

Foundation for a Sustainable Northern Future

REPORT OF THE JOINT REVIEW PANEL FOR THE MACKENZIE GAS PROJECT

EXECUTIVE SUMMARY

DECEMBER 2009



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for the Mackenzie Gas Project

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Joint Review Panel
for the Mackenzie Gas Project

Foundation for a Sustainable Northern Future:
Report of the Joint Review Panel for the Mackenzie Gas Project

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EXECUTIVE SUMMARY

INTRODUCTION

The Mackenzie Gas Project (MGP) offers a unique opportunity to build a sustainable future in the Mackenzie Valley and Beaufort Delta regions. The Project itself, as long-term infrastructure, provides a key basis for future economic development. This opportunity carries the risk of adverse impacts, however. The Proponents' mitigations and enhancements, the measures governments would put in place, and the Panel's recommendations would, in combination, mitigate adverse impacts, reduce the risk and enhance the opportunities. Together they would provide the foundation for a durable and sustainable future in the Mackenzie Valley and the Beaufort Delta regions. With these three elements in combination, the regions could benefit from the Project for a long time to come. Without them, the foundation for the future would be less secure, and the likelihood of significant adverse impacts much greater.

The Joint Review Panel for the MGP has concluded that, subject to the full implementation of the Panel's Recommendations, the adverse impacts of the MGP, and the associated Northwest Alberta Facilities, would not likely be significant and that the Project and those Facilities would likely make a positive contribution towards sustainability. In the Panel's view, the MGP could provide the foundation for a sustainable northern future.

Most of the Panel's recommendations to the Proponents are intended to ensure that, should the Project proceed, detailed Project designs, prevention or mitigation plans and baseline information not available at the time of the Panel's hearings would be provided as needed to regulators, as for the most part the Proponents committed to do. Some Panel recommendations would require monitoring during construction and operations. Some would require best practice or best available technology, or higher standards during construction and operations. The Panel's recommendations do not require major Project rerouting.

The Panel's recommendations regarding cumulative impacts are a critical element of the foundation for the future. Future developments would likely be largely or entirely those of parties other than the Proponents, and therefore these recommendations are directed to government and regulatory agencies or authorities

(federal, territorial and Aboriginal). It is those public agencies that would be charged with planning for and responding to the pace and scale of future developments and the impacts of those developments.

The Panel has made recommendations for monitoring, follow-up and adaptive management of Project-specific impacts. In addition, the Panel has made recommendations for more active and anticipatory actions by governments to use scenario-based planning and explicit transition planning as key components of a comprehensive regime for the management of cumulative impacts and for building a sustainable northern future.

The Panel has recommended that the Government of Canada engage in the activities and commit the funding required to implement things it has already committed to do, such as fulfilling its obligations under the *Species at Risk Act*, the *Mackenzie Valley Resource Management Act*, and the Protected Areas Strategy.

The Panel's recommendations to governments address mainly the need to be prepared for cumulative impacts of the Project in combination with future developments. There was a broad consensus among participants (although by no means unanimity) that the Project on its own, with few modifications and with the appropriate responses from governments, could be acceptable and indeed beneficial.

THE PROJECT

The Proponents of the MGP have applied to the National Energy Board (NEB) for approvals necessary for five developments:

- three natural gas fields, referred to as the "Anchor Fields," located in the Mackenzie Delta;
- the Mackenzie Gathering System, consisting of gathering pipelines from the Anchor Fields to a processing facility near Inuvik and a natural gas liquids (NGLs) pipeline from Inuvik to connect with the existing Norman Wells oil pipeline at Norman Wells; and

- the Mackenzie Valley Pipeline (MVP), a 30-inch pipeline with three compressor stations and a heater station, to carry processed natural gas from Inuvik approximately 1,196 km to a proposed interconnection 10 metres south of the Northwest Territories–Alberta border with new facilities to be constructed in Alberta.

These five developments together comprise the “Mackenzie Gas Project,” referred to in the Panel’s report as the MGP or the “Project.”

NOVA Gas Transmission Ltd. (NGTL) applied to the relevant Alberta regulatory authority for approval of an associated project in Alberta to connect the MVP to the existing NGTL network. The Panel refers to this project as the “Northwest Alberta Facilities.” The Northwest Alberta Facilities would in turn enable gas transported on the MVP to reach the North American market for natural gas, which is fully integrated and functions as a single market.

The MGP and the Northwest Alberta Facilities, as applied for, would have the capacity to transport 1.2 Bcf/d of natural gas, as well as the NGLs produced in association with that gas. Production from the Anchor Fields, however, is expected to be approximately 0.83 Bcf/d. Therefore, without further developments, the MGP and the Northwest Alberta Facilities, if fully built as applied for, would have a **capacity** of 1.2 Bcf/d but the available gas supply would provide a **throughput** of only approximately 70 percent of that capacity. Further developments to produce additional volumes of gas up to the capacity of the MVP at 1.2 Bcf/d had not been proposed at the close of the Panel’s record. Those developments would require regulatory review and approvals in the future.

The MVP would be designed to allow for its future expansion, beyond its initial capacity, by the addition of up to 11 compressor stations, to a maximum capacity of 1.8 Bcf/d. There is currently no proposal to expand the MVP to this capacity. Such expansion would require the development of further gas fields within an accessible distance of the MVP, likely by parties other than the Proponents of the MGP. No specific developments for this purpose have been identified or proposed.

The specific proposed developments reviewed by the Panel are:

- the five components of the MGP:
 - the three Anchor Fields;
 - the Mackenzie Gathering System;
 - the MVP; and
- the Northwest Alberta Facilities.

The Panel has undertaken a comprehensive review of the direct impacts and cumulative impacts of these developments.

In order to clearly distinguish the specific developments that are the subject of current applications for regulatory approvals

from future developments that may follow, the Panel sometimes refers to the MGP and the Northwest Alberta Facilities together as the “Project as Filed.” The Project as Filed is the foundation of the Panel’s review.

As noted, no specific developments to support throughput on the MVP beyond 0.83 Bcf/d had been identified or proposed at the close of the Panel’s hearings. The Panel has not, therefore, reviewed the direct impacts associated with exploration, development and production activities that would be required to increase throughput on the MVP and the Northwest Alberta Facilities above the production volume of 0.83 Bcf/d from the Anchor Fields, either to the applied-for capacity of 1.2 Bcf/d or its maximum capacity of 1.8 Bcf/d.

However, the Panel has generally considered the impacts on the biophysical and socio-economic environment of facilities that could be added to the MVP (mainly 11 additional compressor stations and supporting infrastructure) and, with the limited information available on future developments, has considered the cumulative impacts of projects that might be undertaken in combination with the effects of the Project as Filed.

The distinction between the specific developments comprising the Project as Filed and future developments that would likely follow the construction of the Project presented challenges to participants in the review process and indeed to the Panel itself. The scope of such future developments ranges along a spectrum from highly likely to reasonably foreseeable to highly speculative. While the nature of developments in the highly likely category can be assumed (the development of additional gas fields to fill the MVP to its applied-for capacity of 1.2 Bcf/d), no specific locations had been identified at the close of the Panel’s hearings.

Furthermore, while many participants expressed concerns about the impacts of the Project itself, the fundamental concerns of many were grounded in uncertainty about future developments that might follow from the Project as Filed. The specific challenge that faced both participants and the Panel in this regard was that less and less information was available the further one projected into the future. This reality was especially challenging in the context of assessing cumulative impacts of the Project as Filed in combination with future developments, the location and scale of which are not known.

THE PANEL’S REVIEW

The Panel and its Mandate were established by the *Agreement for an Environmental Impact Review of the Mackenzie Gas Project* (JRPA) between the Mackenzie Valley Environmental Impact Review Board, the Inuvialuit as represented by the Inuvialuit Game Council and the federal Minister of the Environment. The JRPA, which came into force on August 18, 2004, resulted from the *Cooperation Plan for the Environmental Assessment and Regulatory Review of a Northern Gas Pipeline*

Project through the Northwest Territories (Cooperation Plan). The Cooperation Plan was released in June 2002. Its underlying principles included the desire of the relevant regulatory agencies to cooperate and the need for a “made-in-the-North” process.

The Cooperation Plan contemplated that the Panel’s review process would consider all matters related to the environmental impact assessment of the Project and that there would be no need to revisit those matters during the final phases of the regulatory process. In the Panel’s view, this goal has not been achieved through the Panel’s review. Downstream regulators would play an important ongoing role in completing detailed impact assessments of certain elements of the Project when the necessary information becomes available as the Project proceeds, if it is approved.

The Proponents’ Environmental Impact Statement (EIS) was submitted to the Panel on October 7, 2004. On July 18, 2005, the Panel issued a Sufficiency Determination in which it concluded that there was sufficient information to proceed to the hearings phase of its review, subject to certain further information being filed within a time frame prescribed by the Panel.

The Panel’s public hearings began in Inuvik on February 14, 2006 and concluded in Inuvik on November 29, 2007. The Panel held 115 days of hearings in 26 centres and northern communities. The Panel heard directly from 558 presenters, as either individuals or as representatives of groups or organizations.

CUMULATIVE IMPACTS MONITORING AND MANAGEMENT

The assessment and management of cumulative impacts resulting from the MGP was a central issue of heated debate and widespread public concern during the Panel’s review. Much of this concern centred on a mix of hopes and fears about what the Project as a major industrial undertaking would introduce into northern regions and the environment that many communities were closely tied to. These hopes and fears rested largely on the possibilities implicit in the Project as Filed for future expansion and on competing ideas about the range of future scenarios that might be associated with any future expansion. The demands on cumulative impacts management are particularly challenging for this Project, given its scale, the possibilities for a range of further developments that might follow, the limited capacity of regional management agencies, and the lack of established thresholds and sources of monitoring information.

The Panel has considered the ability of governments and other agencies to anticipate, monitor and manage the cumulative impacts of the Project. This includes the impacts associated with the pace and scale of development and climate change, and applies both at a Project specific and cumulative regional scale.

The Panel has made recommendations for the full implementation and funding of the Northwest Territories (NWT)

Cumulative Impacts Monitoring Program (CIMP) required by the *Mackenzie Valley Resource Management Act*. CIMP would provide the framework for the follow-up program for the Project’s cumulative impacts management regime. Panel recommendations related to the CIMP focus on incorporating scenario-based cumulative impacts assessment and monitoring programs, the establishment of cumulative impact thresholds, and clear integration with land use plans linked to regional land use planning boards and regulatory bodies responsible for project authorizations. Although this regime has the potential to avoid significant adverse cumulative impacts and to enhance the Project’s contribution to sustainability, the Panel recognizes the complexity of the monitoring and modelling efforts, and finds cause for concern in the delays in CIMP implementation to date. These delays have hindered timely project reviews and fuelled public anxieties about the pace and scale of future developments, and left unfulfilled commitments in land claim agreements which were agreed to by governments in order to address these concerns.

Given the Project’s scale and the implicit possibilities for further developments, as well as the capacity and preparedness of regional management agencies, the demands of cumulative impacts management in the NWT would be particularly challenging if the MGP is approved and built. In the Panel’s view, a follow-up program to support adaptive management measures, provide information to improve future environmental assessments and support management systems to manage cumulative impacts would be required. Considering the abilities of governments and other agencies, the Panel has concluded that the CIMP would provide the logical platform to implement the follow-up program as the focal point for the monitoring and management of the MGP’s cumulative impacts. Actual management of cumulative impacts would be the responsibility of the appropriate regulators. However, the key responsibility for monitoring and analysis would rest with the Responsible Authority for the CIMP, and would require the strong support of governments.

It is crucial that, before Project construction begins, governments have in place mechanisms to anticipate and respond to the pace and scale of development and to monitor and adjust mitigation measures. Successful implementation would not only enhance the potential positive contribution of this Project, but would also allow higher quality and accelerated decision making on future development opportunities.

SUSTAINABILITY

The Panel advised in its Sufficiency Determination of July 18, 2005, of its intention to adopt a sustainability framework for its assessment of the Project. The Panel recognized that key sustainability objectives are to ensure net gains without significant adverse impacts during the life of the Project and effective use of the Project and associated opportunities as a

bridge to a desirable and durable future, especially in the Project Review Area. In light of these objectives, the core question asked by the Panel was:

Can we be reasonably confident that the Project as Filed, if built and operated with full implementation of the Panel's recommendations, would deliver valuable and lasting overall benefits, and avoid significant adverse environmental impacts?

The Panel identified five key sustainability issues:

- cumulative impacts on the biophysical environment;
- cumulative impacts on the human environment;
- equity impacts;
- legacy and bridging; and
- cumulative impacts management and preparedness.

CUMULATIVE IMPACTS ON THE BIOPHYSICAL ENVIRONMENT

These include impacts on the longer-term resilience of ecosystems and what they provide (as recognized in special conservation areas, protected areas and land use plans) and on the wildlife harvesting and other traditional land-based cultural and livelihood activities that they support during Project life and beyond.

The Panel's summary conclusions are:

- With Panel recommendations, the Project would provide a basis for managing cumulative impacts and for maintaining the capacity of renewable resources that are likely to be significantly affected by the Project to meet existing and future needs.
- The Project would involve and likely induce increased levels of industrial activity but also provide an opportunity for effective action on measures to address continuing declines in the *Species at Risk Act* (SARA)-Listed species and measures to prepare for the management of future cumulative environmental impacts. These measures include the use of habitat offsets, the development of cumulative impact thresholds, interim and permanent land withdrawals, the updating and completion of conservation and land use plans, and the establishment of a special conservation regime for the Mackenzie Delta.
- Avoidance of significant adverse cumulative impacts from the Project depends on full implementation of the Panel's recommendations.
- The pace and scale of future developments are unknown and the potential effectiveness of the Panel's recommendations is therefore uncertain beyond 1.2 Bcf/d.

CUMULATIVE IMPACTS ON THE HUMAN ENVIRONMENT

These include impacts on community economic and socio-cultural well-being during the stages of the Project life and beyond, including vulnerability to cumulative impacts on community economic and socio-cultural well-being and vulnerability to boom and bust impacts.

The Panel's summary conclusions are:

- Without Panel recommendations, the Project would bring important economic opportunities along with some negative impacts and risks.
- With Panel recommendations, the Project would distribute resource revenues more equitably among governments and Aboriginal authorities, and would improve labour force development in the NWT.
- With Panel recommendations, the Project would assist governments and regulators to respond to future developments at the Project level and at the regional and local levels.

The Project has the potential to transform the economy of the NWT. Along with these potential benefits would come potential adverse impacts on social well-being. The importance of effective benefits capture and protection of social well-being in building a self-reliant and sustainable economic future is recognized in a number of commitments from the Proponents and governments. They include: the \$500 million Mackenzie Gas Project Impacts Fund to mitigate adverse socio-economic impacts; a Socio-Economic Agreement to improve training, employment and business opportunities; access and benefits agreements; and the equity stake of the Aboriginal Pipeline Group in the Mackenzie Valley Pipeline. The Panel's recommendations would augment these commitments and extend social and cultural protections.

EQUITY IMPACTS

These include the distribution of positive and negative impacts (especially concerning access to opportunities and resources, revenue flows, and exposure to burdens and risks) within and among communities, and between men and women, youth and Elders, and present and future generations, including the impacts of the anticipated use of hydrocarbon resources (upstream and downstream impacts of product life cycle from gas exploration to end use of gas) and greenhouse gas loadings.

The Panel's summary conclusions are:

- The null alternative would continue and perhaps deepen existing disparities between regional centres and small communities.
- Without Panel recommendations, the Project may have a mixed impact on the reduction of territorial, regional and community disparities based on Proponent commitments and certain established government measures. These disparities

could be reduced depending on the future investment of Project-related revenues received by the GNWT and Aboriginal authorities.

- With Panel recommendations, positive equity impacts are likely to be enhanced in areas concerning federal–territorial resource revenue disparities, diversity plans, especially for gender equity, and transition planning and funding, especially for future generations.
- With Panel recommendations, risks are reduced and opportunities are enhanced for a positive Project contribution to sustainability.

LEGACY AND BRIDGING

These include impacts from use of the Project and associated revenues and other impacts as a bridge to more sustainable livelihoods and generally more sustainable futures for the Beaufort Delta and Mackenzie Valley regions. They also include use of the Project and associated activities for building capacities of individuals, communities, agencies and other organizations to manage impacts, and to obtain and retain benefits from Project-related opportunities.

The Panel's summary conclusions are:

- Without recommendations, the Project has valuable labour force development components which should enhance lasting capacities, but is otherwise not accompanied by measures to promote economic diversification beyond exploitation of the region's non-renewable hydrocarbon resources to a more diverse, flexible and lasting basis for livelihoods in the region.
- With Panel recommendations, the Project would make a more positive contribution to a transition to a sustainable future, though some uncertainties would remain, especially with expansion beyond 1.2 Bcf/d if this occurred at an unrestrained pace and scale of development. Recommended measures include utilizing future Project revenues to promote economic diversification and a Project legacy that would mitigate lasting burdens, and investing in initiatives that would enhance regional and local capacity, community resilience and economic self-reliance.

CUMULATIVE IMPACTS MANAGEMENT AND PREPAREDNESS

These include the preparedness of government agencies and other responsible authorities to manage the cumulative impacts of the Project and associated activities in a way that ensures lasting, multiple, mutually reinforcing gains, including their capacity and preparedness to apply, monitor, enforce and adjust necessary terms and conditions. They also include carrying out the design and delivery of impact mitigation or enhancement programs, planning and management for acceptable development scale and pacing, and dealing with uncertainties and surprises, positive and negative.

The Panel's summary conclusions are:

- With Panel recommendations, the management of the cumulative impacts of the Project would be enhanced, especially in anticipating, monitoring, and responding to uncertainty associated with the pace and scale of future development, transition and legacy planning, and management. The adequacy of the recommended measures would need to be subject to regular review and improvement. Recommended measures include full implementation and funding of the NWT's Cumulative Impacts Monitoring Program (CIMP), and an MGP-specific follow-up program which would be implemented via the CIMP and entail scenario-based cumulative impacts assessment, the establishment of socio-economic and biophysical cumulative impacts thresholds, the updating and completion of land use and conservation plans and the implementation of a system of protected areas. Recommended anticipatory actions to avoid cumulative impacts resulting from future developments at an unrestrained pace and scale are essential as are actions to enhance positive cumulative impacts and transition planning for a more diversified and self-reliant economic base.
- Effective mitigation of the greenhouse gas emissions of the Project remains an area of uncertainty in the absence of federal government policy, legislation and regulation.

Although the Panel has recommended industry-wide policies with respect to gas as a transition fuel and the regulation of GHG emissions, it is not confident that the likely results would deal adequately with the use of Mackenzie gas as a transition fuel for sustainability purposes.

NATURAL ENVIRONMENT

PROJECT DESIGN, CONSTRUCTION AND OPERATIONS

The MGP would be the largest construction project to date in the NWT. The construction and operation of a buried non-ambient temperature gas pipeline in a permafrost environment has no direct precedent in North America. It could thaw frozen ground and freeze unfrozen ground, destabilizing terrain and disrupting water courses. The Project thus poses distinctive engineering and environmental challenges. In view of the limited experience of constructing and operating such a pipeline in a northern environment, the Panel considers that there is a need for conservatism in Project design and construction methods, caution in impacts prediction and mitigation, and well-designed and effectively implemented monitoring programs.

