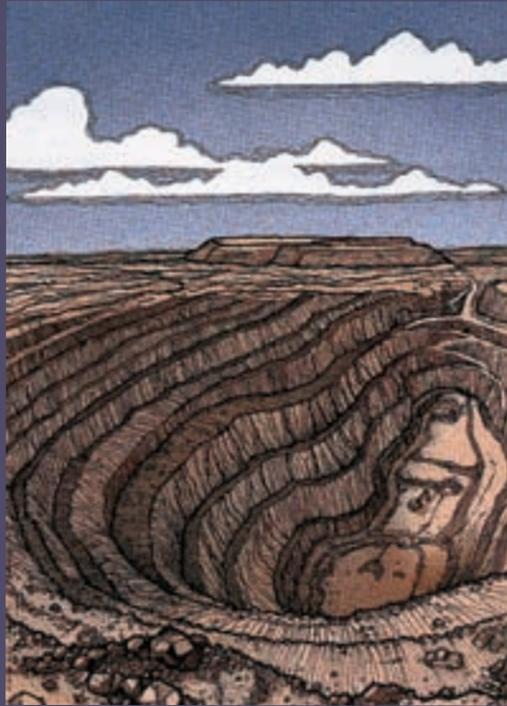


Volume I



NWT Diamonds Project *Project Description*

Overview – Project Description

Volume I provides a description of the proposed NWT Diamonds Project. The Proponent, a joint venture between BHP and the Blackwater Group, has completed several years of exploratory work for diamonds on its mineral claim block at Lac de Gras in the Northwest Territories. Based on the results of extensive bulk sampling of kimberlite ore, the Proponent has proposed a diamond mine development with on-site processing facilities. Project development will consist of the mining of five kimberlite pipes, each underlying a lake. The majority of mine tailings will be placed and managed in a dewatered lake basin, with the rest deposited in excavated mining pits.

Section 1 begins with a brief discussion about the project's location and examines the role of traditional knowledge as it applies to the project. An economic analysis summarizes the viability and profitability of the proposed project. The project setting is described with respect to its regional context, land claims and related concerns and the regulatory environment within which the project would operate. The corporate background of the Proponent and its contractors is provided to show the Proponent's corporate accountability for the management of environmental and socioeconomic issues in its mining developments throughout the world.

Section 2 provides a detailed description of most aspects of the proposed project. The initial discovery and exploration activities are discussed, the local and regional geology is reviewed and the development of the five kimberlite pipes is explained. The overall scheduling of mining activities is provided in the Mining Plan. Specific project components such as mineral processing, tailings disposal, infrastructure, construction and transportation plans, human resources and occupational health and safety are described.

Alternatives to the proposed mine development plan are discussed in Section 3. These include a discussion of work force location, alternative mining activities, plant site locations, mineral processing options, ore treatment production rates, tailings disposal and power and transportation options. Future development is also examined with reference to three hypothetical areas of high potential within the claim block.

Section 4 describes BHP's philosophies and policies toward the environment, host nations, local communities, employees and shareholders. These philosophies and policies are examined and discussed with reference to the NWT Diamonds Project.

BHP's approach to communications and public involvement is explained in Section 5. The Proponent has initiated extensive information programs with Aboriginal and other residents of the Northwest Territories, interested

VOLUME I - PROJECT DESCRIPTION
TABLE OF CONTENTS

Overview - Project Description..... i

Table of Contents iii

List of Tables xii

List of Figures.....xiv

List of Plates xviii

List of Appendices.....xxi

Table of Conformity.....xxiii

Acknowledgmentsxxxiii

Disclaimer.....xl

1. Introduction1.1

 1.1 The Project.....1.1

 1.2 Traditional Knowledge – The Importance of Knowing..... 1.10

 1.2.1 “Understanding” Traditional Knowledge 1.11

 1.2.1.1 A Dene Definition – The Proponent’s Attempt
 to Focus on a Working Definition..... 1.12

 1.2.1.2 The Ndè and Traditional Environmental
 Knowledge (TEK)..... 1.12

 1.2.2 Proponent’s Approach to the Integration of Traditional
 Knowledge – The Process..... 1.13

 1.2.3 Literature Review..... 1.15

 1.2.4 Dene/Metis Land Use Maps 1.16

 1.2.5 An Anthropological Perspective on “Traditional
 Knowledge” 1.17

 1.2.6 Where Cultures Meet 1.18

 1.2.7 Communications Program and Public Involvement 1.18

 1.2.8 Traditional Knowledge Study 1.21

 1.2.8.1 Phase One..... 1.22

 1.2.8.2 Phase Two..... 1.23

1.2.8.3 Current Status of the Traditional Study Program	1.23
1.2.9 Benefits Agreements – Future Steps	1.24
1.2.10 Conclusion	1.25
1.3 Project Economic Analysis	1.25
1.3.1 Context: The NWT Economy	1.26
1.3.2 NWT Diamonds: A Major Mining Project for the Territories	1.28
1.3.3 Economic Benefits to the NWT and Local Communities...	1.28
1.3.4 Government Costs.....	1.32
1.3.5 Strategic Considerations.....	1.34
1.4 Project Setting.....	1.35
1.4.1 Regional Context	1.36
1.4.2 Land Claims	1.41
1.4.3 Regulatory Environment.....	1.48
1.4.3 Regulatory Environment	1.48
1.4.3.1 Environmental Assessment Review Process.....	1.49
1.4.3.2 Permits and Licences.....	1.51
1.4.3.3 International Agreements and Conventions.....	1.63
1.5 The Proponent.....	1.65
1.5.1 BHP.....	1.66
1.5.1.1 BHP’s Policies and Philosophies.....	1.67
1.5.1.2 BHP Experience.....	1.72
1.5.1.3 BHP in Canada.....	1.77
1.5.1.4 BHP in Arctic and Subarctic Regions	1.79
1.5.2 The Blackwater Group.....	1.80
1.5.2.1 Dia Met Minerals Ltd.	1.80
1.5.2.2 Charles Fipke	1.81
1.5.2.3 Dr. S.L. Blusson	1.81
1.5.3 Proponent Obligations.....	1.82
1.5.4 Principal Contractors	1.82
1.5.4.1 Rescan Environmental Services	1.83
1.5.4.2 Fluor Daniel Wright Signet	1.85
2. Project Description.....	2.1
2.1 Discovery and Exploration Phases	2.1
2.2 Project Plan and Schedule.....	2.4
2.2.1 Approval and Permitting	2.5
2.2.2 Preproduction/Construction Phase.....	2.5
2.2.2.1 Facilities Construction.....	2.5
2.2.2.2 Mine Preproduction/Bulk Civil Works	2.7
2.2.3 Production Phase	2.18
2.2.4 Closure Phase	2.19
2.2.5 Post Closure Phase.....	2.20
2.3 Geology	2.20

2.3.1 Kimberlites and Diamonds.....	2.20
2.3.1.1 Diamond Genesis	2.20
2.3.1.2 Kimberlite Formation	2.22
2.3.1.3 World Diamond Mining	2.22
2.3.1.4 Kimberlite Morphology.....	2.25
2.3.2 Petrology of the NWT Diamond Project	
Kimberlite Varieties	2.25
2.3.2.1 Crater Facies.....	2.27
2.3.2.2 Diatreme Facies	2.27
2.3.2.3 Hypabyssal Facies	2.28
2.3.3 Regional Geologic Setting of the Lac de Gras	
Kimberlite Field	2.28
2.3.4 NWT Diamonds Project Property Geology.....	2.29
2.3.4.1 Kimberlites	2.29
2.3.4.2 Geology of the Koala Area.....	2.33
2.3.4.3 Geology of the Panda Area	2.33
2.3.4.4 Geology of the Fox Area.....	2.34
2.3.4.5 Geology of the Leslie Area.....	2.34
2.3.4.6 Geology of the Misery Area	2.35
2.4 Mining Plan.....	2.35
2.4.1 General Description.....	2.35
2.4.2 Mine Production Schedule.....	2.37
2.4.3 Water Diversion and Lake Drainage	2.41
2.4.3.1 Panda Lake	2.41
2.4.3.2 Misery Lake.....	2.43
2.4.3.3 Koala Lake	2.44
2.4.3.4 Fox Lake	2.44
2.4.3.5 Leslie Lake	2.44
2.4.4 Open Pit Mining.....	2.45
2.4.4.1 Pit Design	2.45
2.4.4.2 Equipment Requirements and Operation.....	2.46
2.4.4.3 Drilling and Blasting	2.49
2.4.4.4 Loading and Hauling.....	2.50
2.4.4.5 Mobile Support Equipment	2.51
2.4.4.6 Other Support Equipment	2.52
2.4.4.7 Equipment Maintenance	2.52
2.4.4.8 Preproduction Stripping Operations	2.53
2.4.4.9 Production Phase Operations	2.56
2.4.5 Waste Rock Dumps.....	2.66
2.4.5.1 Design and Construction	2.66
2.4.5.2 Waste Rock Dumps	2.67
2.4.5.3 Overburden Reclamation Stockpiles.....	2.69
2.4.5.4 Lake Bottom Sediments Impoundments	2.70
2.4.5.5 Dump Reclamation	2.72
2.4.6 Underground Mine Operations	2.73

2.4.6.1 Mine Access	2.73
2.4.6.2 Mining Conditions	2.76
2.4.6.3 Mining Method Selection	2.77
2.4.6.4 Preproduction Development.....	2.78
2.4.6.5 Mine Operating Plan	2.80
2.4.6.6 Equipment Requirements	2.83
2.4.7 Haul Roads and Ore Delivery	2.86
2.4.7.1 External Haul Roads	2.86
2.4.7.2 Misery Haul Road.....	2.87
2.4.7.3 Ore Stockpiling and Haulage.....	2.88
2.5 Mineral Processing	2.89
2.5.1 Process Design.....	2.90
2.5.2 Primary and Secondary Crushing	2.96
2.5.2.1 Primary Crushing and Stockpiling	2.96
2.5.2.2 Secondary Crushing	2.99
2.5.3 Scrubbing.....	2.100
2.5.4 High Pressure Grinding Rolls (HPGR).....	2.100
2.5.5 Degritting and Desanding	2.101
2.5.6 Heavy Medium Separation (HMS)	2.102
2.5.7 Recovery Section	2.103
2.5.8 Tailings Thickening and Transport.....	2.106
2.5.9 Process Water Reticulation.....	2.108
2.5.10 Final Concentrate Cleaning and Sorting.....	2.108
2.6 Tailings Disposal Plan.....	2.109
2.6.1 Long Lake Preparation.....	2.111
2.6.1.1 Perimeter Containment Dams.....	2.111
2.6.1.2 Intermediate Tailings Retention Dikes	2.116
2.6.1.3 Basin Diversion Structures	2.120
2.6.1.4 Emergency Spillway.....	2.120
2.6.2 Long Lake Operations.....	2.123
2.6.2.1 Filling Sequence and Water Management	2.123
2.6.2.2 Seasonal Deposition.....	2.126
2.6.3 Long Lake Reclamation and Abandonment.....	2.126
2.6.4 Pit Disposal and Restoration.....	2.126
2.7 Infrastructure.....	2.129
2.7.1 Facility Layout and Design	2.129
2.7.2 Property Access	2.132
2.7.2.1 Roads	2.132
2.7.2.2 Airstrip	2.135
2.7.3 Coarse Ore Handling Area	2.135
2.7.4 Process Plant.....	2.135
2.7.5 Power Plant	2.136
2.7.5.1 Power Generation and Distribution	2.137
2.7.5.2 Energy Conservation.....	2.139
2.7.6 Truckshop/Offices/Warehouse.....	2.140

2.7.6.1 Main Complex	2.140
2.7.6.2 General Bulk Storage.....	2.141
2.7.6.3 Truck Ready Line and Warming Shed	2.142
2.7.7 Permanent Camp.....	2.142
2.7.8 Fuel Supply and Storage.....	2.143
2.7.8.1 Bulk Fuel Tank Farm	2.143
2.7.8.2 Mobile Equipment Fuel Stations.....	2.144
2.7.9 Ammonium Nitrate Storage and Emulsion Plant	2.144
2.7.10 Water Supply and Distribution.....	2.147
2.7.10.1 Process and Fire Protection Water	2.147
2.7.10.2 Potable Water	2.148
2.7.11 Site Services.....	2.148
2.7.11.1 Fire Protection	2.148
2.7.11.2 Sewage and Waste Disposal.....	2.149
2.7.11.3 Heating, Ventilating and Air Conditioning...	2.151
2.7.11.4 Communications Systems.....	2.151
2.7.11.5 Plant Site Drainage Control.....	2.152
2.7.12 Misery Lake Facilities.....	2.152
2.7.13 Underground Mine Facilities	2.153
2.7.14 Security.....	2.153
2.7.14.1 Security Measures.....	2.154
2.7.14.2 Operation of Security Building	2.155
2.7.15 Off-site Facility	2.156
2.8 Construction and Plant Commissioning Plan	2.156
2.8.1 Procurement.....	2.156
2.8.2 Contracting Approach	2.158
2.8.3 Pre-construction Support	2.159
2.8.3.1 Safety Program	2.159
2.8.3.2 Community Relations Plan	2.159
2.8.3.3 Schedule Development.....	2.159
2.8.4 Construction Execution Plan	2.159
2.8.4.1 Completion of Exploration Facility Work (1995)	2.160
2.8.4.2 Initial Construction Phase	2.160
2.8.4.3 Second Construction Phase.....	2.168
2.8.4.4 Third Construction Phase.....	2.169
2.8.4.5 Fourth Construction Phase.....	2.170
2.8.4.6 Fifth Construction Phase	2.172
2.8.4.7 Final Construction Phase.....	2.173
2.8.5 Work Force Requirements.....	2.174
2.8.6 Construction Materials	2.174
2.8.7 Construction Equipment.....	2.176
2.8.8 Construction Facilities.....	2.177
2.8.8.1 Construction Accommodation.....	2.178
2.8.8.2 Construction Offices	2.179

