NO ACTION

3.17.3.2.1 DIRECT AND INDIRECT EFFECTS

Under the No Action Alternative the Donlin Gold Project would not be undertaken and permits would not be issued. There would be no development of the Mine Site, Transportation Corridor, or Pipeline. Consequently, no visual resources impacts would result from implementation of the No Action Alternative. Alternative 1 would have no effect on climate change as related to visual resources in the EIS Analysis Area.

3.17.3.3 ALTERNATIVE 2 – DONLIN GOLD'S PROPOSED ACTION

3.17.3.3.1 MINE SITE

<u>Direct and Indirect Impacts from Construction</u>

Construction of the Donlin Gold Mine Site would result in direct effects to visual resources and landscape character resulting from facility modules transport, site preparation, infrastructure installation, and commissioning. Intensity of direct impacts related to site preparation and installation is expected to increase incrementally to strong visual contrast against the existing landscape as vegetation is cleared for roads, pads, and airstrips, and infrastructure is expanded from the existing footprint of the Donlin Gold exploration camp. Cleared areas would appear as distinct uniform lines or shapes resulting from weak to moderate contrast of tan color and coarse texture of exposed soils against surrounding low stature vegetation characteristic of the uplands of the Kuskokwim Mountains. Additional sources of visual contrast could result from the increase in activity and movement of personnel, presence of equipment, and construction-

related dust at the Mine Site. Collectively, sources of visual contrast would vary from weak to strong. These actions would be consistent with existing activity and infrastructure-related clearing at the Donlin Gold exploration camp. The duration of direct impacts would involve changes to the landscape character that would last longer than the estimated life of the project and after Closure. The extent or scope of the affected area would be predominantly limited to the foreground-middleground distance zone (three to five miles) when viewed from ground-based locations. This is primarily due to the large scale and ruggedness of the landscape relative to the Donlin Gold Project, and ability of existing topography to limit geographic extent of views of the Mine Site (viewshed extent) (Figure 3.17-15).

Direct and Indirect Impacts from Operations

Operation of the Donlin Gold Mine Site would result in direct impacts to visual resources and landscape character, resulting from operations of mining equipment, excavation of the American Creek Magnetic Anomaly (ACMA) and Lewis pits, and mining related infrastructure (Tailings Storage Facility [TSF], Waste Rock Facility [WRF], water management structures). Impacts would last longer than the estimated life of the project. Collectively, excavation and related activity and infrastructure would result in strong visual contrast against the existing landscape, viewer duration would be prolonged, and views would be experienced from foreground-middleground distance zones.

The greatest source of visual contrast would result from the open pits, where changes in landform (pit), line (haul roads), and color and texture of soils due to excavation. Likewise, smooth texture and reflective qualities of the water management facilities would introduce strong visual contrast against the more muted tones of the surrounding landscape. Operation-related actions and resulting changes in visual resource attributes could attract attention and dominate the landscape, particularly when viewed from higher elevation vantage points such as overflying aircraft where features would appear dominant. Changes in visual resource attributes of the Project Area would last longer than the estimated life of the project and after Closure. The geographic extent or scope of the affected area would be predominantly within the foreground-middleground distance zone (three to five miles) when viewed from ground-based locations, as the viewshed of the mine would be restricted by the rugged topography of the Kuskokwim Mountains (Figure 3.17-15). In context, impacts would not affect sensitive viewer groups or areas recognized for scenic value. Though strong visual contrast of mine features could be visible from overflying recreational aircraft, viewer exposure would be transient, and experienced within the larger scale context of the landscape. Predominant viewer exposure would be transient, and experienced from the background distance zone (5 to 15 miles) or beyond.

Indirect effects to visual resources could occur if Construction or Operations resulted in displacement of recreation and/or subsistence use, and subsequent creation of user trails or Off Highway Vehicle (OHV) roads. Considering the extent or scope of impacts from Construction and Operations of the Donlin Gold Mine Site, low use levels and restrictions to public access, would result in imperceptible indirect effects and are not considered further in this analysis.

Direct and Indirect Impacts from Closure

Closure of the Mine Site is expected to reduce impacts to visual resources and landscape character as a result of restoration of the disturbed area. Though the TSF, WRF, roads, building,

and equipment would be reclaimed, recontoured, and revegetated, strong visual contrast could remain in the mine pit due to the accumulation of water and creation of a pit lake. The smooth, reflective surface of the water would contrast the existing muted tones of the surrounding landscape, and could attract attention. The intensity of direct impacts to visual resources from the remaining pit lake would result in strong visual contrast against the existing landscape. Viewer duration would be prolonged or transient, and views would be experienced from foreground-middleground or background distance zones. The duration of these changes to landscape character would last longer than the estimated life of the project and after closure. The extent or scope of the affected area would be predominantly within the foreground-middleground distance zone (three to five miles) when viewed from ground-based locations.

Mine Site Summary

At the Donlin Gold Mine Site under Alternative 2, direct impacts to visual resources and landscape character would result in strong visual contrast against the existing landscape, with prolonged viewer duration and views that are experienced from foreground-middleground distance zones. The duration of direct impacts would last longer than the estimated life of the project and after closure, due to infiltration of the combined ACMA and Lewis pit. When viewed from ground-based locations, the extent or scope of impacts would be largely restricted to the foreground-middleground distance zone (three to five miles) by rugged topography. In context, impacts would not affect sensitive viewer groups or areas recognized for scenic value. Collectively, direct impacts to visual resources would alter the natural and intact landscape character of the Kuskokwim Mountains physiographic province within the vicinity of the Mine Site. The affected area is not recognized for its scenic value.

3.17.3.3.2 TRANSPORTATION CORRIDOR

The proposed Transportation Corridor to support Construction and Operations under Alternative 2 include:

- Existing fuel and cargo terminals in the Pacific Northwest and Dutch Harbor;
- Improvements to the Bethel Port site (a connected action; see Chapter 1, Purpose and Need, Section 1.2.1);
- A new port at Angyaruaq (Jungjuk);
- A new 30-mile access road between Angyaruaq (Jungjuk) Port and the Mine Site;
- A 5,000–foot airstrip near the Mine Site; and
- Use of the Kuskokwim River for barge transit.

Impacts to visual resources would result from Construction and Operations of ports, fuel storage facilities, and access roads, as well as Operations of river barges on the Kuskokwim River.

Based on the scale and level of activity associated with existing fuel and cargo terminals in ports in the Pacific Northwest and Dutch Harbor, potential changes in visual resource attributes are expected to be imperceptible. Consequently, these areas are not discussed further in this analysis.

Bethel Port Site

Direct effects to visual resources could result from expansion and operation of the cargo port and fuel dock at Bethel (connected action). Construction and Operations at this facility would result in weak visual contrast against the existing landscape. Construction-related impacts would last only until the Port was complete. The extent or scope of the affected area would be predominantly restricted to the foreground-middleground distance zone (three to five miles). Operations-related impacts would extend for the 27-year life of the Donlin Gold Project. Existing cargo and fuel infrastructure is located in Bethel and the area is used as an active port. The geographic extent or scope of direct impacts would be largely restricted to an approximately half-mile section of the river surrounding the Port, and ridge tops of surrounding mountains. Impacts would be consistent with existing landscape character. Visual contrast would range from weak to moderate due to size and scale of the facility and the periodic nature of barge activity operating between Dutch Harbor and Bethel. In context, impacts would not affect sensitive viewer groups or areas recognized for scenic value.

Angyaruaq (Jungjuk) Port and Mine Access Road

Construction of the Angyaruaq (Jungjuk) Port site and mine access road would result in direct impacts to visual resources and landscape character. Sources of visual contrast include the Port, mine access road, material sites, and increased activity of construction-related vessel traffic. For all facilities and infrastructure, visual contrast in form and line would increase incrementally to a moderate level as these features were constructed, and excavation at material sites was underway. Collectively, construction-related activity would result in moderate to strong visual contrast against the existing landscape. The duration of changes to landscape character would last only for the duration of Construction (up to four years). The geographic extent or scope of the affected area would not extend beyond the foreground-middleground distance zone (three to five miles), primarily due to the ruggedness of surrounding mountains limiting views of the Mine Site (viewshed extent) (Figure 3.17-15 above).Views of transportation facilities would be largely restricted to ridge tops of surrounding mountains, with limited viewer extent from the Kuskokwim River.

In context, direct effects could impact the Kuskokwim River, which is recognized for its scenic quality, but is not protected by existing legislation, as temporary views of Construction-related activity could be experienced by river-based viewers in the area. Viewers situated in villages on the Kuskokwim River located upriver of the proposed Angyaruaq (Jungjuk) Port site, notably Crooked Creek, would not be affected as these areas are situated outside of the viewshed of these project components.

Direct impacts to visual resources would result from Operations of the Angyaruaq (Jungjuk) Port site and the mine access road, and would extend through the life of the project (27 years). Direct impacts would result in strong visual contrast of facilities and related barge and vehicle activity and potential operations-related dust, particularly when viewed from the Kuskokwim River (Figure 3.17-18, Simulation of the Angyaruaq [Jungjuk] Proposed Port Site). Though the terminus of the mine access road at the Port would be visible from the Kuskokwim River, it is expected to appear as a discontinuous bold line that is less dominant than the port facility. Likewise, the access road would be visible as a discrete bold line when viewed from higher elevation or aerial vantage points; however, it would be subdominant to other mine infrastructure. Viewer exposure would be transient, as views of the Port would be experienced

for approximately one mile when traveling up and down river in the vicinity of the Angyaruaq (Jungjuk) Port site. The geographic extent or scope of the affected area would be predominantly limited to the foreground-middleground distance zone (three to five miles) by the topography of the Kuskokwim River basin. The affected area may be recognized for its scenic quality, though scenic resources are not protected by existing legislation.

As described for the Mine Site, no indirect impacts to visual resources are expected to result from Construction or Operations of the Angyaruaq (Jungjuk) Port site and mine access road.

Kuskokwim River

Direct impacts to visual resources would result from operation of river barges on the Kuskokwim River during the Construction and Operations phases at the Angyaruaq (Jungjuk) Port site. Operation of river barges would vary in intensity and result in weak to strong visual contrast against the existing landscape. Viewer exposure to barge traffic from villages along the Kuskokwim or other river-based locations (e.g., recreation-, subsistence-, or transit-based boating), including portions within the Yukon Delta NWR, would be short and episodic with viewer extent limited by site-specific topography and existing river bends (Figure 3.17-17A through Figure 3.17-17E above). For example, the extent or scope of views from Aniak and Napaimute are largely limited to foreground-middleground distance zones (three to five miles). From Chuathbaluk, Upper Kalskag, and Lower Kalskag, views of the river are largely downriver where they extend to background distance zones (five to 15 miles). Based on the number of barge trips per season traveling upriver and back down, it is estimated that a viewer at a single point would see just over two barge trips per day in a combination of up and down-river tows, which could alter the existing landscape character. Repetitive transit and barge traffic would vary in intensity due to varied levels of visual contrast against the existing landscape. Impacts would last for the duration of the Construction and Operations phases (approximately 31 years). The extent or scope of the affected area would not extend beyond the foreground-middleground distance zone (three to five miles). However, impacts would be spread across the larger geographical region of the Kuskokwim River, from Angyaruaq (Jungjuk) Port to Bethel. Direct impacts would involve changes to landscape character that would extend through the life of the project (27 years). The affected area along the Kuskokwim River and Yukon Delta NWR is recognized for its scenic quality, though scenic resources are not protected by existing legislation. No indirect impacts to visual resources are expected to result from barge traffic on the Kuskokwim River.

