

---

**Hamlet of Tuktoyaktuk, Town of Inuvik  
Government of Northwest Territories**

**ISSUED FOR REVIEW**

**ENVIRONMENTAL IMPACT STATEMENT OUTLINE  
FOR CONSTRUCTION OF  
THE INUVIK TO TUKTOYAKTUK HIGHWAY,  
NORTHWEST TERRITORIES**

**V23201098.1300**

**July 2010**

**EXECUTIVE SUMMARY**

<b>EXECUTIVE SUMMARY</b> .....	<b>i</b>
<b>1.0 TITLE</b> .....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
<b>2.0 CONTACT NAMES AND ADDRESSES</b> .....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
<b>3.0 PURPOSE OF THE PROPOSED DEVELOPMENT</b> .....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
<b>4.0 REGULATORY REVIEW AND APPROVALS</b> .....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
4.1 Previous Regulatory Approvals .....	<b>Error! Bookmark not defined.</b>
4.2 Application of Relevant Legislation to Impact Review .....	<b>Error! Bookmark not defined.</b>
4.3 Applicability of the Inuvialuit Final Agreement .....	<b>Error! Bookmark not defined.</b>
4.3.1 Applicability of the Canadian Environmental Assessment Act.....	<b>Error! Bookmark not defi</b>
4.3.2 Limitations .....	<b>Error! Bookmark not defined.</b>
4.4 Anticipated Regulatory Approvals Processes.....	<b>Error! Bookmark not defined.</b>
4.4.1 Inuvialuit Land Administration Authorizations.....	<b>Error! Bookmark not defined.</b>
4.4.2 Northwest Territories Water Board Water Licensing .....	<b>Error! Bookmark not defined.</b>
4.4.3 Indian and Northern Affairs Canada Authorizations .....	<b>Error! Bookmark not defined.</b>
4.4.4 Fisheries and Oceans Canada Authorizations .....	<b>Error! Bookmark not defined.</b>
4.4.5 Navigable Waters Permits for Construction .....	<b>Error! Bookmark not defined.</b>
4.4.6 Research Authorizations .....	<b>Error! Bookmark not defined.</b>
<b>5.0 LOCATION</b> .....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
<b>6.0 SCOPING</b> .....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
6.1 Scope of the Development .....	<b>Error! Bookmark not defined.</b>
6.2 Scope of Impact Assessment.....	<b>Error! Bookmark not defined.</b>
6.3 Scope of Public Participation.....	<b>Error! Bookmark not defined.</b>
<b>7.0 DEVELOPMENT SUMMARY</b> .....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
7.1 Rationale .....	<b>Error! Bookmark not defined.</b>
7.2 Background .....	<b>Error! Bookmark not defined.</b>
7.2.1 Brief History of Alternative Alignments Considered.....	<b>Error! Bookmark not defined.</b>
7.2.2 Alignments Considered in the Current Stage of Project Development.....	<b>Error! Bookmark</b>
7.2.2.1 PWC 1977 .....	<b>Error! Bookmark not defined.</b>
7.2.2.2 2009 Route .....	<b>Error! Bookmark not defined.</b>
7.2.2.3 Upland Route Option .....	<b>Error! Bookmark not defined.</b>
7.2.2.4 Realignment Options for 2009 Route to Address Husky Lakes Setback Requirements .....	<b>Error! Bookmark not defined.</b>