2.8.8.3 Warehouse and Laydown	2.179
2.8.8.4 Ancillary Construction Facilities	2.179
2.8.8.5 Construction Power	2.180
2.8.8.6 Temporary Water Supply	2.180
2.8.8.7 Construction Effluents and Emissions Disposal	2.180
2.8.9 Commissioning and Start-up.....	2.181
2.9 Transportation Plan	2.181
2.9.1 Road Transport	2.182
2.9.1.1 Yellowknife to Site	2.182
2.9.1.2 Edmonton to Yellowknife	2.185
2.9.1.3 Quantities of Materials Shipped by Road.....	2.186
2.9.2 Air Transport	2.186
2.9.2.1 Flight Requirements	2.186
2.9.2.2 Site Airstrip	2.189
2.9.3 Transport Logistics	2.191
2.10 Human Resources.....	2.192
2.10.1 The Labour Standards Act.....	2.193
2.10.2 Human Resources Policy	2.194
2.10.2.1 Equal Opportunity/Hiring Preference	2.194
2.10.2.2 Sexual Harassment.....	2.194
2.10.2.3 AIDS and HIV	2.195
2.10.2.4 Drugs and Alcohol	2.195
2.10.2.5 Firearms.....	2.195
2.10.2.6 No Smoking Policy	2.195
2.10.2.7 Medical Examination.....	2.195
2.10.2.8 Security/Confidentiality	2.196
2.10.3 Recruitment	2.196
2.10.3.1 Preference.....	2.196
2.10.3.2 Recruitment Process	2.196
2.10.3.3 Point of Hire	2.196
2.10.4 Training/Education.....	2.197
2.10.4.1 Pre-Employment Training	2.197
2.10.4.2 Orientation.....	2.197
2.10.4.3 Initial Job Training	2.198
2.10.4.4 Certification	2.198
2.10.4.5 Continuing Development.....	2.198
2.10.5 Labour Relations	2.199
2.10.5.1 Employment Contracts.....	2.199
2.10.5.2 Grievance Procedure.....	2.200
2.10.5.3 Discipline Procedure	2.200
2.10.5.4 Unions	2.200
2.10.5.5 Shift Schedule.....	2.200
2.10.6 Employee Benefits.....	2.200
2.10.6.1 Pension Plan	2.200

2.10.6.2 Health Care Plan	2.201
2.10.6.3 Work Clothing and Safety Equipment	2.201
2.10.6.4 Employee Assistance Programs	2.201
2.10.6.5 Vacation Leave	2.202
2.10.6.6 Salary	2.202
2.10.6.7 Allowances	2.202
2.10.7 Organizational Design	2.202
2.10.7.1 Organizational Structure	2.202
2.10.8 Community Programs.....	2.203
2.10.8.1 Scholarships.....	2.205
2.10.8.2 Schools	2.205
2.10.8.3 Pre-Employment Training	2.205
2.10.8.4 Community Communication.....	2.205
2.10.9 Accommodation.....	2.205
2.10.9.1 Camp Rules	2.206
2.11 Occupational Health and Safety	2.206
2.11.1 BHP Occupational Health and Safety Policy Overview ..	2.206
2.11.2 BHP Minerals “Benchmarking Safety”.....	2.207
2.11.3 BHP Minerals Safety Management Framework.....	2.207
2.11.4 BHP Minerals Safety Reporting.....	2.208
2.11.5 NWT Diamonds OH&S Program Overview	2.210
2.11.6 OH&S Communications.....	2.211
2.11.6.1 Employees	2.211
2.11.6.2 Contractors, Suppliers and Visitors	2.212
2.11.6.3 Occupational Health and Safety Committee.....	2.213
2.11.7 Safety Hazards	2.213
2.11.7.1 Arctic Safety	2.214
2.11.7.2 Open Pit Mining.....	2.216
2.11.7.3 Underground Mining.....	2.217
2.11.7.4 Other Safety Hazards	2.220
2.11.8 Occupational Hygiene Issues	2.221
2.11.8.1 Kimberlite.....	2.221
2.11.8.2 Asbestos	2.223
2.11.8.3 Quartz	2.223
2.11.8.4 Diesel Emissions, Exhaust Particulates and Gases.....	2.224
2.11.8.5 Blasting By-products.....	2.225
2.11.8.6 Atmospheric Inversion	2.225
2.11.8.7 Ferrosilicon.....	2.226
2.11.8.8 Cold.....	2.226
2.11.8.9 Noise	2.227
2.11.8.10 Radioactive Materials.....	2.228
2.11.8.11 Vibration.....	2.230
2.11.8.12 Welding	2.230
2.11.8.13 Chemicals	2.230

2.11.8.14 Confined Space	2.231
2.11.8.15 Bloodborne Pathogens	2.231
2.11.8.16 Indoor Air Quality.....	2.232
2.11.9 OH&S Management Systems	2.232
2.11.9.1 Procedures Manual	2.232
2.11.9.2 Training	2.234
2.11.9.3 Hazard Assessment/Job Safety Analysis	2.235
2.11.9.4 Work Permit Program.....	2.235
2.11.9.5 Workplace Monitoring and Control.....	2.236
2.11.9.6 Protection Programs	2.237
2.11.9.7 Medical Surveillance Programs	2.238
2.11.9.8 Emergency Response Plan.....	2.238
2.11.9.9 Inspections and Audits	2.240
2.11.9.10 Incident/Accident Investigation and Reporting.....	2.241
3. Alternatives and Future Development.....	3.1
3.1 Fly-In/Fly-Out Work Force Versus Permanent Mining Town	3.1
3.2 Open Pit and Underground Mining	3.2
3.2.1 Open Pit Mining	3.4
3.2.2 Underground Mining	3.5
3.3 Backfilling of Open Pits	3.7
3.4 Plant Site Location	3.8
3.5 Mineral Processing Options	3.10
3.6 Ore Treatment Production Rates	3.11
3.7 Alternative Tailings Disposal Site and Facility Assessment	3.13
3.7.1 Factors Important to Tailings Facility Assessment	3.13
3.7.2 Alternative Sites	3.15
3.7.3 Alternative Management Methods	3.15
3.7.4 Alternative Construction Methods	3.18
3.8 Power Generation Options.....	3.20
3.9 Transportation Options.....	3.22
3.10 Future Development	3.24
3.10.1 Potential Future Development	3.24
3.10.1.1 Project Duration	3.27
3.10.2 Hypothetical Future Development	3.29
3.10.2.1 Hypothetical North Pit	3.30
3.10.2.2 Hypothetical Northeast Pit	3.32
3.10.2.3 Hypothetical East Pit.....	3.32
3.10.2.4 Reclamation Plans	3.33
3.10.3 Diamond Market Effects	3.33
4. Corporate Policies, Procedures and Commitments.....	4.1
4.1 Corporate Citizenship.....	4.1
4.2 Environmental Responsibility	4.3

4.3 Responsibility to Host Nations and Local Communities	4.3
4.4 Responsibility to Employees	4.5
4.5 Financial Responsibility, and Responsibility to Shareholders.....	4.8
4.6 Site-specific Programs	4.8
4.6.1 Commuting, Work Rotation and Northern Residency	4.8
4.6.2 Recruitment/Hiring and Associated Human Resource Support Activities	4.9
4.6.3 Training and Counselling.....	4.9
4.6.4 Occupational Health and Safety.....	4.9
4.6.5 Security Management.....	4.10
4.6.6 Employee Assistance Program/Drugs and Alcohol Abuse.	4.10
4.6.7 Accommodation for Traditional Activities	4.11
4.6.8 Committees and Liaisons.....	4.11
4.6.9 Contracting and Procurement.....	4.11
4.6.10 Community Education and Training.....	4.12
4.6.11 Youth and Educational, Training and Employment Opportunities.....	4.12
4.6.12 Environment Training and Emergency Response Plans ...	4.12
5. Communications Program and Public Involvement	5.1
5.1 Local and Regional Residents	5.3
5.1.1 Aboriginal Peoples	5.6
5.1.1.1 Historical Context.....	5.10
5.1.1.2 Communication Tools Used for the Aboriginal Communication Program	5.10
5.1.1.3 Field Trips	5.12
5.1.1.4 Traditional Knowledge Meetings, Workshops and Studies	5.19
5.1.1.5 Community Involvement	5.22
5.1.2 Other Northerners	5.25
5.1.2.1 Field Trips	5.30
5.1.2.2 Media Communications.....	5.33
5.2 Organizations and Resource Users.....	5.35
5.3 Governmental Entities	5.38
5.3.1 Federal.....	5.39
5.3.2 Territorial.....	5.40
5.3.3 Local Government.....	5.42
5.4 Methods of Addressing Future Concerns	5.42
References.....	R.1
Keywords.....	K.1
Glossary and Abbreviations.....	G.1

List of Tables

Table	Page
1.3-1 Comparison of Drivers of Community Costs	1.34
2.3-1 Geological Formations and Events in the NWT Diamonds Project Property.....	2.31
2.4-1 Open Pit Mining Equipment	2.48
2.4-2 Embankment Fill Volumes	2.55
2.4-3 Waste Rock Dump Capacities	2.67
2.4-4 Underground Mining Equipment	2.83
2.6-1 Dam and Dike Fill Volumes	2-113
2.7-1 Estimated Initial Electrical Load.....	2.137
2.8-1 Possible Northwest Territories-based Contracts	2.158
2.8-2 Earthworks and Concrete Materials Required by Facility.....	2.176
2.8-3 Other Construction Materials Requirements	2.176
2.8-4 Estimated Construction Equipment Requirements	2.177
2.9-1 Historic Periods of Echo Bay Winter Road Availability	2.183
2.9-2 Anticipated Construction Quantities and Truckloads Required (to Koala Plant Site)	2.186
2.9-3 Anticipated Quantities of Road-shipped Supplies During Preproduction.....	2.187
2.9-4 Anticipated Annual Quantities of Road-shipped Supplies During Operation	2.188
2.9-5 Anticipated Number of Aircraft Trips to Site.....	2.190
2.11-1 Accident Statistics - Mines in the Northwest Territories - 1994.....	2.210
2.11-2 Free Silica Analysis of Granite and Kimberlite	2.222

Table of Contents

2.11-3 Asbestos Analysis of Kimberlite2.222

2.11-4 Radioactivity Test Results2.228

3.2-1 *In situ* Values of Underground Mine Resources
NWT Diamonds Project vs. Existing NWT Mines3.3

3.10-1 Ratio of Payable to Non-payable Kimberlites in the Kalahari
Craton’s Major Diamondiferous Group of Pipes.....3.26

List of Figures

Figure	Page
1.1-1 The NWT Diamonds Project.....	1.2
1.1-2 Development Area Plan.....	1.5
1.3-1 Unemployment Rates, 1994 NWT vs. Canada and Alberta	1.27
1.3-2 Project Contributions to NWT Mining Economics.....	1.29
1.3-3a,b Potential Economic Benefits of the Project.....	1.30
1.3-4 Project Employment in Year 2007 - NWT Communities.....	1.33
1.4-1 Coppermine River Drainage Basin.....	1.38
1.4-2 Communities near the NWT Diamonds Project.....	1.40
2.2-1 Master Schedule	2.6
2.2-2a Mine Development Schedule - Exploration.....	2.8
2.2-2b Mine Development Schedule - Operation	2.10
2.2-2c Mine Development Schedule - Reclamation.....	2.16
2.3-1 Model for the Genesis of Diamond.....	2.21
2.3-2 Model of an Idealized Kimberlite Pipe.....	2.23
2.3-3 World Primary Diamond Deposits.....	2.24
2.3-4 South African Model of a Kimberlite Pipe	2.26
2.3-5 Regional Geologic and Terrane Map of the Slave Province	2.30
2.3-6 Regional Geologic Map.....	2.32
2.4-1 Total Ore/Waste Production by Year	2.38
2.4-2 Process Plant Tonnage by Pipe by Year.....	2.39
2.4-3 Waste Rock Tonnage by Pit by Year	2.40
2.4-4 Panda Diversion Channel.....	2.42
<i>NWT Diamonds Projects</i>	xiv

Table of Contents

2.4-5	Pit Slope Angles.....	2.47
2.4-6	Mine Start-up Schedule.....	2.54
2.4-7	Panda Preproduction Section, Views of Mining Sequence	2.57
2.4-8	Mine Development Plan - Panda Pre-stripping Period.....	2.58
2.4-9a	Mine Development Plan (2000).....	2.59
2.4-9b	Mine Development Plan (Misery 2000)	2.60
2.4-10	Mine Development Plan (2002).....	2.61
2.4-11a	Mine Development Plan (Misery 2006)	2.62
2.4-11b	Mine Development Plan (2006).....	2.63
2.4-12	Mine Development Plan (2007).....	2.64
2.4-13	Mine Development Plan (2022).....	2.68
2.4-14	Lake Bottom Sediments Impoundment.....	2.71
2.4-15	Sublevel Caving Operation	2.74
2.4-16	Schematic View of Koala and Panda Underground Mines	2.75
2.4-17	Sublevel Drilling Pattern	2.79
2.4-18	Panda Pre-production Development Sequencing.....	2.81
2.4-19	Typical Sublevel Layout.....	2.82
2.4-20	Panda Underground Ventilation Schematic.....	2.84
2.5-1	Stages in Diamond Recovery.....	2.92
2.5-2	Process Block Flowsheet Primary Concentration Section	2.93
2.5-3	Process Block Flowsheet Recovery Section.....	2.94
2.5-4	Process Design Envelopes.....	2.95
2.6-1	Tailings Impoundment.....	2.112
2.6-2	Perimeter Dam - Typical Cross Section	2.115

