

INTRODUCTION

MACKENZIE GAS PROJECT
SUPPLEMENTAL INFORMATION
PROJECT UPDATE

BACKGROUND

1.1.1 REGULATORY FILINGS**1.1.1.1 Applications for National Energy Board Approval**

On October 7, 2004, Imperial Oil Resources Ventures Limited (Imperial), on behalf of itself and the other proponents of the Mackenzie Gas Project (the project) filed regulatory applications with the National Energy Board (NEB) for approval to construct and operate the:

- Mackenzie gathering system (NEB Exhibits IORVL-1A to IORVL-1G)
- Mackenzie Valley pipeline (NEB Exhibits IORVL-2A to IORVL-2D)

In related filings, the following applications were filed with the NEB for approval of the development plans for the three anchor fields:

- the Development Plan for Niglintgak Field, submitted by Shell Canada Limited (Shell) (NEB Exhibit SCL-1)
- the Development Plan for Taglu Field, submitted by Imperial Oil Resources Limited (IORL) (NEB Exhibit IORL-1)
- the Development Plan for Parsons Lake Field, submitted by ConocoPhillips Canada (North) Limited (ConocoPhillips) on behalf of itself and ExxonMobil Canada Properties (ExxonMobil) (NEB Exhibit CPCNL-1)

1.1.1.2 Environmental Impact Statement for Joint Review Panel Review

All of these applications are supported by an Environmental Impact Statement (EIS) for the Mackenzie Gas Project (JRP Exhibit J-IORVL-00028), which Imperial filed with the Joint Review Panel (JRP) on October 7, 2004, on behalf of the project proponents.

1.1.1.3 Supplemental Information Filings

To satisfy requests for additional information from the NEB and intervenors in the NEB regulatory review process, and the JRP and intervenors in its environmental review process, the proponents provided a substantial amount of supplementary information, including responses to information requests, undertakings, filings and hearing testimony. This included the following updates:

1.1.1.3 Supplemental Information Filings (cont'd)

- *Niglintgak Gas Conditioning Facility, Supplemental Report*, filed February 25, 2005 (NEB Exhibits SCL-11A and SCL-11B and JRP Exhibits J-SCL-00001 to J-SCL-00003)
- *Niglintgak Field Development, Supplemental Information – Project Description Update*, filed December 8, 2005 (NEB Exhibits SCL-21A and SCL-21B and JRP Exhibit J-SCL-00007)
- *Niglintgak Development Plan Proposed Method to Dispose of Production Well Drilling Waste*, August 29, 2006 (NEB Exhibit SCL-38 and JRP Exhibit J-SCL-00024)
- *Parsons Lake Field Supplemental Information*, (NEB Exhibit CPCNL-6 and JRP Exhibits J-CPCNL-00001 and J-CPCNL-00003)
- *Parsons Lake Field Supplemental Information – Second Submission*, filed December 8, 2005 (NEB Exhibits CPCNL-15A and CPCNL-15B and JRP Exhibits J-CPCNL-00005 and J-CPCNL-00006)
- *Parsons Lake Field Supplemental Information – Third Submission*, filed October 16, 2006 (NEB Exhibit CPCNL-22 and JRP Exhibit J-CPCNL-00021)
- *Taglu Field Development, Project Description Update*, filed December 8, 2005 (NEB Exhibits IORL-11A and 11B and JRP Exhibit J-IORVL-00384)
- *Project Update – Supplemental Information*, filed November 23, 2005 (NEB Exhibits IORVL-88A and IORVL-88L and JRP Exhibits J-IORVL-00360 to J-IORVL-00371)
- Letter to JRP and NEB filed December 8, 2005, regarding Project Schedule Updates (NEB Exhibit IORVL-90 and JRP Exhibit J-IORVL-00381)
- *Mackenzie Gas Project, EIS Additional Information, Northwestern Alberta*, December 2004 (JRP Exhibit IORVL-00021)
- *Mackenzie Gas Project, EIS Additional Information for the Joint Review Panel*, Parts 1 and 2, March 2005 (JRP Exhibit IORVL-00085)

1.1.1.4 Cost and Schedule Update, March 12, 2007

On March 12, 2007, the proponents filed an updated cost estimate and schedule with the NEB and JRP. The cost of the initial and future facilities for the Mackenzie Gas Project is estimated to be about \$16.2 billion (2006 Cdn), with an earliest project start in 2014. The ongoing engineering and construction planning continues to improve the technical definition of project requirements. However, the fundamental design of all project pipelines and facilities is unchanged.

1.1.2 PURPOSE OF THIS UPDATE

This update describes refinements to the project that respond to community input, workforce availability and increasing costs. The update has been structured to address the March 26, 2007, letter from the JRP. In many areas, this document consolidates the changes from the 2004 regulatory filings and supplemental filings up to March 31, 2007.

As the fundamental design of the project has not changed, this update focuses on the ongoing refinements of the construction plans. These refinements are largely related to the timing of activities and some location changes. Specifically, this update:

- identifies changes, discussed during the public hearings, that have been made to the location of some project sites in response to community input
- describes improvements to the construction plans that have been made in response to workforce availability and increased costs
- provides the results of the updated biophysical and socio-economic assessments associated with the refinements and location changes
- consolidates and updates the project descriptions provided in the previously filed applications for the anchor fields, the Mackenzie gathering system, the Mackenzie Valley pipeline and Volume 2 of the EIS

During the JRP Topic 10 hearings on Project-Related Expenditures and Economic Benefits in Yellowknife from November 6 to 8, 2006, the proponents indicated that they would consider the need to provide a revised assessment of economic effects, based on the updated cost. The summary of economic effects is provided in Section 10. Detailed information on the predicted economic impacts is being filed separately with the JRP and will replace the *Predicted Economic Impacts of the Proposed Mackenzie Gas Project, Construction and Operations*, Ellis Consulting Services, November 15, 2004 (JRP Exhibit J-IORVL-00077).

1.1.3 SCOPE OF THIS UPDATE

Information in this update is structured to align with EIS Volume 2, Project Description, as follows:

- Anchor Fields (see Section 2)
- Pipelines (see Section 3)
- Facilities (see Section 4)
- Infrastructure (see Section 5)
- Logistics and Transportation (see Section 6)
- Expenditures and Workforce (see Section 7)
- Environmental Inputs and Outputs (see Section 8)
- Biophysical Assessment (see Section 9)
- Socio-Economic Assessment (see Section 10)

1.1.3 SCOPE OF THIS UPDATE (cont'd)

In each section, refinements are identified and discussed. Where appropriate, consolidated tables are also provided.

