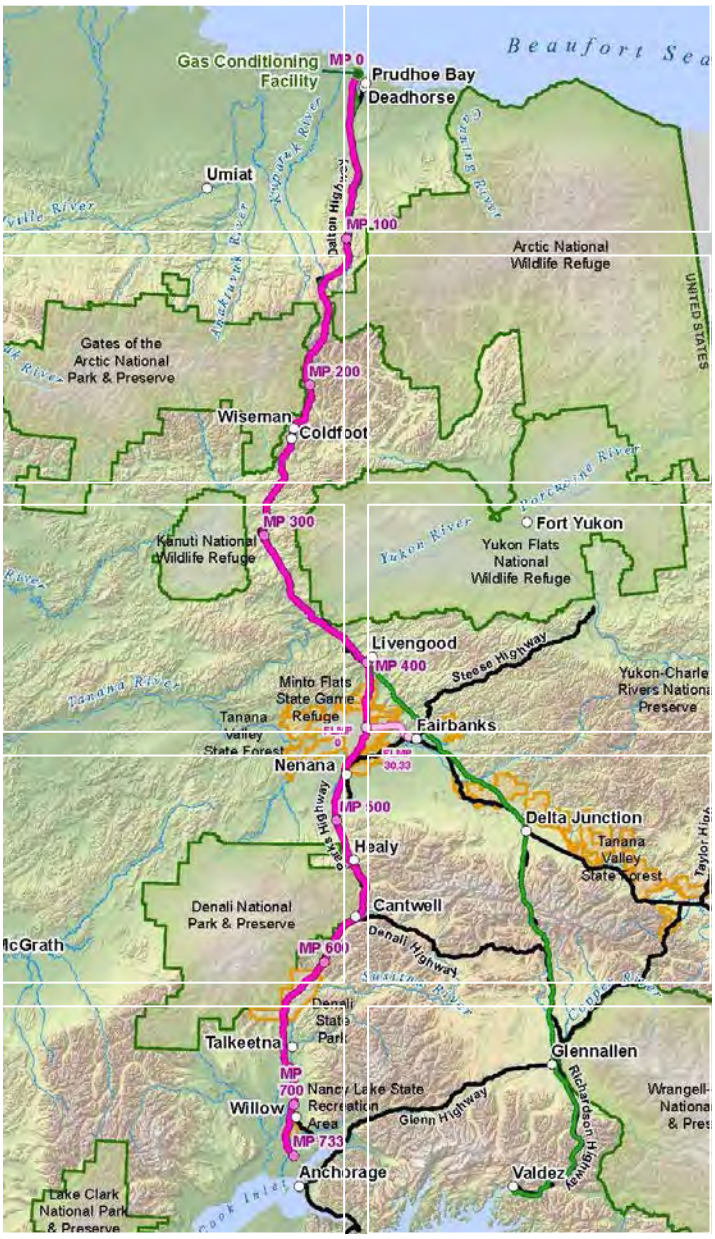

Prepared for:

US Army Corps of Engineers
Alaska District

Alaska Stand Alone Pipeline Project

Final Supplemental Environmental Impact Statement

Executive Summary

June 2018

Photo credits: Alaska Gasline Development Corporation, U.S. National Park Service, Alaska Department of Fish & Game, Alaska Department of Natural Reources, and U.S. Fish & Wildlife Service

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Alaska Stand Alone Pipeline Project

Final Supplemental Environmental Impact Statement

Executive Summary

June 2018

United States Army Corps of Engineers, Alaska District

In Cooperation with:

U.S. Bureau of Land Management
U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration
U.S. National Park Service
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
Alaska Department of Natural Resources, State Pipeline Coordinator's Section

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Acronyms and Abbreviations

AGDC	Alaska Gasline Development Corporation
APE	Area of Potential Effect
ASAP	Alaska Stand Alone Pipeline
BLM	Bureau of Land Management
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DA Application	Department of the Army Permit Application
DH	Dock Head
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
GCF	Gas Conditioning Facility
GHG	Greenhouse Gas
HAP	Hazardous Air Pollutant
HDD	Horizontal Directionally Drilled
MMscfd	million standard cubic feet per day
NEPA	National Environmental Policy Act
NOA	Notice of Availability
NPP	National Park and Preserve
NRHP	National Register of Historic Places
psig	pound per square inch gauge
ROW	right-of-way
SEIS	Supplemental Environmental Impact Statement
TAPS	Trans-Alaska Pipeline System
U.S.	United States
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
VRM	Visual Resource Management
VSM	Vertical Support Members

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EXECUTIVE SUMMARY

INTRODUCTION

The Alaska Stand Alone Pipeline (ASAP) Project is a 733-mile-long, buried, natural gas pipeline system spanning from Alaska's North Slope to an existing natural gas distribution system (ENSTAR Natural Gas Company [ENSTAR]) that serves the Southcentral region of the state. The intent of this Supplemental Environmental Impact Statement (SEIS) is to evaluate, in compliance with the National Environmental Policy Act (NEPA) (42 United States [U.S.] Code [U.S.C.] 4321 et seq.) and the U.S. Army Corps of Engineers' (USACE) NEPA Guidance[1], the potential direct, indirect, and cumulative impacts on the human environment of constructing and operating the proposed ASAP Project and alternatives.

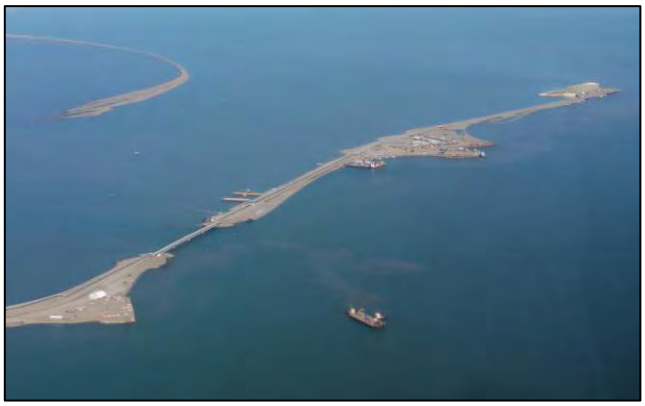
As a supplement to the Final Environmental Impact Statement (FEIS) published by USACE in October 2012, this SEIS focuses on evaluating changes to the proposed Project that have occurred since the FEIS. These Project changes are evaluated within this document to fulfill the NEPA compliance responsibilities for USACE and Cooperating Agencies. This SEIS intends to disclose information to the public, allow for comments, and provide agency decision-makers with data necessary for making informed permitting decisions.

This executive summary provides an overview of the following topics:

- Project Background (including Project changes, scoping, and Draft SEIS comment period and next steps)
- Project Purpose and Need
- Alternatives (including the proposed Action [Alternative 1], the Denali National Park and Preserve [NPP] Route Variation [Alternative 2], and the No Action alternative [Alternative 3])
- Environmental Consequences (including steps for determining level of impact, mitigation measures considered, and cumulative effects)

PROJECT BACKGROUND

On December 4, 2009, USACE, Alaska District, and seven Cooperating Agencies initiated the NEPA process for the proposed ASAP Project. A Draft Environmental Impact Statement (EIS) was issued on January 20, 2012 (USACE, 2012b) and the FEIS was issued on October 9, 2012 (USACE, 2012a). The 2012 FEIS examined the potential impacts of construction and operation of a proposed natural gas pipeline from the North Slope of Alaska to Fairbanks and the Cook Inlet area. The original 2012 FEIS can be accessed online from the ARLIS website at: http://www.arlis.org/thepipefiles/Record/1472882.

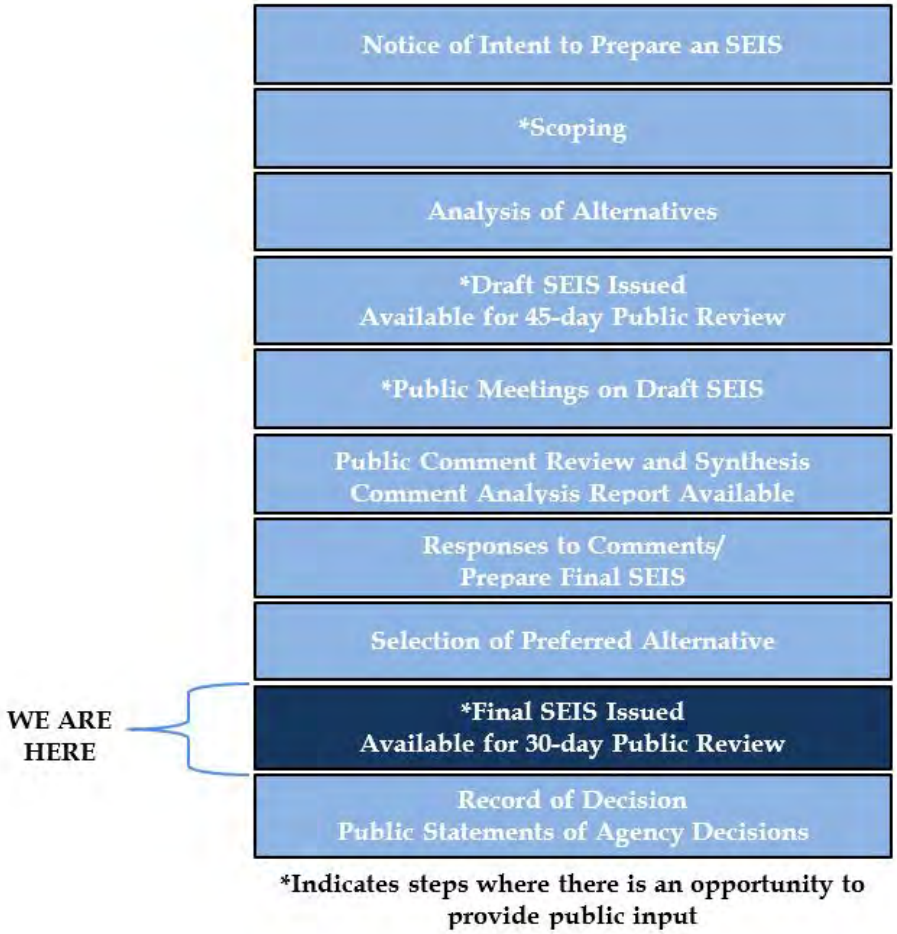


[1] 33 Code of Federal Regulation (CFR) 230 Procedures for Implementing NEPA

Since the publication of the 2012 FEIS, Alaska Gasline Development Corporation (AGDC) has selected the location for material sites, access roads and other infrastructure, as well as proposed revisions to the ASAP Project based on several design improvements that would increase efficiency, make gas more accessible and affordable, and reduce environmental impacts.

Whenever there are changes, new information, or new circumstances for a project for which a draft or final EIS has been prepared, a determination must be made as to whether these result in significant environmental impacts that were not evaluated in the EIS, and therefore, warrant the need for preparation of an SEIS. USACE determined that an SEIS was required based on a revised Department of the Army Permit Application (DA Application) submitted by ADGC on July 23, 2014, requesting a Department of the Army permit pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344) and Section 10 of the Rivers and Harbors Appropriation Act of 1899 (33 U.S.C. 403) (AGDC, 2014b). AGDC subsequently submitted revised DA Applications to USACE in January 2016, July 2016, and April 2018. The Environmental Evaluation Document (and addenda) was also resubmitted to USACE in January 2016, and then amended in July 2016 (AGDC, 2016b). Figure ES-1 provides a summary of the steps in the NEPA process.

Figure ES-1 NEPA Process Overview Figure



Project Changes

Conceptual design changes and refinements that occurred between publication of the 2012 FEIS (USACE, 2012a) and the DA Application (AGDC, 2016a) are summarized below and described in Table 2.2-1 of Chapter 2.

- Use of lean natural gas (rather than enriched natural gas), which does not require additional facilities to make gas accessible
- The need for a 23-barge sealift (from a 9-barge sealift) requires dredging of a navigation channel at West Dock and nearshore disposal of the dredged material
- Reduced Mainline pipeline length (733 miles, a difference of 4 miles)
- Reduced Fairbanks Lateral length (30 miles, a difference of 4 miles)
- Increased Mainline pipeline diameter (36-inch, an increase of 12 inches)
- Refinements in the number and locations of materials sites, access roads, and other infrastructure and support facilities (*i.e.*, worker camps and pipeline storage yards)
- Route refinements (*i.e.*, alignment shifts for the North Slope, Minto Flats/Summer Ridge, Anderson/Clear, and Nancy Lake State Recreation Area, along Murphy Dome and Old Murphy Dome Roads for the Fairbanks Lateral, and refinements listed in Appendix M, Attachment II)

Scoping

A Notice of Intent to prepare an SEIS was published in the *Federal Register* (79 FR 44758) on August 1, 2014. A scoping period was held August 1 through October 14, 2014, to gather stakeholder input regarding the Project.

Public scoping meetings were held in 16 Alaska communities between August 18 and October 8, 2014. A total of 78 submissions were received in addition to verbal comments made during scoping meetings. In all, 26 issues were raised by stakeholders during the scoping process. These are included in Appendix Q of this SEIS.

Draft SEIS Comment Period

USACE published a Notice of Availability (NOA) in the *Federal Register* on June 30, 2017, which began the 60-day review period. USACE provided the times and locations of public meetings for the Draft SEIS, and provided the deadlines for submitting comments on the Draft SEIS. USACE, along with Cooperating Agencies, analyzed and responded to substantive comments received in response to the Draft SEIS. These comments and responses have been assimilated and published in an ASAP Comment Analysis Report (Appendix Q). USACE made changes in the SEIS reflecting comments received.

Final SEIS and Next Steps

USACE published a NOA in the *Federal Register* on June 22, 2018, which began the 30-day waiting period prior to publishing the Record of Decision.

As required by 40 CFR 230.10(a), USACE may only authorize the proposed Project's least environmentally damaging practicable alternative. USACE will issue the Record of Decision after the Final SEIS is released to the public. This decision document will conclude the NEPA process on the proposed Action.

Visit the ASAP Project website for Project updates: http://asapeis.com/.

PROJECT PURPOSE & NEED

The proposed ASAP Project would deliver North Slope natural gas to Fairbanks, Southcentral, and other communities in Alaska. The proposed Project would provide Alaskans with a stable, affordable, long-term supply of natural gas for heating and powering their homes and businesses. The purpose of AGDC, the Project sponsor, is established in Alaska Statute 31.25.005, which states that the corporation shall, for the benefit of the state, to the fullest extent possible:

> *…Develop and have primary responsibility for developing natural gas pipelines…and other transportation mechanisms to deliver natural gas in-state for the maximum benefit of the people of the state;*
>
> *When developing natural gas pipelines…and other transportation mechanisms to deliver natural gas in-state, provide economic benefits in the state and revenue to the state;*
>
> *Assist the Department of Natural Resources and the Department of Revenue to maximize the value of the state's royalty natural gas, natural gas delivered to the state as payment of tax, and other natural gas received by the state;*
>
> *Advance an in-state natural gas pipeline…in a safe, prudent, economical, and efficient manner, for the purpose of making natural gas…available to Fairbanks, the Southcentral region of the state, and other communities in the state at the lowest rates possible;*
>
> *…Endeavor to develop natural gas pipelines …to deliver natural gas…to public utility and industrial customers in areas of the state to which the natural gas…may be delivered at commercially reasonable rates; and*
>
> *Endeavor to develop natural gas pipelines …that offer commercially reasonable rates for shippers and access for shippers who produce natural gas…*

The proposed ASAP Project would provide up to 500 million standard cubic feet per day (MMscfd) of natural gas from North Slope gas reserves to in-state markets; thereby meeting current and projected future in-state energy demands (AGDC, 2014b; Northern Economics, Inc., 2013), as well as helping to improve air quality in the Fairbanks area.

ALTERNATIVES

USACE and Cooperating Agencies have, in accordance with guidance from the Council on Environmental Quality (CEQ) on implementing NEPA (40 CFR 1500) and USACE's own NEPA procedures for regulatory actions (Appendix B of 33 CFR 325), developed two alternatives to the proposed Action for evaluation in this Final SEIS. In line with CEQ guidance (40 CFR 1501.7), USACE has considered comments received during the scoping period (see Chapter 1, Section 1.10) in determining the substantive issues related to the proposed Action during development of the alternatives presented herein.

The differences between the proposed Action and Alternatives 2 and 3 can be summarized as follows:

- Proposed Action: The ASAP Project, including use of Dock Head 3 (DH3) at West Dock, nearshore disposal of dredge material, buried pipeline (except at fault crossings, elevated bridge stream crossings, pigging facilities, and block valve locations), strain-based pipeline design in discontinuous permafrost as required, and horizontal directional drilling (HDD) at the Yukon River;
- Alternative 2: The Denali NPP Route Variation, use of Dock Head 2 (DH2) at West Dock, ocean disposal of dredge material, pipeline elevated on vertical support members (VSMs) from MP 0 to MP 62, and aerial crossing at Yukon River; and
- Alternative 3: No Action Alternative.

The following sections provide an overview of Alternatives 1 and 2.

Alternative 1 - Proposed Action

The proposed ASAP Project would include construction of the following infrastructure:

- A gas conditioning facility (GCF) near Prudhoe Bay, which is capable of producing an annual average of 500 MMscfd of natural gas;
- A buried 36-inch, 733-mile-long, 1,480-pound per square inch gauge (psig) buried pipeline connecting the GCF to the existing ENSTAR pipeline system in the Matanuska-Susitna Borough; and
- A buried, 12-inch, 30-mile-long, 1,480-psig, lateral line connecting the Mainline to Fairbanks; and associated facilities.

The pipeline system would be designed to transport natural gas that would be accessible to and useable by the public.

The proposed pipeline would typically be buried with a minimum cover of 30 inches and a bottom-of-ditch depth of 6 to 8 feet, except at fault crossings, elevated bridge stream crossings, pigging facilities, and block valve locations. The proposed ASAP route would generally parallel the Trans-Alaska Pipeline System (TAPS) and Dalton Highway corridor to near Livengood, northwest of Fairbanks. At Livengood, the route would continue south, to the west of Fairbanks and Nenana. The pipeline would bypass Denali NPP to the east, and would then generally parallel the Parks Highway corridor to Willow, continuing south to its connection with ENSTAR's pipeline system at MP 39 of the Beluga Pipeline, southwest of Big Lake (Figure ES-2).

The following components are specific to Alternative 1: dredging of at DH3 (approximately 250,000 cubic yards), HDD crossing at the Yukon River, nearshore disposal of the dredged material in Prudhoe Bay as shown in ES-6, and a route that remains to the east of (outside the boundary of) the Denali NPP boundary from MP 535 to MP 543. The Fairbanks Lateral tie-in would be located approximately 2.5 miles south of the Mainline Chatanika River crossing at MP 440 of the Mainline. From the tie-in, the Fairbanks Lateral pipeline would travel east, following the Murphy Dome and Old Murphy Dome Roads, and then extending southeast into Fairbanks (Figure ES-3).

Additional details on specific aspects of Alternative 1, such as access roads and material sites, are provided in Section 2.2 of this SEIS.

