

8. RESOURCE VALUES AND ENVIRONMENTAL CONCERNS

This section summarizes resource values and environmental concerns for the pipeline route. Impacts to resources are expected to be temporary and localized, and associated primarily with the Construction phase.

8.1 LOCATION WITH RESPECT TO EXISTING CORRIDORS

The ASAP mainline route uses existing transportation and utility corridors where possible to reduce new ground disturbance. The proposed pipeline route lies adjacent to and often parallels the TAPS corridor, the Dalton Highway to Livengood, and the Parks Highway from just north of Nenana to approximately ASAP MP 697 near Willow. Much of the pipeline route lies outside of these ROWs in order to minimize total ground disturbance, minimize risks, and meet the standards of 49 CFR 192, Transportation of Natural Gas and Other Gas by Pipeline: Minimum Federal Safety Standards. Construction outside of the highway ROW corridors accommodates a pipeline WT that is durable, safe, and economical and that meets USDOT and PHMSA regulations.

8.2 ANTICIPATED CONFLICTS WITH RESOURCES OR PUBLIC HEALTH AND SAFETY

8.2.1 Air

The construction and operation of the ASAP project is not expected to have significant effects on air quality within the project area. The proposed project's emission levels will trigger new-source construction permitting either as minor source or major source permitting.

The proposed project's emission inventory is under development, but the primary air contaminants will include NO_x, CO, small-diameter particulate (particulate matter of 10 microns in diameter or smaller [PM₁₀] and particulate matter of 2.5 microns in diameter or smaller [PM_{2.5}]), Sulfur Dioxide (SO₂), and Volatile Organic Compounds (VOCs). These contaminants are collectively known as "criteria pollutants." The level of expected emissions will dictate whether the proposed project is permitted as a minor source or as a major source. The major source regulations require Best Available Control Technology (BACT) to reduce emissions. The major source regulations also require the applicant to demonstrate that the proposed project will not significantly adversely affect existing air quality.

Construction Phase

The proposed project will have a localized effect on air quality during the project Construction phase, primarily due to diesel-powered mobile construction equipment and, perhaps, some wind-blown dust during the summer construction season. These potential particulate matter impacts in the Fairbanks non-attainment area for PM_{2.5} from construction of the Fairbanks Lateral will be mitigated by BMPs for fugitive dust control and the use of Ultra-low-sulfur Diesel (ULSD) fuel by construction equipment. Since much of the proposed pipeline will parallel or share existing transportation corridors, including the Parks Highway and railroads, fugitive dust emissions will be managed as a public safety factor for people traveling on the highway and railroad. Some open burning may be conducted during construction and will be subject to applicable ADEC air quality regulations.

Construction activities will use measures to minimize short-term effects to air quality, including:

- Developing and implementing a Quality Assurance (QA)/QC program that tracks and assures implementation of all permit conditions associated with eliminating or reducing effects to local air quality
- Scheduling construction activities at times when there will be the fewest number of tourists or local residents engaged in outdoor recreation
- Reducing fugitive dust from construction traffic on unpaved roads
- Minimizing the number and location of permanent access roads
- Maximizing the use of snow and ice roads during pipeline construction
- Burning of slash at times when effects to air quality are minimized
- Using construction camp incinerators to dispose of only those materials that the incinerator is designed and permitted to burn

Operations Phase

The stationary facilities associated with the project will be located outside of the Fairbanks non-attainment area for PM_{2.5} and will neither directly nor indirectly impact the National Ambient Air Quality Standards (NAAQS) or Alaska Ambient Air Quality Standards (AAAQS) for particulate matter. Effects from operation of the proposed project on air quality will be due to combustion products from natural-gas-fired equipment located at the GCF and from venting small quantities of hydrocarbon vapor at other select locations along the pipeline. Environmental effects of emissions from these facilities are likely to be minimal because hydrocarbon venting is expected to occur only during abnormal operations. Additionally, the GCF may require implementation of control technologies to reduce emissions and demonstrate compliance with NAAQS and AAAQS.

Smaller internal combustion equipment will be required for power generation and refrigerant compression. All gas-fired equipment will be fitted with BACT to reduce emissions as appropriate for the particular equipment and governing codes and standards.

The criteria pollutants emitted will result in an insignificant regionalized effect on air quality with respect to NAAQS and AAAQS. Hazardous Air Pollutants (HAPs) from the facilities should be

less than applicable USEPA/ADEC HAP regulatory thresholds. HAP applicability will be confirmed as part of the emissions inventory. The facilities will result in CO₂ emissions that will be quantified as part of the proposed project emission inventory.

The facility emissions, depending on their location and size, could possibly have an effect on visibility by producing a visible vapor cloud during cold weather. Location of permanent facilities will consider local air quality requirements. Special attention was given so that facilities do not cause significant long-term effects on the designated Class I airshed for DNP&P and Gates of the Arctic National Park and Preserve, and to local communities. This special attention was also given to public recreation areas, such as BLM recreation sites in the Transportation and Utility Corridor through the Brooks Range southward to the Yukon River, similar state and local facilities located along the Elliott and Parks Highways, and to the DNP&P.

Project maintenance-related activity, primarily from vehicle traffic, will result in a smaller, localized, insignificant effect on air quality.

Potential Effects

Potential effects from operation of the GCF include increases in ambient concentrations of Nitrogen Oxides (NO_x), Ozone (O₃), and Carbon Monoxide (CO) from the fuel combustion process. Increases in Greenhouse Gas (GHG) emissions (for example, CO₂) will also occur as a result of diesel-fuel combustion. Increases in particulate matter (PM₁₀ and PM_{2.5}) emissions will likely occur from construction activities and from operation of diesel-fueled combustion equipment at the camps. Minor increases in SO₂ and VOC emissions from construction equipment will also occur.

Mitigation

Mitigation measures that can be implemented to address effects on public health and safety include:

- Implementation of BMPs during construction activities to mitigate fugitive dust and reduce particulate matter emissions
- Use of BACT for combustion equipment to mitigate NO_x and CO emissions
- Use of ULSD fuel for construction equipment and non-natural-gas combustion equipment to mitigate emissions of SO₂, particulate matter, and VOCs
- Operation of all combustion equipment in accordance with manufacturer's specifications to mitigate NO_x, CO, VOC, and particulate emissions resulting from incomplete combustion
- Maintenance of emissions control equipment in accordance with manufacturer's specifications to mitigate emissions and maintain emission control efficiency

At present, there are no USEPA-approved control technologies available for GHG emissions mitigation on construction and combustion equipment. These technologies are currently in the research and development phase, can be used for mitigation once these technologies are available, and can be evaluated as part of BACT.

8.2.2 Noise

Noise sources within the boundaries of the ASAP are expected to be temporary and localized during construction. Noise sources during O&M will be limited to activities associated with O&M of the pipeline facilities. Measures to comply with requirements for noise abatement will be implemented.

Construction Phase

Increased noise levels during project construction activities will be localized and transitory as construction activity proceeds along the proposed 727-mile pipeline length. The primary sources of construction-related noise include diesel-powered mobile equipment, pipe installation, and construction worker verbal communication. Noise will be associated with winter construction activities at West Dock when marine mammals and fish are not present.

Operations Phase

The proposed project should have little to no effect on the surrounding areas. Much of the area adjacent to the route is undeveloped with low ambient noise levels. Noise generated at the GCF may include noise from compressors, boilers, generators, and heaters. In addition, there will be noise during O&M from vehicles on access roads and nearby highways, and equipment operating at material sites. There may be some additional, short-term noise increases resulting from vehicle traffic and small, fixed-wing aircraft and helicopters during maintenance and surveillance activities.

Potential Effects

The potential effects from noise could include:

- Short-term increases in ambient noise levels from construction activities – trucks bringing materials, heavy equipment trenching and moving pipe, human interactions (radios, conversations), and workers' private vehicles
- Minor and localized noise from project-maintenance-related activity, primarily from vehicle traffic
- Fixed-wing aircraft and helicopter traffic

Mitigation

Mitigation measures that can be implemented to address noise effects include:

- Development and implementation of a Noise Abatement Program
- Development and implementation of a Construction Communications Plan to inform adjacent residences of construction activities

8.2.3 Geologic Hazards

The benefit of undertaking a geologic hazard assessment of the route is so that effective design, construction, and operational mitigation measures are in place to reduce the potential for pipe integrity issues and the number of non-routine maintenance interventions. To the extent possible, known geologic hazards will be taken into account in the selection of final pipeline routing, and final pipeline and facility design. A geologic hazard is defined as a naturally occurring or project-induced geological, geotechnical, or hydrogeological phenomenon that could load the pipeline, causing a pipeline integrity concern, or that could impact the ROW, causing an environmental concern.