Airstrip at the Mine Site

Direct impacts would result from Construction and Operations of the airstrip at the Mine Site. In terms of intensity, direct impacts may result from visual contrast in color, line, and texture of the existing linear gravel runway against the surrounding muted tones and variable textures of the landscape. Though operational conditions would include regular flight travel to and from the Mine Site, expected level of activity would not be likely to attract attention from viewers (recreational or subsistence) in the region. Viewer exposure would be transient and predominantly experienced from background distance zones (five to 15 miles). Direct impacts are expected to extend through the life of the project (27 years). The geographic extent or scope of the affected area would be predominantly within the foreground-middleground distance zone, with views of the airstrip and related activity generally occurring from isolated ridge tops

located to the west of the mine site (Figure 3.17-15 above). In context, impacts would not affect sensitive viewer groups or areas recognized for scenic value.

Indirect impacts to visual resources are not expected to result from Operations of the airstrip at the Mine Site.

Direct and Indirect Impacts from Closure

Closure and reclamation of many transportation facilities and related operations would result in impacts to visual resources. Sources of visual contrast created by barge traffic and the Port structure would be removed. However, a primitive barge landing and the mine access road would be retained for monitoring. The extent or scope of direct impacts from Closure would be generally restricted to foreground-middleground distance zone (three to five miles). In terms of context, the area may be recognized for its scenic quality, and landscape character of villages on the Kuskokwim River and the Yukon Delta NWR; these attributes would be restored as barge traffic ceased and the Port structure was removed.

Transportation Corridor Summary

Direct effects to visual resources and landscape character under Alternative 2 would result from the weak to moderate visual contrast of increased barge traffic on the Kuskokwim River and Operations of the Angyaruaq (Jungjuk) Port site. These impacts would result in changes in landscape character attributes of the Kuskokwim River, including the Yukon Delta NWR that would persist through the life of the project. Direct impacts would be episodic and not extend beyond the foreground-middleground distance zone due to the geographically limited viewshed of villages, and the transient nature of river-based views. In terms of context, direct impacts would affect villages on the Kuskokwim River and the Yukon Delta NWR that would experience changes in landscape character. The affected area may be recognized for its scenic quality and landscape character, though scenic resources are not protected by existing legislation. No indirect impacts to visual resources are expected to result from Construction or Operations of the Transportation Corridor. Termination of barge operations after closure of the mine would reduce direct impacts to visual resources, as sources of visual contrast created by barge traffic and the Angyaruaq (Jungjuk) Port structure would be removed and existing landscape character at the Port site and river would largely be restored.

3.17.3.3.3 PIPELINE

Based on comments on the Draft EIS from agencies and the public, one route option has been included in Alternative 2 to address concerns due to pipeline crossings of the Iditarod National Historic Trail (INHT):

- North Option: The MP 84.8 to 112 North Option would realign this segment of the natural gas pipeline crossing to the north of the INHT before the Happy River crossing and remain on the north side of the Happy River Valley before rejoining the alignment near MP-112 where it enters the Three Mile Valley. The North Alignment would be 26.5 miles long, with one crossing of the INHT and only 0.1 mile physically located in the INHT right-of-way (ROW). The average separation distance from the INHT would be 1 mile.

Construction-related impacts to visual resources associated with the Pipeline would result from four types of effects: 1) vegetation removal; 2) construction infrastructure; 3) pipeline delivery; and 4) pipeline installation. Because of the variation in impacts due to seasonality and construction techniques, these effects are discussed below by Pipeline segment:

- Beluga to Threemile Creek (MP 0 to MP 111.6)
- Threemile Creek to the South Fork of the Kuskokwim River (MP 111.6 to MP 126)
- South Fork of the Kuskokwim River to the Kuskokwim River (MP 144.4 to MP 247.6)
- Kuskokwim River to Donlin Mine (MP 247.6 to MP 315.8)

Operational impacts are presented by physiography as follows:

- Upper Matanuska Valley
- Alaska Range
- Tanana-Kuskokwim Lowlands
- Nushagak-Big River Hills
- Kuskokwim Mountains

The intensity and geographic extent of construction-related impacts depends on the season of construction and the extent of vegetation clearing required for the Pipeline ROW, as well as the characteristics of ancillary infrastructure required, water body crossings, and pipe installation method. Within the ROW, the intensity of this action would increase incrementally as ROW clearing progressed along the alignment, although pipeline installation is generally completed within one season in a given segment of the ROW.

Direct impacts are expected to be greatest in forest areas and woodlands where extensive vegetation removal is required and at activity nodes, where multiple construction-related actions occur simultaneously (mainline construction camps, airstrips, material sites, major pipeline storage yard and/or, horizontal directional drilling [HDD] crossings) (Appendix T, Visual Pipeline Engineering Strip Maps). Across all segments, the increase in activity of personnel and presence of equipment at identified activity nodes could attract attention due to increased movement and equipment in these areas during the construction period.

Viewer exposure and effect on resources would also vary across the length of the Pipeline based on the timing of Construction-related actions, as seasonal use patterns differ in the broad geographies crossed by the proposed ROW. Direct effects could be experienced by viewers at ground level or in aircraft. Indirect effects from Construction-related visual impacts could occur if existing land users (i.e., recreation or subsistence) are disturbed or displaced to new locations, or to areas maintained for operation of the Pipeline (i.e., cleared ROW, airstrips), as a result of the visual effects of the Donlin Gold Project. This shift in use areas could result in proliferation of user trails, and subsequent creation of distinct lines in the landscape.

Construction would include vegetation removal, staging of equipment and supplies, pipeline delivery, trenching, and installation. Impact analysis of construction activities is organized below into four geographic segments of the Pipeline. The analysis takes into account prevailing vegetation structure where ROW clearing would be required, season and timing of activities, location of activity nodes, and anticipated viewer receptors.

Beluga to Threemile Creek (MP 0 to MP 111.6)

Construction between Beluga and Threemile Creek would occur during the winter months, between November and April in the Upper Matanuska River Valley and Alaska Range physiographic provinces. Impacts would result in the moderate to strong visual contrast of cleared areas, infrastructure, and exposed soils against the surrounding landscape. Views of potential construction-related impacts would be shielded from on-the-ground viewers due to tall vegetation and the rugged topography of the Alaska Range. Construction-related actions could temporarily affect the INHT setting, which has a Congressional designation.

This Alternative includes an option for a Pipeline alignment that would realign the segment from MP 84.8 to 110. The optional alignment would depart from the proposed alignment at MP 84.8 and cross to the north of the INHT before the Happy River crossing and remain on the north side of the Happy River Valley before rejoining the proposed alignment near MP 110 where it enters the Three Mile Valley. The basic impact mechanisms for this option would be similar to that described for Alternative 2; however direct impacts to the INHT would be reduced from fewer ROW crossings, and fewer miles of collocation with the ROW.

Vegetation Removal – Direct impacts from removal of vegetation for infrastructure sites and the pipeline ROW would be expected to range in intensity. Cleared areas of the ROW and activity nodes would appear as discrete, uniform and bold line or shapes that contrast at a moderate to strong level against the contiguous open forests of the Upper Matanuska Valley, and the lower elevation portions of the Alaska Range along the Skwentna and Happy rivers. Visual contrast would be expected to be moderate in the southern portion of the ROW, where vegetation is of lower stature. Grading would be required for portions of this spread, and would contribute to the visual contrast. Visual contrast would diminish to a weak level beyond foreground-middleground distance zones due to the scale and the level of existing natural lines from drainages, geology, and slide areas in the landscape.

Visual contrast resulting from vegetation clearing within the Construction ROW would be temporary, as shrub and groundcover vegetation would reestablish naturally within 10 years. In some areas, revegetation would be expedited through reseeding with Alaska-certified weed-free products.

Actions could temporarily affect the scenic quality and landscape character of the INHT, which has a Congressional designation. Construction-related actions could be seen by winter recreationists on the INHT, including where the trail intersects the Construction ROW (approximately MP 50-52 and MP 86-106, or MP 86 for the North Option), or where the INHT crosses the viewshed of the Construction ROW (Figure 3.17-23A and Figure 3.17-23B). Important landmark features and view areas identified in the INHT CMP (BLM 1982) would not be affected by Construction-related actions in this segment, as no actions are proposed at or on landmark features, and view areas do not intersect the Project's viewshed. Scenic integrity of one significant viewpoint at the Skwentna River could be affected by higher intensity impacts, as views of construction-related actions would be experienced from a foreground vantage point. This analysis focuses on impacts perceived from recreationists on the INHT; additional discussion of impacts to the setting and integrity of the INHT are provided in Section 3.20 (Cultural Resources).

Temporary indirect impacts to visual resources could result from proliferation or growth of informal user trails in the vicinity of the ROW. In some cases, this already occurs from the

various trails associated with the INHT, but it is also possible that new informal trails would emerge from the ROW, particularly in areas that cross, parallel, or are proximate to the INHT.

Visual resource attributes of the Alexander Creek and Lake Creek recreation rivers or the Kroto and Moose Creek recreation areas would not be affected by Construction-related impacts to visual resources. The construction activities would be shielded from view due to topography and vegetation, or visual contrast would have attenuated to a weak level due to the distance between Construction-related actions and these areas. Recreationists in these areas are not expected to experience Construction-related impacts as these areas are primarily used during summer months.

Construction Infrastructure – Four activity nodes were identified in Sections 1 and 2 of Spread 2: Beluga Landing, Deep Creek, Skwentna River, and Happy River. At Beluga Landing, Construction-related infrastructure would be expected to be of low intensity, characterized by weak visual contrast of the camp facilities, large pipeline storage yard, and barge landing improvements against the existing landscape. At Deep Creek, Skwentna River, and Happy River, direct impacts to visual resources are expected from Construction-related infrastructure. Direct impacts would result in moderate visual contrast of straight lines, cubic forms, and variable textures of camp facilities, airstrips, material sites, and pipeline storage yards against the contiguous open forests of the surrounding landscape. Visual contrast from Construction-related infrastructure would only last for the duration of the Construction Phase, as facilities would be demobilized upon completion of construction.

