Alaska's In-State Gas Pipeline

ALASKA STAND ALONE PIPELINE/*ASAP* PROJECT

Addendum #2 to the 2014 ASAP Plan of Development

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REVISION HISTORY

Revision	Date	Description of Revision	Author	Approval	
				Company Preparing Report	ASAP Senior Project Manager
1	10/2/15	Issue for Use	Kalb Stevenson	ASAP	David Haugen
	2/3/16	Issue for Use	Kalb Stevenson	ASAP	David Haugen

ACRONYMS AND ABBREVIATIONS

ADA	Alaska Department of Administration
ADEC	Alaska Department of Environmental Conservation
ADNR	Alaska Department of Natural Resources
AGDC	Alaska Gasline Development Corporation
ARRC	Alaska Railroad Corporation
AS	Alaska Statute
ASAP	Alaska Stand Alone Pipeline
BLM	Bureau of Land Management
BLMRB	Big Lake Maintenance and Response Base
BPXA	British Petroleum Exploration Alaska
CFR	Code of Federal Regulations
CGF	Central Gas Facility
CO_2	carbon dioxide
DH	Dock Head
DNP&P	Denali National Park and Preserve
DSEIS	Draft Supplemental Environmental Impact Statement
EED	Environmental Evaluation Document
FEIS	Final Environmental Impact Statement
FMRB	Fairbanks Maintenance and Response Base
FTE	Full-Time Equivalent

GCF	Gas Conditioning Facility
GCFMLRB	Gas Conditioning Facility Maintenance and Response Base
GIS	Geographic Information System
HDD	Horizontal Directional Drilling
HSSEQ	Health, Safety, Security, Environmental, and Quality
IT	Information Technology
JAfP	Joint Application for Permit
MAOP	Maximum Allowable Operating Pressure
MCY	million cubic yards
MLBV	Mainline Block Valve
MLLW	mean lower low water
MMSCFD	million standard cubic feet per day
MP	milepost
MSB	Matanuska Susitna-Borough
NEPA	National Environmental Policy Act
NGL	natural gas liquid
O&M	Operations and Maintenance
PBU	Prudhoe Bay Unit
PLO	Public Land Order
POD	Plan of Development
psi	pounds per square inch
psig	pounds per square inch gauge

PSY	Pipe Storage Yard
ROW	Right-of-Way
SOA	State of Alaska
SPCS	State Pipeline Coordinator's Section
SPMT	Self-Propelled Module Transporter
TAPS	Trans-Alaska Pipeline System
TW	Temporary Workspace
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
VSM	Vertical Support Member
wt	weight

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1. INTRODUCTION

1.1 BACKGROUND

The Alaska Stand Alone Pipeline (ASAP) Project has been proposed by the Alaska Gasline Development Corporation (AGDC) to provide North Slope natural gas to markets in Fairbanks, South-central Alaska, and other Alaska communities. The ASAP Project was previously provided with an approval for ROW lease on State of Alaska Lands by ADNR in 2011 for a prior alignment (ADNR, 2011a), along with a set of stipulations agreed to by the State and the Applicant (ADNR, 2011b).

The ASAP Project underwent a series of conceptual design changes and refinements from 2012 to 2014 and produced a revised Plan of Development (POD) (AGDC, 2014). The 2014 POD provided ample technical information on construction and operations, described the revised Project Footprint, and provided information on design components and factors. It also described the Project Right-of-Way (ROW) for the different phases of the ASAP Project and discussed resource values, environmental concerns and plans for stabilization and mitigation of Project impacts. Much of the technical information in the POD that describes construction and operation methodologies and activies for ASAP remains valid in the current design. This addendum, in conjunction with specific design information and project geodatabase files provided to the United States Army Corps of Engineers (USACE) in a revised Joint Application for Permit (404/10) (AGDC, 2015), serves to update the 2014 POD.

A State ROW lease (ADNR, 2011a) and a set of stipulations (ADNR, 2011b) were approved for an earlier version of the ASAP Project by the Alaska Department of Natural Resources (ADNR) in 2011. However, a revised alignment resulted from the collection and review of new engineering, geotechnical, and environmental data between 2011 and 2015. The Project required an amendmended ROW lease to match the new alignment. AGDC submitted a request to amend the ROW Lease to match the current Project Footprint on Jan 15, 2016 to ADNR. On the same day, AGDC also requested a Federal Grant of ROW through all federal lands. Both requests are currently under review. The ROW is described in detail in Section 2.5, below.

This addendum is designed to provide state and federal agencies, namely the ADNR State Pipeline Coordinator's Section (SPCS) and the U.S. Bureau of Land Management (BLM), with updated information on the anticipated Project footprint, components, and ROW. The revised Project footprint and all design components are provided in an updated Project Mapbook (AGDC, 2015). The Project's engineering design is predicated upon the ASAP Design Basis and is consistent with other documentation that has been prepared for other state and federal agencies. AGDC recently prepared and submitted a revised Joint Application for Permit (JAfP) (404/10) to the United States Army Corps of Engineers (USACE) (AGDC, 2015). The permit application, which is currently under review by the USACE, provides an updated description of Project impacts to wetlands. The Project also provided a revised Environmental Evaluation Document (EED) to the USACE and its cooperating agencies to help inform the National Environmental Policy Act (NEPA) process (AGDC,

2016). The EED describes the Project, the affected environment, and the expected effects on the physical, biological, and human environment. The USACE is presently developing a Draft Supplemental Environmental Impact Statement (DSEIS) that will update information on Project impacts since the publication of the 2012 ASAP Environmental Impact Statement (EIS) (USACE, 2012).

1.2 PURPOSE OF THIS ADDENDUM

The purpose of this Addendum to the POD is to provide state and federal agencies adjudicating the ASAP ROW requests with a current and detailed Project Description and to provide reference to other pertinent Project documents that could be useful in the adjudication process.

1.3 PURPOSE AND NEED OF THE ASAP PROJECT

The purpose and need of the ASAP Project have remained consistent since its inception. The ASAP Project will deliver North Slope natural gas to Fairbanks, Southcentral, and as many other communities within Alaska as is economically practical. The project will provide Alaskans with a stable, affordable, long-term supply of natural gas for heating and powering their homes and businesses.

The purpose of the AGDC, the sponsor of the ASAP Project, is established in Title 31, Chapter 25 of Alaska Statute (AS) 31.25.005.

AS 31.25.005 states that the Corporation shall, for the benefit of the state, to the fullest extent possible:

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

endeavor to develop natural gas pipelines …that offer commercially reasonable rates for shippers and access for shippers who produce natural gas…

The ASAP Project helps meet the statewide demand for improved access to an energy source that is clean, reliable, and affordable. These demands have intensified to such a level in the Fairbanks area that an interim plan exists to provide some Fairbanks North Star Borough (FNSB) communities with Liquefied Natural Gas (LNG) by truck until an in-state gas pipeline can be developed (AS 44.88.010(a)). Furthermore, Southcentral's energy infrastructure relies almost entirely on natural gas, with three of four residents using it to heat and power their homes and businesses. The Cook Inlet Basin is currently the sole source of natural gas consumed in the Railbelt, but production has generally declined over the past decade, as reported in Alaska Department of Administration's Alaska Oil and Gas Conservation Commission Monthly Production Reports (ADA, 2014). Existing natural gas demands could fail to be met in Southcentral by as early as 2018[1]. Although recent drilling and development activity has occurred in Cook Inlet, new wells remain unproven and may not satisfy the long-term energy demands for residential and commercial use. The ASAP project can supplement or replace the natural gas currently provided by these fields.

Natural gas will help to improve air quality in the Fairbanks area, which is adversely affected by widespread combustion of wood and coal. Fairbanks is currently classified as an air quality non-attainment area by the Alaska Department of Environmental Conservation (ADEC) and the U.S. Environmental Protection Agency (USEPA). Fairbanks air quality non-attainment is described in detail in documents provided on the ADEC Division of Air Quality website: http://dec.alaska.gov/air/pm2-5_ak.htm. Infrastructure for local gas distribution is currently being developed in and around Fairbanks, and a reliable supply of natural gas will result in cleaner air, as well as more affordable heating and electric power generation.

The ASAP Project will address these needs by providing up to 500 million standard cubic feet per day (MMSCFD) of natural gas from North Slope gas reserves to in-state markets; thereby, meeting current and projected future in-state energy demands (AGDC, 2014; Northern Economics, Inc., 2010) and helping to improve Fairbanks air quality. Since the ASAP Project will transport natural gas, it will be accessible to communities adjacent to the line that choose to develop the local infrastructure to use it. The Project will make statewide expansion of commercial and industrial enterprises possible. It will also provide a substantial number of jobs to Alaskans and economic benefit to the State of Alaska (SOA) through royalties. A stable and reliable supply of natural gas is needed to meet the current and future demand of 500 MMSCFD as follows:

- 200 MMSCFD – Cook Inlet area current demand
- 50 MMSCFD – Cook Inlet area future demand (2030)

[1] 2018 is the first year when gas supply needs for electric utilities and ENSTAR Natural Gas Company (ENSTAR) are not secured by gas purchase contracts in their entirety; whereas, utilities have historically held much longer-term gas supply contracts (10 to 20 years)

- 30 MMSCFD – Fairbanks area future demand (2030)
- 220 MMSCFD – Future commercial and industrial use

The public benefit of the ASAP Project is the potential for delivery of a long-term, reasonably priced supply of natural gas to Southcentral, Fairbanks, and other Alaskan communities for:

- Heating homes, public safety facilities, military bases, and businesses
- Generating electrical energy
- Continuing economic stability and growth by supporting industrial users
- Accommodating future population growth and increased commercial usage served by the existing ENSTAR's Beluga local distribution system, and for the Fairbanks–North Pole area and other Railbelt communities
- Improving air quality in the Fairbanks area, which is currently classified as an air quality non-attainment area by ADEC and USEPA (see the ADEC Division of Air Quality web-site: http//dec.alaska.gov/air/PM2-5_AK.htm).
- Promoting Compressed Natural Gas (CNG) as a substitute for gasoline and diesel fuel used by cars and trucks in Fairbanks; for use by communities along the Parks Highway, including tour buses in Denali National Park and Preserve (DNP&P); and for use by Anchorage and communities on the Kenai Peninsula
- Providing CNG for distribution to rural Alaska communities via the Yukon and Tanana Rivers and marine barges from Cook Inlet
- Facilitating the development of infrastructure to allow more economic development of mining and oil and gas projects

The geographic majority of Alaska has no long-term source of fuel other than wood, coal, or heating oil. Alaska's North Slope has over 30 trillion cubic feet of conventional natural gas reserves. A pipeline is the safest and most efficient way to transfer this energy source and develop it for the maximum benefit of Alaskans.

Community, commercial, and industrial development in interior Alaska could be facilitated with a reliable supply of natural gas. ASAP is expected to provide jobs, new business opportunities, and tax revenues for Alaska. Through the ASAP Project, new jobs will become available during both the construction and operational phases. The ASAP pipeline will also provide a clean and affordable energy source that is accessible to residents, businesses, government entities, and natural resource development projects throughout Alaska.