Figure ES-2 Current ASAP Alignment

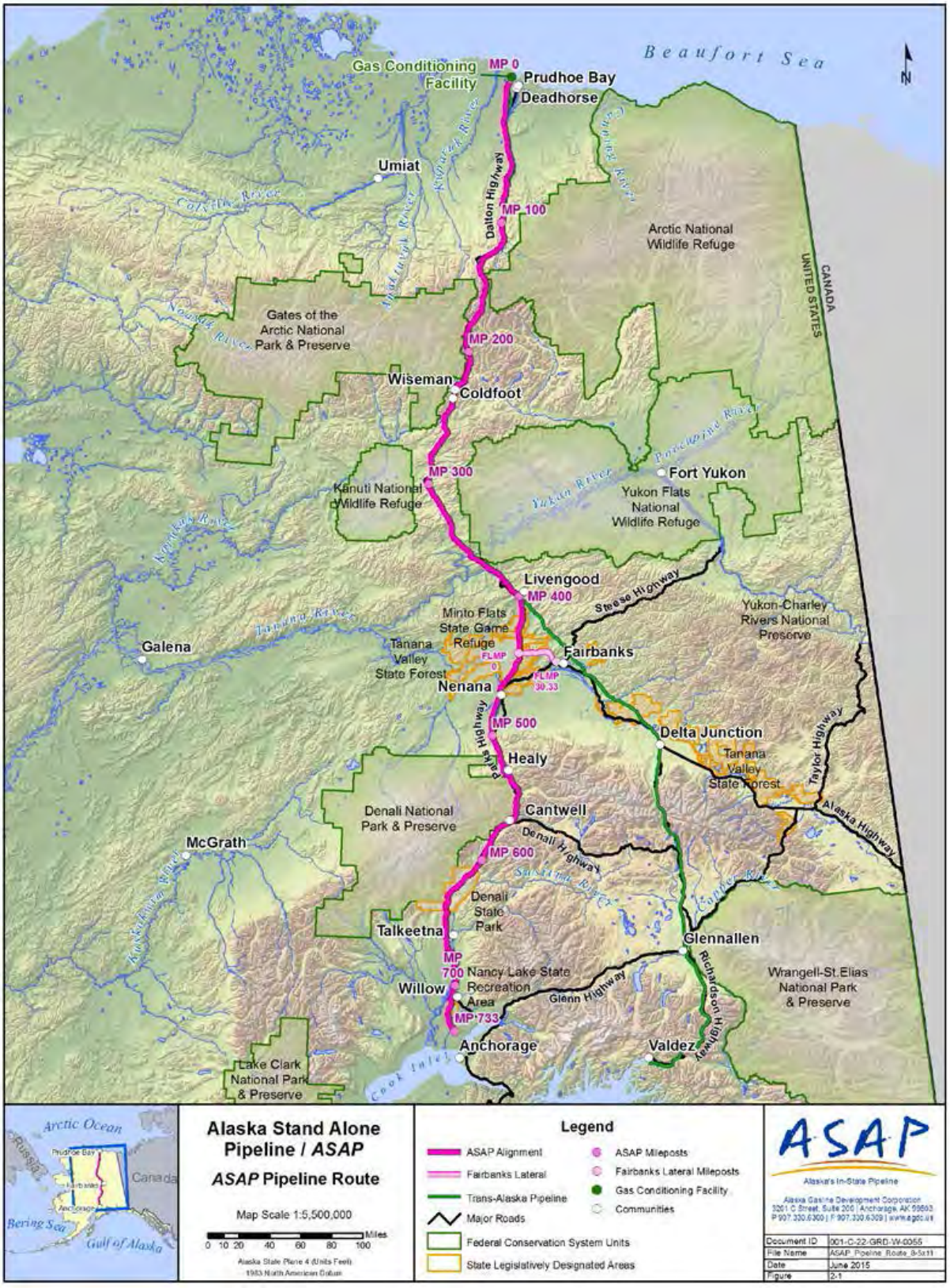
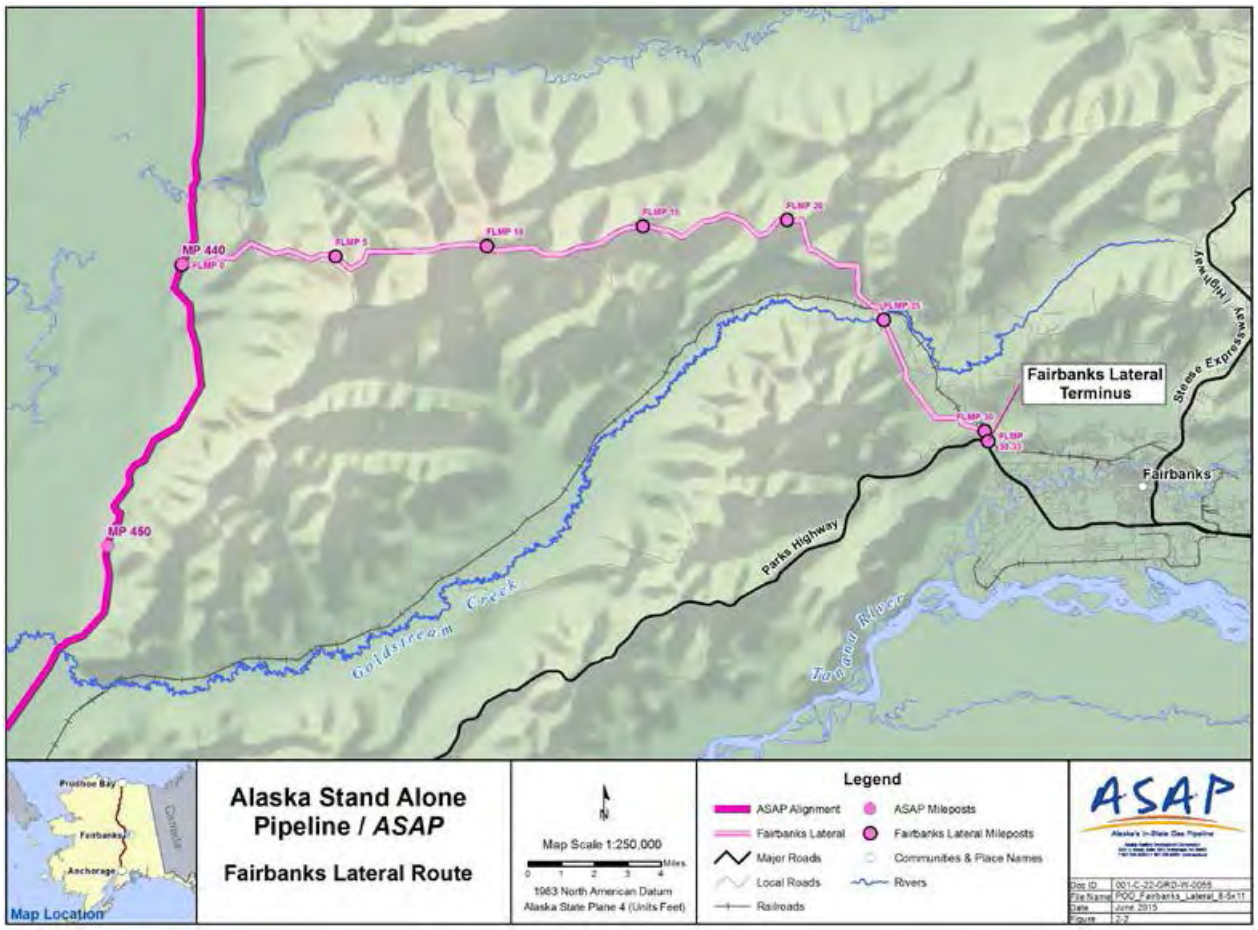


Figure ES-3 ASAP 2016 Fairbanks Lateral Alignment

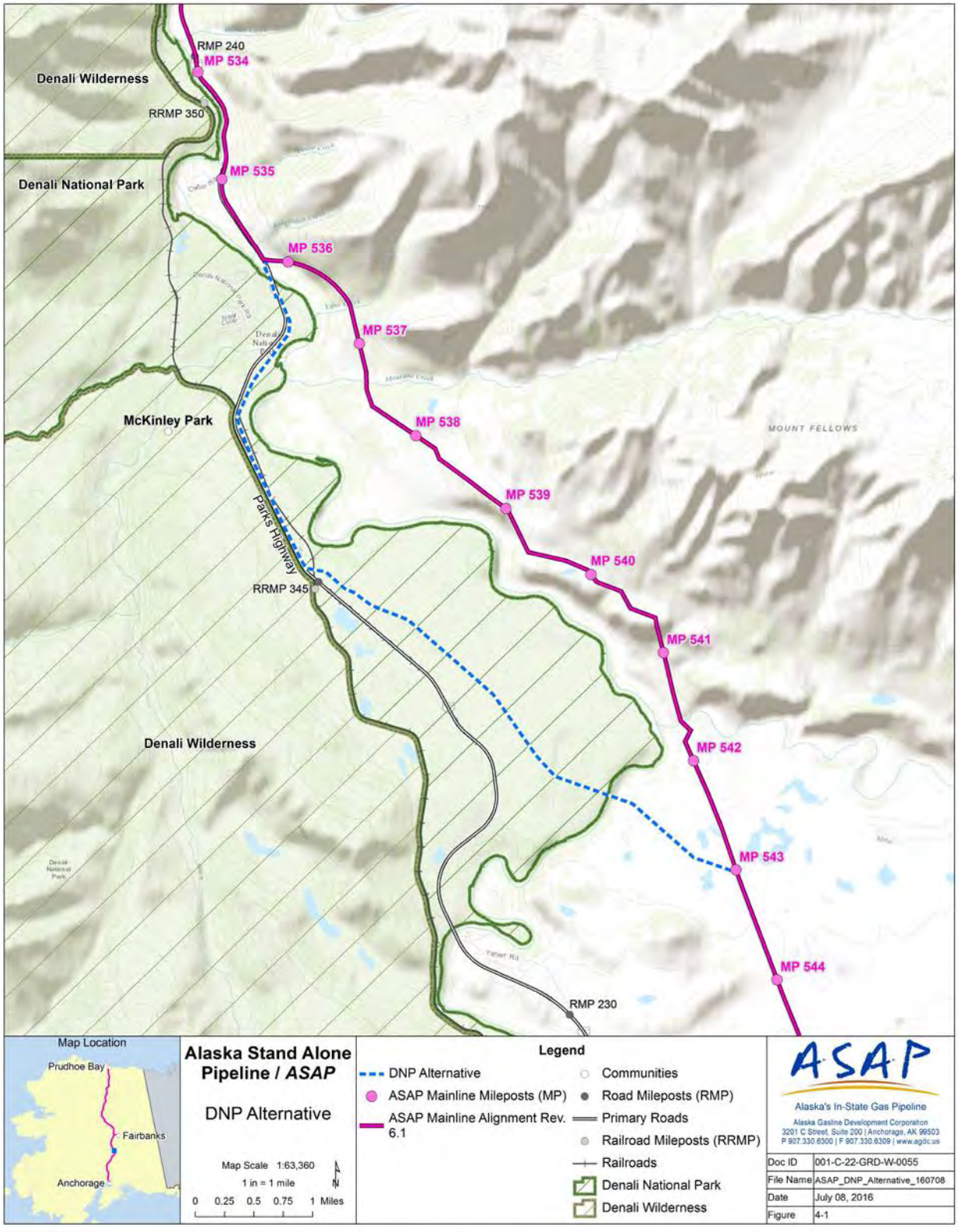


Alternative 2 - Denali National Park and Preserve Route Variation

The Denali NPP Route Variation (Alternative 2) would begin at MP 535.8 and enter the Denali NPP boundary, immediately upon crossing the western side of the Nenana River on the pedestrian bridge to the west of the Parks Highway (also contained within Denali NPP) (Figure ES-4). Just south of the pedestrian bridge, the Denali NPP Route Variation would cross the Parks Highway again (from west to east) and remains on the east side of the road. The route would parallel the highway until the second crossing south of the Denali NPP entrance, at which point the route would diverge from it.

At this location, the route would shift to the southeast, away from the Parks Highway, crossing the Nenana River downstream (east) of McKinley Village. The Denali NPP Route Variation would rejoin the proposed pipeline route at MP 543. The lengths of both routes are similar, only differing by about 0.3 mile. Routing and design through Denali NPP have attempted to utilize uplands and minimize environmental impacts to the extent practicable. The Denali NPP Route Variation is depicted as the blue dotted line shown in Figure ES-4.

Figure ES-4 Denali NPP Route Variation



Additional components of Alternative 2 include the following aspects:

- Aboveground pipeline mode (MP 0 to MP 62) and belowground (buried) pipeline mode MP 62 to MP 733.5 as well as the Fairbanks Lateral;
- DH2 at West Dock;
- Ocean disposal of dredge material; and
- Aerial crossing at Yukon River.

Under Alternative 2, the existing channel from DH2 would need to be widened and deepened to the 9-foot depth contour to accommodate large vessels delivering the modules. Bathymetric data suggest the depth at DH2 could require dredging more than 750,000 cubic yards to allow for the barges. To stabilize DH2, new sheet piling would be installed prior to beginning any dredge work. Under this alternative, dredge material would be disposed of in the ocean at the location depicted in Figure ES-6.

Alternative 2 includes aerial crossing of the pipeline across the Yukon River using a new suspension bridge. No permanent structures, such as footings, would be installed within the Yukon River under this alternative (see Figures 2.4-3 and 2.4-4 in Chapter 2). Additional aspects of Alternative 2 are discussed in Section 2.4.3 of this SEIS.

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Beaufort Sea

MP 0

Deadhorse

Aboveground Pipeline Mode

Umiat

MP 62

Anaktuvuk Pass

Wiseman

Bettles

Stevens Village

Rampart

Livengood

Tanana

Minto

Chena Hot Springs

Fox

Fairbanks

Anderson

Big Delta

Healy

McKinley Park

Cantwell

Talkeetna

Chickaloon

Willow

Susitna

Big Lake

MP 733

Anchorage

- City or Village

ASAP v6.1 Mainline

- Aboveground Pipeline Mode
- Belowground Pipeline Mode
- FBX v4.1 Lateral (Belowground)
- Beaufort Coastal Plain

Permafrost Extent - Alaska (Jorgenson et al 2008)

- Continuous (>90%)
- Discontinuous (50-90%)
- Sporadic (10-50%)
- Isolated (>0-10%)
- Glacier
- Large Waterbodies (unfrozen below)
- Absent

Service Layer Credits: Created from the dataset used for Jorgenson et al 2008 and provided to ABoVE by Guido Grosse.

ERM

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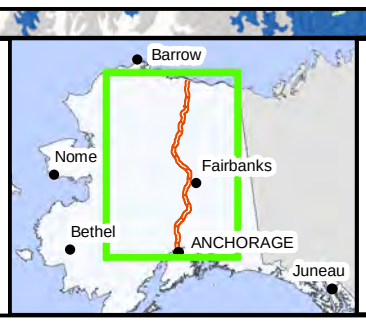
Figure ES-5: MILEPOST LOCATION WHERE VSMS END AND PIPELINE BURIAL BEGINS ALASKA STAND ALONE PIPELINE

0 25 50 100 150 Miles



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PROJ. No.: 0416166

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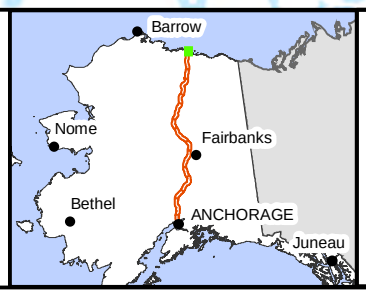
Figure ES-6: DREDGE MATERIAL DISPOSAL LOCATIONS FOR ALTERNATIVE 1 (PROPOSED ACTION) AND ALTERNATIVE 2 (DENALI NPP ROUTE VARIATION) ALASKA STAND ALONE PIPELINE

0 0.5 1 2 3 Miles



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Alternative 3 - No Action

Section 1502.14 of NEPA requires federal agencies to explore all reasonable alternatives, including the alternative of No Action. The No Action alternative provides a benchmark, enabling decision makers to compare the magnitude of environmental effects of the action alternatives.

In this case, No Action (Alternative 3) would mean that utility-grade natural gas would not be transported via pipeline from the North Slope to southcentral Alaska because no pipeline would be constructed. Additionally, no operations and maintenance requirements would exist.

ENVIRONMENTAL CONSEQUENCES

The direct and indirect effects, or environmental consequences, to the human environment were analyzed for each alternative. Each alternative was also evaluated to determine its contribution to cumulative effects on each biological, physical, or socioeconomic resource. Detailed analyses and discussions of effects can be found in Chapter 4.

Steps for Determining Level of Impact

The impact criteria used to determine the significance, context, and intensity of the impacts, as required by the CEQ, are described below.

- The geographic extent of the potential impacts are described in terms of the species or regional level, subpopulation or local level and the individual level;
- The duration or frequency of the impact was considered either short-term if the impacts are expected to be temporary in nature, or long-term if the effects are expected to last for years or permanently;
- The magnitude or intensity of the impact is described in terms of the extent that the impact could alter a resource in a way that would degrade its value, integrity, or function to the point that it could not be used, or would endanger/harm biological resources or human health; and
- The likelihood was evaluated based on an assumed percent chance that the impact would occur.

Specific criteria were developed in terms of the parameters described above and used to evaluate whether the impacts to each resource were major, moderate, minor, or negligible. These criteria are described under each resource section in Chapter 4.

Mitigation Measures Considered

In compliance with CEQ guidance, and as described in Chapter 2, the route for Alternative 1 (proposed Action) has undergone several revisions since 2012 to refine the alignment and reduce impacts to resources and communities. AGDC has incorporated several design features, mitigation measures, and Best Management Practices (BMPs) (which are provided in Appendix M) to minimize impacts of the proposed Project. Appendix M, Attachment I, presents a list of mitigation measures and BMPs proposed by AGDC, while Part II provides route changes (including the specific MP location) and the rationale behind AGDC's proposed change for minimizing potential impacts. Each resource section in Chapter 4 includes a specific section titled "*Applicant-Proposed Design Features, Mitigation Measures, Best Management Practices, and Project Management Plans,*" which includes

resource-specific measures evaluated in the analysis. Therefore, the conclusions presented in this SEIS include consideration of these measures proposed by AGDC.

Chapter 4 also describes regulatory agency-required or recommended measures to be considered during permit evaluation process for the chosen alternative. Summary of Environmental Consequences

The direct and indirect effects, or environmental consequences, to the human environment were analyzed for each alternative. Table ES-1 below provides a summary of environmental resources considered, along with key impact issues evaluated in this SEIS.

Context figures for each environmental resource illustrate the varying degrees of the potential impacts discussed in Table ES-1 and place the key findings from the impact analysis into a geographic context. Context Figures ES-7 through ES-29 are intended to summarize the Project's overall impacts at a large scale; these figures are only a component of the complete description of potential environmental consequences described in Chapter 4. The context figures are provided at the end of this executive summary.

The steps used to determine the level of impact, as well as the resources that are expected to be subjected to greater impacts or receive greater attention, are described in more detail in the following subsections. Alternative 3 (No Action) is expected to have negligible impacts to all resources during construction or operations and maintenance, unless otherwise specified in Table ES-1.