The Panel is largely confident in the Proponents' understanding of the engineering challenges related to the Project, and in their design approach to addressing these challenges. Even if there were to be an accident or malfunction, such as a pipeline rupture

or well blow-out, the environmental impacts would likely be localized and short-lived.

The Panel accepts the Proponents' approach to right-of-way construction and site preparation, except where a higher standard would be required in order to preserve critical or otherwise important wildlife habitat. In the Panel's view, this would apply to Project facilities in the Kendall Island Bird Sanctuary (KIBS) and to the portion of the gathering system that crosses Fish Island, and the Panel has therefore recommended that the Proponents implement a higher construction standard for that segment of the gathering system.

The Panel concludes that extraction-induced subsidence at both Niglintgak and Taglu could exceed the Proponents' estimates, although by how much, with what probability and with precisely what impact cannot be stated with certainty, except to note that the areal extent of submergence that would result from subsidence would be substantially greater than the physical footprint of Niglintgak and Taglu.

MIGRATORY BIRD HABITAT AND THE KENDALL ISLAND BIRD SANCTUARY

The Panel concludes that bird habitat would be lost or reduced in its effectiveness within KIBS and adjacent Fish Island due to a combination of extraction-induced subsidence, the footprint and zone of influence of the facilities and pipelines, and predators attracted to facilities because of increased access and enhanced opportunities. Although the actual extent of this loss is uncertain, the Panel found some participants' identification of the factors contributing to the loss of effective habitat — and the likely zone of influence of those factors — more persuasive than the Proponents'.

KIBS is the only protected area within the outer Mackenzie Delta, which is one of the most significant wetland complexes in North America. Environment Canada's approach to managing long-term impacts to KIBS involves two interrelated elements: limiting development to not more than a 1% threshold for direct physical impacts, and requiring habitat offsets for subsidence-induced flooding impacts. The Panel endorses this approach and considers that it should be applied in future to any and all future developers operating within the boundaries of KIBS. In the Panel's view, the impact of extraction-induced subsidence on migratory bird habitat could be mitigated only by a firm commitment on Canada's part to give force and effect to Environment Canada's proposed approach to habitat offsets. The Panel has therefore recommended measures to that end.

In the Panel's view, the *Migratory Bird Sanctuary Regulations* as currently written are not sufficiently robust to provide Environment Canada with the necessary capacity to achieve its objectives, either with respect to the Project as Filed or to future developments related to Significant Discovery Licences in KIBS and the Beaufort Sea. Additional measures would be required, particularly with respect to the potential impacts on birds and

bird habitat within KIBS. The Panel therefore recommends that Canada take the necessary steps to implement and give force and effect to Environment Canada's management policies for KIBS, and to promulgate regulations applicable to KIBS for that purpose.

SPECIES AT RISK

The Panel notes that the results of its review do not and cannot provide the competent Ministers with the full range of information required to exercise their legal responsibilities under the SARA for Listed species relevant to the Project. The Panel has recommended that Environment Canada complete recovery strategies and action plans as required by the SARA, including the determination of critical habitat for woodland caribou, wood bison and peregrine falcon, within one year of the Government Response to the Panel's Report.

WOODLAND CARIBOU

Woodland caribou (boreal population) is listed as "threatened" under the SARA. As of the close of the Panel's record, however, neither a completed national recovery strategy for woodland caribou (boreal population) nor regional action plans and management strategies for the NWT or northwest Alberta woodland caribou populations were in place. The absence of these key initiatives means that Proponents and resource managers lack the tools necessary to address Project-specific impacts.

The Panel concludes that, despite the level of protection potentially available under the SARA and various attempts by industry to mitigate industrial impacts, experience in Alberta and elsewhere shows either continuing declines in caribou range or declines in abundance, or at best, no progress in recovery. The Panel considers that implementation of its recommendation that Canada complete the actions required of it under the SARA is a necessary condition for ensuring that future developments that are implicit in the Project as Filed would not have significant adverse impacts on woodland caribou. However, this action alone is not sufficient.

In the Panel's view, the lack of effective activity-specific mitigations lends urgency to the adoption of land use plans that incorporate threshold limits for certain activities. The effect would be to restrict certain types of activities, within limits, on lands that are not otherwise protected. Thus, linear developments would be permitted up to a limit, allowing for development on those lands at a reduced pace and scale. The objective would be to ensure that caribou populations could coexist with limited development. For the time being, however, in order to protect woodland caribou from significant adverse cumulative impacts associated with future developments, the Panel has recommended that such developments in woodland caribou range in the Project Review Area be subject to at least the same level of protection that the Panel recommends be applied to the activities of the Proponents.

The Panel has recommended that governments develop range management plans that would include threshold limits for certain activities, in relation to barren-ground caribou, grizzly bear and polar bear. These limits would provide a means of ensuring the sustainability of these populations considering the potentially significant cumulative impacts of the Project in combination with future developments.

MARINE AND AQUATIC ENVIRONMENTS

Polar bears, beluga and bowhead whales are highly valued marine species that are vulnerable to the combined impacts of climate change and future industrial development. The Panel is concerned that in the event of future expansions in throughput beyond 0.83 Bcf/d, the threat of adverse cumulative impacts would be uncertain, and would increase with the pace and scale of development, particularly offshore. In order to mitigate these threats to some degree, the Panel has recommended establishment of a range plan for Southern Beaufort polar bears to guide management of future offshore developments, a program to assess the level of risk to the sustainability of the Southern Beaufort Sea polar bear population from offshore development and climate change, and the completion of a strategic environmental assessment of future offshore developments. The Panel has also recommended a Marine Mammal Protection Plan for the MGP that would apply prescribed measures for monitoring and reporting the location of whales; adjust the routing, frequency and timing of marine transits; and manage the timing of dredging activities to avoid interference.

No significant adverse impacts on fish and fish habitat are anticipated if the Proponents' proposed mitigation is completed and implemented subject to Fisheries and Oceans Canada (DFO) agreement, and a phased approach to construction over four winter seasons. To address the combined adverse impacts of pipeline construction activities on fish habitat over hundreds of streams and rivers, the Panel has recommended that DFO develop a strategic approach for impacts management of all water crossings on a regional basis.

GREENHOUSE GASES

The Panel is confident that commitments by the Proponents and Panel recommendations could result in further reductions in GHG emissions from the Project's construction and operations phases.

However, the Project's upstream emissions represent a small percentage of its total life-cycle emissions. Some participants were concerned about the end use of the gas transported in the MVP on two grounds: first, that it would be used as a fuel source in Alberta oil sands developments, and secondly that it would increase global outputs of GHGs and contribute to climate change.

The Panel is not persuaded that gas from the MGP would in fact be used in the exploitation of the oil sands. Further, the Panel sees no viable way by which specific end uses could be assigned

to or excluded from Project gas. The Panel acknowledges the Proponents' concern that, until a national climate change policy and regulatory framework are in place, they would not be participating on a level playing field if the Project were to have requirements placed upon it that would be significantly different from those placed on other energy projects serving similar markets. Therefore, the Panel has not recommended that the Project be required to offset its GHG emissions at this stage, although the Panel has recommended that national standards be developed. The Panel also concludes that mandating carbon neutrality and intervening in the market to specify preferred end uses for natural gas cannot be resolved on a project-by-project basis through the environmental assessment process. Rather, these matters must be addressed by governments through comprehensive climate change strategies. The Panel has recommended that Canada's climate change policies include provisions for optimizing the benefits of using natural gas as a transition fuel to developing a sustainable low-carbon economy.

At the same time, the Panel observes that in the absence of global controls on energy consumption, if the Project were not to proceed, it is likely that the energy production foregone would be replaced by other energy sources to meet global demand. There is no assurance that these other energy sources would not be more GHG-intensive than Mackenzie gas. Consequently there is no assurance that, without the Project, there would be any measurable abatement of the global level of GHGs, or any amelioration of climate change effects in the Mackenzie Valley and Beaufort Delta regions.

For the NWT and the rest of Canada, the Project represents both an opportunity and a challenge to achieve sustainability objectives associated with resource use efficiency and to enhance any future positive trends of emissions reductions directed at achieving international and national targets. Depending on how emissions from the Project are managed over its life, the Project also has the potential to erode and delay progress on future emissions reductions.

CONSERVATION

In the Panel's view, regional land use plans and a network of protected areas are important and possibly the most effective conservation measures for managing cumulative impacts on areas of ecological and cultural importance. Taken in isolation, the Panel accepts that impacts from the Project on existing and proposed protected areas and on the establishment of a network of protected areas in the Mackenzie Valley would not likely be significantly adverse. However, the Panel also considers that this Project brings into sharp relief the need for conservation planning at the landscape level to be put in place now, in order to manage cumulative impacts from the Project in combination with other developments. The Panel has recommended timelines for the completion of the establishment of a protected area network within the Mackenzie Valley.

With respect to land use plans and Community Conservation Plans, the Panel has recommended the introduction of socio-economic and ecological thresholds within these plans, the strengthening of the Community Conservation Plans in the Inuvialuit Settlement Region (ISR), the completion of the strategic environmental assessment of future oil and gas exploration and development in the Beaufort Sea, and the completion of the Sahtu and Dehcho land use plans.

Although there are extensive provisions for protected areas in the ISR, the Mackenzie Delta itself — an exceptionally productive and diverse environment — is, with the exception of the small area of KIBS, essentially unprotected. The Panel has therefore recommended the creation of a Mackenzie Delta special management area, the purpose of which would be to accommodate and protect important wildlife, environmental and cultural values, and traditional uses in the area while allowing controlled development to continue.

ECONOMY

PROCUREMENT AND BUSINESS

Northern business would benefit significantly during the construction period. Indeed, Project requirements during those years would greatly exceed the current capacity of northern business. Benefits Agreements negotiated between the Proponents and Aboriginal authorities would ensure a share of opportunities to northern Aboriginal businesses. Although Project procurement requirements would be much lower during operations, this would not necessarily result in a downturn for northern businesses because Project demand might still exceed regional business capacity. Project-generated expenditures in relation to Anchor Field development requirements should continue to generate substantial business opportunities in the Beaufort Delta region and probably also Yellowknife.

The direct revenues from gas production would flow largely to producers headquartered outside the NWT. However the Aboriginal Pipeline Group (APG), which would own a share of the MVP, provides a means of capturing a portion of those revenues for Aboriginal beneficiaries in each of the four regions traversed by the pipeline in the NWT. Should MVP throughput not expand beyond 0.83 Bcf/d, these benefits would be modest. However, with throughput increases even to the 1.2 Bcf/d level, the APG's ownership share and its dividend levels would rise sharply. Expansion of capacity to the MVP's design potential of 1.8 Bcf/d could yield very substantial benefits to APG shareholders, but only if sufficient additional gas is contracted to shippers within ten years of Project start-up.

EMPLOYMENT AND INCOME

During construction, the Project would likely employ over 1,000 NWT residents annually. Most of these jobs would be on a rotational basis at remote sites, and many would be seasonal.

The Proponents' commitments to hire northern workers and to pay for their travel to work from their home communities would make these jobs available on an equitable basis throughout the NWT. Direct Project employment during the operations phase of the Project would be much lower, although much of it would be available on a full-time and long-term basis. Expansion beyond the Project as Filed would likely generate more indirect employment in the NWT on a continuing basis, not only in exploration and development but also a variety of services.

The greatest need and desire for Project employment appears to be in the smaller communities. However, low levels of literacy and educational attainment in those communities are key barriers to Project employment. The Proponents' employment projections assumed that the entire potential labour pool in the NWT would have been offered training opportunities. In view of the uncertainty as to whether and when the Proponents would make a decision to construct, the likely short window between such a decision and the actual commencement of construction, and the short duration of the construction phase itself, the Panel considers the timely realization of this objective unlikely. Attention to training and education that would enable northern residents to take advantage of the more durable employment opportunities that would likely follow Project construction would be as important as or more so than focusing on the short-run opportunities in the construction phase.

The Proponents and the GNWT have committed to implementing a training fund for oil and gas industry employment. These, along with other training programs already initiated, and which the Panel has recommended be continued, would contribute to NWT residents gaining durable skills and employment during the operations phase. The Panel has recommended that the Proponents' commitment to pay the costs of employee travel between their home communities and the work sites become standard practice in industry, to ensure that rotational employment opportunities continue to be made available to residents of small communities. The Panel has also recommended that the Proponents develop diversity programs, inclusive of gender equity, to reduce barriers to Project employment.

REVENUES TO GOVERNMENTS

Revenues to governments would consist primarily of corporate and personal income taxes and, in the case of the federal government, royalties. The Proponents' forecasts of revenues to the GNWT were based on a gas sales point in the NWT, but the validity of this assumption was not confirmed by the close of the Panel's record. To the extent that some portion of the Proponents' corporate taxes on gas revenues generated in the NWT become payable in some other jurisdiction, the potential benefits to the GNWT would be reduced.

The GNWT would carry the chief burden of costs in dealing with the Project (except for the Mackenzie Gas Project Impacts Fund (MGPIF)), but would receive little of the revenue share directly

and, to the extent its revenues are increased, this is offset by the Territorial Formula Financing grant. The Panel has recommended a revenue sharing agreement between Canada and the GNWT as a means of increasing the revenues flowing directly to governments in the NWT.

Over the long term, Project increments to government revenues would more than offset ongoing costs to governments associated with the Project, and probably by an increasing margin over time. In the Panel's view, some portion of these funds should be dedicated to planning and investing in a transition from the eventual winding down of the Project. The Panel has recommended that the GNWT establish mechanisms for funding transition programs, based on revenues it would obtain from non-renewable resource royalties.

PROJECT LEGACY

The key Project legacy would be the gas delivery system itself — the MVP and the Mackenzie Gathering System — which provides essential infrastructure for future gas development in the NWT. Construction of these pipelines would be a long-term investment in infrastructure that would likely operate much longer than the Project as Filed. The MVP would likely lead to more development of gas resources in the Mackenzie Delta and off-shore, and perhaps in the Colville Hills, as well as the Eagle Plains and Peel Plateau areas of the northern Yukon. Without the MVP, such developments are much less likely, at least in the foreseeable future. In the Panel's view, it is the pipeline infrastructure that holds the promise of continuing exploration and development and the possibility of sustained and durable economic activity throughout much of the Project Review Area. Exploration and development at an unrestrained pace and scale are of concern, and the Panel has made recommendations to address this concern. The alternative, however, is a continuation of the current pattern of episodic bursts of short-term exploration activity followed by economic slowdowns, with few durable and lasting benefits to the NWT's economy and social well-being.

The operations phase of the Project would provide sustained benefits to the NWT for at least twenty years. Procurement and business opportunities would be enhanced for the entire period. Training initiatives would more likely lead to employment because as job opportunities become available on a continuing basis, the timing constraint of a single, limited opportunity disappears, and possibly also as the demand for skills becomes more diverse. In this regard, the training fund that would be jointly established by the Proponents and the GNWT under the Socio-Economic Agreement (SEA) would be an important legacy of the Project, because it is not directed primarily to the needs of construction or operations but rather to employment that could become available with future developments. The program would endure through to decommissioning and the potential benefits would likely be more evenly distributed throughout the Project Review Area.

The Panel is confident that there would be enhanced economic benefits with future expansions of the Project as Filed, certainly up to 1.2 Bcf/d and probably up to 1.8 Bcf/d. In the Panel's view, however, it does not necessarily follow that other future developments at an unrestrained pace and scale would be similarly beneficial at the regional scale. Optimum and sustainable long-run benefits are more likely to be achieved if economic growth and economic and social capacity move ahead consistently. It is conceivable that the pace and scale of future developments could be so large and so rapid as to outstrip the capacities and resilience of northern people, firms and governments to adapt and to ensure that economic benefits continue to outweigh fiscal and other costs.

An important element of the Project's legacy is that of using the Project and associated activities for building capacities of individuals, communities, businesses, governments and other organizations in the NWT to manage impacts and to optimize and retain benefits from the Project and future development opportunities. Realizing this legacy would depend heavily on the effective implementation of the Panel's recommendations for anticipatory planning and management of cumulative impacts from future developments, and for transition initiatives that would plan a more diverse, flexible and lasting basis for livelihoods in the NWT.

SOCIAL AND CULTURAL ENVIRONMENT

The Panel heard widespread concerns about current conditions of social well-being in the Project Review Area, and the potential for the Project to aggravate them. Another focus of concern was that the Project would result in increased demands on the provision of health care, social services and policing — services which in the view of many are already overburdened and understaffed.

In the Panel's view, if the Project did not proceed, it is unlikely that either the conditions of social well-being or the provision of health and social services would improve. While the Panel acknowledges that, without mitigation, the Project could exacerbate current conditions, the Panel considers that the Project also provides an opportunity to improve those conditions.

The Panel considers that the Proponents have made reasonable efforts to address these concerns, within the areas of their responsibility, especially in the work place and in transportation arrangements to and from work. The Proponents have committed to taking appropriate measures to minimize the direct impacts of an influx of temporary construction workers, by establishing closed work camps and by hiring southern workers at southern locations rather than encouraging speculative in-migration.

The Panel considers that the SEA between the GNWT and the Proponents addresses the potential additional burdens that the Project might place directly on the provision of public services.

However, the indirect impacts of the Project would likely place additional burdens on existing service levels. The Panel therefore considers that there would likely be some adverse impacts, at least during the construction phase, on vulnerable sectors of the population and on the services available to them. The Panel has made recommendations to reduce these with respect to women, children, Elders and the homeless.

The creation of the MGPIF is a recognition by the Government of Canada that resources far beyond those currently available to the GNWT or to NWT communities would be required to address the combination of potential Project impacts and the existing conditions of social well-being. The MGPIF, as a response to the potential impacts of a large project in Canada, is unprecedented both in magnitude and design. It provides for \$500 million in expenditures over ten years, following a decision to construct. The MGPIF provides for the allocation of funds directly to the five regional organizations, thereby giving those most likely to be affected by the Project some control over the mitigation process. Because the program would be in place in advance of construction, it provides a basis for planned expenditures to anticipate as well as respond to Project impacts. The MGPIF is not a compensation fund requiring proof of impacts or the cause of those impacts after the fact. In view of the innovative nature and the magnitude of the MGPIF, the Panel considers that it would be important to monitor and evaluate its contribution to well-being closely to ensure its success.

The Panel is of the view that additional measures would be necessary to address the potential adverse socio-cultural impacts of the Project and has recommended that, prior to the commencement of construction, the GNWT demonstrate that it has the capacity to meet both existing service demands and the incremental demand that would be imposed by the Project in the areas of health care, drug and alcohol treatment, policing, child care, homeless and women's shelters, Elder care and suicide prevention. In the longer run, the Panel is of the view that the increases in employment and personal income, as well as the increases in government revenue likely to be generated by the Project over its life, could serve to improve conditions of personal, social and community well-being in the Project Review Area.

PUBLIC CONFIDENCE IN GOVERNMENT PREPAREDNESS

Many participants in the Panel's review expressed a major concern about the readiness of governments to respond to and adequately manage the impacts of the MGP. As a result, many of the Panel's recommendations are directed to governments. The Panel is generally satisfied that, if these recommendations are adopted and implemented, governments would be effective in addressing the concerns to which the recommendations are directed. The Panel is also satisfied that, if governments accept and act on the recommendations that are directed

to them, governments would be ready and prepared, in the sense of being **able**, to respond to the challenges that the Project would present. In this narrow meaning of "government preparedness," the Panel is satisfied that implementation of its recommendations would address the issue.