1.4 ASAP'S COMMITMENT TO AVOID AND MINIMIZE IMPACTS

The June 29, 2011 State of Alaska Right-of-Way Lease for the Alaska Stand Alone Gas Pipeline/ASAP includes a comprehensive list of stipulations that require additional plans, procedures, and best management practices to avoid and minimize environmental impacts (ADNR 2011a, b). The avoidance and minimization of impacts have been key considerations for wetlands, streams,

fish, terrestrial and marine wildlife, threatened and endangered species, subsistence resources, cultural resources and cumulative effects. The current design configuration reflects many of these important considerations (AGDC, 2015).

1.5 INTERACTIVE MAP VIEWER

The Alaska Stand Alone Pipeline (ASAP) Interactive Map Viewer is designed to provide the general public with the Project's geographic footprint and design components so that impacts associated with construction and operation of the pipeline can be visualized. The Interactive Map Viewer overlays the entire pipeline route and associated ancillary facilities on aerial photography or topographic maps. It integrates information pertaining to nearby communities, ROWs, land status, and wetlands with visual representations of land and waterways. The Map Viewer's accompanying User Guide provides instructions for operation, navigation, and interpretation of symbols and features. It can be accessed from AGDC's website or from the USACE's ASAP SEIS website: http://asapgas.agdc.us/interactivemap.html or http://www.asapeis.com/.

2. REVISED PROJECT DESCRIPTION

The Alaska Stand Alone Pipeline (ASAP) Project comprises a Gas Conditioning Facility (GCF) near Prudhoe Bay capable of producing an annual average of 500 million standard cubic feet per day (MMscfd) of natural gas; a buried, 36-inch, 733-mile-long, 1,480-pound per square inch gauge (psig) buried natural gas pipeline connecting the GCF to the existing ENSTAR Natural Gas Company (ENSTAR) pipeline system in the Matanuska-Susitna Borough (MSB); a buried, 12-inch, 30-mile-long, 1,480-psig, lateral line connecting the Mainline to Fairbanks; and associated facilities. The pipeline system will be designed to transport natural gas that will be accessible to and useable by communities, government entities, and natural resource development projects.

The proposed pipeline will typically be buried with a minimum cover of 30 inches and a bottom-of-ditch depth of 6 to 8 feet, except at fault crossings, elevated bridge stream crossings, pigging facilities, and block valve locations. The ASAP route will generally parallel the Trans-Alaska Pipeline System (TAPS) and Dalton Highway corridor to near Livengood, northwest of Fairbanks. At Livengood, the route will continue south, to the west of Fairbanks and Nenana. The pipeline will bypass Denali National Park and Preserve (DNP&P) to the east and will then generally parallel the Parks Highway corridor to Willow, continuing south to its connection with ENSTAR's distribution system at Mile Post (MP) 39 of the Beluga Pipeline southwest of Big Lake (Figure 1). The Fairbanks Lateral tie-in will be located approximately 2.5 miles south of the Mainline Chatanika River crossing at MP 440. From the tie-in, the Fairbanks Lateral pipeline will traverse east following the Murphy Dome and Old Murphy Dome Roads, then extending southeast into Fairbanks (Figure 2).

Figure 1. Alaska Stand Alone Pipeline Route

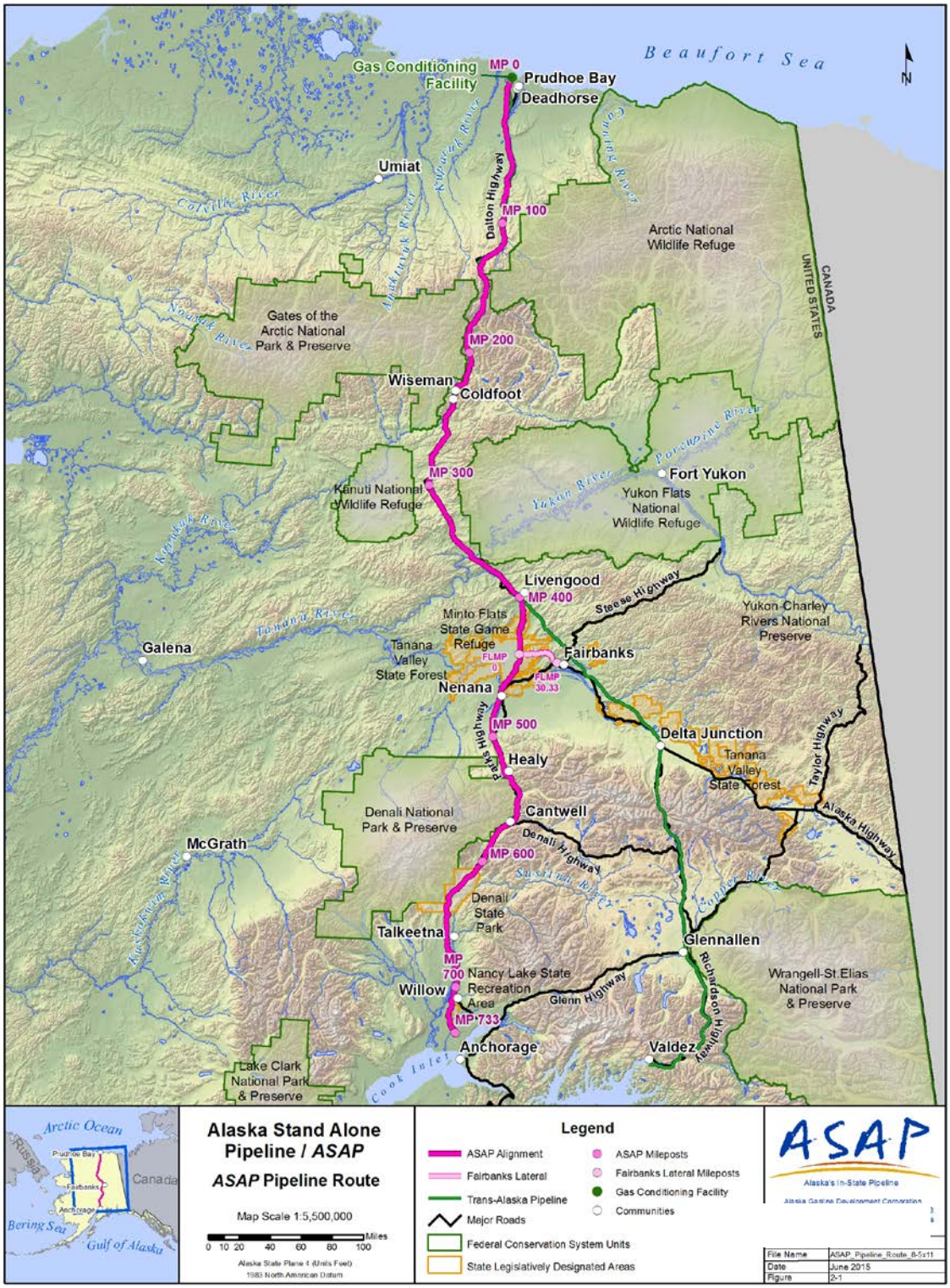
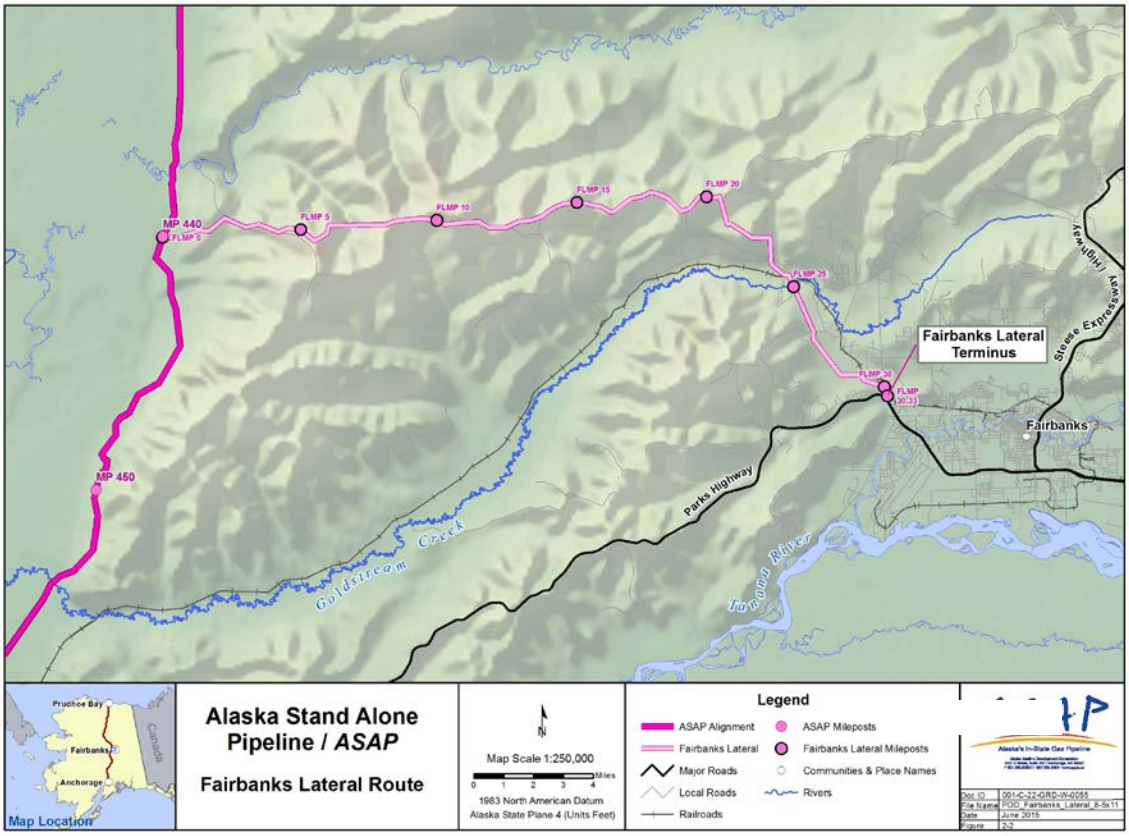


Figure 2. Fairbanks Lateral Route



Changes to the ASAP conceptual design and additional design refinements have occurred since the publication of the 2012 ASAP FEIS. These changes and refinements are summarized in Table 1, below. The table provides some new information on project components and design that have advanced since the publication of the 2014 POD (AGDC, 2014).