Potential Effects

The potential effects from geologic hazards could include:

- Freezing of unfrozen ground
- Thawing of permafrost terrain
- Landslides
- Tectonic/seismicity
- Hydrotechnics/watercourse hydraulics
- Erosion
- Geochemical effects
- Unique soil structure

Mitigation

Mitigation measures that could be implemented during construction and O&M to address effects of geologic hazards on the integrity of the project include:

- Design Considerations:
 - Special installation techniques and foundations
 - Earthquake mitigation measures and special design considerations at fault crossings
 - Special design considerations at river crossings
 - Erosion control measures
- Operational Considerations:
 - Slope stability monitoring
 - Seismic/earthquake monitoring
 - River hydrology monitoring
 - O&M Manuals
 - QA Manual
 - Inspection Services Manual
 - Design Basis updates
 - Surveillance Manual
 - Other controls to be determined

8.2.4 Mineral and Energy Resources

There are areas along the proposed route that may be used for mining activities, both recreational and commercial. Recent exploration mining by International Tower Hill Mines Ltd. in Interior Alaska near Livengood has identified potential large-scale mineral resources. There are a significant number of mining claims in the vicinity of Wiseman, adjacent to Gates of the Arctic National Park and Preserve. Additional research will be required to identify mining claims along the proposed route and identify active claims. Further coordination with mining interests will occur once the specific route is identified and negotiations for access are filed.

Potential Effects

The potential effects from mineral and energy resource development could include:

- Potential gas source to provide energy in support of mining operations
- Potential increased access opportunities, which should be examined, and potential conflicts with mining

Mitigation

Mitigation measures that can be implemented to address effects on mineral and energy resource development activities include:

- Development and implementation of a Construction Access Plan and Traffic Control Plan, including coordination with mining operators and adjacent landowners

8.2.5 Paleontological Resources

Paleontological resources are fossilized remains, imprints, and trace fossils of plants and animals used to study past organisms and ecosystems. Effects on paleontological resources are permanent and irreversible. Ground-disturbing activities have the potential to adversely affect paleontological resources, particularly if those activities extend below alluvial deposits or deep soils and into sedimentary bedrock.

Fossils are protected by the Antiquities Act of 1906, as they are non-renewable resources. In addition, fossils on federal lands are protected by the Federal Land Policy and Management Act of 1976. The Paleontological Resources Preservation Act was passed into law on March 30, 2009, and requires the management and protection of paleontological resources on federal land by the Secretaries of the Interior and Agriculture (16 U.S. Code [U.S.C.] 470). Specific provisions for the various land-managing agencies reinforce policies regarding the collection and curation of paleontological resources and the confidentiality of location information. Fossils associated with archaeological sites and large caves are protected by the Archaeological Resources Protection Act of 1979 and the Federal Cave Resources Act of 1988. The Alaska Historic Preservation Act (AHPA) protects paleontological resources in Alaska.

Construction Phase

There are currently no known paleontological sites listed in the *Alaska Heritage Resource Survey* (AHRs) database (State of Alaska, 2014) within the ASAP route. However, for the segments of the project route south of Livengood, studies may be required prior to commencement of construction to determine the presence of bedrock units known to contain fossils within the ASAP route, as well as evaluations of shallow bedrock and near-surface alluvium for the potential to yield fossils.

Potential Effects

The potential effects on paleontological resources could include:

- Ground-disturbing construction activities, such as trenching, grading, and excavation
- Development of workpads, PSYs, camps, fuel storage sites, materials storage sites, and disposal sites, and the placement of fill materials over the resource

Mitigation

Avoidance is the preferred mitigation measure. If permanent effects are unavoidable, they should be mitigated in accordance with requirements of the appropriate agencies and applicable laws. If any known or previously undiscovered paleontological resources are encountered during construction activities, the owner/operator will be required to contact the State Historic Preservation Office (SHPO) (if on state lands) and the Authorized Officer (AO) responsible for paleontological and cultural resources if on federal land. A qualified Paleontological Monitor may be required to be onsite during construction near known paleontological resources, or areas where the likelihood of finding such resources is high.

While paleontological studies will be performed prior to beginning construction activities, there is always the possibility that cultural resources will be discovered during the project. An Unanticipated Cultural Discoveries Plan will be developed to outline the exact procedures that will be followed in the event of an unanticipated paleontological discovery.

8.2.6 Soils

Soil characteristics along the proposed pipeline generally consist primarily of weathered bedrock, glacial till and outwash, fluvial sand, silt and clay, lacustrine silt and clay, colluviums, and wind-blown silt and fine sand. Physiographic regions crossed by the route are discussed in this section.

Arctic Coastal Plain Region

The Arctic Coastal Plain soils are composed primarily of organic silt several feet thick over coarse sands and gravel, with massive ground ice present. The project lies adjacent to the Sagavanirktok River, but does not cross it. Its braided floodplain is principally unvegetated coarse-grained alluvium. Previously deposited sandy silt may line sand and gravel in the river channel remnant of former floodplains. Cold, continuous permafrost underlies the Arctic Coastal Plain, averaging temperatures less than 19°F with a thickness of 670 to 2,150 feet. At shallow depths, the soil is ice-rich

and primarily frozen, but still susceptible to seasonal thawing. Lakes and river channels with depths greater than 6 feet may insulate the underlying soil enough to develop thaw bulbs (BLM, 2002).

Arctic Foothills Region

The Arctic Foothills are composed of coarse-grained, glacial deposits of a mixture of clay, sand, gravel, and boulders. These moraines are often covered with windblown silt, while thaw ponds and basins are partially filled with colluvia, and rich peat and organic-rich slopewash deposits partially fill upland, flat-floored depressions. Cold, continuous permafrost also underlies the Arctic Foothills, again averaging temperatures less than 19°F. Till in the region may be compromised by massive ground ice locally totaling up to 50 percent of its volume. As on the Arctic Coastal Plain, the Sagavanirktok River insulates the surrounding ground, creating discontinuous permafrost adjacent to the active channel and thaw bulbs beneath the water. Permafrost becomes more continuous as distance from the Sagavanirktok River increases (BLM, 2002).

Brooks Range Region

The Brooks Range is underlain with coarse-grained sand and gravel in the Atigun and Dietrich River Valleys. Cold, continuous permafrost can be found throughout the Brooks Range, except in alluvium beneath major active river channels. The depth of permafrost is greater in the northern areas of the Brooks Range than in the southern area, and is also greater in soils with larger grain sizes. Ground ice is less than 15 percent of the total volume in fluvial silt and sand, while it may be up to 95 percent of the total volume in lacustrine silt and clay, especially near Galbraith Lake (BLM, 2002).

Chandalar Ridge and Lowland Region

Deposits of coarse-grained glacial till exist in the Chandalar Ridge and Lowland regions. Near the main channels of the Middle Fork Koyukuk and South Fork Koyukuk Rivers, coarse-grained and glacial fluvial sediment deposits are found, while fine-grained silt and clay of eolian and lacustrine origin are found over coarse-grained till away from the main channel. Discontinuous permafrost with temperatures between 26 and 30°F is found underlying this section. Permafrost is generally absent under unvegetated floodplains, but old floodplains may be underlain with permafrost 5 to 50 feet thick. The lowlands between the Koyukuk River forks realize well-developed thaw lakes in the silts present there (BLM, 2002).

Kokrine-Hodzana Highlands and Yukon-Tanana Uplands

Residual soils, a few feet thick, from weathering bedrock are dominant on hilltops away from the Tanana and Yukon Rivers. The soil at the bottom of valleys can be up to 40 feet thick and comprise a combination of colluviums, fluvial sands, gravel, and weathered bedrock. Windblown silt is common over coarse-grained subsoil in the uplands and deposited from floodplains. Discontinuous permafrost is found here with average temperatures between 26 and 30°F. Permafrost is absent near major streams. Old floodplains may be in the process of creating new permafrost because of the migration of the rivers. Thermokarst lakes are common in valley bottoms, where ice-rich soils freeze at depths of up to 50 feet (BLM, 2002).

Ray Mountains

The Ray Mountains are composed of an overlapping series of compact ranges that move in an east-west direction and are underlain by the Ruby terrain. Metamorphic bedrock in the area is generally covered in rubble, which results in shallow and rocky soils. Permafrost is primarily discontinuous and varies in thickness from thin to moderate (Ferrians, 1998).