However, in the Panel's view the issue of "government preparedness" has a broader, systemic dimension, to do with the degree of government **commitment to implementation** of the recommendations that it accepts. It is one thing for governments to accept recommendations. It is another to ensure their timely and effective implementation, and to provide the funding and other resources that serious commitment to implementation would entail. The Panel was provided with documentary evidence of criticism from independent sources of government shortcomings in delivering on its legislated obligations and its existing commitments, and meeting the spirit of those commitments.

This has led the Panel to conclude that an additional measure is required in order to give confidence to the Panel and others that the Panel's recommendations that are accepted will in fact be fully and effectively implemented. Specifically, the Panel recommends the establishment of an independent mechanism to monitor the performance of governments in implementing the Panel's recommendations.

CONCLUSION

The Panel is confident in its assessment of the impacts of the Project as Filed and its likely contribution to sustainability. Because of the lack of or unreliability of information about future developments, particularly such developments as would be required to support an increase of throughput on the MVP beyond 1.2 Bcf/d, the Panel has made a number of recommendations specifically directed towards anticipating and allowing for appropriate mitigation of any adverse impacts of those developments. With the full implementation of these recommendations, governments and regulatory authorities responsible for reviewing and approving proposals for future developments would be better informed and would be equipped to ensure that appropriate and effective mitigation measures were in place before such developments were authorized to proceed.

The Panel acknowledges the uncertainty that is inherent in predicting the future and has approached the challenge that this presents as an opportunity/risk matrix. Accordingly, the Panel has given careful attention to means of anticipating and managing cumulative impacts and ensuring a positive legacy from the Project, possible expansions and other future developments. The Panel is confident that, with appropriate policy and regulatory initiatives and responses to manage future developments built on the implementation of the Panel's recommendations, the MGP, and future developments that might follow from the Project, could proceed in an acceptable manner.

Overall, subject to the full implementation of the following recommendations, the Panel has concluded that the adverse impacts of the Mackenzie Gas Project and the Northwest Alberta Facilities would not likely be significant and that the Project and those Facilities would likely make a positive contribution towards a sustainable northern future.

In the Panel's view, the Mackenzie Gas Project and the associated Northwest Alberta Facilities would provide the foundation for a sustainable northern future. The challenge to all will be to build on that foundation.

JOINT REVIEW PANEL RECOMMENDATIONS

CHAPTER 5 — APPROACH AND METHODS

<i>Proponents' Commitments</i>	5-1	<p><i>The Panel recommends that the National Energy Board's proposed conditions tabled by the Board in the Mackenzie Gas Project Hearing Order GH-1-2004 proceeding be amended for each of the Proponents to the Mackenzie Gas Project as follows:</i></p>
		<p><i>1. Unless the National Energy Board (or Chief Conservation Officer) otherwise directs, or except where the Joint Review Panel for the Mackenzie Gas Project (the Panel) has recommended otherwise, [the Proponents] shall cause the approved facilities to be designed, located, constructed, installed and operated in accordance with the specifications, standards, policies, mitigation measures, procedures, and other information referred to in their application or in the Environmental Impact Statement or other filings with the Panel or as otherwise agreed to during the GH-1-2004 Hearing or the review conducted by the Panel.</i></p>
<i>NGTL Approval Conditions</i>	5-2	<p><i>The Panel recommends that the National Energy Board include in any certificate or approvals it might issue in relation to the Northwest Alberta Facilities those conditions the Panel has recommended for inclusion in any certificate or approvals for the Mackenzie Gas Project that could be applied to the Northwest Alberta Facilities, with such modification as the National Energy Board may determine is appropriate having regard to the location, nature and scope of those facilities.</i></p>

CHAPTER 6 — PIPELINE DESIGN, CONSTRUCTION AND OPERATIONS

<i>Baseline</i>	6-1	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to provide prior to the commencement of trenching:</i></p> <ul style="list-style-type: none"> <i>• an updated inventory and assessment of baseline permafrost, ground-ice and terrain conditions along the Project corridor;</i> <i>• an updated delineation of massive ground ice along the Mackenzie Gathering System and at associated facilities, based on all available data sources and any additional field data collected as part of the Geotechnical Verification Program; and</i> <i>• information on the stratigraphy, locations and extent of ice-rich soils at stream crossings.</i> <p><i>The information filed in accordance with this National Energy Board condition should also be provided to other appropriate regulators for review.</i></p>
<i>Final Designs, Impact Assessments, Mitigation Plans</i>	6-2	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, for approval, six months prior to the commencement of trenching:</i></p> <ul style="list-style-type: none"> <i>• final designs that incorporate updated characterization of ground-ice conditions, including delineation of massive ground-ice occurrence at the gathering system facilities and along the gathering system route, fully utilizing published data as well as any additional field data collected by the Proponents prior to or post-right-of-way clearing;</i> <i>• an update of their ground stability and drainage impact assessments and of their environmental management and mitigation plans based on this additional baseline information on ground-ice conditions, including massive ice;</i>

- identification of areas where impacts related to permafrost thaw and frost bulb formation along the right-of-way could be most severe (e.g. settlement, heave, ponding, erosion and drainage alteration) and where pre-burial or early mitigation might be required. This assessment should incorporate updated baseline information and thermal modelling. The assessment should examine a range of pipe temperatures along the route over the Project's life, including scenarios of adding compressor stations with various configuration durations, and the potential for associated impacts on right-of-way and pipe integrity, including those sections of the route where a period of freezing (and frost bulb formation) is followed by a reversal to thawing;
- an effects monitoring plan that includes, in addition to pipeline integrity monitoring, monitoring of permafrost, terrain and geotechnical parameters (such as ground temperatures, thaw bulb size, frost bulb size, ground movements and drainage and erosion changes) relevant to thaw bulb and frost bulb impact assessment;
- environmental management and mitigation plans based on the updated baseline information and geohazard assessment; and
- a mitigation "tool kit" that includes the thresholds for monitored permafrost, terrain and geotechnical parameters (e.g. ground temperatures, thaw depth and ground movement) that, once reached, will trigger the need for mitigation, as well as the criteria for selecting the most appropriate mitigation technique.

The information filed in accordance with this National Energy Board condition should be provided to other appropriate regulators and agencies in sufficient time for them to review and provide input to the National Energy Board.

Impacts of Climate Change

6-3

The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, for approval, prior to the commencement of trenching or well pad and facility construction, final design plans that incorporate further analysis of the impacts of climate change on permafrost and terrain stability over the design life of the Project and post-abandonment. This analysis should be conducted for a series of representative locations, conditions and terrain types and should incorporate climate variability and, in particular, upper limit temperature scenarios to account for the range of future temperature conditions, including their variability and extremes, and the impact of this variability on stream flow regimes. The results should also be incorporated into the monitoring, mitigation and adaptive management plans.

The information filed in accordance with this National Energy Board condition should be provided to other appropriate regulators in sufficient time for them to review and provide input to the National Energy Board.

Construction and Operations Plan — KIBS/ Fish Island

6-4

The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, for approval, six months prior to the commencement of construction, a construction and operations plan for the Project facilities in Kendall Island Bird Sanctuary and for the Fish Island segments of the Mackenzie Gathering System that has been developed in consultation with, and to the satisfaction of, Environment Canada and that includes:

- the goals of the plan;
- the manner in which the Proponents will address the recommendations of Environment Canada with respect to construction and operations of the Kendall Island Bird Sanctuary and the Fish Island segment of the Mackenzie Gathering System;
- measures to avoid, prevent or mitigate adverse impacts to migratory birds, their nests, eggs or habitat in Kendall Island Bird Sanctuary and on Fish Island;

- plans for monitoring compliance and impacts during construction and operations, as well as proposed responses to address unanticipated impacts; and
- reporting frequency and content.

The plan must also include details on how it will be implemented. When implemented, the Proponents must file copies of their monitoring reports with Environment Canada.

Fill and Ditch Subsidence

6-5

The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, for approval, six months prior to the commencement of construction, plans that describe, with respect to the entire right-of-way, including watercourse crossings:

- the methods for determining the quality and quantity of imported fill that may be required to minimize the need for subsequent refilling and regrading;
- the timing and methods for hauling and stockpiling those fill requirements;
- the methods for monitoring for and remediating ditch subsidence in the first year after construction and as required during operations; and
- the methods for disposal of excavated material not required for backfill.

The information filed in accordance with this National Energy Board condition should be provided to other appropriate regulators and land managers in sufficient time for them to review and provide input to the National Energy Board.

Frost Bulb and Aufeis Mitigation

6-6

The Panel recommends that the National Energy Board, as a condition of any certificate or approvals that it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, for approval, six months prior to the commencement of construction, their plans for identifying the potential for and preventing or mitigating any impacts to stream flow or diversion from frost bulb and aufeis creation as a result of the Project. The plans should be developed in consultation with, and to the satisfaction of, Fisheries and Oceans Canada. The plans should include:

- field procedures to be utilized in determining the potential locations where a frost bulb may impede drainage;
- proposed design and construction methods for frost bulb and aufeis prevention and mitigation and the criteria for their selection;
- selection of pipe insulation materials and methods of application and installation, including the rationale for same, and the estimated longevity of their effectiveness; and
- proposed mitigations for reduced effectiveness of pipe insulation, should it occur, and the criteria for initiating those mitigations.

The crossing designs and criteria for frost bulb and aufeis mitigation should also address changes in the thermal regime of the pipe associated with the installation of any additional compressor stations required to enable the throughput of the Mackenzie Valley Pipeline to be increased above 1.2 Bcf/d.

Groundwater Mitigation

6-7

The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, for approval, six months prior to the commencement of construction, detailed descriptions of:

- installation procedures and limitations of using ditch plugs to mitigate groundwater flow along the pipeline ditch and horizontal directional drilling pathways;
- alternative methods for the control of groundwater infiltration and flow along the ditch and horizontal directional drilling pathways and evaluation of the methods' effectiveness in northern conditions; and
- how monitoring will be implemented to ensure the effectiveness of these mitigations.

The information filed in accordance with this National Energy Board condition should be provided to other appropriate regulators in sufficient time for them to review and provide input to the National Energy Board.

<i>Sediment Mitigation</i>	6-8	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, for approval, six months prior to the commencement of construction, detailed mitigation plans to reduce the release of sediments at stream crossings during construction and in the post-construction phase.</i></p> <p><i>The plans filed in accordance with this National Energy Board condition should be provided to other appropriate regulators in sufficient time for them to review and provide input to the National Energy Board.</i></p>
<i>Acid Rock Drainage Mitigation</i>	6-9	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, for approval, prior to the commencement of quarrying or trenching:</i></p> <ul style="list-style-type: none"> <i>• the results of acid rock drainage surveys and/or analyses performed to identify Project activity areas with potential for acid rock drainage;</i> <i>• detailed mitigation and management plans for acid rock drainage prevention or disposal of potentially acid-generating materials, in the event that either expected or unexpected sulphide-rich bedrock is exposed during construction; and</i> <i>• an outline of a monitoring program that would be implemented during operations to assess the effectiveness of mitigation measures.</i> <p><i>The information filed in accordance with this National Energy Board condition should be provided to the other appropriate regulators in sufficient time for them to review and provide input to the National Energy Board.</i></p>
<i>Taglu/Niglintgak Subsidence and Flooding</i>	6-10	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, for approval, prior to the commencement of construction of the facilities at the Taglu or Niglintgak Anchor Fields, a program to monitor subsidence and flooding related to hydrocarbon extraction generated reservoir consolidation for the purpose of verifying predictions of flooding impacts. The monitoring program, developed in collaboration with the appropriate regulators, should include a description of the monitoring techniques that will be used to monitor the ground and water level surfaces and movements, the current accuracy of each monitoring technique, the frequency with which each monitoring technique will be applied, and details on periodic reporting on the monitoring to the appropriate regulators.</i></p>
<i>Permafrost and Terrain Research and Monitoring Program</i>	6-11	<p><i>The Panel recommends that, as part of the follow-up program for the Mackenzie Gas Project, the Government of Canada establish, prior to the commencement of construction, a multi-year permafrost and terrain research and monitoring program for collaborative government–industry monitoring that engages government agencies with relevant scientific expertise in the development of and participation in the follow-up monitoring program. This program should continue into the post-abandonment phase of the Mackenzie Gas Project.</i></p>
<i>Adoption of Proposed NEB Conditions</i>	6-12	<p><i>The Panel recommends that, in addition to the foregoing Panel recommendations, the National Energy Board adopt its Proposed Conditions 10, 11, 12, 13, 14, 15, 16, 17, 18, 39, 40, 41, 42 and 43 as set out in the Proposed Conditions for the Mackenzie Valley Pipeline and Mackenzie Gathering System, and Proposed Condition 7 as set out for the Proposed Conditions for Shell Canada Limited (Shell) Development Plan for the Niglintgak Field and for Imperial Oil Resources Limited (IORL) Development Plan for the Taglu Field, amended to apply to the relevant proponent and component of the Mackenzie Gas Project and the Northwest Alberta Facilities, as final conditions in any certificate or approvals it might issue in relation to the Project or the Northwest Alberta Facilities.</i></p>

CHAPTER 7 — ACCIDENTS, MALFUNCTIONS AND EMERGENCY RESPONSE

<i>Arctic Marine Spills and Accidents</i>	7-1	<i>The Panel recommends that, within one year of the date of the Government Response to the Panel's Report, the Government of Canada publish a plan that demonstrates that Transport Canada has adequate capacity in place to ensure that spills and accidents in the Arctic marine environment are appropriately prevented, detected and remediated, and that contraventions of existing legislation will be prosecuted.</i>
<i>Spill Contingency Planning and Reporting</i>	7-2	<i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, prior to the commencement of construction and in conjunction with their Environmental Management Plans, the results of their discussions with the Government of the Northwest Territories regarding spill contingency planning and consolidated spills reporting and how the Proponents have addressed the concerns of the Government of the Northwest Territories in these areas.</i>
<i>Spill Prevention and Response — Highways</i>	7-3	<i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, prior to the commencement of construction and as part of their Environmental Management Plans, adequate mitigation measures for spill response for any bulk carriage of diesel or gasoline on roads within the Northwest Territories. At minimum, such mitigation should include the carriage of appropriate spill response kits on all trucks transporting diesel or gasoline and the development of a Spill Contingency Plan to be implemented in the event of a spill. Further, these mitigation measures should receive endorsement from the Government of the Northwest Territories prior to being filed with the National Energy Board.</i>
<i>Spill Prevention and Response — Hazardous Materials</i>	7-4	<i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, prior to the commencement of construction and as part of their Environmental Management Plans, the qualifications of the trained personnel monitoring the movement of controlled and hazardous goods and their plan for ensuring compliance with regulations and land use permits.</i>
<i>Spill Prevention and Response — Bulk Fuel Storage on Ice or Water</i>	7-5	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, prohibit the Proponents from storing Project-related bulk fuel or dangerous goods in or on ice or in or upon water without the prior approval of Transport Canada.</i></p> <p><i>The Panel further recommends that Transport Canada, when considering whether to grant an approval for storage of Project-related bulk fuel or dangerous goods in or on ice or in or upon water, have regard to whether there are logistically or economically practical alternatives to such storage. Where such storage is permitted, the Panel recommends that such storage not be allowed to occur in single-hulled barges and that the following mitigation is in place:</i></p> <ul style="list-style-type: none"> • <i>appropriate secondary containment;</i> • <i>an appropriate spill response kit; and</i> • <i>a minimum of weekly monitoring for any spills or leaks.</i>
<i>Spill Prevention and Response — Bulk Fuel Storage on Land</i>	7-6	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents, prior to the commencement of construction, to incorporate the following best management practices into management planning for refined petroleum products, hazardous materials and dangerous goods:</i></p> <ul style="list-style-type: none"> • <i>new bulk fuel storage facilities and any newly placed storage tanks meet the requirements of:</i> <ul style="list-style-type: none"> • <i>the most recent version of the National Fire Code of Canada;</i>

- *the Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products, Canadian Council of Ministers of the Environment, 2003 (including but not limited to Sections 3, 4, 8 and 9);*
- *equipment used for the purpose of refined petroleum product transfer and storage, including, but not limited to, fittings, valves, couplings and hoses, be designed for the environmental conditions under which it is to be used; and*
- *the Arctic Waters Oil Transfer Guidelines, April 1997, Transport Canada, be used for Arctic and inland waters operations.*

In the absence of federal or territorial regulations for the management of refined petroleum products, hazardous materials or dangerous goods, the Panel recommends that the Proponents adopt a relevant standard or best management practice in consultation with the appropriate regulatory authority. Where a best management practice requires a more stringent requirement than a regulation or standard, the best management practice must be followed.

Environmental Emergency Plans

7-7

The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, prior to the commencement of construction, their Environmental Emergency Plans to the appropriate regulatory authorities for review and approval. These plans should:

- *include:*
 - *an inventory of petroleum products, chemicals and other hazardous substances that will be transported, stored and/or used during pre-construction, construction and operational phases;*
 - *storage facilities and locations of inventoried products;*
 - *identification of resources (equipment and staff) to be on-site and/or available to respond to environmental emergencies;*
 - *procedures for responding to spills and releases, including an incident reporting and notification system;*
 - *a list of response contractors and their respective roles;*
 - *clean-up and disposal procedures for generated wastes;*
 - *identification of sensitive areas such as groundwater sites and sensitive habitat;*
 - *a commitment to design and implement, as appropriate, pre- and post-development monitoring to enable the Proponents to readily identify, respond to and rehabilitate spills and/or chronic contamination should such events occur;*
- *address:*
 - *the types of emergencies that might reasonably be expected to occur, including potential on-site and off-site consequences;*
 - *prevention (evaluation of risks), preparedness (resources and training), response (notification and mobilization of resources) and recovery (assessment of damages and restoration of environment);*
 - *involvement of communities and stakeholders who may be impacted by an environmental emergency or involved in an emergency response; and*
- *be consistent with industry standard publications such as CAN/CSA-Z731-03 Emergency Preparedness and Response and the requirements of all federal and territorial government departments and agencies.*

The Panel further recommends that the effectiveness of these Environmental Emergency Plans be evaluated by the National Energy Board and the appropriate regulatory authorities through exercises conducted each year in which Project-related construction takes place and every three years during operations. Local and territorial emergency authorities should be involved in these exercises as appropriate, and communities should be involved in these exercises to the extent possible considering logistical and safety concerns.