Construction infrastructure could affect a resource that may be recognized for its scenic quality, as actions could temporarily affect the landscape character of the INHT, particularly in the vicinity of the Shell and Happy River mainline camps and airstrips. Construction activity at this location could be observed in the immediate foreground (<0.5 miles) by winter recreationists on the INHT between the Skwentna River and Onestone Lake.

Pipeline Delivery – Pipeline for Sections 1 and 2 of Spread 2 would be delivered by barge at Beluga Landing and by existing overland winter roads connecting the George Parks Highway to approximately MP 50.5 at the Skwentna River and MP 42 at Deep Creek. Moderate visual contrast from pipeline delivery would be limited to winter construction. Pipeline delivery could be observed by winter recreationists on the INHT where the trail crosses (14 or 6 locations), is collocated with (approximately 2.5 miles or 0.2 miles), or is located within 1,000 feet of (approximately 14.3 miles, or 5.3).

Pipeline Installation – Pipeline installation would result in moderate visual contrast due to the darker color and rough texture of excavated areas and construction mats against the surrounding white snow cover. Strong visual contrast could result at the Skwentna River (approximately MP 50) and Happy River (approximately MP 86), where HDD is proposed. Visual contrast would result from the darker color and rough texture of exposed soils in extra work areas against surrounding snowpack. For both trenching and HDD associated with pipeline installation, personnel and equipment at the outer extent of Pipeline construction and activity nodes could attract attention. Visual contrast resulting from Pipeline installation would last only during the Construction Phase as extra work spaces would be restored and ground cover vegetation within the operational ROW would reestablish. Impacts would be the same for both alignment options.

Viewer exposure to direct impacts resulting from Pipeline installation would be similar to that described for vegetation removal. Impacts related to Pipeline installation could be observed by winter recreationists on the INHT where the Pipeline ROW intermittently crosses or intersects the trail between approximately MP 50-52 and MP 85-106.

Threemile Creek to the South Fork of the Kuskokwim River (MP 111.6 to MP 126)

Construction of the Pipeline between Threemile Creek and the South Fork of the Kuskokwim River would occur during the summer months, between June and September. This portion of the ROW would be located in the Alaska Range physiographic province.

Vegetation Removal – Direct impacts from removal of vegetation for infrastructure sites and the Pipeline ROW are expected. Vegetation clearing is expected to appear as a uniform line characterized by weak to moderate visual contrast against the predominantly low growing vegetation and horizontal lines at the toe slope of the Threemile Creek and Jones River valleys. Likewise, clearing for infrastructure at Threemile Creek and Bear Paw is expected to result in weak visual contrast against both low growing vegetation and bare ground of the Jones River floodplain. Visual contrast is expected to be strong where linear features or activity nodes cross patches of contiguous open forest, particularly on the east side of the Kuskokwim River.

Direct impacts would result from shielding by the rugged topography of the Alaska Range. Direct impacts of vegetation clearing would not affect the setting of the INHT, and actions are not expected to be visible from the INHT. Viewer exposure is also expected to be limited, as vegetation clearing would occur during the summer months when recreation use on the INHT is low.

Construction Infrastructure – Three activity nodes were identified where the ROW crosses the Alaska Range: Threemile Creek, Bear Paw, and Jones. At each activity node, direct impacts from Construction infrastructure are expected to result from weak to moderate visual contrast of camp facilities, airstrips, material sites and pipeline storage yards against the existing rugged and incised landscape. As described for the Beluga to Threemile Creek segment, the increase in human activity and presence of equipment at activity nodes could attract attention due to movement and equipment in these areas. However, the rugged and remote terrain would restrict the geographic extent of views. Visual contrast resulting from Construction infrastructure would last only for the duration of the Construction Phase, as facilities would be demobilized upon completion of construction actions. Impacts from Construction infrastructure would not affect resources in a landscape that is recognized for scenic quality. Though the Threemile Creek activity node could be visible from the INHT, recreationists on the trail are not expected to be affected as activity would occur in the summer months when use of the INHT is low.

Pipeline Delivery – Pipeline delivery would occur by overland winter roads connecting the George Parks Highway to approximately MP 50.5 at the Skwentna River. Visual contrast resulting from pipeline delivery would be similar to that described for the Beluga to Threemile Creek Segment.

Pipeline Installation – Pipeline installation would result in moderate to strong visual contrast of darker color and rough texture of excavated areas against the surrounding landscape, personnel activity, and presence of equipment. Visual contrast resulting from Pipeline installation would be last only during the Construction Phase, as work spaces would be restored and ground cover

vegetation within the operational ROW would reestablish. No sensitive viewers or special management areas were identified in this area. Winter recreationists on the INHT would not experience construction-related impacts, as installation would occur during summer months (May to August).

South Fork of the Kuskokwim River to the Kuskokwim River (MP 144.4 to MP 247.6)

Construction of the Pipeline between the South Fork of the Kuskokwim River and main stem Kuskokwim River would occur during the winter months between November and April. This portion of the ROW would cross the Tanana-Kuskokwim Lowland and the Nushagak-Big River Hills physiographic province and intersect lands administered by the BLM.

Vegetation Removal – Temporary direct impacts from removal of vegetation for infrastructure and the Pipeline ROW would be expected. Weak visual contrast would occur where the ROW crosses areas with predominantly low stature vegetation in the Tanana Kuskokwim Lowlands and moderate contrast where the ROW crosses the open forests of the Nushagak-Big River Hills physiographic units. Impact mechanisms are similar to those described for the Beluga to Threemile Creek Segment. No sensitive viewers or special management areas were identified in this area. Potential direct impacts of vegetation clearing would occur during the winter months, when recreation, subsistence hunting, and fishing activity in this area is low.

Construction Infrastructure – Two activity nodes were identified in this segment: Farewell and Big River. Minimal changes from existing conditions to would be expected at the Farewell airstrip. At Big River, direct impacts from new construction infrastructure would be expected to result in weak to moderate visual contrast of camp facilities, airstrips, material sites and pipeline storage yards against the existing broad topography and large scale of the existing landscape. Visual contrast resulting from construction infrastructure would last only during the duration of the Construction Phase, as facilities would be demobilized upon completion of construction. No sensitive viewers or special management areas were identified in this area.

Pipeline Installation – Pipeline installation would result in temporary direct impacts to visual resources. Pipeline trenching would introduce contrast due to the darker color and rough texture of excavated areas and construction mats against the surrounding white snow cover. Impact mechanisms would be similar to that described for winter pipeline installation in the Beluga to Threemile segment. No sensitive viewers or special management areas were identified in this area.

Kuskokwim River to Donlin Mine (MP 247.6 to MP 315.8)

Construction of the Pipeline between the Kuskokwim River and the Donlin Gold Mine Site would occur during the summer months. Direct impacts would be expected to result from construction of the Pipeline in this area. Impacts would result from the moderate to strong visual contrast of vegetation clearing, gravel surfacing of shoofly roads, and exposed soils of trenching a HDD against the surrounding landscape. Views would be shielded from on-the-ground observers due to vegetation and topography.

Vegetation Removal – Direct impacts from removal of vegetation for infrastructure sites, the Pipeline ROW, and shoofly roads would be expected to result in weak to moderate visual contrast between cleared areas and the surrounding landscape. Weak visual contrast would be expected in higher elevation portions of this spread where vegetation is dominated by low

stature tundra species, and taller canopy vegetation is limited due to recent wildfire. Visual contrast of cleared areas would be expected to increase in areas where vegetation is characterized by contiguous open/closed forest (i.e., George River Valley and tributaries), and where gravel surfacing of ROW and/or shoofly roads is required. No sensitive viewers or special management areas were identified in this area.

Construction Infrastructure – No activity nodes are proposed within this segment, though barge landings and pipe storage yards would be constructed on both the east and west sides of the Kuskokwim River. Intensity of actions would be restricted to construction equipment and temporary camps. Direct impacts would be primarily located within the foreground-middleground zones due to the varied topography of the area and large scale of the landscape. No sensitive viewers or special management areas were identified in this area.

Pipeline Installation – Direct impacts to visual resources are expected to result from installation of the Pipeline in this segment, and at HDD crossings at the Kuskokwim River, George River, East Fork George River, and North Fork George River. Direct impacts from Pipeline installation would be similar to that described in other Pipeline segments. Additional direct effects would result from Pipeline installation in this segment due to the multiple HDD crossings and summer installation period. Actions associated with the four HDD sites would be of high intensity, resulting from strong visual contrast of darker color and rough texture of excavated areas against the surrounding landscape, personnel activity, and presence of equipment. Visual contrast resulting from pipeline installation would only last for the duration of the Construction Phase, as work spaces would be restored and ground cover vegetation within the operational ROW would reestablish. No sensitive viewers or special management areas were identified in this area.

Direct and Indirect Effects from Operations

Operations of the Pipeline would result in direct impacts to visual resources. The operational ROW would have been cleared as part of Construction; impacts of ongoing operations would be similar to those described for the Construction Phase. The primary visual impact mechanism is the potential for the operational ROW to appear as a bold and discrete line in the otherwise natural landscape as a result of vegetation clearing. As with Construction-related vegetation clearing, the level of visual contrast and resulting intensity of visual impacts would depend largely on vegetation communities crossed by the ROW, seasonality, and site-specific landscape character attributes. In forested areas, it is expected that the ROW would result in strong visual contrast during winter months as snow accumulates in cleared areas, thereby resulting in a bold white line against the darker green of surrounding vegetation. Visual contrast of the ROW in these areas during the winter season would appear strongest when viewed from the air, as the linear extent of the ROW would be visible. Where vegetation is of shorter stature, the ROW would be obscured during winter months from contiguous snow cover across the landscape.

The proposed ROW under Alternative 2 would be within 1,000 feet of the INHT for approximately 8 miles, and would be collocated for approximately 4.5 miles. The INHT race route would cross the proposed pipeline ROW at 12 locations. The proposed pipeline ROW could affect scenic attributes of the INHT where the trail intersects, parallels, or is located in the vicinity of the proposed operational ROW. Viewers located on the trails would experience potential negative change in scenic attributes at close proximity, within the immediate foreground (< 0.5 miles).

Anticipated direct impacts to visual resources are discussed below by physiographic province.

Upper Matanuska Valley

Direct impacts to visual resources would be expected to result from vegetation management within the operational ROW where it would cross the Upper Matanuska Valley physiographic province. Impacts would result in weak to strong visual contrast of cleared areas against the surrounding open forest. Visual contrast is expected to be weak toward the southern portion of the ROW where vegetation is primarily characterized by low growth forms (Figure 3.17-25). Visual contrast would be expected to increase to a moderate to strong level where the ROW would pass though areas of dense and contiguous forest approaching the Alaska Range. Visual contrast of the ROW would be strongest in these areas when viewed from elevated or aerial vantage points. Views of the ROW would largely occur from within the foreground-middleground distance zone. Direct impacts could affect a resource that may be recognized for its scenic quality, where the proposed operational ROW crosses the INHT (described in detail below).