Table ES-1 Summary of Environmental Consequences

Environmental Resource	Summary of Potential Impacts
Soils and Geology	• The most significant impacts to soil and geologic resources could occur in areas of continuous and discontinuous permafrost, while there would be negligible impacts where continuous and discontinuous permafrost does not occur. Significant impacts to drainage patterns, vegetation, and landscape could occur in areas where the pipeline is buried in frost susceptible soil and/or sensitive terrain. Thus, both alternatives would have major impacts to soil and geologic resource. • Construction and operation of a pipeline and other facilities in active layer soils above permafrost may result in propagation of permafrost thaw and alternations to drainage patterns. Permafrost thaw and development of frost bulbs could reduce environmental functions and could result in reduced support for the pipeline. • Thaw and development of frost bulbs could alter the thermal regime and change drainage patterns. Propagation of thaw into surrounding soils could occur and present a positive feedback loop where changes in the thermal regime and water flow routes result in additional degradation. • Alternative 2 would have less impact as the pipeline would be constructed aboveground from MP 0 to MP 62. Impacts to discontinuous permafrost would still be considered major. • A geographic representation of expected impacts within the proposed Project Area is provided in Figures ES-7 and ES-8, immediately following this executive summary.
Water	• Impacts to water resources including surface water, groundwater, stream bank stability and geomorphology, flooding, and water availability are expected to range from moderate to major during construction and minor to moderate during operations. • The effect of thawing of permafrost could significantly alter the groundwater flow characteristics in addition to contributing to soil subsidence, erosion, and impacts to surface

Environmental Resource	Summary of Potential Impacts
	water, especially in areas of discontinuous permafrost (MP 168 to MP 634). Impacts to permafrost could permanently and irreversibly alter the permafrost and groundwater flow. • Impacts to surface water and stream bank stability are expected to occur somewhat equally throughout the proposed Project Area at open-cut and isolated open-cut stream and waterbody crossings as well as sediment loading from aboveground facilities and access roads, as described in Sections 4.7.4 and 4.7.5. • Localized impacts to water availability where water would be withdrawn for HDD and hydrostatic tests would occur throughout the proposed Project Area from MP 20 to MP 705.5, as described in Section 4.7, Tables 4.7-5 and 4.7-6. • Temporary flooding could occur in a few isolated locations (*i.e.*, ice roads and waterbody crossings). Flood impacts may be greater within existing floodplains, which are identified on Chapter 3, Figure 3.3-8; however, a significant portion of the proposed Project Area is not mapped by the Federal Emergency Management Agency, and these areas are designated as having possible, but undetermined, flood hazard risks. • Although Alternative 2 would result in a lesser impact to permafrost from MP 0 to MP 62, the overall impact ratings remain the same between the two alternatives. • A geographic representation of expected impacts within the proposed Project Area is provided in Figure ES-9, immediately following this executive summary.
Vegetation	• Vegetation loss or disturbance is ranked as a moderate direct impact to vegetation resources during construction of both the Alternatives 1 and 2. Vegetation loss or disturbance would be widespread throughout the entire pipeline ROW, impacts would be long-term, and forested communities would be converted to scrub/shrub or another community type. During operations in both Alternative 1 and 2, vegetation loss/disturbance is considered minor. • The impact ranking for the potential introduction of non-native, invasive, or noxious plants for both Alternatives 1 and 2 are moderate and direct for both construction and operations phases of the proposed Project. Permanent impacts to the vegetation communities could result upon the introduction of these species. • Habitat fragmentation was given a ranking of major and direct for the construction phase in for the entire proposed Project in both alternatives, but is minor in the operations phase, as little new fragmentation would occur during operations of either alternative. However, in the Beaufort Coastal Plain habitat fragmentation is ranked as negligible during operations, as the pipeline here would be suspended on VSMs. Fragmentation could be widespread throughout the pipeline right-of-way (ROW), would be long-term, and would likely be irreversible. • Soil compaction and erosion was ranked as moderate and direct for both Alternatives 1 and 2 in the construction phase, but minor in the operations phases. Soil compaction could be widespread throughout the pipeline ROW. • Construction and operation of a pipeline and other facilities in active layer soils above permafrost may result in propagation of permafrost thaw and alternations to drainage patterns. Thaw and development of frost bulbs could alter the thermal regime and change drainage patterns. • A geographic representation of expected impacts within the Project Area is provided in Figures ES-10-1 and ES-10-2, immediately following this executive summary.
Wetlands	• Wetland loss or disturbance was ranked as a moderate and direct impact to wetland resources during construction of both Alternatives 1 and 2. Wetland loss or disturbance would be widespread throughout the pipeline ROW. Impacts would be long-term, and forested wetlands would be converted to scrub/shrub or another wetland type. During operations, the impact is ranked as minor and direct, as most loss of wetlands would occur during construction, but dust deposition could still occur during operations and may impact wetlands long-term in either alternative. • Wetland fragmentation would occur during the construction phases of Alternatives 1 and 2; this was given a ranking of major for the entire Project route in both alternatives. Impacts are considered direct for the construction phase. Additional fragmentation could occur during operations, so the impact has been rated minor, except in Alternative 2 operations on the

Environmental Resource	Summary of Potential Impacts
	Beaufort Coastal Plain where it is negligible. Wetland fragmentation could be widespread throughout the pipeline ROW, would be long-term, and would likely be irreversible. • There is potential for the proposed Project to change the function, value, or water type code of wetlands, similarly with both Alternatives 1 and 2. Impacts range from minor to moderate for the construction phase of both alternatives. This impact is considered minor during the operations phase, as chemicals from vehicles and salts used for de-icing could drain into wetlands, potentially degrading the permafrost, and dust deposited on vegetation could occur long-term during operations. • A geographic representation of expected impacts within the Project Area is provided in Figures ES-11-1 and ES-11-2, immediately following this executive summary.
Wildlife	• For both alternatives, the potential operations impacts to wildlife were considered minor overall for impacts to mortality, and moderate for impacts to reproduction, function, health, and resilience. • For both alternatives, the potential construction impact to wildlife (*i.e.,* disturbance, disease, invasive species, hunter access, collision with vehicles or structures, and increased predation) resulting in increased mortality was determined to be minor. Impacts would be expected to be short-term, limited in geographic scope, and limited to impacts to individual animals rather than populations. • Reproductive effects such as impacts to function, health, and resilience could result from: Increased fragmentation of habitat; displacement of wildlife from noise and human activity during construction; changes to predator populations that could affect prey abundance, distribution, and demography; disease, invasive species, and predation; disturbances and stresses from noise and presence of vehicles, aerial activity, and equipment during construction; habituation or food conditioning; exposure to toxic substances (*i.e.,* oil or hazardous materials spills); and/or diminished juvenile recruitment. • Under Alternative 2, aboveground construction of the segment between MP 0 to MP 62 would result in less permafrost and hydrologic alterations, and impacts to wildlife habitat. Depending on the proximity of the pipeline to roads (*e.g.*, within 500 feet), this segment could result in disturbance to caribou movement and migration. • A geographic representation of expected impacts within the Project Area is provided in Figures ES-12 and ES-13, immediately following this executive summary.
Fish	• Overall construction impacts from Alternatives 1 and 2 were determined to be minor for each of the biological resource effects, although the degree of impacts would depend on the following factors: crossing type, construction timing, fish habitat types, construction techniques, and the effectiveness of the selected conservation measures. Under both alternatives, impacts are expected to be site or river reach-specific temporary impacts to fish and fish habitat and would affect only a few individuals in a population. • Under both Alternatives 1 and 2, impacts on fish and fish habitat during operations were determined to be negligible and limited to the potential (unlikely and site specific) contamination due to spills during maintenance activities, fugitive dust from gravel access roads adjacent to waterbodies, and minor hydraulic changes in streams due to permanent structures at crossings (bridges or culverts). • In the marine environment at West Dock, Alternative 1 would be expected to have less impact on marine fish and fish habitat than Alternative 2, due to less dredging and material disposal required for the use of DH3 at West Dock. • Alternative 2 is expected to have similar, although slightly less, impact to freshwater fish and fish habitat as a result of 5 fewer fish-bearing stream crossings within the aboveground portion of the route and the aerial crossing at the Yukon River. • A geographic representation of expected impacts within the Project Area is provided in Figure ES-14, immediately following this executive summary.

Environmental Resource	Summary of Potential Impacts
Marine Mammals	• Alternatives 1 and 2 are similar in terms of the types and magnitude of effects expected for marine mammals. These effects primarily consist of increased disturbance due to vessel traffic and presence, increased underwater noise associated with vessels, dredging, short-term increases in turbidity, and vibratory pile driving and cutting of mooring piles. Impacts would be expected to range from negligible to moderate during construction and would be negligible during operations. • The risk of invasive species causing effects under any alternatives is negligible. • While spills of diesel fuel or other toxic substances could occur, the limited duration of vessel activities (two seasons) decreases the likelihood of such an event. The effects of a spill would most likely be minor under Alternatives 1 or 2 as they would also likely be small and procedures would be in place to respond quickly (see Section 4.12.3). • While the construction and use of ice roads could result in mortality (due to crushing) or disturbance from vibration or noise, studies indicate that ringed seals may tolerate the presence of low frequency industrial noise and vibration related to ice road construction. The potential for effects associated with Alternative 1 on ringed seals in lairs (including pups) are considered minor overall, as the area would be cleared for ringed seal lairs prior to construction of ice roads and pads. • Dredging and DH2 improvements necessary under Alternative 2 are expected to result in minor impact due to the amount of dredging required. There is very low likelihood that any marine mammal mortality would occur under either alternative during winter dredging and DH2 improvements. • Alternative 2 would result in greater impacts due to a greater level of activity and depend on potential extent of the ensonified areas (*i.e.,* more pile driving, dredging requirements, and increased vessel traffic to the ocean disposal site), though these are likely to be minor. • A geographic representation of expected impacts within the Project Area is provided in Figure ES-15 immediately following this executive summary.
Benthic	• Given that Alternative 2 would require dredging more than 750,000 cubic yards as compared to 250,000 cubic yards under Alternative 1, the effects of Alternative 2 construction would be minor, while Alternative 1 construction would be negligible. Potential impacts during operations would be negligible for benthic communities under any alternative. • Dredging of the nearshore environment during winter would result in direct loss of some productive benthic habitat under both Alternatives 1 and 2. Under both alternatives, there would be mortality of marine invertebrates inhabiting or overwintering in the local substrate due to dredging and screeding. Dredging operations would result in a negligible effect on benthic food availability under any alternative. • Disposal of dredged material under either alternative is not expected to affect benthos on a population or even localized scale given the natural coastal processes that regularly scour the nearshore environment (Alternative 1) and that material disposed in the open ocean would be dispersed relatively quickly (Alternative 2). • The effects of increased turbidity or due to a potential spill of hazardous materials on benthos would also be negligible, as catchment basins would be used to remove contaminants from surface runoff prior to delivery to any receiving waters. • A geographic representation of expected impacts within the Project Area is provided in Figure ES-16, immediately following this executive summary.
Threatened & Endangered Species	• Alternatives 1 and 2 are similar in terms of the types and magnitude of effects expected for threatened, endangered, and candidate species. Impacts range from negligible to moderate. The most significant impacts to threatened and endangered species would be those associated with injury or mortality. • Both Alternatives 1 and 2 would result in minor, but direct, impacts due to habitat loss, biological/behavioral responses to disturbance, changes to predator distributions, turbidity, and spills/contaminants for threatened, endangered, and candidate species. Although there is low likelihood that any marine mammal threatened, endangered, and candidate species mortality would occur under either alternative during construction or operations, summer vessel traffic under both Alternatives 1 and 2 would increase the chance of a strike in

Environmental Resource	Summary of Potential Impacts
	Prudhoe Bay and in Seward. However, a slower transit speed has been shown to decrease the likelihood of a strike as well as mortality due to a strike (NMFS, 2013). Steller's or spectacled eider could be injured or die from collisions with the GCF, or with equipment, which would result in a moderate impact. • Introduced non-native, invasive, and parasitic species impacts would be negligible for both alternatives in both construction and operations phases. • Proposed Project activities, vessels in particular, could contribute pollutants and contaminants into the habitats of threatened, endangered, and candidate species. Spills of diesel fuel or other toxic substances could occur from vessels in either Prudhoe Bay or in Seward. • Dredging and DH2 improvements necessary under Alternative 2 would result in a greater level of impact than Alternative 1; however, these are still expected to be minor. Slightly more disturbance would occur in Alternative 2 in Prudhoe Bay because more work would be needed to modify DH2 than DH3, and the ocean disposal location of dredge material would be a further distance away from the proposed Project. Alternative 2 would likely cause more turbidity than Alternative 1 if screeding were required, as more screeding work would be needed to upgrade DH2 than at DH3 at West Dock. • A geographic representation of expected impacts within the Project Area is provided in Figure ES-17, immediately following this executive summary.
Land Use	• Alternatives 1 and 2 would result in similar impacts to land use resources during both construction and operation of the proposed Project. Effects to land use planning and conservation are expected to be minor and effects to land cover (forestland, agriculture, important farmlands, developed areas) overall are expected to be moderate. Effects to transportation and utilities, waste generation, and effects to land ownership and zoning are expected to be minor. • Although the affects to the current land use from proposed Project construction would be temporary and localized, the proposed Project would intersect lands managed according to numerous federal, state, borough, and local management plans resulting in impacts throughout the proposed Project area. The impacts to land use planning and conservation as a result of construction of the proposed Project are expected to be minor. • Impacts to land cover would be moderate overall. Very few acres of agricultural land are impacted by the proposed Project, and are considered negligible. The impact to forestland would be major for both construction and operation activities. • Although impacts under Alternative 2 would differ slightly as described in Section 4.15, the overall impacts would be similar between Alternative 1 and 2. • A geographic representation of expected impacts within the Project Area is provided in Figure ES-18, immediately following this executive summary.
Recreation	• Overall, the proposed Project could result in short-term adverse effects on recreation, primarily attributed to a general decline in recreation quality, competition for local public services, and restricted access in proximity to the pipeline route during construction. Impacts are expected to be moderate during construction and minor during operations. • Alternatives 1 and 2 would result in similar impacts to recreation during both construction and operations phases of the proposed Project, as activities would be the same for both alternatives (*e.g.,* restriction to recreation areas, construction noise, etc.): o Potential recreation impacts are attributed to shipment of construction materials, construction activity within the temporary ROW (*e.g.,* use of heavy equipment and machinery), and influx of construction labor to the proposed Project Area. o The highest concentration of recreational opportunities appears to be located south of Livengood, between the proposed Project terminus and Denali NPP. o The Mainline pipeline would either cross, or be located within 1 mile of a number of key recreation features in Alaska. o The Mainline pipeline would cross Atigun Pass, where drivers cross the Continental Divide and watch for Dall sheep. o In addition, both public and private land along the Mainline route, outside designated recreation areas, is commonly subject to dispersed recreation activities.

Environmental Resource	Summary of Potential Impacts
	• A geographic representation of expected impacts within the Project Area is provided in Figure ES-19, immediately following this executive summary.
Visual	• Overall, impacts to visual resources are expected to range from minor to major along the pipeline route. Visual impacts along the Fairbanks Lateral are expected to be minor. • Elements of the Bureau of Land Management's (BLM) Visual Resource Management (VRM) system have informed the evaluation of visual impacts. The VRM system consists of an inventory of visual conditions and visual management objectives. Impact levels were evaluated in the context of existing scenic quality and viewer sensitivity for each pipeline segment. • Visual impacts during construction are generally higher than during operations due to the presence of construction activities, materials, equipment, open-cuts in the landscape, and work camps. • The operations phase visual impacts of Alternative 2 would be slightly higher than for Alternative 1, due to the presence of VSMs between MP 0 and 62, as well as the aerial crossing of the Yukon River • A geographic representation of expected impacts within the Project Area is provided in Figures ES-20 and ES-21, immediately following this executive summary.
Socioeconomics	• Overall impacts on socioeconomics range widely from major positive impacts to major negative impacts. The impacts are expected to be similar under Alternatives 1 and 2. • Moderate to major positive impacts would be expected to employment (during both construction and operation) and energy supply (during operation). Moderate positive effects on state government revenues are expected in the long-term during pipeline operations. • Moderately negative impacts are expected to include impacts to: population due to a potential influx of non-permanent workers during construction of the Fairbanks Lateral; housing availability in the Fairbanks area during construction and operations of the Fairbanks Lateral; and infrastructure and services in communities located along the Mainline due to increased pressure during pipeline construction. • Major negative impacts could be experienced in the form of government expenditures needed to construct the pipeline (although these are expected to be major positive impact in the long term) and in the form of increased pressure on infrastructure and services. • A geographic representation of expected impacts within the Project Area is provided in Figure ES-22, immediately following this executive summary.
Cultural Resources	• Impacts to cultural resources that are potentially eligible for inclusion under the National Register of Historic Places (NRHP) and are within the direct area of potential effects (APE) were evaluated on a site-by-site basis. An impact ranking was assigned to each of the 121 sites. Impact rankings range from negligible to major depending on the site and the proposed mitigation measures. In total, the direct impact area for Alternative 1 would have 19 major effects, 40 moderate effects, 43 minor effects, and 19 negligible effects. • The indirect impact area could potentially affect 544 sites in the indirect APE that are either eligible under the NRHP or are pending consultation to determine eligibility. • The direct impact area for Alternative 2 would have 19 major effects, 39 moderate effects, 42 minor effects, and 19 negligible effects. The indirect impact area could potentially affect 549 sites.
Subsistence	• Impacts to subsistence were evaluated by community. Communities along the pipeline route are expected to experience negligible to major impacts. Potential impacts include direct impacts (the subsistence use area overlaps the Project Area), resource availability, user access, competition, cost and time, and culture. • Major impacts to subsistence are concentrated in rural communities where subsistence use areas lie directly along the proposed Project or areas of undisturbed habitat and where impacts to user access and resource availability would be elevated. For construction, these major impacts are anticipated for Wiseman, Coldfoot, and Minto. For operation, these major impacts are anticipated for Minto and Nenana.

Environmental Resource	Summary of Potential Impacts
	• Moderate impacts in construction and/or operations are expected for the remainder of rural communities located directly along the proposed Project route and who reside outside state designated nonsubsistence areas. • Minor impacts in construction and/or operations are expected for rural communities (and the nonrural community of Fairbanks) that are located farther from the proposed Project but who are more likely to harvest in subsistence areas crossed by the ASAP Project. • Negligible impacts in construction and/or operations are expected for the remaining study communities, which are primarily nonrural, or located the farthest from proposed Project activities and to who effects related to user access and resource availability are more unlikely. • The overall impact rankings are the same between Alternatives 1 and 2, as the differences are relatively minor and do not constitute a large enough change to affect overall impact rankings. Impacts under Alternative 2 would be slightly greater to subsistence than Alternative 1 due to the presence of an elevated pipeline from MP 0 - MP 62. While elevated structures would exist under both alternatives, the presence of an elevated pipeline in addition to these structures could raise the likelihood of impacts to resource availability and impacts to user access during operations, specifically for the villages of Nuiqsut and Kaktovik. • A geographic representation of expected impacts within the proposed Project Area is provided in Figure ES-24, immediately following this executive summary
Public Health	• Alternatives 1 and 2 would be expected to result in similar impacts to public health ranging from moderate negative impacts to several health effect categories to minor positive impacts to chronic disease. • During operations, Alternatives 1 and 2 could potentially have a minor positive impact on air quality in the Fairbanks area, where any transition to natural gas from wood or coal fired heat may have a positive impact on chronic respiratory disease. However, these changes depend on expansion of the gas distribution network in Fairbanks. • Impacts to the following health effect categories (described in detail in Table 4.21-1) would be considered moderate negative during both construction and operations: social determinants of health; accidents and injuries; food, nutrition, and subsistence activity, and infectious disease. Exposure to hazardous materials would be considered moderate during construction and minor during operations. • The impact of Alternative 3 (No Action) would likely have no impact (negligible) on public health, with the exception that not developing the pipeline could potentially have a minor negative impact on the chronic disease health effects category, as related to the continued exceedance of air quality standards for particulate matter in and near Fairbanks. • A geographic representation of expected impacts within the Project Area is provided in Figure ES-25, immediately following this executive summary.
Air Quality, Climate Change, and Greenhouse Gas Emissions	• Alternatives 1 and 2 would most likely result in moderately increased levels of air contaminant concentrations and fugitive dust emissions during pipeline construction. These impacts would be reduced to minor during the operations and maintenance phase of the proposed Project. • Increased levels of air contaminant concentrations (criteria pollutants, greenhouse gases [GHGs], and Hazardous Air Pollutants [HAPs]) could result from operation of fuel-fired vehicles and equipment during construction and operation and maintenance of aboveground facilities. • Increased fugitive dust emissions could result from excavation activities and disturbance of ground cover during construction, and ongoing operation and maintenance of aboveground facilities. • Decreased emissions would result from improved access to natural gas and decreased reliance on heating oil, coal, and wood. This impact is expected to be positive and minor. • Independent of the proposed Project, GHG emissions, and climate change will continue to affect the proposed Project Area, as well as the rest of the state, if future natural gas availability and quantities continue to be restricted.

Environmental Resource	Summary of Potential Impacts
	• A geographic representation of expected impacts within the Project Area is provided in Figure ES-26, immediately following this executive summary.
Noise	• Airborne noise impact on Alternatives 1 and 2 are similar; however, Alternative 2 would have a slightly greater impact to airborne noise during the construction phase of the proposed Project. Impacts range from negligible to major negative depending on the construction activity and proximity to receptors. • Construction and operation of the ASAP Mainline and Fairbanks Lateral (excluding HDD crossings) would have negligible to minor negative noise impacts at nearest residential receptors and recreational visitors. • Two HDD crossings would have major negative impacts on airborne noise at nearest residential receptors and/or recreational visitors. These crossings include the Denali NPP Commercial Area HDD and the Kashwitna River HDD. • Five additional HDD crossings could result in minor to moderate negative impacts on airborne noise at nearest residential receptors only, and the remaining HDD crossings would have negligible impact on airborne noise. • Under Alternative 2, the Yukon Aerial Crossing (suspension bridge construction) would result in major negative impacts, compared to moderate negative impacts of an HDD crossing under Alternative 1. • A geographic representation of expected impacts within the Project Area is provided in Figures ES-27 and ES-28, immediately following this executive summary.
Navigation Resources	• Impacts to navigation resources resulting from increased navigational resource use by vessels is expected to be minor under both Alternative 1 and 2 during the construction phase and negligible during the operations phase. • Displacement of vessels from their current route and impacts of non-native and invasive species are expected to be negligible. • While impacts would be similar overall under each alternative, Alternative 2 would result in the following slightly increased impacts to navigation: vessel traffic at Prudhoe Bay; navigational impacts along the Yukon River as a result of aerial suspension bridge construction; two crossings of the Nenana River proposed along the Denali NPP Route Variation; placement of pipe on the existing pedestrian bridge; and an open cut crossing. • A geographic representation of expected impacts within the Project Area is provided in Figure ES-29, immediately following this executive summary.
Reliability and Safety	• A buried pipeline is considered less susceptible to random acts of violence and terrorism. The very remote location of the portion of the Alternative 2 pipeline on VSMs also provides significant protection from intentional damage. • Remote locations make accidents like underground utility strikes less likely. However, the remote route may hamper activities needed to operate, maintain, or repair the pipeline. • Short-term disruptions in service could result in a loss of natural gas to users and put strain on other natural gas providers as well as other energy resources. • A geographic representation of expected impacts within the Project Area is not applicable to this resource.