Table of Contents

2.6-3	-2°C Isotherms in Perimeter Dam Over Initially Frozen Foundation	2.117
2.6-4	Permafrost Core Dam, Temperature History of Base at Core	2.118
2.6-5	Intermediate Dike - Typical Cross Section.....	2.119
2.6-6	Water Diversion Structures	2.121
2.6-7	Spillway Alignment and Cross Section	2.122
2.6-8	Tailings Disposal in Cell.....	2.124
2.6-9	Tailings and Maximum Possible Water Levels in Cells A Through E	2.125
2.6-10	Seasonal Deposition of Tailings.....	2.127
2.6-11	Water Rise in Panda Pit During Tailings Infilling	2.128
2.7-1	Layout of Plant Site Facilities.....	2.130
2.7-2	Overland Transportation Routes to Project Site.....	2.133
2.7-3	Ammonium Nitrate Storage Area Site Plan.....	2.146
2.8-1	Construction Sequence (First Phase)	2.161
2.8-2	Construction Sequence (Second Phase).....	2.162
2.8-3	Construction Sequence (Third Phase).....	2.163
2.8-4	Construction Sequence (Fourth Phase).....	2.164
2.8-5	Construction Sequence (Fifth Phase).....	2.165
2.8-6	Construction Sequence (Final Phase).....	2.166
2.8-7	Construction Work Force Requirements.....	2.175
2.10-1	Business Unit Inter-relationship Structure	2.205
3.10-1	Potential Access Roads and Areas of Interest	3.25
3.10-2	Access Roads and Hypothetical Targets	3.31
5-1	Project Events and Communications Program	5.2

Table of Contents

5.1-1 Map of Communities and Distance from Project Site.....5.4

5.1-2 Local and Regional Communities - Date and Number of Visits.....5.5

5.1-3 Aboriginal Contacts - Date and Number of Visits5.11

5.1-4 Koala Campsite Visits - Date and Number of Visits.....5.17

5.1-5 NWT Diamonds Project Highlights5.34

List of Plates

Plate	Page
1.4-1 Aerial photo of Koala Lake, Panda Lake and environs.....	1.37
2.1-1 Prospectors following a trail of indicator minerals	2.3
5.1-1 Bruce Turner, Project Manager, addresses a Public Meeting at Wha Ti, April 1994	5.7
5.1-2 Jaap Zwaan, Chief Mine Engineer, explains aspects of the scale model of the development site to residents of Wha Ti, April 1994.....	5.8
5.1-3 Public Meeting at N'dilo, March 30, 1994.....	5.9
5.1-4 Bruce Turner, Project Manager, with Chief Isadore Zoe at the Public Meeting at Wha Ti, April 1994.....	5.9
5.1-5 Dogrib Treaty 11 delegates visit the Upper Fruitland Community, Navajo Nation, during their tour of W.U.S.M. operations at Farmington, N.M., December 1993	5.13
5.1-6 Ed Raymond, Senior Tribal Affairs Representative, presents Chief Jonas Sangris, Yellowknives Treaty 8, with a traditional Navajo Rug, December 1, 1994, Farmington, N.M.....	5.14
5.1-7 Jeff Young, Environmental Coordinator, San Juan Mine, briefs members of the Treaty 8 delegation during their visit to Farmington, N.M., December 1, 1994.....	5.14
5.1-8 Members of the Navajo delegation who attended the Dogrib Treaty 11 Annual Assembly at Wha Ti, August 1994.....	5.16
5.1-9 Dogrib Treaty 11 field trip to Koala Camp, including MLA Henry Zoe, accompanied by BHP management. The April 27, 1994, trip was in conjunction with meetings held in Wha Ti, Rae Lakes and Snare Lake.....	5.18
5.1-10 Alphonse Apples (far right), Koala Camp employee from Rae Lakes, prepares to accompany Mardy Semmler, Environmental Technician, BHP Diamonds, Inc.; Vivian Banci, Wildlife Biologist, Rescan Environmental Services Ltd.; and the helicopter pilot on a caribou survey, July 1994	5.20

Table of Contents

5.1-11	Summer students B. François (Treaty 8) and C. Zoe Chocolate (Treaty 11) assemble an herbarium as part of the Proponent's summer environmental program, Koala Camp, June 1994	5.20
5.1-12	Students from Snare Lake School arrive for their first Koala Camp visit, June 6, 1995	5.24
5.1-13	Snare Lake students pose in front of some crushed kimberlite during their tour of Koala Camp, June 6, 1995	5.24
5.1-14	Mrs. Barbara Brown, Director, Community Development Associates, leads the first session of the Community Mobilization workshop May 10, 1995, Wha Ti	5.26
5.1-15	Mrs. Barbara Brown with Christine Simpson, Community Mobilization program May 10, 1995, Wha Ti	5.27
5.1-16	Youth discussion group, Community Mobilization workshop, Wha Ti, May 1995	5.28
5.1-17	Elders and young people with Mrs. Barbara Brown during the Community Mobilization workshop, Wha Ti, May 1995	5.28
5.1-18	Members of the Yellowknife community attend the Open House, March 30, 1994. Terry Janes, Senior Project Engineer, answers questions using maps and core samples	5.29
5.1-19	Jaap Zwaan, Chief Mine Engineer (centre), discusses the project with an interested Yellowknife resident at the Open House, March 30, 1994	5.29
5.1-20	Vivian Banci, Wildlife Biologist for Rescan Environmental Services Ltd., discusses wildlife surveys with two Coppermine residents at the Public Meeting held November 8, 1994	5.31
5.1-21	Vivian Banci, Wildlife Biologist of Rescan Environmental Services Ltd., delivers her presentation on wildlife surveys in the Lac de Gras area at the Public Meeting in Umingmaktok, November 9, 1994	5.31
5.1-22	The Public Meeting held at the Explorer Hotel in Yellowknife, March 27, 1995. Approximately 170 people attended the three-hour meeting	5.32

Table of Contents

5.1-23	Jim Eccott, President of Dia Met, addresses the Public Meeting held at the Explorer Hotel in Yellowknife March 27, 1995 (Photo: Jake Ootes).....	5.32
5.2-1	Dan Johnson, Manager, Mine Development, addresses the Yellowknife Chamber of Commerce at a breakfast meeting held at the Explorer Hotel, March 1, 1995. Approximately 150 members of the local business community attended the early morning meeting (Photo: Jake Ootes)	5.36
5.2-2	Jim Peterson of the Northwest Territories Barren Ground Caribou Outfitters Association asks questions and states his views at the Public Meeting held at the Explorer Hotel, March 27, 1995 (Photo: Jake Ootes)	5.37
5.3-1	Premier Nellie Cournoyea, accompanied by Grant Farrows, Senior Process Engineer, BHP Diamonds Inc., during a tour of the bulk sample process plant at Koala Camp, April 8, 1995.....	5.41

List of Appendices

The appendices to this volume are contained in a supplementary report entitled Volume I - Appendices.

Appendix A - Introduction

- I-A1 Literature Review
- I-A2 Interview Guide
- I-A3 Traditional Aboriginal Knowledge/ Studies
- I-A4 Regulatory Environment

Appendix B - Project Description

TRANSPORTATION PLAN

- I-B1 Echo Bay Winter Road Agreement

HUMAN RESOURCES

- I-B2 Sexual Harassment
- I-B3 AIDS
- I-B4 Security/ Confidentiality
- I-B5 Recruitment (Preference)
- I-B6 Pre-Employment Training
- I-B7 Pension Plan

OCCUPATIONAL HEALTH AND SAFETY

- I-B8 Occupational Health and Safety Policy and Guidance Notes
- I-B9 Safety Report Form
- I-B10 "Safety Bulletin"
- I-B11 MSDS ("Duramet")
- I-B12 Work Permit

Appendix C - Policies Procedures and Commitments

I-C1 Environmental Policy

Appendix D - Communications Programs and Public Involvement

I-D1 Communications (multiple parts)

Table of Conformity

The following table indicates how the design and contents of the EIS conform to the requirements of the “Final Guidelines for the Preparation of an EIS” issued by the BHP Diamond Mine Environmental Assessment Panel in May 1995.

EIS Guideline Requirements	EIS Reference
4.0 EIS Overview	EIS Summary, Volumes I - IV
4.1 Study Strategy and Methods	Vol. II, Sec. 1.1 Methods Vol. IV, Sec. 1.1 Methods
Traditional Knowledge	Vol. I, Sec. 1.2 Indigenous Knowledge Vol. I, Sec. 5.1.1.4 Traditional Knowledge Meetings, Workshops and Studies Vol. II, Sec. 1.2 The Aboriginal Context Vol. II, Sec. 4.1.3 The Traditional Economy Vol. II, Sec. 4.1.4 Emergence of the Mixed Economy Vol. II, Sec. 4.1.5 The Current Economy Vol. II, Sec. 4.1.6 Concerns Vol. III, Sec. 1.2 Role of Indigenous Peoples & Knowledge in Environmental Management Vol. IV, Sec. 4.1 Local and Regional Perceptions of the project Vol. IV, Sec. 4.2 Aboriginal Employee Perceptions of the Project Vol. IV, Sec. 4.8 Traditional Economies/Lifestyles
4.2 EIS Presentation Conformity with Guidelines Keywords References Preparation Glossary	Table of Conformity List of Keywords Reference List Acknowledgments Glossary
4.3 EIS Summary	EIS Summary Volume

Table of Contents

5.0 Introduction	Vol. I, Sec. 1	Introduction
5.1 The Project	Vol. I, Sec. 1.1	The Project
5.2 The Setting	Vol. I, Sec. 1.4	Project Setting
5.2.1 Regional Context	Vol. I, Sec. 1.4.1	Regional Context
5.2.2 Land Claims	Vol. I, Sec. 1.4.2	Land Claims
5.2.3 Regulatory Environment	Vol. I, Sec. 1.4.3	Regulatory Environment
5.3 The Proponent	Vol. I, Sec. 1.5 Vol. I, Sec. 1.5.1 Vol. I, Sec. 1.5.2 Vol. I, Sec. 1.5.3 Vol. I, Sec. 1.5.4	The Proponent BHP The Blackwater Group Proponent Obligations Principal Contractors
6.0 Project Description and Overview	Vol. I, Sec. 1.1	The Project
Management Plans	Vol. III, Sec. 2 Vol. III, Sec. 3 Vol. III, Sec. 4 Vol. III, Sec. 5 Vol. III, Sec. 6 Vol. III, Sec. 7 Vol. III, Sec. 8 Vol. III, Sec. 9	Air Quality Management Plan Water Management Plan Materials Management Plan Waste Management Plan Traffic Management Plan Wildlife Management Plan Aquatic Life Management Plan Reclamation, Decommissioning and Closure Management Plan
Commitments and Policies	Vol. I, Sec. 4	Policies, Procedures and Commitments
7.0 Environmental Assessment Boundaries	Vol. II, Sec. 1.1 Vol. II, Sec. 2 Vol. II, Sec. 3 Vol. II, Sec. 4 Vol. IV, Sec. 1.1 Vol. IV Sec. 5.1	Methods Physical Setting Biological Setting Socioeconomic Setting Methods Cumulative Effects - Boundary Definitions