	PAGE
7.3 Design Parameters for the All-weather Highway .....	Error! Bookmark not defined.
7.3.1 Design Embankment .....	Error! Bookmark not defined.
7.3.2 Geometric Design .....	Error! Bookmark not defined.
7.3.3 Stream Crossing Design Considerations .....	Error! Bookmark not defined.
7.4 Comparison of Alignment Options .....	Error! Bookmark not defined.
7.4.1 Identification of Preferred Alignment .....	Error! Bookmark not defined.
7.5 Terrain Conditions Along Preferred Alignment .....	Error! Bookmark not defined.
7.6 Key Highway Geotechnical Issues .....	Error! Bookmark not defined.
7.6.1 Permafrost .....	Error! Bookmark not defined.
7.6.2 Sensitive Terrain .....	Error! Bookmark not defined.
7.6.2.1 Polygons .....	Error! Bookmark not defined.
7.6.2.2 Thick Organics (Peatland) .....	Error! Bookmark not defined.
7.6.2.3 Thermokarst .....	Error! Bookmark not defined.
7.6.2.4 Retrogressive Thaw Flow Slides .....	Error! Bookmark not defined.
7.6.2.5 Pingos .....	Error! Bookmark not defined.
7.7 Detailed Quantity Estimates for the Preferred Alignment .....	Error! Bookmark not defined.
7.8 Borrow Sources .....	Error! Bookmark not defined.
7.8.1 General Information on Borrow Sources in the Area .....	Error! Bookmark not defined.
7.8.2 Available Information on Borrow Sources in the Area .....	Error! Bookmark not defined.
7.8.3 Borrow Material Requirements .....	Error! Bookmark not defined.
7.8.4 Further Investigation of Borrow Sources .....	Error! Bookmark not defined.
7.8.5 Site Evaluation Criteria .....	Error! Bookmark not defined.
7.8.6 Pit Development Plans .....	Error! Bookmark not defined.
7.8.7 Winter Access Roads .....	Error! Bookmark not defined.
7.9 Construction .....	Error! Bookmark not defined.
7.9.1 Winter Approach to Construction .....	Error! Bookmark not defined.
7.9.2 Construction Overview .....	Error! Bookmark not defined.
7.9.3 Construction Activities .....	Error! Bookmark not defined.
7.9.4 Production Rate, Construction Staging and Overall Schedule .....	Error! Bookmark not defined.
7.9.5 Anticipated Equipment and Personnel .....	Error! Bookmark not defined.
7.9.6 Winter Access/ Haul Roads .....	Error! Bookmark not defined.
7.9.6.1 Construction .....	Error! Bookmark not defined.
7.9.6.2 Water Usage .....	Error! Bookmark not defined.
<b>8.0 PROJECT TIMETABLE .....</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>

	PAGE
<b>9.0 TRADITIONAL AND OTHER LAND USES.....</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
9.1 Tuktoyaktuk Peninsula .....	<b>Error! Bookmark not defined.</b>
9.2 Inuvik .....	<b>Error! Bookmark not defined.</b>
9.3 Heritage Resources.....	<b>Error! Bookmark not defined.</b>
9.3.1 Human History Summary .....	<b>Error! Bookmark not defined.</b>
9.3.1.1 Prehistory .....	<b>Error! Bookmark not defined.</b>
9.3.1.2 Historic Period .....	<b>Error! Bookmark not defined.</b>
9.3.1.3 Inuvialuit Ethnography .....	<b>Error! Bookmark not defined.</b>
9.3.2 Previous Archaeological Studies.....	<b>Error! Bookmark not defined.</b>
9.3.2.1 Recorded Heritage Resources .....	<b>Error! Bookmark not defined.</b>
9.3.3 Archaeological Overview Assessment .....	<b>Error! Bookmark not defined.</b>
9.3.3.1 Findings .....	<b>Error! Bookmark not defined.</b>
9.3.3.2 Heritage Expectations .....	<b>Error! Bookmark not defined.</b>
9.3.3.3 Heritage Site Locations .....	<b>Error! Bookmark not defined.</b>
9.3.3.4 Heritage Site Types .....	<b>Error! Bookmark not defined.</b>
9.3.4 Heritage Resources Conclusions .....	<b>Error! Bookmark not defined.</b>
9.4 Traditional Land Use Areas .....	<b>Error! Bookmark not defined.</b>
9.5 Special Management Areas .....	<b>Error! Bookmark not defined.</b>
9.6 Past and Existing Land Uses.....	<b>Error! Bookmark not defined.</b>
9.6.1 Ikhil Gas Development and Pipeline Project .....	<b>Error! Bookmark not defined.</b>
9.6.2 Tuktoyaktuk to Source 177 Access Road .....	<b>Error! Bookmark not defined.</b>
9.6.3 Winter Access Trails.....	<b>Error! Bookmark not defined.</b>
9.6.4 Husky Lakes Area .....	<b>Error! Bookmark not defined.</b>
9.6.5 Former Northern Canada Power Commission (NCPC) Power Line.....	<b>Error! Bookmark not defined.</b>
9.6.6 Seismic Lines .....	<b>Error! Bookmark not defined.</b>
9.6.7 Oil and Gas Well Sites .....	<b>Error! Bookmark not defined.</b>
9.7 Proposed Future Land Uses.....	<b>Error! Bookmark not defined.</b>
9.7.1 Mackenzie Gas Project .....	<b>Error! Bookmark not defined.</b>
9.7.2 Parsons Lake Gas Field Associated Infrastructure and Gathering Pipeline.....	<b>Error! Bookmark not defined.</b>
9.8 Natural Resources Harvesting.....	<b>Error! Bookmark not defined.</b>
9.8.1 Wildlife.....	<b>Error! Bookmark not defined.</b>
9.8.1.1 Caribou .....	<b>Error! Bookmark not defined.</b>
9.8.1.2 Big-Game .....	<b>Error! Bookmark not defined.</b>
9.8.1.3 Furbearers and Small Mammals .....	<b>Error! Bookmark not defined.</b>