Cook Inlet Basin

The Cook Inlet Basin is gradually sloping lowland and characterized by past glacial influence. Accordingly, the Cook Inlet Basin floor is composed of fine-textured lacustrine deposits surrounded by lesser amounts of coarse-textured glacial tills and outwash. The basin contains numerous lakes, ponds, wetlands, and several river systems. The area is generally free of permafrost and has a mix of maritime and continental climates, which means moderate fluctuations of seasonal temperature and abundant precipitation.

Potential Effects

The construction and operation of the ASAP is not expected to have significant effects on soils within the project area. Most of the potential effects are expected to be minimal and limited to a short period during construction. Effects on soils are likely to be limited to erosion and production of stormwater runoff.

Mitigation

Mitigation measures that can be implemented to address effects on soils include:

- Development and implementation of an Erosion Control Plan (Section 7.4.3)
- Development and implementation of an SWPPP (Section 7.4.3)

8.2.7 Water Resources

The construction and operation of the ASAP are not expected to have significant effects on surface waters or groundwater within the project area. Most of the potential effects on groundwater and surface waters are expected to be minimal and limited to a short period of time during construction. Disturbed areas will be returned to pre-project contours and revegetated with native vegetation to maintain surface drainage patterns. Groundwater drainage patterns should also re-establish immediately after construction activities and site restoration are completed. BMPs and mitigation measures will be used to minimize long-term effects on both groundwater and surface water within the project area. The ASAP is not crossing any waterways included in the list of Alaska Impaired Waters (ADEC, 2010).

Direct Effects

The ASAP mainline will cross an estimated 359 waterways and drainages, of which 27 are major streams, 61 are anadromous fish streams, and an additional 7 were nominated for inclusion in the ADF&G Anadromous Waters Catalogue.

Pipeline construction will not result in long-term alterations to stream flow, stream profile, or structural components of streams and other waterbodies crossed by the pipeline. For most stream crossings, short-term disturbances will be limited to the actual construction disturbances. Streambeds, streambanks, and riparian areas will be restored to pre-project contours and configurations to the maximum extent possible. Streambanks and riparian areas will be revegetated to prevent erosion and to maintain streambank stability. The pipeline will be buried to a depth that provides a minimum of 5 feet of cover at each stream crossing to minimize potential for streambed scour.

Potential Effects

Maintaining the existing thermal regime is an important factor in limiting impacts to water resources and water-dependent resources. As described earlier in Section 4.3, the temperature of the proposed mainline and Fairbanks Lateral pipelines will change seasonally, with temperatures closely approaching seasonal temperatures of the surrounding ground. Use of chilled pipelines or pipelines maintained at a higher temperature than surrounding soil temperature is not ideal. A chilled pipeline will create ice damming along streams and waterways or thick layers of ice formed by successive freezing of stream overflow (aufeis fields). This could result in a reduction of water flow downstream, diversion of water outside of existing stream channels, or storage of water in aufeis fields. A chilled pipeline may also reduce the water temperature at stream crossings, affecting fish behavior or causing direct effects on fish habitat (delaying hatching of fish eggs). A pipeline that is maintained at a higher temperature than the surrounding soils and waters it passes through can also result in negative impacts. The most obvious is melting permafrost soils.

The pipeline will be operated at below-freezing temperatures in predominantly permafrost terrains to protect the thermal stability of the surrounding ground. Similarly, the pipeline will be operated at above-freezing temperatures in predominantly thawed ground settings so as not to create frost bulbs around the pipe that could lead to frost-heave displacement of the pipeline or adverse hydraulic impacts on drainages crossed by the pipeline.

Mitigation

Mitigation measures that can be implemented to avoid or minimize adverse effects on surface water and groundwater include:

- Minimize the number of river and stream crossings, as follows:
 - Use existing bridges where feasible.
 - Use HDD where other crossing methods are not feasible.
- Maintain, to maximum extent practicable, the existing surface hydrology at all waterbody crossings, as follows:
 - Prevent discharges that have the potential to adversely affect waterbodies.
 - Stabilize cut slopes immediately when the designed grade is obtained.
 - Initiate reclamation of disturbed areas as soon as practicable.
 - Verify water withdrawals meet federal and state standards and guidelines.
- Keep construction activities within the footprint of the pipeline ROW and the disturbed area of the adjacent construction zone to the maximum extent practicable.

- Minimize the construction of new permanent access roads by emphasizing winter construction using snow-ice roads.
- Perform water crossings in a manner that minimizes effects on water quality, as follows:
 - Use materials for dam construction that do not introduce sediment or other harmful substances into waters when using the open-cut isolation method.
 - Use materials for the flume pipe system that do not introduce sediment or other harmful substances into waters when using the open-cut isolation method.
 - Position flume pipe system discharges to prevent erosion or scouring.
- Minimize the effect of the pipeline on the existing thermal regime as follows:
 - Use engineering controls, such as insulation and non-frost-susceptible fill, to control the thermal signature of the pipeline.
- Implement dewatering practices that avoid adverse effects to vegetation and to existing quality of surface waters, including erosion and scouring.
- Locate fuel storage, equipment refueling, and equipment maintenance operations at least 100 feet from surface waters.
- Avoid contaminated sites.
- Use temporary bridges for transportation of construction equipment and materials.

8.2.8 Wetlands and Vegetation

Wetlands

Wetlands evaluation for the ASAP began in 2008 with a reconnaissance survey of the pipeline alignment. Pre-mapping of the route and a limited fieldwork program were completed in 2009. The 2009 effort included field survey of the route in the Minto area. The results of the 2008 and 2009 fieldwork and pre-mapping were submitted in *Wetland Technical Report In-State Gas Pipeline Project Prudhoe Bay to Wasilla, Alaska, April 2010 (POA 2009-651)* submitted to the USACE in April 2010 (AES, 2010).

For purposes of evaluating wetlands along the ASAP in 2010, a fieldwork planning corridor spanning 2,000 feet (1,000 feet each side of the centerline) was established through aerial photo interpretation, wetlands pre-mapping, and desktop analysis, and through discussions and meetings with the USACE. Once pre-mapping of the corridor was completed, wetland determination points were identified: where the wetland classification through pre-mapping appeared inconclusive, where there were problematic wetland/upland boundaries, or for those wetlands that lacked National Wetland Inventory (NWI) coverage. These determination points were uploaded to a Global Positioning System (GPS) device for field data collection.

A total of 121 field observation data points were visited between 2008 and 2009 using data collection protocol evaluated and accepted by the USACE. A total of 399 data points were visited in 2010. All wetland areas were mapped to the Cowardin subclass level with added hydrologic modifiers (for example, PSS1B). Other site-specific data collection protocol followed the *Corps of Engineers Wetlands Delineation Manual* (USACE, 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region*. (USACE, 2007), and the Magee protocol for assessing wetland functional capacity (Magee, 1998). This wetland mapping approach allowed

incorporation of all wetland types within the entire 2,000-foot-wide corridor to be classified, while concentrating field efforts on verification of wetland types within the 300-foot-wide analysis corridor (150 feet each side of the centerline), which allows for adjustments to the pipeline alignment to avoid wetlands, if determined practical and feasible.

The 2010 *Wetland Preliminary Jurisdictional Determination Report* includes results of field studies from 2010 and was submitted to USACE in March 2011 (AES, 2011a). Based upon this report and the 2009 *Wetlands Technical Report* submitted in April 2010 (AES, 2010), the USACE provided a Preliminary Jurisdictional Determination (PJD) on June 10, 2011 (AES, 2011a).

Additional data were collected during a 2011 field investigation to fill data gaps resulting from minor alignment shifts and to provide additional data the USACE requested in their June 2011 PJD. A total of 118 additional data points were visited in 2011. The data were included in a March 2012 *Wetlands and Waters of the United States Delineation Report to Supplement the March 2011 Preliminary Jurisdictional Determination* (AES, 2012a).

The wetlands mapped along the route were divided into wetland type based on the NWI classification systems, as represented in Table 20. Acreage represents mapped wetlands in the 300-foot corridor. The total acreage affected by the project is expected to differ from the totals due to the project planning and mitigation efforts. Planning efforts to avoid wetlands by shifting the pipeline alignment or the use of HDD will reduce the affected acreage of wetlands.