Iditarod National Historic Trail

Direct impacts could affect resources of the INHT where it passes through SQRUs SL-8, SL-7, SL-6, SL-5, and SL-4 in the Upper Matanuska Valley physiographic province (BLM 1982). Direct impacts to scenic quality as perceived by recreationists on the trail (and as described in the INHT CMP [BLM 1982]) are discussed below.

SQRU SL-08 is located south of McDoel and Columbia peaks and extending from approximately Finger Lake to the Happy River. Dominant visual attributes include Happy River to the south, terraced landforms of upland areas, and the edge-break provided by both vegetation and landform in the southern portion of the unit. Scenic quality is ranked as Class A. The unit is described as a "well-defined visual corridor directed toward the pass, with mountains providing continuous visual landmarks on either side" (BLM 1982). The operational ROW would intersect the viewshed of INHT for approximately 10 percent (1.4 miles) of this SQRU, corresponding largely to areas where the ROW would parallel or intersect the trail. For viewers situated on the trail, the ROW could be apparent as a wider and more uniform corridor particularly where it passes through dense forest characteristically typical in this area. The ROW edges would be discrete and uniform and could appear distinct and unnatural. These areas of change could result in the perception of increased cultural modification of the landscape and change in natural vegetation pattern and lines. There would be no change to scenic quality attributes of other factors, particularly the influence of landform, and water. The visual corridor directed toward the pass would remain a dominant visual element. However, the integrity of the landscape, as viewed from a significant viewpoint located at the western end of this SQRU (confluence of the Skwentna and Happy rivers) (BLM 1982) could be reduced, as discrete lines of the ROW would be visible from an elevated viewer position (see Section 3.20, Cultural Resources). Views directed to the northwest across the Skwentna River valley would not be affected.

SQRU SL-07 is located north of the Skwentna River, extending from roughly the confluence with the Talachulitna River to south of McDoel Peak, and are typical of the foothills of the Alaska Range. Though several lakes (including Shell Lake and Onestone Lake) are within a mile of the trail, these features are seldom seen due to the spruce-poplar and lowland/upland

spruce-hardwood forests. Surrounding mountains are identified as view areas, particularly the Shell Hills to the north. The proposed operational ROW would cross, be collocated, and sited within 1,000 feet of the INHT within the southern portion of this unit for approximately two miles. Where the trail and ROW are separated, views of the ROW would be blocked by existing forest vegetation. Where the ROW would be visible, cultural modification would be apparent and vegetation pattern and line mat appear unnatural due to the uniform edges of the ROW.

SQRU SL-06 is located at the intersection of the INHT and the Skwentna River. Similar to the Susitna River crossing, the intersection of the INHT and the Skwentna River provides "significant relief from the vast homogenous forests of the Susitna Lowlands" (BLM 1982). The operational ROW would cross this unit at two locations on the north side of the Skwentna River. With the exception of where the proposed operational ROW crossed the INHT, views of the ROW would be shielded by existing forest vegetation. Visual contrast would be strong; however, because the ROW would cross at a perpendicular angle, viewer exposure would be minimized by recreationists moving through the trail. The ROW would be visible for approximately a half-mile, or five percent of the Scenic Quality Rating Unit. These areas of change could result in the perception of increased cultural modification of the landscape and change in natural vegetation pattern and lines. The Skwentna River, the primary factor contributing to scenic quality in this unit, would remain the dominant visual element in this unit.

SQRU SL-05, located in the Upper Matanuska Valley physiographic province east of Mt. Susitna and Beluga Mountain, is homogenous with little visual interest or diversity. Scenic quality was ranked as Class C. Beluga Mountain is identified as both a viewing area and an important landmark feature (BLM 1982). Cultural modification was identified as a contributing factor to the reduction of scenic quality in this unit. Operation of the Donlin Gold Project could affect scenic quality attributes of this segment. The viewshed of the Donlin Gold Project intersects this SQRU for approximately a half-mile where the ROW could be seen from the background distance zone (five to 15 miles). Visual contrast of the proposed ROW as viewed from this location would be weak to moderate due to the low stature of surrounding vegetation and the consistency of weak lines of the ROW with existing lines at the toe slope of Beluga Mountain. Though the ROW could be detected by the informed eye, it would not be a dominant feature on the landscape and would not command attention. Further, typical viewers would experience views of the ROW while traveling by dog sled or snow machine, thereby reducing both potential exposure time and degree to which the ROW was focal to views.

SQRU SL-04 is located in the Upper Matanuska Valley physiographic province, east of Mount Susitna where the trail crosses the Susitna River, has scenic quality attributes contributing the most to the setting. These include the openness of views experienced in this segment compared to surrounding areas where viewer extent is limited by forest. Mount Susitna is identified as both a view area and an important landmark feature (BLM 1982). The proposed ROW would not affect scenic attributes of this scenic quality rating unit as it is located outside the viewshed of the ROW due to shielding of topography of Mount Susitna.

Alaska Range

Direct impacts to visual resources would be expected to result from vegetation management within the operational ROW where it would cross the Alaska Range physiographic province. Impacts would range in intensity. In the northwestern portion of this segment (MP 147 and MP

101), impacts would result in weak visual contrast of cleared areas against surrounding low stature vegetation and areas of bare ground. In the southeastern portion of this segment (south of MP 101), impacts would be of result in moderate-strong visual contrast of cleared areas against surrounding open forest and woodlands (Figure 3.17-23A and Figure 3.17-23B). Visual contrast of the ROW would appear strong when viewed from elevated or aerial vantage points, particularly low-altitude recreational aircraft. Impacts would extend through the life of the project and views of the ROW are largely restricted to the foreground-middleground distance zone (three to five miles) by the rugged topography of the Alaska Range.

Iditarod National Historic Trail

Both SQRU AR-1 and AR-2 of the INHT are in the Alaska Range physiographic province. SQRU AR-2 is located in the Happy River Valley south of Kohlsaat Peak, and Rainy Pass Creek south of Rainy Pass. Dominant visual elements in this segment include the expansive, uninterrupted views from the trail due to lack of vegetation along the trail. The ROW would not cross the INHT; however, the operational ROW would intersect the viewshed of the INHT for approximately 1.6 miles (10 percent) within a distance of five miles. These potential viewshed impacts would be primarily located in the southern portion of SQRU AR-2 located in the Happy River Valley (Figure 3.17-23A and Figure 3.17-23B). Because the ROW separates from the INHT corridor at Threemile Creek, scenic quality attributes within the northern portion of this SQRU would not be affected.

SQRU AR-1 is located in the Happy River Valley between Destin Peak and Puntilla Mountain. This unit includes dominant visual elements of steep jagged mountains of the Alaska Range, and the expansive views and vistas where the INHT crosses higher elevation terraces. The INHT would cross the operational ROW six times, and intersect the viewshed of the trail for approximately 17 percent of this unit. Because of the natural variability in vegetation communities within this unit – including open areas of muskeg bogs – the bold line created from vegetation clearing in the ROW would not appear contiguous, and visual contrast would range from moderate to strong. Diversity in visual experience along this portion of the trail would be maintained. Areas of change could result in the perception of increased cultural modification of the landscape and change in natural vegetation pattern and lines within both AR-1 and AR-2.

Indirect impacts to visual resources could result from proliferation of user trails stemming from the ROW, particularly in areas that cross, parallel, or are proximate to the INHT.

The Alternative route that would realign the segment from MP 84.8 to 110 of the proposed natural gas pipeline would reduce overall impacts to the INHT in AR-1 and AR-2 by reducing the number of times the ROS crossed or paralleled the INHT.

Tanana Kuskokwim Lowland

Direct impacts to visual resources are expected to result from vegetation management within the operational ROW and aboveground segments of the ROW within the Tanana Kuskokwim Lowland physiographic province. Vegetation management within the operational ROW would result in weak-moderate visual contrast of cleared areas of the ROW against the mosaic of low stature and open forest vegetation (Figure 3.17-22). Visual contrast is expected to attenuate to a weak level beyond the foreground-middleground distance zone (three to five miles).

The Pipeline would be located aboveground at the Castle Mountain and the Denali-Farewell faults, where it would run aboveground on lateral supports. Views of aboveground segments would result in moderate visual contrast against the surrounding landscape. Though the structure would appear as a distinct linear feature on the landscape when viewed at close proximity, it would be expected to become less apparent characterized by weak visual contrast from background distance zone (five to 15 miles). Viewer exposure would be transient, limited to seasonal recreationists. With the exception of the INHT crossings described below, views of the project features would be experienced from the foreground-middleground (three to five miles) and background (five to 15 miles) distance zones. Direct impacts would not extend beyond the foreground-middleground distance zones due to the low stature of this feature and the limited extent of the viewshed.

Iditarod National Historic Trail

Within the Tanana-Kuskokwim Lowlands physiographic region, the operational ROW would cross at two locations in the AR-6 SQRU of the INHT west of the South Fork of the Kuskokwim River. Scenic quality within this unit was ranked as Class A. The affected area may be recognized for its scenic quality, though scenic resources are not protected by existing legislation. Dominant scenic attributes of this unit includes the distinct changes in setting as views from the expansive, rugged, and incised Alaska Range transitions to the broad, flat, and panoramic qualities of the Tanana-Kuskokwim Lowlands. Scenic quality attributes are experienced in a directional manner, as this approximately five mile trail segment heads northward across the lowland. Two scenic resources are identified in the INHT CMP (BLM 1982): 1) Egypt Mountain, identified as an important landmark feature, and 2) the valley walls of the Alaska Range, identified as a view area. Neither feature would be affected by the ROW. The ROW would cross this unit once at the southern portion of the unit, as the trail emerges from the Alaska Range and enters the Tanana-Kuskokwim Lowlands. Approximately 3.3 miles of the INHT within this SQRU (approximately 17 percent) would cross the viewshed of the Project. The majority of this portion of the INHT would be located within 0.5-5 miles of the Pipeline ROW.

The ROW would be apparent in this area due to vegetation clearing. ROW edges would appear discrete and uniform in riparian and upland forested areas. Where the INHT crossed the ROW at two locations, viewers would experience impacts in the immediate foreground (<0.5 miles), and at a perpendicular angle. Viewer exposure would be transitory, with the scale of the ROW appearing subordinate to surrounding landscape features. Aboveground portions of the ROW would not be visible. Impacts to setting and integrity of the INHT are provided in Section 3.20, Cultural Resources.

Indirect impacts to visual resources could result from use of the operational ROW as a travel route, as recreationists and individuals engaged in subsistence hunting could access the ROW from the INHT. This access-induced use could create new user trails that appear distinct due to tread marks, exposed soils, and/or snow trails.