Table 1. Summary of ASAP Conceptual Design Changes and Refinements

ITEM	FEIS (USACE, 2012)	JOINT APPLICATION FOR PERMIT (AGDC, 2015)
Conceptual Design Changes		
Gas Composition	**Enriched Natural Gas:** • Contains Natural Gas Liquids (NGLs) • Requires higher-pressure, dense-phase gas pipeline (2,500 psig Maximum Allowable Operating Pressure (MAOP)) • Requires multiple compressor stations • Requires NGL extraction facility to make gas accessible	**Lean Natural Gas (non-enriched):** • 89 mole % methane; No NGLs • Lower pressure pipeline (1,480 psig MAOP) • Transport of preconditioned gas for general use • Does not require additional facilities to make gas accessible
West Dock at Prudhoe Bay	**Modification Undefined:** • 9-barge sealift importing GCF components and materials • Build facility from smaller modular components onsite • Use of West Dock without additional dredging (assumed BPXA would dredge under its permit)	• **Modification Defined:** • 23-barge sealift importing prefabricated modules • Winter dredging of a navigation channel and turn basin at West Dock • Nearshore disposal of dredge material on bottomfast sea ice in Prudhoe Bay, landward of Territorial Sea Boundary • Modification to DH3 berths and widening of the causeway road • Temporary bridge composed of two ballasted barges to facilitate offload and transport of large modules (bypass of weight-limited causeway bridge)
Design Refinements		
GCF-CGF Connection	• Two feeder lines (natural gas and NGL) and two return lines (undefined diameter) • Connecting lines were described as a Connected Action • Four lines supported on 17 Vertical Support Members (VSMs) spaced 60 ft apart; approximately 1k ft of line required	• One natural gas feeder line, one 8-inch CO_2 return line, one 3-inch liquid return line, and an interface module • Design has advanced to allow connecting lines to be assimilated into the Project Description • Three lines supported on 171 VSMs, spaced 25 ft apart; approximately 4,200 ft of line required
Mainline Characteristics	• 737 miles • 24-inch diameter • 2,500 pounds per square inch gage (psig) • Right-of-Way corridor, as follows: o Construction: A 100-foot-wide ROW, nominally, for the full length of the pipeline (9.5k acres; includes operational footprint) o Operation and Maintenance: 52-foot-wide ROW on federal lands, and 30-foot-wide ROW elsewhere for the full length of the pipeline (3.3k acres) • Coating and double-jointing in Fairbanks • First 7 miles aboveground; remainder belowground • 29 Mainline Block Valves (MLBVs) • Topsoil layer stripped and replaced when possible • Pipeline generally within existing transportation corridor ROWs	• 733 miles (difference of about -4 miles) • 36-inch diameter • 1,480 psig • Right-of-Way corridor, as follows: • Construction: variable width, 120 ft-wide minimum temporary ROW, plus additional lands out to 350 ft to construct • Operation and Maintenance: A 53 ft-wide minimum permanent ROW, plus additional lands out to 350 ft to maintain land • Coating and double-jointing prior to arrival in Alaska • Buried along entire route, except at elevated bridge crossings, fault crossings, pigging facilities, and valves • 40 MLBVs (location changes) • Topsoil layer stripped; replaced only on agricultural lands • Pipeline largely outside of existing ROWs; alignment shifts include North Slope, Minto

ITEM	FEIS (USACE, 2012)	JOINT APPLICATION FOR PERMIT (AGDC, 2015)
		Flats / Summer Ridge, Anderson / Clear, and Nancy Lake State Recreation Area
Fairbanks Lateral Characteristics	• 34 miles • Routed through Goldstream Valley along the ARR route • 2 Fairbanks Lateral block valves • ROW corridor as follows: o Construction: A 100-foot-wide ROW, nominally, for the full length of the pipeline (0.4k acres; includes operational footprint) o Operation and Maintenance: A 52-foot-wide ROW on federal lands, and 30-foot-wide elsewhere for the full length of the pipeline (0.1k acres)	• 30 miles (difference of about -4 miles) • Routed along Murphy Dome and Old Murphy Dome Roads • 1 Fairbanks Lateral block valve • ROW corridor, as follows: • Construction: variable width, 100 ft-wide minimum temporary ROW, plus additional lands out to 350 ft to construct • Operation and Maintenance: 30 ft-wide minimum permanent ROW, plus additional lands out to 350 ft to maintain land
Support Facilities	• GCF (69 acres for GCF pad; additional GCF facilities undefined in acreage) • Multiple compressor stations • Straddle Plant at Fairbanks Lateral • NGL extraction facility at Pt. Mackenzie	• GCF Facility Pad & Workspace: 90.6 acres • GCF Camp: 20.2 acres • Compression incorporated into GCF
Stream Crossings[a]	• Total Defined Stream Crossings: 515 • Total anadromous waterbodies: 75 • Preferred Alternative for Yukon River Crossing: New Suspension Bridge • Crossing methods: o Horizontal Directional Drilling (HDD) (also called Trenchless Drilling): 41 o Open Cut / Isolated Open Cut: 470 o Bridge: 4 • Access road stream crossings not yet defined	• Total Project Stream Crossings: 312 • Centerline Stream Crossings: 272 o 265 Mainline crossings - 50 anadromous - Crossing Modes: ▪ Bridge: 6 ▪ Isolated Open Cut: 155 ▪ Open Cut: 97 ▪ HDD: 7 o 7 Fairbanks Lateral crossings - 0 anadromous - Crossing Modes: ▪ Open Cut: 3 ▪ Isolated Open Cut: 4 • Access Road Stream Crossings: 40 o 14 anadromous o Access Road Crossing Modes - 17 Bridges ▪ 14 Temporary ▪ 3 Permanent - 23 Culverts ▪ 4 Temporary ▪ 19 Permanent
Material Sites and Volume[b]	• 546 existing potential sites • 13.1 Million Cubic Yards (MCY) required for preliminary features and facilities that were defined; expectation that this number will increase as features became defined / quantified	• 91 total material sites required o Development of 89 material sites - Use and expansion of existing sites - Development of new sites - Total of 5,200 acres of lands used for material sites; primarily uplands o Use of 2 existing commercial sites; near Willow and Fairbanks • Approximately 25 MCY of material needed from gravel sources, project-wide.

ITEM	FEIS (USACE, 2012)	JOINT APPLICATION FOR PERMIT (AGDC, 2015)
Pipe Storage Yards	• 26 PSY locations	• 29 PSY locations
Construction Camps and Workforce [b]	• 15 camp locations (camp capacities in parentheses, if available), including: o Prudhoe Bay o Franklin Bluffs (500) o Happy Valley (500) o Galbraith Lake (500) o Atigun (250) o Chandler (500) o Coldfoot (500) o Old Man (500) o Seven Mile (500) o Livengood (500) o Nenana (500) o Healy (500) o Cantwell (500) o Chulitna Butte (500) o Sunshine (500) • Total camp capacity: 6,750 + Prudhoe Bay (undetermined) • Mainline Construction: 5,500 employees • GCF Construction: 900 employees • Operations: 50-75 employees	• 13 camp locations (camp capacities in parentheses): o GCF/Prudhoe Bay (800) o Franklin Bluffs (600) o Happy Valley (1,000) o Galbraith Lake (1,000) o Dietrich (1,000) o Prospect (600) o Five Mile (1,000) o Livengood (1,000) o Dunbar (600) o Healy (1,000) o Cantwell (600) o Swan Lake (1,000) o Rustic Wilderness (1,000) • Total camp capacity: 11,200 • Mainline Construction: 6,000 employees or contractors at peak construction • GCF Construction: 130+ employees and additional contractors • Operations: 240 employees or contractors • Most camps collocated with a PSY location
Access Roads [b]	• 133 access roads; additional roads not yet defined or quantified in acreage • 91 new roads; additional roads not yet defined or quantified in acreage • 42 existing roads; additional roads not yet defined or quantified in acreage	• 298 new access roads totaling 174.4 miles • 23 temporary ice access roads totaling 22.9 miles
Additional Infrastructure and Facilities	• Not yet determined	• 8 sets of HDD Entry Pads (1.4 acres), Exit Pads (0.5 acres), and False ROWs • Pig Launchers and Receivers o 36” Launcher at GCF o 36” Launcher / Receiver at Coldfoot o 36” Launcher / Receiver at Mainline / Lateral Tie-in o 36” Receiver at Mainline / ENSTAR Tie-in at Big Lake o 12” Launcher at Mainline / Lateral Tie-in o 12” Receiver at Lateral Offtake • 70 Temporary Workspaces (TWs) totaling 74.9 acres (size range of 0.3 to 1.5 acres; TW ROW width out to 800 ft max. width) o 29 TWs partially or fully outside permanent impact areas (57.8 acres) o 41 TWs inside permanent impact areas (17.1 acres) • 9 Rail Sidings • 2 metering stations with terminus facilities o Mainline tie-in at Big Lake o Fairbanks Lateral Terminus at Fairbanks • 2 Marshalling Yards o Seward o Fairbanks

ITEM	FEIS (USACE, 2012)	JOINT APPLICATION FOR PERMIT (AGDC, 2015)
		• 3 Operations & Maintenance Response Bases (MRBs) o GCF MRB o Fairbanks MRB o Big Lake MRB • ASAP Headquarters o Anchorage Offices
Transportation and Equipment [b]	• 3,800 rail cars of pipe • 9,000 truckloads of pipe • Standard pipeline construction equipment list	• 6,000 rail cars of pipe • 17,700 truckloads of pipe • Revised equipment list
Project Footprint [b]	• **Project Footprint & Impacts Developing** • • Permanent Land Impacts For Facilities that were Defined and Quantified at that time: 4.1k acres • Additional Temporary Land Impacts for Facilities Defined and Quantified at that time: 10.9k acres[c] • Note: Material Site Investigation Areas and other facilities not yet defined at that time	• **Project Footprint & Impacts Defined** **Wetlands Impacts: 8,907.0 acres** • **Freshwater Wetlands: 8,734.6 acres** o Permanent Impact: 7,573.2 acres o Temporary Impact: 1,161.4 acres o Includes PEM, PSS, PFO, Pond, Lake, Intermittent, Perennial streams • **Intertidal Wetlands: 0.9 acres** o Permanent Impact: 0.8 acres o Temporary Impact: 0.1 acres • **Subtidal Wetlands: 171.5 acres** o Permanent Impact: 171.5 acres o Temporary Impact: 0.0 acres **Upland Impacts:12,330.3 acres** **Total Project Footprint: 21,237.3 acres**

Notes:

a. In addition to the stream crossings identified, ASAP Project engineers and scientists have identified several hydrologic points of interest that, while not meeting the wetlands standard for a stream, do require special consideration for pipeline design

b. The FEIS (USACE, 2012) acknowledged that 2012 information related to these categories was preliminary as some specific components of the Project were developing; current data estimates are more accurate due to project refinement. Area calculations were summarized from geospatial data from the FEIS Geodatabase developed by CardnoEntrix in 2012.

c. The temporary impact defined in the FEIS (USACE, 2012) includes some operational footprint acreage; therefore, some of the FEIS operational impact was also tallied as temporary impact.

ARR - Alaska Railroad
BPXA - British Petroleum Exploration Alaska
CGF - Central Gas Facility
CO_2 - carbon dioxide
DH - Dock Head
GCF - Gas Conditioning Facility
GIS - Geographic Information System
HDD - Horizontal Directionally Drilled
MAOP - maximum allowable operating pressure
MCY - million cubic yards
MLBV - Mainline block valve
NGL - natural gas liquid
PEM - palustrine emergent wetland
PFO - palustrine forested wetland

ITEM	FEIS (USACE, 2012)	JOINT APPLICATION FOR PERMIT (AGDC, 2015)
psig - pounds per square inch gauge PSS - palustrine shrub wetland PSY - pipe storage yard ROW - Right-of-Way VSM - vertical support member		

2.1 GAS COMPOSITION

Table 2 describes the chemical composition of natural gas capable of being transported in the revised ASAP Project design. The natural gas is a leaner composition than the enriched gas described in the FEIS (USACE, 2012) in that it doesn't contain high concentrations of the heavier hydrocarbons or Natural Gas Liquids (NGLs). The lean gas has a composition of approximately 89 mole % methane and will be compatible with the ENSTAR distribution network. It will be accessible to the public without need for additional costly processing facilities. This is in contrast to an enriched gas scenario in which gas having a higher concentrations of the heavier hydrocarbons would be transported under a much higher pressure, thereby requiring additional processing facilities to remove them to make the gas useful for the general public. The ASAP Project does not include any local distribution infrastructure.