Cumulative Effects

Each alternative was evaluated to determine its contribution to cumulative effects on all resources where environmental consequences were evaluated when combined with past, present, and reasonably foreseeable future actions. Table ES-2 below summarizes the direct, indirect, and cumulative effects under each alternative and compares this with the expected cumulative effects. Detailed analyses and discussions of effects can be found in Chapter 4, Environmental Consequences.

Under Alternative 3 (No Action), projected energy demand for natural gas in the rail belt would not be met with known natural gas resources from the Cook Inlet area alone.

An estimated peak of 6,400 temporary construction jobs and 50 to 75 permanent jobs associated with the proposed Project would not materialize. An unknown number of jobs associated with constructing and operating the flow lines on the North Slope would also not occur. The potential property tax and land lease revenues would not be realized.

Overall, negative cumulative impacts of Alternative 3 are likely to be mostly economic. Air quality and public health benefits in the Fairbanks area that could result from the proposed Project and improved access to natural gas (as described in Section 4.21, Public Health) would not be realized.

Table ES-2 Summary of Direct, Indirect, and Cumulative Effects

	Alternative 1		Alternative 2		Alternative 3	
Types of Effects	**Construction**	**Operation**	**Construction**	**Operation**	**Construction**	**Operation**
Soils & Geology						
Effects to local topography, soil, and geology	*Major (-)*	*Major (-)*	*Major (-)*	*Major (-)*	*Negligible*	*Negligible*
Effects to permafrost and geology	*Major (-)*	*Major (-)*	*Major (-)*	*Major (-)*	*Negligible*	*Negligible*
Water						
Altered Surface Water Quality	*Moderate (-)*	*Minor (-)*	*Moderate (-)*	*Minor (-)*	*Negligible*	*Negligible*
Altered Groundwater	*Major (-)*	*Moderate (-)*	*Major (-)*	*Moderate (-)*	*Negligible*	*Negligible*
Stream Bank Stabilization and Geomorphology	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Moderate*	*Negligible*	*Negligible*
Flooding	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Negligible*	*Negligible*
Altered Water Availability	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Negligible*	*Negligible*
Vegetation					*Negligible*	*Negligible*
Vegetation Loss/Disturbance	*Moderate (-)*	*Minor (-)*	*Moderate (-)*	*Minor (-)*	*Negligible*	*Negligible*
Non-native, Invasive, and Noxious Plants	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Negligible*	*Negligible*
Habitat Fragmentation	*Major (-)*	*Minor (-)*	*Major (-)*	*Minor (-), Negligible on the Beaufort Coastal Plain*	*Negligible*	*Negligible*
Soil Compaction and Erosion	*Moderate (-)*	*Minor (-)*	*Moderate (-)*	*Minor (-)*	*Negligible*	*Negligible*
Wetlands						
Loss of Wetlands	*Moderate (-)*	*Minor (-)*	*Moderate (-)*	*Minor (-)*	*Negligible*	*Negligible*
Wetland Fragmentation	*Major (-)*	*Minor (-)*	*Major (-), Moderate (-) on the Beaufort Coastal Plain*	*Minor (-), Negligible on the Beaufort Coastal Plain*	*Negligible*	*Negligible*
Change in Function, Value or Water Type Code	*Ranging from Minor to Moderate (-)*	*Minor (-)*	*Ranging from Minor to Moderate (-)*	*Minor (-)*	*Negligible*	*Negligible*
Wildlife						
Mortality	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Negligible*	*Negligible*
Reproductive Effects / Function / Health / Resilience	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Negligible*	*Negligible*

	Alternative 1		Alternative 2		Alternative 3	
Types of Effects	**Construction**	**Operation**	**Construction**	**Operation**	**Construction**	**Operation**
Fish						
Mortality	*Minor (-)*	*Negligible*	*Minor (-)*	*Negligible*	*Negligible*	*Negligible*
Reproductive Effects/Growth/Health/ Distribution	*Minor (-)*	*Negligible*	*Minor (-)*	*Negligible*	*Negligible*	*Negligible*
Effects to habitat	*Minor (-)*	*Negligible*	*Minor (-)*	*Negligible*	*Negligible*	*Negligible*
Marine Mammals						
Mortality	*Minor (-)*	*Negligible*	*Minor (-)*	*Negligible*	*Negligible*	*Negligible*
Displacement, Disturbance, Diminished Reproduction	*Ranging from Minor to Moderate (-)*	*Negligible*	*Ranging from Minor to Moderate (-)*	*Negligible*	*Negligible*	*Negligible*
Disease, Invasives, Predation, Exposure to Toxins	*Negligible*	*Negligible*	*Minor (-)*	*Negligible*	*Negligible*	*Negligible*
Benthic						
Mortality	*Negligible*	*Negligible*	*Minor (-)*	*Negligible*	*Negligible*	*Negligible*
Reproductive Effects / Function / Health / Resilience	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*
Threatened & Endangered Species						
Injury or Mortality	*Moderate (-) if injury or mortality, Minor if disturbance*	*Moderate (-) if injury or mortality, Minor if disturbance*	*Moderate (-) if injury or mortality, Minor if disturbance*	*Moderate (-) if injury or mortality, Minor if disturbance*	*Negligible*	*Negligible*
Physical habitat loss, alteration, and fragmentation	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Negligible*	*Negligible*
Biological and behavioral responses to disturbance, including changes to distributions	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Negligible*	*Negligible*
Changes to predator distributions and increased predation	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Negligible*	*Negligible*
Introduced non-native, invasive and parasitic species	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*
Turbidity	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Negligible*	*Negligible*
Spills and Contaminants	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Negligible*	*Negligible*

	Alternative 1		Alternative 2		Alternative 3	
Types of Effects	**Construction**	**Operation**	**Construction**	**Operation**	**Construction**	**Operation**
Land Use						
Effects to Land Use Planning and Conservation	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Negligible*	*Negligible*
Effects to Existing Transportation and Utilities; Easements/ ROW Rights	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Negligible*	*Negligible*
Effects to Forestlands; Agriculture; Important Farmlands; Developed Areas	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Negligible*	*Negligible*
Waste Generation	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Negligible*	*Negligible*
Land Ownership and Zoning	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Negligible*	*Negligible*
Recreation						
Changes to Recreational Quality	*Moderate (-)*	*Minor (-)*	*Moderate (-)*	*Minor (-)*	*Negligible*	*Negligible*
Changes to Recreational Access	*Moderate (-)*	*Minor (-)*	*Moderate (-)*	*Minor (-)*	*Negligible*	*Negligible*
Visual						
MP 0 to MP 62 (GCF to TAPS PS2)	*Moderate (-)*	*Minor (-)*	*Moderate (-)*	*Moderate (-)*	*Negligible*	*Negligible*
MP 62 to MP 400 (TAPS PS2 to Livengood)	*Moderate (-)*	*Minor (-)*	*Moderate (-)*	*Moderate (-)*	*Negligible*	*Negligible*
MP 400 to MP 535 Livengood to Denali NPP	*Moderate (-)*	*Minor (-)*	*Moderate (-)*	*Moderate (-)*	*Negligible*	*Negligible*
MP 535 to MP 634 Denali NPP to Byers Lake in Denali State Park	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Negligible*	*Negligible*
MP 634 to End	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Negligible*	*Negligible*
Fairbanks Lateral: Along Murphy Dome and Old Murphy Dome Roads	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Minor (-)*	*Negligible*	*Negligible*
Denali NPP Route Variation: Mainline MP 536 to MP 543	*N/A*	*N/A*	*Moderate (-)*	*Minor (-)*	*Negligible*	*Negligible*
Socioeconomics						
Population Trends and Projections	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Negligible*	*Negligible*
Employment	*Major (+)*	*Moderate (+)*	*Major (+)*	*Moderate (+)*	*Negligible*	*Negligible*
Housing and Property Values	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Negligible*	*Negligible*
Government Revenue and Expenditures	*Major (-)*	*Major (+)*	*Major (-)*	*Moderate (+)*	*Negligible*	*Negligible*
Infrastructure and Services	*Moderate (-)*	*Major (-)*	*Moderate (-)*	*Major (-)*	*Negligible*	*Negligible*
Increased Energy Supply	*Negligible*	*Major (+)*	*Negligible*	*Major (+)*	*Negligible*	*Negligible*

	Alternative 1		Alternative 2		Alternative 3	
Types of Effects	**Construction**	**Operation**	**Construction**	**Operation**	**Construction**	**Operation**
Cultural Resources[a]						
Cultural Resource Effects – Direct Impact Area	*Major (-) (26)*		*Major (-) (25)*		*Negligible*	
Cultural Resource Effects – Direct Impact Area	*Moderate (-) (11)*		*Moderate (-) (10)*		*Negligible*	
Cultural Resource Effects – Direct Impact Area	*Minor (-) (21)*		*Minor (-) (21)*		*Negligible*	
Cultural Resource Effects – Direct Impact Area	*Negligible (14)*		*Negligible (14)*		*Negligible*	
Subsistence[b]						
Communities with Impact Ranking: 15-18	*Major (-) (3)*	*Major (-) (2)*	*Major (-) (3)*	*Major (-) (2)*	*Negligible*	*Negligible*
Communities with Impact Ranking: 10-14	*Moderate (-) (10)*	*Moderate (-) (11)*	*Moderate (-) (10)*	*Moderate (-) (11)*	*Negligible*	*Negligible*
Communities with Impact Ranking: 5-9	*Minor (-) (16)*	*Minor (-) (7)*	*Minor (-) (16)*	*Minor (-) (7)*	*Negligible*	*Negligible*
Communities with Impact Ranking: 0-4	*Negligible (22)*	*Negligible (31)*	*Negligible (22)*	*Negligible (31)*	*Negligible*	*Negligible*
Public Health						
Social Determinants of Health	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Negligible*	*Negligible*
Accidents and Injuries	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Negligible*	*Negligible*
Exposure to Hazardous Materials	*Moderate (-)*	*Minor (-)*	*Moderate (-)*	*Minor (-)*	*Negligible*	*Negligible*
Food, Nutrition, and Subsistence Activity	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Negligible*	*Negligible*
Infectious Disease	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Moderate (-)*	*Negligible*	*Negligible*
Water and Sanitation	*Minor (-)*	*Negligible*	*Minor (-)*	*Negligible*	*Negligible*	*Negligible*
Non-Communicable and Chronic Disease	*Moderate (-)*	*Minor (+)*	*Moderate (-)*	*Minor (+)*	*Negligible*	*Minor (-)*
Health Services Infrastructure and Capacity	*Minor (-)*	*Negligible*	*Minor (-)*	*Negligible*	*Negligible*	*Negligible*
Air Quality, Climate Change, and Greenhouse Gas Emissions						
Increased levels of air contaminant concentrations (criteria pollutants and HAPs)	*Moderate (-)*	*Minor (-)*	*Moderate (-)*	*Minor (-)*	*Negligible*	*Negligible*
Increased Fugitive Dust emissions	*Moderate (-)*	*Minor (-)*	*Moderate (-)*	*Minor (-)*	*Negligible*	*Negligible*
Decreased emissions as a result of improved access to natural gas	*Negligible*	*Minor (+)*	*Negligible*	*Minor (+)*	*Negligible*	*Negligible*
Noise[c]						
Channel Dredging and Access Construction on Prudhoe Bay	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*
Mainline Segment 1a	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*

		Alternative 1		Alternative 2		Alternative 3	
Types of Effects		Construction	Operation	Construction	Operation	Construction	Operation
Mainline Segment 1b		*Minor (-)*	*Negligible*	*Minor (-)*	*Negligible*	*Negligible*	*Negligible*
Yukon River HDD	Residential	*Moderate (-)*	*N/A*	*N/A*	*N/A*	*Negligible*	*Negligible*
	Recreational	*Negligible*	*N/A*	*N/A*	*N/A*	*Negligible*	*Negligible*
Yukon Aerial Crossing (Suspension Bridge Construction)	Residential	*N/A*	*N/A*	*Major (-)*	*Negligible*	*Negligible*	*Negligible*
	Recreational	*N/A*	*N/A*	*Negligible*	*Negligible*	*Negligible*	*Negligible*
Mainline Segment 2	Residential	*Minor (-)*	*Negligible*	*Minor (-)*	*Negligible*	*Negligible*	*Negligible*
	Recreational	*Ranging from Minor to Moderate (-)*	*Ranging from Negligible to Minor (-)*	*Ranging from Minor to Moderate (-)*	*Ranging from Negligible to Minor (-)*	*Negligible*	*Negligible*
Tanana River HDD	Residential	*Moderate (-)*	*N/A*	*Moderate (-)*	*N/A*	*Negligible*	*Negligible*
	Recreational	*Negligible*	*N/A*	*Negligible*	*N/A*	*Negligible*	*Negligible*
Mainline Segment 3	Residential	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*
	Recreational	*Ranging from Minor to Moderate (-)*	*Ranging from Negligible to Minor (-)*	*Ranging from Minor to Moderate (-)*	*Ranging from Negligible to Minor (-)*	*Negligible*	*Negligible*
Denali NPP Route Variation	Residential	*N/A*	*N/A*	*Negligible*	*Negligible*	*Negligible*	*Negligible*
	Recreational	*N/A*	*N/A*	*Moderate (-)*	*Negligible*	*Negligible*	*Negligible*
Denali NPP Commercial Area HDD		*Major (-)*	*N/A*	*Major (-)*	*N/A*	*Negligible*	*Negligible*
	Recreational	*Major (-)*	*N/A*	*Major (-)*	*N/A*	*Negligible*	*Negligible*
Honolulu Creek HDD		*Negligible*	*N/A*	*Negligible*	*N/A*	*Negligible*	*Negligible*
Mainline Segment 4	Residential	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*
	Recreational	*Minor (-)*	*Negligible*	*Minor (-)*	*Negligible*	*Negligible*	*Negligible*
Troublesome Creek HDD		*Negligible*	*N/A*	*Negligible*	*N/A*	*Negligible*	*Negligible*
Chulitna River HDD		*Negligible*	*N/A*	*Negligible*	*N/A*	*Negligible*	*Negligible*
Kashwitna River HDD	Residential	*Major (-)*	*N/A*	*Major (-)*	*N/A*	*Negligible*	*Negligible*
	Recreational	*Negligible*	*N/A*	*Negligible*	*N/A*	*Negligible*	*Negligible*
Willow Creek HDD		*Negligible*	*N/A*	*Negligible*	*N/A*	*Negligible*	*Negligible*
Fairbanks Lateral	Residential	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*
	Recreational	*Minor (-)*	*Negligible*	*Minor (-)*	*Negligible*	*Negligible*	*Negligible*

	Alternative 1		Alternative 2		Alternative 3	
Types of Effects	**Construction**	**Operation**	**Construction**	**Operation**	**Construction**	**Operation**
Navigation						
Increased Navigational Resource Use by Vessels	*Minor (-)*	*Negligible*	*Minor (-)*	*Negligible*	*Negligible*	*Negligible*
Displacement of Vessels from Current Route	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*
Non-native and Invasive Species	*Negligible*	*N/A*	*Negligible*	*N/A*	*Negligible*	*Negligible*
Reliability and Safety						
Fatalities	*Minor (-)*	*Minor (-)*	*Moderate (-)*	*Minor (-)*	*Negligible*	*Negligible*
Injuries or Property Damage (>$114,000)	*Moderate (-)*	*Minor (-)*	*Moderate (-)*	*Minor (-)*	*Negligible*	*Negligible*
Gas Supply Interruptions	*N/A*	*Moderate (-)*	*N/A*	*Moderate (-)*	*N/A*	*N/A*

[a] For cultural resources, the effect categories are not mutually exclusive, and certain effects (*e.g.*, introduction of vibration, noise, or atmospheric elements) could occur from construction activities, operational activities, and/or proposed Project infrastructure. For this reason, the construction and operational impacts are expected to be similar. Additionally, cultural resources are categorized by the number of sites at each impact ranking rather than type of impact. The number in parenthesis indicates how many communities/cultural resource sites may be affected.
[b] The number in parenthesis for subsistence indicates how many communities may be affected.
[c] Impact ratings for noise are the same for residential and recreational in rows that are not divided.

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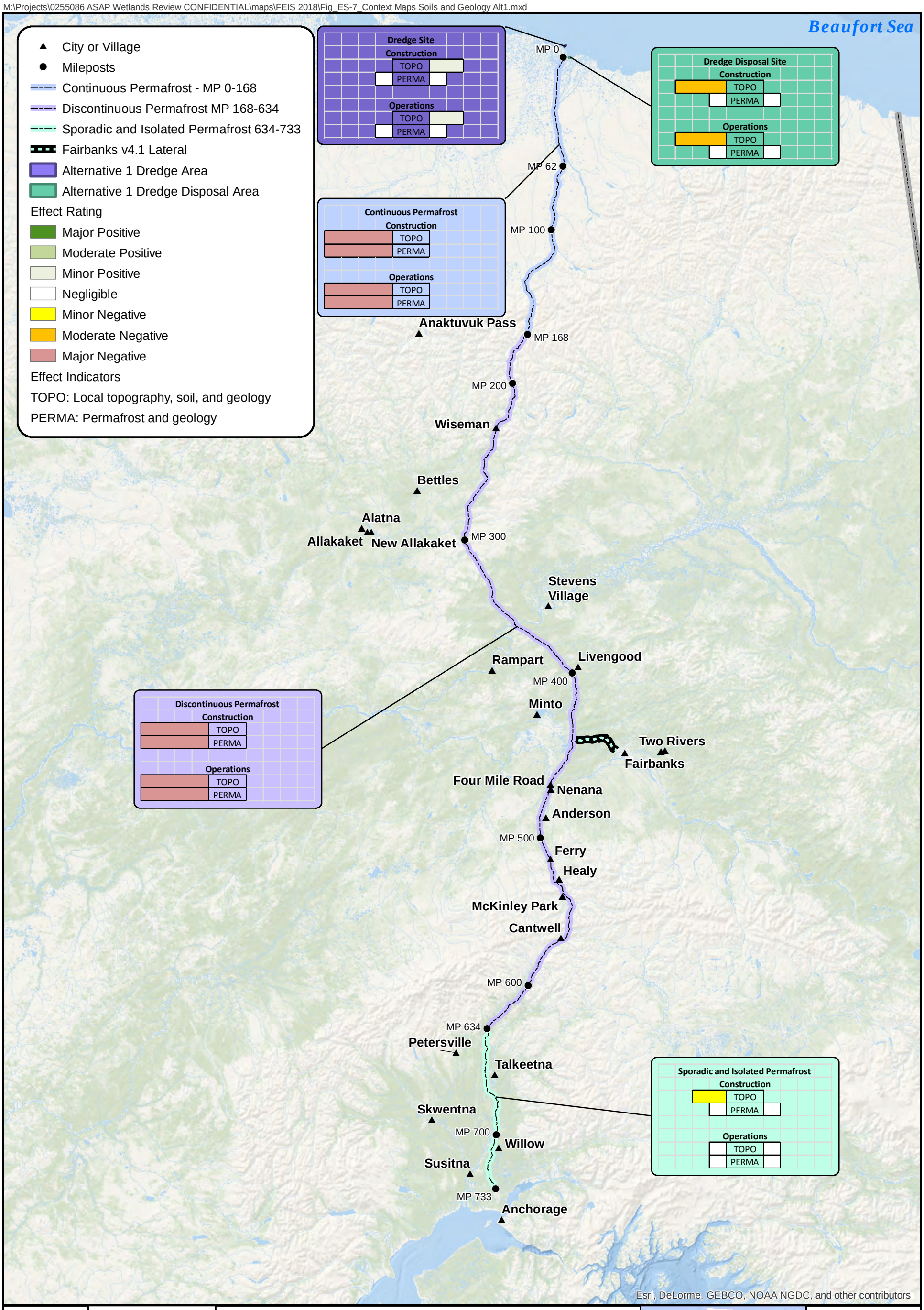