Accident and Malfunction Plans — Earthquakes	7-8	<i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to provide to the appropriate regulators for review and approval, in advance of the National Energy Board granting the Proponents Leave to Open, the Proponents' accident and malfunction plans that include response activities for earthquakes.</i>
Transportation Emergency Preparedness and Response Plan	7-9	<i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to provide to the appropriate regulators for review and approval, prior to the commencement of construction, an Emergency Preparedness and Response Plan for all forms of transportation associated with the Mackenzie Gas Project that includes a continuing education program for the public who might be affected by a transportation-related accident, malfunction or spill associated with the Project. At minimum, the continuing education program should outline how the Proponents and their transportation providers will inform the public of actions to be taken in the event of an emergency and how those potentially affected by an accident or malfunction would be informed of such an event.</i>
Local Spill Response Teams	7-10	<i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to provide, prior to the commencement of construction, as part of the Emergency Preparedness and Response Plan referred to in Panel Recommendation 7-9, their assessment of the potential for establishment of local, community-based spill response teams, their commitments to build community spill response capacity, and a discussion of opportunities and constraints in establishing local spill response teams.</i>
Spills Management — Mackenzie River	7-11	<i>The Panel recommends that, within one year of the date of the Government Response to the Panel's Report, the parties to the Northwest Territories/Nunavut Spills Working Agreement review, update and publish their plans to manage a Project-related accident or spill along the Mackenzie River or in the Mackenzie Delta. The update of these plans should address the specific measures to be taken to notify the public of any spills, the actions to be taken to notify the front-line members of the lead agency that has responsibilities flowing from the agreement, and a method to keep the plans up-to-date. The Panel also recommends that the parties conduct a mock exercise to test these plans. This exercise should be repeated each year that construction is under way and every three years during operations.</i>

CHAPTER 8 — AIR AND WATER QUALITY

Regional Air Quality Management Strategy	8-1	<i>The Panel recommends that, prior to approval of any facility that would enable the throughput of the Mackenzie Valley Pipeline to be increased above 1.2 Bcf/d, Environment Canada and the Government of the Northwest Territories develop a Regional Air Quality Management Strategy for the Northwest Territories to uphold the "Keeping Clean Areas Clean" principle and provide clear guidance to industry on air quality targets and expectations. The strategy should be developed in collaboration with key stakeholders, including industry. The Panel recommends that the National Energy Board not issue any certificate or approvals for any such facility until the Regional Air Quality Management Strategy and related targets are in place.</i>
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Final Design, Construction and Operations Procedures

8-2

The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, six months prior to the commencement of construction, for review by Environment Canada and the Government of the Northwest Territories, details of their final design as well as construction and operations procedures for upstream facilities, compressor facilities, gathering systems and pipelines that include information on:

- *measures to mitigate methane leakage and venting from all Project-related activities arising from well testing and completion, gas gathering and processing, compressor stations and the mainline piping and valve systems, taking into account existing and new best management practices under development in the natural gas industry;*
- *overall system operation optimization and maintenance scheduling to maximize system reliability and safety, optimize energy efficiency and minimize methane and air contaminant releases;*
- *design choices for the capture and use of exhaust energy at the Inuvik Area Facility; and*
- *design of compressor stations, including unit size, efficiency and conformity with National Emission Guidelines for Stationary Combustion Turbines (Canadian Council of Ministers of the Environment, 1992).*

Air Quality and Emissions Management Plan

8-3

The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, prior to the commencement of construction, a comprehensive Air Quality and Emissions Management Plan that:

- *demonstrates the application of best available technology and best management practices;*
- *provides for identifying, mitigating and tracking emissions of air pollutants and greenhouse gases from all Project-related sources throughout the life of the Mackenzie Gas Project; and*
- *enables the Mackenzie Gas Project's residual air pollutant emissions to meet the Northwest Territories' ambient air quality standards, Canada-Wide Standards for Particulate Matter (PM) and Ozone, National Ambient Air Quality Objectives, and any other applicable thresholds, including any air quality targets developed by Environment Canada and the Government of the Northwest Territories in compliance with Panel Recommendation 8-1.*

The Air Quality and Emissions Management Plan should include, but not be limited to:

- *a description of the best available technology to be implemented at each facility or, if best available technology is not proposed, evidence that a different technology standard will in fact enable the Mackenzie Gas Project to meet comparable goals;*
- *a description of the best management practices to be implemented at each facility and the Proponents' proposed continuous improvement efforts, including plans or strategies to prevent unnecessary vehicle idling and mitigate dust within and outside communities;*
- *an emissions tracking and monitoring system, including emissions reporting that is legally required (e.g. the National Pollutant Release Inventory);*
- *a commitment to reassess environmental impacts, in consultation with Environment Canada and the Government of the Northwest Territories, should significant changes occur to quality and quantity of existing facility emissions sources and new sources to be added to the Mackenzie Gas Project;*
- *an ambient Air Quality Monitoring Program including, but not necessarily limited to, passive nitrogen dioxide monitoring; and*
- *procedures for publicly available annual reporting.*

<i>Air Quality Impacts Monitoring Program</i>	8-4	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, prior to the commencement of construction, an Impacts Monitoring Program that addresses, but is not limited to, the following air quality issues:</i></p> <ul style="list-style-type: none"> • <i>impacts on northern communities during the construction phase;</i> • <i>impacts of Project-related nitrogen deposition within the Project Review Area on vegetation and wildlife habitat; and</i> • <i>impacts of accidents and malfunctions.</i> <p><i>The Impacts Monitoring Program must be developed in consultation with Environment Canada, the Government of the Northwest Territories, affected communities and Health Canada, and must identify mitigation measures and the means for implementation of those measures.</i></p>
<i>Waste Management Plan — Incineration</i>	8-5	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, prior to the commencement of construction, as part of their Waste Management Plan, a specific incineration management strategy that has been approved by the Government of the Northwest Territories and Environment Canada. The strategy should include:</i></p> <ul style="list-style-type: none"> • <i>an analysis of alternatives to incineration and, where incineration has been selected, an analysis of why it was the preferred option;</i> • <i>a description of technology and practices employed at each facility, including the incineration technology selected, the facility Waste Separation Program and the facility waste tracking system, to document the amount and types of waste incinerated;</i> • <i>a commitment to ship to an approved landfill all material that cannot be incinerated properly;</i> • <i>procedures for operational and maintenance record keeping;</i> • <i>details of operator training requirements;</i> • <i>details of emissions measurement methods, where applicable;</i> • <i>an Incineration Residuals-Testing and Reporting Program as well as disposal procedures that are in compliance with criteria specified in the Government of the Northwest Territories' Guideline for Industrial Waste Discharges in the NWT;</i> • <i>procedures for publicly available annual reporting;</i> • <i>a review of the strategy every five years if permanent incineration facilities are proposed; and</i> • <i>where permanent incineration facilities are proposed for the Mackenzie Gas Project, an Environmental Impacts Monitoring Plan to measure incineration-related toxins that is based on the results of further consultation with Environment Canada, the Government of the Northwest Territories and Health Canada.</i>
<i>Greenhouse Gas Emissions Targets</i>	8-6	<p><i>The Panel recommends that, if federal regulations under the Kyoto Protocol Implementation Act are not in place by the time the Proponents make their Decision to Construct the Mackenzie Gas Project, the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to establish, in collaboration with Environment Canada and the Government of the Northwest Territories, prior to the commencement of construction and in sufficient time to inform the final design, a greenhouse gas emissions target or series of targets based on an effective program involving:</i></p> <ul style="list-style-type: none"> • <i>a design philosophy based on rigorous conservation and efficiency;</i> • <i>extensive use of best available technology;</i>

- use of renewable energy technologies;
- best management practices;
- training and motivation of personnel; and
- a commitment to continuous improvement.

Should the legislation contemplated by Panel Recommendation 8-8 come into effect during the life of the Mackenzie Gas Project, whichever is the lower target should apply to the Project.

<i>Greenhouse Gas Emissions Monitoring</i>	8-7	<i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to include greenhouse gas emissions from their facilities in the Mackenzie Gas Project's ongoing monitoring program and to report annually following the commencement of construction, to the National Energy Board, Environment Canada, the Government of the Northwest Territories and the public on the Project's achievements with respect to the greenhouse gas emissions target.</i>
<i>Greenhouse Gas Emissions National Targets</i>	8-8	<i>The Panel recommends that the Government of Canada develop and implement, as soon as possible, legislation and regulations to reduce greenhouse gas emissions in Canada to meet or exceed existing national targets in the Climate Change Plan for Canada.</i>
<i>Preferential Use of Natural Gas</i>	8-9	<i>The Panel recommends that governments, particularly the Government of Canada, within three years of the date of the Government Response to the Panel's Report, include in their climate change policies and their climate action plans an implementation strategy involving legislation and non-legislative tools that will:</i> <ul style="list-style-type: none"> • <i>optimize the benefits of using natural gas as a transitional fuel in the process of developing a sustainable low-carbon economy; and</i> • <i>ensure that cleaner natural gas is preferentially used to replace and not augment more carbon-intensive and polluting fuels.</i>
<i>Greenhouse Gas Emissions in Environmental Assessments</i>	8-10	<i>The Panel recommends that the Canadian Environmental Assessment Agency, the Environmental Impact Review Board for the Inuvialuit Settlement Region, and the Mackenzie Valley Environmental Impact Review Board, within two years of the date of the Government Response to the Panel's Report, develop a guidance document on the assessment of greenhouse gas emissions in environmental assessments in which sustainability is an overarching objective or principle.</i>

CHAPTER 9 — FISH AND MARINE MAMMALS

<i>Fish and Fish Habitat Decision Trees</i>	9-1	<i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, six months prior to the commencement of construction, the final suite of decision trees they propose to employ to manage the impacts of the Mackenzie Gas Project on fish and fish habitat, including the decision-making process, the criteria for decision-making and the mitigation options. The decision trees should be developed in consultation with, and to the satisfaction of, Fisheries and Oceans Canada and the relevant management boards and agencies.</i> <p><i>In preparing the decision trees, the Proponents should outline how they will address the importance of relevant fish habitat and fish populations to local communities and harvesters, taking into consideration the information provided to them by Fisheries and Oceans Canada and the appropriate management boards and agencies.</i></p>
<i>DFO Management of Watercourse Crossings</i>	9-2	<i>The Panel recommends that Fisheries and Oceans Canada outline its strategic approach to managing the large number of watercourse crossings by the Mackenzie Gas Project and make that approach available to its management partners, the Proponents, stakeholders and the public. This strategic approach should be completed within three months of the date of the Government Response to the Panel's Report. The approach should make clear how Fisheries and Oceans Canada proposes to manage the review of the watercourse crossings and should set out the information it will require the Proponents to file and the time frame for filing same.</i>

<i>Stream Flow Mitigation</i>	9-3	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, six months prior to the commencement of construction, the monitoring program for impacts on fish and response actions to be taken for frost bulbs and aufeis, including monitoring at an appropriate level of coverage in space and time. The response actions should address situations where mitigation measures are not working as expected (e.g. reduced effectiveness of pipe insulation), and the Mackenzie Gas Project is posing a risk to fish populations. The monitoring program and response protocols should be reviewed and agreed to by the appropriate regulatory authorities prior to the commencement of construction.</i></p>
<i>Fish Habitat Compensation Plan</i>	9-4	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, no later than six months prior to the commencement of construction, a fish habitat compensation plan. The fish habitat compensation plan should be developed in consultation with, and to the satisfaction of, Fisheries and Oceans Canada. The plan should provide the basis for implementing effective habitat compensation measures such that the users of the local fisheries resource benefit from the habitat compensation measures over the long term. The plan should include:</i></p> <ul style="list-style-type: none"> <i>• the decision-making process to be used for achieving No Net Loss in accordance with Fisheries and Oceans Canada's National Habitat Management Policy, including how public and Aboriginal input will be incorporated;</i> <i>• locations of potential Project-related HADD sites and the method for quantifying HADD fish habitat associated with the Mackenzie Gas Project;</i> <i>• plans for fish habitat compensation measures to address HADD and the achievement of No Net Loss and the locations in which the plans are to be implemented;</i> <i>• the process the Proponents will follow, and the criteria they will consider, in the selection of compensation measures that would be implemented when the location of the mitigation is not at the site where the impacts are occurring; and</i> <i>• plans to be used to verify and measure the success of the fish habitat compensation techniques.</i>
<i>Fish Habitat Compensation Measures</i>	9-5	<p><i>The Panel recommends that, prior to issuing any authorizations under the Fisheries Act for activities related to the Mackenzie Gas Project, Fisheries and Oceans Canada develop a strategy for ensuring that effective habitat compensation measures are implemented by the Proponents, such that the users of the local fisheries resource benefit from the habitat compensation measures to the greatest extent possible over the long term and that Fisheries and Oceans Canada reflects the principles of this strategy in any authorizations it issues under the Fisheries Act for activities related to the Mackenzie Gas Project.</i></p>
<i>Fish and Fish Habitat Inspection and Enforcement</i>	9-6	<p><i>The Panel recommends that Fisheries and Oceans Canada, Environment Canada, Indian and Northern Affairs Canada, Transport Canada, the National Energy Board and any other department or agency with responsibility for inspection and enforcement in relation to fish or fish habitat or the aquatic and marine environments re-visit existing arrangements and develop a strategy that will provide for effective inspection and enforcement in relation to protecting fish, fish habitat, and the aquatic and marine environments in the north and in relation to Project-related activities. This strategy should also identify the resources necessary for its implementation, including identification of staff needed in the field to carry out the inspection and enforcement. The enforcement and inspection strategy should be completed prior to the commencement of construction and filed with the National Energy Board, as the lead regulatory agency for the Mackenzie Gas Project.</i></p>

<i>Dredging and Barge Landings Plans</i>	9-7	<p>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, at least six months prior to the commencement of construction, their final plans for Project-related dredging and installing barge landings. The plans should be developed in consultation with potentially affected communities and identify the concerns expressed by those communities and how those concerns have been addressed in the development of the plans. The plans should also be developed in consultation with, and to the satisfaction of, Fisheries and Oceans Canada and Transport Canada, and indicate how dredging activities will be undertaken so as to avoid conflict with community fisheries and provide for monitoring.</p>
<i>Dredging Plans — VLMs</i>	9-8	<p>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, at least six months prior to the commencement of dredging, their final plans for dredging in support of transport of the Very Large Modules and the Gas Conditioning Facility. The plans should be developed in consultation with, and to the satisfaction of, Fisheries and Oceans Canada, Environment Canada and Transport Canada. The plans should be developed in consultation with the Fisheries Joint Management Committee and the Inuvialuit Game Council as well as the potentially affected communities, and identify the concerns expressed by those bodies and how those concerns have been addressed in the development of the plans. The plans should include the specific measures proposed to address any adverse impacts and provide for monitoring.</p>
<i>Excavation/Dredging Plan — Niglintgak</i>	9-9	<p>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require Shell Canada Limited to file, either as an individual applicant or as a part of a filing in support of Panel Recommendation 9-8, at least six months prior to the commencement of construction, its plan for excavation/dredging at the site of the Gas Conditioning Facility at Niglintgak. Shell Canada Limited's plan should describe the potential impacts associated with dredging and the site-specific mitigation measures proposed to address those adverse impacts. The plan should be developed in consultation with the Fisheries Joint Management Committee and the Inuvialuit Game Council and indicate how the concerns of these bodies have been addressed in the plan. The plan should be developed in consultation with, and to the satisfaction of, Fisheries and Oceans Canada.</p>
<i>Marine Mammal Protection Plan</i>	9-10	<p>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, at least six months prior to any Project-related barging or marine transportation activity in the Beaufort Sea or Kugmallit Bay, a Marine Mammal Protection Plan that has been developed in consultation with, and endorsed by, Fisheries and Oceans Canada, other appropriate regulatory agencies, management boards and affected communities and that:</p> <ul style="list-style-type: none"> • prescribes the measures the Proponents will implement to protect marine mammals from adverse impacts and the monitoring and adaptive management activities to be undertaken; • reflects the compilation and consideration of all available data on the beluga harvest in order to refine Mackenzie Gas Project activity timing to avoid disturbing marine mammals and marine mammal harvesting; • includes development of maps that overlay both Project-related noise distribution and marine mammal distribution; • includes provision for on-board vessel experienced marine mammal observers during shipping activities and dredging. Marine mammal observers should be hired locally and the protocol for observations should be submitted to Fisheries and Oceans Canada and the management organizations for review and approval prior to filing with the National Energy Board; • includes the use of aerial surveys flown before ship transit and dredging in order to schedule or plan activities to avoid impacts to marine mammals; • identifies the zone of influence within which activity must be shut down or the route altered when marine mammals are observed;

- consistent with Panel Recommendations 9-8 and 9-9 describes dredging plans, including how dredging in relation to the transport of the Gas Conditioning Facility will be completed in one season. Dredging plans must include provision for consulting Hunters and Trappers Committees in Tuktoyaktuk, Inuvik and Aklavik and the Fisheries Joint Management Committee, and must avoid interference with the beluga harvest. Dredging should also be completed in one summer season — a one-time event occurring over less than two months in localized areas, if at all possible;
- includes protocols for observing, reporting and responding to monitoring results before dredging and transportation of the Gas Conditioning Facility;
- establishes a clear means of consultation and communication between hunters/communities and operators to ensure that dredging and Mackenzie Gas Project–related marine traffic does not occur in the areas to be traversed or dredged until after the communities of Tuktoyaktuk, Inuvik and Aklavik have completed their beluga whale hunt and that advance notification is provided to the Hunters and Trappers Committees in Tuktoyaktuk, Inuvik and Aklavik of when the barges will be transported through their areas in order to avoid negative interactions with marine mammal harvesting activities; and
- describes how the plan will be updated with the acquisition of annual monitoring data.

The plan should also be filed with the local communities, appropriate regulatory authorities and management organizations.