Table 2. Chemical Composition of Gas to be Transported

GAS COMPOSITION	CGF RESIDUE (MOLE %)	PIPELINE GAS AFTER CONDITIONING (MOLE %)
CO_2	12.00	**2.75**
Nitrogen	0.60	**0.67**
Methane	80.13	**88.78**
Ethane	5.35	**5.85**
Propane	1.65	**1.69**
I-butane	0.08	**0.08**
N-butane	0.13	**0.12**
Pentanes +	0.06	**0.06**
Total	100.00	**100.00**
CGF = Central Gas Facility		

2.2 USE OF WEST DOCK AT PRUDHOE BAY

The GCF will be constructed from 53 prefabricated modules that will be delivered to West Dock in Prudhoe Bay on twenty-three barges in a single-year sealift (AGDC, 2015). The barges will arrive at a marine marshalling area 3-5 miles offshore from West Dock in two separate groups. Barges will be assisted by shallow-draft tugs into a navigational channel leading up to Dock Head

3, which will accommodate simultaneous offloading of up to three barges. The navigational channel will have been dredged to -9 ft below mean lower low water (MLLW) the previous winter, as the barges will have a maximum payload of 5,500 short tons (s/tons) and a maximum draft of 7.6 ft. Disposal of dredge material will have occurred on bottomfast ice in the nearshore environment in southern Prudhoe Bay. A temporary bridge will be constructed through the use of two barges in the fleet to allow self-propelled modular transporters (SPMTs) to bypass an existing weight-limited bridge spanning the 650 ft gap in the causeway.

Upgrades to dock and causeway infrastructure will be required and will occur primarily in winter. One of the existing dock ramps will be raised to 25 ft to accommodate a taller barge sideshell height, while the other two will remain at a height of 20 ft. Portions of the causeway road will be widened to 60 ft to accommodate module transport. Sheet piling and gravel will be used to develop abutments that will connect the temporary bridge to each side of the causeway gap. Mooring dolphins will be inserted the winter before the sealift to help stabilize the barge bridge.

The first two barges to offload modules at Dock Head 3 will be used in construction of the temporary bridge to facilitate transport of modules off of the causeway. These barges will be moved into place against the mooring dolphins, where they will be ballasted and fastened to the causeway abutments and each other. Ramps will be installed to accommodate smooth transport of the SPMTs over the bridge. Modules will be transported by SPMTs down the causeway and over the temporary bridge to a staging pad at the base of West Dock. From there, they will be moved south over approximately 6 miles of new and existing roads to the GCF construction area and permanent location.

Barges will be demobilized following offload. West Dock modifications will be left in place at the conclusion of module offload, as their removal would result in greater disturbance to the surrounding environment. Mooring dolphin beams will be cut below the sediment surface and removed, and then covered with surrounding sediment.

More specific details of dredging, disposal, dock and causeway construction, and module offload are provided in ASAP's West Dock Dredge and Disposal Plan, contained within the JAfP (AGDC, 2015).

2.3 GAS CONDITIONING FACILITY AND CONNECTING LINES

The GCF and an associated workspace will be constructed from modules on a 90.6 acre gravel pad, approximately 1 mile west of the existing Central Gas Facility and five miles south of West Dock. An additional pad area for the GCF camp will require a 20.2 acre pad that will be constructed nearby the GCF. Each GCF module will have a structural steel base and will be mounted on piles driven through the gravel pad. Modules containing process and utility equipment will generally be enclosed and heated during the Operations and Maintenance phase of the Project. Modules will be connected by utilidor modules that provide an enclosed, heated walkway for personnel and small utility trailers, as well as freeze and weather protection for interconnecting utilities and piping.

Site preparation is expected to be completed using gravel from sources in close proximity to the GCF. The GCF will require a standalone construction camp, since lodging facilities in the area cannot accommodate the increased labor force required for GCF construction. The temporary construction camp will be dismantled and removed following completion of GCF construction, commissioning, and startup. A GCF Permanent Operations Camp will be built at the time of GCF construction to house workers and will remain on the site permanently.

Natural gas will be transported from the existing Central Gas Facility to the GCF through the use of a 36-inch, 4,200 ft above-ground transmission pipeline. The transmission line will be supported by vertical support members (VSMs) set 25 ft apart at a height that will allow at least 7ft of clearance beneath it for wildlife passage. The resulting cumulative footprint from the estimated 171 VSMs will be 839 square feet. An 8-inch CO_2 return line and a 3-inch liquid return line will be supported on the same set of VSMs to return wastes to the Central Gas Facility (CGF). These connecting lines were not well-defined in the FEIS where they were evaluated as a Connected Action (USACE, 2012), and at that time a natural gas liquids (NGL) supply line was also expected. The Project has progressed since that time with the elimination of NGLs and the need for an NGL supply line. The connecting lines in the current project design, described above, have since been assimilated into the Project.

2.4 PIPELINE CHARACTERISTICS

2.4.1 Pipe Diameter, Pressure, and Operating Capacity

The 2012 FEIS described ASAP as a 24-inch high-pressure pipe with a Maximum Allowable Operating Pressure (MAOP) of 2,500 pounds per square inch gauge (psig) (USACE, 2012). The revised ASAP Project will use a conventional pipe diameter of 36 inches for the Mainline operated at an MAOP of 1,480 psig (AGDC, 2015). Pipeline compression will be provided at the GCF; no additional compressor stations will be required. The Fairbanks Lateral will remain a 12-inch-diameter pipe, as was described in the FEIS. Its MAOP will be 1,480 psig (identical to the Mainline).

The Mainline is expected to operate near its MAOP and will transport approximately 500 MMSCFD, up to the Fairbanks Lateral tie-in. The Fairbanks Lateral is expected to transport a maximum of 30 MMSCFD. Differing weather conditions, maintenance needs, and other factors could cause day-to-day fluctuations in the gas flow rate. The Fairbanks Lateral could fluctuate more than the Mainline, as needs for Fairbanks may be more weather or season dependent.

The revised Project will not market NGLs. Since there is no need to maintain a single dense phase of with both methane gas and NGL transported simultaneously, the 500 MMSCFD volume of gas can be transported in a larger pipe with a lower pressure without intermediate compression.

2.4.2 Pipe Wall Thickness

Table 3 identifies the pipeline location classes, Wall Thickness (WT), and MAOP for the Mainline pipe, which is 36-inch outer diameter, gradeline pipe. The AGDC plans to use American Petroleum

Institute X70 for the mainline pipe and X52 for the Fairbanks Lateral. AGDC will meet applicable U.S. Department of Transportation (USDOT) integrity management (49 Code of Federal Regulations [CFR] 192, Subpart O) and corrosion control requirements (49 CFR 192, Subpart I).

Table 3. Mainline Containment Pressure

LOCATION CLASS	WT (INCHES)	MAXIMUM ALLOWABLE OPERATING PRESSURE FOR THE MAINLINE 36-INCH PIPE (psig)
Location Class 1 (Division 2)	0.527	1,480
Location Class 2	0.632	1,480
Location Class 3	0.758	1,480
Location Class 4	0.957	1,480

2.4.3 Pipe Burial and Temperature

The pipeline will be aboveground only at specified locations, such as pigging facilities, block valves, fault crossings, and bridge crossings. The ASAP buried line will vary in depth, generally having at least 30" of cover, meeting conditions of 49 CFR 192.327(a), "Cover." The bottom of the pipe ditch will be approximately 6 to 8 feet deep, allowing for bedding, pipe installation, and overburden backfill.

The pipeline is designed to operate as a belowground ambient-temperature pipe with temperatures closely approaching seasonal temperatures of the predominant terrain. The gas will be conditioned to below-freezing temperature at the GCF and would be compatible with the ground temperatures expected in the northern portion of the route. The pipeline would operate at below-freezing temperatures in predominantly permafrost terrains to protect the thermal stability of the surrounding soil. Similarly, the pipeline would operate at above-freezing temperatures in predominantly thawed settings so as to not create frost-bulbs around the pipe that could lead to frost-heave displacement or adverse hydraulic impacts on drainages. The anticipated operating temperature changes along the route, seasonally and as a function of throughput. The pipeline operating temperature will be governed by the combined influence of Joule-Thompson cooling associated with gas pressure drop and pipe-wall heat transfer between the gas pipeline and surrounding soil.

Previously, the first 7 miles of pipe were designed to be supported on VSM's above ground, while the remaining 730 miles of the Mainline and 34 miles of Fairbanks Lateral were belowground, except at the specified locations described above (USACE, 2012). One refinement to the current design is the burial of these first 7 miles. The north-to-south configuration of the pipeline means that pipe buried under wetlands on the North Slope will run parallel to the direction of sheet water flow that is directed by the downward elevation gradient from the Brooks Range foothills north towards the Beaufort Sea. Additional stabilization and mitigation measures will be implemented to avoid negative impacts to soils and hydrology.

Burying the first 7 miles of pipeline from the GCF will reduce impacts to wildlife migration and movement, particularly caribou (Smith and Cameron, 1992; Lawhead et al., 2006). An additional aboveground feature on the North Slope in the same vicinity of TAPS and the Dalton Highway could potentially impact caribou behavior and movement. Subsistence users and North Slope Borough community leaders have previously commented on the issue of additional aboveground features on the North Slope (BLM, 2002).

2.5 PIPELINE RIGHT-OF-WAY

The ASAP Project was designed with consideration of cross slope, terrain type, and avoidance and minimization of impacts to environmental resources where possible. The ASAP Project will require a variable-width temporary construction ROW. The Mainline construction ROW is 120' nominally, meaning it will range from a 120' easement at its narrowest point to a 350' easement at its widest point where additional workspace is required. The Fairbanks Lateral construction ROW is 100' nominally, meaning it will range from a 100' easement at its narrowest point to a 350' easement at its widest point. Temporary Workspaces and HDD False Rights-of-Way used during construction will require up to an 800-ft wide easement.

The ASAP Project will require a permanent operational ROW that is 53' nominally, meaning it will range from a 53' easement at its narrowest point to a 350' easement at its widest point to maintain certain side slope cuts performed during construction. The Fairbanks Lateral operational ROW is 30ft nominally, meaning it will range from a 30' easement at its narrowest point to a 350' easement at its widest point to access and maintain land.

Security and surveillance along the ROW will require approximately 10 Full-time Equivalent (FTE) management positions; clearing and maintaining the ROW will require approximately 3 FTE management positions after year 5 of operational activity.

2.6 ROUTE ALIGNMENT

Route refinements have been made to the Mainline and Fairbanks lateral alignments evaluated in the FEIS. This section highlights the major differences between the route alignment in the FEIS and the alignment proposed in the 2015 JAfP submitted to the USACE (AGDC, 2015).

2.6.1 A Shorter, Straighter Route

The revised ASAP alignment is shown in Figure 1. Through optimization, the ASAP Mainline decreased in length from 737 miles to 733 miles (-4 miles). The Fairbanks Lateral decreased in length from 34 to 30 miles (-4 miles). The result of this route refinement is a shorter, straighter pipeline that is 8 miles shorter in overall length (763 miles in the JAfP [AGDC, 2016, 2015], as opposed to 771 miles in the FEIS [USACE, 2012]).