Table 20. Wetlands Impacts for the Alaska Stand Alone Pipeline Survey Corridor

WETLAND TYPE	APPROXIMATE ACREAGE ^a	APPROXIMATE PERCENT
Freshwater Forested/Shrub Wetland	10,115.1	66.2
Freshwater Emergent Wetland	4,877.4	31.9
Riverine	206.7	1.4
Freshwater Pond/Lake	74.1	0.5
Total	15,273.4	100.0
a. Values are for a linear distance of mainline and Fairbanks Lateral times the 300-foot wetlands survey corridor		

A field season was conducted in 2012 to collect data along the proposed access road alignments located outside the 2,000-foot planning corridor, and to fill in large spatial gaps in existing data.

Potential Effects

The construction and clearing activities associated with the ASAP will have both direct and indirect effects on wetlands and vegetation. Effects related to pipeline and facilities construction will be categorized as either temporary or permanent. As the majority of the proposed pipeline will be buried, most permanent effects are expected to be limited. An example of direct and permanent impacts to a wetland area are draining and filling for construction activities, roadways, pipeline location placement, and construction of the GCF. Temporary effects on wetlands and vegetation

during construction include clearing, grubbing, and trenching activities associated with the laying of pipe.

Mitigation

The permitting process for placing fill in wetlands requires compliance with the mitigation steps outlined in the NEPA to maintain wetland functions. These steps include:

- **Avoid:** A wetland should not be affected if there is a less environmentally damaging practicable alternative.
- **Minimize:** Unavoidable effects should be minimized to the extent possible.
- **Compensate:** Any remaining effects should be offset, if practicable and appropriate, through restoration, enhancement, creation, preservation actions, or a combination.

Mitigation options will be developed collaboratively with the USACE. Site-specific BMPs will be defined and applied as means of mitigation. Overall, mitigation measures will likely be geographically dependent, as some procedures will have a greater efficacy toward the northern end of the proposed pipeline corridor, whereas others might be better suited to the southern portions. Traditional construction methods can help avoid significant effects on wetland habitats and will likewise avoid long-term effects on wetland functions and values if mitigation measures are implemented. Traditional wetland mitigation measures may include the following:

- Schedule pipeline construction across wetlands during the winter to the maximum extent practicable.
- Avoid and minimize ground-disturbing activity in wetland habitats, as follows:
 - Limit grading except for trenching, to the maximum extent practicable to preserve root systems.
 - Maintain slope stability.
 - Use mats or other types of mitigation during non-winter construction to prevent rutting.
 - When possible, locate permanent facilities, including access roads and workpads, outside of wetlands.
 - Reduce construction ROW width across wetlands as practical.
- Maintain existing hydrologic systems.
- Re-establish vegetation that is typical of the general area, where practicable, as follows:
 - Segregate topsoil and use as top trench fill to the greatest extent practicable.
 - Reseed and revegetate affected areas upon completion of construction activities.
- Minimize the number of stream crossings.
- Use existing bridges or HDD when crossing streams.
- Contain fuel and lubricant spills during construction.
- Remove the top vegetative layer of the wetland with a backhoe or similar equipment, and set aside separately from the subsoil spoils. The vegetative mat will be placed on top of the ditch as the last layer.
- Develop a Non-native Invasive Plant Prevention Plan, which will address procedures to reduce and eliminate the spread of non-native invasive plants.

Vegetation

The ASAP route traverses a variety of vegetation types, from arctic tussock tundra in the north to taiga in the interior and south. Arctic tundra and alpine tundra areas are distinguished by cold climates, short growing seasons, and low vegetation dominated by grasses, sedges, mosses, and lichens. Taiga, or boreal forest, stretches across much of Alaska and is distinguished by trees of moderate height, including conifer forests, marshes, and bogs. The southernmost area of the ASAP is typically covered by deciduous trees, such as aspen, cottonwood, and birch.

Potential Effects

Direct impacts to vegetation will be from brush clearing of the ROW and removal of the vegetative mat during grading. These effects are expected to be short-term and transitory, only occurring during construction activities. Upon completion of construction activities, remediation, rehabilitation, and restoration of all ground-disturbed areas associated with the pipeline construction will be implemented, as discussed in Section 9.

A potential effect of the project is the introduction of non-native invasive plants or non-native weeds. These are plant species that were introduced to an area where they did not naturally evolve. Some non-native invasive plants can produce significant changes to vegetation, composition, structure, or ecosystem function. A total of 332 non-native invasive plants are currently being tracked in Alaska (AKEPIC, 2014). It is typically more effective to prevent the introduction and spread of non-native invasive plants than to attempt to control infestations.

Mitigation

Mitigation measures that can be implemented to prevent the introduction and spread of non-native invasive plants include a Non-native Invasive Plant Prevention Plan, which will address procedures to reduce or eliminate the spread of non-native invasive plants at project locations, such as airports (particularly at gravel airstrips), material sites, and temporary use areas, such as PSYs and camps. Restoration of cleared areas will also be addressed in the Non-native Invasive Plant Prevention Plan. Leaving cleared areas unrestored may present an opportunity for non-native invasive plants to establish a foothold without competition from local species. More information about rehabilitation and restoration is provided in Section 9. The Non-native Invasive Plant Prevention Plan will provide details of the measures to be used to control invasive species through appropriate site preparation, monitoring, revegetation of disturbed areas with native species, and performance standards. Additional mitigation measures that can be implemented to minimize effects on terrestrial vegetation include:

- Develop and implement a stabilization, rehabilitation, and restoration plan following ADNR's *Plant Materials Center Revegetation Manual for Alaska* (Wright, 2009) in consultation with the BLM.
- Implement BMPs during construction to reduce fugitive dust, which will minimize dust deposition on vegetation adjacent to construction work areas.
- Develop and implement an SWPPP.

- Re-establish vegetation that is typical of the general area, where practicable, as follows:
 - Segregate topsoil and use as top trench fill to the greatest extent practicable.
 - Reseed and revegetate affected areas upon completion of construction activities.
- Contain fuel and lubricant spills during construction.

8.2.9 Fisheries Resources

The ASAP mainline will cross an estimated 359 waterways and drainages, of which 61 are confirmed anadromous fish streams or were nominated for inclusion in the ADF&G Anadromous Waters Catalogue. Along the ASAP route, fish are an important subsistence and recreational resource. Furthermore, the construction and use of West Dock during GCF module offload will take place in a migration path of anadromous fish. A listing of potentially sensitive areas and fish habitat along the proposed route is found in Attachment 6.

Potential Effects

There could be temporary and localized effects on fisheries resources from ASAP construction, depending on the construction methods used. However, a long-term effect on fish populations is not expected from pipeline operations or construction and module offload at West Dock. Probable short-term effects that may occur are alteration or loss of fish habitat and temporary obstructions to fish passage during construction. Temporary loss of habitat may result from diverting rivers or stream channels, removing riparian vegetation, excavating stream-bed materials, or altering the water quality.

So that habitat impacts do not cause direct mortality to fish, fish population size, and fish habitat, ADF&G permits are required under AS, Title 16, which protects freshwater habitat in streams and rivers that support anadromous fish. The ADF&G has developed effective standards and practices to protect fishery resources during sensitive periods. Each crossing will be evaluated for fishery resources, and the proposed crossing technique will be developed cooperatively with the ADF&G to avoid adverse effects to fish and fish habitat.

Mitigation

Mitigation measures that can be implemented to minimize effects on fish include:

- Follow mitigation measures for water quality identified in Section 8.2.7.
- Schedule the timing of construction and offloading activities from barges at West Dock to mitigate against impacting fish.
- Minimize the number of fish stream crossings where practicable.
- Use open-cut isolation methods for stream crossings at locations where an open-cut is prevented by overwintering and spawning fish, or where stream flow conditions make open-cut impractical.
- Follow the Blasting Control Plan as identified in Section 7.6.3 that will be developed in accordance with ADF&G blasting standards to protect adult fish, juvenile fish, and developing fish eggs when blasting activities occur in or near streams.

- Use existing bridges or HDD.
- Use pipeline designs and construction scheduling that minimize disruption of fish passage and spawning fish, and effects to fish habitat.
- Develop supplemental site-specific fishery data to fill data gaps for the design of fish stream crossings and for lakes where water will be withdrawn during the winter for snow/ice road construction and maintenance during pipeline construction.
- Maintain to the maximum extent practicable existing stream hydrologic regimes at fish stream crossings.
- Maintain to the maximum extent practicable existing temperature regimes along the corridor.
- Use construction methods and reclamation of disturbed areas that eliminate or reduce the potential for erosion and sedimentation reaching fish streams.
- Minimize cumulative effects to surface hydrology, stream bottom, and stream bank habitats when the pipeline crossing of a fish stream is downstream from an existing stream crossing by the highway, the TAPS, or other buried utility system.
- Use temporary bridges for transportation of construction equipment and materials.
- To the maximum extent practicable, locate material storage, refueling activities, fuel, and related liquid storage at least 100 feet from the bank of a fish stream.
- Implement hydrostatic testing in a manner that minimizes the potential that freeze depressants could be inadvertently discharged to fish-bearing waters.
- Assure water withdrawals use appropriately sized fish screens and other state and federal guidelines for fish protection.
- Complete instream pipeline construction in 1 to 3 days from start of construction.