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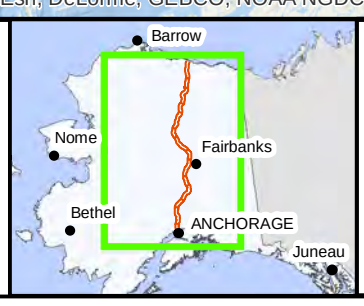
Figure ES-7: SOIL AND GEOLOGY IMPACTS CONTEXT MAP, ALTERNATIVE 1
ALASKA STAND ALONE PIPELINE

0 25 50 100 150 Miles



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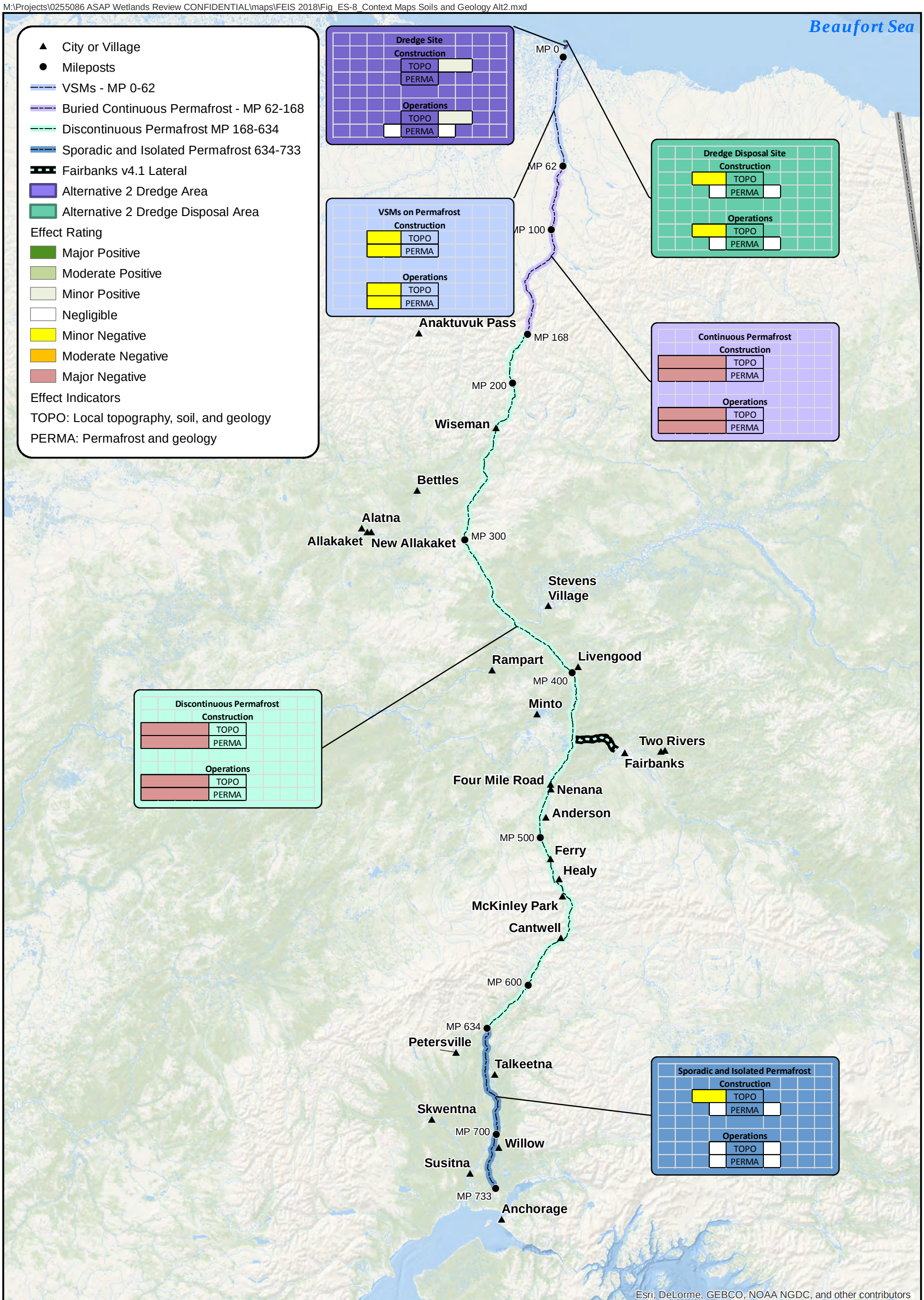

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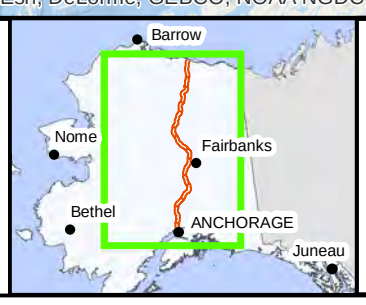
Figure ES-8: SOIL AND GEOLOGY IMPACTS CONTEXT MAP, ALTERNATIVE 2
ALASKA STAND ALONE PIPELINE

0 25 50 100 150 Miles



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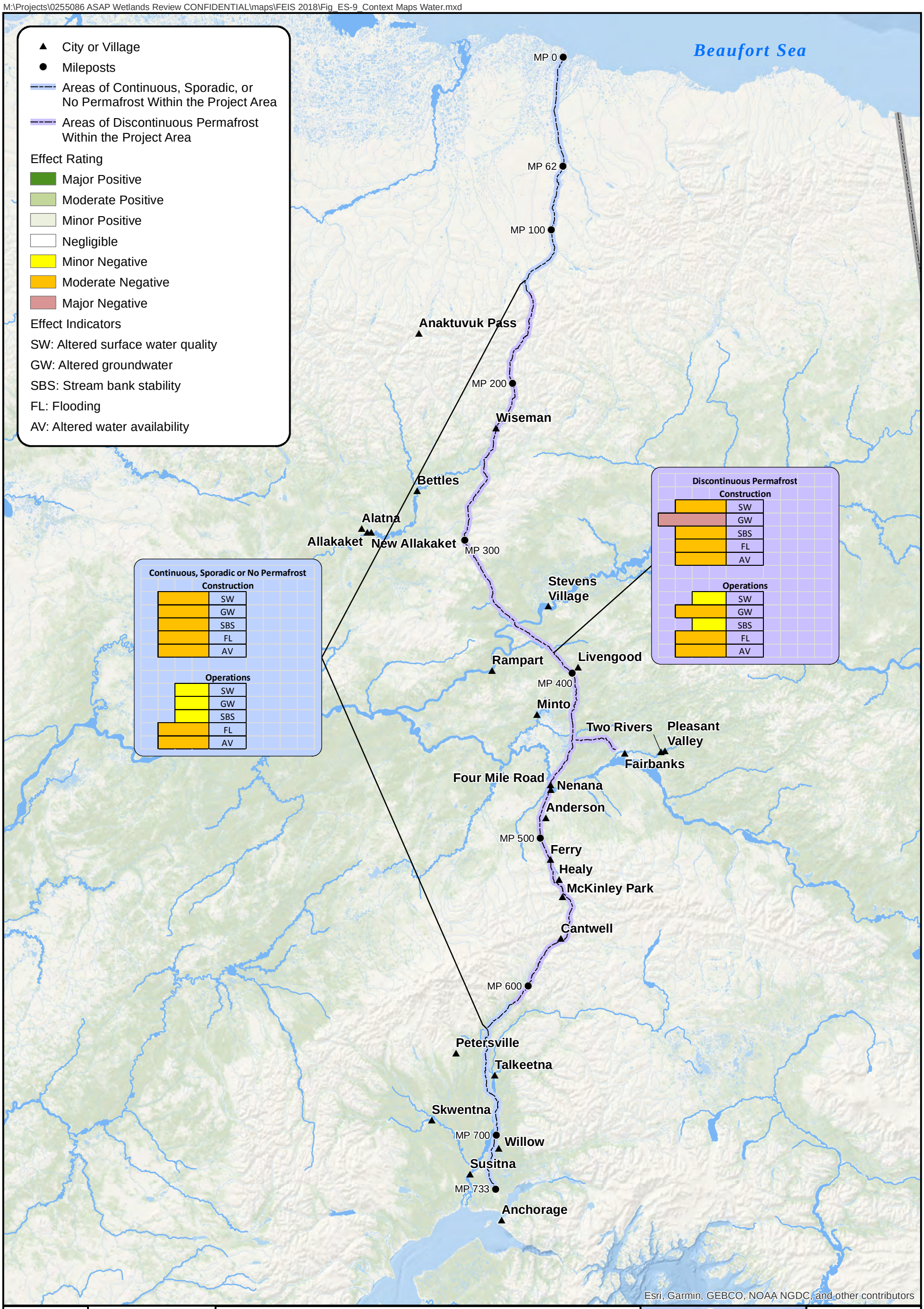

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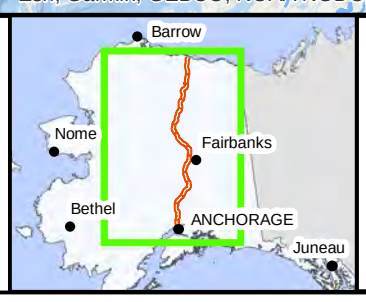
Figure ES-9: WATER IMPACTS CONTEXT MAP
ALASKA STAND ALONE PIPELINE

0 25 50 100 150 Miles



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- City or Village
- Mileposts
- Beaufort Coastal Plain Ecoregion
- Other Ecoregions with Permafrost: Brooks Foothills, Brooks Range, Kobuk Ridges and Valleys, Ray Mountains, Tanana-Kuskokwim Lowlands, and Yukon-Tanana Uplands
- Ecoregions lacking Permafrost: Alaska Range and Cook Inlet Basin
- Fairbanks v4.1 Lateral

Effect Rating

- Major Positive
- Moderate Positive
- Minor Positive
- Negligible
- Minor Negative
- Moderate Negative
- Major Negative

Effect Indicators

GRA: Placement of gravel fill
CLR: Clearing, grubbing, and grading
TRN: Open-cut trenching and backfilling
HAB: Habitat fragmentation
DUST: Dust deposition
SOIL: Soil compaction and erosion
INV: Introduction of non-native, invasive, or noxious plants
REVEG: Rehabilitation and revegetation activities

Beaufort Sea

MP 0
MP 62
MP 100
MP 200
MP 300
MP 400
MP 500
MP 600
MP 700
MP 733

Anaktuvuk Pass
Wiseman
Bettles
Stevens Village
Rampart
Livengood
Minto
Two Rivers
Fairbanks
Four Mile Road
Nenana
Anderson
Ferry
Healy
McKinley Park
Cantwell
Petersville
Talkeetna
Skwentna
Willow
Susitna
Anchorage

Beaufort Coastal Plain Ecoregion
Construction: GRA, CLR, TRN, HAB, DUST, SOIL, INV, REVEG
Operations: CLR, HAB, DUST, SOIL, INV

Other Ecoregions with Permafrost
Construction: GRA, CLR, TRN, HAB, DUST, SOIL, INV, REVEG
Operations: CLR, HAB, DUST, SOIL, INV

Ecoregions Lacking Permafrost
Construction: GRA, CLR, TRN, HAB, DUST, SOIL, INV, REVEG
Operations: CLR, HAB, DUST, SOIL, INV

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Figure ES-10-1: VEGETATION IMPACTS CONTEXT MAP, ALTERNATIVE 1
ALASKA STAND ALONE PIPELINE

0 25 50 100 150 Miles

Barrow, Nome, Fairbanks, Bethel, ANCHORAGE, Juneau

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- City or Village
- Mileposts
- Beaufort Coastal Plain Ecoregion
- Other Ecoregions with Permafrost: Brooks Foothills, Brooks Range, Kobuk Ridges and Valleys, Ray Mountains, Tanana-Kuskokwim Lowlands, and Yukon-Tanana Uplands
- Ecoregions lacking Permafrost: Alaska Range and Cook Inlet Basin
- Fairbanks v4.1 Lateral

Effect Rating

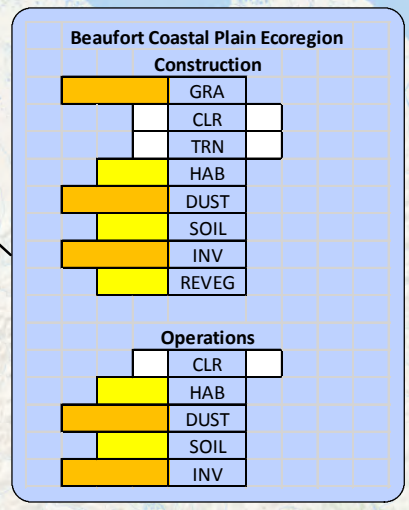
- Major Positive
- Moderate Positive
- Minor Positive
- Negligible
- Minor Negative
- Moderate Negative
- Major Negative

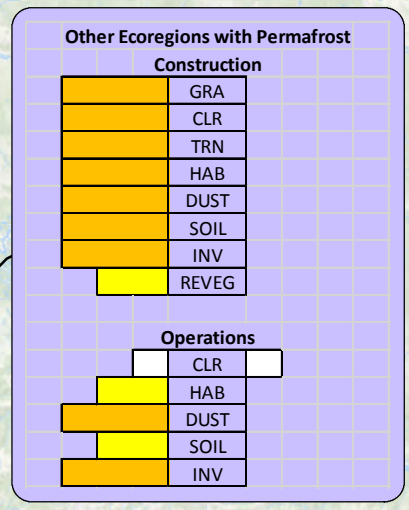
Effect Indicators

GRA: Placement of gravel fill
CLR: Clearing, grubbing, and grading
TRN: Open-cut trenching and backfilling
HAB: Habitat fragmentation
DUST: Dust deposition
SOIL: Soil compaction and erosion
INV: Introduction of non-native, invasive, or noxious plants
REVEG: Rehabilitation and revegetation activities

Beaufort Sea

MP 0
MP 62
MP 100
Anaktuvuk Pass
MP 200
Wiseman
Bettles
MP 300
Stevens Village
Rampart
Livengood
MP 400
Minto
Two Rivers
Fairbanks
Four Mile Road
Nenana
Anderson
MP 500
Ferry
Healy
McKinley Park
Cantwell
MP 600
Petersville
Talkeetna
Skwentna
MP 700
Willow
Susitna
MP 733
Anchorage





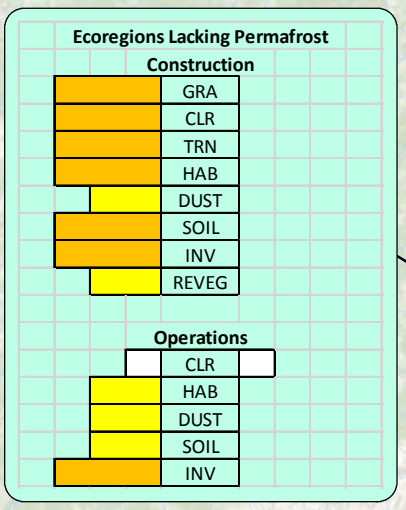


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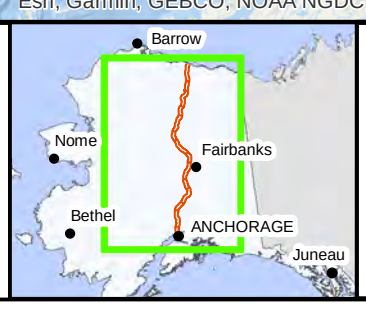
Figure ES-10-2: VEGETATION IMPACTS CONTEXT MAP, ALTERNATIVE 2
ALASKA STAND ALONE PIPELINE

0 25 50 100 150 Miles



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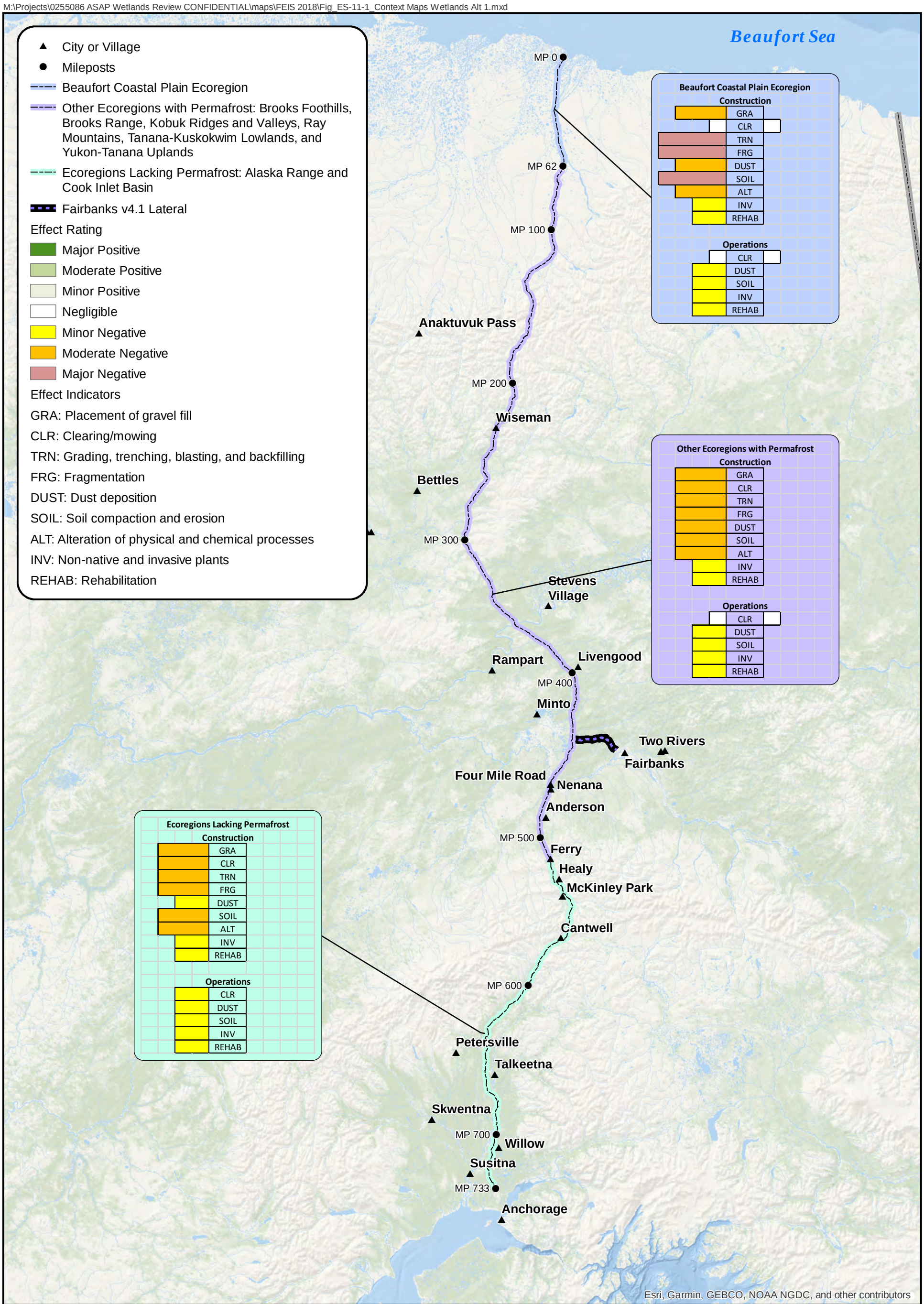

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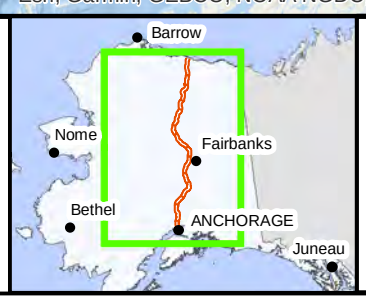
Figure ES-11-1: WETLANDS IMPACTS CONTEXT MAP, ALTERNATIVE 1
ALASKA STAND ALONE PIPELINE

