

Information contained in these spreadsheets is based upon a review of the proposed AGPPT ERL scope. Cost estimate for each task is intended to be order of magnitude assuming an average labor rate of \$100/hr; approximately 10,000 hr/\$1MM; approximately one man yr/\$200K. ERL scope needs to be refined through consultation with agencies. Cost estimate is +/- 30%.

Phase/Task	Comments	Cost/Task
Establish Methodologies/Agency Consultation	Assume Geo-botanical mapping is available along the proposed route. Consult with agencies regarding methods and existing mapping. Utilize existing information where available.	\$200,000
Streams & Lake Water Availability (Alaska) Subtotal		\$200,000
T&E (Alaska)		
Consultations and Meetings	Meeting w/ USF&WS	
T&E Surveys	Eiders, Birds	\$25,000
Mitigation Plans	Schedule of construction activity in Eider habitat. Provide plan to USF&WS	\$100,000
T&E (Alaska) Subtotal		\$10,000
Noise Survey and Modeling (Alaska)		\$135,000
Noise Studies (Ambient Noise Assessment) AK	Assume Noise studies required for facilities	
Noise Survey and Modeling (Alaska) Subtotal		\$200,000
Air Emissions and Quality Modeling (Alaska)		\$200,000
Air quality and meteorological monitoring (AK)		
Air Emissions and Quality Modeling (Alaska) Subtotal		\$500,000
Support for Miscellaneous Engineering Studies (Alaska)		\$500,000
Test Trench Study Permits		
Centerline Borehole Drilling		\$50,000
Miscellaneous Engineering Studies (Alaska) Subtotal		\$100,000
Miscellaneous (Alaska)		\$150,000
Agency Required Field Study Permits	Studies associated with environmental or civil permit activities required or requested as a condition of the permit	\$1,000,000
Fish and Wildlife Studies (AK)	Contingency for unanticipated data gaps or agency resource data requirements and requests	
Construction and Post-construction Environmental Impact Studies	Studies associated with permit stipulations and requirements for impact assessment. Examples: caribou, ring seals, eiders, fish on arctic coastal plain. Impact on benthic habitat. Disturbance of physical habitat (boulder patch, fish, birds). The scope of any additional studies should be defined through consultation with agencies and be identified in the conditions of the permits issued for the project, along with any required mitigation.	\$750,000
Design Review	Ensure compliance with conditions of permits and authorizations.	\$2,500,000
HSE Field Organization and Compliance (AK)		\$2,500,000
HSE Incident Response and Plan (AK)		\$2,000,000
Misc (Alaska) Subtotal		\$1,000,000
		\$9,750,000
	Total	\$22,985,000

Agency/Stateholder	Permit Type	Description	Assumptions	Permit Cost
FERC	FERC Certificate of Public Convenience and Necessity Grant of ROW	Authorization for interstate transportation of natural gas pipeline on federal lands	Environmental support to AGPPT Lands team's environmental report.	\$0
USDI, BLM	Gravel Material Sales	Authorization to remove gravel materials from Federal Lands		\$250,000
USDI, BLM	Archeological Resources Protection Act Permit (ARPA)	Issued by federal agency with land management responsibility to authorize cultural resource field surveys		\$500,000
US Army Corps of Engineers	Section 404 - Wetlands	Permit for discharge of dredged material in waters of the U.S. (activity in jurisdictional wetlands). Determination.	All costs for Section 404, Section 10 and Section 401 are rolled into Section 404	\$150,000
US Army Corps of Engineers	Section 10 - Navigable Waters	Pipeline construction activities or structures in navigable waters of the US; includes dredging of barge channel into Prudhoe Bay	Permit prep up to construction and compliance monitoring during construction. Costs rolled into Section 404 permit.	\$0
US Army Corps of Engineers	Section 401 - Water Quality Certification	Certification of compliance with applicable water quality standards (associated with Section 10 and 404)	Costs rolled into Section 404 permit.	\$0
US Army Corps of Engineers/US EPA	Ocean Dumping Permit (Section 103 of Marine Protection, Research, and Sanctuaries Act)	Transport and ocean disposal of dredge spoil from excavation of barge access channel		\$350,000
US EPA/Alaska Department of Environmental Conservation	NPDES	Plan for disposition of facility wastewater (camps, compressor stations, hydrotest fluids)	Assume a Statewide General/Programmatic Permit for wastewater/hydrotest discharges	\$200,000
USEPA	Spill Prevention, Containment, Cleanup Plans	Required plan for storage of more than 660 gallons of petroleum products in a single container or 1320 gallons of fuel in aggregate in above-ground tanks	Assume storage tank greater than 660 gallons. Development of site-specific SPCC plans. Includes USCG OPA 90, EPA Spill Plan and ADEC ODPCCP.	\$100,000
ADEC	Oil Discharge Prevention and Contingency Plan (ODPCP)	Plan for storage, transfer, and cleanup of petroleum products during construction and operation (camps, compressor stations, field activities)	Costs include prep for permits and ODPCP which includes EPA and USCG OPA 90 requirements	\$500,000
USEPA	NPDES General Stormwater/Industrial Activity	Stormwater drainage plan during construction and operation activities	Permitting and development of	\$300,000
USEPA	RCRA small quantity generator - satellite storage site	Generation and storage of RCRA-regulated wastes	Assume no waste prior to construction and small quantity generator	\$100,000