1.1.4 PROJECT PROPONENTS

The Mackenzie Gas Project is being developed by:

- Imperial Oil Resources Ventures Limited, a subsidiary of Imperial Oil Limited, which will construct and operate the Mackenzie gathering system and the Mackenzie Valley pipeline on behalf of the gathering system and pipeline proponents. Imperial Oil Resources Limited holds the Significant Discovery Licence (SDL) for, and operates, the Taglu gas field.
- the Mackenzie Valley Aboriginal Pipeline Limited Partnership (APG), which was formed by representatives of various Aboriginal groups to represent the ownership interest of the Aboriginal people of the Northwest Territories in the Mackenzie Valley pipeline
- ConocoPhillips Canada (North) Limited (ConocoPhillips), which holds 75% of the Parsons Lake gas field SDL, and ExxonMobil Canada Properties (ExxonMobil), which holds 25% of the Parsons Lake gas field SDL. The Parsons Lake field is operated by ConocoPhillips. ConocoPhillips and ExxonMobil each have an interest in the Mackenzie gathering system and the Mackenzie Valley pipeline. ConocoPhillips' interest in the Mackenzie Valley pipeline is held by ConocoPhillips Northern Partnership.
- Shell Canada Energy, which holds the beneficial interest in the Niglintgak gas field SDL, operates the field, and will have an interest in the Mackenzie gathering system and the Mackenzie Valley pipeline. Effective January 1, 2007, Shell Canada Limited transferred its upstream Exploration and Production assets to Shell Canada Energy. However, Shell Canada Limited, on behalf of Shell Canada Energy, continues to hold legal title to the Niglintgak SDL.

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PROJECT OVERVIEW

1.2.1 PURPOSE OF PROJECT

The purpose of the Mackenzie Gas Project (the project) is to develop three onshore natural gas fields (anchor fields) in the Mackenzie Delta and to transport natural gas and natural gas liquids (NGLs) by pipeline to market. The project has been designed to accommodate additional natural gas and NGL from other sources in the Mackenzie Delta and Mackenzie Valley.

The required facilities and pipelines remain the same as described in the Supplementary Information previously filed with the NEB and JRP. Only the location of the Great Bear River compressor station has been changed. This compressor station has been relocated to the east side of the Great Bear River in response to input from the community of Tulita.

The construction plan has been modified to respond to workforce and equipment availability and increased cost. As a result, changes are required to the:

- location of some supporting infrastructure (see Section 5)
- logistics and transportation plans (see Section 6)
- timing for pipeline and facility installation (see Section 3)

In making these changes, consideration has been given to input from ongoing consultation (see Public Consultation in Section 1.5).

1.2.2 SCOPE OF PROJECT

The scope of the Mackenzie Gas Project remains unchanged. The project will involve:

- drilling, completing and operating wells, and installing and operating facilities, including:
 - well pads
 - flow lines
 - gas conditioning facilities
- installing infrastructure to support construction and operations activities, including:
 - barge landing sites
 - camps

1.2.2 SCOPE OF PROJECT (cont'd)

- fuel storage sites
- stockpile sites
- access roads
- airstrips and helipads
- borrow sites

- constructing and operating gas processing and separation facilities

- constructing and operating pipelines and associated pipeline facilities, including compressor stations, a heater station, metering and pigging facilities

- connecting with the existing Enbridge Pipelines (NW) Inc. (Enbridge) pipeline at Norman Wells

- connecting with the NOVA Gas Transmission Ltd. (NGTL) pipeline system at an interconnection facility to be built by NGTL in Alberta, near the Northwest Territories boundary

- decommissioning and abandoning components at the end of their operating life, and reclaiming the land

Figure 1-1 shows the project components in the production area. Figure 1-2 shows the project components along the NGL and gas pipeline corridors, including the ancillary NGTL project components.