<p>8.0 Description of the Existing Environment</p>	<p>Vol. II, Sec. 2 Vol. II, Sec. 3 Vol. II, Sec. 4</p>	<p>Physical Setting Biological Setting Socioeconomic Setting</p>
<p>8.1 Physical Environment</p> <ul style="list-style-type: none"> a) geology b) permafrost c) ground instability d) hydrology e) water quality f) sediment quality g) air quality h) climate i) other components 	<p>Vol. I, Sec. 2.3 Vol. II, Sec. 2.1 Vol. II, Sec. 2.2 Vol. II, Sec. 2.3 Vol. II, Sec. 2.4 Vol. II, Sec. 2.5 Vol. II, Sec. 2.7 Vol. II, Sec. 2.6 Vol. II, Sec. 2.8</p>	<p>Geology Terrain and Permafrost Ground Instability Hydrology Water Quality Sediments Air Quality Climatology Noise</p>
<p>8.2 Biological Environment</p> <ul style="list-style-type: none"> a) fish and other aquatic life and habitat b) birds, wildlife and habitat c) vegetation including wetlands 	<p>Vol. II, Sec. 3.1 Vol. II, Sec. 3.3 Vol. II, Sec. 3.2</p>	<p>Aquatic Life Wildlife Vegetation</p>
<p>8.3 Socioeconomic Environment</p> <ul style="list-style-type: none"> a) public health 	<p>Vol. I, Sec. 5.1.1.5 Vol. II, Sec. 4.1.11 Vol. II, Sec. 4.2.5 Vol. II, Sec. 4.2.6.3 Vol. II, Sec. 4.4.4 Vol. II, Sec. 4.3.5 Vol. II, Sec. 4.3.3.3 Vol. II, Sec. 4.3.4.2 Vol. II, Sec. 4.4.5.2 Vol. II, Sec. 4.4.6 Vol. II, Sec. 4.5.2.1 Vol. II, Sec. 4.5.4 Vol. II, Sec. 4.5.5 Vol. II, Sec. 4.5.6</p>	<p>Community Involvement Social Infrastructure Infrastructure - Municipal Government Social/Leadership Resources Infrastructure Outlook Infrastructure Social/Leadership Resources Social/Leadership Resources Outlook Public Administration/ Education/Health Infrastructure Capacity for Growth Outlook</p>

b) demographics	Vol. II, Sec. 4.1.7 Vol. II, Sec. 4.2.2 Vol. II, Sec. 4.3.1 Vol. II, Sec. 4.4.1 Vol. II, Sec. 4.5.1	People/Demographic Profile People/Demographic Profile People/Demographic Profile People/Demographic Profile People/Demographic Profile
c) social and cultural patterns	Vol. I, Sec. 1.2 Vol. II, Sec. 4.1.3 Vol. II, Sec. 4.1.4 Vol. II, Sec. 4.1.5 Vol. II, Sec. 4.1.6 Vol. II, Sec. 4.1.8 Vol. II, Sec. 4.2 Vol. II, Sec. 4.2.6 Vol. II, Sec. 4.3 Vol. II, Sec. 4.3.5 Vol. II, Sec. 4.4 Vol. II, Sec. 4.4.5 Vol. II, Sec. 4.5 Vol. II, Sec. 4.5.5 Vol. II, Sec. 4.5.6	Traditional Knowledge - The Importance of Knowing The Traditional Economy The Emergence of the Mixed Economy The Current Economy Concerns Economic Activity/Sectors First Nations Communities Capacity for Growth Coppermine Outlook Yellowknife Capacity for Growth Hay River Capacity for Growth Outlook
d) archaeological, paleontological, cultural, heritage, burial sites	Vol. I, Sec. 5.1.1.4 Vol. II, Sec. 4.8	Traditional Knowledge Meetings, Workshops and Studies Archaeology
e) land and resource use	Vol. II, Sec. 4.1.3 Vol. II, Sec. 4.1.4 Vol. II, Sec. 4.1.5 Vol. II, Sec. 4.1.6 Vol. II, Sec. 4.1.8	The Traditional Economy Emergence of the Mixed Economy The Current Economy Concerns Economic Activity/Sectors

<p>e) land and resource use</p>	<p>Vol. II, Sec. 4.2.3 Economic Activity/Sectors Vol. II, Sec. 4.3.2 Economic Activity/Sectors Vol. II, Sec. 4.4.2 Economic Activity/Sectors Vol. II, Sec. 4.5.2 Economic Activity/Sectors</p>
<p>f) local, regional and territorial economy</p>	<p>Vol. II, Sec. 4.1.3 The Traditional Economy Vol. II, Sec. 4.1.4 Emergence of the Mixed Economy Vol. II, Sec. 4.1.5 The Current Economy Vol. II, Sec. 4.1.6 Concerns Vol. II, Sec. 4.1.8 Economic Activity/Sectors Vol. II, Sec. 4.1.9 Income and Investment Vol. II, Sec. 4.1.14 NWT Revenues and Expenditures Vol. II, Sec. 4.2.3 Economic Activity/Sectors Vol. II, Sec. 4.2.4 Income Vol. II, Sec. 4.3.2 Economic Activity/Sectors Vol. II, Sec. 4.3.3 Income Vol. II, Sec. 4.4.2 Economic Activity/Sectors Vol. II, Sec. 4.4.4.12 Financial Resources Vol. II, Sec. 4.5.2 Economic Activity Sectors Vol. II, Sec. 4.5.3 Other Income</p>
<p>g) employment, education and training</p>	<p>Vol. I, Sec. 2.10 Human Resources Vol. II, Sec. 4.1.7 People/Demographic Profile Vol. II, Sec. 4.1.8 Economic Activity/Sectors Vol. II, Sec. 4.1.9.1 Wages/Employment Vol. II, Sec. 4.1.11 Social Infrastructure Vol. II, Sec. 4.2.2 People/Demographic Profile Vol. II, Sec. 4.2.6.2 Education/Work Force Vol. II, Sec. 4.3.1 People/Demographic Profile Vol. II, Sec. 4.3.4.1 Work Force Vol. II, Sec. 4.4.1 People/Demographic Profile Vol. II, Sec. 4.4.3.1 Wages/Employment</p>

Table of Contents

g) employment, education and training	Vol. II, Sec. 4.4.4.7 Vol. II, Sec. 4.5.1 Vol. II, Sec. 4.5.3.1 Vol. II, Sec. 4.5.4.7 Vol. II, Sec. 4.5.5.1	Education Facilities People/Demographic Profile Wages/Employment Education Facilities Work Force
h) services and infrastructure	Vol. I, Sec. 2.7 Vol. I, Sec. 2.9 Vol. II, Sec. 4.1.6 Vol. II, Sec. 4.1.7 Vol. II, Sec. 4.2.5 Vol. II, Sec. 4.3.3.3 Vol. II, Sec. 4.4.4 Vol. II, Sec. 4.5.4	Infrastructure Transportation Plan Infrastructure Social Infrastructure Infrastructure - Municipal Government Infrastructure Infrastructure Infrastructure
i) government	Vol. I, Sec. 1.4.2 Vol. I, Sec. 1.4.3 Vol. I, Sec. 5.3 Vol. II, Sec. 4 Vol. II, Sec. 4.1.1 Vol. II, Sec. 4.2.3.1 Vol. II, Sec. 4.2.5 Vol. II, Sec. 4.3.2 Vol. II, Sec. 4.3.2.1 Vol. II, Sec. 4.3.3.3 Vol. II, Sec. 4.4.4.2 Vol. II, Sec. 4.5.4.2	Land Claims Regulatory Environment Government Entities Socioeconomic Setting Political Setting Government Infrastructure - Municipal Government Economic Activity/Sectors Government Infrastructure Municipal Government Municipal Government
9.0 Impact Assessment	Vol. IV	Environmental Impacts and Mitigation
Cumulative Effects Impact Significance 9.1 Effects on the Physical Environment	Vol. IV, Sec. 5 Vol. IV, Sec. 2	Cumulative Effects Physical Impacts and Mitigation

Table of Contents

<p>9.1 Effects on the Physical Environment (cont.)</p> <p>a) bedrock geology, surficial geology and geomorphology</p> <p>b) permafrost</p> <p>c) ground instability</p> <p>d) hydrological features</p> <p>e) water quality</p> <p>f) sediment quality and quantity</p> <p>g) ambient air quality and noise levels</p> <p>h) climate</p>	<p>Vol. IV, Sec. 2.1</p> <p>Vol. IV, Sec. 2.1</p> <p>Vol. IV, Sec. 2.2</p> <p>Vol. IV, Sec. 2.3</p> <p>Vol. IV, Sec. 2.4</p> <p>Vol. IV, Sec. 2.4</p> <p>Vol. IV, Sec. 2.5</p> <p>Vol. IV, Sec. 2.7</p> <p>Vol. IV, Sec. 2.6</p>	<p>Terrain Impacts</p> <p>Terrain Impacts</p> <p>Ground Instability Impacts</p> <p>Hydrology Impacts</p> <p>Water Quality Impacts</p> <p>Water Quality Impacts</p> <p>Air Quality Impacts</p> <p>Noise Impacts</p> <p>Climatology Impacts</p>
<p>9.2 Effects on the Biological Environment</p> <p>a) fish and other aquatic life</p> <p>b) birds and wildlife</p> <p>c) plant and vegetation communities</p>	<p>Vol. IV, Sec. 3</p> <p>Vol. IV, Sec. 3.1</p> <p>Vol. IV, Sec. 3.3</p> <p>Vol. IV, Sec. 3.2</p>	<p>Biological Impacts and Mitigation</p> <p>Aquatic Life Impacts</p> <p>Wildlife, Birds and Habitat Impacts</p> <p>Vegetation Impacts</p>
<p>9.3 Effects on Socioeconomic Environment</p> <p>a) public health</p>	<p>Vol. II, Sec. 4</p> <p>Vol. IV, Sec. 4</p> <p>Vol. IV, Sec. 4.1</p> <p>Vol. IV, Sec. 4.2</p> <p>Vol. IV, Sec. 4.10</p>	<p>Socioeconomic Setting</p> <p>Socioeconomic Impacts and Mitigation</p> <p>Local and Regional Perceptions of the Project</p> <p>Aboriginal Employees' Perceptions of the Project</p> <p>Community Well-being</p>
<p>b) demographics</p>	<p>Vol. IV, Sec. 4.4</p>	<p>Population Growth/Decline</p>
<p>c) social and cultural patterns</p>	<p>Vol. I, Sec. 3.1</p> <p>Vol. I, Sec. 5.4</p> <p>Vol. II, Sec. 4.7</p>	<p>Fly-In/Fly-Out Work Force Versus Permanent Mining Town</p> <p>Methods of Addressing Future Concerns</p> <p>No Development Scenario</p>

c) social and cultural patterns	Vol. IV, Sec. 4.1	Local and Regional Perceptions of the Project
	Vol. IV, Sec. 4.2	Aboriginal Employees Perceptions of the Project
	Vol. IV, Sec. 4.3	Employment and Income Impacts
	Vol. IV, Sec. 4.8	Traditional Economies/Lifestyles
	Vol. IV, Sec. 4.10	Community Well Being
	Vol. IV, Sec. 4.11	Cross-cultural Impacts
	Vol. IV, Sec. 4.12	Job and Education Aspirations
d) cultural sites	Vol. IV, Sec. 4.1	Local and Regional Perceptions of the Project
	Vol. IV, Sec. 4.15	Archaeological Impacts
e) land and resource use	Vol. I, Sec. 1.4.2	Land Claims
	Vol. I, Sec. 1.4.3	Regulatory Environment
	Vol. I, Sec. 5.4	Methods of Addressing Future Concerns
	Vol. IV, Sec. 4.1	Local and Regional Perceptions of the Project
	Vol. IV, Sec. 4.2	Aboriginal Employees Perceptions of the Project
	Vol. IV, Sec. 4.9	Land Users in Vicinity of the Mine
f) local, regional and territorial economy	Vol. I, Sec. 1.3	Project Economic Analysis
	Vol. II, Sec. 4.6	Competing/Complimentary Projects in the NWT
	Vol. II, Sec. 4.7	No Development Scenario
	Vol. IV, Sec. 4.1	Local and Regional Perceptions of the Project
	Vol. IV, Sec. 4.2	Aboriginal Employees Perceptions of the Project
	Vol. IV, Sec. 4.3	Employment and Income Impacts
	Vol. IV, Sec. 4.6	Local Economies
	Vol. IV, Sec. 4.8	Traditional Economies/Lifestyles
	Vol. IV, Sec. 4.13	Government Income and Expenses
	Vol. IV, Sec. 4.14	Economic Impacts

<p>g) employment, education and training</p>	<p>Vol. I, Sec. 1.4.2 Vol. I, Sec. 1.4.3 Vol. I, Sec. 2.10 Vol. I, Sec. 2.11.9.2 Vol. I, Sec. 4.0 Vol. I, Sec. 5.1.1.5 Vol. I, Sec. 5.4 Vol. IV, Sec. 4.1 Vol. IV, Sec. 4.2 Vol. IV, Sec. 4.3 Vol. IV, Sec. 4.8 Vol. IV, Sec. 4.12</p>	<p>Land Claims Regulatory Environment Human Resources Training Corporate Policies, Procedures and Commitments Community Involvement Methods of Addressing Future Concerns Local and Regional Perceptions of the Project Aboriginal Employees Perceptions of the Project Employment and Income Impacts Traditional Economies/Lifestyles Job and Education Aspirations</p>
<p>h) services and infrastructure</p>	<p>Vol. IV, Sec. 4.6 Vol. IV, Sec. 4.7 Vol. IV, Sec. 4.13</p>	<p>Pass-through Traffic - Yellowknife Use of NWT Infrastructure and Services Government Income/Expenses</p>
<p>i) government</p>	<p>Vol. I, Sec. 1.4.2 Vol. I, Sec. 1.4.3 Vol. I, Sec. 5.4 Vol. II, Sec. 4.7 Vol. III, Sec. 10.4 Vol. IV, Sec. 4.13 Vol. IV, Sec. 4.14</p>	<p>Land Claims Regulatory Environment Methods of Addressing Future Concerns No Development Scenario Socioeconomic Impacts Monitoring Government Income/Expenses Economic Impacts</p>

Table of Contents

10.0 Mitigation Measures and Residual Effects	Vol. I, Sec. 1.3 Vol. IV, Sec. 2 Vol. IV, Sec. 3 Vol. IV, Sec. 4	Project Economic Analysis Physical Impacts and Mitigation Biological Impacts and Mitigation Socioeconomic Impacts and Mitigation
11.0 Monitoring Programs	Vol. III, Sec. 10	Environmental Monitoring Strategy
12.0 Alternatives and Future Development	Vol. I, Sec. 3.1 Vol. I, Sec. 3.2 Vol. I, Sec. 3.3 Vol. I, Sec. 3.4 Vol. I, Sec. 3.5 Vol. I, Sec. 3.6 Vol. I, Sec. 3.7 Vol. I, Sec. 3.8 Vol. I, Sec. 3.9 Vol. I, Sec. 3.10	Fly-In/Fly-Out Work Force Versus Permanent Mining Town Open Pit and Underground Mining Backfilling of Open Pits Plant Site Location Mineral Processing Options Ore Treatment Production Rates Alternative Tailings Disposal Site and Facility Assessment Power Generation Options Transportation Options Future Development
13.0 Information Programs & Public Involvement	Vol. I, Sec. 5	Communications

Acknowledgments

Preparation of the Environmental Impact Statement (EIS) for the NWT Diamonds Project involved a significant effort by many of Canada's leading consultants, specialists and support companies. The Proponent wishes to acknowledge the contribution that these groups have made and the high standard of work and support given to this project.