Agency/Stakeholder	Permit Type	Description	Assumptions	Permit Cost
NMFS	Essential Fish Habitat Consultation	Associated with stream crossing and offshore construction of pipeline in marine waters, construction affecting anadromous fish habitat	Assume NMFS defers to ADF&G. Assume studies required for this are part of the biological studies conducted under the ERL Alaska Studies & Surveys. This should be limited to preparation of a report summarizing results of surveys and obtaining a clearance letter from NMFS/ADF&G regarding EFH.	\$50,000
USF&WS	Letter of authorization for Incidental Take of Marine Mammals (polar bear)	Construction and operation activities in polar bear habitat	T&E Surveys and obtaining Incidental Take Permit	\$100,000
USF&WS	Endangered Species Act Section 7 Consultation	(Spectacled Eider)	T&E Surveys and obtaining "no effect finding" concurrence.	\$50,000
US Coast Guard	Permit for access/bridges across navigable waters	Construction of bridges or facilities across navigable waters		\$50,000
ADNR JPO	Right of Way Lease	Authorization to construct and operate common carrier pipeline on State of Alaska land	Assume DNR ROW lease will require construction monitoring of permafrost stabilization and restoration and continuing cost associated with ice dams and frost bulb development. Portion of monitoring redundant with FERC construction monitoring.	\$1,000,000
ADNR, Division of Mining, Land, and Water	Material Sales Contract	Purchase and extraction of gravel from state lands and waters	Assume continuous mitigation monitoring after construction	\$500,000
ADNR, Division of Mining, Land, and Water	Land Use Permit	State land activities and temporary uses are not part of common carrier pipeline construction and operation. Includes Fish, Wildlife, and Habitat Reclamation Plan	Activities on State Land require a temporary use permit.	\$1,000,000
ADNR, Division of Mining, Land, and Water	Water Use Permit	Onshore/offshore ice road construction, domestic use for construction camps, dust control, drilling activities including HDD, hydrotest intake and discharge	Studies identifying sources conducted as part of ERL Alaska Studies and Surveys. Identify any water rights issues.	\$200,000
ADNR, Office of Archeology and History	Archeological Field Survey Permit	Authorization to conduct cultural resource surveys on state lands		\$50,000
ADNR, Department of Environmental Conservation	Open burning permits	Open burning activities, including disposal of clearing debris/slash		\$50,000
ADEC/EPA	Air Quality Construction Permit (Prevention of Significant Deterioration)	Construction of the GTP, compressor stations, pipeline	Studies conducted as part of ERL Alaska Studies & Surveys.	\$250,000
ADEC	Title V Air Quality Operating Permit	Operation of compressor stations		\$300,000