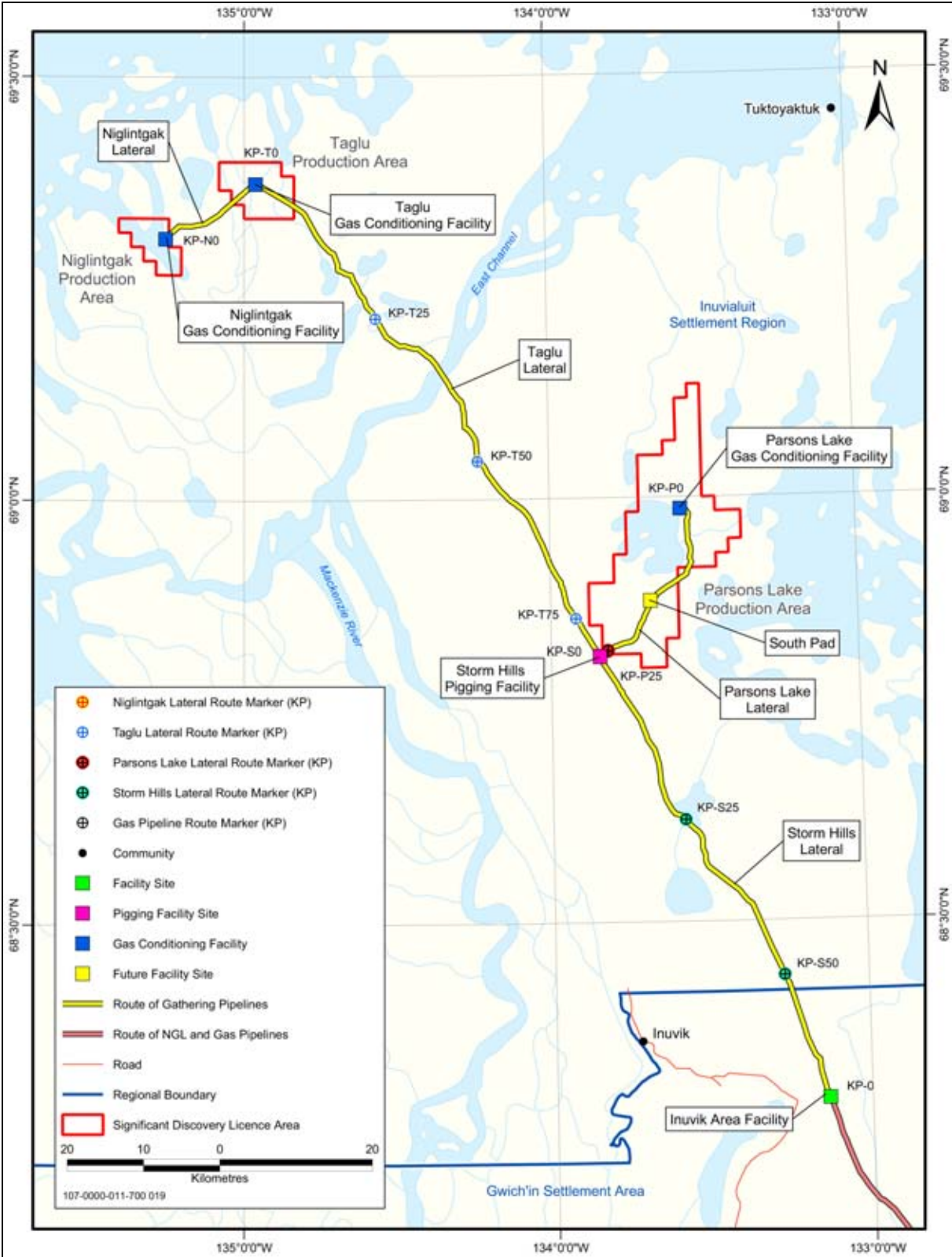


Figure 1-1: Regional Overview Map of the Mackenzie Gas Project Production Area

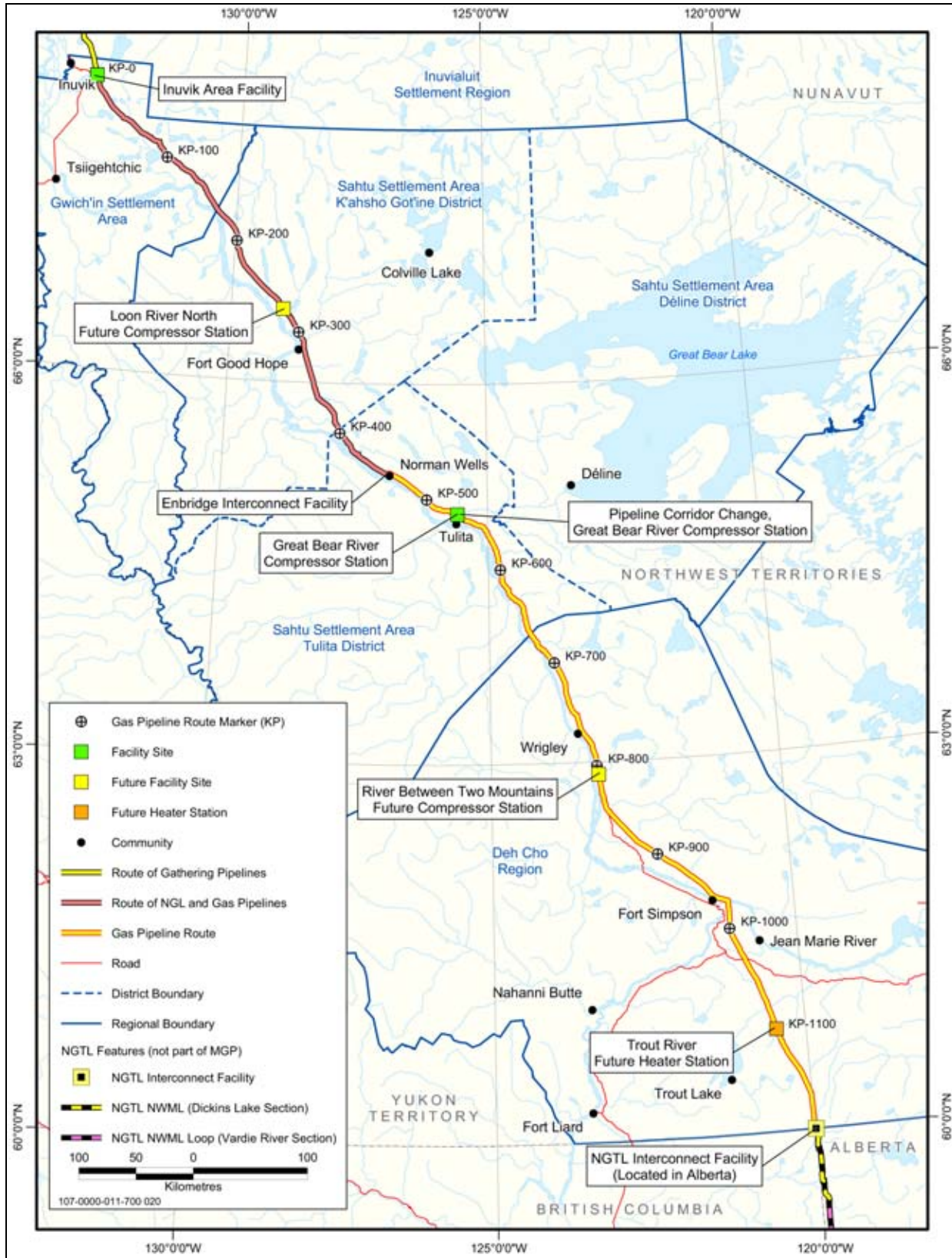


Figure 1-2: Regional Overview Map of the Mackenzie Gas Project Pipeline Corridor

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PROJECT SCHEDULE

1.3.1 SUMMARY SCHEDULE

The schedule for the Mackenzie Gas Project has been updated to reflect the current outlook for the regulatory review process. The summary schedule for the five project components is shown in Figure 1-3.

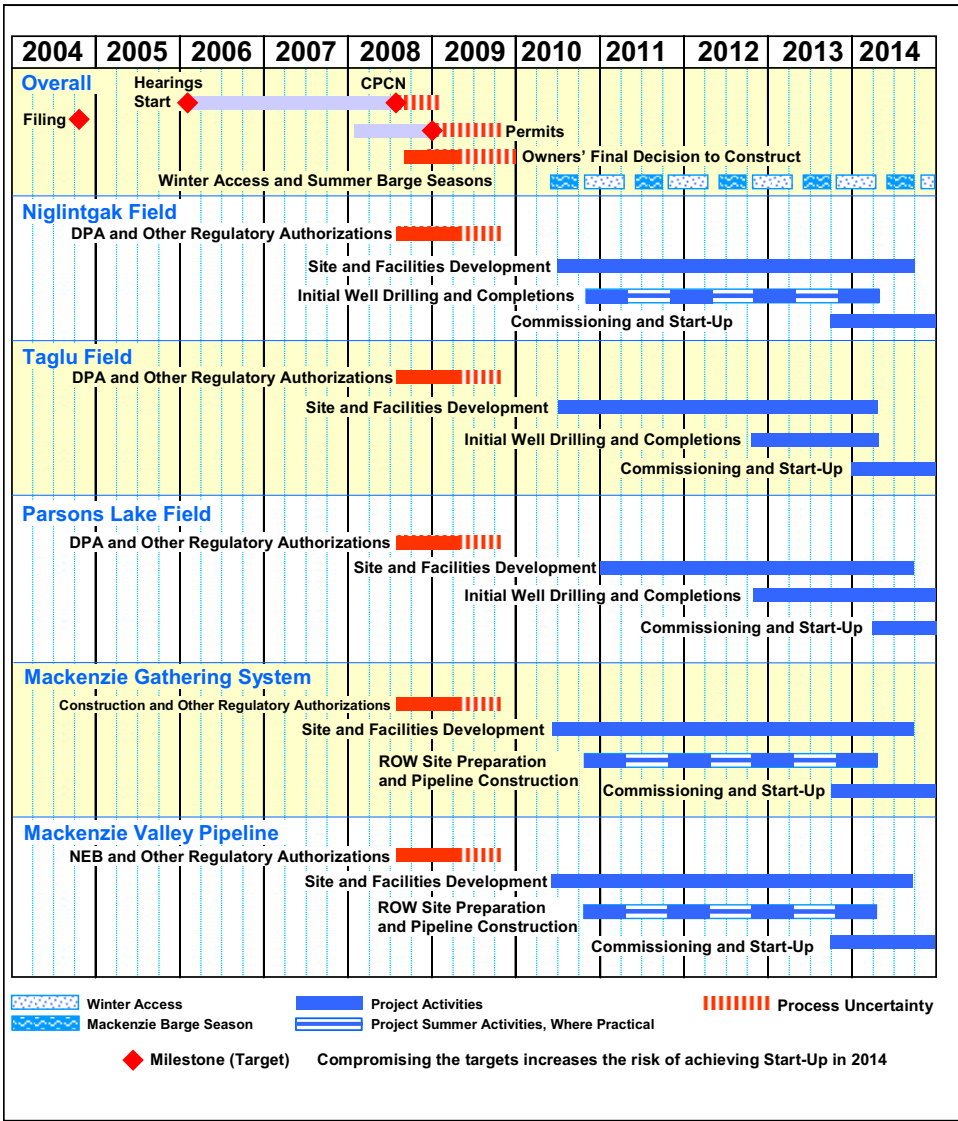


Figure 1-3: Mackenzie Gas Project Summary Schedule

1.3.2 INITIAL CONSTRUCTION

The revised schedule reflects the earliest possible start-up and assumes that:

- the Certificate of Public Convenience and Necessity for the Mackenzie Valley pipeline and the Construction Authorization for the Mackenzie gathering system are received in 2008
- development plan authorizations for each anchor field are received in 2008
- the remaining approvals and authorizations are received during 2009
- construction activities begin in the summer of 2010
- start-up activities for initial facilities are completed in 2014

The proponents will make a final decision on whether or not to proceed with construction of the project after assessing the terms and conditions associated with the CPCN, authorizations and permits required to allow construction activities to begin. Timely actions by all parties, including the proponents, governments and regulators, will be required to achieve this schedule.

NGTL will be responsible for constructing the ancillary NGTL facilities in Alberta in time to allow tie-in and start-up activities for the Mackenzie Gas Project to be completed in 2014. The required facilities have not changed and are summarized in the response to information request JRP 4.03 (Exhibit J-NGTL-0006).

1.3.3 PROJECT PHASES

The Mackenzie Gas Project is being developed in phases:

- the Project Definition Phase, which began in 2002, is now scheduled to end in 2009
- the Design and Construction Phase is scheduled to begin in 2009, with field construction beginning in the summer of 2010
- the Operations Phase is scheduled to begin in 2014 and continue as long as there is economic gas production in the region

1.3.3.1 Project Definition Phase

Activities in the Project Definition Phase include:

- completing conceptual and preliminary engineering design
- conducting field investigation programs to support preliminary design
- completing a preliminary construction execution plan
- conducting biophysical and socio-economic studies and assessments

- developing access agreements and benefits plans
- consulting with the public, particularly northern communities
- developing and submitting applications for regulatory approval
- participating in the regulatory review process

At the end of this phase, the proponents will decide whether to proceed with construction. This decision will be based on such factors as:

- the terms and conditions of the regulatory approvals
- project costs
- the outlook for natural gas markets
- fiscal certainty

1.3.3.2 Design and Construction Phase

The Design and Construction Phase is expected to take about six years and is scheduled to begin in 2009. Construction activities would begin in the summer of 2010 and end in 2014. Activities in this phase include:

- conducting field investigation programs required to support detailed design
- completing the detailed engineering design
- complying with conditions specified in approvals, authorizations and permits
- purchasing goods and services
- consulting with the public, particularly northern communities
- transporting materials and equipment to site
- developing and constructing infrastructure sites, such as borrow sites
- drilling and completing wells at the anchor fields
- constructing production facilities and flow lines at the anchor fields
- constructing the gathering system
- constructing the gas pipeline and associated facilities

During this phase, the project will have the most interaction with the surrounding natural environment and communities. Areas disturbed during construction that will not be used during operations, such as borrow sites and infrastructure sites, will be reclaimed after construction.

1.3.3.3 Operations Phase

The Operations Phase is expected to begin in 2014. Activities in this phase include:

- commissioning and starting up the anchor fields, pipelines and associated facilities
- processing raw natural gas and transporting natural gas and NGL to market by pipeline
- operating and maintaining the anchor fields, including:

1.3.3.3 Operations Phase (cont'd)

- adding compression facilities
- drilling, completing and connecting wells
- servicing wells

- operating and maintaining pipelines and facilities

- adding two compressor stations and a heater station when shipping commitments materialize

- continuing ongoing consultation with the public, particularly northern communities

The Operations Phase will continue while there is economic gas production in the region, which is expected to be at least 20 years. Development of other natural gas fields in the Mackenzie Delta and Mackenzie Valley has the potential to extend the life of the pipelines and gas conditioning facilities.

When the commercial life of the fields has ended, the facilities and infrastructure will be decommissioned and abandoned according to the regulatory requirements in effect at the time. Surface facilities will be removed and the surface reclaimed to an acceptable condition. Abandonment and reclamation plans will consider both:

- input obtained through public consultation
- potential alternative uses of the sites being abandoned

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SUMMARY OF PROPOSED CHANGES

1.4.1 PROJECT DESCRIPTION REFINEMENTS

Refinements to the project description since previous updates and filings include:

- modifying the construction plan to reduce costs and improve schedule certainty by maintaining a four-year construction schedule and spreading the pipeline installation more evenly over three winters
- modifying the construction plan to reduce the cost of the Inuvik area facility by including larger modules, which are to be transported to the site via the Beaufort Sea route by ocean-going vessels and by barge on the Mackenzie River. This change will likely require some dredging in the Mackenzie River, the construction of a new barge landing, a stockpile site and roads south of the Inuvik town centre.
- relocating the Great Bear River compressor station, including adding 1.4 km to the length of the pipeline corridor, in response to community input
- modifying the design of the pipeline and gathering system construction camps to allow camp modules from the larger camps to be used at more than one site
- deferring construction of two compressor stations and a heater station until additional shipping commitments are received. This is assumed to be three years after start-up of the initial facilities.
- relocating and eliminating some infrastructure sites in response to community input and to reduce costs
- modifying the transportation and logistics plan to align with the updated construction plan and to reduce costs
- updating estimated expenditures and workforce requirements to reflect the current technical definition and project schedule

The engineering design for anchor fields, pipelines and facilities is essentially unchanged as a result of these refinements, as shown in Table 1-1.

1.4.2 UPDATED BIOPHYSICAL AND SOCIO-ECONOMIC EFFECTS

Since the EIS was filed in 2004, the estimated costs have increased, although the fundamental design of the project has not changed.

This update involves changing the location or timing of some project activities or footprints that were previously assessed in the EIS. In most cases, these refinements were made in response to input received during consultation, or to increased costs. These adjustments and refinements are expected to further mitigate potential adverse effects and enhance project benefits.

The approach used to assess the effects of the project changes was consistent with that described in EIS Volume 1, Section 2 (JRP Exhibit J-IORVL-00028). The project changes were assessed using the effect pathways and attributes described in the EIS, and focused on areas where the project change might alter the assessment results.