0 25 50 100 150 Miles



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- City or Village
- Mileposts
- Beaufort Coastal Plain Ecoregion
- Other Ecoregions with Permafrost: Brooks Foothills, Brooks Range, Kobuk Ridges and Valleys, Ray Mountains, Tanana-Kuskokwim Lowlands, and Yukon-Tanana Uplands
- Ecoregions Lacking Permafrost: Alaska Range and Cook Inlet Basin
- Fairbanks v4.1 Lateral

Effect Rating

- Major Positive
- Moderate Positive
- Minor Positive
- Negligible
- Minor Negative
- Moderate Negative
- Major Negative

Effect Indicators

GRA: Placement of gravel fill
CLR: Clearing/mowing
TRN: Grading, trenching, blasting, and backfilling
FRG: Fragmentation
DUST: Dust deposition
SOIL: Soil compaction and erosion
ALT: Alteration of physical and chemical processes
INV: Non-native and invasive plants
REHAB: Rehabilitation

Beaufort Sea

MP 0
MP 62
MP 100
Anaktuvuk Pass
MP 200
Wiseman
Bettles
MP 300
Stevens Village
Rampart
Livengood
MP 400
Minto
Two Rivers
Fairbanks
Four Mile Road
Nenana
Anderson
MP 500
Ferry
Healy
McKinley Park
Cantwell
MP 600
Petersville
Talkeetna
Skwentna
MP 700
Willow
Susitna
MP 733
Anchorage

Beaufort Coastal Plain Ecoregion

Construction	
	GRA
	CLR
	TRN
	FRG
	DUST
	SOIL
	ALT
	INV
	REHAB

Operations	
	CLR
	DUST
	SOIL
	ALT
	INV
	REHAB

Other Ecoregions with Permafrost

Construction	
	GRA
	CLR
	TRN
	FRG
	DUST
	SOIL
	ALT
	INV
	REHAB

Operations	
	CLR
	DUST
	SOIL
	ALT
	INV
	REHAB

Ecoregions Lacking Permafrost

Construction	
	GRA
	CLR
	TRN
	FRG
	DUST
	SOIL
	ALT
	INV
	REHAB

Operations	
	CLR
	DUST
	SOIL
	ALT
	INV
	REHAB

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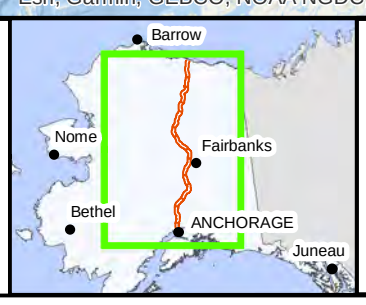
Figure E-11-2: WETLANDS IMPACTS CONTEXT MAP, ALTERNATIVE 2 ALASKA STAND ALONE PIPELINE

0 25 50 100 150 Miles



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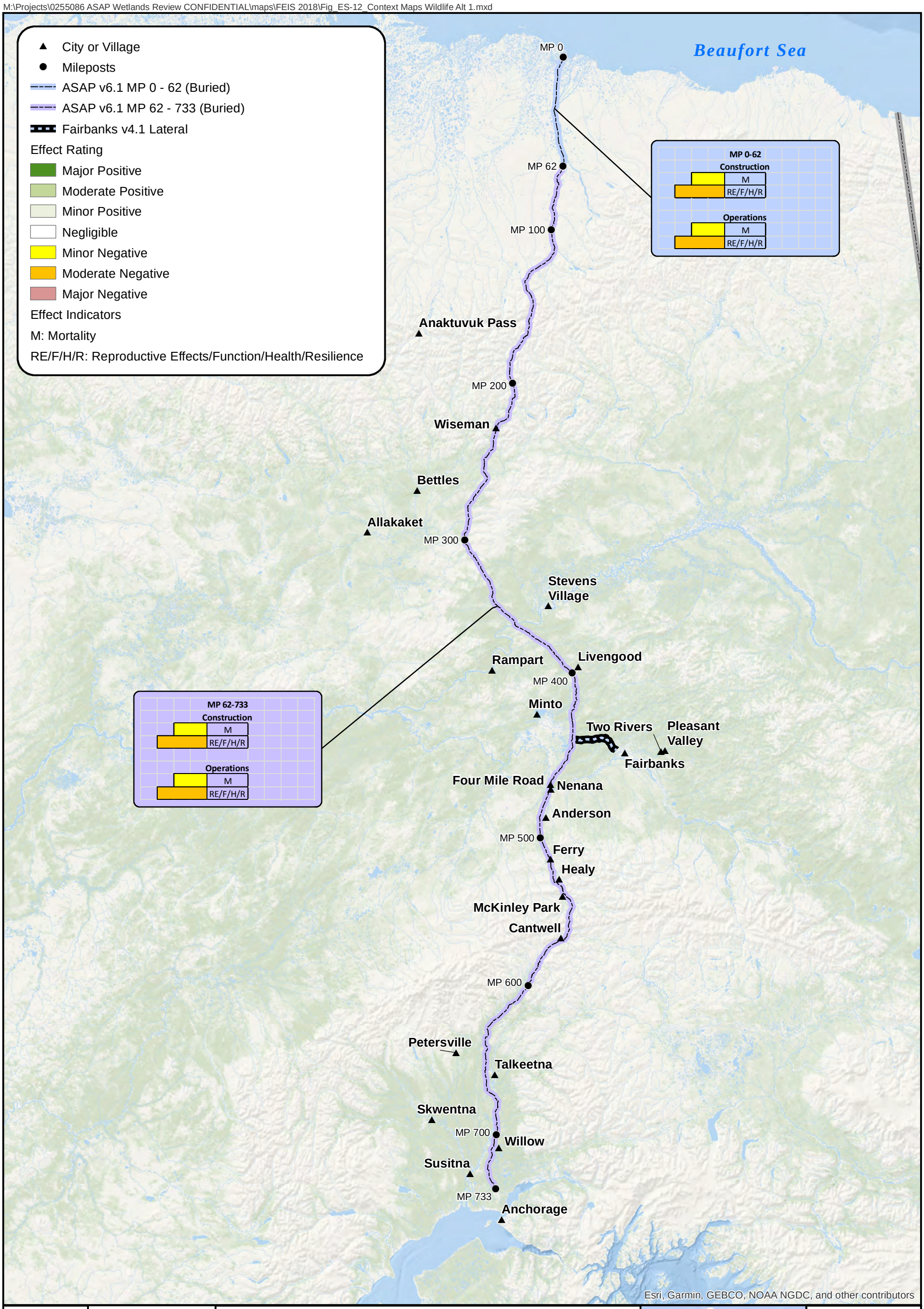

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PROJ. No.: 0416166

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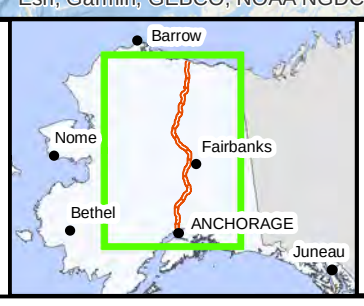
Figure ES-12: WILDLIFE IMPACTS CONTEXT MAP, ALTERNATIVE 1
ALASKA STAND ALONE PIPELINE

0 25 50 100 150 Miles



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- City or Village
- Mileposts
- ASAP v6.1 MP 0 - 62 (Aboveground)
- ASAP v6.1 MP 62 - 733 (Buried)
- ASAP Yukon Crossing (Aerial)
- Fairbanks v4.1 Lateral
- Denali NPP Route Variation

Effect Rating

- Major Positive
- Moderate Positive
- Minor Positive
- Negligible
- Minor Negative
- Moderate Negative
- Major Negative

Effect Indicators

M: Mortality

RE/F/H/R: Reproductive Effects/Function/Health/Resilience

Beaufort Sea

MP 0

MP 62

MP 100

MP 200

MP 300

MP 400

MP 500

MP 600

MP 700

MP 733

MP 0-62 (Aboveground)
Construction: M, RE/F/H/R
Operations: M, RE/F/H/R

Yukon Crossing (Aerial)
Construction: M, RE/F/H/R
Operations: M, RE/F/H/R

MP 62-733 (Aboveground)
Construction: M, RE/F/H/R
Operations: M, RE/F/H/R

Anaktuvuk Pass
Wiseman
Bettles
Allakaket
Stevens Village
Rampart
Livengood
Minto
Two Rivers
Pleasant Valley
Fairbanks
Four Mile Road
Nenana
Anderson
Ferry
Healy
McKinley Park
Cantwell
Petersville
Talkeetna
Skwentna
Willow
Susitna
Anchorage

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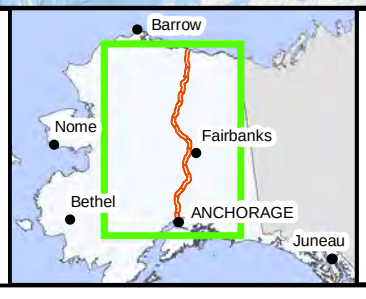
Figure ES-13: WILDLIFE IMPACTS CONTEXT MAP, ALTERNATIVE 2
ALASKA STAND ALONE PIPELINE

0 25 50 100 150 Miles



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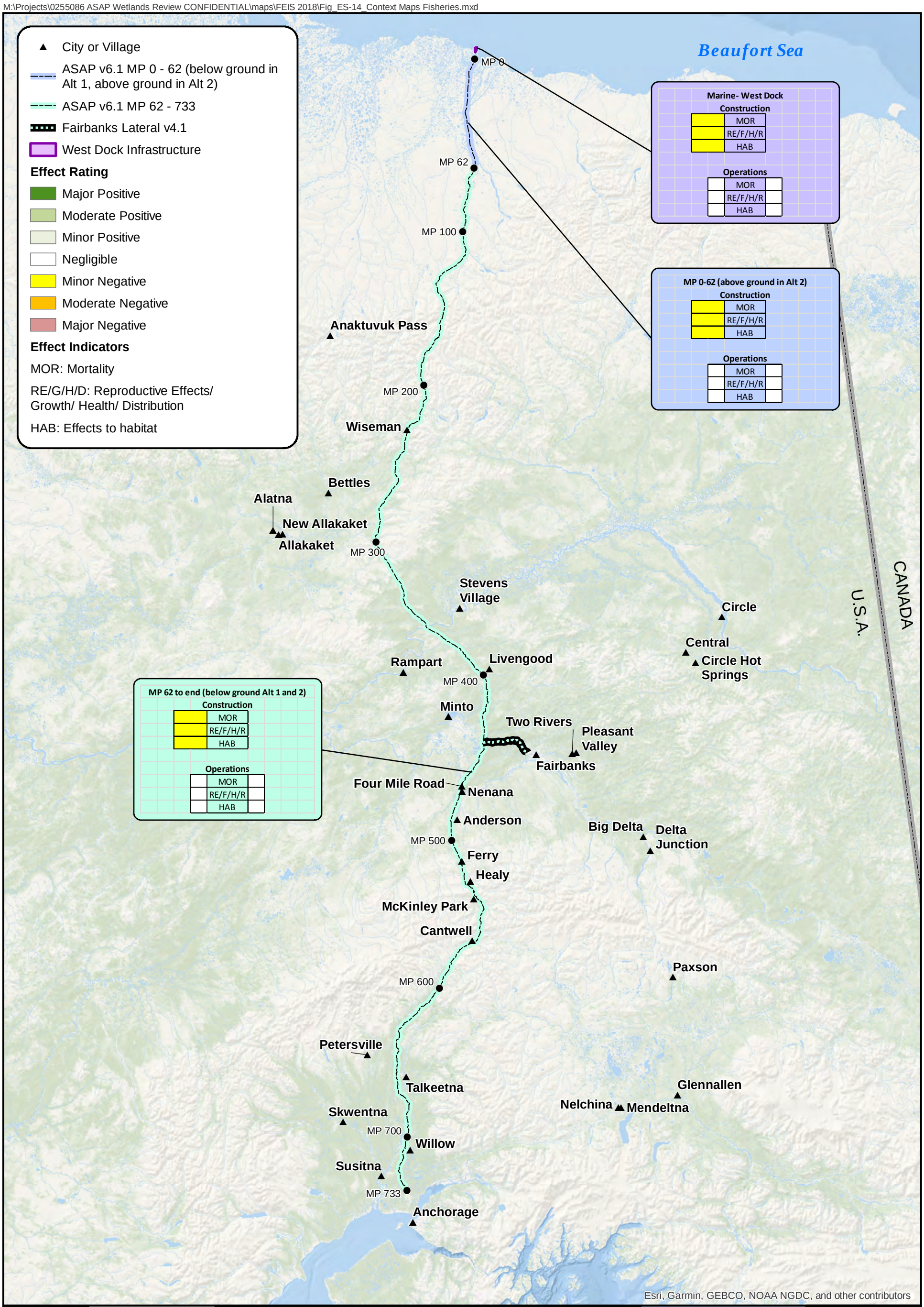

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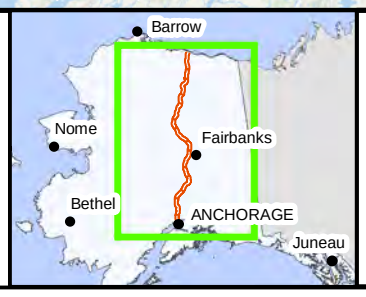
Figure ES-14: FISHERIES IMPACTS CONTEXT MAP ALASKA STAND ALONE PIPELINE

0 25 50 100 150 Miles



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M:\Projects\0255086 ASAP Wetlands Review CONFIDENTIAL\maps\FEIS 2018\Fig_ES-15_Context Maps Marine Mammal.mxd

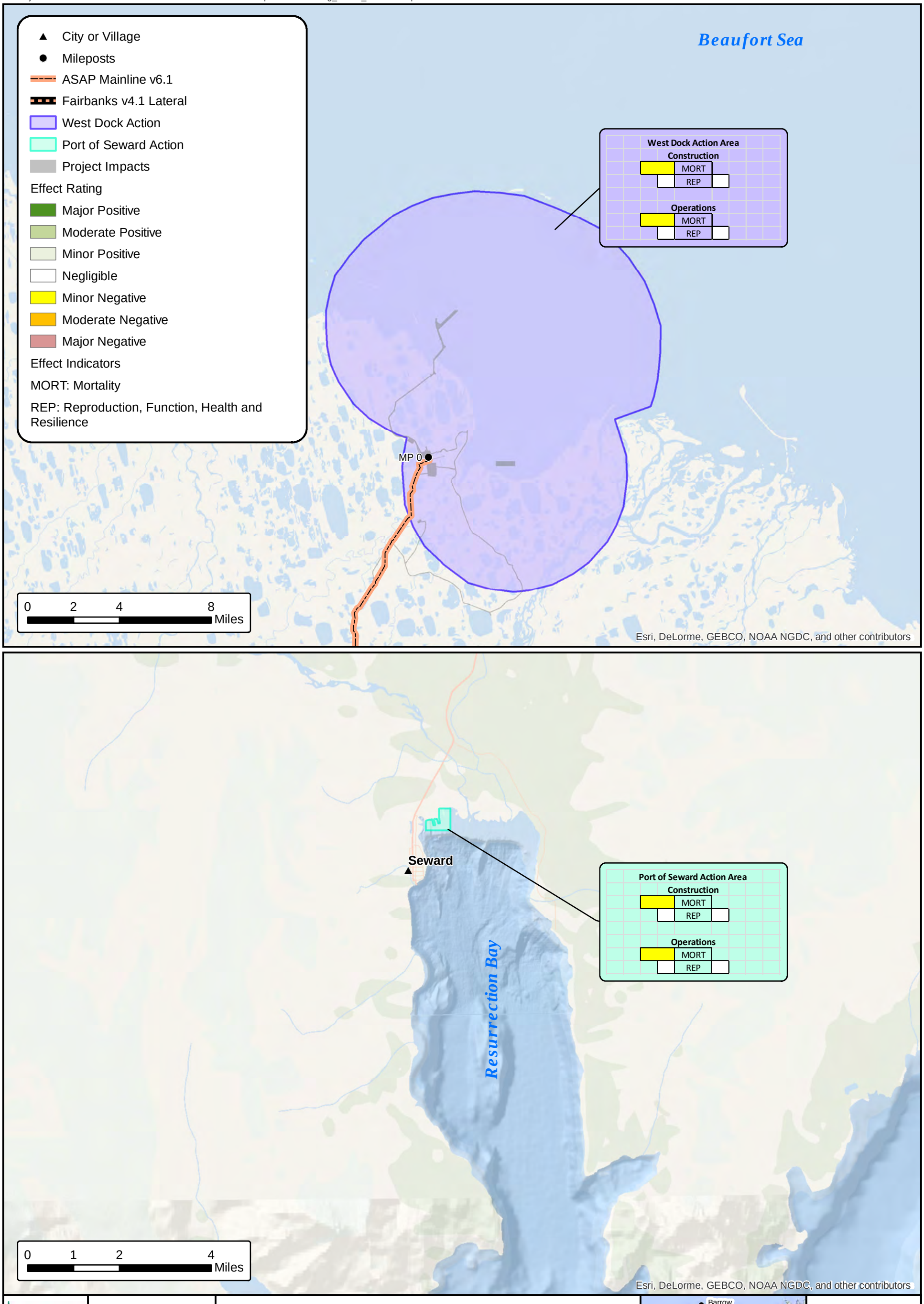

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Figure ES-15: MARINE MAMMAL IMPACTS CONTEXT MAP ALASKA STAND ALONE PIPELINE

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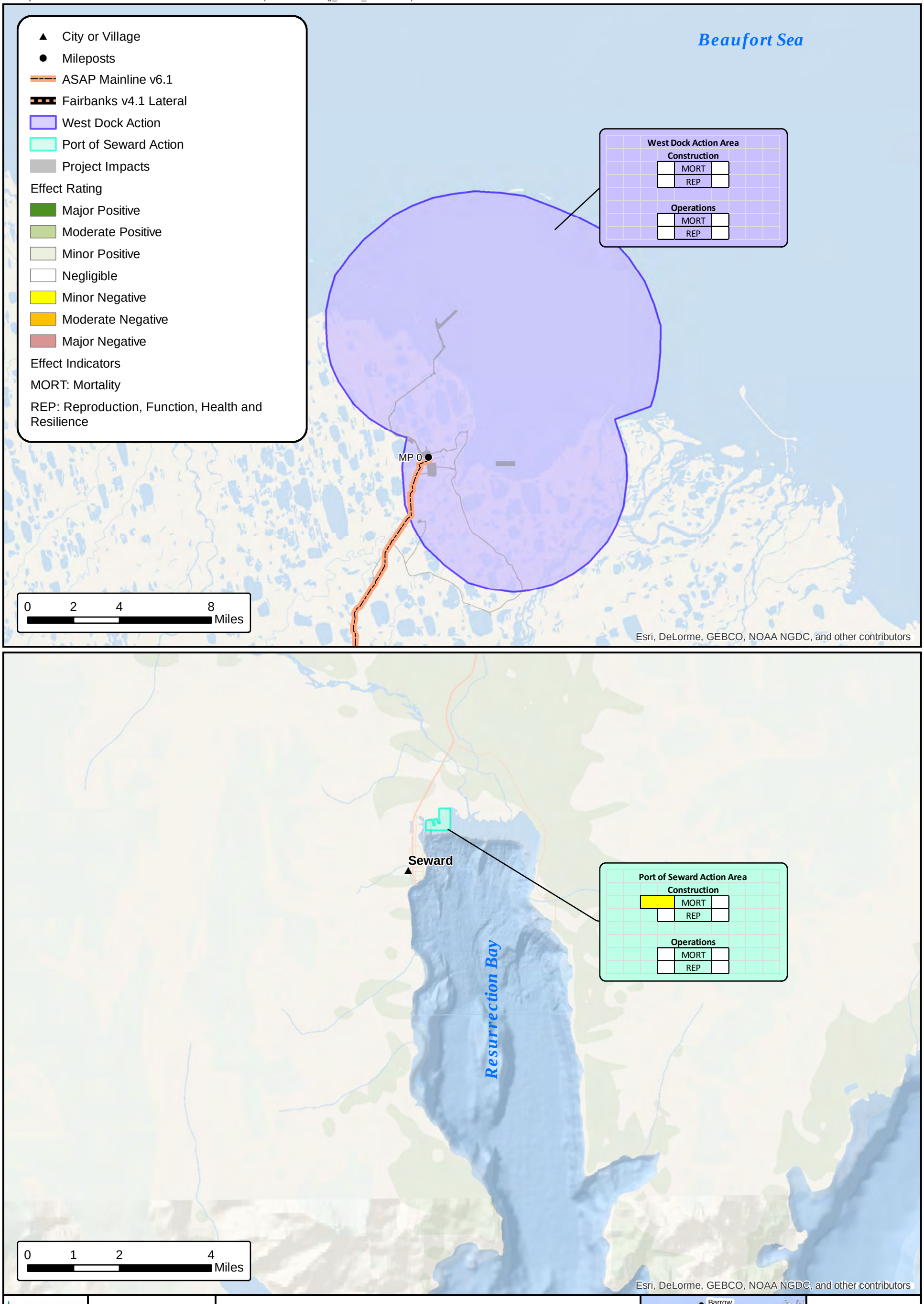