Agency/Stakeholder	Permit Type	Description	Assumptions	Permit Cost
ADEC	Solid Waste Disposal Permit	Development and operation of waste disposal sites for waste generated by pipeline construction activities, construction camps, compressor stations	Includes preparation of Waste Management Plan	\$1,000,000
ADEC	Water and Sewage Plan approvals	Operation of construction camps, compressor stations	Assume plan is prepared prior to construction, compliance monitoring during and following construction. Quarterly monitoring during construction and operation.	\$200,000
ADF&G, Division of Habitat	Alaska Statute Title 16.05.870 Anadromous Fish Habitat Permit	Activities affecting or water appropriation from designated anadromous fish streams (in-stream gravel removal, pipeline crossing, installation of drainage structures, hydrotest water intake and discharge); not required if HDD is utilized, except for water appropriation for drilling.	Environmental support of engineering tests and studies, develop permits during preconstruction, monitor during construction and operation. Surveys described in ERL Studies & Surveys.	\$100,000
DOT	Utility permits for Encroachment, Driveway Permits for access roads	Construction and operation use activities that encroach on state roads and associated rights-of-way.		\$50,000
Division of Governmental Coordination, Office of the Governor/North Slope Borough	Alaska Coastal Management Program (ACMP) Consistency Review	Consistency with statewide coastal zone standards and enforceable policies of the North Slope Borough coastal management program; consolidated review of all state and federal permits within the designated coastal area, including the 3-mile limit of state waters, and the inland limits of the North Slope Borough coastal zone. North Slope Borough will conduct consistency review if only local municipal or borough permits required.	Any activity on the North Slope which requires a permit. Synergy with other major permitting activities; not a stand alone permitting activity.	\$100,000
North Slope Borough	Zoning requirements and Title 19 Land Management Regulations (Development Permit)	Land use planning and controls within the North Slope Borough; Master Plan Revision/Statement of Conformance for new facilities within the Borough.	Any activity on the North Slope which requires a p	\$150,000
North Slope Borough	Road plans	Approval of roads within the North Slope Borough		\$100,000

Permit Land Expenditures

Agency/Stakeholder	Permit Type	Description	Assumptions	Permit Cost
Fairbanks North Star Borough	Zoning and Land Use Approval	Land use planning and controls within Fairbanks North Star Borough		\$150,000
Delta Junction	Zoning and Land Use Approval	Land use planning and controls within Delta Junction		\$100,000
NHPA	Section 106 Consultation	Requires consultation for projects that may affect eligible historic properties on state, federal, and tribal land, as well as eligible properties of interest to tribes, regardless of land ownership	Costs included in AK Survey 106 Consultations	\$0
Alaska Oil and Gas Conservation Commission Regional and local Native Corporations and tribal governments	Glass 2 Injection Wells Leases, ROWs, and Land Use Authorizations	Process discharge Authorization for pipeline construction and operation activities on Native interest lands; possible authorization to conduct cultural resource surveys on native interest lands	Class 2 well at GTP Assume potential cultural resource consultation a	\$0 \$200,000
Total				\$8,450,000

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Project Component	Work Description	General Activity Outcome
1. Project Identification	Front End Evaluation	Generally Completed by Perspective Owner/Operator
Source of Supply for the Pipeline	Identify the point of origin of the system.	Analysis of location, volume of production.
Market/Customers for the Pipeline	Identify interconnections, customer connections and terminus of the system.	Market analysis, customer contact, volume determination, location of potential connecting carriers, end users.
System Cost	Estimate/anticipated cost of the system.	Produce and iterate case estimates for likely customer, volume, location, system configurations, origin and terminus variations
Economics	Determine project value in terms of ROR, cashflow, etc. for the system	Generate economic cases, runs, iterate.
Project Funding	Determine internal and external sources of funding for the project.	Identify potential funding sources.
2. Conceptual Project/Route Selection	Primarily Desktop Work	Generally Completed by Perspective Owner/Operator or Consultant Therefore
Alternatives Analysis (project)	Define and analyze potential system alternatives that meet owner's commercial et al project objectives, alternatives to the project that may be available, including a no action alternative.	This analysis is performed to determine if an alternative exists that meet project commercial objectives and to determine if a new system is necessary. Is the proposed system the most stakeholder friendly, can placement of the system be approved and ultimately constructed with limited variation.
Alternatives Analysis (route)	Define and analyze the potential system route alternatives as part of the National Environmental Policy Act (NEPA) process.	At a minimum, data from multiple desktop studies (described below as the environmental review) would be required to conduct this task. This exercise is to identify a number of different routes and to illustrate that the route to be permitted is the most stakeholder friendly (preferred route). Route Alternatives analysis would be refined through preliminary design and up to permit application submittal with data collected from site investigations and field surveys.