Nushagak-Big River Hills

Direct impacts to visual resources would be expected to result from vegetation management within the operational ROW where it would cross the Nushagak-Big River Hills physiographic province. Impacts would extend through the life of the Project and result from moderate visual

contrast of cleared areas of the ROW against the tall open forests in this area (Figure 3.17-21). Visual contrast would be expected to attenuate to a weak level beyond the foreground-middleground distance zone (three to five miles).

Indirect impacts to visual resources could result from proliferation of user trails stemming from the ROW, particularly in areas near the Big River where existing two track trails are visible on the landscape.

Kuskokwim Mountains

Direct impacts to visual resources would be expected to result from vegetation management within the operational ROW. Impacts would result from visual contrast of cleared areas of the ROW and shoofly access roads against existing vegetation. In upland portions of this physiographic region, visual contrast would be expected to be weak, as surrounding vegetation is predominantly characterized by low tundra or shrub vegetation and large areas where vegetation was burned during recent forest fire. Visual contrast would be expected to be moderate to strong and more prominent in scale where the ROW crosses water bodies of the Kuskokwim River and the George River Valley, as vegetation in these drainages is characterized by open to closed forest types. In these areas, ROW edges could appear discrete, particularly when viewed from higher elevation vantage points, low-flying aircraft, or from the river (see Figure 3.17-19).

Though visual contrast would be greater when viewed from the air than from land, the predominantly low stature vegetation would reduce the prominence of the ROW in this context. Air-based viewers would experience the landscape in transit, with views extending to other co-dominant features of the landscape. Expected visual contrast when viewed from the air would be weak to moderate.

Direct impacts would primarily affect resources that are not recognized for scenic value. However, the Kuskokwim River, a resource that is recognized for its scenic value although not protected by existing legislation, would be affected at the Pipeline ROW crossing. Views of the ROW from the river would be transient, typically experienced while moving up or downriver in motorized craft. Devil's Elbow, a noted feature of the Kuskokwim River, is outside the viewshed of the proposed ROW (Figure 3.17-20).

Indirect impacts to visual resources could result from proliferation of user trails stemming from the ROW, particularly in areas near the Kuskokwim River or George River trail.

Pipeline Summary

Direct impacts to visual resources would be expected to result from Construction of the Pipeline under Alternative 2. Construction-related actions would range in intensity from strong visual contrast against the existing landscape, resulting from of vegetation removal, infrastructure, and increased activity for pipeline installation. Intensity of impacts would be expected to be greatest in forested areas due to the extent of required vegetation clearing, in areas where HDD would occur during Pipeline installation, and other concentrated activity areas. In terms of geographic extent or scope, overall direct impacts from Construction would not extend beyond the foreground-middleground distance zones (three to five miles) due to the rugged topography, predominant vegetation, or large scale of the landscape. The context of construction-related actions would affect areas not recognized for their scenic value, with the

exception of portions of the Upper Matanuska valley and Alaska Range, where the INHT would parallel or intersect the ROW. Direct impacts would last only for the duration of the Construction Phase.

Direct impacts to visual resources would be expected to result from Operations of the proposed Pipeline under Alternative 2. Direct effects from Operations of the Pipeline would primarily result from vegetation removal required to maintain the operational ROW. In terms of intensity, actions would range in the level of visual contrast against the existing landscape where the ROW would cross areas characterized by low stature or variable vegetation structure (Kuskokwim Mountains, Tanana-Kuskokwim Lowlands, northern portion of the Alaska Range, and southern portion of the Upper Matanuska Valley), depending on season. In these areas, visual contrast of the ROW would be minimized as edges would blend with existing low vegetation or open areas. In other areas, actions would result in moderate to strong visual contrast of cleared areas against surrounding forest vegetation in the George River Valley, Nushagak-Big River Hills, the southern portion of the Alaska Range, and the northern portion of the Matanuska Valley. Visual contrast of the ROW would be strongest in these areas when viewed from elevated or aerial vantage points. The extent or scope of direct impacts would be primarily experienced in the foreground-middleground distance zone (three to five miles). The context of impacts would vary from areas not recognized for its scenic value, to areas such as the INHT that are recognized for its scenic quality. Scenic quality attributes of the INHT could be altered in the northern portion of the Upper Matanuska Valley and southern portion of the Alaska Range. Indirect impacts to visual resources could occur if there was a proliferation of user-generated trails stemming from the ROW under Alternative 2.

3.17.3.3.4 CLIMATE CHANGE

The Donlin Gold Project would contribute to climate change as discussed in Section 3.8, Air Quality, through production of greenhouse gasses. The level of greenhouse gas emissions generated by implementation of Alternative 2 is not likely to create climate change effects to visual resources. If current climate change trends persist, impacts to visual resources would likely be similar to the Vegetation and Wetlands discussion in Section 3.26, Climate Change.

3.17.3.3.5 SUMMARY OF IMPACTS FOR ALTERNATIVE 2

Operation of the Donlin Gold Mine Site would impact visual resources from mining equipment, excavation of the ACMA and Lewis pits, and mining related infrastructure (TSF, WRF, water management areas). In terms of intensity, excavation and related activity and infrastructure would result in strong visual contrast of these mine site facilities against the existing landscape. Indirect effects to visual resources could occur if Construction or Operations resulted in displacement of recreation and/or subsistence use, and subsequent creation of user trails or OHV roads. The extent or scope of impacts to visual resources would be largely restricted to the foreground-middleground distance zone (three to five miles) when viewed from ground-based locations, and would remain following closure due to remaining open pits. Affected areas are not recognized for scenic quality and do not contain sensitive viewers.

Construction and Operations of the Transportation Corridor under Alternative 2 would result in noticeable visual contrast against the existing landscape primarily from increased barge and Port traffic. The duration of impacts would extend through the life of the project. In terms of

context, impacts could affect resources recognized for scenic quality, as villages on the Kuskokwim River and the Yukon Delta NWR would experience changes in landscape character. Termination of barge operations would result in reduced direct impacts to visual resources, as sources of visual contrast created by barge traffic and the Port structure would be removed and existing landscape character at the Port site would largely be restored, though the access road and airstrip would remain.

Construction of the Pipeline under Alternative 2 is expected to result in strong visual contrast against the existing landscape (Table 3.17-3). The intensity of impacts is expected to be greatest in forested areas due to the extent of required vegetation clearing, in areas where HDD would occur during pipeline installation, and other concentrated activity areas. Vegetation removal required to maintain the operational ROW would extend through the life of the project. Impacts would result in weak to moderate visual contrast against the existing landscape where the ROW would cross areas characterized by low stature or variable vegetation structure, (Kuskokwim Mountains, Tanana-Kuskokwim Lowlands, northern portion of the Alaska Range, and southern portion of the Upper Matanuska Valley). Impacts may result in strong visual contrast against the existing landscape where the ROW would cross areas characterized by open or closed forests (southern portion of the Alaska Range, and northern portion of the Upper Matanuska Valley). Visual contrast of the ROW would be strongest in these areas when viewed from elevated or aerial vantage points. The extent or scope of direct impacts would be largely restricted to foreground-middleground distance zone (three to five miles) due to vegetation screening. The context of impacts would vary from areas not recognized for its scenic value, to areas such as the INHT that are recognized for its scenic quality. Impacts from Alternative 2-North Option would be the same as Alternative 2.

3.17.3.3.6 MITIGATION AND MONITORING FOR ALTERNATIVE 2

Effects determinations take into account impact reducing design features (Table 5.2-1 in Chapter 5, Impact Avoidance, Minimization, and Mitigation) proposed by Donlin Gold and also the Standard Permit Conditions and BMPs (Section 5.3) that would be implemented.

Design features important for reducing impacts to visual resources include:

- Where practicable, the project design includes proposed facilities with earth tone colors characteristic of the natural landscapes during the summer months (browns, tans, warm grays, and greens) with matte-finish to minimize visual impacts. The project design includes features to minimize visual impacts to the natural landscape to extent practicable;
- The project design includes routing transmission lines in proximity to roads, where possible, to reduce additional vegetation impacts;
- Areas of disturbed bedrock and surficial deposits along the pipeline ROW, roads, and material sites would be contoured to match existing landforms as feasible, ripped to mitigate compaction effects, covered with growth media as needed and revegetated, and would support the overall drainage of the site, the long-term geotechnical stability, and post-mining land use;
- The shape of the WRF has been designed to conform to the landscape to the extent practicable to reduce visual impact;

- Burying the pipeline and blending with the natural setting minimizes the potential for pipeline to dominate the landscape and decreases visual impacts. The cleared pipeline right-of-way ROW would be revegetated progressively throughout construction as segments of construction are complete. Vegetative cover would be maintained during Operations to the extent permitted under PHMSA regulations; minimizing visual contrast of ROW by blending with existing low vegetation or open areas. While the ROW would be revegetated, PHMSA regulations require brushing of the 50 foot ROW;
- During the Operations Phase, concurrent reclamation activities (e.g., certain tiers and areas within the WRF) would be conducted immediately after construction and stabilization and whenever practicable in disturbed areas no longer required for active mining;
- The project design includes routing decisions to minimize visual impacts to the Iditarod National Historic Trail (INHT) including co-location of the proposed pipeline with the INHT where appropriate to reduce multiple crossings by the pipeline and thereby reduce the possibility that the pipeline ROW becomes used as a separate trail;
- Donlin Gold will work with user groups to promote trail preservation and use. Any actual mitigation measures for impacts to the INHT would be agreed to as a part of the Section 106 compliance process and specified in the PA;
- Donlin Gold has studied various pipeline corridors that would avoid and/or minimize adverse effects to the INHT. The most significant route modifications have been incorporated into the analysis (Jones Route Alternative and the North Route Option); and
- Donlin Gold proposes the following measures to minimize adverse visual effects to the INHT. Final details of mitigation measures for impacts to the INHT would be agreed to as a part of the Section 106 compliance process and specified in the PA:
    - Visual Documentation – Collection of photo and video documentation of the INHT scenic area during winter conditions from the Skwentna Crossing to Three-mile Creek, and at Egypt Mountain.
    - Pipeline Construction at INHT Crossings – As practicable, construction of pipeline ROW / INHT crossings in a manner that minimizes the observer's view of the pipeline ROW. This may include narrowing and/or feathering of the pipeline construction ROW and placement of visual barriers such as vegetation, brush piles, and/or berms.
    - Placement of Surface Infrastructure – As practicable, placement of mile markers, main blocks valves, and cathodic protectors at inconspicuous locations to avoid or minimize their view from the INHT.
    - Material Site MS-25 – Reevaluation of the need to develop Material Site 25 (MS-25) during detailed construction planning. MS-25 may not be required and thus, not developed. If required, Donlin Gold would investigate means to minimize adverse effects by reducing the area of disturbance of the material site. If developed, MS-25 would be reclaimed by re-contouring the area to blend with the surrounding environment and methods would meet State of Alaska

reclamation requirements. Visual barriers may also be installed, depending on the final configuration of the development at MS-25.