BHP, as Operator of the project and on behalf of the Proponent, initiated environmental studies and the community consultation process in 1992. Since the summer of 1993, Rescan Environmental Services Ltd. (Rescan) was contracted to conduct field sampling for the baseline environmental studies. Rescan, with BHP's direction, has also been responsible for document preparation and the coordination of the many facets of this study. Outcrop Northern Agency Ltd. of Yellowknife has been the principal consultant with respect to the socioeconomic assessment of the project. Various sub-consultants provided specialist services for components of this EIS document, including the following:

Consultants	Contribution
ARA Consulting Group Inc. Vancouver, B.C.	Economic Analysis
Agra Earth and Environmental Calgary, AB	Fish Habitat Evaluation
Applied Technical Services Victoria, B.C.	Benthic Invertebrates and Zooplankton Identification
ASL Laboratory Services Vancouver, B.C.	Water Quality, Sediment and Tissue Analysis
Jerry W. Bair Houston, TX	Communications, Government Affairs, Traditional Knowledge
Barb Brown Community Development Associates Vancouver, B.C.	Community Assessment and Community Mobilization
Barron Kennedy Lyzun and Associates Vancouver, B.C.	Noise Assessment
BC Research Laboratory Vancouver, B.C.	Toxicity Testwork

Consultants	Contribution
Bruce Geotechnical Consultants Inc. Vancouver, B.C.	Groundwater Modelling and Permafrost
Canadian Circumpolar Institute University of Alberta Edmonton, AB	Dene and Inuit Traditional Knowledge Literature Review
Chemex Laboratory North Vancouver, B.C.	Acid Base Accounting Testwork
Chris Hanks Victor, Colorado	Indigenous and Traditional Knowledge
Davis & Co. Vancouver, B.C. Yellowknife, NWT	Legal Services
Dene Cultural Institute Hay River, NWT	Traditional Knowledge
Dene Nation Yellowknife, NWT	Traditional Land Use Maps
EBA Engineering Consultants Ltd. Edmonton, AB	Geotechnical Engineering and Permafrost Assessment
Elemental Research Laboratory North Vancouver, B.C.	ICP/MS Low Level Water Quality Analyses
Fluor Daniel Wright Ltd./ Signet Engineering Pty Ltd. Vancouver, B.C.	Infrastructure and Process Design
Fraser Taxonomic Services Vancouver, B.C.	Periphyton and Phytoplankton Identification
Hamlet of Coppermine Coppermine, NWT	Indigenous and Traditional Knowledge
Inuvik Fisheries Consulting and Age Laboratory Inuvik, NWT	Fish Aging, Scales

Consultants	Contribution
Janet Kidd ABR Inc. Fairbanks, Alaska	Reclamation Literature Review and Research Design
George Kurilko LSA Richmond, Ca.	Socioeconomics
Lockhart Risk Management Vancouver, B.C.	Industrial Hygiene
Metis Heritage Association Yellowknife, NWT	Traditional and Indigenous Knowledge
Dr. Kevin Morin President Morwijk Enterprises Ltd. Vancouver, B.C.	Acid Base Accounting
MORWIJK Enterprises Ltd. Vancouver, B.C.	Geochemistry and Acid Generation Evaluation
Oikos Ecological Group Vancouver, B.C.	Ecosystem Mapping
Elizabeth Wyman Office Compliments Yellowknife, NWT	Long Distance Labour Commuting
Points West Consulting Vancouver, B.C.	Archaeological Assessment
Polster Reclamation Services Vancouver, B.C.	Reclamation
Sandwell Inc. Calgary, AB	Winter Road and Ice Assessment
SRK Geotechnical Engineers Vancouver, B.C.	Geotechnical Assessment for Open Pits and Underground Mines

Consultants	Contribution
Dr. Marc Stevenson Canadian Circumpolar Institute University of Alberta Edmonton, AB	Indigenous and Traditional Ecological Knowledge
The Training Group Edmonton, AB	Training Modules for Human Resource Assessment
Treaty 11 Band Council Rae-Edzo, NWT	Traditional Knowledge
UBC Mineral Laboratory University of British Columbia Vancouver, B.C.	Tailings Settling Testwork

Invaluable assistance was provided by specialist advisors in ecology, wildlife, fisheries, permafrost/terrain, tailings, air quality, hydrology and socioeconomics:

Advisors	Contribution
Dr. Peter Boothroyd Associate Professor Centre for Human Settlements University of British Columbia Vancouver, B.C.	Social Issues
Dr. Peter Byrne, P.Eng. Professor of Civil Engineering University of British Columbia Vancouver, B.C.	Tailings Structures and Seismicity
Dr. Bill Freedman Professor of Ecology Dalhousie University Halifax, Nova Scotia	Valued Ecosystems, Sustainable Development, Cumulative Effects, Ecosystem Linkages
Dr. Lionel Johnson Retired Arctic Fisheries Biologist Victoria, B.C.	Fisheries and Aquatics (Lake Trout Specialist)

Advisors	Contribution
Walter Keys President Intertec Management Ltd. Regina, Sask.	EIS Report Presentation
Dr. Peter McCreath, P.Eng. Hydrologist Clearwater Consultants Ltd. Vancouver, B.C.	Hydrology and Water Management
Dr. François Messier Professor of Wildlife Ecology University of Saskatchewan Saskatoon, Sask.	Grizzly Bears, Caribou and Wildlife Habitat
Dr. Holly Peterson Associate Professor Environmental Engineering Department University of Montana Butte, Montana	Air Quality and Dispersion Modelling
Dr. Wayne Savigny, P.Eng. Professor Geology and Geomorphology University of British Columbia Vancouver, B.C.	Terrain and Permafrost
Dr. David Segó, P.Eng. Professor of Civil Engineering University of Alberta, Edmonton, AB	Tailings in Northern Climates

For the socioeconomic analysis particular assistance was provided by:

- the staff of NWT Bureau of Statistics
- Mr. Bernie Scott, NWT Energy, Mines and Petroleum Resources
- Mr. Dan Westman, NWT Economic Development and Tourism
- staff of the City of Yellowknife and the Town of Hay River

- staff of RCMP, Yellowknife
- Human Resources Managers: Colomac, Lupin, Nanisivik, Polaris

A series of field sampling protocols were developed with the assistance of the Department of Indian and Northern Affairs' Regional Environmental Review Committee (RERC) in the fall of 1993. The environmental baseline studies protocol document was screened and amended by the RERC. The protocol document outlined the biophysical study parameters, methodologies, sampling frequencies and locations proposed for the baseline studies. Members of the RERC provided comments on the draft protocol document that were incorporated in the final baseline studies protocols. The following RERC members participated in the development of the protocols:

Department of Indian and Northern Affairs

Land Resources Division

Water Resource Division

Environment and Conservation Division

Environment Canada

Environmental Protection Service

Canadian Wildlife Service

Atmospheric Environment Service

Inland Water Directorate

Fisheries and Oceans

Government of Northwest Territories

Department of Renewable Resources

Department of Energy

Mines and Petroleum Resources

Policy and Directive Office

Education, Culture and Employment

Aboriginal Communities

Dogrib Treaty 11 Environment Committee

Yellowknives Dene Treaty 8 Environment Committee

Dene Metis Nation

NWT Chamber of Mines

The assistance provided by the above groups was greatly appreciated and particularly important in scoping the environmental baseline studies. A special acknowledgement goes to Environment Canada's Freshwater Institute in Winnipeg and particularly to Dr. Harold (Buster) Welch, Dr. Jack Klaverkamp and Mr. Chris Katopodis.

In addition, assistance received from professionals associated with Natural Resources Canada, Department of Indian Affairs and Northern Development and Environment Canada in Ottawa and GNWT Renewable Resources in Yellowknife was particularly appreciated.

Special mention should be made of the many people involved in the report preparation, graphics, art work and technical editing, in particular the staff at RESCAN, First Wave Publishing, Karen D. Lunde, Ken Cookson, and Timm Williams Design.

In summary, the Proponent wishes to thank all the many individuals named and unnamed that assisted in the preparation of this document.

Disclaimer

The material contained in this E.I.S. has been prepared in response to guidelines issued by the Panel established by the Government of Canada pursuant to the Environmental Assessment and Review Process Guidelines Order. The contents hereof represent the Proponent's best estimate of its prospects for developing the project on its mineral claim block in the Lac de Gras area, based on information currently available and believed by management to be reliable. Any estimates or forecasts of levels of production, ore grades and reserves have been prepared for purposes of the environmental review process only. They have not been prepared in accordance with securities regulatory requirements pertaining to disclosure of future-oriented financial information and accordingly may not be relied upon for investment purposes.

organizations, resource users and governments. Previous and ongoing communications programs are described; samples of communication packages such as brochures and lists of videotapes are provided in the appendices to this volume.

Overall, this volume provides a general summary of the development plans for the NWT Diamonds Project. Details regarding the environmental setting, environmental management, and potential impacts, mitigation and residual effects are described extensively in accompanying volumes.

1. Introduction

Section 1 describes the important components of the NWT Diamonds Project. The project is located 300 km northeast of Yellowknife, Northwest Territories (NWT), near Lac de Gras. Diamonds will be mined in the region for approximately 25 years in both open pit and underground operations. Aboriginal peoples and their knowledge will both play an important role in the development and operation of the mine. It is estimated that the mine will employ 650 to 850 people in each full year of production and generate annual revenues of \$400 million to \$500 million.

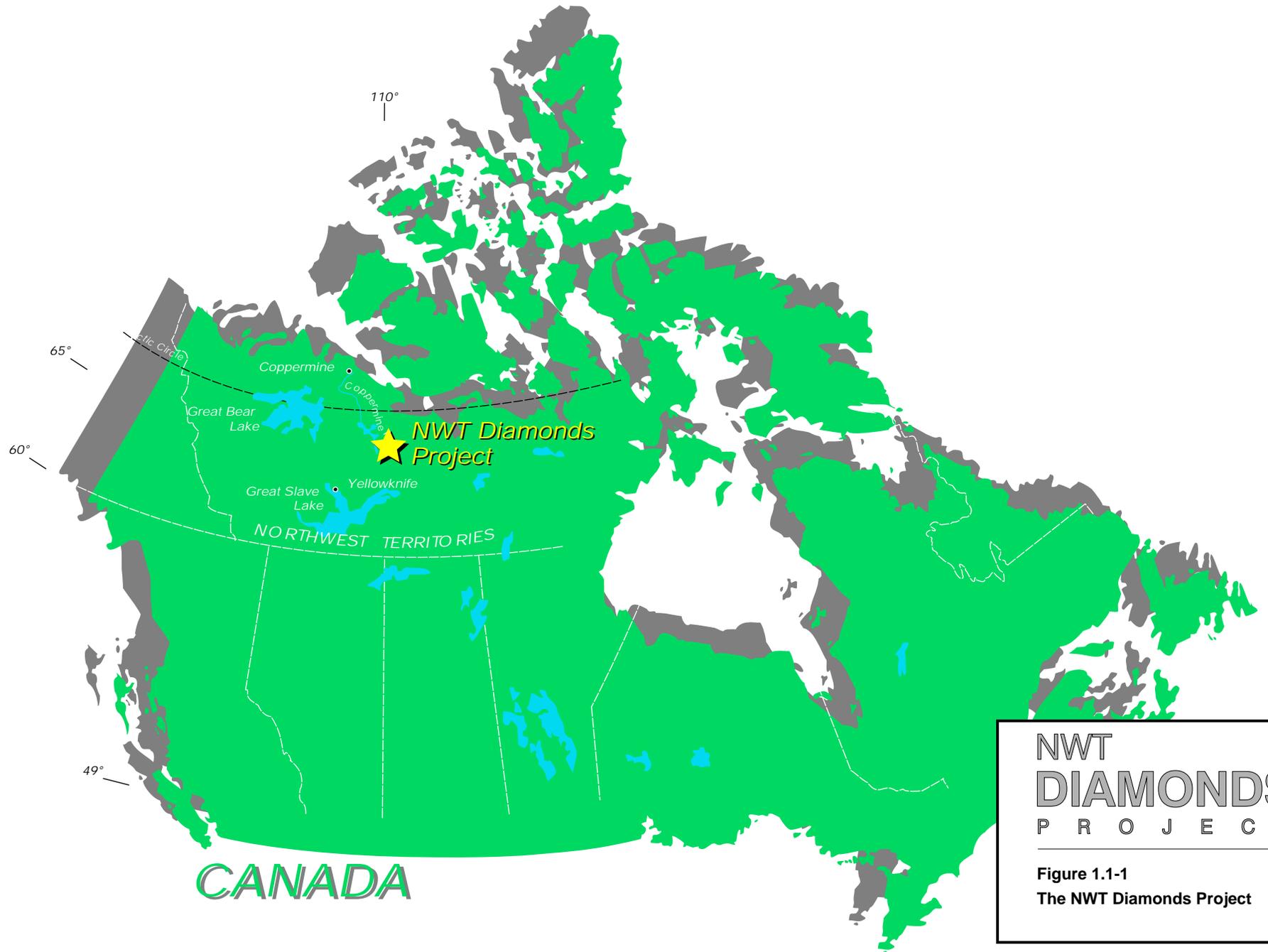
The project site lies within the Coppermine River basin. This is a traditional use area of the Dene and Inuit, and regional land claims negotiations that include this area are currently in progress. These land claims and other concerns raised by Aboriginal peoples are described in this section. The various permits and approvals required for project development are explained according to the regulatory environment that pertains to the project.