The ASAP Pipeline route will continue to generally parallel the TAPS and Dalton Highway corridor to near Livengood, northwest of Fairbanks. The revised ASAP route is still captured within the

established federal utility corridor managed by the Bureau of Land Management (BLM) under Public Land Order (PLO) 5150. At Livengood, the revised Mainline route will continue south, to the west of Fairbanks and Nenana. The pipeline will bypass DNP&P to the east and will then generally parallel the Parks Highway corridor to Willow, continuing south to its connection into ENSTAR's distribution system at MP 39 of the Beluga Pipeline southwest of Big Lake (Figure 1).

The Fairbanks Lateral tie-in will be located approximately 2.5 miles south of the Chatanika River at MP 440 of the Mainline. From the Mainline tie-in point, the Fairbanks Lateral pipeline will traverse east over Murphy Dome, following the Murphy Dome and Old Murphy Dome Roads, and then extend southeast into Fairbanks (Figure 2).

ASAP will 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 that is durable, safe, and economical and that meets USDOT and PHMSA regulations.

2.6.2 North Slope Routing Shifts (MP 0 to MP 175)

The GCF will be located approximately 5,500 ft northwest of the location in the FEIS (USACE, 2012), (Umiat Meridian, Township 11 N; Range 14 East; Sections 11 and 14 [U011N014E11 and U011N014E14]). The northernmost section of the Mainline also shifted west of the previous alignment described in the FEIS (MP 0 to MP 29).

At approximately MP 28 the current alignment and the alignment in the FEIS rejoin and generally follow the Dalton Highway alignment east of the Sagavanirktok River to approximately MP 129. Within this segment the current alignment generally deviates from the alignment in the FEIS by following higher elevation contours with greater separation from the Sagavanirktok River and Dalton Highway.

At MP 129 the revised alignment shifts to the east from the alignment in the FEIS and runs southwest where it crosses TAPS and the Dalton Highway at approximately MP 136.5. This route refinement straightens and shortens the alignment by over 2 miles. From MP 136.5 to MP 219 the revised route generally follows that same alignment as proposed in the FEIS.

2.6.3 Brooks Range to Yukon River (MP 175 to MP 356)

The revised route generally follows the FEIS alignment adjacent to the Dalton Highway from MP 175 to MP 356. Deviations within this segment are generally where the revised route follows a straighter and shorter route in relatively close proximity to the FEIS route and Dalton Highway. From MP 219 to MP 228 the route is shifted to the east to avoid three rivers crossings and a Native Allotment.

2.6.4 Yukon River to Fairbanks Lateral (MP 356 to MP 440)

The revised route and the route evaluated in the FEIS generally follow a common alignment from the Yukon River to approximately MP 402. From MP 402 to MP 435 the revised route begins a significant departure to higher elevation contours east of the FEIS route. Moving southward, the revised route climbs the crest of the ridge lying east of Minto Flats ("Summer Ridge") to the junction with the Fairbanks Lateral at MP 440, approximately 2.5 miles south of the Mainline Chatanika River crossing. In this segment of the Project the FEIS route previously followed an alignment at a lower elevation through the Minto Flats region. However, this was changed to avoid wetlands and improve constructability. Both the FEIS route and the current route utilized lands in the Minto Flats State Game Refuge and Tanana Valley State Forest.

2.6.5 Fairbanks Lateral (MP 0 to MP 30.33)

The revised Fairbanks Lateral alignment is a significant departure from the previous route in the FEIS, which followed the Alaska Railroad transportation corridor adjacent to Goldstream Creek for a total length of 34.4 miles. The revised route is approximately 4 miles shorter and traverses east from the Mainline at MP 440 along the higher elevation of Murphy Dome, generally following the Old Murphy Dome Road and existing power lines, avoiding Department of Defense property and private property where possible.

2.6.6 Fairbanks Lateral to Cantwell (MP 440 to MP 566)

The revised route diverges from the FEIS route at approximately MP 440.8, moving upslope to the east of the FEIS alignment to traverse over drier terrain and avoid crossing Native Allotments and private lands. The revised alignment continues southwest, parallel to the FEIS route until MP 470 where the current and historic routes overlap.

At approximately MP 471.5 the revised route shifts to the west side of the Nenana River rather than following the Alaska Railroad Right-of-Way on the east side of the Nenana River and through the City of Nenana and Clear Air Force Base. The two routes cross at MP 497.5 with the FEIS alignment following the Parks Highway Right-of-Way, and the revised alignment shifting east closer to the Tanana River to avoid crossing Native Allotments and private lands. The historic and current routes again overlap between MP 511 and MP 521.

From MP 521 to MP 529, the revised route shifts west to avoid Native Allotments and private property around the town of Healy. The historic and current routes again overlap between MP 529 and MP 559.

Between MP 559 and 569, the revised route shifts to the east of the FEIS route along the Parks Highway to avoid Native Allotments and private lands in the Cantwell area.

2.6.7 Cantwell to Willow (MP 566 to MP 707)

Between MP 566 and MP 587 the revised route generally follows the FEIS route alignment. Between MP 587 and MP 605 the revised route moves upslope and east of the FEIS route alignment to relatively drier ground, avoiding crossings of private land and minimizing stream impacts.

The revised route generally follows the FEIS route between MP 605 and MP 638. Within this segment the FEIS closely follows the Parks Highway Right-of-Way. The revised route deviates from the FEIS alignment in this segment to cross drier ground and minimize impacts to wetlands.

At MP 638 the revised route crosses the Chulitna River and moves south on the west side of the river to avoid private land crossed by the FEIS route on the east side of the river. The revised route rejoins the FEIS route at MP 646 and both follow a generally common alignment to MP 658. Between MP 658 and MP 732, several segments of the revised route shift less than a mile away from the FEIS route to minimize impacts to wetlands and avoid private property.

Between MP 666.5 and 707 the revised route generally follows the FEIS with minor deviations to avoid crossing sensitive habitat areas, Native Allotments, the Montana Creek State Recreational Area, and private property.

2.6.8 Willow to Southern Terminus (MP 707 to MP 733)

Between MP 707 and MP 733 the revised route generally follows the FEIS route with minor deviations to straighten and shorten the alignment and avoid crossing sensitive habitat areas. The final one mile segment of the revised route is the same as the FEIS route.

2.7 FACILITIES

The change in gas composition has resulted in design refinements that will eliminate needs for compressor stations, a straddle and offtake facility at the Fairbanks Lateral tie-in, and the NGLEP at Cook Inlet. These facilities are no longer included in the Project Description.

Off-ROW facilities will be collocated together where possible to avoid and minimize disturbance to environmental resources. A summary of facilities is provided above in Table 1, above.

2.7.1 Access Roads

Roads are necessary for transporting equipment, materials, and personnel to access the pipeline ROW, MLBVs, camps, pipe storage yards, material sites, and water sources from existing roads. The Project requires use of 298 new access roads totaling 174.4 miles and 23 ice access roads totaling 22.9 miles.

Public roads will be used to transport equipment, materials, and personnel to the greatest extent possible where marine and rail transport are not available. The Elliot and Dalton Highways will be

used north of Fairbanks, whereas the Parks Highway will be used between Fairbanks and the southern terminus of the pipeline. Other public access roads will be used to the greatest extent practicable to reduce the construction of temporary access roads.

GCF module offload and construction will require road improvements between West Dock and the GCF pad, as well as new road construction from K-Pad at Prudhoe Bay to the GCF. Access roads will also be constructed from the GCF pad to material sites and from the GCF pad to the CGF.

Vehicles using the access roads during construction include semi-trailer trucks with lowboy flatbed trailers hauling tracked equipment, pipe trucks, dump trucks, crew buses, and heavy-duty passenger vehicles, such as pickup trucks or sport-utility vehicles.

Typical standard drawings for gravel access roads and culverts can be found in the JAfP (AGDC, 2015). All access roads are considered permanent project features..

2.7.2 Material Sites

The number of potential material sites under investigation in the FEIS was 546, and all were expected to be existing sites (USACE, 2012). This number has since been refined to 89 developed material sites totaling 5,200 acres that will be developed for the Project (Table 4), along with plans to purchase material from two commercial sites. Several existing sites will be used and expanded, while other new sites will be developed. Approximately 25 million cubic yards (MCY) of material will be required for construction. The volume of material quoted in the FEIS was only for known components of the Project at that time (USACE, 2012); all Project material needs have since been defined and determined.

Table 4. ASAP Material Site Locations and Characteristics

ID	MP	Longitude	Latitude	Material Site Status[a]	Area of Total Land Use (Acres)	Volume of Material[b] (MCY)	MTRS	Land Status
MS 1A-A	0.3	-148.544697	70.309997	New	136.89	2.00	U011N014E15	State of Alaska
MS 1B-F	18.0	-148.539313	70.078687	New	75.15	0.28	U008N014E01	State of Alaska
MS 1B-D	40.4	-148.684205	69.766051	New	174.29	0.28	U005N014E20, 29	State of Alaska
MS 1B-G	54.8	-148.600831	69.575232	New	138.29	0.28	U003N014E25, 26, 36	State of Alaska
MS 1C-A	65.1	-148.701147	69.422829	Existing	42.75	0.28	U001N014E21, 22	State of Alaska
MS 1C-H	77.9	-148.776117	69.261600	New	72.33	0.28	U002S014E16, 21	State of Alaska
MS 1C-G	85.2	-148.820412	69.148368	Existing	55.28	0.28	U003S014E29, 30, 32	State of Alaska
MS 1C-D	90.8	-148.759031	69.081046	New	225.34	0.28	U004S014E21	State of Alaska
MS 1C-E	109.5	-148.836168	68.825889	New	92.80	0.28	U007S014E17, 20, 21	State of Alaska
MS 1C-F	113.6	-148.867843	68.782051	New	104.96	0.28	U007S014E32, U008S014E05, 06	State of Alaska
MS 1D-A	113.8	-148.854805	68.763279	Existing	146.40	0.28	U008S014E07, 08, 17	State of Alaska
MS 1D-C	130.2	-149.299688	68.619315	Existing	67.35	0.28	U009S012E33, 34	Federal
MS 1D-E	142.4	-149.480209	68.464213	Existing	147.77	0.28	U011S011E26	Federal
MS 1D-F	148.5	-149.334396	68.407421	Existing	74.79	0.28	U012S012E09, 16	Federal
MS 1D-H	155.8	-149.352454	68.305227	Existing	36.86	0.28	U013S012E21, 22	Federal
MS 1D-I	160.0	-149.415268	68.248182	New	38.43	0.28	U014S012E08	Federal
MS 1D-J	162.4	-149.396799	68.216568	Existing	84.25	0.28	U014S012E20	Federal
MS 1F-A	173.5	-149.563347	68.087328	Existing	30.85	0.28	U016S011E03	Federal
MS 2A-B	194.1	-149.824627	67.843388	New	46.85	0.28	F035N010W21	Federal
MS 2A-L	201.8	-149.752990	67.734562	New	36.83	0.28	F034N010W26, 35	Federal
MS 2A-C	207.6	-149.714403	67.656297	New	40.48	0.28	F033N010W25	Federal
MS 2A-D	218.8	-149.838538	67.514883	Existing	78.55	0.28	F031N010W17, 18	Federal
MS 2A-G	229.6	-150.070519	67.411314	Existing	87.54	0.28	F030N011W19, 20	Federal
MS 2A-H	230.4	-150.087273	67.397520	Existing	25.87	0.21	F030N011W30	Federal
MS 2A-I	236.1	-150.135873	67.319658	Existing	40.22	0.28	F029N012W24	Federal, State of Alaska