- Communication and Coordination – Communication and coordination with INHT trail users (including the Iditarod Trail Committee and the Irondog) about pipeline construction plans and progress to enable free and safe passage at INHT/construction ROW crossings. Through its Public Outreach work, Donlin Gold would also provide information regarding pipeline construction and maintenance activities.
- Donlin Gold INHT Annual Endowment – Providing the INHTA with an annual endowment. Donlin Gold believes the proposed funding offer is proportionate to the INHT significance and integrity, and is conservative with respect to the scale of the effects.

Standard Permit Conditions and BMPs important for reducing impacts to visual resources include:

- Development and maintenance of Oil Discharge Prevention and Contingency (ODPCP) Plans, Spill Prevention, Control and Countermeasure (SPCC) Plans, and Facility Response Plans (FRP);
- Implementation of Stormwater Pollution Prevention Plans (SWPPPs) and/or Erosion and Sediment Control Plans (ESCPs) and use of industry standard BMPs for sediment and erosion control; and
- Preparation and implementation of a Reclamation and Closure Plan (SRK 2017f).

Additional measures are being considered by the Corps and Cooperating agencies to further minimize project impacts, as reasonable and practicable, and are further assessed in Chapter 5, Impact Avoidance, Minimization, and Mitigation (Section 5.5 and Section 5.7). Examples of additional measures being considered that are applicable to this resource include:

- Install signs that clearly distinguish trails from the pipeline ROW at points where the pipeline crosses trails to guide trail users to stay on the trail and off of the pipeline ROW where the two are not collocated. As practicable, revegetate, or otherwise block access to, a narrow strip of the pipeline ROW where it crosses the trail to help steer and keep trail users on the trail and reduce the visual effect of the pipeline ROW crossing;
- Where practicable, when clearing brush and shrubs as required to maintain the operations ROW, introduce variation in the edges of clearing (i.e., avoid extended straight lines) to minimize effects to visual resources;
- Include measures to mitigate visual impacts to known sensitive cultural resource areas, such as clearing a narrower construction ROW, using HDD drilling under a sensitive site, minor realignment of the construction ROW, or other appropriate measures to avoid known sensitive areas;
- During final design locate any potential vegetation buffers to reduce visual impacts; and
- To the extent practicable, bury all transmission lines to reduce potential impacts to visual resources and birds from overhead lines.

Table 3.17-3: Summary Impacts of Alternative 2 on Visual Resources by Project Component

Impacts		Assessment Criteria[10]			
		Magnitude or Intensity[1]	Duration[2]	Extent or Scope[3]	Context[4]
Physiographic Province: Mine Site					
Kuskokwim Mountains	Change in Landscape Character[5]	Intensity: Strong visual contrast against the existing landscape, viewer duration is prolonged, and views are experienced from foreground-middleground distance zones. Visual Contrast[6]: Strong Scale[7]: Dominant Exposure[8]: Transient Distance[9]: B	Changes to landscape character would last longer than the estimated life of the Project and after Closure.	The extent or scope of the affected area would be predominantly within the foreground-middleground distance zone (3-5 miles);	Visual resources of the affected area are in a landscape that is not recognized for its scenic value.
Physiographic Province: Transportation Corridor					
Yukon Kuskokwim Coastal Lowland	Change in Landscape Character - Bethel	Intensity: Low visual contrast against the landscape. Viewer duration is prolonged or transient, and experienced from foreground-middleground or background distance zones. Visual Contrast: Weak Scale: Not Evident Exposure: Prolonged Distance: F/M	Changes to landscape character would extend through the life of the Project	Same as above.	Same as above.

Table 3.17-3: Summary Impacts of Alternative 2 on Visual Resources by Project Component

Impacts		Assessment Criteria[10]			
		Magnitude or Intensity[1]	Duration[2]	Extent or Scope[3]	Context[4]
Kuskokwim Mountains	Change in Landscape Character - Angyaruaq (Jungjuk) Port	Intensity: Moderate visual contrast against the existing landscape, viewer duration is prolonged or transient, and views are experienced from foreground-middleground or background distance zones. Visual Contrast: Moderate Scale: Prominent Exposure: Transient Distance: F/M	Same as above.	Same as above.	Visual resources are in an affected area that may be recognized for its scenic quality; visual resources are not protected by existing legislation.
Yukon Kuskokwim Coastal Lowland and Kuskokwim Mountains	Change in Landscape Character - Kuskokwim River	Intensity: Same as above. Visual Contrast: Moderate Scale: Prominent Exposure: Transient Distance: F/M	Same as above.	At villages: 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. Elsewhere: The affected area would extend to the background distance zone (15 miles) and/or VRI scores for affected SQRU(s) would be altered.	Same as above.

Table 3.17-3: Summary Impacts of Alternative 2 on Visual Resources by Project Component

Impacts		Assessment Criteria[10]			
		Magnitude or Intensity[1]	Duration[2]	Extent or Scope[3]	Context[4]
Kuskokwim Mountains	Change in Landscape Character - Mine Strip (Air Strip)	Intensity: Weak visual contrast. Viewer duration is prolonged or transient, and experienced from foreground-middleground or background distance zones. Visual Contrast: Weak Scale: Not Evident Exposure: Transient Distance: B	Same as above.	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.	Visual resources of the affected area are in a landscape that is not recognized for its scenic value.
Physiographic Province: Pipeline					
Kuskokwim Mountains	Change in Landscape Character	Intensity: Intensity would range from weak to strong visual contrast against the existing landscape. Visual Contrast / Scale: Low to Strong – dependent upon vegetation type surrounding ROW and viewer perspective. Exposure: Transient Distance: B	Same as above.	Same as above.	Kuskokwim River: Visual resources in the affected area may be recognized for scenic quality; visual resources are not protected by existing legislation. Elsewhere: Visual resources of the landscape are not recognized for scenic value.

Table 3.17-3: Summary Impacts of Alternative 2 on Visual Resources by Project Component

Impacts		Assessment Criteria[10]			
		Magnitude or Intensity[1]	Duration[2]	Extent or Scope[3]	Context[4]
Nushagak-Big River	Change in Landscape Character	Intensity: Moderate visual contrast against the existing landscape, viewer duration is prolonged or transient, and views are experienced from foreground-middleground or background distance zones. Visual Contrast: Moderate Exposure: Transient Distance: B	Same as above.	Same as above.	Visual resources of the affected area are in a landscape is not recognized for its scenic value.
Tanana-Kuskokwim Lowlands	Change in Landscape Character	Intensity: Weak visual contrast. Viewer duration is prolonged or transient, and experienced from foreground-middleground or background distance zones. Visual Contrast: Weak Scale: Subordinate Exposure: Transient Distance: B; however, F/M where the ROW crosses the INHT	Same as above.	Same as above.	ROW crossing at INHT: Visual resources in the affected area may be recognized for scenic quality; visual resources are not protected by existing legislation. Elsewhere: Visual resources of the affected area are in a landscape that is not recognized for its scenic value.
Alaska Range	Change in Landscape Character	Intensity: Weak to moderate visual contrast against the existing landscape. Visual Contrast: Weak-Moderate Scale: Evident Exposure: Transient Distance: F/M where the ROW crosses, is collocated, or parallels the INHT	Same as above.	Same as above.	Same as above.

Table 3.17-3: Summary Impacts of Alternative 2 on Visual Resources by Project Component

Impacts		Assessment Criteria[10]			
		Magnitude or Intensity[1]	Duration[2]	Extent or Scope[3]	Context[4]
Upper Matanuska Valley	Change in Landscape Character	Intensity: Weak to Strong visual contrast against the existing landscape. Visual Contrast: Weak-Strong Scale: Evident Exposure: Transient Distance: F/M where the ROW crosses, is collocated, or parallels the INHT	Same as above.	Same as above.	Same as above.

Notes:

1 **Magnitude:** A measure of level of visual contrast and scale dominance of the Project, and viewer exposure and proximity to project features.
2 **Duration:** Measured by the anticipated temporal extent of impacts (how long effects would last in relation to the project).
3 **Geographic Extent:** Measured by the degree to which the affected area includes immediate foreground (<3 miles), foreground-middleground (3-5 mile), background views (15 miles), or seldom seen (beyond 15 miles) distance zones.
4 **Context:** Measured by the estimated sensitivity of viewers, applicable legislative protection of visual resources, and the potential for impacts to alter the human experience of the landscape.
5 **Change in Landscape Character:** Measured by the combined effect of visual contrast, scale dominance, viewer exposure, and geographic extent of contrast.
6 **Contrast:** The visual contrast of the project feature against existing landscape features, defined as: 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.
7 **Scale:** A measure of scale dominance of the Project relative to landscape features. Ranking includes: Not visually evident, visually subordinate, visually evident, and dominant.
8 **Exposure:** A description of viewer conditions classified as transient, stationary, or prolonged.
9 **Distance:** The typical viewing distance of a particular viewer group. F -- immediate foreground; F/M -- foreground-middleground; B -- background; SS -- seldom seen.
10 **Impacts :** Accounts for impact reducing design features proposed by Donlin Gold and Standard Permit Conditions and BMPs that would be required. It does not account for additional mitigation measures being considered.

3.17.3.4 ALTERNATIVE 3A – REDUCED DIESEL BARGING: LNG-POWERED HAUL TRUCKS

Alternative 3A would use liquefied natural gas (LNG) instead of diesel to power the large haul trucks that would move waste rock and ore from the open pits.

3.17.3.4.1 MINE SITE

Construction and Operations of the Donlin Gold Mine Site under Alternative 3A would result in similar direct impacts to visual resources as described in Alternative 2.

Though Operations of the LNG plant could introduce new sources of strong visual contrast in form, line, color, and texture; this structure would still be expected to be less dominant than excavated areas of the Lewis and ACMA pits. Use of LNG-powered haul trucks would not change the level of activity occurring at the mine site during the Operations Phase. Collectively, impact mechanisms for direct and indirect impacts to visual resources would be similar to that described under Alternative 2.

Direct effects from Closure of the Mine Site would be expected to result in similar reductions of indirect impacts to visual resources as described in Alternative 2.

3.17.3.4.2 TRANSPORTATION CORRIDOR

Under Alternative 3A, impacts similar to those under Alternative 2 would be expected to result from Construction, Operations, and Closure. Though peak annual Donlin Gold Project related barge traffic on ocean routes and the Kuskokwim River would be reduced, direct impacts would remain similar to Alternative 2.

3.17.3.4.3 PIPELINE

Under Alternative 3A, impacts to visual resources expected to result from Construction and Operations of the Pipeline would be the same as described for Alternative 2.