The corporate backgrounds of the Proponent – BHP and the Blackwater Group – as well as its contractors, are provided to show the Proponent's past and ongoing corporate accountability for its mining developments throughout the world. The management of environmental and socioeconomic issues is an important priority in any mining project undertaken by the Proponent.

1.1 The Project

The NWT Diamonds Project has been organized to explore and develop claims in the Lac de Gras area, approximately 300 km northeast of Yellowknife (Figure 1.1-1). BHP Diamonds Inc. has earned a 51% interest in the joint venture and is the operator for the project. The other joint venture party is the Blackwater Group, consisting of Dia Met Minerals Ltd., Charles E. Fipke and Dr. Stewart L. Blusson. The joint venture partners believe that the project will develop Canada's first diamond mine. An aggressive development schedule is being pursued under which development would begin in mid-1996 and diamond production in late 1997.

This Environmental Impact Statement (EIS) has been prepared to meet the requirements of the federal Environmental Assessment and Review Process (EARP). In July 1994, the Minister of Indian Affairs and Northern Development referred the project to the Minister of Environment for public review by a federal Environmental Assessment Panel. After conducting public scoping meetings, the Panel issued guidelines on May 23, 1995, for the preparation of an EIS. The EIS has been prepared in response to these guidelines.



**NWT
DIAMONDS
PROJECT**

**Figure 1.1-1
The NWT Diamonds Project**

Source: BHP

The discovery of diamond-bearing kimberlite pipes in the Northwest Territories followed systematic prospecting by geologist Charles Fipke for over ten years. The claim block is located in the Archean Slave province of the Canadian Shield. The regional cratonic rocks consist of metasediments of the Yellowknife Group, which are locally intruded by granitoid rocks ranging in age from 2.6 to 3.3 billion years. Kimberlite pipes, one of which has been dated at 52 million years, have intruded into these country rocks. Exploration of the kimberlite pipes has been complicated because kimberlite is generally a soft rock that has been preferentially eroded by glacial activity. Consequently, kimberlite pipes in the Lac de Gras area are frequently associated with depressions which, since the last ice age, have often become lakes.

Since the initial discovery in 1991, a total of 44 kimberlites have been identified on the property. Of these, 39 have been proven to be diamond-bearing. Each pipe is unique with respect to diamond content, size and quality. During exploration and bulk sampling to date, more than 10,000 tonnes of material have been recovered and processed. Results compare favourably with those at other diamond mines in the world. Bulk sampling and other drilling programs are continuing in order to provide sufficient samples and data for planning, design, development and marketing purposes.

The NWT Diamonds Project can meet present regulatory requirements and is economically feasible at today's prices and tax and royalty regimes. Assuming no major changes in these conditions or the development plan, a decision to proceed to full-scale development is anticipated on receipt of approvals by regulatory agencies and by the joint venture partners.

The Proponent is committed to sustainable development and will undertake its mining development operations with concern for the long-term influence on the communities that may be affected by its mining activity. Project planning, construction and operation will be undertaken in consultation with Aboriginal peoples and territorial and federal representatives in order to minimize environmental and socioeconomic disruption and to ensure that the benefits derived from mining development are shared locally.

As a sign of its commitment to sustainable development, the Proponent has endeavoured to include traditional knowledge in overall project planning. Efforts to gain an understanding of traditional knowledge for integration into project design have consisted of community meetings, personal interviews, site visits, discussions with employees, funding for research and land use maps. The inclusion of traditional knowledge will benefit the project and ensure that the mine development is carried out with respect for the concerns of present and future generations.

The mining development plan involves five diamondiferous pipes. Four are located within a few kilometres of each other in the Koala watershed north of Lac

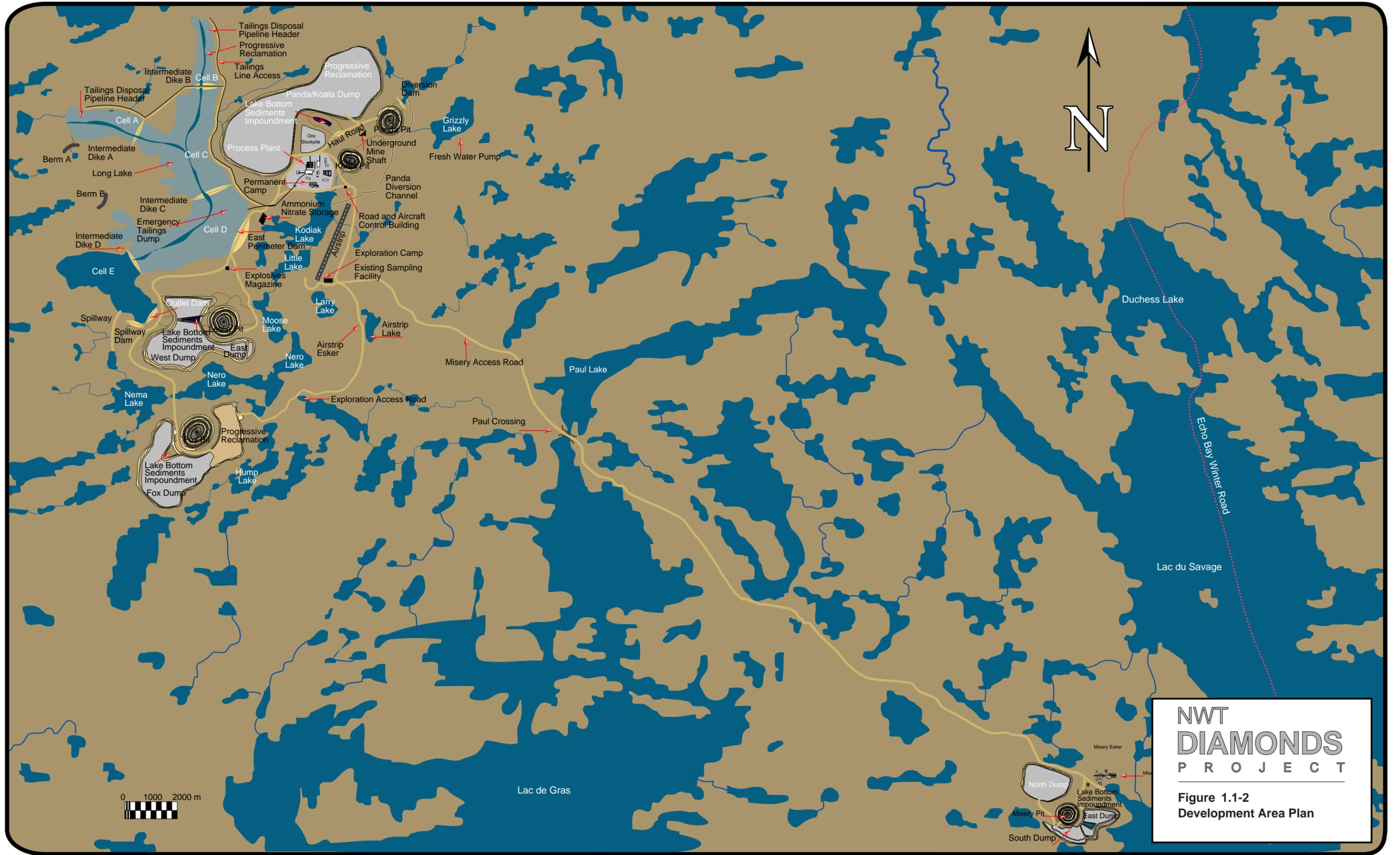
de Gras, and the fifth is about 29 km to the southeast, adjacent to Lac de Gras (Figure 1.1-2). The pipes, termed Panda, Misery, Koala, Fox and Leslie, are situated under lakes of the same names. Conventional open pit mining will be carried out in all five areas, followed by underground development of two of the pipes. The Panda pit would be developed first, followed by Misery, Koala, Panda (underground), Fox, Koala (underground) and Leslie. During the first nine years of operation, the mine will provide ore for processing at a rate of 9,000 t/d, increasing to 18,000 t/d for the remaining life of the project. A total of approximately 133 million tonnes of ore will be processed over 25 years. Depending on the results of further exploration and development, the life of the project may be extended.

Each mine will require the lake overlying the pipe to be dewatered. The open pit design for each of the five pits is similar, with both single and double benching applied depending on prevailing conditions. Excavated rock will be loaded into large haul trucks and transported to either a waste rock dump or a collection point for processing. On depletion of their economic open pit reserves, the Panda and Koala pipes will be mined underground by means of sublevel caving, which is a high production method suited for massive and steeply dipping, medium-width ore bodies such as those commonly found in kimberlite deposits. Should ground conditions be different than anticipated, an alternative underground mining method may be utilized.

Between 35 and 40 million tonnes of waste rock will be excavated annually from the open pits and smaller volumes from the underground operations. This material will be stockpiled in dumps in the vicinity of each pit. It will also be used as building material for roads and other construction requirements. Ultimately, the waste dumps will be contoured to blend in with existing topography.

A single, centralized process plant will be located southwest of the Koala pit. The plant and mining operation will operate 24 h/d, 365 d/a. Processing of kimberlite diamond-bearing ore is unique in that extremely high recoveries of the diamonds must be obtained without causing breakage. Basic unit operations will include crushing, dense medium separation and X-ray sorting.

Fine tailings from the process plant will be thickened and discharged into Long Lake, to the west of the mines and plant site. The tailings will be discharged by beaching upstream of divider dikes in summer. To accommodate the volume of tailings to be stored over the life of the disposal site, it will be necessary to raise the lake level by approximately 9 m by damming the outlet and constructing other dams at various locations around the periphery. The coarser fraction of tailings



**NWT
DIAMONDS
PROJECT**

**Figure 1.1-2
Development Area Plan**

(approximately 20%) will be separated and hauled by truck to the waste rock dumps. Process water for the process plant will be pumped from Long Lake, and the system will operate almost entirely on a recycle basis.

Since diamonds are valuable and easy to conceal, a comprehensive security control plan has been developed. The mine site and off-site facilities will be divided into several different levels of security. Access to high security zones will be restricted and closely monitored, requiring special access cards at controlled entrances. Access to the recovery section at the mine site and the off-site cleaning and sorting area will be restricted to personnel required only in those sections.

Due to the remote location of the project, the site will include a full range of ancillary facilities. A permanent camp will be provided to serve the estimated 400-person mine and process plant on-site work force. A truckshop and administrative complex will be built adjacent to the process plant. Power will be generated on site by six 4.4 MW generators.

Access to the site by road will be possible for about three months each year when the Echo Bay winter road is operable. An access road will be constructed to connect the facilities to the winter road, approximately 32 km to the southeast. A runway suitable for use by Hercules aircraft and cargo jets has been completed and will be used for year-round access.

The NWT Diamonds Project has been designed with sensitivity for the tundra environment in which it will operate. Project design has been based on state-of-the-art technology and methods proven in subarctic conditions. Experience gained through exploration activities will ensure that project activities are planned with consideration for the cold climate and remote location of the mine development and to avoid or minimize disruption to the environment. Particular attention will be focused on those elements viewed as being valued ecosystem components.

In its commitment to sustainable development, the Proponent will consider the links between ecosystem integrity, social health and economic stability, as well as the cultural values that influence these relationships. An integrative approach will be used to evaluate the potential effects of specific mining activities on their surrounding environment. This will include an examination of the cumulative effects of the current proposal as well as future expansion possibilities for this specific project.

One environmental impact that may be expected to arise from project development is the loss of a small amount of aquatic habitat with low productivity in the Koala watershed. Dewatering of the lakes overlying the kimberlite pipes planned for development, and of Airstrip Lake to gain access to construction materials, will eliminate fish habitat, as will the in-filling of Long Lake. A diversion channel connecting upper Panda and Kodiak lakes and bypassing Panda

and Koala lakes will preserve a pathway for the free movement of fish and ameliorate these effects to some extent. In addition, a restrictive angling policy will be established for project site personnel. Due to the abundance of fish habitat in the Lac de Gras area and the small area of affected lakes, the overall impact of aquatic losses will be minimal and should not reduce regional biodiversity.

Preliminary post-closure plans are to allow the mined out pits to refill with water through runoff, precipitation and groundwater seepage. In time, the water in these re-established lakes will return to normal levels, although they are not expected to recover historical aquatic production levels, given the relatively great depths of the pits and the lack of littoral habitat. Measures to be considered for compensation of the relatively small loss of fish habitat include the enhancement of habitat in the vicinity of the lost habitat and possibly the improvement of habitat outside of the claim block, near human populations.

Project development may have some effect on wildlife such as barren-ground caribou, grizzly bears and wolves. The habitat found in the project area is not unique, and the area of disturbance is small in relation to the habitat available. Mining activities, to some extent, may cause habitat loss or alteration, interference with migration patterns, increased noise disturbance, hazards and altered ecology. Construction may reduce local food sources and certain types of habitat. In the immediate development area, increased levels of human activity and noise may disturb wildlife and cause slightly higher levels of mortality through encounters with mine traffic. Hunting will be prohibited within the claim block.

Mining activities will be conducted so as to address any potential environmental issues and to minimize impacts on surrounding wildlife. Local populations will be monitored, and particular attention will be paid to effects on vulnerable species. Measures to mitigate potential impacts include siting and timing of project activities, habitat enhancement, employee education and regular monitoring.

Potential impacts to permafrost, eskers, vegetation, wildlife habitat, air and water quality and hydrology will be minor or negligible on a regional scale and appear to be manageable. The implementation of environmental management plans will ensure that these valued ecosystems components are protected.