ID	MP	Longitude	Latitude	Material Site Status[a]	Area of Total Land Use (Acres)	Volume of Material[b] (MCY)	MTRS	Land Status
MS 2A-J	238.3	-150.169371	67.287148	Existing	60.01	0.28	F028N012W03, F029N012W35	State of Alaska
MS 2B-A	241.4	-150.144967	67.240991	New	36.06	0.28	F028N012W22, 23	Federal, State of Alaska
MS 2B-B	243.2	-150.203720	67.226911	Existing	21.38	0.26	F028N012W28	Federal
MS 2B-C	250.8	-150.340342	67.141927	Existing	57.44	0.28	F027N013W23, 26	Federal
MS 2B-D	255.3	-150.385741	67.079274	Existing	142.31	0.40	F026N013W14, 15, 16	Federal
MS 2B-F	260.3	-150.286470	67.020505	New	56.08	0.28	F025N012W06, F025N013W01	Federal
MS 2B-G	262.3	-150.289430	66.993983	Existing	32.40	0.28	F025N012W18, F025N013W13	Federal
MS 2B-H	271.7	-150.530553	66.895572	Existing	84.95	0.28	F024N014W23	Federal
MS 2B-I	276.4	-150.574902	66.827252	New	16.88	0.27	F023N014W10, 15	Federal
MS 2B-J	278.9	-150.610877	66.800723	New	86.87	0.10	F023N014W20, 21	Federal
MS 2B-K	283.5	-150.681221	66.744947	New	30.70	0.28	F022N014W07	Federal
MS 2C-A	287.2	-150.650208	66.694953	New	47.81	0.28	F022N014W29, 31, 32	Federal
MS 2C-B	289.2	-150.660772	66.663136	Existing	71.95	0.39	F021N014W05, 07, 08	Federal
MS 2C-D	296.3	-150.747595	66.577978	Existing	30.93	0.28	F020N015W10	Federal
MS 2C-E	299.6	-150.716397	66.531480	New	27.22	0.28	F020N015W26	Federal
MS 2C-F	305.1	-150.661075	66.460074	New	42.85	0.28	F019N015W24	Federal
MS 2C-G	312.3	-150.522091	66.383637	New	28.91	0.28	F018N014W15	Federal
MS 2C-H	315.8	-150.463032	66.338026	New	52.12	0.28	F018N014W36	Federal
MS 2C-J	324.3	-150.285142	66.243338	Existing	41.48	0.28	F016N013W03	Federal
MS 3A-A	336.6	-150.157471	66.082295	Existing	29.32	0.28	F015N012W31	Federal
MS 3A-B	337.4	-150.171158	66.064577	New	22.63	0.15	F014N012W06	Federal
MS 3A-C	341.0	-150.112304	66.026910	New	63.24	0.28	F014N012W20, 21	Federal
MS 3A-E	348.2	-149.920959	65.967745	Existing	182.91	0.30	F013N011W08	Federal
MS 3A-F	353.1	-149.776086	65.929522	New	33.26	0.28	F013N011W25	Federal
MS 3A-G	364.3	-149.519053	65.815925	Existing	120.34	0.28	F011N009W06, F011N010W01, F012N009W31, F012N010W36	State of Alaska
MS 3A-I	371.2	-149.353792	65.748497	Existing	25.09	0.19	F011N009W25, 26	State of Alaska
MS 3A-J	377.3	-149.190524	65.692424	New	35.49	0.28	F010N008W15	State of Alaska

ID	MP	Longitude	Latitude	Material Site Status[a]	Area of Total Land Use (Acres)	Volume of Material[b] (MCY)	MTRS	Land Status
MS 3A-M	383.6	-149.025229	65.643456	New	24.83	0.28	F009N007W04, F010N007W33	State of Alaska
MS 3A-N	387.9	-148.928425	65.606682	New	34.97	0.28	F009N007W13, 14	State of Alaska
MS 3A-O	393.7	-148.844180	65.529508	Existing	91.22	0.28	F008N006W07, 08, 17, 18	State of Alaska
MS 3A-R	400.8	-148.657454	65.458220	New	79.92	0.28	F007N005W06, 07	State of Alaska
MS 3C-B	456.0	-148.798944	64.728168	New	79.26	0.28	F002S006W20	Native Corporation
MS 3C-C	469.3	-149.112816	64.606949	New	41.14	0.28	F003S008W34, 35	Native Corporation
MS 3C-E	477.4	-149.149615	64.489172	New	10.44	0.15	F005S008W09	State of Alaska
MS 3D-A	497.5	-149.294392	64.220461	New	41.08	0.28	F008S009W14, 15	State of Alaska, Municipal/ Borough
MS 3D-B	502.0	-149.282523	64.152088	New	53.06	0.28	F009S009W03, 10, 11	State of Alaska, Private
MS 3D-C	508.4	-149.205363	64.073629	Existing	31.92	0.28	F010S008W06	State of Alaska
MS 3D-D	513.6	-149.125952	64.006984	New	25.94	0.28	F010S008W33	University of Alaska
MS 3D-I	520.6	-149.072893	63.912278	Existing	37.23	0.10	F011S008W35, F012S008W02	State of Alaska, Municipal/ Borough
MS 3D-G	527.8	-149.003689	63.835396	Existing	38.17	0.27	F012S007W31	Alaska Railroad
MS 3D-H	529.1	-148.975519	63.819953	New	27.03	0.10	F013S007W06	State of Alaska, Municipal/ Borough
MS 3F-A	538.1	-148.849368	63.712916	New	43.48	0.28	F014S007W11	Municipal/ Borough
MS 3F-B	541.3	-148.771808	63.685401	New	9.37	0.10	F014S006W20	State of Alaska
MS 4A-A	543.6	-148.767239	63.655951	Existing	107.11	0.29	F014S006W32, F014S007W36	State of Alaska, Municipal/ Borough
MS 4A-B	546.8	-148.778585	63.616503	Existing	28.71	0.27	F015S006W18	Native Corporation
MS 4A-C	549.9	-148.816635	63.571302	Existing	40.97	0.28	F015S007W36	Native Corporation
MS 4A-E	557.8	-148.806960	63.469219	Existing	43.25	0.28	F017S007W01	Native Corporation

ID	MP	Longitude	Latitude	Material Site Status[a]	Area of Total Land Use (Acres)	Volume of Material[b] (MCY)	MTRS	Land Status
MS 4A-G	564.0	-148.883027	63.391399	New	20.68	0.28	F017S007W34, F018S007W03	State of Alaska
MS 4A-H	571.3	-149.089082	63.354486	New	20.25	0.28	F018S008W16	Federal
MS 4A-I	580.0	-149.235975	63.251625	New	40.70	0.28	F019S009W22, 23	Native Corpo-ration, Univer-sity of Alaska
MS 4A-J	584.2	-149.327252	63.209380	New	17.64	0.25	F020S009W05	State of Alaska, Alaska Railroad
MS 4A-L	591.9	-149.451709	63.123939	Existing	43.44	0.28	F021S010W03	State of Alaska, MHTA
MS 4B-A	609.5	-149.716144	62.914789	Existing	77.22	0.28	S033N002W30, 31	State of Alaska
MS 4B-C	622.7	-149.981260	62.783593	New	104.46	0.28	S031N004W11, 14, 15	State of Alaska
MS 4B-G	645.7	-150.245613	62.540322	Existing	87.38	0.28	S028N005W05, 08	State of Alaska, Munic-ipal/ Borough
MS 4B-H	653.7	-150.252446	62.435380	New	11.68	0.10	S027N005W08, 17	State of Alaska, Munic-ipal/ Borough
MS 4C-B	670.3	-150.214461	62.205282	Existing	27.79	0.28	S024N005W04, S025N005W33	State of Alaska
MS 4C-C	676.8	-150.105847	62.144321	New	49.48	0.28	S024N005W25	State of Alaska
MS 4C-F	689.7	-150.057076	61.986673	Existing	14.08	0.06	S022N004W20	State of Alaska
MS 4D-E	714.5	-150.189453	61.660838	New	77.61	0.28	S018N005W09	Municipal/ Borough
MS 4D-F	720.9	-150.216807	61.574564	New	51.13	0.28	S017N005W08	Municipal/ Borough
MS 4D-G	725.7	-150.199532	61.509953	New	49.50	0.28	S016N005W04, 05	Municipal/ Borough
MS 4D-H	733.5	-150.014566	61.399770	New	20.63	0.28	S015N004W09	Municipal/ Borough
MS FL-A	FL 8.6	-148.428471	64.951825	New	15.31	0.25	F002N004W31	State of Alaska
			TOTALS		**5,199.82**	**25.25**		

Notes:

a. Material Site Status was denoted as 'New' if the area of existing land disturbance at the site was estimated to be < 1 acre.

b. 89 Material sites are shown. It is expected that some additional material will be purchased from 2 commercial sites.

