



ALASKA STAND ALONE GAS PIPELINE / *ASAP*

Applicant-Proposed Mitigation Measures

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ACRONYMS AND ABBREVIATIONS

ADF&G	Alaska Department of Fish and Game
AGDC	Alaska Gasline Development Corporation
ASAP	Alaska Stand Alone Gas Pipeline
BACT	best available control technology
BMP	Best Management Practices
CO	carbon monoxide
GHG	Greenhouse Gas
HABS/HAER	Historic American Building/Historic American Engineering Record
HDD	horizontal directional drilling
MP	milepost
NEPA	National Environmental Policy Act
NO _x	nitrogen oxides
NIPs	non-native invasive plants
O&M	Operation and Maintenance
POD, Rev. 1	Plan of Development, Revision 1
ROW	right-of-way
SHPO	State Historic Preservation Officer
SO ₂	sulfur dioxide
TAPS	Trans Alaska Pipeline System
VOC	volatile organic compound

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1.0 INTRODUCTION

This Applicant-Proposed Mitigation Measures document has been prepared by the Alaska Gasline Development Corporation (AGDC) to support the planning and development of the Alaska Stand Alone Gas Pipeline/**ASAP** (ASAP) and to provide detailed information on applicant-proposed mitigation measures to support the preparation of required National Environmental Policy Act (NEPA) documents.

The proposed project is a 24-inch-diameter natural gas pipeline with a natural gas flow rate of 500 million standard cubic feet per day (MMscfd) at peak capacity. The proposed pipeline will be buried except from milepost (MP) 0 to 6, and at elevated-bridge stream crossings, compressor stations, possible fault crossings, pigging facilities, and off-take valve locations. The pipeline system will be designed to transport a highly-conditioned natural gas highly-enriched in non-methane hydrocarbons.

The routing of ASAP is from Prudhoe Bay following the Trans Alaska Pipeline System (TAPS) and Dalton Highway corridors, generally paralleling the highway corridor from the North Slope to near Livengood, northwest of Fairbanks. At Livengood, the pipeline route heads south, joining the Parks Highway corridor west of Fairbanks near Nenana. From there it continues south and terminates at MP 737. It will connect at MP 39 of the Beluga Pipeline (ENSTAR's distribution system) near Wasilla. A lateral pipeline to Fairbanks (Fairbanks Lateral) will take off from the main pipeline just a few miles north of Nenana at Dunbar. The Fairbanks Lateral will travel northeast to Fairbanks, a distance of approximately 35 miles.

The AGDC can implement mitigation measures to reduce the risk of environmental degradation, the chances of injury or harassment of animals, and the risk of negative effects on people who live, work, and recreate near the pipeline corridor that may result from the construction and operation and maintenance (O&M) of the ASAP.

The Plan of Development, Revision 1 (POD, Rev. 1) published in March 2011 describes the proposed ASAP. Construction and O&M techniques described in the POD, Rev. 1 were chosen in large part to limit negative effects on resources within the project area. In addition, this document identifies specific mitigation measures that the applicant proposes and commits to follow as part of the ASAP.

2.0 AIR

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

- Implementation of Best Management Practices (BMPs) during construction activities to mitigate fugitive dust and reduce particulate matter emissions.
- Utilization of Best Available Control Technology (BACT) for combustion equipment to mitigate nitrogen oxides (NO_x) and carbon monoxide (CO) emissions.
- Utilization of ultra low sulfur diesel fuel for construction equipment and non natural gas combustion equipment to mitigate sulfur dioxide (SO₂) emissions, particulate matter emissions and volatile organic compound (VOC) emissions.
- Operate all combustion equipment in accordance with manufacturer's specifications to mitigate NO_x, CO, VOC and particulate emissions resulting from incomplete combustion.
- Maintain emissions control equipment in accordance with manufacturer's specifications to mitigate emissions and maintain emission control efficiency.

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

3.0 NOISE

Mitigation measures that will be implemented to address effects on noise include:

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

4.0 GEOLOGIC HAZARDS

Mitigation measures that will 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
 - Quality Assurance Manual
 - Inspection Services Manual
 - Design Basis Updates
 - Surveillance Manual
 - Environmental Management System Compliance Manual
 - Other controls to be determined

5.0 MINERAL AND ENERGY RESOURCES

A Construction Access Plan and Traffic Control Plan will be developed and implemented to address effects on mineral and energy resource development activities. Development of these plans will include coordination with mining operators and adjacent landowners.