Baseline data collected for the EIS, which were applicable to the project refinements, were assessed to determine whether:

- the effects stated in the EIS or the November 2005 Project Update had changed
- EIS mitigation and monitoring commitments would be sufficient to address project-related effects

The biophysical and socio-economic assessment of the proposed changes indicates that:

- the overall environmental impacts of the updated project are similar to those assessed in the EIS, and the significance of the impacts has not changed
- the predicted economic effects described in the 2004 EIS will be enhanced
- the project commitments and associated mitigation measures, as outlined in the response to information request JRP 5.33 (JRP Exhibit J-IORVL-00934), will be used to reduce, or avoid, potential effects that might arise as a result of the proposed changes

Table 1-1: Refinements by Mackenzie Gas Project Component

Component	Description of Proposed Change
Niglintgak	<ul style="list-style-type: none"> No change.
Taglu	<ul style="list-style-type: none"> No change.
Parsons Lake	<ul style="list-style-type: none"> No change.
Gathering system	<ul style="list-style-type: none"> No change to the pipeline and facility design or operating temperature guidelines. Increased the size of modules to be used in constructing the Inuvik area facility, from modules transportable by truck to large modules requiring ocean transport, to reduce cost.
Gas pipeline	<ul style="list-style-type: none"> No change to the pipeline design or operating temperature guidelines. Reduced the annual average operating temperature for the Great Bear River crossing from 2°C to about -7°C as a result of relocating the compressor station.
Pipeline corridor (1 km)	<ul style="list-style-type: none"> Increased the gas pipeline length by about 1.4 km to accommodate the relocation of the Great Bear River compressor station.
Pipeline facilities	<ul style="list-style-type: none"> No change to the facilities design. Relocated the Great Bear compressor station to a location northeast of the Tulita airport on the east side of the river, in response to community input. Deferred installation of the Loon River North and River Between Two Mountains compressor stations, and the Trout River heater station, until additional shipping commitments are received. This is assumed to be three years.
Infrastructure sites	<ul style="list-style-type: none"> Relocated the proposed Trout Lake camp to the site of the Trout River heater station in response to community concerns. Eliminated the module assembly camp proposed for Vale Island in Hay River, by using larger modules for the Inuvik area facility. This addresses community inputs. Improved the definition of project requirements for the 20 mobile camps. Locations have been identified for some temporary camps for short-term activities, i.e., less than 60 days, such as horizontal directional drilling (HDD) construction. This includes five new locations for HDD operations that are distant from the larger camps, and locating HDD camps at four larger pipeline camps to reduce the footprint. Added a new barge landing and dock (Inuvik South), to unload the larger modules proposed for the Inuvik area facility, and an all-weather road, stockpile site and winter road in Inuvik to reduce traffic through the industrial area of Inuvik. Identified four alternative routes for winter access roads to Parsons Lake, three from the Mackenzie River to Parsons Lake, and one route from Tuktoyaktuk. A heavy haul route from Tuktoyaktuk is no longer considered an alternative. One route will be selected for site access for most years. A second route will be required in the year that the larger modules are to be transported to site. Increased the estimate of borrow requirements from 6.8 Mm³ to 7.6 Mm³, based on site evaluations and improved definition of requirements for proposed infrastructure sites, partially offset by reduction in requirements for the pipelines and facility sites. Identified three new borrow sites with low-grade material northeast of Tulita, and located the Great Bear River compressor station on a separate site from the infrastructure site. Optimized the size of infrastructure sites to align with the improved understanding of project requirements and revisions to the construction plan. This includes increasing and decreasing the size of some sites to accommodate revisions in pipe and fuel storage. Identified the need for a temporary camp, fuel storage, a helipad, a barge landing and a potential ice strip at Yaya River to support borrow site development and to reduce activities within the Kendall Island Bird Sanctuary.

Table 1-1: Refinements by Mackenzie Gas Project Component (cont'd)

Component	Description of Proposed Change
Transportation	<ul style="list-style-type: none"> • Eliminated the need to purchase additional tugs and barges by: <ul style="list-style-type: none"> • increasing the use of truck transportation for project construction activities located south of Wrigley • refurbishing out-of-service equipment • spreading construction activities more evenly over four years • increasing the use of the Dempster Highway • Eliminated the need to upgrade the rail bed by reducing the weight of loads on railcars. • Developed transportation plans to move camp components between large pipeline camp sites as pipeline installation proceeds.

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PUBLIC CONSULTATION

1.5.1 CONSULTATION APPROACH

The proponents have continued to consult with communities in the project area, to keep them informed of the proposed refinements, and to gather their input. Since 2001, the proponents have held over 1,300 documented meetings with northern communities. This does not include the many informal daily interactions with community residents by project staff located in regional offices in Inuvik, Norman Wells, Fort Simpson and Hay River.

Many project refinements described in this Project Update are responses to requests made, or concerns expressed, by the affected communities during consultation meetings carried out by the project proponents over the last few years. Therefore, most of the refinements have previously been discussed or explored with the affected communities.

1.5.2 UPDATE-RELATED CONSULTATION

Consultation activities related to this update include:

- conducting follow-up community meetings, where commitments were previously made to get back to the community, once project refinements were better understood
- developing and discussing project update information packages with community organizations and leaders
- offering to conduct, and conducting, meetings with communities, on request
- mailing information packages to the communities indirectly affected by the refinements
- responding to questions and concerns raised during the public meetings and discussions
- continuing with ongoing consultation, in alignment with community expectations and desires, and with project requirements

1.5.3 CONSTRUCTION PLAN CONSULTATION

The additional pipeline installation season is generally viewed by communities consulted to date as a positive adjustment. This provides more employment and should result in additional employment income for northern residents. Future construction of the deferred facilities would have a similar effect of spreading employment and business opportunities over a longer period.

1.5.4 FACILITIES CONSULTATION

1.5.4.1 Inuvik Area Facility Modules

During the first two weeks in April 2007, the proponents met informally with representatives of Inuvik organizations to discuss refinements to project plans in the Inuvik area. This included reviewing maps showing potential dredging locations and the new infrastructure associated with transporting modules for the Inuvik area facility. The proponents received suggestions and input from the local organizations on the revised project plans and answered questions raised. The proponents have offered to hold further discussions and meetings with Inuvik residents and organizations.

1.5.4.2 Great Bear River Compressor Station

During meetings held in 2005 and 2006 in Tulita, community residents and leaders requested that the proposed Great Bear River compressor station be relocated to the east side of the Great Bear River. This would provide a more accessible tie-in point for community natural gas and foster potential business opportunities for the community.

Additional project scoping, field investigations and numerous meetings have taken place to determine a suitable location and associated infrastructure, including granular materials. The outcome of the technical assessments and community input resulted in the compressor station being relocated.

1.5.5 INFRASTRUCTURE CONSULTATION

1.5.5.1 Trout Lake Camp Relocation

During the past few years, the proponents had several meetings with the Trout Lake community to discuss the proposed construction camp in that vicinity. The 900-person camp was originally proposed at a location about 2.5 km east of K'eotsee (Trainor Lake). A new camp location farther north was identified in 2006 to address concerns expressed by community residents. Some residents had still expressed concerns of potential effects on water quality, fish habitat and population that might result from camp activities.

Relocating this camp out of the K'eotsee watershed area to the future location of the Trout River heater station site should address most concerns expressed by the Trout Lake community. Informal meetings were held in Trout Lake on March 27,

2007, to discuss the refinements related to the Trout Lake area. The relocation of the camp was viewed by Trout Lake residents and leaders as a positive response to their input.

1.5.5.2 Elimination of Hay River Camp on Vale Island

During meetings with Hay River residents in 2006, residents of Vale Island expressed opposition to the proposed 425-person construction camp on Vale Island. The proponents committed to identifying alternative options and to holding another public meeting to discuss this matter further.