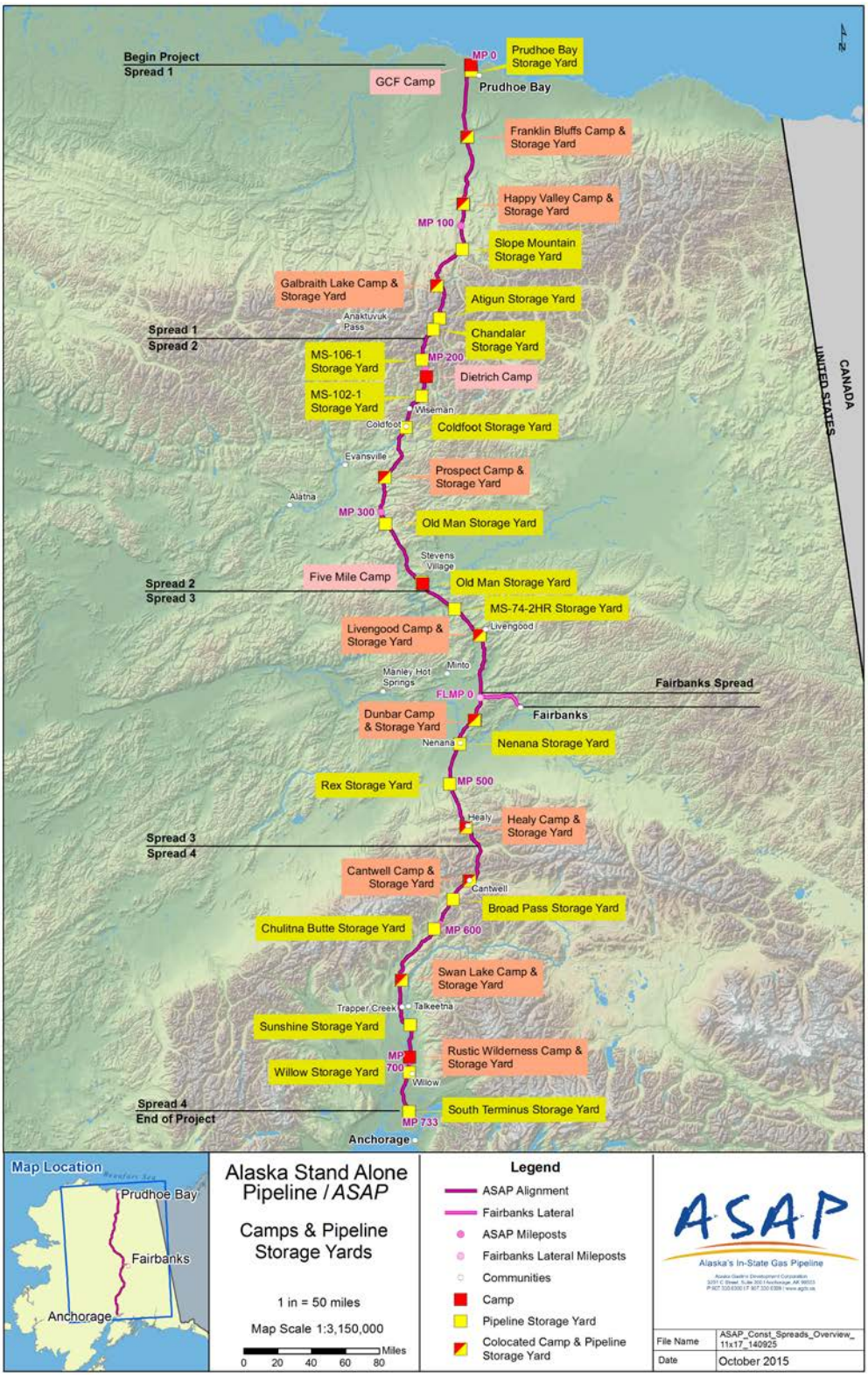
2.7.3 Camps and Pipe Storage Yards

AGDC proposes to establish 13 stationary construction camps (12 Mainline + 1 at GCF) and 29 pipe storage yards to support construction (Figure 3, below; AGDC, 2015). Most of the stationary construction camp locations will be collocated within a mile of a PSY. The PSYs and stationary construction camps will primarily be located in previously-disturbed areas that were used for construction of TAPS, Alaska Railroad Corporation (ARRC) facilities, or public events. The PSYs will require manpower of approximately 18 FTE management positions over 2.5 years; an additional 8 FTE management positions are also expected for supply warehousing at this time.

Stationary construction camps will house project personnel, including construction workers, management, agency staff, and support service personnel. Further, stationary construction camps will be used for fuel and equipment storage yards. These camps can house between approximately 600 and 1,000 workers and will range in size from 15 to 40 acres. Further, approximately 800 workers may be housed in the GCF construction camp in Prudhoe Bay. The Project will require approximately 130+ employees or contractors for the GCF over 3.5 years and 6,000 employees or contractors for the pipeline over 2.5 years.

Mobile construction camps will be used during the construction preparation phase, or preconstruction. These mobile camps will be 8.5 to 10 acres in size and will exist at different locations for short durations. Stationary construction camps will be erected along the proposed Mainline pipeline. Where possible, mobile construction camps will be located within previously cleared and disturbed areas. The use of mobile camps will be primarily limited to the construction preparation phase prior to the establishment of stationary construction camps..

Figure 3. Stationary Construction Camps and Pipe Storage Yards



2.7.4 Block Valves

The Project will install and maintain 40 Mainline block valves and 1 Fairbanks Lateral block valve (AGDC, 2015). By regulation, these will be above-ground features, with one valve at least every 20 miles. Siting of exact locations was dependent upon on suitability of terrain.

2.7.5 Pig Launchers and Receivers

Pig launchers will be used to inspect and maintain operability and compliance of the pipe. Pig launchers for the 36-inch Mainline will be at the GCF, Coldfoot and the Fairbanks Lateral Tie-in, while receivers will be located at Coldfoot, the Fairbanks Lateral Tie-in, and the Mainline ENSTAR Tie-in (AGDC, 2015). Launchers and receivers will be collocated at Coldfoot and the Lateral Tie-in. The launcher for the 12-inch pipe will be collocated on the same pad with the 36-inch launcher / receiver at the Fairbanks Lateral Tie-in location, while the receiver will be at the Fairbanks offtake location.

2.7.6 Metering Stations and Offtake Facilities

Metering stations and offtake facilities will be located at the end of the Mainline and the Fairbanks Lateral where gas flow will be monitored and recorded. The Mainline will tie directly into an existing local distribution system for southcentral Alaska (ENSTAR). The Fairbanks Lateral will tie in to a local distribution system to be determined later.

2.7.7 Temporary Workspaces, HDD Pads, and False Right-of-Ways

Areas of supplemental use will be needed for the ASAP project during the construction phase of the Project, including Temporary Workspaces (TWs), Horizontal Directional Drilling (HDD) Entry and Exit Pads, and HDD False ROWs. The Project requires use of 70 TWs, and 8 sets of HDD Entry / Exit Pads and False ROWs (AGDC, 2015).

2.7.8 Marshalling Yards

Marshalling yards will consist of workspace and a pipe storage system for the safe, efficient, and secure storage and distribution of line pipe as it transitions between ocean and/or railway transit systems to PSYs. Marshalling yard gravel pads will be constructed and operational several months prior to initial pipeline construction. Each yard will be approximately 21 acres and will have the capacity to store 40,000 tons of pipe. The yards will be located in Seward and Fairbanks and will be sited within existing rail yards or adjacent to railways to reduce the time and effort spent handling and hauling pipe.

Each marshalling yard will have an equipment storage area and an office, at which staff can work out of mobile units. There will be office space for site management, administrative, logistical, quality assessment/quality control (QA/QC), and operational staff. The marshalling yard office / equipment storage areas will be surrounded by a chain-link fence with three 20 ft gates. This fence will

serve a dual purpose to secure equipment and materials and to keep foot traffic safely segregated from the material haul routes associated with the pipe storage area. Areas have been identified for storing snow during the winter months. Office trailers, portable toilets, dumpsters, generators with accompanying fuel storage systems, an 80 ft x 120 ft cold storage / equipment maintenance facility, and secure lockable storage containers will be rented and temporary in nature. Marshalling Yards will require approximately 24 FTE management positions over 2.5 years.

2.7.8.1 Seward Marshalling Yard

The Seward Marshalling Yard will be located near the Seward Harbor and the Alaska Railroad terminus. Pipe will arrive by barge and will be transported directly to the Seward Marshalling Yard or placed on railcars. The Seward Marshalling Yard will be required for 30 months, which allows for 4 months to coordinate mobilization activities and 2 months at the conclusion of pipe distribution operations for demobilization. It is assumed that pipe will be delivered to the Port of Seward and transferred to the Seward Marshalling Yard over a 24 month period, with each ship requiring 7 to 10 days to fully discharge the load. During the ship offload cycles, operations will proceed for 12 hours each day with multiple crews.

2.7.8.2 Fairbanks Marshalling Yard

The Fairbanks Marshalling Yard will be located in Fairbanks, adjacent to Alaska Railroad tracks. The pipe will arrive by rail and will be stored and sorted before moving it to smaller PSYs. The Fairbanks Marshalling Yard will be operational for approximately 30 months. Personnel will be tasked with a 6 day x 60 hour work week. The staff assigned to the Fairbanks Marshalling Yard will provide management oversight for the rail siding near the Fairbanks Lateral tie-in to the Mainline. This siding is planned to be utilized as a direct offload point from the Alaska Railroad to truck pipe to PSYs.

2.7.9 Maintenance and Response Bases

Approximately 240 employees and contractors will be required to staff the Project during its Operations and Maintenance Phase. Work at the Project's three Maintenance and Response Bases will require a total of 24 FTE management positions. Some of these roles are noted in the facility descriptions, below.

2.7.9.1 GCF and the GCF Maintenance and Response Base (GCFMRB)

The GCF complex and the integrated GCF Maintenance and Response Base (GCFMRB) will be located within the Prudhoe Bay Unit and will be a stand-alone modular facility for gas processing, support (e.g., office, storage, shop, and equipment) and camp facilities. Its purpose is to:

1. Provide self-sustaining utilities, power, and housing for the GCF complex

2. Reliably process and provide conditioned gas for intra-state shipping via the pipeline to Fairbanks and to the ENSTAR Natural Gas Company (ENSTAR)-operated Beluga Pipeline near Big Lake
3. Serve as the 24-hours a day, 7 days a week (24/7) center of operations for ASAP, including the GCF, the pipeline, and the Fairbanks and Big Lake gas offtake facilities
4. Support maintenance and emergency response activities for the GCF complex and the pipeline right-of-way from Mile Post (MP) 0 through MP 183.

A high degree of reliability and prompt response times are required of staff at this facility. The physical size of the overall GCF complex demands a high volume and variety of maintenance activities for the physical facilities. The ASAP infrastructure that will be developed compliments the existing utilities and services available nearby.

Key operational functions of the GCF complex and the GCFMRB will be:

- GCF process facilities operations
- GCF camp operation
- 24/7-staffed control room (GCF and pipeline)
- Upstream gas coordination (PBU)
- GCF metering and chain-of-custody
- Mainline pipeline pressure and overpressure control
- Valve position remote monitoring
- Leak detection remote monitoring
- Corrosion protection remote monitoring
- River crossing remote (camera and sensor) monitoring
- Unmanned security systems monitoring and alarms
- Fairbanks Lateral remote metering
- Fairbanks utility delivery rates and pressures
- Fairbanks utility remote metering and chain-of-custody
- Downstream Fairbanks utilities coordination
- Beluga utility delivery rates and pressures
- Beluga utility remote metering and chain-of-custody
- Downstream Beluga utilities coordination (ENSTAR)
- Security crew
- Control and coordination of line-wide maintenance activities

Maintenance activities on the ROW between MP 0 and MP 183 will be primarily supported from the GCFMRB. These activities will be performed under a manager and a support team, which will be housed, deployed, and provided equipment and facilities support from the GCF complex. Their activities will be:

- Pig launching/receiving
- Valve maintenance

- Cathodic protection system maintenance
- Communications system maintenance
- Supervisory Control and Data Acquisition Systems maintenance
- Civil infrastructure maintenance (for example, bridge, access road, slope erosion, vegetation control, and flood damage)
- ROW monitoring: ground
- ROW monitoring: aerial

A security crew will be based at the GCF. Emergency response for the GCF complex and the pipeline ROW from MP 0 through MP 183 will be managed from the GCF and supported by the GCFMRB. To provide first response, the GCF complex will have 24/7 staffing of security and emergency response-trained personnel capable of delivering first response emergency services and contacting appropriate backup support.

Current plans are to staff the GCF complex with qualified operators for control room and module operations, and with qualified maintenance personnel to perform maintenance activities at the GCF complex and on the pipeline ROW from MP 0 to MP 183, as described in earlier sections. Consistent with traditional North Slope scheduling protocol, personnel assigned to the GCF complex are planned to work a 2-week-on/2-week-off schedule. Personnel based at the GCF will be housed at the permanent GCF camp.

The GCFMRB will require approximately 10 FTE management positions stationed onsite that will function in roles of administration, staff supervision, management, and technical services. All GCFMRB staff will be housed on-site in 2-week on, 2-week off rotational shifts.