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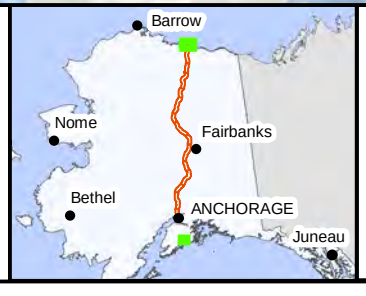
Figure ES-16: BENTHIC IMPACTS CONTEXT MAP
ALASKA STAND ALONE PIPELINE



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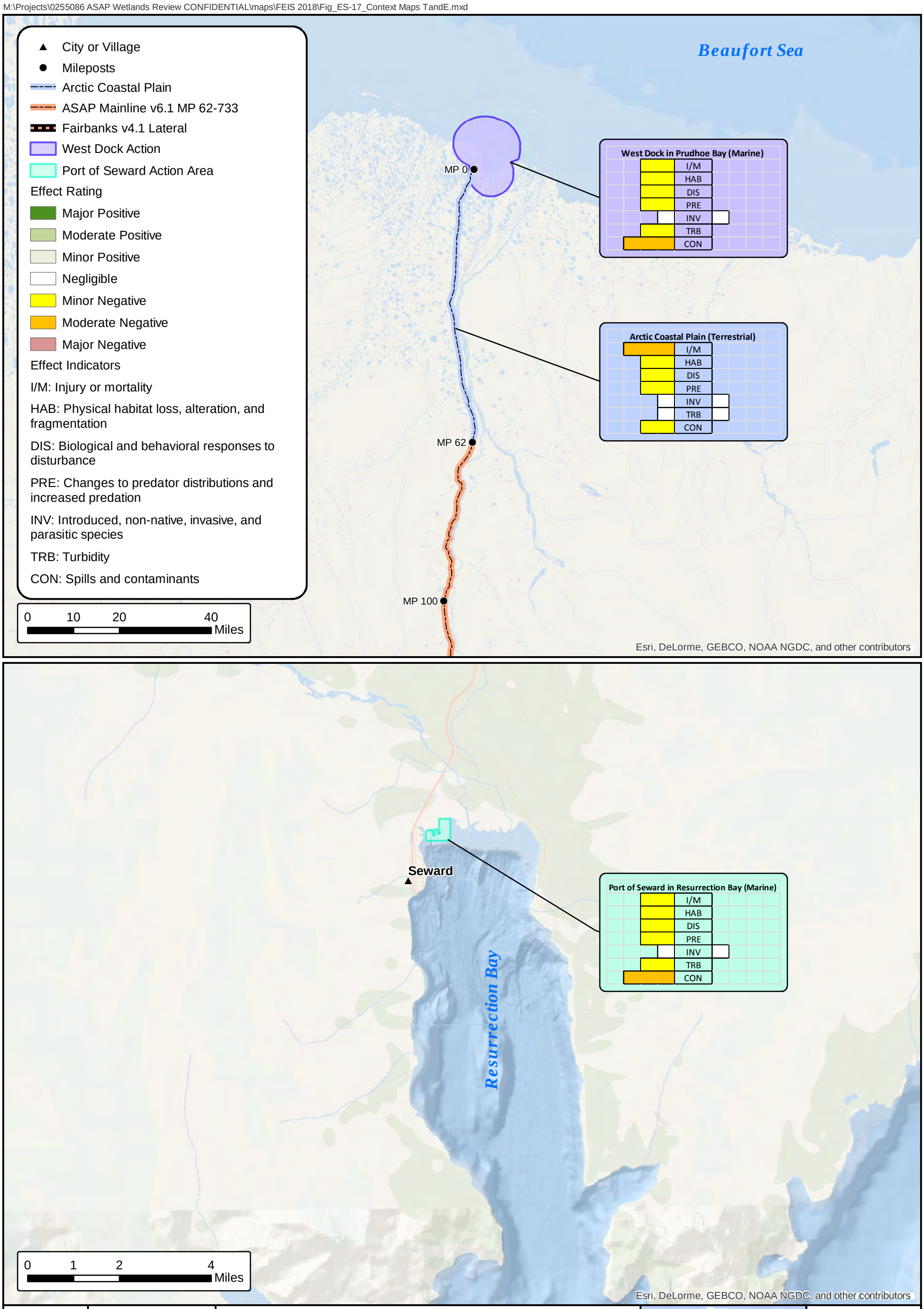

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Figure ES-17: THREATENED AND ENDANGERED SPECIES IMPACTS CONTEXT MAP
ALASKA STAND ALONE PIPELINE

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City or Village
Mileposts
ASAP v6.1 MP 0-250
ASAP v6.1 MP 250-500
ASAP v6.1 MP 500-733
Fairbanks v4.1 Lateral
Nancy Lake SRA
Denali National Park and Preserve

NLCD (2011)
Agricultural Land near ROW
Forested Land near ROW

Public Lands Management
Bureau of Land Management
Fish and Wildlife Service
National Forest Service
National Park Service
State Lands

Effect Rating
Major Positive
Moderate Positive
Minor Positive
Negligible
Minor Negative
Moderate Negative
Major Negative

Effect Indicators
LAN: Land Use Planning and Conservation
EXI: Existing Transportation, Utilities, Easements, and ROWs
FOR: Forestland
AGR: Agriculture Land
DEV: Developed Areas
WAS: Waste Generation
PRO: Property Ownership and Zoning

Beaufort Sea
MP 0
MP 100
MP 200
MP 250
MP 300
MP 400
MP 500
MP 600
MP 700
Mollie Beattie Wilderness
Arctic National Wildlife Refuge
Gates of the Arctic National Preserve
Gates of the Arctic Wilderness
Gates of the Arctic National Park
Wiseman
Bettles
Stevens Village
Rampart
Livengood
Minto
Steese Highway
Two Rivers
Pleasant Valley
Fairbanks
Yukon-Charley Rivers National Preserve
Nowitna National Wildlife Refuge
Four Mile Road
Nenana
Anderson
Richardson Highway
Ferry
Healy
McKinley Park
TANANA VALLEY SF
Innoko National Wildlife Refuge
Innoko Wilderness
Denali National Preserve
Cantwell
Denali Wilderness
Denali National Park
Denali Highway
Tok Cut-Off
Petersville
Talkeetna
TALKEETNA REC RIVER
Skwentna
Willow
Susitna
SUSITNA REC RIVER
CHUGACH SP
Anchorage
Lake Clark Wilderness
Lake Clark National Park
Lake Clark National Preserve
Tuxedni Wilderness
KENAI RIVER SMA
Chugach National Forest
Kenai Wilderness
Seward
Kenai Fjords National Park
Kenai National Wildlife Refuge
Togiak Wilderness
U.S.A.
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ASAP v6.1 MP 0-250
Construction: LAN, EXI, FOR, AGR, DEV, WAS, PRO
Operations: LAN, EXI, FOR, AGR, DEV, WAS, PRO

ASAP v6.1 MP 250-500
Construction: LAN, EXI, FOR, AGR, DEV, WAS, PRO
Operations: LAN, EXI, FOR, AGR, DEV, WAS, PRO

ASAP v6.1 MP 500-733
Construction: LAN, EXI, FOR, AGR, DEV, WAS, PRO
Operations: LAN, EXI, FOR, AGR, DEV, WAS, PRO

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Figure ES-18: LAND USE IMPACTS CONTEXT MAP
ALASKA STAND ALONE PIPELINE

0 30 60 120 180 Miles

Barrow
Nome
Fairbanks
Bethel
ANCHORAGE
Juneau

N

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City or Village
Mileposts
Recreation Features
Iditarod Trail
ASAP v6.1 Mainline
Yukon Crossing and Denali Alternative Reroute
Fairbanks v4.1 Lateral

Public Lands Management
Bureau of Land Management
Fish and Wildlife Service
National Forest Service
National Park Service
State Lands

Effect Rating
Major Positive
Moderate Positive
Minor Positive
Negligible
Minor Negative
Moderate Negative
Major Negative

Effect Indicators
CRQ: Changes to Recreation Quality
CRA: Changes to Recreation Access

Beaufort Sea
MP 0
Prudhoe Bay
MP 62
MP 100
Mollie
Mainline and Fairbanks Lateral
Construction
CRQ
CRA
Operations
CRQ
CRA
Anaktuvuk Pass
Gates of the Arctic National Park
Atigun Pass
MP 200
Wiseman
Coldfoot
Marion Creek Campground
Arctic Interagency Visitor Center
Bettles
Alatna
New Allakaket
Allakaket
MP 300
Kanuti National Wildlife Refuge
Yukon Flats National Wildlife Refuge
Five Mile Camp
Stevens Village
Koyukuk Wilderness
Koyukuk National Wildlife Refuge
Rampart
Livengood
MP 400
Steese Highway
Minto
TANANA VALLEY SF
Yukon-Charley Rivers National Preserve
Two Rivers
Pleasant Valley
Fairbanks
Four Mile Road
Nenana
Richardson Highway
Anderson
MP 500
TANANA VALLEY SF
Yukon River Crossing and Denali Alternative
Construction
CRQ
CRA
Operations
CRQ
CRA
Ferry
Healy
Innoko National Wildlife Refuge
McKinley Park
Denali National Preserve
Denali National Park
Cantwell
Innoko Wilderness
Denali Wilderness
MP 600
East Fork Chulitna River Campground
Denali Highway
Wrangell-Saint Elias National Preserve
Petersville
TALKEETNA REC RIVER
Talkeetna
NELCHINA PUBLIC USE AREA
Glenn Highway
Skwentna
Montana Creek SRA
MP 700
Willow
Wrangell-Saint Elias Wilderness
Susitna
NANCY LAKE SRA
LITTLE SUSITNA REC RIVER
MP 733
Anchorage
Wrangell-Saint Elias National Park
CHUGACH SP
Lake Clark Wilderness
Lake Clark National Park
KENAI RIVER SMA
Lake Clark National Preserve
Tuxedni Wilderness
Kenai National Wildlife Refuge
Chugach National Forest
Kenai Wilderness
KACHEMAK BAY SP
Kenai Fjords National Park
Togiak Wilderness
KACHEMAK BAY OIL & GAS CL

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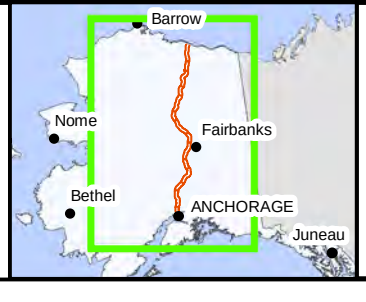
Figure ES-19: RECREATION IMPACTS CONTEXT MAP
ALASKA STAND ALONE PIPELINE

0 30 60 120 180 Miles



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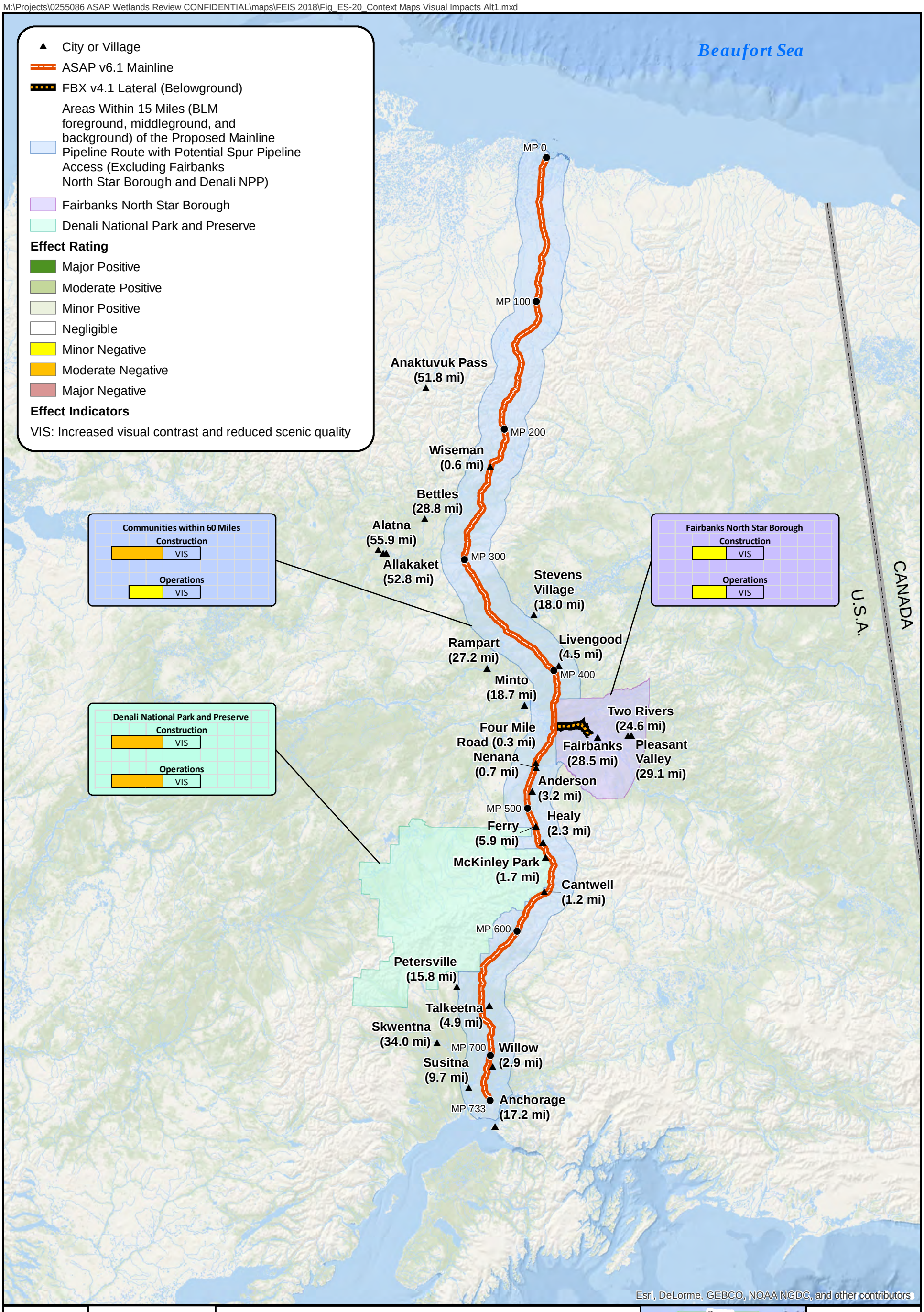

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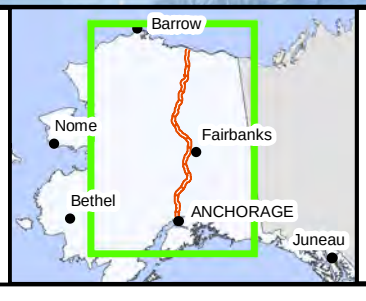
Figure ES-20: VISUAL IMPACTS CONTEXT MAP, ALTERNATIVE 1
ALASKA STAND ALONE PIPELINE

0 30 60 120 180 Miles



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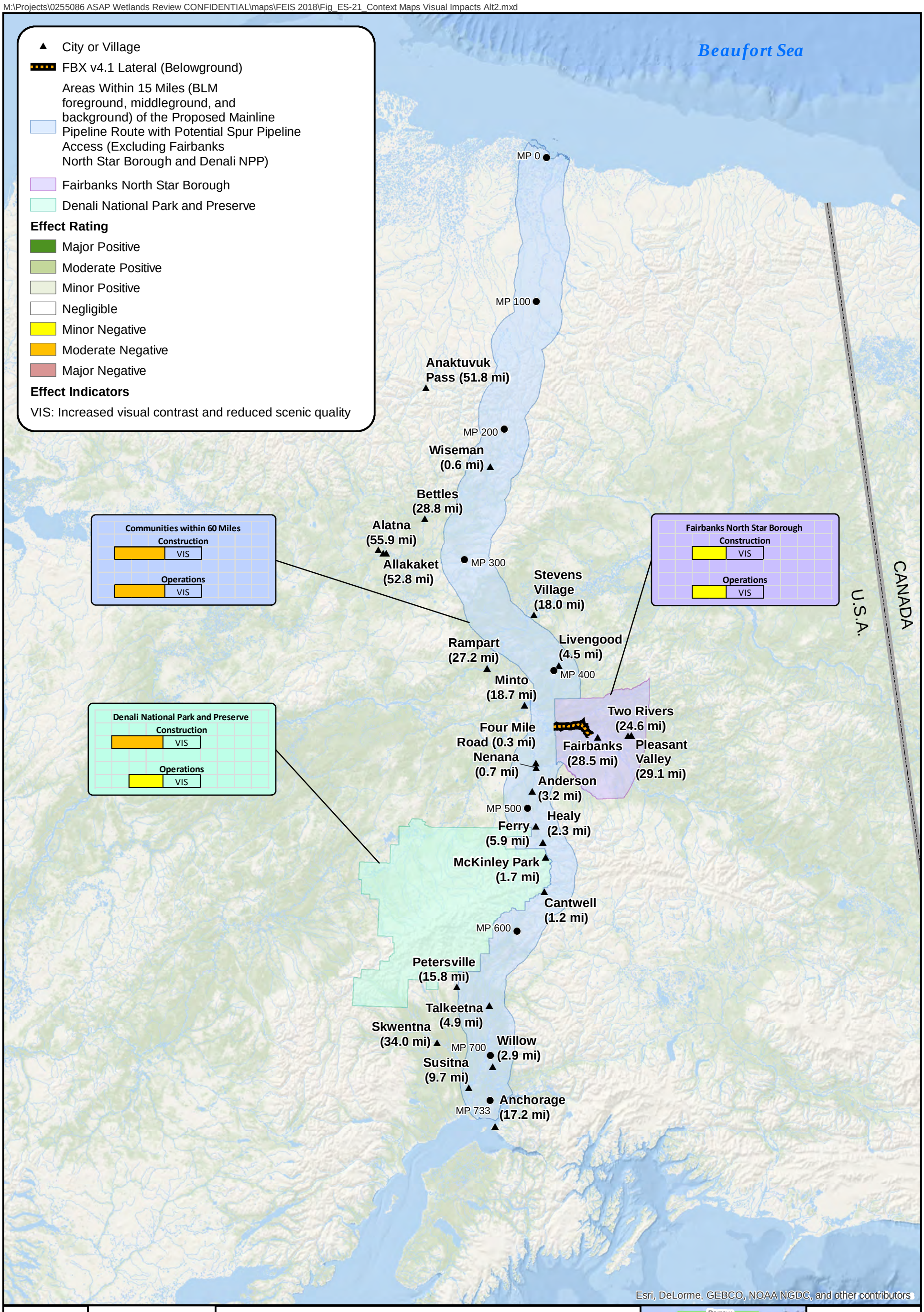

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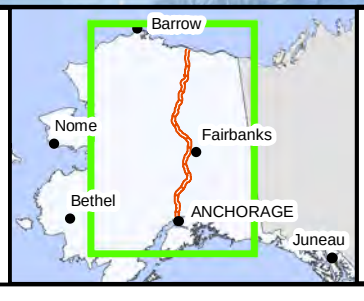
Figure ES-21: VISUAL IMPACTS CONTEXT MAP, ALTERNATIVE 2
ALASKA STAND ALONE PIPELINE