6.0 PALEONTOLOGICAL RESOURCES

Avoidance is the preferred mitigation measure for effect on paleontological resources. To the extent practical, ASAP will be sited to avoid impacts to these resources. If permanent effects are unavoidable, they will 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 contact the State Historic Preservation Officer (SHPO) (if on state lands) and the Authorized Officer as responsible for paleontological and cultural resources if

on public land. A qualified paleontological monitor may be required to be on-site during construction near known paleontological resources, or in areas where the likelihood of finding such resources is high as determined in consultation with SHPO or the Authorized Officer.

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.

7.0 SOILS

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

- Development and implementation of an Erosion Control Plan (as addressed in Section 7.4.3 of the POD, Rev. 1)
- Development and implementation of a Storm Water Pollution Prevention Plan (as addressed in Section 7.4.3 of the POD, Rev.1)

8.0 WATER RESOURCES

Mitigation measures that will be implemented to avoid or minimize adverse effects on surface and ground waters include:

- Minimize the number of river and stream crossings
 - Use existing bridges where feasible
 - Use horizontal directional drilling (HDD) or other trenchless technology to minimize disturbance to water bodies as proposed in Attachment 4 of the POD, Rev. 1.
- Maintain, to maximum extent practicable, the existing surface hydrology at all water body crossings
 - Prevent discharges that have the potential to adversely affect water bodies
 - Stabilize cut slopes immediately when the designed grade is obtained
 - Initiate reclamation of disturbed areas as soon as practicable
 - Ensure water withdrawals meet federal and state standards and guidelines
- Keep construction activities within the footprint of the pipeline right-of-way (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
 - 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
 - Design the pipeline and components to take into account the thermal regime, including placement and size of compressor stations and chillers.
 - Use engineering controls such as insulation and non-frost-susceptible fill to control the thermal signature of the pipeline.

- Implement de-watering 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

9.0 WETLANDS AND VEGETATION

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

- **Avoid:** A wetland should not be affected if there is a less environmentally damaging and 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, and/or preservation actions.

Mitigation options will be developed collaboratively with the U.S. Army Corps of Engineers upon their review of the 2011 Preliminary Jurisdictional Determination. At that time, 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 that will be implemented 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.
 - 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 compressor stations, 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
 - 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 or other trenchless technology as proposed in Attachment 4 of the POD, Rev. 1.
- Contain fuel and lubricant spills during construction.
- During ditch excavation, the top vegetated-mat wetland layer will be removed with a backhoe or similar equipment and set aside separately from the subsoil spoils. After pipeline installation and

during backfill activities, the vegetative mat will be placed back in the ditch as the last (i.e., top) item with the top of the vegetative mat at the surface of the backfilled ditch.

Mitigation measures that will be implemented to prevent the introduction and spread of non-native invasive plants (NIPs) include a NIP Prevention Plan. The NIP Prevention Plan will address procedures to reduce or eliminate the spread of NIPs at project locations such as airports, particularly at gravel airstrips, material sites, temporary use areas such as laydown yards and camps. Restoration of cleared areas will also be addressed in the NIP Prevention Plan. Leaving cleared areas un-restored may present an opportunity for NIPs to establish a foothold without competition from local species. More information about rehabilitation and restoration is provided in the POD, Rev. 1, Section 9.0. The NIP 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.

10.0 FISHERIES RESOURCES

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

- Follow mitigation measures for water quality identified in Section 8.0, water resources.
- 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.
- A Blasting Control Plan, as identified in the POD, Rev. 1 Section 7.6.3, will be developed in accordance with Alaska Department of Fish and Game (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 as proposed in Attachment 4 of the POD, Rev.1
- 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 corridor.
- Use construction methods and reclamation of disturbed areas that eliminates or reduces 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, 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 activity, 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.

11.0 WILDLIFE RESOURCES

Mitigation measures that will 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 across the ROW occur (i.e., migrations).
- 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 (e.g., 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.
- Ensure construction camp operations and pipeline facility construction activities comply with measures that avoid attracting wildlife.
- 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 nesting migratory birds.
- Limit public accessing 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 which follows ADF&G standards protective of wildlife in sensitive areas or during sensitive life stages
 - Bear Avoidance and Human Encounter/Interaction Plan
- To minimize human/carnivore interaction and discourage wildlife presence and feeding opportunities the following plans will be developed to assure the appropriate handling and disposal of wastes:
 - Comprehensive Waste Management Plan
 - Hazardous Materials Emergency Contingency Plan
- Where vertical support members are used to elevate pipe, a minimum of 7 feet of clearance from ground surface to the bottom of pipe will be maintained for wildlife movement.