8.2.10 Wildlife Resources

Wildlife resources are widely distributed along the proposed route. Construction and O&M activities will affect wildlife resources; however, the effects are likely to be short-term and localized. A listing of wildlife, habitat, and periods of sensitivity along the proposed route is found in Attachment 6.

Potential Effects

Potential effects on wildlife are likely to be associated with construction activities and will be temporary and localized. Individual animals are expected to be potentially affected and not the entire population. The potential short-term effects on wildlife during construction include:

- Temporary disturbance/displacement resulting in short-term changes in habitat use and short-term changes in behavior
- Temporary habitat loss or alteration
- Obstruction to movement
- Death/injury to animals due to collisions with vehicles

In general, long-term effects on wildlife from the ASAP are not expected. However, increased access to remote areas with the addition of access roads could lead to increased human use of the area for hunting.

Mitigation

Mitigation measures that could be implemented to address wildlife resources include:

- Avoid locating pipeline facilities in sensitive wildlife habitats to the maximum extent practicable.
- Schedule construction activities to avoid effects during sensitive periods in the life cycle of wildlife to the extent practicable, including scheduling excavation activities during times of the year when major movements (that is, migrations) across the ROW occur.
- Minimize the duration of open-ditch construction activities to mitigate the risk of animal entrapment in an open ditch.
- Develop systems or mechanisms to facilitate escape of wildlife from the pipeline trench in the event wildlife becomes trapped (for example, escape ramps).
- Develop a Blasting Control Plan as identified in Section 7.6.3 in accordance with ADF&G blasting standards to protect wildlife. A Blasting Control Plan is particularly necessary if blasting is required in sensitive areas or during sensitive life stages for wildlife.
- Use methods to avoid attracting wildlife during construction camp operations and pipeline facility construction activities.
- Adopt motor vehicle and aircraft procedures that minimize disturbances to wildlife.
- Identify and then avoid or minimize situations where wildlife may be killed in defense of life or property.
- Avoid or minimize construction and operational activities during sensitive periods in life cycles, such as moose and caribou calving, bear denning, raptor nesting, and migratory bird nesting.
- Limit public access to ROW for recreation or hunting by blocking entry areas with large boulders, berms, or fencing.
- Rehabilitate pipeline construction access roads in a manner that allows public access and consistent safe operation of the pipeline system, and that is in accordance with the plans of the landowner/land manager.
- The following plans will be developed prior to construction activities, and followed during construction and operations to minimize human interactions with wildlife:
 - Wildlife Interaction and Habitat Protection Plan
 - Blasting Control Plan identified in Section 7.6.3 that follows ADF&G standards protective of wildlife in sensitive areas or during sensitive life stages
 - Bear Avoidance and Human Encounter/Interaction Plan
 - CWMP, to assure the appropriate handling and disposal of wastes, minimize human/carnivore interaction, and discourage wildlife presence and feeding opportunities
- Where VSMs will be used to elevate the pipe, a minimum of 7 feet of clearance from ground surface to the bottom of the pipe will be maintained for wildlife movement.

8.2.11 Sensitive, Threatened, and Endangered Species

A variety of federal regulations provide protection for designated species in Alaska. Regulations relevant to the proposed pipeline include the Endangered Species Act (ESA) of 1973, the Marine Mammal Protection Act, the Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act. In addition to these federal regulations, the State of Alaska has lists of endangered species (5 AAC 93.020) and species of special concern.

Species included in this discussion are either listed under the ESA, have previously been listed, or are considered a species of special concern by the State of Alaska or BLM.

Threatened and Endangered Species

The pipeline route is located within an area that provides habitat for some species that were federally listed as threatened. There are no endangered species that occur near the route.

Polar bears (*Ursus maritimus*) and beluga whales (*Delphinapterus leucas*) are found near the planned project area. Polar bears were listed as threatened under the ESA on May 15, 2008 (Federal Register 73: 202 [76249]) and may occur in the vicinity of the proposed pipeline alignment. Currently, there is no critical habitat designated for the polar bear. Cook Inlet beluga whales were listed by the NMFS as endangered under the ESA on October 22, 2008 (Federal Register 73:205 [62919]). A final rule for designation of critical habitat was published in the Federal Register on April 11, 2011 (Federal Register 76:69 [20180]).

This project is not expected to affect polar bears and beluga whales, nor the subsistence harvests of these animals. Polar bears may be temporarily displaced by the operation of heavy equipment during winter dredging, dock construction, and pipeline construction activities at the northern portion of the pipeline route near Prudhoe Bay. Polar bears den nearshore or onshore during winter, and appropriate mitigation measures will be in place to limit any disturbance or encounters with denning bears. The temporary displacement of polar bears is expected to have no effect on the present subsistence harvest of polar bear by Alaska Natives. Construction and operations activities are not planned to occur in Cook Inlet. This project is not expected to affect Cook Inlet beluga whales, which are not harvested for subsistence.

Bowhead whales (*Balaena mysticetus*), which were listed as endangered under the ESA in 1970 (Federal Register 35: 233 [18319]), migrate past Prudhoe Bay and West Dock in the spring and fall. Construction and dredging at West Dock will occur in winter when the bowhead whales are not present in the area; thus, the ASAP will not impact the whales or subsistence activities. Module offload during summer is planned to occur between the spring and fall migrations; therefore, are not expected to affect migrating bowhead whales or subsistence activities.

Fin whales (*Balaenoptera physalus*) and humpback whales (*Megaptera novaeangliae*) are listed as endangered under the ESA (Federal Register 35: 233 [18319]), but are not expected to occur in the

project areas in Cook Inlet or Prudhoe Bay. They may occur near the port in Seward and be temporarily displaced by vessel traffic. Their temporary displacement is expected to have no effect on these species, which are not harvested for subsistence.

Ice seals make dens on sea ice, which may occur in areas of winter activity during construction and dredging near West Dock. Ringed seals (*Phoca hispida*) and bearded seals (*Erignathus barbatus*) were recently listed as threatened under the ESA on December 28, 2012 (Federal Register 77:249 [ringed: 76706; bearded: 76740]). No critical habitat has been designated for either seal species.

Pacific walrus (*Odobenus rosmarus divergens*), an ESA candidate species, may occur in the Beaufort Sea, but are not as common as other marine mammal species near Prudhoe Bay. Walrus migrate south to the Bering Sea during winter; therefore, construction and dredging will not affect them. If present in the area, walrus may be temporarily displaced by vessel activity; however, this is expected to have no effect on the present subsistence harvest of walrus by Alaska Natives.

Northern sea otter (*Enhydra lutris kenyoni*), listed as threatened under the ESA in 2005 (Federal Register 70: 152 [46387]), may occur near Seward during port activities. Temporary displacement of otters could occur during shipping, but are not expected to have a substantial effect.

Steller's eiders (*Polysticta stelleri*) and spectacled eiders (*Somateria fischeri*) are threatened species that may occur in the vicinity of the proposed pipeline alignment. Migratory birds are federally protected by the USFWS. Eagles are protected under the Bald Eagle Protection Act and the Migratory Bird Treaty Act.

Arctic and American peregrine falcons (*Falco peregrinus*) were listed as threatened and endangered, but were delisted in 1994 and 1999, respectively. They are, however, still considered species of special concern for the State of Alaska. Peregrine falcons are uncommon migrant breeders in the Prudhoe Bay area. The Sagavanirktok and Colville Rivers serve as the main breeding areas for Arctic peregrine falcons. Nesting concentrations are greatest at Franklin Bluffs and Sagwon Bluffs.

Bureau of Land Management Sensitive Species

The BLM within Alaska must designate and manage sensitive species, in part, to reduce the likelihood and need for new listings under the ESA, in accordance with BLM 6840 Manual direction (BLM, 2008). The BLM must include as sensitive species those designated as candidate and proposed under the ESA, as well as species that were delisted from the ESA within the past 5 years. At-risk species with no current ESA status are based upon the following eligibility criteria:

- 1) Species must be native species that occur on BLM lands or land for which the BLM has a significant management capability to affect the conservation status of, and
- 2) One of the two following conditions applies:
 - a. The species is known or predicted to be undergoing a downward population trend that could affect the viability of the species, or a distinct population of the species is at risk across a significant portion of its range; or

- b. The species depends upon specialized or unique habitats, and there is evidence that such areas are being threatened with alteration such that the continued viability of the species is at risk.