0 30 60 120 180 Miles



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- City or Village
- ASAP v6.1 Mainline
- FBX v4.1 Lateral (Belowground)
- Communities Within 60 Miles of the Proposed Mainline Pipeline Route with Potential Spur Pipeline Access (Excluding Fairbanks North Star Borough)
- Fairbanks North Star Borough
- Communties That May Access Natural Gas Indirectly (Through Truck, or Existing Infrastructure)

Effect Rating

- Major Positive
- Moderate Positive
- Minor Positive
- Negligible
- Minor Negative
- Moderate Negative
- Major Negative

Effect Indicators

POP: Population Trends and Projections
EMP: Employment
HOU: Housing and Property Values
REV/EXP: Government Revenue and Expenditures
INF: Infrastructure and Services
SUP: Increased Energy Supply

Beaufort Sea

MP 0
MP 100
MP 200
MP 300
MP 400
MP 500
MP 600
MP 700
MP 733

Anaktuvuk Pass (51.8 mi)
Wiseman (0.6 mi)
Bettles (28.8 mi)
Alatna (55.9 mi)
Allakaket (52.8 mi)
Stevens Village (18.0 mi)
Rampart (27.2 mi)
Minto (18.7 mi)
Livengood (4.5 mi)
Four Mile Road (0.3 mi)
Nenana (0.7 mi)
Anderson (3.2 mi)
Healy (2.3 mi)
Ferry (5.9 mi)
McKinley Park (1.7 mi)
Cantwell (1.2 mi)
Petersville (15.8 mi)
Talkeetna (4.9 mi)
Skwentna (34.0 mi)
Willow (2.9 mi)
Susitna (9.7 mi)
Anchorage (17.2 mi)
Pleasant Valley (29.1 mi)
Two Rivers (24.6 mi)
Fairbanks
Circle
Central
Circle Hot Springs
Big Delta
Delta Junction
Paxson
Glennallen
Nelchina
Mendeltna

Fairbanks Northstar Borough
Construction: POP, EMP, HOU, REV/EXP, INF, SUP
Operations: POP, EMP, HOU, REV/EXP, INF, SUP

Communities within 60 miles
Construction: POP, EMP, HOU, REV/EXP, INF, SUP
Operations: POP, EMP, HOU, REV/EXP, INF, SUP

Communities with Indirect Access
Construction: POP, EMP, HOU, REV/EXP, INF, SUP
Operations: POP, EMP, HOU, REV/EXP, INF, SUP

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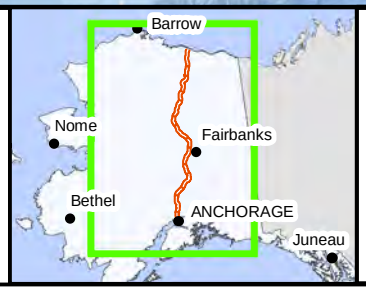
Figure ES-22: COMMUNITY IMPACTS ALONG THE PROPOSED PIPELINE ROUTE ALASKA STAND ALONE PIPELINE

0 30 60 120 180 Miles



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Map Legend

AHRS Sites in Direct Impact Area (n=121)

Impact Ranking	Transportation Impact Ranking
Major	Major
Moderate	Minor
Minor	Negligible
Negligible	

AHRS Sites in Indirect Impact Area (n=549; includes 12 sites in Seward not shown on map)

ASAP Project

Roads

Note: Direct and Indirect Impact Area includes AHRS sites that are eligible for the NRHP and those with no determination.

Beaufort Sea

Prudhoe Bay

GCF to MP 536
Major Negative: 13
Moderate Negative: 30
Minor Negative:27
Negligible: 18
Note: 15 site impact rankings would reduce from minor to negligible after construction.

Fairbanks Lateral
Major Negative: 0
Moderate Negative: 1
Minor Negative: 1
Negligible: 0

Fairbanks

Nenana

Alternative 2 (DNPP)
Major Negative: 0
Moderate Negative: 0
Minor Negative: 0
Negligible: 0

Alternative 1 (MP 536-543)
Major Negative: 0
Moderate Negative: 1
Minor Negative: 1
Negligible: 0
Note: 1 site impact ranking would reduce from minor to negligible after construction.

Healy

Cantwell

MP 543-733
Major Negative: 6
Moderate Negative: 8
Minor Negative: 14
Negligible: 1
Note: 2 site impact rankings would reduce from minor to negligible after construction.

Talkeetna

Anchorage

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Cultural Resources Context Figure & Project-wide Impacts Assessment

0 30 60 Miles

FIGURE

ES-23

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Barrow
Nuiqsut
Prudhoe Bay
Kaktovik
ASAP Project
Anaktuvuk Pass
Wiseman
Coldfoot
Evansville
Bettles
Allakaket
Alatna
Beaver
Stevens Village
Livengood
Rampart
Tanana
Manley Hot Springs
Minto
Fairbanks
Four-Mile Road
Nenana
Anderson/Clear
Ferry
Healy
McKinley Park
Cantwell
ASAP Project
Chase
Talkeetna
Susitna North
Palmer, Wasilla
Lake Louise
Gakona
Glennallen
Copper Center
Kenny Lake
McCarthy
Petersville
Trapper Creek
Skwentna
Willow
Chickaloon
Valdez
Alexander Creek/Susitna
Eklutna
Beluga
Anchorage
Tyonek
Point Possession
Hope
Whittier
CANADA

Construction Impacts
(top half of circle)
Operations Impacts
(bottom half of circle)

Impact Negligible
Construction 22 communities
Operations 31 communities

Impact Minor Negative
Construction 16 communities
Operations 7 communities

Impact Moderate Negative
Construction 10 communities
Operations 11 communities

Impact Major Negative
Construction 3 communities
Operations 2 communities

ASAP Project
Road

Because of the variation in impacts across communities, this figure presents the impacts on a community level rather than a regional level.

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Alaska Stand Alone Pipeline
Community Subsistence Impacts Along Pipeline Route

0 50 100 Miles

FIGURE
ES-24

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City or Village
ASAP v6.1 Mainline
FBX v4.1 Lateral (Belowground)
Potential Affected Communities (Excluding Fairbanks North Star Borough)
Fairbanks North Star Borough

Effect Rating

Major Positive
Moderate Positive
Minor Positive
Negligible
Minor Negative
Moderate Negative
Major Negative

Effect Indicators

SDH: Social Determinants of Health
A&I: Accidents and Injuries
EHM: Exposure to Hazardous Materials
FN&S: Food, Nutrition, and Subsistence Activity
ID: Infectious Disease
W&S: Water and Sanitation
NC&CD: Non-Communicable and Chronic Disease
HSI&C: Health Services Infrastructure and Capacity

Potentially Affected Communities

Construction: SDH, A&I, EHM, FN&S, ID, W&S, NC&CD, HSI&C

Operations: SDH, A&I, EHM, FN&S, ID, W&S, NC&CD, HSI&C

Fairbanks North Star Borough

Construction: SDH, A&I, EHM, FN&S, ID, W&S, NC&CD, HSI&C

Operations: SDH, A&I, EHM, FN&S, ID, W&S, NC&CD, HSI&C

Beaufort Sea
MP 0
Prudhoe Bay
MP 100
MP 200
Wiseman
Coldfoot
MP 300
Livengood
MP 400
Gold Stream
College
Fairbanks
Ester
Four Mile Road
Nenana
Anderson
MP 500
Healy
McKinley Park
Cantwell
MP 600
Trapper Creek
Talkeetna
North Susitna
MP 700
Willow
Wasilla
Big Lake
MP 733
Point MacKenzie
U.S.A.
CANADA

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PROJ. No.: 0416166

Figure ES-25: PUBLIC HEALTH IMPACTS CONTEXT MAP ALASKA STAND ALONE PIPELINE

0 30 60 120 180 Miles

Barrow
Nome
Fairbanks
Bethel
ANCHORAGE
Juneau

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City or Village
ASAP v6.1 Mainline
FBX v4.1 Lateral (Belowground)
Communities Within 60 Miles of the Proposed Pipeline Route with Potential Spur Pipeline Access
Gas Conditioning Facility
Communities with Indirect Access

Effect Rating

Major Positive
Moderate Positive
Minor Positive
Negligible
Minor Negative
Moderate Negative
Major Negative

Effect Indicators

FUG: Fugitive Dust
IAC: Increased Air Contaminant Concentrations
DEC: Decreased Emissions

Gas Conditioning Facility
Construction: FUG, IAC, DEC
Operations: FUG, IAC, DEC

Pipeline ROW & Fairbanks Lateral
Construction: FUG, IAC, DEC
Operations: FUG, IAC, DEC

Communities with Indirect Access
Construction: FUG, IAC, DEC
Operations: FUG, IAC, DEC

Beaufort Sea
MP 0
MP 100
MP 200
MP 300
MP 400
MP 500
MP 600
MP 700
MP 733
Anaktuvuk Pass (51.8 mi)
Wiseman (0.6 mi)
Bettles (28.8 mi)
Alatna (55.9 mi)
Allakaket (52.8 mi)
Stevens Village (18.0 mi)
Rampart (27.2 mi)
Livengood (4.5 mi)
Minto (18.7 mi)
Four Mile Road (0.3 mi)
Nenana (0.7 mi)
Anderson (3.2 mi)
Healy (2.3 mi)
Ferry (5.9 mi)
McKinley Park (1.7 mi)
Cantwell (1.2 mi)
Petersville (15.8 mi)
Talkeetna (4.9 mi)
Skwentna (34.0 mi)
Willow (2.9 mi)
Susitna (9.7 mi)
Anchorage (17.2 mi)
Fairbanks (28.5 mi)
Two Rivers (24.6 mi)
Pleasant Valley (29.1 mi)
Circle
Central
Circle Hot Springs
Big Delta
Delta Junction
Paxson
Glennallen
Nelchina
Mendeltna
U.S.A.
CANADA
Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors

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DRWN: A.V.K.
PROJ. No.: 0416166

Figure ES-26: AIR QUALITY IMPACTS CONTEXT MAP ALASKA STAND ALONE PIPELINE

0 30 60 120 180 Miles

Barrow
Nome
Fairbanks
Bethel
ANCHORAGE
Juneau

N

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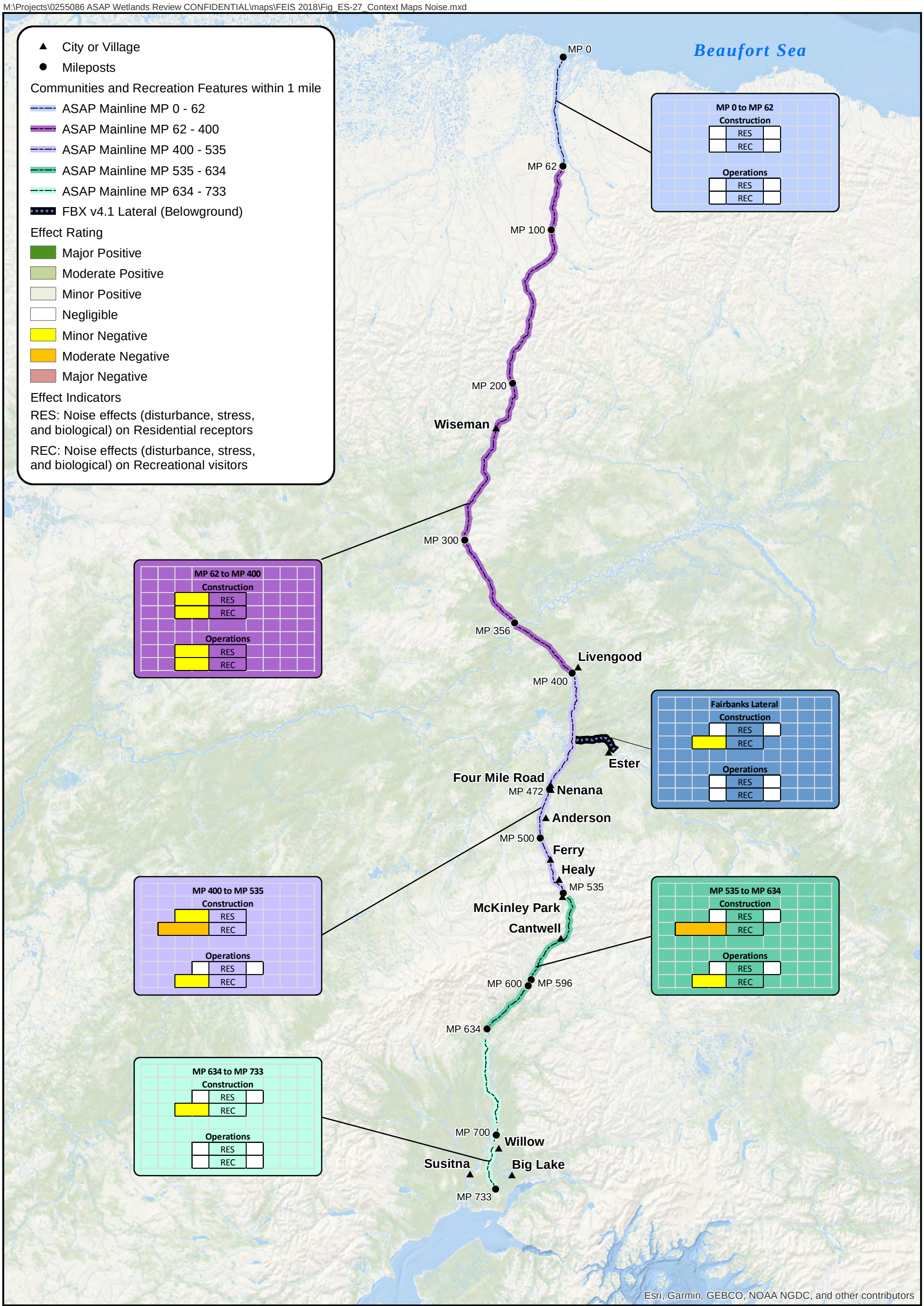

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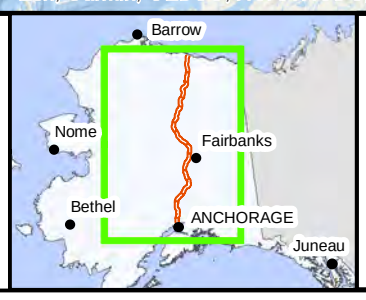
Figure ES-27: NOISE IMPACTS ALONG THE PROPOSED PIPELINE ROUTE CONTEXT MAP ALASKA STAND ALONE PIPELINE

0 25 50 100 150 Miles



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- City or Village
- Mileposts

Communities and Recreation Features within 1 mile of HDD Crossing

- Yukon River HDD
- Tanana River HDD
- Denali NPP Commercial Area HDD
- Honolulu Creek HDD
- Troublesome Creek HDD
- Chuitna River HDD
- Kashwitna River HDD
- Willow Creek HDD
- ASAP v6.1 Mainline
- FBX v4.1 Lateral (Belowground)

Effect Rating

- Major Positive
- Moderate Positive
- Minor Positive
- Negligible
- Minor Negative
- Moderate Negative
- Major Negative

Effect Indicators

RES: Noise effects (disturbance, stress, and biological) on Residential receptors

REC: Noise effects (disturbance, stress, and biological) on Recreational visitors

MP 300
MP 400
MP 500
MP 535
MP 600
MP 634
MP 700
MP 733

Livengood
Ester
Fairbanks
Four Mile Road
Nenana
Anderson
Ferry
Healy
McKinley Park
Cantwell
Willow
Susitna
Big Lake
Anchorage

Yukon River HDD Construction: RES, REC

Tanana River HDD Construction: RES, REC

Honolulu Creek HDD Construction: RES, REC

Denali NPP Commercial Area HDD Construction: RES, REC

Chulitna River HDD Construction: RES, REC

Troublesome Creek HDD Construction: RES, REC

Willow Creek HDD Construction: RES, REC

Kashwitna River HDD Construction: RES, REC

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Figure ES-28: NOISE IMPACTS AT HDD CROSSINGS CONTEXT MAP
ALASKA STAND ALONE PIPELINE

0 15 30 60 90 Miles

Barrow
Nome
Fairbanks
Bethel
ANCHORAGE
Juneau

N

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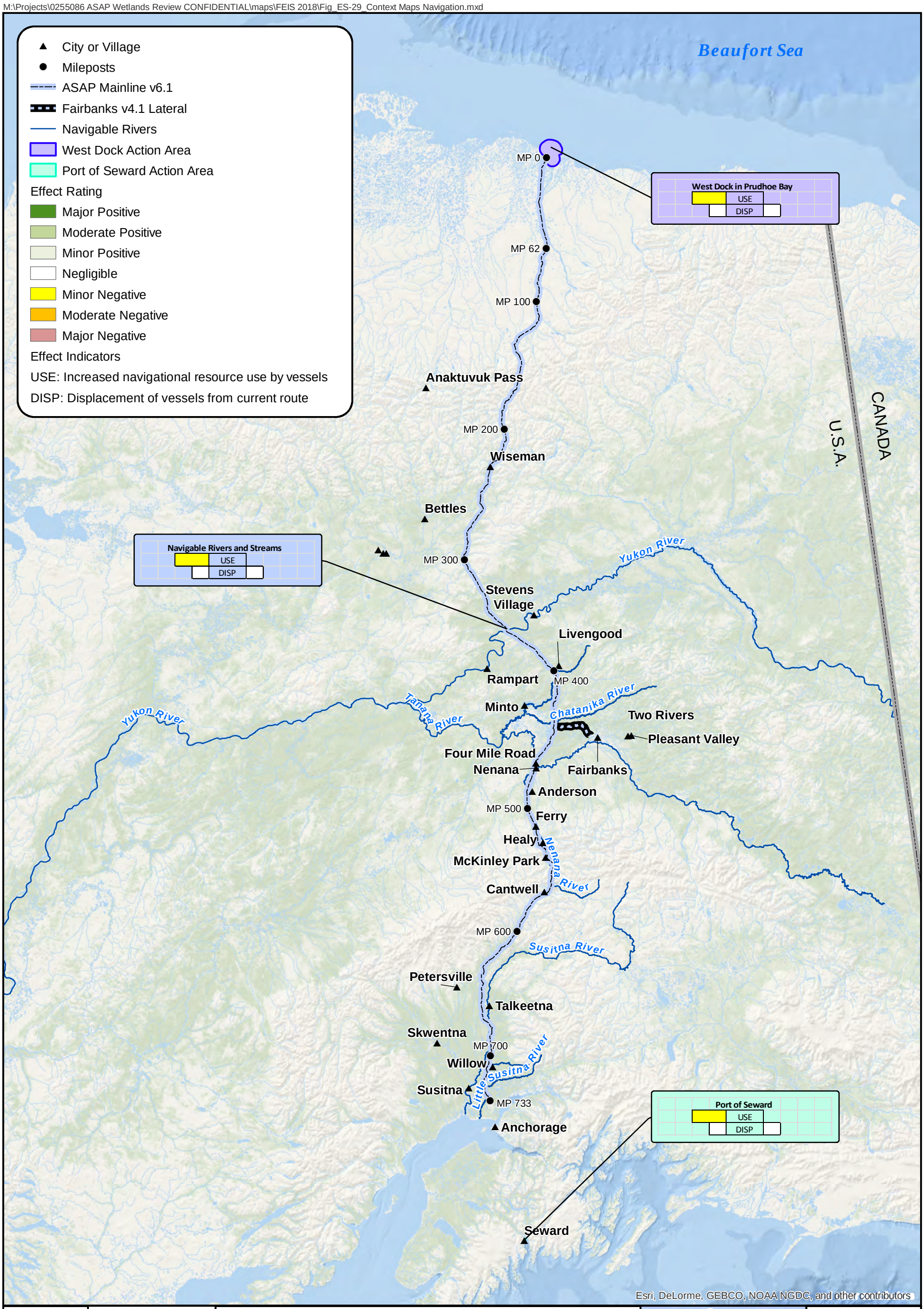

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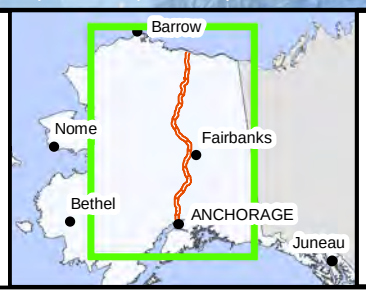
Figure ES-29: NAVIGATION IMPACTS CONTEXT MAP
ALASKA STAND ALONE PIPELINE

0 30 60 120 180 Miles



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