Construction plans have been modified, eliminating the need for module assembly and a camp in Hay River. This, and other refinements, were discussed at a public meeting held in Hay River on March 29, 2007. Some residents expressed their disappointment about the elimination of the Vale Island camp, as they viewed the camp as providing potential business opportunities. However, it was also recognized that the project would provide more employment and business opportunities than northern residents and businesses could supply.

1.5.5.3 Camp Requirements and Optimizations

Project plans have been revised to:

- optimize the use of temporary construction camps by moving some camp modules between camp locations, to reduce footprint and impact, to better align with peak requirements, and to reduce the number of modules required
- identify locations for some small temporary camps to support construction of HDD crossings for up to two months. Other HDD camps can be combined with pipeline camps, which are located close to the proposed crossing location.
- adjust pipe and fuel storage requirements to support the three-winter pipeline installation plan, resulting in an increased footprint for some camps, while decreasing the footprint of others

The proposed location of the HDD camp near Fort Simpson was discussed during a public meeting in Fort Simpson on March 28, 2007. Maps of the HDD location were displayed and residents were advised that some traffic might be routed through Fort Simpson to bring supplies, fuel and workers to and from the camp. No concerns were expressed about the location of the camp and potential routing of trucks, because most of the project traffic would still bypass the village. The residents were asked if they had any suggestions for alternative routes across the river to the camp. No specific alternatives were provided.

During previous meetings with the Town of Norman Wells and the local Aboriginal land corporation, options were explored for the location of a 1,350-person camp and stockpile site in Norman Wells. The camp is now proposed to be located adjacent to the industrial park, as described in the 2004 regulatory applications. The stockpile site remains in the quarry. Further discussions with the Town are proceeding.

1.5.5.3 Camp Requirements and Optimizations (cont'd)

Informal meetings were held in Wrigley on April 11 and 12, 2007, with band members of the Pehdzeh Ki First Nation. Copies of an information package describing the update were left at the band office for review and comment. Information about the HDD camps in the Blackwater River and Willowlake River areas was discussed. No concerns were raised relative to the HDD camp requirements in these areas. The project will continue to consult with the Pehdzeh Ki First Nation.

1.5.5.4 Logistics and Transportation Plan

The refinements associated with rail, barge and truck traffic primarily affect Hay River and, to a lesser extent, the communities of Enterprise, Fort Providence and Fort Simpson. Truck traffic is expected to increase as a result of the project refinements. However, residents pointed out that current truck traffic associated with the 2007 winter diamond mine resupply exceeded the peak year predictions for the Mackenzie Gas Project's requirements.

A public meeting was held in Fort Simpson on March 28, 2007, and informal meetings were held with officials in Enterprise on March 30 and Fort Providence on April 2, 2007. No concerns about the transportation changes were raised by these communities. The reduction of about 100 barge loads per year during the peak period partially mitigates concerns previously expressed by the community of Fort Providence. A public meeting was held in Hay River on March 29, 2007, to discuss these refinements and no concerns were raised.

A meeting was held with representatives of the Yukon government on September 28, 2006, to discuss the project's increased requirements for using the Dempster Highway. No highway capacity issues were identified. Another meeting has been scheduled for May 17, 2007.

1.5.6 FUTURE CONSULTATION

The project's public consultation program will continue throughout the regulatory process, and throughout the construction and operations phases. Community consultation activities are being coordinated through local project offices in Inuvik, Norman Wells, Fort Simpson and Hay River. Staff from these offices have met with representatives of northern communities to reconfirm the understanding of past discussions relative to project refinements, and to provide an opportunity for communities to provide input on other project adjustments.

The proponents appreciate the input they have received from northern communities. This input has resulted in improvements to the project plans, and further meetings and discussions will take place. For example, the proponents expect to consult with affected communities to discuss requirements related to rail, barge and truck traffic.

In addition, Yukon government representatives and other interested parties will continue to be consulted regarding the project requirements for using the Dempster Highway.

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1.6.1 SCOPE OF COMPARISON

On March 26, 2007, the JRP issued a letter to the proponents of the Mackenzie Gas Project describing their expectations for a consolidated project description. This included such factors as workforce, expenditures, environmental inputs and outputs, and supporting infrastructure.

To facilitate the review of this document by the JRP and the NEB, a comparison of the updated project description to previously filed information for the anchor fields is shown in:

- Table 1-2 for Niglintgak
- Table 1-3 for Taglu
- Table 1-4 for Parsons Lake

A comparison of this 2007 Project Update description to previously filed information for the pipelines and facilities is shown in:

- Table 1-5 for the pipeline and facilities' description
- Table 1-6 for the pipeline and facilities' expenditures and workforce

A comparison of this 2007 Project Update description to previously filed information for the Mackenzie Gas Project is shown in:

- Table 1-7 for infrastructure
- Table 1-8 for logistics and transportation
- Table 1-9 for environmental inputs and outputs

Table 1-2: Niglintgak Project Description Comparison

Component	2004 Filing and IRs to Mid 2005	Updates and IRs to Start of Hearings	NEB and JRP Hearings, Undertakings and IRs	May 2007 Update
Field Description:				
Wells:				
• Production (initial/future)	6 to 12	No change	No change	No change
• Injection (cuttings)	0	No change	No change	No change
• Disposal	1	No change	No change	No change
Production (sales)	3.7 Mm ³ /d	No change	No change	No change
Facility sites	5 3 well sites 1 gas conditioning facility site 1 Camp Farewell	No change	No change	No change
Drilling cuttings sump	1 remote sump	No change	Eliminate remote sump	No change
Total land requirements:				
• Permanent – new disturbance	37.4 ha	No change	10 ha ¹	No change
• Temporary	17.5 ha	No change	63 ha ²	No change
Private land requirements	Included in project totals ³	No change	No change	No change
Expenditures and Workforce:				
Capital expenditure, \$M (initial)	369	No change	No change	800
Capital expenditure, \$M (future)	0	No change	No change	No change
Operating cost (\$M/yr – 5-year average)	10	No change	No change	No change
Construction duration (months) ⁴	42	50	No change	54
Construction personnel:				
• Peak	102, 132 ⁵	No change	No change	193
• Total person years	60	No change	No change	244
Drilling duration (months)	30	No change	No change	No change
Drilling personnel:				
• Peak	122, 186 ⁵	No change	No change	No change
• Total person years	305	No change	No change	No change
Operations personnel	13	No change	No change	10
Note:				
1. Permanent new disturbances were clarified in hearing testimony.				
2. Temporary disturbance includes reclassifying elevated flow lines from permanent to temporary.				
3. Some private lands are required for borrow site and road development. These are included in the overall project estimates.				
4. Includes completing commissioning and start-up activities.				
5. An update was provided in the response to information request JRP GNWT 1.100 (JRP Exhibit J-IORVL 00112).				