The socioeconomic impacts of this mining development are expected to be largely positive:

“We agree in principle with the Proponent that sustainable development implies a balance between social, economic and ecological systems... and for now we agree with BHP’s tentative conclusion that the key impacts of this mining development are expected to be socioeconomic and they will be largely positive” (Mayor Dan Marion of Rae-Edzo).

Although there are no communities within the immediate project vicinity, employment will be generated for Aboriginal communities in the region, and significant socioeconomic benefits will be realized in Yellowknife, which is the closest major centre and an important source of supplies and employment. In addition to creating employment and stimulating economic development in the Northwest Territories, economic benefits related to employment and business opportunities will likely flow to other parts of Canada as well.

Much of the western Northwest Territories is under Aboriginal land claims, including the NWT Diamonds Project area, which lies within the North Slave Division of the Dene/Metis Land Claim Region. Consultation with Aboriginal groups has been an important component of activities to date and will continue to be so during development and operational phases of the project.

It is currently estimated that approximately 1,220 person-years of employment will be created during the construction phase. During the initial operation phase, there will be 640 employees, increasing to an average of 830 over the 25-year mine life; this represents 20,800 person-years of employment. Shift rotation will be on a fly-in/fly-out basis, with Yellowknife and local communities serving as the departure points for flights and the likely places of residence for many employees.

BHP has in place a progressive Occupational Health and Safety Policy. Compliance with all applicable laws, regulations, codes and standards relating to occupational health and safety is an integral part of this policy. In the interest of preventing injury and to promote a safe work environment, safe working practices and efficient operations, it is strict BHP policy to ensure that health and safety programs are followed and that all employees receive proper orientation and training in safe work practices.

An environmental management plan has been developed and is presented within this EIS. The plan focuses on the safe and permanent storage of process plant tailings in Long Lake and mined out pits; the management and proper disposal of domestic and other wastes; construction and operation of the project in such a manner as to minimize environmental disturbance; and the development of an appropriate site reclamation and decommissioning and closure plan.

The management and disposal of process plant tailings is an important component of the environmental management plan. The tailings management system is designed to contain and recycle any turbid water, to discharge only water that meets established criteria and to provide a stable, restored landscape at closure. Long Lake will be the tailings disposal pond for the first 20 years. The lake basin will be divided into five cells by the construction of four intermediate interior dikes that will be filled sequentially from the upper portion of the basin. Filling the individual cells in this way will optimize the available storage volume and increase the flexibility of the disposal plan. No tailings will be deposited in the last cell, which will serve as a final clarifier pond where water quality will be

monitored and the water treated, if required before discharge. Tailings generated after Long Lake has been filled will be directed to exhausted mine pits. Planning for reclamation includes building up the tailings level until they become elevated above the water level, then covering the tailings with waste rock riprap to prevent erosion by wind and water.

Considerable volumes of fuel will be hauled to the site over the winter road and stored during the remaining nine months of the year. The final storage area will meet all requirements of the National Fire Safety Code. All staff involved in fuel handling will be properly trained, and all tanks, lines and equipment will be inspected regularly.

A General Contingency Plan has been developed to minimize the effects of a spill from a system failure (e.g., slurry or tailings lines) or a fuel spill by establishing predetermined lines of response and plans of action. The plan is associated with and references other emergency and contingency plans, including health and safety plans and fire and emergency plans.

Wastes generated on site will be recycled, treated or disposed of safely. Domestic sewage will be treated in two sewage treatment plants, one at the permanent camp and the other at the Misery camp. Domestic garbage will be incinerated at both locations. Ethylene glycol (antifreeze) will be stored on site and recycled. When necessary, the waste ethylene glycol will be sent to waste disposal facilities. Waste oil and grease will be burned as fuel for garbage incinerators and for supplemental space heating, mixed with ammonium nitrate to make a blasting agent (ANFO – ammonium nitrate and fuel oil) or stored and sent to a waste disposal firm for recycling.

Roads will be designed and constructed so as to minimize environmental impacts. Permafrost will be protected through sufficient road bed thicknesses. Culvert placement will be designed to ensure that free fish passage is not impeded, and effects on drainage patterns will be minimized. Disturbance of significant heritage sites will be avoided.

A reclamation and closure plan has been developed according to guidelines set forth by the Northwest Territories Water Board. The goal of the reclamation and closure plan is to ensure that no residual effects would prevent future generations from benefitting from the land and resources within the claim block. Research programs to support the reclamation effort have already begun. In addition, a preliminary reclamation, decommissioning and closure plan has been formulated to ensure that if the bulk sampling or initial operations are shut down, the site will be left in an environmentally acceptable condition and will pose no long-term threat to the surrounding area.

Through its sampling and evaluation process, the Proponent has become acquainted with many of the major market participants in the diamond industry,

with existing industry practices and with various marketing alternatives. As a result, the Proponent believes that any diamond processing and manufacture beyond the sale of the rough diamonds is unattractive economically and has no plan to enter into this part of the business. No cutting, polishing or other such downstream processing will be established as part of the project.

The Proponent plans to sell rough diamonds on the world market at world prices. Sale may be directly to dealers or manufacturers; through joint venture marketing entities with established industry vendors or agency arrangements; or by auction or tender. In any case, a test marketing phase will be required for proper introduction of goods and the development of a reliable customer base, and to establish prices for Canadian goods based on tender, auction and direct sale methods. All transactions will be subject to the same valuation and auditing procedures as any other exported goods in international trade.

Implicit in this plan is the intent to perform final cleaning and sorting of rough diamonds at a site readily accessible to potential purchasers. While such a site remains to be selected, it is most likely to be Antwerp in Belgium, which is the world's major diamond centre. Not only is it important for the marketing effort to be near its customers, it is vitally important to have the needed skills in evaluation, sorting and preparation of saleable parcels to maximize the revenues from the project's product. Such skills take many years to acquire and are not currently available in Canada.

As a means of assuring that the NWT Diamonds Project does obtain the best prices, the final marketing and sales plan adopted will include a continuous system of reference to current market conditions through competitive tender or auction procedures of a representative sample of rough diamonds being sold. Each step in the process will be open to observation and audit by relevant Canadian authorities.

1.2 Traditional Knowledge – The Importance of Knowing

“We are different from anyone else in the world, because we value tradition and customs which have been passed on from generations and we want to continue that kind of lifestyle” (Former Dogrib Grand Chief Nick Black, March 8, 1994).

In 1992, one year after the initial discovery of diamonds, the Proponent committed to a program designed to consult with local Aboriginal peoples and to incorporate their unique ecological perspectives into the NWT Diamonds Project. This was not an easy task and there were no quick answers. Most traditional knowledge is passed from generation to generation orally; thus, recorded information is limited. Information that is recorded is often non-specific to the Lac de Gras area or contains generalizations and conflicting concepts that reflect different life experiences. Traditional knowledge also has political implications,

and initial attempts to request information were frequently met with suspicion and resistance by the Aboriginal organizations. The Proponent has learned that greater understanding can be gained by asking specific questions about how to proceed in a manner compatible with traditional values and how to incorporate Aboriginal knowledge and culture into resource management and sustainable development. The Proponent has also learned to listen carefully to the answers. These “answers” with regard to traditional knowledge are integrated with scientific concepts and findings throughout the EIS. The process of listening and learning is not over. On the contrary, it began in 1992 and will continue beyond closure of the mine. By providing Aboriginal people with the opportunity to express their concern and knowledge about the environment and ecological relationships, it is the Proponent’s hope to gain insight into “the importance of knowing...”.

Throughout the EIS, the Proponent has used the term “Aboriginal” when referring to the indigenous people of the North. Some may find the term inappropriate, given the cultural diversity of the regional Native groups. It is not the intention of the Proponent to offend any group or to suggest insensitivity and disrespect. However, for discussion purposes, a term had to be selected by which all Native people and those of Native ancestry could be referred to. If, inadvertently, the Proponent should offend any group, band or nation by the use of the term, it respectfully offers its sincere apology. Within the context of the EIS, “Aboriginal” includes the First Nations Dene (Treaty 8 Yellowknives Dene and Lutsel K’e Chipewyan Dene; Treaty 11 Dogrib Dene), the Inuit and the Metis (those of mixed European and Dene ancestry). Where discussion warrants, specific groups are identified by their respective name.

In the same regard, every effort has been made to use the correct spelling of the regional Aboriginal communities. In some cases, there are several spellings and the Proponent has chosen the one most often used by the Aboriginals themselves. The Proponent is also aware that Aboriginal names exist for all the communities but may not be readily identified by the general public. Their omission is not intended to offend, but rather to facilitate communication.

1.2.1 “Understanding” Traditional Knowledge

Traditional knowledge by its very nature is broad, pervasive and permeates all aspects of Aboriginal life. To understand or define traditional knowledge is a daunting if not impossible task for Aboriginals and non-Aboriginals alike due to the complexity of its content, structure, cultural context and translation of oral language nuances and cultural context.

1.2.1.1 A Dene Definition – The Proponent’s Attempt to Focus on a Working Definition

“Traditional Knowledge is handed down through the generations. It would be a challenge to understand the components of traditional knowledge in the modern day. We support what the Dene Cultural Institute forwarded to the Panel” (Chief Felix Lockhart, Treaty 8, Scoping Meeting, Lutsel K’e, April 17, 1995).

The Dene Cultural Institute’s (DCI) definition of traditional knowledge was developed at the Elders Gathering on Traditional Knowledge in Fort Providence in October 1993:

“Knowledge and values which have been acquired through experience, observation from the land or from spiritual teachings, and handed down from generation to generation.”

The DCI, whose Board of Directors is composed of representatives appointed by several Dene band councils, has been actively involved in issues relating to traditional knowledge. It was a meeting of the Dene that led to the formation of the DCI in 1987. Traditional Environmental Knowledge (TEK) was the very first project selected for research. This was a consequence of the fact that the land is such a prominent factor in Dene culture, and many saw their culture eroding with the passing of the elders.

1.2.1.2 The Ndè and Traditional Environmental Knowledge (TEK)

“If we try to speak about our ancestors’ knowledge, we will never complete it (in a month). Our ancestors really spoke the truth (because they really understood the land)...” (Suzie Mackenzie, May 11, 1995).

As alluded to above, reliance on the land is a way of life for Aboriginal people and opens up additional dimensions of traditional knowledge relating to land-based issues, economies and social concerns. “Ndè” is a term usually translated as “land”; however, the concept is much broader.

“Ndè is much closer to the scientific concept ‘ecosystem’, however, where ecosystem is based on the idea that living things exist in association with non-living elements, the Dogrib term Ndè includes both the spiritual and physical aspects of the land, people, animals and their habitats” (Dogrib report, June 19, 1995, contained in EIS Appendix I-1A).

The Inuit have a similar concept known as “avatik”, which emphasizes connections or linkages within a larger concept (e.g., Gombay 1995).

One of the most important findings of the traditional environmental knowledge research undertaken by the DCI was the recognition that documenting and

interpreting TEK is a difficult and time-consuming task. The research identified a methodology for interviews that is culturally appropriate, and it established proper procedures for the conduct of participatory community research.

The research was able to identify important types of environmental knowledge and to describe some of the practices and beliefs that are essential to a traditional system of management. It demonstrated that traditional environmental knowledge consists of many details on all components of the natural environment and combines ecology and ideology within a single intellectual framework. In the Dene system of resource management, animals are meant to be used by man. This use is marked by different practices and taboos that serve to guarantee the perpetuity of the animals. Every family has a particular animal with which they have a special relationship, and these relationships imply certain conservation measures. A detailed review of this subject is compiled in a report prepared by the Inuit Circumpolar Conference for Indian and Northern Affairs, Canada, entitled, “The Participation of Indigenous People and the Application of their Environmental and Ecological Knowledge in the Arctic Environmental Protection Strategy (Vol. 1) – A Report on Findings” (ICC 1993).

The DCI, in the course of its research, has developed the following definition of traditional environmental knowledge:

“...a body of knowledge and beliefs transmitted through oral tradition and first hand observation. It includes a systems of classification, a set of empirical observations about the local environment, and a system of self-management that governs resource use. Ecological aspects are closely tied to social and spiritual aspects of the knowledge system. The quantity and quality of TEK varies among community members, depending upon gender, age, social status, intellectual capability, and profession (hunter, spiritual leader, healer, etc.). With its roots firmly in the past, TEK is both cumulative and dynamic, building upon the experience of earlier generations and adapting to the new technological and socioeconomic changes of the present” (written submission by the DCI to EARP Panel, April 6, 1995).

1.2.2 Proponent’s Approach to the Integration of Traditional Knowledge – The Process

The Proponent is committed to respecting the Aboriginal lifestyle and giving full and equal consideration to their traditional knowledge. In order to integrate their contributions into scientific investigations and project operations, the Proponent embarked upon a process to learn as much as possible and as quickly as possible. It was through this process that the Proponent became aware of certain cultural concerns voiced by the Aboriginals themselves.

During the initial phases of this process, the Proponent often heard the following comments:

“We disagree with the approach taken so far by BHP in collecting traditional knowledge (referring to non-Aboriginal consultants collecting the information). We should be collecting the information ourselves in our own way to meet the needs of the EIS” (Lutsel K’e, April 7, 1995).

“...We are concerned about the elders’ information in terms of intellectual property rights. We can’t let outside contractors have it. BHP is requesting the communities to share our traditional knowledge with them and with Rescan so that they can pass the EIS and they can make the money and our children can inherit the mess” (Chief Felix Lockhart, Treaty 8 Scoping Meeting, Lutsel K’e, April 7, 1995).