12.0 SENSITIVE, TREATENED AND ENDANGERED SPECIES

Mitigation measures that will be implemented to address Sensitive, Threatened, and Endangered Species are those identified in Sections 9.0, Wetlands and Vegetation; 10.0, Fisheries Resources; and 11.0,

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.

13.0 CULTURAL RESOURCES

Avoidance is generally the preferred mitigation measure for cultural resources eligible for the National Register of Historic Places. To the extent practical, ASAP will be sited to avoid impacts to cultural resources. If negative effects are unavoidable, they will be mitigated in accordance with Section 106 and in coordination with the appropriate agencies, entities, and individuals. Mitigation measures will be specific to each cultural resource and will be determined and conducted in accordance with Alaska Statute 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 Alaska Heritage Resource Survey (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 have been conducted, the contractor 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/or heritage preservation groups, among others.
- Consult with state and federal agency historic preservation officers.
- Consult with Alaska Native Tribes.

The HABS/HAER documentation would be completed for historic structures prior to pipeline construction and support activities. Archaeological monitoring, as implied above, 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.

14.0 VISUAL RESOURCES

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

- Review the practicality of avoiding or minimizing significant adverse effects on visual resources created by the construction and operation of ASAP and incorporate proven mitigation measures into the design and location of the project where appropriate.
- Minimize the construction of new permanent access roads by using snow/ice roads during construction.
- Restore the construction zone in a manner that facilitates reestablishment 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 would 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.

15.0 SOCIAL AND ECONOMIC

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

- Time construction activities to minimize impacts to subsistence activities where possible.
- Time construction activities to minimize impacts to high-use tourist and local recreation seasons (e.g., wildlife viewing, hunting, snowmachining, fishing, or dog sledding).
- Time construction activities to minimize impacts to local business (i.e., avoid summer and fall construction for recreational and tourist areas).
- Develop and implement traffic control plans to minimize negative impacts to local businesses from blocked access during construction.
- Identify and promote work opportunities for local residents.
 - 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, and city government, and other groups to identify qualified individuals that are interested in working on the project.
 - Promote use of local businesses to support the project (e.g., lodging, food, services, and sundries)

- Develop training programs for local residents so that they can be employed during construction and O&M
 - Coordinate with Alaska training centers and universities on workforce development and training opportunities, which may include, but are not limited to, future job fairs in the region.

16.0 SUBSISTENCE

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

- Identify locations and times when subsistence activities occur, and minimize work during these times and in these areas to the maximum extent practicable.
- Schedule work (e.g., blasting) to avoid conflict with subsistence activities when possible.
- Notify workers that subsistence activities are ongoing in the area and direct them to avoid actions that may affect the activities (e.g., not removing trap-line markers).
- A Wildlife Avoidance and Human Encounter/Interaction Plan will be developed and implemented for the construction and operation of ASAP to avoid impacts to subsistence species.
- Develop a Subsistence Plan of Cooperation to mitigate potential conflicts between ASAP activities and subsistence activities.

17.0 RECREATION ACTIVITIES

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

- Retain existing public access routes and uses.
- Minimize activities in areas with tourist-related facilities during high use periods to the extent practical.
- Minimize activities in areas with public recreation facilities during high use periods to the extent practical.
- Minimize creating new public vehicular access to remote areas.
- Minimize impacts to the existing natural landscape to the extent practicable.
- Schedule pre-construction work to minimize activity during peak periods of tourism and recreation.
- Conduct early and continuing consultation with the public, tourism, and recreation businesses.
- Collocate with existing and planned transportation and utility system where practicable.

18.0 WILDERNESS

In order to mitigate potential effects on wilderness, a Communications Plan for fieldwork, construction, and O&M activities will be developed and implemented. The Communications Plan will require close coordination with the applicable local, state, and federal agencies to minimize unnecessary noise that could affect the wilderness experience.



Alaska Gasline Development Corporation; a subsidiary of Alaska Housing Finance Corporation