Marine Dredging	9-11	<i>The Panel recommends that Fisheries and Oceans Canada and Environment Canada require, as a condition of any authorization granted under the Fisheries Act or the Canadian Environmental Protection Act, 1999 for Project-related activities in relation to dredging or dredged spoil disposal in the vicinity of the Kittigazuit S-bends, that dredging and disposal of dredge spoils not commence until the date mutually agreed to by the Inuvialuit Game Council, Fisheries Joint Management Committee and local hunters. Fisheries and Oceans Canada and Environment Canada should communicate with the Proponents and with hunters for the purpose of incorporating appropriate measures in their regulatory approvals with a view to enabling dredging to begin as early as possible without adversely affecting the beluga whale hunt and to completing the dredging in one season.</i>
Marine Transportation Surveillance and Monitoring	9-12	<i>The Panel recommends that Fisheries and Oceans Canada, at least six months prior to any Project-related barging or marine transportation activity in the Beaufort Sea or Kugmallit Bay review its position with respect to aerial surveillance and monitoring in support of Mackenzie Gas Project vessel transits in the Beaufort Sea and develop a policy broadly applicable to shipping in the Beaufort Sea and potential increases in marine transportation activity in the future. The policy and program initiatives to manage and monitor vessel transit activities should include the requirement for overflights and observers on a basis that is fair and equitable to all operators and reflects the degree of risk to bowhead and beluga whale individuals and populations associated with particular types of operations.</i>
Beluga and Bowhead Whales — Baseline	9-13	<i>The Panel recommends that Fisheries and Oceans Canada work with its management partners and other international jurisdictions to increase its knowledge base regarding beluga and bowhead whale population levels, movements, feeding areas, behaviour and energetics in the Beaufort Sea and throughout their ranges, and to identify potential cumulative stressors on the populations, to build an understanding of the role and degree of impact that the Mackenzie Gas Project and future development in the Beaufort Sea may have at the individual and population levels.</i>
Ballast Water Control and Management Regulations	9-14	<i>The Panel recommends that, prior to the commencement of shipping activities in support of the Project that will transit the Beaufort Sea in Canada, Transport Canada prepare and publish its policy on how the Ballast Water Control and Management Regulations will be implemented and that Transport Canada demonstrate that it has an effective system for ensuring compliance with the regulations for Project-related shipping activities, including how and where inspectors will be deployed in order to prevent the introduction of non-indigenous invasive aquatic species.</i>

<i>Ballast Water Exchange Zone</i>	9-15	<i>The Panel recommends that the Government of Canada determine the feasibility of establishing a ballast water exchange zone for vessels prior to entry into the Beaufort Sea. Provided such a zone is feasible, Transport Canada should create the zone within three years of the date of the Government Response to the Panel's Report.</i>
<i>Ballast Water Control Management Regulations</i>	9-16	<i>The Panel recommends that Transport Canada evaluate the effectiveness of the Ballast Control and Management Regulations as applied to the Mackenzie Gas Project, with a particular emphasis on the scientific basis for the regulations. The evaluation should be completed and, if any amendments to the Ballast Control and Management Regulations are required as a result of the evaluation, necessary regulatory reform should be implemented within three years of the date of the Government Response to the Panel's Report.</i>
<i>Management of Harvest Pressures</i>	9-17	<i>The Panel recommends that, within two years of the date of the Government Response to the Panel's Report, Fisheries and Oceans Canada and its management partners review current harvest management programs and take the necessary steps to put in place the policies and programs to manage any increased harvest pressures and to enhance their public education and enforcement programs. Fisheries and Oceans Canada and its management partners should make public the actions they are taking to address increased harvest pressures.</i>

CHAPTER 10 — WILDLIFE

<i>Wildlife Protection and Management Plans</i>	10-1	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project or to the Northwest Alberta Facilities, require the Proponents and NOVA Gas Transmission Ltd., respectively, to file a Wildlife Protection and Management Plan specific to each of the following species as appropriate — woodland caribou, barren ground caribou, grizzly bear, polar bear and wolverine — and a General Wildlife Protection and Management Plan applicable to all other species of wildlife. These Wildlife Protection and Management Plans must be filed six months prior to the commencement of construction. These Wildlife Protection and Management Plans must be developed in consultation with, and to the satisfaction of, the governments of the Northwest Territories and Alberta, wildlife management boards and others as appropriate. The plans should reflect the geographic region and site-specific details of the facilities to which they will be applied and address issues related to fragmentation. The plans must include:</i></p> <ul style="list-style-type: none"> <i>• goals of the plan;</i> <i>• area covered by the plan, including at a minimum all areas within a specified radius of any Project-related facility or construction activity;</i> <i>• assumed zones of influence of Project activities, by activity and by species, and rationales for these assumptions;</i> <i>• timing and dates during which Project-related activities would occur so as to avoid or minimize conflict with caribou movement or sensitive feeding or calving times;</i> <i>• mitigation measures, including but not limited to those needed to minimize width of linear disturbances, maximize vegetation recovery, adjust timing of activities, limit harvesting, limit predator travel corridors, implement employee/contractor access management, ensure effective reporting, eliminate barriers to movements, and ensure effective communications and reporting;</i> <i>• monitoring components applicable to all phases of the Project, including but not limited to documenting vegetation recovery; documenting and reporting wildlife incidents, interactions and mortality; evaluating the effectiveness of access management; and establishing and maintaining linkages to regional programs;</i> <i>• any surveys and protocols to be employed to avoid or prevent impacts to wildlife, including the proposed timing of any den survey activities and how the Proponents will identify current year and active dens;</i>
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- identification of mitigation plans to avoid potential maternal denning areas;
- protocols for managing potential interactions between wildlife and humans, including measures to deter wildlife and, in particular, bears from entering camps and other facilities;
- any wildlife protection measures included in the Proponents' spill contingency plans;
- methods for tracking and reporting human–wildlife interactions and any wildlife mortality that may occur as a result of the implementation of measures contained in the spill contingency plans;
- education and awareness activities aimed at reducing the potential for human–wildlife conflicts at the Proponents' facilities;
- plans for monitoring responses of wildlife to Project activities during all phases of the Project;
- provisions for public consultation on access management;
- the process for updating the protection plan as information gaps are addressed; and
- processes for oversight and reporting and a description of how those processes will be implemented.

Each Wildlife Protection and Management Plan must also include details on how it will be implemented by each operator of a facility of the Mackenzie Gas Project or the Northwest Alberta Facilities, and, based on the advice of wildlife management boards, the measures each operator will take to enable the participation of local monitors. The Proponents and NOVA Gas Transmission Ltd. must file copies of the reports required by the monitoring provisions of the plans with the Government of the Northwest Territories, the Government of Alberta and the relevant wildlife management boards, as appropriate.

Yellow Rail and Western Toad	10-2	<p>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to conduct a survey in those parts of the Local Study Area where, based on the most recent assessment by the Committee on the Status of Endangered Wildlife in Canada, the yellow rail and western toad might occur, to confirm the presence or absence of those species. The survey must be designed to the satisfaction of Environment Canada and conducted prior to the commencement of construction. Where the presence of the yellow rail or western toad is confirmed as a result of the survey, the National Energy Board condition should require the Proponents to notify Environment Canada of the presence of the species, identify their proposed measures to avoid and lessen the impact of the Mackenzie Gas Project on the species, and identify their proposed monitoring measures.</p>
Listed Species Recovery Strategies and Action Plans	10-3	<p>The Panel recommends that Environment Canada complete recovery strategies and action plans as required by the Species at Risk Act, including the determination of critical habitat, for each of the woodland caribou, wood bison and peregrine falcon within one year of the date of the Government Response to the Panel's Report.</p>
Listed Species Assessments	10-4	<p>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project or the Northwest Alberta Facilities, require the Proponents and NOVA Gas Transmission Ltd., prior to the National Energy Board approving the final location of the pipeline route or any site for a facility included in the Mackenzie Gas Project or the Northwest Alberta Facilities, to do the following for any Listed species likely to be impacted by either project that is included in the Species At Risk Act public registry and for which the Ministers have adopted a recovery strategy and action plan:</p> <ul style="list-style-type: none"> • complete a species-specific survey for each Listed species occurring in any Regional Study Area; and

- based on specific mitigative measures developed in response to the information obtained in the survey, complete an assessment of Project-related impacts on each such Listed species in consideration of the requirements of the Species at Risk Act.

The impact assessments should be conducted directly on the Listed species where possible rather than using one or more indicator species and be filed with Environment Canada, the Government of the Northwest Territories, Alberta Sustainable Resource Development, and all relevant resource managers and wildlife management boards for their review and response.

The Panel further recommends that the National Energy Board take into consideration any responses received from Environment Canada, the Government of the Northwest Territories, Alberta Sustainable Resource Development, or any relevant resource managers and wildlife management boards in response to their review of the impact assessment prior to approving the final location of the pipeline route or any site for a facility included in the Mackenzie Gas Project or the Northwest Alberta Facilities.

The Panel further recommends that the National Energy Board, as a condition of any certificate of approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents, prior to the commencement of construction, to update their assessments of Listed species likely to be affected by the Mackenzie Gas Project.

<i>Cumulative Impacts on Listed Species</i>	10-5	<i>The Panel recommends that, prior to approval of any facility that would enable the throughput of the Mackenzie Valley Pipeline to be increased above 1.2 Bcf/d, Environment Canada conduct a regional review of the cumulative impacts on each Listed species occurring in the Project Review Area on which the proposed facility could reasonably be expected to have an impact. The regional review should be based on studies appropriate to the species in areas of potentially suitable habitat, generate results that can be used to determine mitigation options to avoid or minimize impacts on each species, and take place every five years thereafter for the life of the Mackenzie Gas Project.</i>
<i>Future Development and Woodland Caribou</i>	10-6	<i>The Panel recommends that, prior to authorizing any development beyond the Project as Filed, no agency having authority to permit resource development-related activities on the lands or waters within the range of woodland caribou in the Northwest Territories or northwest Alberta issue any new land use permit, lease, licence, authorization, water use permit or licence, certificate, or other form of permission unless the regulatory instrument contains site-specific or activity-specific measures that are the same as or similar to those the Panel is recommending be conditions of any certificate or approvals the National Energy Board might issue to the Proponents or to NOVA Gas Transmission Ltd. that are for the purpose of protecting woodland caribou, more specifically, those conditions set out in Panel Recommendations 5-1 and 10-1. For greater certainty, the recommended conditions, as noted, should be applied to all oil, gas and mineral exploration and development activities as well as the placement, construction, and operation of facilities and infrastructure, within the range of woodland caribou.</i>
<i>Parsons Lake Airstrip Operating Procedures</i>	10-7	<i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, prior to the commencement of construction, operating procedures for the Parsons Lake airstrip. The operating procedures should minimize the environmental impacts of airstrip operations, be developed in consultation with the Inuvik and Tuktoyaktuk Hunters and Trappers Committees, and indicate how the concerns of the Hunters and Trappers Committees have been addressed. These operating procedures should receive endorsement from Transport Canada prior to being filed with the National Energy Board.</i>

<i>Porcupine Caribou Herd Protection Plan</i>	10-8	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, prior to the commencement of construction, a plan to address any impacts from the Mackenzie Gas Project on the Porcupine caribou herd resulting from increased use of the Dempster Highway. This plan could be included as part of the Barren Ground Caribou Protection and Management Plan described in Panel Recommendation 10-1 or be developed in a stand-alone manner. The plan should address the concerns of and be developed in consultation with the Porcupine Caribou Management Board and the Government of Yukon. The contents, distribution and endorsement of the plan should also reflect the requirements outlined in Panel Recommendation 10-1 but be specific to the Porcupine caribou herd. As a matter of principle, the mitigation measures to reduce the impacts of vehicular traffic on wildlife should be developed and applied in a uniform and consistent manner throughout the Project Review Area.</i></p>
<i>Barren Ground Caribou Range Management Plans</i>	10-9	<p><i>The Panel recommends that the Government of the Northwest Territories, within two years of the date of the Government Response to the Panel's Report, develop range management plans for the winter ranges of the Cape Bathurst and Bluenose West barren ground caribou herds that include linear and area density development thresholds. These plans should be developed in consultation with the appropriate wildlife management boards.</i></p> <p><i>The Panel further recommends that these management plans be filed with the appropriate local and regional bodies responsible for environmental assessment and wildlife management, as well as with the administrative and regulatory bodies responsible for disposition of rights to land and water, for consideration when processing regulatory permits for any industrial or commercial activity in the Project Review Area that is within the winter ranges of the Cape Bathurst and Bluenose West barren ground caribou herds.</i></p>
<i>Barren Ground Caribou Range — Roads and Airstrips</i>	10-10	<p><i>The Panel recommends that the Government of Canada, the Inuvialuit Land Administration and the Government of the Northwest Territories jointly develop policies to restrict the proliferation of roads and airstrips within the ranges of Cape Bathurst and Bluenose West barren ground caribou herds. Those policies should be reflected in the Range Management Plans and the setting of linear and area density development thresholds, as outlined in Panel Recommendation 10-9.</i></p>
<i>Grizzly Bear Den Surveys</i>	10-11	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file annually during the construction phase, prior to the commencement of construction planned for the coming season, the results of their grizzly bear den surveys and whether and how grizzly bear dens would be avoided during construction. This information should also be provided to the Government of the Northwest Territories and wildlife management boards.</i></p>
<i>Grizzly Bear Range Management Plans</i>	10-12	<p><i>The Panel recommends that the governments of the Northwest Territories and Yukon and Parks Canada, within two years of the date of the Government Response to the Panel's Report, develop range management plans for grizzly bear, in consultation with the appropriate management agencies, boards and committees.</i></p>
<i>Polar Bear Research and Monitoring</i>	10-13	<p><i>The Panel recommends that the Government of the Northwest Territories and Environment Canada immediately develop a program in relation to the southern Beaufort Sea polar bear population to:</i></p> <ul style="list-style-type: none"> <i>• delineate potential maternity denning habitat and assessment of the potential for den disturbance;</i> <i>• assess the risk and potential impacts of offshore activities to the southern Beaufort Sea polar bear population;</i> <i>• assess the impact of nearshore activities on Inuvialuit polar bear hunting along the nearshore areas of the southern Beaufort Sea coast from Mackenzie Bay to the Tuktoyaktuk Peninsula;</i> <i>• identify key feeding areas in nearshore areas that are used by family groups of polar bears, especially females with young of the year just out of their maternity dens, and prime seal and bear habitat near the outer edge of the landfast ice;</i>

		<ul style="list-style-type: none"> • consider potential interaction of industrial development impacts with effects arising from climate variability and long-term climate change; and • monitor the Beaufort Sea polar bear populations so that such data can inform the management plan noted in Panel Recommendation 10-14.
<i>Polar Bear Range Management Plan</i>	10-14	<i>The Panel recommends that, within two years of the date of the Government Response to the Panel's Report, the Government of the Northwest Territories and Environment Canada develop a range management plan for polar bears in the southern Beaufort Sea Region based on information obtained from the program noted in Panel Recommendation 10-13.</i>
<i>Future Development and Polar Bears</i>	10-15	<i>The Panel recommends that, subject to any existing commitments, no government department or regulatory agency issue any rights for the exploration or development of any offshore oil and gas fields in the southern Beaufort Sea Region until the range management plan for polar bear referred to in Panel Recommendation 10-14 has been finalized and implemented.</i>
<i>Wildlife Protection and Management Plans — Listed Species</i>	10-16	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project or the Northwest Alberta Facilities, require the Proponents and NOVA Gas Transmission Ltd. to include in their Wildlife Protection and Management Plans required by Panel Recommendation 10-1 for each species at risk for which there is a plausible and likely interaction with any Project-related activity or facility measures that include but are not limited to:</i></p> <ul style="list-style-type: none"> • <i>the location of any observations of Listed species or species classified as at risk or that may be at risk on the most recent NWT General Status Ranks or The General Status of Alberta Wild Species;</i> • <i>identification of mitigation measures that:</i> <ul style="list-style-type: none"> • <i>avoid or minimize disturbance;</i> • <i>minimize the development footprint in habitats known to support Listed species;</i> • <i>where Listed species are present, schedule activities so as to avoid disturbance;</i> • <i>implement access management;</i> • <i>ensure effective reporting and data sharing;</i> • <i>minimize disturbance from vehicle and air traffic; and</i> • <i>ensure effective communication with the public; and</i> • <i>identification of monitoring activities that:</i> <ul style="list-style-type: none"> • <i>document habitat loss and habitat change;</i> • <i>document incidents, interactions and mortality; and</i> • <i>assess effectiveness of access management.</i>
<i>Wood Bison Plan</i>	10-17	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, prior to the commencement of construction, a plan in relation to wood bison that has been endorsed by the Government of the Northwest Territories and that documents:</i></p> <ul style="list-style-type: none"> • <i>measures to avoid creation of preferred bison habitat;</i> • <i>a monitoring program to detect wood bison use of the Mackenzie Gas Project's right-of-way; and</i> • <i>a process to develop mitigation measures in consultation with the Government of the Northwest Territories if wood bison start using the Mackenzie Gas Project's right-of-way.</i>

Short-Eared Owls and Rusty Blackbirds Surveys 10-18 *The Panel recommends that the National Energy Board, as a condition of any certificate or approval it might issue in relation to the Mackenzie Gas Project, require the Proponents to file with the Government of the Northwest Territories information they collect from their pre-construction, construction and post-construction surveys and monitoring programs in relation to short-eared owls and rusty blackbirds.*

Peregrine Falcon Protection and Management Plan 10-19 *The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, prior to the commencement of construction, a Peregrine Falcon Protection and Management Plan that includes the following restrictions on Project-related activities or facilities:*

Restricted Activity Period	Activity	Setback Distance from Nest Site
April 15 to September 1	Permanent structures or long-term habitat disturbance (e.g. pipeline right-of-way, road, quarry, campsite, etc.)	1,000 m
April 15 to September 1	Ground and air access	1,000 m
April 15 to September 1	Aircraft overflight	760 m above ground level
April 15 to September 1	Blasting	1,000 m

Raptor Protection and Management Plan 10-20 *The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, prior to the commencement of construction, a Protection and Management Plan for Raptors, other than peregrine falcons but including bald and golden eagles, that includes the following restrictions on Project-related activities or facilities:*

Restricted Activity Period	Activity	Setback Distance from Nest Site
March 30 to July 31	Permanent structures or long-term habitat disturbance (e.g. pipeline right-of-way, road, quarry, campsite, etc.)	1,000 m
March 30 to July 31	Ground and air access	1,000 m
March 30 to July 31	Aircraft overflight	760 m above ground level
March 30 to July 31	Blasting	1,000 m

<i>Habitat Offsets Plan for Subsidence</i>	10-21	<p><i>The Panel recommends that Environment Canada, in relation to resource extractive activities, prepare a plan for compensation that addresses habitat offsets with respect to subsidence-induced habitat loss within the Kendall Island Bird Sanctuary or within any offset areas. The plan must be prepared for review and approval by the Inuvialuit Regional Corporation, the Inuvialuit Game Council and resource managers with responsibility for migratory birds or disposition of rights to lands or resources in the Kendall Island Bird Sanctuary or in potential offset areas, and be finalized within two years of the date of the Government Response to the Panel's Report.</i></p> <p><i>The Environment Canada plan must reflect the following:</i></p> <ul style="list-style-type: none"> • <i>the principle that habitat offsets will reflect and be based on the projected extent of subsidence-induced flooding within the Kendall Island Bird Sanctuary;</i> • <i>the principle that the quantum of habitat that will be set aside through habitat offsets will be the amount of the projected extent of subsidence-induced flooding multiplied by an offset factor reflecting a precautionary approach to conservation, but not less than a factor of five to one;</i> • <i>the identification of the location of the preferred offset area(s) and the actual areas recommended for offset;</i> • <i>the schedule of fees (on a cost-recovery basis) that will be charged to proponents whose development activities would require lands to be set aside to offset the impact of their activities on migratory bird habitat;</i> • <i>identification of the owners of the surface and subsurface of offset area(s) if the lands are not owned by the Crown; and</i> • <i>the preferred legislative, regulatory or policy mechanism for setting aside and protecting the offset lands and the means for achieving same.</i> <p><i>The plan should apply to the subsidence effects of the Mackenzie Gas Project and to any future developments, to the extent that these may affect the Kendall Island Bird Sanctuary or any offset areas that may have been put in place. Once approved, Environment Canada should make the plan public.</i></p>
<i>Implementation of Habitat Offsets Plan for Subsidence</i>	10-22	<p><i>The Panel recommends that, within two years of Environment Canada filing its plan as required in Panel Recommendation 10-21, the Government of Canada take the necessary steps to adopt Environment Canada's plan and to put in place legislative and policy measures to implement it, inclusive of:</i></p> <ul style="list-style-type: none"> • <i>selection of the offset lands that will be withdrawn and the mechanisms by which those lands will be set aside and withdrawn from industrial activities;</i> • <i>the procedures by which land issues with third-party land or rights holders will be settled; and</i> • <i>formal protection of lands selected for offset (including permanent protection or interim protection that will be in place until it is determined that the offsets are no longer required).</i> <p><i>To optimize availability and protection of suitable habitat for migratory birds, formal protection of the offset lands should be completed prior to the National Energy Board granting Leave to Open under any certificate or approvals issued by the National Energy Board for or in relation to the Mackenzie Gas Project.</i></p>
<i>Implementation of KIBS Policy</i>	10-23	<p><i>The Panel recommends that, within three years of the Government Response to the Panel's Report, the Governor-in-Council develop and take steps to promulgate regulations specific to the Kendall Island Bird Sanctuary under appropriate legislation for the management of the Sanctuary and offset lands that:</i></p> <ul style="list-style-type: none"> • <i>are for the purpose of preserving and enhancing the habitat of and environment for migratory birds in accordance with the Migratory Birds Convention;</i>

- incorporate the 1% policy that Environment Canada has been implementing thus far;
- specify whether this 1% policy applies to the land area only or to the entire area included in the Kendall Island Bird Sanctuary;
- prohibit the issuance of subsurface or surface rights in the Kendall Island Bird Sanctuary and offset lands to third parties; and
- restrict the activities, if any, that are permitted in the Kendall Island Bird Sanctuary and offset lands.