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Project Component	Work Description	General Activity Outcome
Preliminary Mapping	Obtain data/resources to complete a route constructibility review, perform environmental review/desktop analysis, to include but not limited to including National Wetlands Inventory (NWI) data, current aerial photography, Natural Resource Conservation Service (NRCS) county soil surveys and United States Geological Survey (USGS) 7.5-minute series topography maps.	NWI data, Aerial Photos, and topographical maps will provide information to identify the preferred route and alternatives to be evaluated as part of the Environmental Review. Soils survey maps would be utilized in the geotechnical evaluation. Aerial photographs are time sensitive with respect to the evaluation of environmental resources (i.e. - wetlands and land use features may change over a relatively short duration). Project schedules should be considered in the evaluation of aerial photography where these types of resources may influence route selection.
Environmental Review (Desktop)	Desktop study conducted to identify and assess potential environmental and/or regulatory factors that could potentially influence route selection and siting of facilities.	Identification and Evaluation of regulatory pitfalls early in the project are undertaken to decrease the likelihood of project delays and cost overruns due to rerouting or redesign for unanticipated environmental impact or constructibility issues.
Surfacewater Resources	Identify surface waterbodies, including any designated surface water protection areas or sensitive waterbodies crossed by or potentially impacted by the project.	Identification of surfacewater resources that could potentially be impacted by construction or operation of the project should be identified and considered in the routing of the pipeline and siting of the project facilities. Crossing methodologies and potential mitigation measures to prevent or minimize impacts to surfacewater resources would be identified during the design phase after the route has been finalized.
Groundwater Resources	Identify all public and private-groundwater supply wells or springs and aquifers that are crossed by the project or could potentially be impacted by construction or operation.	Identification and consideration of groundwater resources within the projects potential area of influence are part of the route alternatives analyses.

Project Component	Work Description	General Activity Outcome
Wetlands	Identify all jurisdictional wetlands crossed by the proposed project, including the total acreage of each and acreage of each type of wetland potentially impacted.	Utilizing NWI maps, a desktop delineation is conducted for potential project routes and facilities sites. During the alternatives analysis this is utilized in the selection of a route which avoids or minimizes impacts to jurisdictional wetlands. Groundtruthing may be conducted to verify information on NWIs and aerial photographs for purposes of alternatives analyses and route selection but generally no field delineation would be conducted prior to identification of a preferred route. Construction and restoration methods for unavoidable impacts would be identified during the design phase after the route has been finalized.
Cultural Resources	Consultation and documentation with the State Historical Preservation Organization (SHPO) and Native Americans to address National Historical Preservation Act (NHPA).	Database search would be conducted after selection of a preferred route alternative. Need for and/or level of effort required for field surveys would be determined through consultation with the SHPO.
Geological Resources	Identify mineral resources, active surface mines, or geologic hazards crossed by the project.	Database search and level of effort field geophysical and other associated surveys required to identify the geological and/or mineral resources present within the project area.
Fisheries	Describe onshore and offshore fisheries present in the project area, including the potential effects of construction and operation of the proposed project on those resources. Identify federally listed essential fish habitat (EFH) that occurs within the project area.	Requires the identification of a preferred and alternative routes to conduct desktop study of the fisheries resources that could/would be impacted by the project.