	PAGE
9.8.2 Waterfowl .....	Error! Bookmark not defined.
9.8.3 Fish.....	Error! Bookmark not defined.
9.8.4 Berries .....	Error! Bookmark not defined.
<b>10.0 COMMUNITY AND REGULATORY CONSULTATIONS .....</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
10.1 October 2009 Consultations .....	Error! Bookmark not defined.
10.2 January 2010 Consultations .....	Error! Bookmark not defined.
10.3 Follow-up 2010 Consultations .....	Error! Bookmark not defined.
10.4 Consultations summary .....	Error! Bookmark not defined.
<b>11.0 ENVIRONMENTAL OVERVIEW .....</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
11.1 Climate .....	Error! Bookmark not defined.
11.1.1 Air Temperature .....	Error! Bookmark not defined.
11.1.2 Precipitation.....	Error! Bookmark not defined.
11.1.3 Wind Speed and Direction.....	Error! Bookmark not defined.
11.1.4 Air Quality.....	Error! Bookmark not defined.
11.1.5 Climate Change.....	Error! Bookmark not defined.
11.1.5.1 Background .....	Error! Bookmark not defined.
11.1.5.2 Inuvialuit Settlement Region .....	Error! Bookmark not defined.
11.1.6 Geology .....	Error! Bookmark not defined.
11.1.7 Bedrock Geology.....	Error! Bookmark not defined.
11.1.8 Surficial Geology .....	Error! Bookmark not defined.
11.1.8.1 General.....	Error! Bookmark not defined.
11.1.8.2 Quaternary History .....	Error! Bookmark not defined.
11.1.8.3 Terrain .....	Error! Bookmark not defined.
11.1.9 Permafrost Conditions.....	Error! Bookmark not defined.
11.2 Vegetation and Soils.....	Error! Bookmark not defined.
11.2.1 General.....	Error! Bookmark not defined.
11.2.2 Vegetation Communities .....	Error! Bookmark not defined.
11.2.2.1 Dwarf Shrub Heath .....	Error! Bookmark not defined.
11.2.2.2 Upland Shrub.....	Error! Bookmark not defined.
11.2.2.3 Cotton-Grass Tussock.....	Error! Bookmark not defined.
11.2.2.4 High-centered Polygons .....	Error! Bookmark not defined.
11.2.2.5 Low-centered Polygons .....	Error! Bookmark not defined.
11.2.2.6 Riparian Shrub.....	Error! Bookmark not defined.