<i>Air Operations Plan — Taglu</i>	10-24	<p>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to prepare an Air Operations Plan for the Taglu facility. Such a plan must identify the initiatives and procedures that will be undertaken to minimize the impact of aircraft activity on migratory birds. The plan must be developed in consultation with, and to the satisfaction of, Environment Canada, Transport Canada, and other appropriate regulatory authorities and the plan must be in place prior to the commencement of construction. The plan should describe:</p> <ul style="list-style-type: none"> • the goals of the plan; • the measures to be used to avoid, prevent or minimize adverse impacts to migratory birds, their nests, eggs or habitat; • the protocols for use of the airstrip, heliport and associated facilities consistent with the goals of the plan; • the program for monitoring impacts during operations and the responses proposed to address unforeseen effects; • procedures for updating the plan, as required; and • reporting requirements and frequency.
<i>De-Icing Fluid Management</i>	10-25	<p>The Panel recommends that the National Energy Board require the Proponents to include a provision in their Environmental Protection Plans that all ethylene glycol or any other fluids used by the Proponents for de-icing purposes for any Project-related activities be contained and recovered for recycling or disposal.</p>
<i>Noise Emissions — KIBS</i>	10-26	<p>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to design any facilities to be located in the Kendall Island Bird Sanctuary such that noise emissions from those facilities meet or are below 50 dBA at 300 m from the fence line.</p>

CHAPTER 11 — CONSERVATION MANAGEMENT AND PROTECTED AREAS

<i>Candidate Protected Areas — Permanent Protection</i>	11-1	<p>The Panel recommends that, within one year of the date of the Government Response to the Panel's Report, the governments of Canada and the Northwest Territories, together with relevant Aboriginal organizations, establish a firm timeline for implementing permanent protection for existing candidate protected areas in the Mackenzie Valley.</p>
<i>Withdrawals from Disposition</i>	11-2	<p>The Panel recommends that, within one year of the date of the Government Response to the Panel's Report, the Governor-in-Council formally withdraw from disposition the following lands for the purpose of achieving interim protection of conservation values:</p> <ul style="list-style-type: none"> • all identified candidate protected areas awaiting interim protection; • all identified areas of interest awaiting further study and assessment; and • all identified Northwest Territories Protected Areas Strategy Goal 2 areas that may be required to complete a network of core representative areas in each of the 16 ecoregions in the Mackenzie Valley.

		<i>The Panel recommends that these lands be withdrawn until such time as permanent protection is achieved for these areas as modified through final boundary determination.</i>
Implementation of Action Plan (2004–2009) — Completion	11-3	<p><i>The Panel recommends that, prior to the commencement of construction, the governments of Canada and the Northwest Territories, working with all partners in the Northwest Territories Protected Areas Strategy process, complete implementation of the Mackenzie Valley Five-Year Action Plan (2004–2009), including:</i></p> <ul style="list-style-type: none"> • <i>identification and interim protection of all Goal 1 areas; and</i> • <i>identification and interim protection of all Goal 2 areas in each of the 16 ecoregions, subject to the consent of the appropriate Aboriginal authorities in the affected settlement areas.</i>
Assessment of Goal 2 Areas	11-4	<i>The Panel recommends that the Government of the Northwest Territories provide the Proponents, industry, regulatory authorities and planning boards with the results of their assessments of Goal 2 ecologically representative areas in the 16 ecoregions as they are completed.</i>
Communication by Proponents	11-5	<i>The Panel recommends that the Proponents communicate and consult directly with the Northwest Territories Protected Areas Strategy Steering Committee staff during route selection for the Mackenzie Gas Project to exchange information on any matters associated with the establishment of a network of permanently protected areas that may affect or be affected by the Mackenzie Gas Project.</i>
Implementation of Action Plan (2004–2009) — Resources	11-6	<i>The Panel recommends that, within one year of the date of the Government Response to the Panel's Report, the governments of Canada and the Northwest Territories provide the Northwest Territories Protected Areas Strategy process with sufficient financial and technical resources to complete the implementation of the Mackenzie Valley Five-Year Action Plan (2004–2009). In addition, these governments should allocate appropriate and adequate financial and technical resources annually to complete the establishment of and implementation of a network of protected areas in the Mackenzie Valley.</i>
Landscape Thresholds and Limits of Acceptable Change	11-7	<i>The Panel recommends that, within three years of the date of the Government Response to the Panel's Report, the bodies responsible for developing Community Conservation Plans and land use plans in the Inuvialuit Settlement Region, the Gwich'in Settlement Area, the Sahtu Settlement Area and the Dehcho Region establish and incorporate landscape thresholds and limits of acceptable change for valued socio-cultural and ecological components into Community Conservation Plans and regional land use plans, including, as appropriate, the core habitat and development density thresholds that apply to boreal caribou, barren ground caribou, grizzly bear, migratory birds and beluga.</i>
Future Development Authorizations	11-8	<i>The Panel recommends that no regulatory agency issue any authorization for an activity or any authorization or approval for a facility that would enable the throughput of the Mackenzie Valley Pipeline to be increased above 1.2 Bcf/d until Community Conservation Plans and land use plans, that incorporate socio-cultural and ecological thresholds for the region in which the activity would occur or the facility would be located, have been approved by the appropriate parties.</i>
Guidance from Wildlife Range Management Plans	11-9	<i>The Panel recommends that the bodies responsible for the development and updating of Community Conservation Plans and land use plans in each region incorporate guidance from the Wildlife Range Management Plans referred to in Panel Recommendations 10-9, 10-12 and 10-14 and any other applicable wildlife range management plans.</i>
Legal Enforceability of Community Conservation Plans in the ISR	11-10	<i>The Panel recommends that within two years of the date of the Government Response to the Panel's Report, the Government of Canada, in consultation with the Inuvialuit, introduce legislative provisions that would provide legal enforceability to approved Inuvialuit Community Conservation Plans comparable to the status of approved land use plans in the Mackenzie Valley and no regulatory agency issue any authorization for an activity or any authorization or approval of a facility that would enable the throughput of the Mackenzie Valley Pipeline to be increased above 1.2 Bcf/d until the Community Conservation Plans have legal enforceability equivalent to approved land use plans in the Mackenzie Valley.</i>

<i>Strategic Assessment of Beaufort Sea Exploration and Development</i>	11-11	<i>The Panel recommends that, within two years of the date of the Government Response to the Panel's Report, the Government of Canada, in conjunction with the relevant responsible parties, complete the proposed strategic environmental assessment of future oil and gas exploration and development in the Beaufort Sea.</i>
<i>Mackenzie Delta Special Management Area — Establishment</i>	11-12	<i>The Panel recommends that Indian and Northern Affairs Canada, Environment Canada, Fisheries and Oceans Canada, and the Government of the Northwest Territories, in collaboration with the Inuvialuit Game Council, the Inuvialuit Regional Corporation, and, as appropriate, the Gwich'in Tribal Council and the Gwich'in Renewable Resources Board, and in consultation with industry, establish the greater Mackenzie Delta as a special management area prior to any authorization for an activity or any authorization or approval of a facility that would enable the throughput of the Mackenzie Valley Pipeline to be increased above 1.2 Bcf/d.</i>
<i>Mackenzie Delta Special Management Area — Funding</i>	11-13	<i>The Panel recommends that, within one year of the date of the Government Response to the Panel's Report, the governments of Canada and the Northwest Territories make available to the appropriate parties adequate financial and technical resources to support the development and implementation of the Mackenzie Delta as a special management area.</i>
<i>Mackenzie Delta Impact Assessment</i>	11-14	<i>The Panel recommends that any proposed developments on the Mackenzie River or its major tributaries that could have the effect of altering the hydrological regime of the Mackenzie Delta, and that might have environmental impacts on the values protected by the proposed special management area recommended in Panel Recommendation 11-12, be subject to a public consultation and review process that considers impacts on the Mackenzie Delta directly.</i>
<i>Interim Protection — Sahtu Settlement Area</i>	11-15	<i>The Panel recommends that no regulatory agency issue any authorization for an activity or any authorization or approval for a facility in the Sahtu Settlement Area that would enable the throughput of the Mackenzie Valley Pipeline to be increased above 1.2 Bcf/d, until Indian and Northern Affairs Canada has established, through withdrawal from disposition, interim protection of lands identified in the draft Sahtu Land Use Plan as having high conservation value or traditional and cultural importance.</i>
<i>Approval of Sahtu Land Use Plan</i>	11-16	<i>The Panel recommends that no regulatory agency issue any authorization for an activity or any authorization or approval for a facility in the Sahtu Settlement Area that would enable the throughput of the Mackenzie Valley Pipeline to be increased above 1.2 Bcf/d, until the Sahtu Land Use Plan has been completed and approved by the responsible parties.</i>
<i>Funding of Sahtu Land Use Plan</i>	11-17	<i>The Panel recommends that the governments of Canada and the Northwest Territories make available immediately to the appropriate parties sufficient financial and technical resources to complete and approve the Sahtu Land Use Plan.</i>
<i>Approval of Dehcho Land Use Plan</i>	11-18	<i>The Panel recommends that no regulatory agency issue any authorization for an activity or authorization or approval for any facility in the Dehcho Region that would enable the throughput of the Mackenzie Valley Pipeline to be increased above 1.2 Bcf/d until the Dehcho First Nations and the governments of the Northwest Territories and Canada approve a Dehcho Land Use Plan.</i>

CHAPTER 12 — HARVESTING

<i>Harvester Compensation Agreements (NWT) — Content</i>	12-1	<i>The Panel recommends that the Governor-in-Council, pursuant to section 8 of the Territorial Lands Act, as a condition of disposing of any federal Crown land required for the Mackenzie Gas Project, require the Proponents to conclude a harvester compensation agreement for each of the Inuvialuit Settlement Region, the Gwich'in Settlement Area, the Sahtu Settlement Area and the Dehcho Region of the Northwest Territories.</i>
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The Panel further recommends that in each of the above noted regions the agreements be concluded with a single harvester organization that acts on behalf of all harvesters in the region, that the Government of Canada provide funds to each regional harvester organization to negotiate harvester compensation agreements with the Proponents, and that each agreement address, at a minimum, the following:

- the scope of coverage (what is eligible for compensation);
- eligibility criteria (who is eligible for compensation);
- categories of remedies available and choices available to the claimant;
- the specific process for making compensation claims (the steps required of the claimant and of the Proponents);
- the information required to substantiate a claim (both burden of proof and extent of loss);
- roles and responsibilities of each party to the agreement in processing and, if necessary, adjudicating compensation claims;
- any additional resources that may be required by Aboriginal authorities that have responsibilities for assisting harvesters with their claims;
- the time frame for reviewing and awarding a claim;
- the process for communicating and informing harvesters about the compensation program;
- provision for mediation;
- a dispute resolution mechanism;
- the enforceability of the agreement; and
- any other matter of importance to either party to the agreement.

<i>Harvester Compensation Agreements (NWT) — Communication</i>	12-2	<i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file the completed harvester compensation agreements (referred to in Panel Recommendation 12-1) with the National Energy Board six months prior to the commencement of construction and to communicate the substance of each agreement with all affected harvesters no later than two months after filing the completed agreement.</i>
<i>Harvester Compensation Agreements (NWT) — Future Developments</i>	12-3	<i>The Panel recommends that the Government of Canada, when disposing of federal Crown land for the purposes of oil and gas development in the Northwest Territories, require the proponent to comply with the same or equivalent conditions, mitigation measures or commitments with respect to harvester compensation agreements as govern the Proponents of the Mackenzie Gas Project.</i>
<i>Harvester Compensation Agreements (Alberta) — Content</i>	12-4	<p><i>The Panel recommends that the Government of Alberta, as a condition of disposing of any provincial Crown land required for the Northwest Alberta Facilities, require NOVA Gas Transmission Ltd. to conclude a harvester compensation agreement with the Dene Tha' First Nation prior to the commencement of construction of the Northwest Alberta Facilities.</i></p> <p><i>The Panel further recommends that NOVA Gas Transmission Ltd. conclude the harvester compensation agreement with the Dene Tha' First Nation, or other harvester organization that acts on behalf of all harvesters in the region that might be affected by the Northwest Alberta Facilities, that Indian and Northern Affairs Canada provide funds to the Dene Tha' First Nation or other harvester organization to negotiate the harvester compensation agreement with NOVA Gas Transmission Ltd., and that the agreement address, as a minimum, the following:</i></p> <ul style="list-style-type: none"> • the scope of coverage (what is eligible for compensation); • eligibility criteria (who is eligible for compensation); • categories of remedies available and choices available to the claimant; • the specific process for making compensation claims (the steps required of the claimant and of NOVA Gas Transmission Ltd.); • the information required to substantiate a claim (both burden of proof and extent of loss);

- roles and responsibilities of each party to the agreement in processing and, if necessary, adjudicating compensation claims;
- any additional resources that may be required by Aboriginal authorities that have responsibilities for assisting harvesters with their claims;
- the time frame for reviewing and awarding a claim;
- the process for communicating and informing harvesters about the compensation program;
- provision for mediation;
- a dispute resolution mechanism;
- the enforceability of the agreement; and
- any other matter of importance to either party to the agreement.

Harvester Compensation Agreements (Alberta) — Communication

12-5

The Panel recommends that the appropriate regulatory authority, as a condition of any licence or authorization it might issue in relation to the Northwest Alberta Facilities, require NOVA Gas Transmission Ltd. to file the concluded harvester compensation agreement (referred to in Panel Recommendation 12-4) six months prior to the commencement of construction of the Northwest Alberta Facilities and to communicate the substance of the agreement to all affected harvesters no later than two months after filing the completed agreement.

Worst-Case Scenarios

12-6

The Panel recommends that the National Energy Board include as conditions of any certificate or approvals it might issue in relation to Mackenzie Gas Project facilities in the Inuvialuit Settlement Region:

- the specific commitments as set out in Section 12.5.1 of this Report that the Proponents have made with respect to mitigating negative impacts on wildlife harvesting in the Inuvialuit Settlement Region; and
- evidence of financial responsibility in a form and amount satisfactory to the National Energy Board to cover the liability from individual Proponents as described in the estimates for the worst-case scenario in the Inuvialuit Settlement Region and as set out in Section 12.5.3 of this Report.

CHAPTER 13 — LAND USE AND HERITAGE RESOURCES

Granular Management Plan/Pit and Quarry Management Plans

13-1

The Panel recommends that:

- (a) No pit or quarry permit in the Northwest Territories be issued to the Proponents in relation to the Mackenzie Gas Project by Indian and Northern Affairs Canada or any Aboriginal or private land owner until the Proponents file with the landowner geotechnical information and a Pit or Quarry Management Plan for each borrow pit or quarry from which they intend to extract granular resources for the Mackenzie Gas Project.
- (b) Indian and Northern Affairs Canada develop a Granular Management Plan that includes the Inuvialuit Settlement Region, the Gwich'in Settlement Area, the Sahtu Settlement Area and the Dehcho Region using information obtained in Panel Recommendation 13-1(a) as well as existing information. The Granular Management Plan must be developed in consultation with owners of Aboriginal private lands and the Government of the Northwest Territories and be endorsed by the Government of the Northwest Territories. The Granular Management Plan is to be developed within two years of the date of the Government Response to the Panel's Report.
- (c) The Granular Management Plan be based on the following principles:
 - granular resources are finite and non-renewable;
 - granular resources must be managed according to impact thresholds; and
 - priority allocations be given to Northwest Territories community and regional needs.

		<p>(d) Following completion of the Granular Management Plan in Panel Recommendation 13-1(b), Indian and Northern Affairs Canada and any Aboriginal or private land owner issue only a pit or quarry permit for granular resources in the Mackenzie Delta or Mackenzie Valley that is informed by, and consistent with, the Granular Management Plan.</p> <p>(e) Indian and Northern Affairs Canada, in consultation with owners of Aboriginal private lands and the Government of the Northwest Territories, maintain and update its granular resource database and the Granular Management Plan identified in Panel Recommendation 13-1(b) at least every five years.</p>
<i>Granular Management Plan</i>	13-2	<i>The Panel recommends that the National Energy Board not approve any facility that would enable the throughput of the Mackenzie Valley Pipeline to be increased above 1.2 Bcf/d until the Granular Management Plan in Panel Recommendation 13-1(b) is completed.</i>
<i>Merchantable Timber</i>	13-3	<i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to notify and consult with Aboriginal and municipal authorities in each community proximate to the Mackenzie Valley Pipeline right-of-way with regard to community use of merchantable timber that would be cleared along the Mackenzie Valley Pipeline right-of-way. Where consultations lead to an agreement between the parties with respect to the decking of, and liability for, cleared timber, these agreements must be filed with the National Energy Board prior to the commencement of construction of the relevant spread.</i>
<i>Timber Supply Feasibility Study</i>	13-4	<i>The Panel recommends that the Government of the Northwest Territories, with the involvement of the Proponents and Aboriginal authorities in those Northwest Territories Project Review Area communities that have either existing sawmilling capabilities or propose to acquire these capabilities, conduct a feasibility study for the potential supply of Northwest Territories-produced timber products to the Mackenzie Gas Project. The feasibility study should be completed and made public within six months of the Proponents' Decision to Construct.</i>
<i>Heritage Resources Impact Assessments</i>	13-5	<p><i>The Panel recommends that:</i></p> <p>(a) <i>The Mackenzie Valley Land and Water Board and Indian and Northern Affairs Canada, as a condition of any licence or permit they might issue in relation to the Mackenzie Gas Project, require the Proponents to file heritage resources impact assessments for all Project-related facilities, including borrow pits and quarries, that have been completed to the satisfaction of the Prince of Wales Northern Heritage Centre.</i></p> <p>(b) <i>The Mackenzie Gas Project heritage resources impact assessments referred to in Panel Recommendation 13-5(a) be completed and submitted to the Prince of Wales Northern Heritage Centre sequentially by pipeline right-of-way clearing spread and in the order that the spreads are scheduled to be cleared, and that the assessments for each spread be filed at least six months prior to the proposed commencement of Project-related clearing or construction activity on each respective spread.</i></p>
<i>Heritage Resources Management Plan</i>	13-6	<p><i>The Panel recommends that:</i></p> <p>(a) <i>The Mackenzie Valley Land and Water Board and Indian and Northern Affairs Canada as a condition of any licence or permit they might issue in relation to the Mackenzie Gas Project, require the Proponents to file, at least one month prior to the commencement of construction, a final Heritage Resources Management Plan as approved by the Prince of Wales Northern Heritage Centre.</i></p> <p>(b) <i>The National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, at least one month prior to the commencement of construction, the Heritage Resources Management Plan, as approved by the Prince of Wales Northern Heritage Centre.</i></p>