3.17.3.4.4 SUMMARY OF IMPACTS FOR ALTERNATIVE 3A

Under Alternative 3A, impacts to visual resources expected to result from Construction, Operations, and Closure of the Donlin Gold Project would be the same as described for Alternative 2. However, the intensity of impacts resulting from barge traffic on the Kuskokwim River would be reduced; visual contrast may be weak. Impacts associated with climate change would also be the same as discussed for Alternative 2. Design features, Standard Permit Conditions and BMPs most important for reducing impacts to visual resources are described in Alternative 2. Examples of additional measures being considered that are applicable to this resource are listed under Alternative 2.

3.17.3.5 ALTERNATIVE 3B – REDUCED DIESEL BARGING: DIESEL PIPELINE

Under Alternative 3B, a 19-inch diameter diesel pipeline would be constructed from Cook Inlet to the mine site along the same corridor as the natural gas pipeline to reduce diesel barging on the Kuskokwim River. Construction and Operations of the Donlin Gold Mine Site under

Alternative 3B would result in similar impacts to visual resources as described for Alternative 2. The diesel pipeline would be buried, and an additional segment to Tyonek Dock would cross the Beluga River using HDD.

3.17.3.5.1 MINE SITE

Direct and indirect impacts to visual resources from Construction, Operations, and Closure of Alternative 3B would be similar to those described for Alternative 2. Though increased diesel fuel storage would be required under Alternative 3B, Construction-related actions and resulting temporary direct impacts would remain the same.

3.17.3.5.2 TRANSPORTATION CORRIDOR

Direct impacts to visual resources resulting from Construction of Alternative 3B would be similar to that described for Alternative 2; however, additional direct impacts could result from construction (expansion) of the existing dock at Tyonek and Operations of the expanded port facility.

Direct and Indirect Impacts from Construction

Temporary direct impacts to visual resources would result from Construction-related actions required to expand the existing dock at the Tyonek North Foreland Facility. In terms of intensity, impacts would result in moderate visual contrast against the existing landscape from construction equipment and related activity. Existing forest vegetation would limit views of Construction-related actions in upland areas. In the Cook Inlet, where viewshed limiting factors such as topography and vegetation do not exist, visual contrast would be expected to attenuate to a weak level within five miles.

Direct and Indirect Impacts from Operations

Direct impacts would be expected to result from Operations of the barge landing at Tyonek. Impacts would result in strong visual contrast of ocean vessels against the existing backdrop of Tyonek when docked at the facility. When present, the large scale of these vessels could alter the landscape character in the immediate vicinity of the area; however, they would be consistent with other similar sized vessels present on the east side of the Cook Inlet. Operations-related impacts would extend through the life of the project, but intermittent. The extent and context of impacts would be the same as described for the Construction Phase.

Alternative 3B would reduce peak annual Donlin Gold related barge traffic on the Kuskokwim River to 64 compared to 122 in Alternative 2. Though barge traffic on the river would still occur, this reduction, combined with the temporary duration of exposure to the barges from sensitive viewer locations along the river, would reduce the intensity of impacts. This would result in weak visual contrast against the existing landscape. Direct impacts would not extend beyond the foreground-middleground distance zones (three to five miles). The duration of impacts would extend through the life of the project, but would be episodic. The context of direct impacts would affect villages along the Kuskokwim River and landscape character attributes of the Yukon Delta NWR that are considered scenic. No indirect impacts to visual resources would be expected to result from barge traffic on the Kuskokwim River during Construction or Operations of the proposed Donlin Gold Project under Alternative 3B.

3.17.3.5.3 PIPELINE

Direct and Indirect Impacts from Construction

Construction and Operations of the diesel pipeline under Alternative 3B would result in similar direct impacts to visual resources as described for the natural gas pipeline under Alternative 2.

Construction and Operations Phases under Alternative 3B would require an additional pipeline segment between Tyonek Dock and the start of the proposed corridor for the natural gas line, or a pipeline that would travel northwest from Port MacKenzie, around the Susitna Flats State Game Refuge, and across the Little Susitna and Susitna rivers to connect with the Alternative 3B alignment at approximately MP 28. Impacts to visual resources would result from Construction and Operations of the pipeline (vegetation clearing, construction infrastructure, pipeline delivery, pipeline installation, and maintenance of the ROW) would be similar to Alternative 2. Visual impacts associated with the additional pipeline segment between Tyonek Dock or Port MacKenzie and the start of the proposed corridor for the natural gas line is described below.

Vegetation Removal – Direct impacts from removal of vegetation for the additional pipeline ROW would result in moderate visual contrast against the existing landscape, with the intensity of this action to increase incrementally as the ROW would be cleared. As in Alternative 2, the cleared ROW is expected to appear as a discrete and uniform bold line or shape characterized by weak to moderate visual contrast against the surrounding landscape. Visual contrast would be greatest when viewed from aerial locations such as low-flying recreational aircraft; however, lines would appear consistent with existing lines on the landscape surrounding Tyonek Dock or Port MacKenzie. As in Alternative 2, visual contrast resulting from vegetation clearing within the construction ROW would last only for the duration of the Construction Phase, as shrub and groundcover vegetation would re-establish naturally within 10 years. In some areas, revegetation would be expedited by reseeding with Alaska-certified weed-free products (SRK 2013b). The extent or scope of impacts would be predominantly restricted to the foreground-middleground distance zone (three to five miles) as views would be shielded due to vegetation and topography. Construction-related actions would occur in areas with no sensitive viewers or special management areas are identified in this location.

Construction Infrastructure – There are no activity nodes identified for the additional pipeline segment between Tyonek Dock or Port MacKenzie and the start of the proposed corridor for the natural gas line.

Pipeline Installation – For the additional pipeline segment, direct impacts to visual resources would be expected to result from installation of the pipeline, particularly where crossing of the Beluga, Susitna, or Little Susitna Rivers would be completed using HDD. Similar impact mechanisms pertaining to pipeline installation would occur with direct impacts resulting from the moderate visual contrast of darker color and rough texture of excavated areas against the surrounding landscape. In terms of intensity, these impacts would result in strong visual contrast against the existing landscape. Where HDD occurs, additional activity of personnel and presence of equipment could attract attention. Visual contrast resulting from pipeline installation would last only for the duration of the Construction Phase, as extra work spaces would be restored, and ground cover vegetation within the operational ROW would reestablish. The extent or scope of direct impacts would not extend beyond the foreground-middleground distance zone (three to five miles), as views of construction-related actions would be limited by existing vegetation. Direct impacts would affect areas with no sensitive

viewers or special management areas on the Beluga River, the Susitna River, or the Little Susitna River.

The option to utilize Port MacKenzie would cross the INHT at 17 locations, would be collocated for 2.6 miles, and would be within 1,000 feet of the INHT for 16.9 miles. Impacts to visual resources would be the same as Alternative 2 in the Upper Matanuska Valley physiographic province.

Direct and Indirect Impacts from Operations

Direct impacts would be expected to result from Operations of the proposed new pipeline segment between Tyonek Dock or Port MacKenzie and the start of the corridor for the natural gas pipeline. Though the ROW would appear as a bold and discrete line, this feature would be consistent with existing lines in the landscape in this area. In terms of intensity, these impacts would result in weak to moderate visual contrast of the cleared ROW against the existing landscape. Direct impacts of the ROW would be largely restricted by existing vegetation. Operation of the ROW would occur in areas with no sensitive viewers or special management areas, with the exception of the where the Port MacKenzie option would affect the INHT. Impacts would be the same as described in Alternative 2, Upper Matanuska Valley.

Summary of Impacts for Pipeline

Direct impacts are expected to result from construction of the proposed ROW. The intensity of impacts would range from moderate to strong visual contrast of vegetation clearing and HDD against the existing landscape. Direct impacts would be reduced during the Operations Phase. The vegetation clearing required to maintain the ROW would result in visual contrast of the operational ROW that may not be noticeable or apparent, and consistent with existing lines in the landscape in this area. Direct impacts would be largely restricted to the foreground-middleground by existing vegetation. In terms of context, the affected area is not considered to have sensitive viewers or identified special management areas, except where the Port MacKenzie Option would affect the INHT. This alternative would also include an option for a collocated diesel and natural gas pipeline; however the impacts would be the same.

3.17.3.5.4 SUMMARY OF IMPACTS FOR ALTERNATIVE 3B

The intensity of impacts would range from moderate to strong visual contrast of vegetation clearing against the existing landscape. The extent or scope of direct impacts would be largely limited to foreground-middleground distance zones due to existing topography, riverbends, and vegetation. The context of the action would affect villages along the Kuskokwim River, and landscape character attributes of the Yukon Delta NWR as well as INHT users. Direct impacts would occur during the Construction and Operations phases that would extend through the life of the project, but would be reduced during Closure. Impacts associated with climate change would also be the same as discussed for Alternative 2. Design features, Standard Permit Conditions and BMPs most important for reducing impacts to visual resources are described in Alternative 2. Additional mitigation measures are also described in Alternative 2. Examples of additional measures being considered that are applicable to this resource are listed under Alternative 2.

3.17.3.6 ALTERNATIVE 4 – BIRCH TREE CROSSING PORT

3.17.3.6.1 MINE SITE

Construction and Operations of the Donlin Gold Mine Site under Alternative 4 would result in similar impacts to visual resources as those described for Alternative 2.

3.17.3.6.2 TRANSPORTATION CORRIDOR

Direct impacts to visual resources from Construction and Operations of the BTC Port site would result in similar direct impacts to visual resources as described for the Angyaruaq (Jungjuk) Port site and the mine access road; however, overall impacts to the Kuskokwim River would be reduced.

Direct and Indirect Impacts from Construction

Similar to construction of the Angyaruaq (Jungjuk) Port site and the mine access road, direct impacts to visual resources would result in moderate visual contrast of port construction, vegetation clearing and grading of the mine access road, excavation of material sites, and increased activity of construction related vessel traffic against the existing landscape. The duration of impacts would last only for the Construction Phase. For all facilities and infrastructure, visual contrast in form line, color, and texture would increase incrementally as construction progressed. Construction-related activities would be limited by the Portage Mountains to the west, and the Russian Mountains and foothills to the east. To the south, views would be expected to be limited by upland vegetation. Affected areas recognized for scenic quality could be affected as viewers engaged in recreation and subsistence on the river would experience views of the facility. However exposure would episodic, as views would typically be experienced while in-transit up or down the river.

Direct and Indirect Impacts from Operations

Operations of the BTC Port site and mine access road would result in similar direct impacts to visual resources as described for the Angyaruaq (Jungjuk) Port site and the mine access road. While the access road to the BTC Port site would be longer, impacts are expected to be similar to those found under Alternative 2. For the Transportation Corridor, direct impacts would result in strong visual contrast of facilities and related barge and vehicle activity, particularly when viewed from the Kuskokwim River. As described in construction impacts, the visibility of direct impacts would be limited by vegetation and topography.

Operations of the BTC Port site and mine access road would result in a reduction in impacts to the Kuskokwim River as compared to Alternative 2. Barge traffic on the Kuskokwim would range in intensity from low to moderate visual contrast against the existing landscape. Villages along the Kuskokwim River located upriver of the Port would not be affected, thereby reducing the effect on resources of the Kuskokwim River (villages and Yukon Delta NWR) that are recognized for their scenic quality.