2.7.9.2 Fairbanks Maintenance and Response Base (FMRB)

The Fairbanks Lateral is the offtake point from which gas will be shipped to Fairbanks for end-user utility consumption. Fairbanks is located at approximately the midpoint along the entire ASAP corridor and possesses existing commercial and industrial infrastructure. It will serve as a major coordination center for pipeline maintenance and response activities. The Fairbanks Maintenance and Response Base (FMRB) is planned to be an urban industrial facility located in Fairbanks near the Fairbanks offtake facilities. ASAP facilities and equipment that will be operated and primarily maintained from the FMRB are:

- Fairbanks Lateral ROW
- Mainline pipeline ROW MP 183 to MP 529
- FMRB facilities, including administrative, storage, warehouse, and equipment facilities
- Backup Control Room

The key maintenance activities supported at the FMRB are:

- FMRB administrative, storage, warehouse, and equipment facilities maintenance
- FMRB Backup Control Room facility maintenance

- FMRB roads and pads
- Original Equipment Manufacturer maintenance
- Rolling-stock equipment O&M

Maintenance activities on the ROW between MP 183 and MP 529 will be primarily supported from the FMRB. These activities will be performed under a manager and team which will be deployed and provided equipment and facilities support from the FMRB. Their activities will include:

- Pig launching/receiving
- Valve maintenance
- Cathodic protection system maintenance
- Communication system maintenance
- Supervisory Control and Data Acquisition Systems maintenance
- Civil infrastructure maintenance (e.g., bridge, access road, slope erosion, vegetation
- control, and flood damage)
- ROW monitoring: ground
- ROW monitoring: aerial

A security crew will be based at the FMRB. Emergency response for the pipeline from MP 183 through MP 529 will be managed from and supported by the FMRB. To provide first response, the FMRB will have 24/7 staffing of security and emergency response trained personnel (on a call-out basis) capable of delivering first response emergency services and contacting appropriate backup support.

Current plans are to staff the FMRB with qualified operators to deliver backup ASAP operations and with qualified maintenance personnel to perform maintenance activities at the FMRB and on the pipeline ROW from MP 183 to MP 529, as described in earlier sections. Personnel assigned to the FMRB, will work a normal urban work schedule and live in the Fairbanks area (offisite) rather than being housed at the facility. The 24/7 staffing of FMRB Security positions will be met through typical three-shift schedules, including day, night, and swing shifts. The FMRB will require approximately 9 FTE management positions with roles functioning in administration, staff supervision, management, technical services, scheduling, and outreach.

2.7.9.3 Big Lake Maintenance and Response Base (BLMRB)

The Big Lake Maintenance and Response Base (BLMRB) will serve as a major support location for pipeline maintenance and response activities north of the offtake point, as there is existing industrial and commercial infrastructure in the Matanuska-Susitna Borough (MSB). The BLMRB is planned to be an urban industrial facility located within the MSB and conceptually collocated with the Big Lake offtake facilities at the end of the ASAP line near its tie-in to the ENSTAR system (Beluga line). ASAP facilities and equipment that will be operated and primarily maintained from the BLMRB are:

- Mainline pipeline ROW MP 529 to MP 733

- BLMRB facilities, including administrative, storage, warehouse, and equipment facilities

The key maintenance activities supported at the BLMRB are:

BLMRB administrative, storage, warehouse, and equipment facilities maintenance

- BLMRB roads and pads
- Original Equipment Manufacturer maintenance
- Rolling-stock equipment O&M

The maintenance activities on the ROW between MP 529 and MP 733 will be primarily supported from the BLMRB. These activities will be performed under a maintenance manager and team that will be deployed and provided equipment and facilities support from the BLMRB. Their activities will be:

- Pig launching/receiving
- Valve maintenance
- Cathodic protection system maintenance
- Communications system maintenance
- Supervisory Control and Data Acquisition Systems maintenance
- Civil infrastructure maintenance (for example, bridge, access road, slope erosion, vegetation control, and flood damage)
- ROW monitoring: ground
- ROW monitoring: aerial

A security crew will be based at the BLMRB. Emergency response for the pipeline from MP 529 through MP 733 will be managed from and supported by the BLMRB. To provide first response, the BLMRB will have 24/7 staffing of security and emergency response trained personnel (on a call-out basis) capable of delivering first response emergency services and contacting appropriate backup support.

Current plans are to staff the BLMRB with qualified maintenance personnel to perform maintenance activities at the BLMRB and on the pipeline ROW from MP 529 to MP 733, as described in earlier sections. Personnel assigned to the BLMRB will work a normal urban work schedule and live in the MSB area rather than being housed at the facility. The 24/7 staffing of BLMRB Security positions will be met through typical three-shift schedules, including day, night, and swing shifts. The BLMRB will require approximately 5 FTE management positions that will function in roles of administration, staff supervision, management, and technical services. All BLMRB staff will be housed off-site (in town)..

2.7.9.4 Anchorage Headquarters

The ASAP corporate headquarters will be located within the Municipality of Anchorage, and will be an urban office facility that will provide offices for corporate staff. Technology will be leveraged

as necessary to provide real-time monitoring of pipeline functions by support teams in the Anchorage headquarters. The ASAP Anchorage offices will be the administrative center of the corporate organization. Key management and administrative functions that support the organization will be centrally resourced in the corporate offices. The Anchorage Headquarters will require 88 FTE management positions for Operations and Maintenance that will function in the following roles:

- Executive Management
- Finance and Accounting
- Commercial and Gas Distribution
- Operations
- Legal Services/Land Management
- Government and External Affairs
- Engineering
- Health, Safety, Security, Environmental, and Quality (HSSEQ)
- Human Resources
- Information Technology

The ASAP corporate organization will be staffed with professionals to support management and administrative functions. Personnel assigned to the corporate offices will work a normal urban work schedule and live in the Anchorage area. The 24/7 staffing of security positions will be met using a third-party contractor that works typical, three-shift schedules, including day, night, and swing shifts. All Anchorage staff will be housed off-site (in town). Headquarters are currently proposed to be located at AGDC's present offices at 3201 C St., Suite 200, Anchorage, AK 99503.

2.8 PROJECT FOOTPRINT

The Project Footprint was not fully defined in the 2012 FEIS, although several components were quantified (Table 1; see also geodatabase for USACE, 2012). Material site acreages and several access road locations were not determined at that time (USACE, 2012). Quantifiable uses of land included approximately 4.1 thousand acres for permanent use and 10.9 thousand acres of land for temporary use (15 thousand acres total), among several other lands considered while the Project developed (USACE, 2012).

The current revised and complete ASAP Project footprint that includes full construction easements and all off-ROW features (including material sites) will require 21,237.3 acres of land (Table 1). This total Project Footprint acreage comprises 8,907.0 acres of impact to freshwater wetlands (7,573.2 acres permanent, 1,161.4 acres temporary), 0.9 acres of impact to intertidal wetlands (0.8 acres permanent, 0.1 acres temporary), 171.5 acres of permanent impact to subtidal wetlands, and 12,330.3 acres of impact to uplands.

2.9 STREAM CROSSINGS

The ASAP Project, including the Mainline, the Fairbanks Lateral and off-ROW facilities (e.g., access roads) will cross a total of 312 streams (See AGDC 2016, 2015 for more detail). Of these streams, 265 will be impacted by the Mainline, 7 by the Fairbanks Lateral, and 40 by access roads.

The ASAP 36-inch Mainline will cross approximately 265 streams or creeks (50 anadromous), as follows:

- 6 aerial (bridge) crossings
- 155 isolated open cut crossings
- 97 open cut crossings
- 7 trenchless crossings using horizontal directional drilling (HDD), including the Yukon River

The 12-inch Fairbanks Lateral will cross 7 streams or creeks (0 anadromous), as follows:

- 4 isolated open cut crossings
- 3 open cut crossings

The access roads will result in culverts (pipes) or bridges being placed in or over 40 streams or creeks (14 anadromous) as follows:

- 17 bridges (14 temporary, 3 permanent)
- 23 culverts (4 temporary, 19 permanent)

The total number of centerline stream crossings in the FEIS was 515 (495 on the Mainline, and 20 on the Fairbanks Lateral) (USACE, 2012). That list was developed by ASAP's engineering and wetlands teams through early desktop and field studies between 2009 and 2010 using the best available information at that time. Since then, changes in pipeline routing and the addition of new access roads and other facilities have occurred, and better desktop and field data for streams and wetlands have been collected.

ASAP's waterways engineering team and its wetlands delineation team played key roles in developing a list of field targets to best inform construction modes and methods through areas that could require special design. Many of these selected targets required on-site visits for engineering purposes to assess surface water features identified during desktop analysis.

In addition to the 312 streams crossed by the Project, ASAP engineers and scientists have identified 179 hydrologic points of interest (HPOIs). The HPOI features do not meet the criteria relative to possessing an ordinary high water mark defined in the USACE Regulatory Guidance Letter (RGL) 05-05, but are jurisdictional areas for which engineers may need to give special design consideration (see AGDC, 2015 or Section 5.2 Water Resources, below, for more information).

The pipeline construction ROW is positioned nearby streams that it does not cross or directly impact. Nearby streams will be evaluated on a site-by-site basis to determine whether special planning or mitigation is needed at these sites during construction or operation of the pipeline.

Some material sources along the Sagavanirktok River in the Northern region will utilize gravel from river banks. This siting is being done with consideration of input from the Alaska Department of Fish and Game (ADFG).

3. REFERENCES

Alaska Department of Administration (ADA). 2014. Alaska Oil and Gas Conservation Commission Monthly Production Reports.

Alaska Department of Natural Resources (ADNR). 2011a. ADL 418997 – Right-of-Way Lease for the Alaska Stand Alone Gas Pipeline/ ASAP.

ADNR. 2011b. ADL 418997 – Right-of-Way Lease for the Alaska Stand Alone Gas Pipeline/ ASAP. Exhibit A – Stipulations.

Alaska Gasline Development Corporation (AGDC). 2016. Alaska Stand Alone Pipeline (ASAP) Environmental Evaluation Document. Document Number 001-C-22-GRD-W-0055. Revised January 2016.

AGDC. 2015. Alaska Stand Alone Pipeline (ASAP) Joint Application for Permit (404 / 10), Revised December 29, 2015. Document Number 001-C-22-PER-D-001.

AGDC. 2014. Alaska Stand Alone Pipeline (ASAP) Plan of Development. October 2014. June 2014. http://asapgas.agdc.us/pdfs/documents/pod2014/POD%20Rev%203_Final_07-22-2014_COMBINED.pdf

Bureau of Land Management (BLM). 2002. Proceedings of the TAPS Renewal DEIS Public Hearing – "Comments and Responses". Barrow, Alaska. August 9, 2002.

CardnoEntrix. 2012. FEIS Geodatabase.

Lawhead, B.E., J.P. Parrett, A.K. Prichard, D.A. Yokel. 2006. *A literature review and synthesis on the effect of pipeline height on caribou crossing success*. BLM Alaska Open File Report 106.

Northern Economics Inc. 2010. In-state Gas Demand Study. Vol. 1. Prepared for TransCanada Alaska Co. LLC. January.

Smith, W.T., and R.D. Cameron. 1992. "Caribou responses to development infrastructures and mitigation measures implemented in the Central Arctic Region." *Research on the potential effects of petroleum development on wildlife and their habitat, Arctic National Wildlife Refuge interim report, 1988-1990*. T.R. McCabe, B. Griffith, N.E. Walsh, and D.D. Young, eds. Fairbanks, Alaska: Alaska Fish and Wildlife Research Center and Arctic National Wildlife Refuge. pp. 79-86

United States Army Corps of Engineers (USACE). 2012. Alaska Stand Alone Gas Pipeline (ASAP) Final Environmental Impact Statement. October 2012.