Species that do not meet the criteria to be placed on the BLM Sensitive Animals and Plants Lists but whose status will be re-evaluated in the future are placed on the BLM Watch List. Watch species are not sensitive species and are not subject to sensitive species policy. However, additional research will be conducted and information gathered prior to re-evaluation during subsequent sensitive species list revisions. Table 21 provides numbers of species on the BLM Sensitive Species and Watch Lists.

Table 21. Bureau of Land Management Sensitive and Watch List Animals and Plants

CATEGORY	BLM SENSITIVE SPECIES LIST	BLM WATCH LIST
Birds	15	6
Mammals	4	0
Fish	2	2
Insects	3	1
Plants	50	49

Potential Effects

The effects of the ASAP project are expected to be temporary and localized. For ESA species, the effects will be limited to marine vessel transit to a Southcentral Alaska port and to West Dock, and construction and dredging at West Dock. For other species, effects will be due to construction activities along the alignment.

Mitigation

Mitigation measures that can be implemented to address sensitive, threatened, and endangered species are those identified in Sections 8.2.8, Wetlands and Vegetation; 8.2.9, Fisheries Resources; and 8.2.10, Wildlife Resources. In addition, mitigation measures identified in the Section 7 consultation as part of the NEPA process and included in permits as stipulations will be followed. It is expected that NMFS will direct mitigation procedures for ice seals (for example, den surveys) or other marine mammals with similar requirements prior to these proposed activities.

8.2.12 Cultural Resources

Cultural resources include archaeological and historic sites, and structures and features that are protected under the Antiquities Act of 1906, the National Historic Preservation Act of 1966 (NHPA) as amended, and the Archaeological Resources Act of 1979. The existing level of knowledge about cultural resources along the ASAP route varies, primarily because much of the route has not been surveyed extensively.

The existing knowledge is based on previous cultural resource studies that were designed for different projects and whose degree of applicability to ASAP varies. The most extensive and exhaustive of these surveys were undertaken prior to construction of TAPS and the Dalton Highway. The surveys conducted in advance of these projects provided substantial information about cultural resources within and near ASAP from the North Slope to Livengood. The existence of cultural resources is not as well-understood between Livengood through the Minto Flats to the Parks Highway, and for parts of the alignment where it departs from the immediate vicinity of the ROW occupied by the Parks Highway, Alaska railroad, and the Anchorage-Fairbanks Intertie.

Several other issues arise with the cultural resource studies completed for TAPS. The TAPS surveys were completed in the 1970s and 1980s, and the primary focus at that time was on prehistoric sites. Of the historic sites or structures that were documented along the route, many were not considered eligible for inclusion in the National Register of Historic Places (National Register) because they were not “historic” at the time (generally defined as 50 years or older). However, many of these places may now meet the criteria for inclusion in the National Register. In addition, survey methods, field documentation, and mapping methods used during TAPS have changed dramatically in the past 30 to 40 years. Archaeologists now use more advanced GPS mapping that results in more accurate field locations. Many sites documented during TAPS may need to be site-checked for accuracy, and to see if the sites are still intact or if they were destroyed.

There is also potential for the project to impact Traditional Cultural Properties (TCP). A TCP is a place (often an ethnographic landscape) that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that are rooted in that community’s history, or its importance in maintaining the continuing cultural identity of the community (Parker and King, 1998). Similarities exist between TCPs and historic and archaeological sites. In fact, historic and archaeological sites can be all or part of a TCP. The key difference is TCPs exhibit a continuing role and importance to people today.

Identification of potential cultural resources (sites, structures, TCPs) prior to ground disturbance is key to avoiding and adverse impacts and mitigating them. The project developer will be required to implement the following measures during the planning and construction of the pipeline:

- Identify cultural resources, in accordance with Section 106 of the NHPA (36 CFR 800.4) and the AHPA (AS 41.35).
- Determine whether or not the properties that may be affected by the undertaking are included in or determined to be eligible for inclusion in the National Register.
- Participate in consultation in accordance with Section 106 of the NHPA to determine what constitutes adverse effects to identified cultural resources.
- Assist the federal agency in the resolution of adverse effects.

Inventory, documentation, and preservation of cultural resources and mitigation of adverse effects to cultural resources will be based on a programmatic agreement between the concerned federal permitting entities, SHPO, and the Advisory Council on Historic Preservation. The agreement will

clarify the procedures for considering cultural resources and will formalize the relationships between the various agencies. The affected Federally-recognized Tribes, Alaska Native corporations, and the public will participate in implementation of the agreement, as required by Section 106.

Cultural Resources Work Completed to Date

In 2008, cultural resources baseline characteristics were examined in An AGDC desktop study, and in 2009, known cultural resources within a 5-mile corridor centered on the proposed pipeline were inventoried with an overflight from Anchorage to Deadhorse and a vehicular survey on the return trip between Deadhorse and Anchorage. The purpose of these reconnaissance efforts was to acquire a preliminary assessment of the project area to facilitate future fieldwork planning. In 2010, approximately 10 percent (75 miles) of cultural resources fieldwork was completed. Areas surveyed in 2010 included segments between Happy Valley (on the North Slope) and Trapper Creek in Southcentral Alaska. In 2011, additional fieldwork occurred along the ASAP mainline between Fairbanks and Big Lake, and along the Fairbanks Lateral.

Potential Effects

An adverse effect to a cultural resource, as defined by 36 CFR 800.5(a)(1), is found when:

“an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that will diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association.”

The potential causes of effects on cultural resources could include:

- Ground-disturbing construction activities, such as trenching, grading, and excavation
- Development of workpads, PSYs, camps, fuel storage sites, materials storage sites, and disposal sites

Archaeological investigation, excavation(s), and documentation will have to be complete prior to pipeline construction and support activities in order to identify and evaluate potential effects on historic properties. Adverse effects must be resolved prior to construction. Adverse effects are resolved through mitigation agreed upon during consultation under Section 106 of the National Historic Preservation Act.

Mitigation

Avoidance is generally the preferred mitigation measure for cultural resources eligible for the National Register. If negative effects are unavoidable, they should be mitigated in accordance with Section 106 and in coordination with the appropriate agencies, entities, and individuals. Mitigation measures can be specific to each cultural resource and will be determined and conducted in accordance with AS 41.35 and Section 106. More than one field season of archaeological survey may be required for determining the necessary level of mitigation.

Some areas within the pipeline ROW may be determined high-priority areas for containing cultural resources. High-priority areas are those areas that are known to contain high densities of cultural resources. These areas are defined through analysis of previous cultural resource studies, existing data on file at the Alaska Office of History and Archaeology's AHRS database, consultation with SHPO and other interested parties, and through current archaeological fieldwork completed for ASAP. In high-priority areas, an Archaeological Monitor may be required during construction.

Alternatively, after the archaeological surveys are conducted, AGDC may wish to avoid certain areas containing cultural resource sites rather than pay for lengthy and expensive excavations. Measures mitigating adverse effects may vary by specific cultural resource, but may include one or a combination of the following:

- Perform archaeological excavation, analysis, and documentation of all or part of the cultural resource site.
- Perform Historic American Building Survey/Historic American Engineering Record (HABS/HAER)-level documentation for historic buildings and structures.
- Perform archaeological monitoring of construction activities.
- Provide interpretation for and involvement of the public. Some examples include brochures, signage, or partnering with local schools, museums, and heritage preservation groups, among others.
- Consult with state and federal agency historic preservation officers.
- Consult with Alaska Native Tribes.

The HABS/HAER documentation will be completed for historic structures prior to pipeline construction and support activities. Archaeological monitoring, as implied, may be conducted during construction activities. Interpretation for the public can be initiated as soon as appropriate information is gathered. Interpretive material does not generally have to be completed prior to the activity that causes adverse effects. Public interpretive signage, for example, is most often installed after an activity is complete or near its completion.

While cultural studies will be performed prior to beginning construction activities, there is always the possibility that cultural resources will be discovered during the project. An Unanticipated Cultural Discoveries Plan will be developed to outline the exact procedures that will be followed in the event of an unanticipated cultural discovery.