	PAGE
11.2.2.7 Riparian Sedge – Cotton-Grass .....	Error! Bookmark not defined.
11.2.2.8 Coastline Shrub .....	Error! Bookmark not defined.
11.2.2.9 Coastline Sedge – Cotton-Grass .....	Error! Bookmark not defined.
11.2.2.10 Coastline Low-centered Polygons .....	Error! Bookmark not defined.
11.2.2.11 Transition Forest.....	Error! Bookmark not defined.
11.2.3 Wildlife.....	Error! Bookmark not defined.
11.2.4 Barren-ground Caribou / Cape Bathurst and Bluenose-West Herds.....	Error! Bookmark not defined.
11.2.5 Woodland Caribou.....	Error! Bookmark not defined.
11.2.6 Moose.....	Error! Bookmark not defined.
11.2.7 Grizzly Bear.....	Error! Bookmark not defined.
11.2.8 Black Bear .....	Error! Bookmark not defined.
11.2.9 Wolf .....	Error! Bookmark not defined.
11.2.10 Red Fox and Arctic Fox.....	Error! Bookmark not defined.
11.2.11 Wolverine .....	Error! Bookmark not defined.
11.2.12 Marten .....	Error! Bookmark not defined.
11.3 Birds .....	Error! Bookmark not defined.
11.3.1 Waterfowl (Swans, Geese, Loons and Ducks).....	Error! Bookmark not defined.
11.3.2 Raptors.....	Error! Bookmark not defined.
11.3.3 Upland Birds.....	Error! Bookmark not defined.
11.4 Species at Risk.....	Error! Bookmark not defined.
11.5 Hydrology .....	Error! Bookmark not defined.
11.6 Fish and Fish Habitat.....	Error! Bookmark not defined.
11.6.1 Lake Whitefish.....	Error! Bookmark not defined.
11.6.2 Round Whitefish .....	Error! Bookmark not defined.
11.6.3 Inconnu.....	Error! Bookmark not defined.
11.6.4 Lake Trout .....	Error! Bookmark not defined.
11.6.5 Northern Pike .....	Error! Bookmark not defined.
11.6.6 Grayling .....	Error! Bookmark not defined.
11.6.7 Burbot.....	Error! Bookmark not defined.
11.6.8 Least Cisco.....	Error! Bookmark not defined.
11.6.9 Stream Crossing Site Investigations .....	Error! Bookmark not defined.
11.7 Human Environment.....	Error! Bookmark not defined.
11.7.1 Tuktoyaktuk (Community Profile) .....	Error! Bookmark not defined.
11.7.1.1 Background .....	Error! Bookmark not defined.

	PAGE
11.7.1.2 Population.....	Error! Bookmark not defined.
11.7.1.3 Employment.....	Error! Bookmark not defined.
11.7.1.4 Education.....	Error! Bookmark not defined.
11.7.1.5 Traditional Activities.....	Error! Bookmark not defined.
11.7.1.6 Language.....	Error! Bookmark not defined.
11.7.1.7 Community Services.....	Error! Bookmark not defined.
11.7.1.8 Housing .....	Error! Bookmark not defined.
11.7.1.9 Crime .....	Error! Bookmark not defined.
11.7.1.10 Income.....	Error! Bookmark not defined.
11.7.2 Inuvik (Community Profile) .....	Error! Bookmark not defined.
11.7.2.1 Background .....	Error! Bookmark not defined.
11.7.2.2 Population.....	Error! Bookmark not defined.
11.7.2.3 Employment.....	Error! Bookmark not defined.
11.7.2.4 Education.....	Error! Bookmark not defined.
11.7.2.5 Traditional Activities.....	Error! Bookmark not defined.
11.7.2.6 Language.....	Error! Bookmark not defined.
11.7.2.7 Community Services.....	Error! Bookmark not defined.
11.7.2.8 Housing .....	Error! Bookmark not defined.
11.7.2.9 Crime .....	Error! Bookmark not defined.
11.7.2.10 Income.....	Error! Bookmark not defined.
<b>12.0 ENVIRONMENTAL IMPACT ASSESSMENT .....</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
12.1.1 Approach to Environmental Management.....	Error! Bookmark not defined.
12.1.2 Environmental and Socio-Economic Assessment Methodology.....	Error! Bookmark not defined.
12.1.3 Project Scoping .....	Error! Bookmark not defined.
12.1.4 Selection of Valued Ecosystem Components .....	Error! Bookmark not defined.
12.1.5 Assessment Boundaries.....	Error! Bookmark not defined.
12.1.5.1 Geographic Spatial Boundaries.....	Error! Bookmark not defined.
12.1.5.2 Temporal Boundaries .....	Error! Bookmark not defined.
12.1.6 Issue Identification.....	Error! Bookmark not defined.
12.1.7 Impact Assessment and Mitigation.....	Error! Bookmark not defined.
12.1.8 Residual Effects .....	Error! Bookmark not defined.
12.1.9 Assessing Impact Significance and Uncertainties.....	Error! Bookmark not defined.
12.1.10 .....	Error! Bookmark not defined.
12.2 Air Quality and Noise.....	Error! Bookmark not defined.