CHAPTER 14 — PUBLIC INFRASTRUCTURE AND HOUSING

<i>Transportation and Logistics Plan</i>	14-1	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, six months prior to the commencement of construction, a Transportation and Logistics Plan, approved by the Government of the Northwest Territories, that documents measures to:</i></p> <ul style="list-style-type: none"> • <i>maintain or enhance safety on the Northwest Territories' highway system, including winter roads, as a result of Project-related traffic;</i> • <i>facilitate traffic flow as a result of Project-related traffic;</i> • <i>ensure community access at all times in the event of an emergency during construction of the Project; and</i> • <i>guarantee community resupply during construction of the Project.</i> <p><i>The plan must be developed in consultation with affected communities.</i></p>
<i>Community Services/Infrastructure</i>	14-2	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to demonstrate, at least six months prior to the commencement of construction, that they have concluded fee-for-service agreements with affected communities respecting the use of community services or infrastructure facilities.</i></p>
<i>Waste Management Plan</i>	14-3	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file with the National Energy Board and the Government of the Northwest Territories, prior to the commencement of construction, a Waste Management Plan that incorporates all of the Proponents' commitments and regulatory requirements. The plan should also include reporting requirements developed in consultation with the Government of the Northwest Territories.</i></p>

CHAPTER 15 — ECONOMIC IMPACTS

<i>Dehcho Benefit Agreement</i>	15-1	<p><i>The Panel recommends that, should the Project proceed, the Proponents and the Dehcho First Nations make best efforts to finalize a Benefit Agreement with respect to the Mackenzie Gas Project and that this agreement be concluded at least six months prior to the commencement of construction in the Dehcho Region. If the Proponents and the Dehcho First Nations are not able to conclude the Benefit Agreement negotiations in that time frame, the Panel recommends that the Proponents negotiate infrastructure and construction "set-aside" contracts with Dehcho First Nations business entities and that these negotiations be concluded prior to the commencement of construction in the Dehcho Region.</i></p>
<i>Literacy Programs</i>	15-2	<p><i>The Panel recommends that the Government of Canada immediately restore funding to at least previous levels for literacy programs in the Northwest Territories and Yukon Territory.</i></p>
<i>Training Plan Implementation</i>	15-3	<p><i>The Panel recommends that the Government of the Northwest Territories immediately assume the responsibility for coordinating implementation of training plans related to the construction phase of the Mackenzie Gas Project.</i></p>
<i>Aboriginal Skills and Employment Partnership</i>	15-4	<p><i>The Panel recommends that governments and industry collaborate to further fund the Aboriginal Skills and Employment Partnership program so as to deliver transferable construction trades training for Northwest Territories residents and that this program re-commence immediately following a Decision to Construct by the Proponents.</i></p>
<i>Project Labour Agreement</i>	15-5	<p><i>The Panel recommends that the Proponents, following their Decision to Construct, and should the Proponents decide that the Mackenzie Valley Pipeline and the Mackenzie Gathering System be a union project, require their contractors as soon as practical to enter into a project labour agreement with the pipeline craft unions that includes commitments made by Northern Pipeline Projects Ltd. during the Panel's hearings to:</i></p>

- streamline and simplify the process for northerners to join the pipeline craft unions, including the lowering of initiation fees;
- promote and provide training of northerners for pipeline employment;
- promote northern hire, including preferential hiring of union trained northerners; and
- contribute to positive and equitable conditions during the construction phase of the Mackenzie Gas Project.

The Panel further recommends that the craft unions consult with the Government of the Northwest Territories in relation to the coordination of training plan implementation as referred to in Panel Recommendation 15-3.

<i>Operations Training Program</i>	15-6	<i>The Panel recommends that the Proponents and their partners re-commence, as soon as practical following the Proponents' Decision to Construct, the Pipeline Facilities Operations Training Program to deliver operations training for Northwest Territories residents and that this program continue for as long as the parties to the program deem necessary.</i>
<i>Inclusion of Yukon</i>	15-7	<i>The Panel recommends that the Proponents immediately expand their Human Resource Training and Employment Database for the Mackenzie Gas Project to include the Yukon Territory.</i>
<i>Whitehorse as Point-of-Hire</i>	15-8	<i>The Panel recommends that the Proponents, immediately following their Decision to Construct, designate Whitehorse as a point-of-hire from which Mackenzie Gas Project employees would be transported to and from worksites at the Proponents' expense, or at the expense of their contractors.</i>
<i>Diversity Plans</i>	15-9	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, three months prior to the commencement of construction, diversity plans, inclusive of gender equality, for both the construction and operations phases of the Mackenzie Gas Project. The plans should include:</i></p> <ul style="list-style-type: none"> • <i>methods for determining goals;</i> • <i>identification of goals;</i> • <i>methods of employee recruitment, selection, and development to achieve the identified goals;</i> • <i>commitments to the provision of a healthy and safe work environment;</i> • <i>steps to create a Diversity Management Committee;</i> • <i>a monitoring and reporting system; and</i> • <i>a communications plan.</i> <p><i>The Panel further recommends that the Proponents require their contractors and subcontractors to comply with the Proponents' diversity plans and that this compliance be made a term of the contract between Proponents and their contractors.</i></p>
<i>Employee Travel to Work Sites</i>	15-10	<i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to a facility that would enable the throughput Mackenzie Valley Pipeline to be increased above 0.83 Bcf/d, require the proponent of such facility to pay for the cost of transportation for all project workers who are NWT residents to travel to and from their respective home communities to a designated point-of-hire for each work rotation.</i>

<i>Resource Revenue Sharing Agreement</i>	15-11	<i>The Panel recommends that the governments of Canada and the Northwest Territories and the Aboriginal Summit continue negotiations towards settlement of a NWT-based resource revenue sharing agreement on a priority basis, and that such an agreement be finalized in advance of the National Energy Board granting the Proponents Leave to Open. If an agreement is not concluded by that time, the Panel recommends that the Government of Canada set aside 50% of the non-renewable resource royalty revenues it receives from the Mackenzie Gas Project to be held in trust for the Government of the Northwest Territories and Aboriginal authorities until such time as a resource revenue sharing agreement has been concluded among the three parties.</i>
<i>Transition Planning</i>	15-12	<p><i>The Panel recommends that, immediately following the Proponents' Decision to Construct, the Government of the Northwest Territories begin establishing mechanisms for transition planning and implementation associated with the Mackenzie Gas Project in combination with future developments to accomplish the following purposes:</i></p> <ul style="list-style-type: none"> • <i>set long-term economic diversification objectives to ensure lasting benefits from the Mackenzie Gas Project with related indicators and targets;</i> • <i>develop and assess alternative future scenarios and adjust objectives in light of the findings;</i> • <i>determine immediate and longer-term priorities;</i> • <i>plan initiatives in partnership with other governments, regional Aboriginal authorities and other partners; and</i> • <i>monitor, respond and review.</i>
<i>Allocation of Royalty Revenues</i>	15-13	<i>The Panel recommends that, within 10 years of the National Energy Board granting the Proponents Leave to Open, the Government of the Northwest Territories identify and allocate a specific portion of its share of non-renewable resource royalty revenues to the funding of the mechanisms established pursuant to Panel Recommendation 15-12.</i>
CHAPTER 16 — SOCIAL AND CULTURAL IMPACTS		
<i>Closed Work Camps</i>	16-1	<i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to implement closed work camps. This requirement should apply to all new work camps proposed by the Proponents, their contractors and subcontractors.</i>
<i>Existing Camps</i>	16-2	<i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to identify whether any of the existing open construction camps will be used, either directly or indirectly, in relation to Project construction. Where existing open camps are to be used and are to remain open, the Panel further recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to develop a plan to minimize and address adverse impacts of any interactions between workers in the open camps and the communities in proximity to those camps. The plan should comply with the commitments made by the Proponents, identify the specific measures to be employed and be developed in consultation with, and to the satisfaction of, the affected communities. The final plan should be filed with the National Energy Board at least six months prior to the commencement of construction.</i>
<i>Worker Interactions — Fort Good Hope and Tulita</i>	16-3	<i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, at least six months prior to the commencement of construction, a plan to monitor the interactions between construction workers and the communities of Fort Good Hope and Tulita and to identify the specific actions to be taken should the monitoring identify unanticipated adverse interactions. The plan should be developed in consultation with the leadership of Fort Good Hope and Tulita and provide for regular consultation with and follow-up reporting back to the leadership of both potentially affected local communities.</i>

<i>Noise Monitoring</i>	16-4	<i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, prior to the commencement of construction, a program to monitor noise emissions in relation to the Mackenzie Gas Project and to confirm that the Project is meeting the noise levels to which the compressor stations will be designed.</i>
<i>Drug and Alcohol Abuse Plan</i>	16-5	<i>The Panel recommends that the Government of the Northwest Territories and the Proponents, consistent with provision 3.6.2(b) of the Socio-Economic Agreement, and prior to the commencement of construction, further develop and make public their plan for preventing Project-related drug and alcohol abuse. The plan should incorporate input from the Royal Canadian Mounted Police, responsible agencies and affected communities in the Project Review Area regarding the measures proposed by the Proponents and any other preventive measures. The plan should also identify government resources (human and financial) required to implement the plan and include the Government of the Northwest Territories' plans for applying those resources.</i>
<i>Contractors and Sub-contractors</i>	16-6	<i>The Panel recommends that the Proponents, prior to the commencement of construction and as part of the plan required by Panel Recommendation 16-5, outline the means by which they will apply their drug and alcohol policies to Mackenzie Gas Project contractors and subcontractors. This should include a description of the mechanisms by which the Proponents will enforce compliance and the consequences of non-compliance.</i>
<i>Alcohol and Drug Abuse Prevention Programs</i>	16-7	<i>The Panel recommends that the Government of the Northwest Territories, within six months of the Proponents' Decision to Construct, and consistent with provision 3.7.2(c) of the Socio-Economic Agreement, file with the Northwest Territories Oil and Gas Socio-Economic Advisory Board a submission that identifies alcohol and drug abuse prevention programs in place for communities in the Project Review Area, an assessment of whether these programs are adequate, and a plan to secure sufficient capacity to accommodate both existing treatment needs for alcohol and drug abuse and the increased demand that would be related to the Mackenzie Gas Project. The programs could include reopening of, and support for, existing treatment centres in the Northwest Territories and the negotiation of arrangements with treatment centres outside the Northwest Territories.</i>
<i>Treatment Facilities Spaces</i>	16-8	<i>The Panel recommends that the Proponents and the Government of the Northwest Territories, prior to the commencement of construction and consistent with provision 3.6.3(b) of the Socio-Economic Agreement, reach an agreement whereby spaces for Mackenzie Gas Project employees who may need access to mental health, drug and alcohol treatment facilities under the Proponents' employee assistance program will be assured without reducing the level of service available to residents of the Northwest Territories.</i>
<i>Coordination of Treatment Services</i>	16-9	<i>The Panel recommends that over the life of the Mackenzie Gas Project Impacts Fund the Government of the Northwest Territories coordinate the provision of its addiction and abuse treatment services and follow-up support with related projects, such as the Inuvialuit Regional Corporation's proposed regional addictions strategy and the Tulita District Land Corporation's healing and wellness centre, that are carried out by regional organizations under the Mackenzie Gas Project Impacts Fund.</i>
<i>Education Programs</i>	16-10	<i>The Panel recommends that the Proponents and the Government of the Northwest Territories, prior to the commencement of construction, work with communities, the Royal Canadian Mounted Police, bylaw officers, community social workers, alcohol and drug counsellors, individual and family counsellors, community health representatives, mental health workers, school counsellors and schools to provide addiction prevention and sexual education programs. The Panel further recommends that the Government of the Northwest Territories coordinate its programs with projects that are carried out by regional organizations under the Mackenzie Gas Project Impacts Fund.</i>

<i>Enforcement of Liquor Laws</i>	16-11	<i>The Panel recommends that, within six months of the Proponents' Decision to Construct, the governments of Alberta and the Northwest Territories provide sufficient resources to enable the Royal Canadian Mounted Police, the Northwest Territories' Liquor Board and the Alberta Liquor Control Board to enforce the Northwest Territories Liquor Act and the Alberta Alcohol and Drug Abuse Act, respectively, during the construction phase and, in particular, to enforce those provisions related to the over-serving of alcohol and to preventive detention of intoxicated persons who may be a danger to themselves and others.</i>
<i>Community Measures</i>	16-12	<i>The Panel recommends that, within six months of receipt of the plan referred to in Panel Recommendation 6-5, communities potentially impacted by the Mackenzie Gas Project review and adopt alcohol and drug control measures and make the necessary provisions to enforce those measures. These measures should be consistent with the plan provided in Panel Recommendation 16-5 and with the projects being carried out by regional organizations under the Mackenzie Gas Project Impacts Fund.</i>
<i>Coordinated Health Care Plan</i>	16-13	<p><i>The Panel recommends that the Government of the Northwest Territories, in consultation with the Proponents, community governments and Aboriginal organizations, within six months of the Proponents' Decision to Construct, prepare a coordinated health care plan that demonstrates that adequate and appropriate health and social services would be in place and available to meet both existing and increased demands in the communities that would be affected by the Mackenzie Gas Project. The plan should indicate for each community affected by the Mackenzie Gas Project:</i></p> <ul style="list-style-type: none"> <i>• the current and planned resource allocations by position, including but not limited to physicians, nurses, community social workers, individual and family counsellors, Community Health Representatives, mental health workers and drug and alcohol counsellors;</i> <i>• the strategy to be employed to staff both current vacant positions and any new positions to be created to respond to Project demands;</i> <i>• the contingency plans for addressing shortfalls in staffing;</i> <i>• monitoring requirements to ensure resource alignment with service demands; and</i> <i>• progress reporting/communication plans.</i> <p><i>The plan should be made public and shared with the regions and communities affected by the Mackenzie Gas Project.</i></p>
<i>Coordination with Regional Organizations</i>	16-14	<i>The Panel recommends that the Government of the Northwest Territories, over the life of the Mackenzie Gas Project Impacts Fund, coordinate its health care plan and the delivery of health and social services with the related projects and activities being carried out by regional organizations under the Mackenzie Gas Project Impacts Fund.</i>
<i>RCMP Funding</i>	16-15	<i>The Panel recommends that the governments of Canada and the Northwest Territories, within six months of the Proponents' Decision to Construct, ensure that the Royal Canadian Mounted Police has sufficient financial resources to implement its plan to address expected Project-related increases in demand for police and public security services. The Panel further recommends that those resources be provided in a manner that addresses existing community demands for police services and does not reduce the levels of police and public security services provided in the other communities in the Northwest Territories.</i>
<i>Coordination of Police and Public Safety Services</i>	16-16	<i>The Panel recommends that the Government of the Northwest Territories, the Proponents and the Royal Canadian Mounted Police, pursuant to provision 3.5.3 of the Socio-Economic Agreement, and in consultation with the leadership of the communities potentially affected by the Mackenzie Gas Project, ensure that coordination of police and public safety services be done in a manner that avoids the reduction of these services in the communities.</i>

<i>Special Constable Program</i>	16-17	<p><i>The Panel recommends that the Government of the Northwest Territories, the Royal Canadian Mounted Police and the affected communities, within six months of the date of the Government Response to the Panel's Report, determine whether the special constable program can play a public safety service role to help address Project-related impacts on the communities. Where it is determined that the special constable program can play an effective role, the Panel further recommends that the Government of the Northwest Territories, the Royal Canadian Mounted Police and the affected communities take the steps necessary to reinstate the program prior to the commencement of construction.</i></p>
<i>Child Care Services</i>	16-18	<p><i>The Panel recommends that the Government of the Northwest Territories, within six months of the Proponents' Decision to Construct, as part of its Project-related program review:</i></p> <ul style="list-style-type: none"> • <i>identify the community-specific demands the Mackenzie Gas Project would place on child care services based on information supplied by the Proponents and by communities;</i> • <i>identify the actions necessary to respond to those Project-related demands, including considerations such as rotational work, seasonal work, weekend care and day homes;</i> • <i>develop and fund a program to implement the actions required to respond to the identified Project-related demand for child care services;</i> • <i>coordinate its programs with projects to address Project-related demands for child care services being carried out by regional organizations, under the Mackenzie Gas Project Impacts Fund and by other organizations; and</i> • <i>to be consistent with the provisions of the Socio-Economic Agreement, develop and implement a plan for:</i> <ul style="list-style-type: none"> • <i>monitoring Project-related demand for child care services;</i> • <i>determining the adequacy of the measures implemented to respond to that demand; and</i> • <i>determining the actions necessary to address, in a timely manner, any inadequacies or unintended consequences.</i>
<i>Homeless Shelters</i>	16-19	<p><i>The Panel recommends that the Government of the Northwest Territories, within six months of the Proponents' Decision to Construct, as part of its Project-related program review:</i></p> <ul style="list-style-type: none"> • <i>determine, for the regional centres that have been identified by the Proponents as being the likely destinations for both transient workers from the south and for residents from the smaller communities, the capacity of the existing homeless shelters;</i> • <i>forecast the likely Project-related increase in demand for those existing shelter spaces;</i> • <i>where forecasted demand exceeds existing capacity, address the need for additional shelter spaces; and</i> • <i>develop and implement a plan for:</i> <ul style="list-style-type: none"> • <i>monitoring Project-related demand for shelter space;</i> • <i>determining the adequacy of the measures implemented to respond to that demand; and</i> • <i>determining the actions necessary to address, in a timely manner, any inadequacies or unintended consequences, consistent with the requirements of the Socio-Economic Agreement.</i>

<i>Family and Women's Shelters</i>	16-20	<p><i>The Panel recommends that the Government of the Northwest Territories, within six months of the Proponents' Decision to Construct, as part of its Project-related program review:</i></p> <ul style="list-style-type: none"> • <i>determine, for each of the regions affected by the Mackenzie Gas Project, the capacity of the existing family and women's shelters and the services necessary to provide ongoing support to those who need sheltering, including the provision of counselling services;</i> • <i>forecast the likely Project-related increase in demand for both shelters and ongoing support services;</i> • <i>where predicted demand exceeds existing capacity, address the need for additional shelter spaces and ongoing support services;</i> • <i>coordinate its programs with similar projects being carried out by regional organizations under the Mackenzie Gas Project Impacts Fund; and</i> • <i>develop and implement a plan for:</i> <ul style="list-style-type: none"> • <i>monitoring Project-related demands on family and women's shelters and related services and the capacity to meet those demands;</i> • <i>determining the adequacy of the measures implemented to respond to those demands; and</i> • <i>determining the actions necessary to address, in a timely manner, any inadequacies or unintended consequences, consistent with the requirements of the Socio-Economic Agreement.</i>
<i>Elder Care Services</i>	16-21	<p><i>The Panel recommends that the Government of the Northwest Territories, within six months of the Proponents' Decision to Construct, as part of its Project-related program review:</i></p> <ul style="list-style-type: none"> • <i>determine the community-specific demands that the Mackenzie Gas Project would place on Elder care services, including the specific needs of those who may be working on the Project, such as those related to shift work, seasonal work and weekend care;</i> • <i>identify the current range of community-specific Elder care services that are available to meet the predicted demand;</i> • <i>where forecasted Project-related demand exceeds existing capacity, address the need for additional capacity and ongoing support services;</i> • <i>coordinate its programs with similar projects being carried out by regional organizations under the Mackenzie Gas Project Impacts Fund; and</i> • <i>develop and implement a plan for:</i> <ul style="list-style-type: none"> • <i>monitoring Project-related demands on Elder care services and the capacity to meet those demands;</i> • <i>determining the adequacy of the measures implemented to respond to those Elder care demands; and</i> • <i>determining the actions necessary to address, in a timely manner, any inadequacies or unintended consequences, consistent with the requirements of the Socio-Economic Agreement.</i>
<i>Suicide Prevention Programs</i>	16-22	<p><i>The Panel recommends that the Government of the Northwest Territories, in cooperation with the Proponents and communities, within six months of the Proponents' Decision to Construct:</i></p> <ul style="list-style-type: none"> • <i>determine community-specific needs for suicide prevention programs, awareness programs and health care workers and address those needs with specific programs;</i>

- coordinate its programs with similar projects being carried out by regional organizations under the Mackenzie Gas Project Impacts Fund; and
- develop and implement a plan for:
 - monitoring Project-related needs for those suicide prevention and awareness programs and counsellors;
 - determining the adequacy of the measures implemented to respond to those needs; and
 - determining the actions necessary to address, in a timely manner, any inadequacies or unintended consequences, consistent with the requirements of the Socio-Economic Agreement.