8.2.13 Visual Resources

Visual resources are defined as those land, water, vegetation, animals, and structures that are visible on the land. The ASAP route passes through the vast, treeless tundra of the Arctic Coastal Plain, the mountains of the Brooks and Alaska Ranges, Tanana Flats, the Nenana River Valley, DNP&P, and the Susitna River Valley. With the exception of a short segment in Prudhoe Bay, and several potential short, aboveground sections near water crossings or pigging facilities, the pipeline will largely be buried and not visible.

Potential Effects

Once constructed, most of the pipeline aboveground facilities, including valve pigging facilities and other related structures, may be visible from adjacent public roads. The proposed pipeline ROW will be cleared within sight of some BLM and state recreation sites, and may be visible from ridgelines along the eastern boundary of the Wilderness Area within the Gates of the Arctic National Park and Preserve, DNP&P, and Denali State Park.

In some areas, the ASAP route will parallel or lie adjacent to existing corridors, helping to minimize disturbance to visual resources. In areas where the pipeline will be near major roadways used by tourists and other visitors, portions of the newly cleared ROW soil disturbance, construction activities, as well as some permanent facilities, may be seen. Many of these activities and much of the disturbed ROW will be transitory in nature. The entire project in any given area usually takes several months to complete prior to restoration.

In addition, the project developer will be required to work with the BLM and state agencies in an effort to minimize or mitigate effects on areas of high scenic and visual values, and expects to create only intermittent and localized effects on visual resources. All portions of the pipeline corridor that pass through BLM-administered land are managed in accordance with BLM Class IV Visual Resource Management (VRM) objectives, which provide for management activities that require major modification of the existing character of the landscape by allowing a high level of change. Consequently, major modifications to the existing landscape are allowed for activities related to energy transportation. The pipeline corridor will be managed according to the Class IV VRM objectives. Every effort will be made to minimize visual effects, particularly in areas of high scenic and visual value.

Mitigation

Mitigation measures that can be implemented to address effects on visual resources could include:

- Review the practicality of avoiding or minimizing significant adverse effects on visual resources created by the construction and operation of the ASAP, and incorporate proven mitigation measures into the design and location of the project where appropriate.
- Shift the pipeline away from existing ROWs frequented by the public during transit or other activities to help mitigate against disturbance to visual resources in several areas.
- Minimize the construction of new permanent access roads by using snow/ice roads during construction.
- Restore the construction zone in a manner that facilitates re-establishment of the adjacent natural vegetation.
- Use root balls, salvaged native plant materials, and topsoil removed from the construction footprint for redistribution on disturbed areas where feasible.
- Maintain a screening of existing natural vegetation when the pipeline is offset from a highway.

- Use existing disturbed areas to the maximum extent practicable for temporary construction activities, such as construction camps, material stockpiling, pipe jointing, and pipe bending.
- Minimize locating pipeline facilities, new material sites, and construction material stockpiling in places with special visual resource values that will be visible to the general public.
- Blend the pipeline system into the natural setting to the extent practicable when crossing places with high visual resource values.
- Use revegetation species that are appropriate for the general area.
- Regrade construction disturbances to a condition that blends with the surrounding terrain and surface drainage patterns.
- Monitor reclaimed, disturbed construction areas, and take remedial action where expected revegetation success is not achieved.

8.2.14 Social and Economic

Larger Alaska communities along the route will be better-prepared to absorb temporary construction impacts than smaller communities. However, all communities are likely to experience some positive long-term socioeconomic effects from the construction and operational phases of the project. The smaller communities north of Fairbanks may experience some temporary effects on rural lifestyle during construction, yet these could potentially benefit in the long-term from lower energy costs. In addition, there are a number of the communities with for-profit village corporations that could benefit from the influx of construction opportunities in the region. The project may also result in improved opportunities to distribute natural gas to rural Alaskan communities. The project could provide employment opportunities for isolated communities that currently have high unemployment rates. In addition, first-class cities and first-class boroughs with taxing authority may have the opportunity to generate tax revenue.

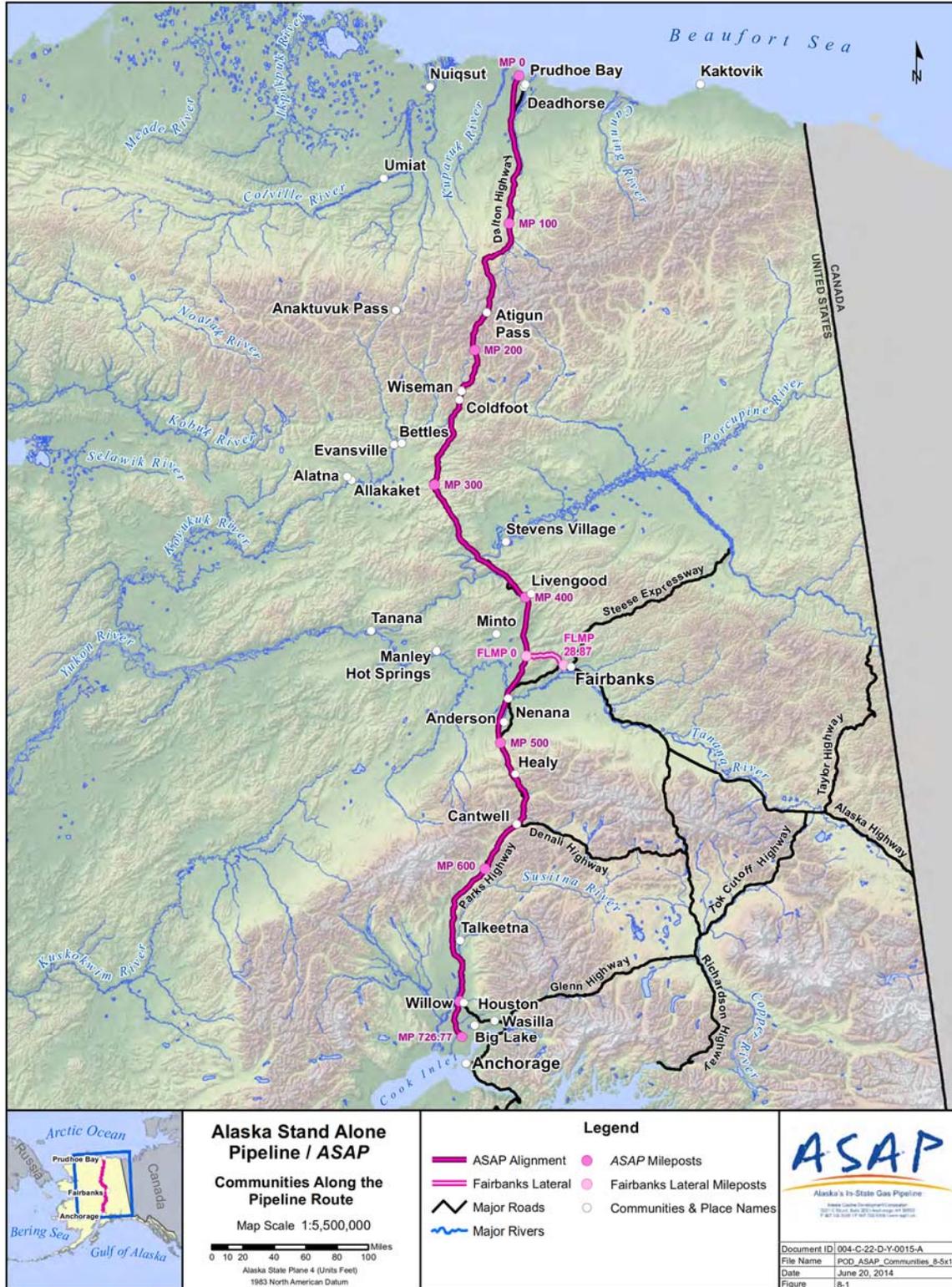
Figure 10 shows those communities that could potentially be affected by ASAP construction and O&M because of their location near the project ROW or because the community uses the region near the project ROW.