	PAGE
12.2.1 Air Quality .....	<b>Error! Bookmark not defined.</b>
12.2.1.1 Emissions .....	<b>Error! Bookmark not defined.</b>
12.2.1.2 Dust .....	<b>Error! Bookmark not defined.</b>
12.2.2 Greenhouse Gases .....	<b>Error! Bookmark not defined.</b>
12.2.3 Noise .....	<b>Error! Bookmark not defined.</b>
12.2.4 Mitigation Measures .....	<b>Error! Bookmark not defined.</b>
12.3 Sensitive Terrain.....	<b>Error! Bookmark not defined.</b>
12.4 Vegetation .....	<b>Error! Bookmark not defined.</b>
12.4.1 Footprint .....	<b>Error! Bookmark not defined.</b>
12.4.2 Construction .....	<b>Error! Bookmark not defined.</b>
12.4.3 Public Traffic.....	<b>Error! Bookmark not defined.</b>
12.4.4 Mitigation Measures .....	<b>Error! Bookmark not defined.</b>
12.5 Wildlife .....	<b>Error! Bookmark not defined.</b>
12.5.1 Potential Effects on Wildlife and Wildlife Habitat.....	<b>Error! Bookmark not defined.</b>
12.5.1.1 Habitat Loss.....	<b>Error! Bookmark not defined.</b>
12.5.1.2 Habitat Degradation.....	<b>Error! Bookmark not defined.</b>
12.5.1.3 Disturbance .....	<b>Error! Bookmark not defined.</b>
12.5.1.4 Wildlife Mortality .....	<b>Error! Bookmark not defined.</b>
12.5.1.5 Carnivore Dens.....	<b>Error! Bookmark not defined.</b>
12.5.2 Wildlife Protection and Mitigation Measures .....	<b>Error! Bookmark not defined.</b>
12.5.2.1 Wildlife Protection.....	<b>Error! Bookmark not defined.</b>
12.5.2.2 Mitigation Measures .....	<b>Error! Bookmark not defined.</b>
12.5.3 Mitigation Measures for Species at Risk .....	<b>Error! Bookmark not defined.</b>
12.6 Fish and Fish Habitat.....	<b>Error! Bookmark not defined.</b>
12.6.1 Construction .....	<b>Error! Bookmark not defined.</b>
12.6.1.1 Stream Crossings.....	<b>Error! Bookmark not defined.</b>
12.6.1.2 Sediment Control.....	<b>Error! Bookmark not defined.</b>
12.6.1.3 Water Extraction .....	<b>Error! Bookmark not defined.</b>
12.6.2 Mitigation Measures .....	<b>Error! Bookmark not defined.</b>
12.7 Consequences of Accidents or Malfunctions.....	<b>Error! Bookmark not defined.</b>
12.7.1 Fuel Storage.....	<b>Error! Bookmark not defined.</b>
12.7.2 Refuelling Operations.....	<b>Error! Bookmark not defined.</b>
12.7.3 Waste Management .....	<b>Error! Bookmark not defined.</b>
12.7.4 Potential Worst Case Scenario .....	<b>Error! Bookmark not defined.</b>