Table 1-3: Taglu Project Description Comparison

Component	2004 Filing and IRs to Mid 2005	Updates and IRs to Start of Hearings	NEB and JRP Hearings, Undertakings and IRs	May 2007 Update
Field Description:				
Wells:				
• Production (initial and future)	10 to 15	No change	No change	No change
• Disposal	1 to 2	No change	No change	No change
Production (sales)	11.3 Mm ³ /d	No change	No change	No change
Facility sites	1	No change	No change	No change
Total land requirements:				
• Permanent	25 ha	30 ha	No change	No change
• Temporary	5 ha	No change	No change	No change
Private land requirements	Included in project totals ¹	No change	No change	No change
Expenditures and Workforce:				
Capital expenditure, \$M (initial)	555	No change	No change	1800
Capital expenditure, \$M (future)	380	No change	No change	750
Operating cost (\$M/yr – 5 year average)	18	No change	No change	26
Construction duration (months) ²	42	48	No change	54
Construction personnel:				
• Peak	135	No change	220	377
• Total person years	270	No change	Did not specify	464
Drilling duration (months)	18	18 to 24	No change	No change
Drilling personnel:				
• Peak	209	No change	No change	238
• Total person years	474	No change	No change	489
Operations personnel	23	No change	No change	No change
Note:				
1. Some private lands are required for borrow site and road development. These are included in the overall project estimates.				
2. Includes completion of commissioning and start-up activities.				

Table 1-4: Parsons Lake Project Description Comparison

Component	2004 Filing and IRs to Mid 2005	Updates and IRs to Start of Hearings	NEB and JRP Hearings, Undertakings and IRs	May 2007 Update
Field Description:				
Wells:				
• Production (initial/future)	9 to 19 North Pad 3 to 7 South Pad	No change	No change	No change
• Injection	1	No change	No change	No change
• Disposal	1	No change	No change	No change
Production, (sales)	8.5 Mm ³ /d	No change	No change	No change
Facility sites	2	No change	No change	No change
Total land requirements - new disturbance	28 ha ¹	591 ha	No change	415 ha ²
Previous disturbance	Did not specify	9 ha	No change	No change
Private land requirements ³	Did not specify	393 ha	No change	345 ha ⁴
Expenditures and Workforce:				
Capital expenditure, \$M (initial)	603	No change	No change	1,200
Capital expenditure, \$M (future)	335	No change	No change	350
Operating cost (\$M/yr – 5 year average)	9	No change	No change	25
Construction duration (months) ⁵	36	48	No change	No change
Construction personnel:				
• Peak	120	266	No change	414
• Total person years	291	Did not specify	No change	900
Drilling duration (months)	26	No change	No change	Continues in 2015
Drilling personnel:				
• Peak	260	175	No change	206
• Total person years	305	Did not specify	No change	529
Operations personnel	19	No change	No change	No change
<p>Note:</p> <ol style="list-style-type: none"> 1. Permanent facilities only. 2. Includes permanent facilities at about 49 ha, Pete's Creek heavy haul winter road alternative at about 251 ha, and Borrow Site 2.028P at about 115 ha. 3. Includes new and existing disturbance. 4. Includes the airstrip, one of the two heavy haul winter road alternatives from the vicinity of Lucas Point or Pete's Creek, and the Tuktoyaktuk to Parsons Lake light haul route, which is the longest of three existing winter access road route alternatives. Normal construction and operation would require only the airstrip and one existing winter access road for a maximum of about 145 ha. 5. Includes completing commissioning and start-up activities. 				

Table 1-5: Pipeline and Facilities Project Description Comparison

Component	2004 Filing and IRs to Mid 2005	Updates and IRs to Start of Hearings	NEB and JRP Hearings, Undertakings and IRs	May 2007 Update
Pipelines and Facilities:				
Total land requirements ¹	9,125 ha	9,150 ha	No change	No change
Private land requirements ¹	2,945 ha	3,115 ha	No change	No change
Mackenzie Gathering System:				
Gathering pipelines:				
• Length	176 km	190 km	No change	No change
• Design pressure	12.2–12.9 MPa	No change	No change	No change
NGL pipeline:				
• Length	476 km	457 km	No change	No change
• Design pressure	9.93 MPa	No change	No change	No change
Gathering facility sites	5	5	No change	No change
Gathering system capability: Inuvik area facility outlet:	30.9 Mm ³ /d	30.9 Mm ³ /d	No change	No change
• summer				
• monthly average	33.3 Mm ³ /d	33.3 Mm ³ /d	No change	No change
Mackenzie Valley Pipeline:				
Gas pipeline:				
• Length	1,220 km	1,194 km	No change	1,196 km
• Design pressure	18.0 MPa	18.7 MPa	No change	No change
• NGTL delivery pressure	11–12 MPa	9.5 MPa	No change	No change
Initial gas pipeline compressor stations	4	3	No change	1+2 ²
Heater station	1	No change	No change	0+1 ²
Block valves at potential future compressor station sites	10	11	No change	13
Gas pipeline design capacity:				
• one compressor station – summer	27.3 Mm ³ /d	No change	No change	No change
• three compressor stations – summer	34.2 Mm ³ /d	34.3 Mm ³ /d	No change	No change
Gas pipeline capability – monthly average	36.8 Mm ³ /d	36.7 Mm ³ /d	No change	36.8 Mm ³ /d
Gas pipeline expansion capability:				
• summer	48.9 Mm ³ /d	49.8 Mm ³ /d	No change	No change
• monthly average	55.2 Mm ³ /d	55.2 Mm ³ /d	No change	No change
Pipeline Watercourse Crossings – Total				
• Large	656	643	No change	No change
• Active 1	18	18	No change	No change
• Active 2	76	71	No change	No change
• Vegetated	70	68	No change	No change
• Ponds or Lakes	481	480	No change	No change
	11	6	No change	No change
Pipeline Watercourse Crossing Methods:				
• HDD	15		17 ³	No change
• Isolated	42		50	No change
• Open cut	599		576	No change
Note:				
1. Includes requirements for some infrastructure, such as roads and borrow sites that will be shared with the anchor fields.				
2. Two compressor stations and the heater station will be deferred for three years. Capabilities expressed for the pipeline assume three compressor stations will be operating.				
3. Includes HDD crossing of Kumak Channel by Niglintgak flow line.				

Table 1-6: Pipeline and Facilities Expenditures and Workforce Comparison

Component	2004 Filing and IRs to Mid 2005	Updates and IRs to Start of Hearings	NEB and JRP Hearings, Undertakings and IRs	May 2007 Update
Initial Pipelines and Facilities:				
Construction:				
• Construction start	Summer	Winter	No change	Summer
• Winters of pipeline installation	2	No change	2 + 1 partial	3 full
• Duration	42 months	48 months	No change	54 months
Construction zones	5	No change	No change	4
Construction spreads	10	11	No change	12
Spread lengths	120 to 160 km	100 to 155 km	No change	85 to 140 km
Total initial construction workforce jobs	17,926	17,600	No change	18,400
person years	6,080	6,000	No change	8,400
Peak annual construction workforce (jobs)	8,600	8,500	No change	6,200
Mackenzie Gathering System:				
Capital expenditure, \$M	1,653	1,671 ¹	No change	3,500
Operating cost (\$M/yr – 5 year average)	50	No change	No change	55
Operating personnel	49	No change	No change	No change
Mackenzie Valley Pipeline:				
Initial capital expenditure, \$M	3,838	3,660 ¹	No change	7,050
Future capital expenditure, \$M	Did not specify	Did not specify	Did not specify	800
Operating cost (\$M/yr – 5 year average)	62	No change	No change	52 – 62 ²
Operating personnel	49	No change	No change	45 – 49 ²
Note:				
1. The 2005 project update provided an estimate of relative cost change based on the 2003 cost estimate basis.				
2. Larger values include operating two future compressor stations and the heater station.				