Project Component	Work Description	General Activity Outcome
Threatened & Endangered (T&E) Species	Identify all federally listed or proposed endangered or threatened species that potentially occur in the vicinity of the project and evaluate the potential for short-term, long-term, and permanent impacts caused by construction and operation of the project and potential measures to mitigate impacts, of identified species.	Required under the Endangered Species Act, this would include the identification of a preferred and alternative routes to determine the specific impacts to T&E species that could be impacted by the project. An inventory of species within the project area would be developed to begin elimination of areas from route alternatives or identify the need for field surveys and further consultation with the agencies. Field surveys and studies would not be feasible prior to selection of a preferred route alternative.
Soils	Identification and description from Natural Resource Conservation Service (NRCS) data and geotechnical studies of the soils associations or series crossed by the project, including identification of prime farmland.	Mapping of the NRCS data is conducted as part of desktop environmental studies and alternatives route analysis. Geotechnical studies are generally conducted on an as-needed basis after selection of a preferred route alternative. NRCS data and geotechnical studies would also be relevant in the identification of potential constructibility issues that would be addressed in preliminary design and detailed design.
Land Use	Classification and quantification of land use affected by pipeline construction and permanent rights-of-way, extra work space and staging areas, access roads, pipe and contractor yards, and aboveground facilities, including identification of areas with special land use, areas classified as natural, recreational, or scenic or those areas within the coastal zone.	Data generated would be utilized during alternatives analysis to identify preferred route alternative (i.e. - elimination of routes that cross recreational or special use areas). During detailed design, data would be utilized to identify any special construction techniques or other forms of mitigation that would be used to prevent or minimize impacts of construction or operation.

Project Component	Work Description	General Activity Outcome
Air and Noise Quality	Identify locations along the proposed project corridor (preferred route) where project construction or operation may result in impacts to the public.	Identify noise sensitive areas as a desktop exercise. Studies to quantify the background/ambient noise levels at identified locations would be conducted following selection of the preferred route alternative. Studies to address noise from compressor stations would be conducted during preliminary design. Quantification of proposed emissions estimates during construction are also conducted after detailed design when construction methodologies were being finalized.
Landowners/Leaseholders	Identification of landowners/leaseholders (including private and government) crossed and affected by construction or operation.	Identification of landowners/leaseholders. Negotiation for survey access is generally conducted prior to field surveys or studies. Compensation for impacts and permanent ROW are negotiated during preliminary and detailed design.
Socioeconomic/Economics	Evaluation of the impacts of the project on employment, housing, local services, local revenues, transportation, local businesses and other relevant socioeconomic factors. Additional economic analysis of construction and operation would include, but not be limited to estimates of payroll, impacts of the project on local government expenditures, estimates for road repair and maintenance, and impacts on public utility costs. Studies also address the availability of infrastructure along project corridor and logistics of constructing the pipeline and facilities.	Socioeconomic studies and economic analysis conducted following identification of a preferred route alternative and will require inputs from detailed design.

Project Component	Work Description	General Activity Outcome
Agency Consultation	Communication with permitting and commenting agencies regarding potential impacts on sensitive resources, how to avoid or minimize those impacts, and need for types and level of effort required in field surveys to address specific issues identified in Environmental Review is generally ongoing.	The desktop Environmental Review and Alternatives Analysis provide basis for discussion and agreement with agencies for the preferred route alternative and the need for data to be collected in specific studies or surveys during field surveys. These elements provide basis for focusing field effort on particular locations or resources rather than entire project corridor. Identification of additions permits, authorization, clearances from local, state, or federal agencies that are required for the proposed project activities can also be carried out.
3. Permitting	Obtain Permits for Project Installation	Completed by Client and Team of Experts
Agency Pre-application Consultation	Pre-Application consultation with the permitting and commenting agencies, and stakeholders, is conducted to review the preferred route alternative and minor variations to ensure that issues of concern have been addressed prior to application submittal.	Pre-application consultation will require a completed environmental review and alternatives analysis and utilize data from environmental completed field studies that have been conducted to this point.
Field Location Survey	Actual field survey of the pipeline centerline, identification of associated features along the centerline and affected areas.	Locates the pipeline and the main associated features to communicate to agencies the location of the pipeline.
Identification of Impact Area	Identification of areas needed for required types of construction.	Determines the impact area of the pipeline construction.
Environmental Field Studies	Environmental Field studies would be conducted following the Environmental Review and Agency Pre-Application Meeting.	Field studies are based upon the information gathered in the environmental review, address data gaps, and designed to meet agency requirements identified in the pre-application meeting. Depending upon type and duration, the environmental field studies will be ongoing during preliminary and detailed engineering and design.