	PAGE
12.8 Effects of Environment on Project – Climate Change .....	Error! Bookmark not defined.
<b>13.0 ANTICIPATED HUMAN ENVIRONMENT EFFECTS AND PROPOSED MITIGATION / MANAGEMENT MEASURES.....</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
13.1 Regional Economic Effects.....	Error! Bookmark not defined.
13.1.1 Capital and Operating Expenditures .....	Error! Bookmark not defined.
13.1.2 Employment .....	Error! Bookmark not defined.
13.1.3 Labour Income .....	Error! Bookmark not defined.
13.1.4 Demography and Population Mobility.....	Error! Bookmark not defined.
13.2 Infrastructure .....	Error! Bookmark not defined.
13.2.1 Transportation .....	Error! Bookmark not defined.
13.2.2 Energy and Utilities .....	Error! Bookmark not defined.
13.2.3 Housing .....	Error! Bookmark not defined.
13.3 Individual, Family and Community Wellness .....	Error! Bookmark not defined.
13.3.1 Cost of Living.....	Error! Bookmark not defined.
13.3.2 Community Wellness and Delivery of Social Services ..	Error! Bookmark not defined.
13.3.3 Training .....	Error! Bookmark not defined.
13.3.4 Health Conditions and Health Care Services .....	Error! Bookmark not defined.
13.3.5 Human Health Risks.....	Error! Bookmark not defined.
13.3.6 Public Safety and Protection Services .....	Error! Bookmark not defined.
13.3.7 Education Attainment and Services .....	Error! Bookmark not defined.
13.4 Traditional Culture .....	Error! Bookmark not defined.
13.4.1 Traditional Harvesting and Land Use .....	Error! Bookmark not defined.
13.4.2 Preservation of Traditional Language and Culture.....	Error! Bookmark not defined.
13.5 Non-Traditional Land and Resource Use .....	Error! Bookmark not defined.
13.5.1 Protected Areas.....	Error! Bookmark not defined.
13.5.2 Granular Resources .....	Error! Bookmark not defined.
13.5.3 Oil and Gas Activities .....	Error! Bookmark not defined.
13.5.4 Tourism Activities .....	Error! Bookmark not defined.
13.5.5 Commercial Activities .....	Error! Bookmark not defined.
13.6 National Sovereignty .....	Error! Bookmark not defined.
13.7 Pollution Prevention and Spill Response in the Arctic Ocean ...	Error! Bookmark not defined.
13.8 Summary of Environmental Protection Commitment (Sect 10.2.1(g))	Error! Bookmark not defin
<b>14.0 CUMULATIVE EFFECTS .....</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
14.1 Spatial Boundaries .....	Error! Bookmark not defined.

	PAGE
14.2 Temporal Boundaries .....	<b>Error! Bookmark not defined.</b>
14.3 Past, Present and Future Projects / Activities Considered .....	<b>Error! Bookmark not defined.</b>
14.3.1 Past and Existing Projects.....	<b>Error! Bookmark not defined.</b>
14.3.1.1 Ikhil Gas Development and Pipeline Project .	<b>Error! Bookmark not defined.</b>
14.3.1.2 Tuktoyaktuk to Source 177 Access Road.....	<b>Error! Bookmark not defined.</b>
14.3.1.3 Winter Access Trails .....	<b>Error! Bookmark not defined.</b>
14.3.1.4 Former NCPC Power Line.....	<b>Error! Bookmark not defined.</b>
14.3.1.5 Seismic Lines .....	<b>Error! Bookmark not defined.</b>
14.3.1.6 Oil and Gas Well Sites.....	<b>Error! Bookmark not defined.</b>
14.3.1.7 Potential Impacts After Practical Mitigation (EIRB Procedures 10.2.1(k))	<b>Error!</b>
14.3.2 Potential Future Projects/ Activities.....	<b>Error! Bookmark not defined.</b>
14.3.2.1 Mackenzie Gas Project.....	<b>Error! Bookmark not defined.</b>
14.3.2.2 Parsons Lake Gas Field Associated Infrastructure and Gathering Pipeline	<b>Err</b>
14.3.2.3 Husky Lakes Development.....	<b>Error! Bookmark not defined.</b>
<b>15.0 SPILL CONTINGENCY PLAN.....</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
<b>16.0 OTHER ENVIRONMENTAL ASSESSMENTS .....</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
<b>REFERENCES .....</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>

\*