Table 1-7: Mackenzie Gas Project Infrastructure Comparison

Component	2004 Filing and IRs to Mid 2005	Updates and IRs to Start of Hearings	NEB and JRP Hearings, Undertakings and IRs	May 2007 Update
Barge landing sites ¹	22, 23 ²	25	23 ³	24
Borrow sources ⁴ – primary	67	68	No change	No change
Borrow sources ⁴ – secondary	49	46	No change	48
Number of Camps:				
• Pipeline camps:				
• More than 1,000 persons	4	No change	No change	No change
• 500 to 1,000 persons	6	No change	No change	No change
• 100 to 500 persons	5	6	5	4
• Less than 100 persons	2	No change	No change	1
• Anchor field camps	10	11	No change	10 ⁵
• Mobile camps	20	No change	No change	No change
• Mobile camps with identified location	Did not specify	Did not specify	Did not specify	9 ⁶
Anchor Fields:				
• Winter roads	175 km	No change	225 km	No change
• All weather	5 km	16 km	No change	No change
Pipelines and Facilities:				
• All-weather roads	75 km	60 km	No change	No change
• Winter roads (includes ice roads)	About 700 km	800 km	No change	820 km
• Ice roads (on rivers and lakes)	Did not specify	Did not specify	Did not specify	235 km
Note:				
1. Some sites, such as Inuvik and Hay River, will be used by the anchor fields, gathering system and the gas pipeline.				
2. Potential Pete's Creek barge anchorage identified.				
3. Existing sites at Fort Simpson, and a second site in Inuvik, were eliminated.				
4. Some borrow sources have two sites.				
5. HDD camp at Taglu is included in mobile camp totals.				
6. Includes HDD camps, which are part of the overall 20 mobile camps.				

Table 1-8: Mackenzie Gas Project Logistics and Transportation Comparison

Component	2004 Filing and IRs to Mid 2005	Updates and IRs to Start of Hearings	NEB and JRP Hearings, Undertakings and IRs	May 2007 Update
Total cargo	868,000 t	865,000 t	No change	1,227,000 t
Fuel	191,000 t (230 ML)	No change	No change	384,000 t (460 ML)
Pipe	430,000 t	Increase	No change	442,000 t
Equipment and supplies	139,000 t	No change	No change	201,000 t
Facilities and supplies	35,000 t	Decrease	No change	96,000 t
Camps	74,000 t	No change	No change	45,000 t
Drilling equipment	22,000 t	No change	No change	60,000 t
Railway:				
• Peak (cars per year)	4,000	No change	No change	4,900
• Total (cars)	8,700	No change	No change	12,600
• Range (trains per week)	3 to 7	No change	No change	No change
River barges:				
• Total from Hay River	1,400	No change	No change	1,525
• Hay River Peak Year	560	No change	No change	455
• Hay River Sailings per week	7	No change	No change	6
• Total from Fort Simpson	100	No change	No change	120
• Fort Simpson Peak Year	66	No change	No change	70
• Fort Simpson sailings per week	2 to 3	No change	No change	No change
Marine transport (trips into delta):				
• Niglintgak	1	No change	No change	No change
• Taglu	N/A	4	No change	No change
• Parsons Lake	N/A	No change	2	No change
• Inuvik area facility	N/A	N/A	N/A	3 to 6
Trucks:				
• Total to NWT	5,800	No change	9,000	14,900
• Total from Hay River	2,860	No change	2,660	7,100
• To NWT in peak year	4,600	No change	5,450	6,900
• From Hay River in peak year	1,570	No change	1,120	3,900
• Total to Yukon on Dempster	600	No change	500	3,415
• To Yukon on Dempster in peak year	300	No change	300	1,025
Fixed-wing aircraft to hubs:				
• Total trips (737)	Did not specify	Did not specify	Did not specify *	1,180
• Annual peak (737)	Did not specify	Did not specify	Did not specify	360
• Range (flights per day)	Did not specify	Did not specify	6 to 9	No change
Note *: The anchor field requirements were filed in the response to Undertaking J U-81.				

Table 1-9: Mackenzie Gas Project Environmental Inputs and Outputs Comparison

Component	2004 Filing and IRs to Mid 2005	Updates and IRs to Start of Hearings	NEB and JRP Hearings, Undertakings and IRs	May 2007 Update
Environmental Inputs:				
Borrow requirements (placed)	5.2 Mm ³	6.8 Mm ³	No change	7.6 Mm ³
Borrow requirements (excavated)	Did not specify	Did not specify	Up to 30% extra	10 Mm ³
Total water requirements	1 Mm ³ /a	Did not specify	Up to 3 Mm ³ /a	No change
Cleared timber volumes	31,300 m ³	18,000 m ³	64,300 m ³	No change
Environmental Outputs:				
Total greenhouse gases:				
• Construction (maximum year)	480 kt/a	No change	No change	608 kt/a
• Operations (maximum year)	1,902 kt/a	1,720 kt/a	No change	No change ¹
Dredge volume (marine)	148,000 m ³	No change	No change	No change ²
Dredge volume (fresh water):				
• Niglintgak gas conditioning facility set-down ³	43,000 – 220,000 m ³	50,000 m ³	No change	No change
• Inuvik area facility module transport	N/A	N/A	N/A	130,000 m ³
Wood products	Did not specify	32,300 m ³	43,600 m ³ (⁴)	36,300 m ³
Waste Total – Construction and Drilling:				
• Solid – Hazardous	755 t	544 t	No change	No change
• Solid – Non-Hazardous	43,000 t	19,000 t	No change	Reduced 20% annually Increased 50% total
• Liquids – Hazardous	57,000 m ³	38,000 m ³	No change	No change
• Liquids – Non-Hazardous	109,000 m ³	727,000 m ³	No change	No change
• Domestic wastewater	857,000 m ³	853,000 m ³	No change	Reduced 20% annually Increased 50% total
Waste Total – Operations:				
• Solid – Hazardous	3,500 t	2,200 t	No change	No change
• Solid – Non-Hazardous	3,000 t	10,400 t	No change	No change
• Liquids – Hazardous	2,200 m ³	2,700 m ³	No change	No change
• Liquids – Non-Hazardous	1,300 m ³	24,000 m ³	No change	No change
• Domestic wastewater	100,000 m ³	253,000 m ³	No change	No change
Note:				
1. Includes operating three compressor stations and a heater station.				
2. Includes estimate of 52,000 m ³ that will be required to transport modules for the Inuvik area facility.				
3. Primarily winter excavation with a small amount of dredging.				
4. Information in the response to information request JRP GNWT 5.01 was provided in units of dimension of lumber. For comparison purposes, estimates of wood products are presented in cubic metres.				