<i>Issues Resolution Program</i>	16-23	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project or the Northwest Alberta Facilities, require the Proponents or NOVA Gas Transmission Ltd., as appropriate, to file, no later than six months prior to the commencement of construction or as otherwise directed by the National Energy Board, their plans for a formal issue resolution program that would be implemented during construction and operations. The program should be prepared in consultation with the governments of the Northwest Territories and Alberta, and Aboriginal authorities, and should include the following:</i></p> <ul style="list-style-type: none"> • <i>a description of the process by which any complaints or issues related to the Mackenzie Gas Project would be raised with the Proponents or governments;</i> • <i>a description of the process by which any received complaints or issues would be allocated among those with responsibility for action and a description of the roles and responsibilities of any party involved in assessing or responding to any complaint or issue;</i> • <i>a description of the process by which any received complaints or issues would be resolved;</i> • <i>a description of any protocols developed for referral and resolution of any complaints or issues;</i> • <i>a description of the recourse mechanisms for any unresolved complaints or issues or any unsatisfactorily resolved complaints or issues; and</i> • <i>a description of the process for communicating and informing communities about the complaint resolution program.</i>
<i>MGPIF Priority Projects</i>	16-24	<p><i>The Panel recommends that the Corporation for the Mitigation of Mackenzie Gas Project Impacts, in consultation with the governments of Canada and the Northwest Territories, determine the priority projects that need to be completed and in place in advance of the commencement of construction. The Panel further recommends that the Minister of Indian Affairs and Northern Development consider recommending that adequate funds be requisitioned to develop and implement those priority projects sufficiently in advance of the commencement of construction and that the Government of Canada advance the requested funds as soon as practical thereafter.</i></p>
<i>Monitoring MGPIF Projects</i>	16-25	<p><i>The Panel recommends that projects funded through the Mackenzie Gas Project Impacts Fund be included in the monitoring and follow-up programs referred to in Panel Recommendations 18-1 and 18-2.</i></p>
<i>Contingency Funding</i>	16-26	<p><i>The Panel recommends that the Corporation for the Mitigation of Mackenzie Gas Project Impacts, in establishing its criteria as required by section 5.(2)(b) of the Mackenzie Gas Project Impacts Act, include provisions that would enable the regional organizations to set aside funds to address unanticipated and unforeseen issues as well as funds to extend some programs beyond the expiration of the Mackenzie Gas Project Impacts Fund.</i></p>

CHAPTER 17 — DECOMMISSIONING AND ABANDONMENT

<i>Extension of NEB Decommissioning and Abandonment Principles</i>	17-1	<i>The Panel recommends that the National Energy Board take the steps necessary to extend application of the principles underlying its RH-2-2008 decision, and any other relevant elements of the Board's Land Matters Consultation Initiative, to all components of the Mackenzie Gas Project and the Northwest Alberta Facilities.</i>
<i>Coordination of Decommissioning and Abandonment Approvals</i>	17-2	<p><i>The Panel recommends that Indian and Northern Affairs Canada, the National Energy Board, the Northwest Territories Water Board and the relevant land and water boards of the Mackenzie Valley convene a meeting within six months of the date of the Proponents' Decision to Construct to establish a coordinated approach, within the mandate of each agency, for:</i></p> <p><i>(a) the development and submission of decommissioning and abandonment plans by the Proponents, including:</i></p> <ul style="list-style-type: none"> <i>• the timing for submission of conceptual plans;</i> <i>• procedures and timing for developing final plans; and</i> <i>• a description of the Project facilities and activities to which the plans apply; and</i> <p><i>(b) establishing the form and amount of financial security the Proponents will be required to submit for decommissioning and abandonment, including:</i></p> <ul style="list-style-type: none"> <i>• the timing and procedure for obtaining estimates of funds needed for abandonment;</i> <i>• the mechanism and timing for the collection and setting aside of those funds; and</i> <i>• identification of the facilities to which the security applies.</i>

CHAPTER 18 — MONITORING, FOLLOW-UP AND MANAGEMENT PLANS

<i>Need for Follow-up Program</i>	18-1	<i>The Panel recommends that there be a follow-up program to verify the accuracy of the environmental assessment and determine the effectiveness of the measures to mitigate the adverse environmental impacts for all phases of the Mackenzie Gas Project. The Panel recommends that the Department of Indian Affairs and Northern Development be designated as the lead Responsible Authority under the Canadian Environmental Assessment Act for overseeing the design and implementation of the follow-up program, and that the program be in place prior to the commencement of construction.</i>
<i>Contents of Follow-up Program</i>	18-2	<i>The Panel recommends that the follow-up program for the Mackenzie Gas Project consist of, but not be limited to, the provisions for Project-specific impact monitoring, adaptive management and cumulative impacts monitoring set out in Panel Recommendations 18-3, 18-4, 18-5, 18-16, 18-18, 18-19, 18-20 and 18-22.</i>
<i>Project-Specific Impact Monitoring Programs</i>	18-3	<p><i>The Panel recommends that all Project-specific impact monitoring programs and related cumulative impact monitoring programs, whether conducted by the Proponents, governments, other agencies or in combination, include the following elements:</i></p> <ul style="list-style-type: none"> <i>• identification of monitoring objectives and means of achieving verifiable results capable of guiding remedial action;</i> <i>• formulation of clearly stated research questions capable of testing impact predictions;</i> <i>• key measurable indicators linking Mackenzie Gas Project activities to outcomes, and thresholds or reference levels to identify Project effects;</i> <i>• strategies and protocols for data collection and quality control;</i> <i>• a design that is compatible with and able to contribute to the Cumulative Impact Monitoring Program;</i>

		<ul style="list-style-type: none"> • protocols for data compilation, storage, control and access; • provision for data analysis and assessment; and • reporting procedures and schedules.
Distribution of Monitoring Results	18-4	<p>The Panel recommends that the Department of Indian Affairs and Northern Development, as the lead Responsible Authority responsible for the Mackenzie Gas Project follow-up program, require the Proponents to provide monitoring data collected in their environmental monitoring program, as appropriate, to and in a form acceptable to the following recipients: downstream regulators, government agencies, Land Use Planning bodies, the Northwest Territories Oil and Gas Socio-Economic Advisory Board, the Corporation for the Mitigation of Mackenzie Gas Project Impacts and the Cumulative Impact Monitoring Program.</p>
Adaptive Management Components	18-5	<p>The Panel recommends that adaptive management for Project-specific or cumulative impacts, whether conducted by the Proponents, governments, other agencies or in combination, include the following components:</p> <ul style="list-style-type: none"> • provision for regular review of adaptive management effectiveness, adjustment of related monitoring and responses to focus on significant continuing concerns; • collaboration with participants in related assessment, planning and adaptive management work, especially where cumulative impacts may be involved; • sharing of findings among participants in monitoring and among stakeholders and others involved in selecting, designing and applying adaptive responses; • a transparent process for setting and adjusting monitoring and management priorities; • implementation and contingency plans and resources to enable responsive action especially in areas where effect predictions are thought to be uncertain and where predictive errors may have serious consequences; and • clearly defined impacts thresholds, where possible, to clarify where and when adaptive responses will be necessary. <p>The Panel recommends that the design of adaptive management approaches pay particular attention to the valued components identified as priorities through the scenario-based cumulative impacts assessment exercise.</p>
Agency Funding for Monitoring and Follow-up Programs	18-6	<p>The Panel recommends that the governments of Canada and the Northwest Territories commit long-term dedicated funding, for a period no less than the duration of the Mackenzie Gas Project, to departments, regulatory agencies and Aboriginal authorities to enable implementation of compliance and impact monitoring and follow-up programs for the duration of the Mackenzie Gas Project.</p>
Local NEB Office	18-7	<p>The Panel recommends that, prior to the commencement of construction, the National Energy Board establish an office in the Northwest Territories to serve as the centre for the National Energy Board's inspection and monitoring activities with respect to the Mackenzie Gas Project.</p>
NEB Reports	18-8	<p>The Panel recommends that the National Energy Board publish reports on its inspection and monitoring activities with respect to the Mackenzie Gas Project, twice yearly during the construction of the Project and annually thereafter. Such reports should be made available in the regional centres in the Northwest Territories and in the communities directly affected by the Mackenzie Gas Project.</p>
Comprehensive Environmental Management Plans	18-9	<p>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents and, where applicable, each of the Project Proponents, to file a complete complement of detailed and comprehensive plans within its environmental management system including the Proponents' plans for:</p> <ul style="list-style-type: none"> • environmental management;

- environmental protection;
- contingency and emergency response; and
- environmental compliance and effects monitoring.

Each plan should describe how it is compatible with the comparable plan of each of the other Proponents, especially where there is the potential for overlapping Project-related impacts, and identify linkages and connections between it and the comparable monitoring and management plans of the other Proponents.

Coordination of Compliance Monitoring	18-10	<i>The Panel recommends that the National Energy Board, downstream regulators and other bodies with monitoring responsibilities for the Mackenzie Gas Project continue to develop a coordinated approach to compliance monitoring among themselves and in cooperation with the Proponents, and that the National Energy Board lead the development of a protocol among the various agencies and other bodies to implement this approach.</i>
Local Monitors	18-11	<p><i>The Panel recommends that the National Energy Board, as a condition of any certificate or approvals it might issue in relation to the Mackenzie Gas Project, require the Proponents to file, prior to the commencement of construction, information related to the hiring of local residents as monitors to carry out compliance and environmental impact monitoring for the Mackenzie Gas Project including:</i></p> <ul style="list-style-type: none"> • <i>the nature of the activities to be monitored;</i> • <i>clearly defined job descriptions for the positions as monitors;</i> • <i>identification of the training that will be offered to monitors to enable them to perform their duties; and</i> • <i>confirmation that monitors have been hired.</i>
Establishment of CIMP	18-12	<i>The Panel recommends that, within six months of the date of the Government Response to the Panel's Report, the Minister of Indian Affairs and Northern Development take the steps necessary to complete the establishment of the Cumulative Impact Monitoring Program and appoint a Responsible Authority as required under the Mackenzie Valley Resource Management Act.</i>
Responsible Authority for CIMP	18-13	<i>The Panel recommends that the Minister of Indian Affairs and Northern Development consider appointing, as the Responsible Authority for the Cumulative Impact Monitoring Program under the Mackenzie Valley Resource Management Act, a corporate entity with a board consisting of one representative from each region in the Northwest Territories and representation from the appropriate government departments of Canada and the Northwest Territories. The Panel also recommends that the Responsible Authority for the Cumulative Impact Monitoring Program have a technical committee and a full-time secretariat to support the board.</i>
Application of CIMP in ISR	18-14	<i>The Panel recommends that, within six months of the date of the Government Response to the Panel's Report, the Minister of Indian Affairs and Northern Development take all reasonable steps to extend the legal application of the Cumulative Impact Monitoring Program into the Inuvialuit Settlement Region, thereby making the program a legal requirement throughout the Northwest Territories.</i>
Funding of CIMP	18-15	<i>The Panel recommends that, within six months of the date of the Government Response to the Panel's Report, the Government of Canada make available sufficient long-term stable funding to implement the Cumulative Impact Monitoring Program as specified in Panel Recommendation 18-16 and as required by law.</i>
Program Guidance for CIMP	18-16	<p><i>The Panel recommends that when establishing the Cumulative Impact Monitoring Program (CIMP), the Minister of Indian Affairs and Northern Development authorize the CIMP Responsible Authority to do the following:</i></p> <ul style="list-style-type: none"> • <i>establish an integrated set of biophysical and socio-economic indicators for the entire Northwest Territories;</i>

- establish an integrated set of thresholds for evaluating cumulative impacts and levels of acceptable change in the biophysical and the socio-economic environments;
- establish a program for conducting scenario-based cumulative impacts assessments;
- establish a program for monitoring the interaction of cumulative impacts on multiple valued components;
- establish Traditional Knowledge study programs;
- provide guidance to impact assessment monitoring programs of the Mackenzie Gas Project and other activities regarding the form in which data is to be collected and provided to the CIMP;
- establish protocols for data access, control and release;
- establish a program for reporting monitoring results to appropriate agencies at a time and frequency that meets the need of the particular agency including the provision of results of the CIMP to the Mackenzie Valley Environmental Impact Review Board, Land Use Planning Boards, NWT Oil and Gas Socio-Economic Advisory Board, Corporation for the Mitigation of Mackenzie Gas Project Impacts, regulators, government departments and renewable resource management agencies for the purpose of informing the decisions of those agencies; and
- provide guidance to the Land Use Planning bodies on cumulative impact thresholds.

<i>Integrated Aquatic Monitoring Program</i>	18-17	<i>The Panel recommends that the Cumulative Impact Monitoring Program establish a program for integrated long-term aquatics monitoring of the Mackenzie River watershed that is consistent with and contributes to the Canadian Aquatic Biomonitoring Network.</i>
<i>Cumulative Impacts Components of MGP Follow-up Program</i>	18-18	<i>The Panel recommends that the cumulative impact components of the follow-up program for the Mackenzie Gas Project be conducted within the operational framework of and under the guidance of the Responsible Authority for the Cumulative Impact Monitoring Program.</i>
<i>Scenario-based Cumulative Impacts Assessment for MGP Follow-up Program</i>	18-19	<p><i>The Panel recommends that the follow-up program for the Mackenzie Gas Project include a scenario-based cumulative impacts assessment for the Mackenzie Gas Project in combination with other developments that:</i></p> <ul style="list-style-type: none"> • <i>identifies plausible scenarios of development that could be induced by the Mackenzie Gas Project, including consideration of those formally presented to the Panel by hearing participants, and that give explicit attention to impacts from climate change;</i> • <i>focuses on the sustainability of valued components in the human and biophysical environments and identifies anticipated cumulative impacts (positive and negative);</i> • <i>identifies priority valued components to be monitored in the follow-up program;</i> • <i>includes the full spatial extent of the Mackenzie Valley from the Proponents' Anchor Fields and adjacent areas in the Mackenzie Delta to the Alberta border and reflects the geological potential of areas for future development;</i> • <i>includes as its temporal scale the anticipated life of the Mackenzie Gas Project and beyond decommissioning;</i> • <i>is informed by relevant audit reports;</i> • <i>is conducted by an independent facilitator and designed with the appropriate expertise; and</i> • <i>includes the participation of the appropriate stakeholders.</i> <p><i>The Panel further recommends that the first scenario-based cumulative impacts assessment for the Mackenzie Gas Project be initiated within six months of the designation of the Responsible Authority for the Cumulative Impact Monitoring Program and that it be reviewed and revised every three years thereafter for the life of the Mackenzie Gas Project.</i></p>

<i>Guidance for MGP Follow-up Program</i>	18-20	<p><i>The Panel recommends that the Department of Indian Affairs and Northern Development require the follow-up program for the Mackenzie Gas Project to establish and conduct a Mackenzie Gas Project cumulative impact monitoring program that:</i></p> <ul style="list-style-type: none"> • <i>reflects the priority valued components and indicators identified by the scenario-based cumulative impacts assessment;</i> • <i>requires governments, Aboriginal authorities and the Proponents to develop and design integrated research protocols for the Mackenzie Gas Project that meet the monitoring needs for Project impact monitoring and cumulative impact monitoring;</i> • <i>identifies the indicators for which data will be required for the Mackenzie Gas Project cumulative impacts follow-up program;</i> • <i>includes as appropriate:</i> <ul style="list-style-type: none"> • <i>select regional or community Traditional Knowledge studies;</i> • <i>Project-specific impact monitoring information provided by the Mackenzie Gas Project and regulators;</i> • <i>interaction of cumulative impacts on multiple valued components; and</i> • <i>is designed in conformity with the provisions of Panel Recommendation 18-3.</i> <p><i>The results of the Mackenzie Gas Project scenario-based cumulative impacts assessment and monitoring programs should be transmitted to downstream regulators, government agencies, Land Use Planning bodies, the NWT Oil and Gas Socio-Economic Advisory Board, and the Corporation for the Mitigation of Mackenzie Gas Project Impacts for the analysis of cumulative impacts and, for the purpose of transition planning, the Government of the Northwest Territories.</i></p>
<i>Future Developments</i>	18-21	<p><i>The Panel recommends that regulators, as a condition of any approvals or permits they might issue for activities and projects, require all proponents of future developments that would enable the throughput of the Mackenzie Valley Pipeline to be increased above 0.83 Bcf/d to provide relevant impact monitoring data to the cumulative impacts monitoring program.</i></p>
<i>Mackenzie Gas Project — specific Audit</i>	18-22	<p><i>The Panel recommends that the Minister of Indian Affairs and Northern Development, as part of the follow-up program, require a Project-specific audit pursuant to section 148 of the Mackenzie Valley Resource Management Act each year during construction and at least once every five years for the life of the Mackenzie Gas Project to assess the effectiveness of the impacts monitoring regime for the Project. There may be more than one audit in any given year and an audit may focus on one or more component of the Mackenzie Gas Project.</i></p>

CHAPTER 19 — SUSTAINABILITY AND NET CONTRIBUTIONS

<i>Implementation by Governments</i>	19-1	<p><i>The Panel recommends that the Annual Report to Parliament of the Commissioner of the Environment and Sustainable Development include a report on the implementation of the Panel's recommendations by the governments of Canada and the Northwest Territories. The first report should occur no later than one year after the date of the Government Response to the Panel's Report and occur annually thereafter for the life of the Mackenzie Gas Project.</i></p>
<i>Implementation by Governments</i>	19-2	<p><i>In the event that the Commissioner of the Environment and Sustainable Development does not accept Panel Recommendation 19-1, the Panel recommends that the governments of Canada and the Northwest Territories jointly establish an independent mechanism to review and publicly report annually on the implementation by the governments of the Panel's recommendations.</i></p>