Potential Effects

The potential social and economic effects include:

- Increased employment opportunities and workforce development
- Changes in community demographics, including:
 - Increase in local population numbers
 - Change in population characteristics (for example, more children or seniors results in an increased need for schools and health care)
- Increased demand for retail/service and housing
- Increase in seasonal residents
- Changes in employment and income levels, including:
 - Former non-cash economy communities experience influx of cash
 - Unemployed now have opportunities previously out-of-town or non-existent

Figure 10. Communities Along the Pipeline Route



- Changes in the aesthetic quality of the community, including:
 - Temporary structures, PSYs, and construction yards
- Increased opportunities for local and regional business development to support construction
- Increase in opportunities to develop housing
- Pressure on regional public safety and emergency services
- Health care systems may not have capacity to handle influx of workers and families

Mitigation

Mitigation measures that can be implemented to address effects on socioeconomics include:

- Time construction activities to avoid subsistence activities where possible.
- Time construction activities to avoid high-use tourist and local recreation seasons (for example, wildlife viewing, hunting, snowmachining, fishing, and dog sledding).
- Time construction activities to prevent impacts to local business (that is, avoid summer and fall construction for recreational and tourist areas).
- Develop and implement traffic control plans to prevent negative impacts to local businesses by blocking access during construction.
- Identify and promote work opportunities for local residents, including:
 - Prepare an Economic Opportunity Plan to describe how the project will operate to enhance locally based economic and employment opportunities for Alaska residents and businesses.
 - Coordinate with the local village corporation, tribal government, city government, and other groups to identify qualified individuals who are interested in working on the project.
 - Promote use of local businesses to support the project (for example, lodging, food, services, and sundries).
- Develop training programs for local residents so that they can be employed during construction and O&M, including:
 - Coordinate with Alaska training centers and universities on workforce development and training opportunities, which may include future job fairs in the region.

8.2.15 Subsistence

Subsistence activities in Alaska are governed federally by the Alaska National Interest Lands Conservation Act (ANILCA) and by the state subsistence law. Federal and state law define subsistence as the “customary and traditional uses” of wild resources for food, clothing, fuel, transportation, construction, art, crafts, sharing, and customary trade. Since 1997, the State of Alaska has taken over a dual subsistence management role and coordinates with the Federal Subsistence Management program in order to effectively manage federal and state laws. Under ANILCA, only rural residents qualify for subsistence, but under the State of Alaska subsistence law, all state residents qualify for subsistence.

Projects that require federal permits and are determined to potentially have an effect on the human environment are required to evaluate the effects of those projects on subsistence uses and needs

under Section 810 of ANILCA. ANILCA requires the preparation of an evaluation of effects of a project on subsistence use and needs, a finding of whether subsistence uses will be significantly affected, convening of a public hearing with prior notification in the area, and a Section 810 determination. An evaluation of subsistence uses will be completed in accordance with Section 810(a) of ANILCA (16 U.S.C. Section 3120) as part of the EIS to be prepared by the USACE, as the lead federal agency.

Many communities, while not located adjacent to the ROW, use the nearby region for subsistence activities. For example, residents of communities not actually adjacent to the pipeline ROW, such as Anaktuvuk Pass, Nuiqsut, Alatna, Allakaket, Stevens Village, and Tanana, obtain furbearing animals, caribou, fish, and moose from the region near the ROW. Summer construction activities are more likely to affect these activities.

Table 22 lists communities (by region) that are found along the proposed ROW route(s) in which subsistence or personal-use harvesting activities are most likely to occur. Subsistence resources of concern for all three regions include waterfowl, anadromous and freshwater fish, furbearers, large mammals, and vegetation.

Table 22. Subsistence or Personal-use Communities by Region

NORTH SLOPE	INTERIOR	SOUTHCENTRAL
Barrow	Alatna	Talkeetna
Prudhoe Bay ^a	Allakaket	Trapper Creek
Nuiqsut	Wiseman	Willow
Anaktuvuk Pass	Coldfoot	Houston ^a
	Evansville	Big Lake ^a
	Bettles	Wasilla ^a
	Steven's Village	Palmer ^a
	Livengood	Skwentna
	Minto	Susitna
	Manley Hot Springs	Knik
	FNSB ^{a, b}	MOA ^{a, c}
	Nenana	
	Tanana	
	Anderson	
	Healy Lake	
	Healy	
	McKinley Park	
	Cantwell	
<p>Notes:</p> <p>a. Communities determined to be non-rural; therefore, do not fall under ANILCA (Subsistence Management Regulations for the Harvest of Wildlife on Federal Public Lands in Alaska, Effective July 1, 2010-June 30, 2012).</p> <p>b. FNSB includes Ester, Fox, North Pole, Eielson Air Force Base, College, Harding Lake, Moose Creek, Pleasant Valley, Salcha, and Two Rivers.</p> <p>c. MOA includes Eklutna.</p>		

Potential Effects

Effects of the ASAP on subsistence are expected to be limited to construction. Construction activities may cause short-term, localized effects on subsistence wildlife species and subsistence activities. It is possible that unauthorized use of the project ROW may also occur for hunting activities. No effects to subsistence are expected at West Dock because construction, transportation, and off-loading are expected to occur outside of times for spring whaling and generally outside of areas where subsistence fishing occurs.

Mitigation

Mitigation measures that can be implemented to address effects on subsistence activities include:

- Identifying locations and times when subsistence activities occur, and avoiding work during these times and in these areas to the maximum extent practicable
- Scheduling work (for example, blasting) to avoid conflict with subsistence activities when possible
- Notifying workers that subsistence activities are ongoing in the area, and directing them to avoid activities that may affect the subsistence activities (for example, not removing trap line markers)
- Using boulders, barriers, and signs to deter unauthorized use of ROWs
- Developing and implementing a Wildlife Avoidance and Human Encounter/Interaction Plan for the construction and operation of the ASAP to avoid impacts to subsistence species

8.2.16 Bureau of Land Management Projects

There are no known BLM projects in or near the proposed pipeline ROW.

8.2.17 Recreation Activities

The ASAP alignment will avoid, to the greatest extent practicable, recreation areas. It will avoid all national parks and federal refuge areas, including the Arctic National Wildlife Refuge, Gates of the Arctic National Park and Preserve, Yukon Flats National Wildlife Refuge, and DNP&P. The alignment will pass through Minto Flats State Game Refuge, Denali State Park, and the Willow Creek State Recreation Area.

In addition to these parks and designated recreation areas, areas along the entire route, both public and private, are used for recreation. As a general rule, tourism-related travel and destinations include DNP&P, with Anchorage and Fairbanks often being trip anchor locations.

Potential Effects

Pre-construction and construction activities can cause short-term adverse effects on tourism and recreation (for example noise, traffic congestion/delays, and competition for campgrounds). Some combination of barge traffic delivering pipe and other heavy construction materials to the South-central Alaska ports will temporarily increase traffic congestion in these communities. Distribution

of construction supplies by the existing highway and railroad transportation systems may result in temporarily increased use of these systems. Construction activities adjacent to tourist and recreation facilities and areas near the Dalton and Parks Highways, as well as local road networks in the Fairbanks, Palmer, Wasilla, and Anchorage areas, will involve temporary delays of traffic.

Tourism peaks during the summer. The major seasons for recreation tend to focus on salmon fishing in the spring and early summer, with big game and waterfowl hunting in the fall. Adverse effects can be minimized by conducting pre-construction and construction activities during winter to the extent feasible. Scheduling summer pre-construction and construction activities to avoid the peak tourist and recreation seasons will greatly reduce any adverse effects.

No long-term effect on tourism or recreation is expected once construction is complete. No new public vehicular access is expected. Existing public access will be retained.

Mitigation

Mitigation measures that can be implemented to address effects on tourism and recreation use areas include:

- Retain existing public access routes and uses.
- Avoid areas with tourist-related facilities.
- Avoid areas with public recreation facilities.
- Avoid creating new public vehicular access to remote areas.
- Minimize impacts to the existing natural landscape to the extent practicable.
- Schedule pre-construction work to avoid peak periods of tourism and recreation.
- Conduct early and continuing consultation with the public, tourism, and recreation businesses.
- Provide new recreation-related opportunities when compatible with pipeline operation.
- Collocate with existing and planned transportation and utility systems where practicable.

8.2.18 Wilderness

The proposed pipeline route does not cross federally designated wilderness areas.

Potential Effects

The proposed pipeline route does not cross any designated wilderness areas, but it parallels the eastern boundary of the Gates of the Arctic National Park and Preserve along the existing Dalton Highway route. While wilderness users may have an expectation for a quiet and remote, undisturbed experience, there will be overflights from helicopters and fixed-wing aircraft associated with environmental and engineering fieldwork, pipeline construction, and O&M activities. These pipeline activities will require close coordination with the applicable local, state, and federal agencies to minimize unnecessary noise that could affect the wilderness experience.

Mitigation

Mitigation measures that can be implemented to address potential effects on wilderness include:

- Development and implementation of a communications plan for fieldwork, construction, and O&M activities.
- Coordination of the location of communication towers used to support overflights with federal wilderness area land managers.