Project Component	Work Description	General Activity Outcome
4. Preliminary Engineering & Design	Engineering and Design That Defines the Project	Completed by Specialized Engineers
Preliminary Route Maps	Preparation of preliminary route maps with data from Environmental and constructibility review are required to conduct environmental field studies, site reconnaissance, and engineering survey.	Developed following the selection of the preferred route alternative and includes variations that require field evaluation.
Site reconnaissance	Engineering field surveys should be conducted to optimize the preferred route alternative.	Focus is on identification of and remedy for any constructibility concerns for the preferred route alternative and elimination or refinement of minor route variations.
Preliminary Engineering	Preliminary Engineering Design would include preparation of the Design Basis, preliminary hydraulics, preliminary cost estimation, and evaluation of project economics.	Defines project at this stage in terms of pipe size, capacity, location, etc., pending additional project knowledge gained prior to detailed design.
Construction Contractor Selection	Prepare and submit pre-qualification bid packages.	This identifies construction contractor with project capability. It is helpful to identify the construction contractor as early as possible in the project design to provide assurance that all constructibility issues have been identified and addressed.
5. Open Season	Identifies Volumes and Shippers of Volumes	Generally Conducted by Owner of System
Conduct Open Season	Conduct an open season to determine the level of interest in the proposed pipeline project.	Customers nominate intention of volumes for shipment for the system proposed.
6. Detailed Design	Finally Defines the Project for Installation	Completed by Specialized Engineers
Detailed Engineering	Detailed Design Engineering would include detailed Approved for Construction (AFC) route mechanical design, detailed hydraulics, cost estimate refinement, and evaluation of project economics.	At this point the project is complete with the exception of installation and commissioning. If the project route changes from the AFC route the above work would be recompleted for the new route.

Project Component	Work Description	General Activity Outcome
Material Procurement	Identify material needed	This defines requirements, but major expenditures are not incurred until material orders are actually placed.
Pre-construction ROW Survey	Prepare workscope for preconstruction survey	By preparing the workscope for the preconstruction survey and not pursuing the survey again major expenditures are deferred.
7. Construction	Project Installation	Completed by Team of Specialized Constructors
Planning	Develop project Construction Procedures.	Construction procedures makes the project ready for construction start but does not engage major installation contractor expense.
Pipeline and Facilities Installation	Develop project Construction Procedures.	Construction procedures makes the project ready for construction start but does not engage major installation contractor expense.
Construction Management	Develop project Construction Management Procedures.	Identifies human resources required to manage the project construction.
8. Commissioning	Project Start Up	Generally Conducted by Design Engineers and Operations Personnel
Project Start Up	Design temporary and/or permanent pig launchers/receivers, prepare pressure testing, pigging, dewatering and linefill procedures and identify the source to be used to fill the line with product.	Commissioning procedures are available for project start up once construction is complete.

Costs of FERC Process

Activity/Task FERC	Cost of Task
Assumptions	
Completion of FERC Resource Reports Resolution of data gaps and incorporation of data into Draft Resource Reports for submittal.	\$500,000
Initial Filing	\$200,000
3rd Party EIS Contractor	\$2,500,000
Supplemental Filings, NEPA, MMS Support	\$1,500,000
Post Certificate Filings	\$1,000,000
FERC Interface During Construction	\$500,000
GPO/JPO Environmental Support - AK	\$1,500,000
Provide technical support to GPO and JPO, at request of owners	
FERC TOTAL	\$7,700,000

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