As in Alternative 2, no indirect impacts to visual resources are expected to result from barge traffic on the Kuskokwim River during Construction or Operations of the Donlin Gold Project.

Closure of the BTC Port site would result in reduced indirect impacts to visual resources as sources of visual contrast would be removed and existing landscape character would be restored.

3.17.3.6.3 PIPELINE

Construction and Operations of the Pipeline under Alternative 4 would result in similar impacts to visual resources as described for Alternative 2.

3.17.3.6.4 SUMMARY OF IMPACTS FOR ALTERNATIVE 4

The Construction, Operations, and Closure of the Donlin Gold Project under Alternative 4 would result in similar direct and indirect effects to visual resources as described for Alternative 2. Impacts associated with climate change would also be the same as discussed for Alternative 2. Design features, Standard Permit Conditions and BMPs most important for reducing impacts to visual resources are described in Alternative 2. Additional mitigation measures are also described in Alternative 2. Examples of additional measures being considered that are applicable to this resource are listed under Alternative 2.

3.17.3.7 ALTERNATIVE 5A – DRY STACK TAILINGS

Under Alternative 5A, the method of handling tailings for the mine site would be dry stack tailings, rather than the wet tailings of the TSF in Alternative 2. Other project components (i.e., Transportation Corridor and the Pipeline) would not be affected by this alternative.

The Construction, Operations, and Closure of the Donlin Gold Project under Alternative 5A would result in similar direct and indirect effects to visual resources as described for Alternative 2. Impacts associated with climate change would also be the same as discussed for Alternative 2. Design features, Standard Permit Conditions and BMPs most important for reducing impacts to visual resources are described in Alternative 2. Additional mitigation measures are also described in Alternative 2. Examples of additional measures being considered that are applicable to this resource are listed under Alternative 2.

3.17.3.8 ALTERNATIVE 6A – MODIFIED NATURAL GAS PIPELINE ALIGNMENT: DALZELL GORGE ROUTE

3.17.3.8.1 MINE SITE AND TRANSPORTATION CORRIDOR

The Construction, Operations, and Closure of the Mine Site and Transportation Corridor under Alternative 6A would result in similar direct and indirect effects to visual resources as described for Alternative 2.

3.17.3.8.2 PIPELINE

Construction and Operations of the Pipeline under Alternative 6A would result in similar direct impacts to visual resources as described for Alternative 2 for all portions of the pipeline segment, except for the segment extending from Threemile Creek to the South Fork of the Kuskokwim River (MP 111.6-126) where the pipeline would be routed through Dalzell Gorge.

Impact mechanisms for the Dalzell Gorge segment would be similar to those described for pipeline construction under Alternative 2, with direct impacts resulting primarily from vegetation removal, construction infrastructure, and pipeline delivery. South of the Tatina and South Fork Kuskokwim River confluence, construction would occur between May and August. North of the Tatina and South Fork Kuskokwim River confluence, construction would occur between November and April.

Direct and Indirect Impacts from Construction

Vegetation Removal and Pipeline Installation – During Construction, direct impacts to visual resources from vegetation clearing would be similar to those described for Alternative 2. Direct impacts would result from vegetation clearing and exposure of soils in excavated areas. Intensity of this action would increase incrementally as ROW clearing progressed along the alignment. Vegetation clearing would appear as a uniform line characterized by moderate visual contrast between Rainy Pass and the Kuskokwim River, where the landscape is characterized by bare ground or low stature. Visual contrast would be reduced where the ROW would parallel the South Fork of the Kuskokwim River, as vegetation cover in this area is patchy to absent. Direct impacts would last only for the duration of the Construction Phase and not extend beyond the foreground-middleground distance zone due to the rugged topography and ability of the landscape to limit viewshed extent. Vegetation clearing north of the Tatina and South Fork Kuskokwim River confluence would occur between November and April. These activities could affect resources of the INHT as activities could coincide with periods of high use during the winter season.

Direct and Indirect Impacts from Operations

During Operations, direct impacts to visual resources are expected to result from vegetation management within the operational ROW in the Dalzell Gorge route. Direct impacts would be similar to those described for the northern portion of the Alaska Range between Threemile Creek and the South Fork of the Kuskokwim River. Direct impacts are expected to result in weak to moderate visual contrast of the operational ROW against the surrounding landscape (Figure 3.17-24). Direct impacts would be largely restricted to foreground-middleground distance zone, but could affect a resource recognized for its scenic quality where the proposed ROW crosses SQRU AR-03, AR-04, and AR-5 of the INHT.

SQRU AR-03 and AR-04 are located in the Rainy Pass and Dalzell Gorge section of the Alaska Range. Predominant landscape character attributes include the enclosed visual corridor surrounded by jagged peaks and narrow U-shaped valleys (BLM 1982). This area has expansive views as well as steep descent and curves in the trail. AR-03 is characterized by “significant views”, whereas AR-04 is characterized by the steep descent and curves in the trail. The ROW would be collocated with the INHT for large portions of this route, thereby minimizing perceived visual contrast of recreationists on the trail.

SQRU AR-05 is located north of the confluence of the Tatina River and the South Fork of the Kuskokwim River, dominant scenic attributes in this unit include the broad and expansive views to the west as the valley opens, and the diversity of lower elevation vegetation communities. Visual contrast of the proposed ROW would be expected to increase in this section as removal of vegetation in the operational ROW could create discrete edges that result

in a bold and distinct straight line in the landscape. This action could result in an increased perception of cultural modification and vegetation patterns may appear unnatural.

3.17.3.8.3 SUMMARY OF IMPACTS FOR ALTERNATIVE 6A

Direct and indirect impacts to visual resources expected to result from Construction and Operations of the Mine Site, Transportation Corridor, and Pipeline under Alternative 6A would be similar to those described for Alternative 2. However, the proposed ROW would be located within 1,000 feet of the INHT for an additional 18.9 miles, which is recognized for its scenic quality.

Direct impacts from Construction would result in moderate visual contrast of vegetation clearing in the ROW and exposed soils in excavated areas of the Pipeline corridor. The duration of direct impacts would extend for the life of the Project. The extent or scope of impacts would be largely restricted to the foreground-middleground distance zone (three to five miles). In terms of context, impacts would affect resources in the INHT that are recognized for scenic quality, particularly in the Rainy Pass and Dalzell Gorge area where construction would occur in the winter months. Impacts associated with climate change would also be the same as discussed for Alternative 2. Design features, Standard Permit Conditions and BMPs most important for reducing impacts to visual resources are described in Alternative 2. Additional mitigation measures are also described in Alternative 2. Examples of additional measures being considered that are applicable to this resource are listed under Alternative 2.

3.17.3.9 ALTERNATIVES IMPACT COMPARISON

A comparison of the impacts to visual resources by alternative is presented in Table 3.17-4.

Table 3.17-4: Comparison of Impacts by Alternative* for Visual Resources

Impact-causing Project Component	Alt. 2 – Proposed Action	Alt. 3A – LNG-Powered Haul Trucks	Alt. 3B – Diesel Pipeline	Alt. 4 – BTC Port (and Road)	Alt. 5A – Dry Stack Tailings	Alt. 6A – Dalzell Gorge Route
Mine Site	Contrast: Strong Scale: Dominant	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.
Transportation Corridor	Exposure: Transient; Geographic Extent Extending from Bethel to Angyaruaq (Jungjuk) Port.	Same as Alternative 2.	Exposure: Transient; Geographic Extent: Extending from Bethel to Angyaruaq (Jungjuk) Port, and also including the expanded Port facility at Tyonek or Port MacKenzie.	Exposure: Transient; Geographic Extent: Extending from Bethel to the Birch Tree Crossing site.	Same as Alternative 2.	Same as Alternative 2.
Pipeline: Crosses or parallels INHT in SQRU AR-6, AR-2, AR-1, SL-8, SL-7, SL-6, SL-5, and SL-4.	Number of INHT crossings: 14 or 5 Length of INHT Collocation : 2.5 or 0.2 miles Length of Trail Segment within 0- 5 mile Viewshed of Pipeline: 14 miles or 5	Same as Alternative 2.	Same as Alternative 2, as vegetation management of the ROW between the Tyonek Dock and the start of the proposed corridor would occur in areas characterized by low stature vegetation.	Same as Alternative 2.	Same as Alternative 2.	Number of INHT crossings: 34 Length of INHT Collocation : 14.5 Length of Trail Segment within 0- 5 mile Viewshed of Pipeline: 9.5 miles
Impact Summaries						
Mine Site	Intensity: Strong visual contrast against the existing landscape due to mining equipment, ACMA and Lewis pits, and infrastructure. Duration: Impacts would persist following Closure of the Mine Site. Extent or Scope: The affected area would be largely restricted to the foreground-middleground distance zone (3-5 miles). Context: The affected area is not recognized for its scenic value and does not contain sensitive viewers.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.
Transportation Corridor	Intensity: Moderate visual contrast against the existing landscape due to increased barge and port traffic. Duration: Changes in landscape character would extend through the life of the project. Extent or Scope: The affected area would be largely restricted to the foreground-middleground distance zone (3-5 miles). Context: Discrete areas along the Kuskokwim River are recognized for their scenic quality.	Impacts would be similar to Alternative 2; however, the intensity of impacts resulting from barge traffic would be less as the number of trips would be reduced.	Impacts would be similar to Alternative 2; however, the intensity of impacts resulting from barge traffic would be less as the number of trips would be reduced. Also, additional direct impacts could result from construction (expansion) of the existing dock at Tyonek and operations of the expanded port facility.	Impacts would be similar to Alternative 2; however, impacts resulting from barge traffic would not extend above the BTC Port site, thereby eliminating impacts to villages between Aniak and Crooked Creek.	Same as Alternative 2.	Same as Alternative 2.
Pipeline	Intensity: Intensity of impacts would vary depending on the location, with weak to moderate visual contrast against the existing landscape where the ROW would cross areas characterized by low stature or variable vegetation structure. Visual contrast would be moderate to strong where the ROW crosses areas characterized by open or closed forests. Visual contrast of the ROW would be strongest in these areas when viewed from elevated or aerial vantage points. Duration: Same as above for the Transportation Corridor. Extent or Scope: Same as above for the Transportation Corridor. Context: Same as above for the Transportation Corridor.	Same as Alternative 2.	Impacts would be similar to Alternative 2; however, additional direct impacts could result from additional pipeline segments from either Tyonek or Port MacKenzie.	Same as Alternative 2.	Same as Alternative 2.	Impacts would be similar to Alternative 2; however, the pipeline would cross, be collocated, or be located in close proximity to the INHT for a greater percentage of the corridor.

Notes:

* The No Action Alternative would have no impacts on Visual Resources.