“We also feel that BHP and all other future proponents should develop a consistent policy on Traditional Ecological Knowledge. We do not want our information to be turned and used against us in the future...” (Bill Erasmus, Dene National Chief, written submission to EARP Panel, April 5, 1995).

As the quotes point out, there are many Aboriginal concerns about the disclosure of traditional knowledge, and thus the Proponent’s approach to research was constantly refined to accommodate these concerns. Specifically, the Proponent learned of the following considerations:

- The collection and use of traditional knowledge by outside researchers, without reference to Aboriginal issues, knowledge and points of view, needs to be avoided.
- The Treaty 8 and Treaty 11 are involved in treaty land entitlement and comprehensive land claims negotiations with the federal government. Traditional knowledge may be used as a basis for confirming treaty boundaries. Thus, there is a reluctance by the Aboriginal organizations to put their traditional knowledge in the public domain during this sensitive period.
- Traditional knowledge is the intellectual property of the Aboriginal people who possess this knowledge, and the management and release of this information must remain in their hands. The Aboriginals do not want to see their traditional knowledge commercially exploited by third parties (for example, certain knowledge of plants and how they can be used for self-protection, or knowledge relating to animals and the advantage this gives Aboriginals in hunting, etc.).
- Traditional knowledge should not be limited to just the development phase of the project. It should also be a necessary component of the monitoring of operations during production and closure phases of the project. In addition, linkage should be shown between traditional knowledge and these monitoring programs. Traditional knowledge should also be incorporated into larger studies such as the Regional Review or specific developments.

To balance these concerns, the Dogrib are developing protocols that will allow them to manage the flow of traditional knowledge to project proponents or to third parties. Under these protocols, the Dogrib will work with a proponent to gather and interpret the appropriate traditional knowledge and consider the implications of the information in the plan of development. A proponent will be limited to publishing only a general review of traditional knowledge in any public documents. This would include an EIS.

The Proponent for the NWT Diamonds Project learned of these considerations during its consultation program and subsequently approached the DCI to indicate its desire to participate in a study of traditional knowledge that would assist the DCI “in the protection, promotion and enhancement of the Dene Culture.” The Proponent hoped that such a study would provide innovative ways to undertake sustainable development throughout the planning of the project. The Proponent requested DCI to assist in preparing the following information:

- a summary of research that has been done to date
- a list of communities or areas that have been studied
- the culturally correct approaches to be used in compiling the traditional knowledge data
- a summary of ongoing research plans for a more comprehensive study
- a plan to assist the DCI in achieving its own cultural development goals.

The DCI elected not to participate in the proposed study unless and until it was requested to do so by its member band councils and/or communities. The most important criterion of the DCI study process is that the Aboriginal community request the research. If the community does not request the research, it is unlikely that its members will feel the research is necessary, nor will they feel committed to the research. Also, community participation assures the development of project guidelines, the direction of the research and the selection of the most appropriate researchers (for in-depth discussion, see Appendix 2 of the Dogrib Report, EIS Appendix I-A1). The Proponent therefore altered its direction and approached the Treaty 8 and Treaty 11 councils as well as the Kitikmeot Inuit Association.

1.2.3 Literature Review

In an effort to access additional information on traditional knowledge pertaining to the project area, two graduate students were commissioned through the Canadian Circumpolar Institute at the University of Alberta to conduct a review of the available literature.

In their review, the researchers examined more than 200 sources including books, videos, development hearing transcripts, reports on studies and other documents. The review is attached in its entirety in Appendix I-A2. The researchers noted that only a limited amount of the available literature is relevant to the Lac de Gras area. Many times findings were obtained from neighbouring Dene or Inuit outside of the project area. It is interesting to note, however, that many of the recurring issues highlighted in the research were echoed in the Proponent's consultation program. Examples of these recurring themes include the following:

- the value of the land being much greater to Aboriginal people than can be expressed by its simple economic value
- the desire to preserve the land for future generations
- the importance of historical land use
- the need to record Aboriginal history and traditional knowledge so that it will not be lost.

The graduate students also noted that the literature reveals the difficulty Aboriginal people sometimes have in expressing their traditional knowledge, and cautioned that the lack of documented concern over the use of an area or resource does not necessarily mean that information or knowledge on that concern does not exist.

1.2.4 Dene/Metis Land Use Maps

In 1974 the Dene Nation leadership decided to carry out a traditional land use and occupancy study to document Dene use of the NWT. This study focused on recording the trails and activities of approximately 600 Dene and Metis hunters and trappers, or about 30% of all Dene/Metis land users in the western NWT. Associated with this map information was detailed knowledge of the dates and seasons of activity, animal species harvested, modes of transport and other relevant details covering a 70-year period from the early 1900s to the mid-1970s.

In order to gain a better understanding and appreciation of Dene/Metis use of the project area and what this use means to Aboriginal people, the Proponent approached the Dene Nation with a request to access this data source. More than 20 maps documenting Dene/Metis land use of a region encompassing the project area were produced for the Proponent. Presented in Volume II and Appendix I-A3, these maps have contributed significantly to the Proponent's ability to incorporate traditional knowledge into this EIS. The land use maps confirm and support the detailed scientific studies that have been conducted in the project area for the last two years. Specifically, the map of historic caribou migration routes confirms what wildlife biologists are observing in the Lac de Gras area today.

1.2.5 An Anthropological Perspective on “Traditional Knowledge”

Increasingly, anthropologists have begun to realize what Dene, Inuit and Metis people across Canada’s North have known all along: they possess knowledge that is contemporary as well as traditional. Viewing the knowledge that Aboriginal people have as essentially “traditional” conjures up images of Aboriginal people adhering to the past, no matter the circumstances (Gombay 1995). Some Aboriginal people feel that their traditional knowledge plays a pivotal role in maintaining their cultural identity and connection to the land. But some also believe that the use of this term to refer to all their knowledge and experiences may impose a way of life on them that is shackled to the past and does not reflect the realities of modern Aboriginal life (Gombay 1995).

In recognition of this concern, some researchers (e.g., Gombay 1995; Stevenson in EIS Appendix I-A4; Wolfe *et al.* 1992) use the term “indigenous knowledge” to refer to the experiences and knowledge that Aboriginal people can bring to bear on environmental impact assessment and wildlife management. In this view, indigenous knowledge is composed of and constructed from traditional environmental knowledge (TEK), which includes historical experience with the land as well as other kinds of traditional knowledge that take into consideration emotional well-being, customary social philosophies, cultural values and practices and spiritual beliefs. All of these aspects are intimately related, if not inseparable, in the minds of many Aboriginal people.

The DCI’s definition of TEK is thus constructed of much more than simply specific knowledge pertaining to the environment. It includes intimate knowledge of ecosystem relationships and a code of ethics governing the maintenance of appropriate ecological as well as human relationships.

The knowledge of Aboriginal people who have had extensive experience with both traditional lifestyles and non-traditional land-based activities, such as mining, may be especially valuable in environmental impact assessment. Not only have these individuals had first-hand experience with the impacts of such activities, but their understandings of these impacts are often the outcome or resolution of both systems of knowledge. People who have been raised in the Aboriginal lifestyle but have worked in other professions, such as Metis prospectors, are a good example of this. Thus, the knowledge that these and other individuals possess may offer insights into assessing the impacts of the project that neither system alone could provide. Another advantage to viewing the knowledge and experiences of Aboriginal people in this light is that it lessens the potential to take traditional knowledge out of context and use it in a way that does not serve Aboriginal interests (Appendix I-A4).

1.2.6 Where Cultures Meet

Traditional knowledge is an integral part of Aboriginal culture, just as scientific knowledge has become a cornerstone of Western culture. As stated in the ICC (1993) report:

“Aboriginal peoples state that their knowledge, once understood and made explicit can play an important role in many of the activities...the value of indigenous knowledge will be enhanced and the range of applications expanded when it can be used in conjunction with information derived from western science. The question should not be one of ‘who knows best?’ when discussing the relative merits of these two information systems, but rather how to use both systems in a way that will maximize an understanding of the environment and ecosystems.”

This is similarly stated by Grant Blondin of Yellowknife, 1995: *“Today the world is different than it was when the elders were young. Native people need to create a new balance that incorporates significant scientific knowledge. Southern scientists cannot simply impose their views. They must be interlinked. Water chemistry is an area where scientists know more than we do. How dry is dry? How wet is wet? Scientific knowledge is good at quantifying impacts. It depends on the question what the appropriate blend of traditional and scientific knowledge should be at any given time.”*

The DCI agrees and states that the goals of both Western scientific resource management and traditional environmental management can be common: *“...to ensure that the land and its natural resources are used wisely for the benefit of wildlife and the people who depend on it”* (Dene Cultural Institute Quarterly, Volume 1, No. 2, April 1993).

1.2.7 Communications Program and Public Involvement

“We seem to agree with what BHP is proposing because they have taken the right approach in consulting communities before they go ahead. BHP seems to have respect for the communities and are consulting the communities regularly, which is good” (Elder Harry Simpson, Dogrib Treaty 11, Scoping Meeting, Rae Lakes, March 28, 1995).

“There has been no recognition by BHP of the Metis in the North Slave region...if this indicates the quality of research conducted by the Proponent, this could be a very long review process” (Gary Bohnet, President, Metis Nation, written submission to EARP Panel, April 1995).

In 1992, the Proponent embarked upon its communications program, detailed in Section 5, to consult with all the interest groups in the project area, especially the Aboriginal people. This important part of the process affords each group an

opportunity to express its unique concerns and allows the Proponent to listen and learn from the discussions. As seen by the quotes above, it has taken some time to identify all the Aboriginal interest groups in the area. The Proponent has continually adapted and modified its program to address the changing needs of the different interest groups. Given the special significance of traditional knowledge, the substance and approach of the typical public information meeting format was changed to one of listening and learning about traditional values and contemporary concerns. This type of format was conducive to good communications given that most traditional knowledge is passed from generation to generation orally. The Proponent welcomed questions and comments from an Aboriginal perspective and the specific information offered by them to gain a greater understanding. The Proponent's questions of how to proceed in a manner compatible with traditional values and how to incorporate the knowledge and culture were often discussed.

As the community consultation program progressed, the Proponent perceived that the Aboriginal people want to continue to live in their homes and to pursue hunting and fishing for both sustenance and traditional purposes. From the Aboriginal perspective, management and use of the land cannot be separated from functional responsibilities to cherish, protect and nurture the land (Volume IV, Section 4.1). The Dene of Lutsel K'e have expressed this relationship by stating that they consider themselves to be "guardians" of the land, rather than merely "landlords".

In spite of these traditional concepts the communities recognize the value of a wage-based economy to purchase trucks, snowmobiles, rifles, boats, food and clothing to supplement their traditional lifestyle. Many of the elders spoke of their concern for young people to acquire better education and obtain employment, modern training and job training, while still maintaining their traditional values and the activities that support them:

"...the Dogrib people want jobs. Trapping was very good – but no longer – so the people want jobs for the community" (Grand Chief Joe Rabesca, Dogrib Treaty 11, Yellowknife, March 8, 1994).

"We would appreciate greater recognition of skills drawn from Dene land-based activities – such as endurance, manual dexterity, and hand/eye coordination – for potential goods and service provision. Rather than being offered only narrow options from other people's concept of what our capabilities are, we would appreciate consideration for genuine participation in the fullest range of business" (Chief Darrell Beaulieu, Treaty 8, March 1995).

The Proponent is committed to respecting the Aboriginal lifestyle while providing modern training and employment. Based on what it learned, the Proponent has incorporated several concepts that support traditional lifestyles into the plan of development for the NWT Diamonds Project. For example:

- A 2 weeks on/2 weeks off work schedule has been implemented to accommodate traditional lifestyles and subsistence (Sections 4.6.1 and 4.6.7).
- Employees from designated communities will continue to reside in their own villages and will be flown to the mine site, maintaining their ties to family and community (Section 4.6.1).
- Caribou and other wildlife will be protected as a source of sustenance and traditional ways (Volume III, Section 7).
- The Ndè will be protected by actively monitoring the quality of water, air and the land, minimizing impacts on the surrounding subsistence ecosystems, i.e., sustainable exploitation of wildlife resources so that they will remain a part of their culture and economy (Volume III, Section 10).
- The decision to maintain a fly-in camp, with no permanent road access, will prevent a major influx of new settlements in the Lac de Gras region, preserving their traditional relationship with the land and also reducing impacts to outfitter groups who employ Aboriginal people as guides (Section 2.7.2).
- Elders were invited to participate in archaeological field programs to locate, protect and avoid burial sites. The elders also participated in Archaeological and Environmental Workshops (Volume II, Section 4.9).

The use of traditional resources, including the ability to make a living in a modern world, remains a concern to the Aboriginal communities. Simultaneously, to address contemporary concerns such as employment, education and job training and cultural erosion through alcohol and drug abuse, the Proponent has initiated several programs to help provide future economic security and community stability while assisting in sustaining traditional lifestyles, as follows:

- a commitment to the preferential hiring for Aboriginal people; on-site job training and certification programs; a relaxation of strict educational employment standards (Sections 2.10.2, 2.10.3 and 2.10.4)
- preferential hiring of Aboriginals and requirements to be applied to contractors and sub-contractors (Sections 2.10.2, 2.10.3 and 2.10.4)
- preference to Aboriginal businesses (Sections 2.8.3 and 4.6.9)
- scholarship programs for Aboriginal students (Sections 2.10.8 and 5.1.1.5)
- cross-cultural training workshops as learning tools to share cultural concerns in a unique work environment (Section 2.10.4)

- Community Mobilization strategies and partnerships, which will bring all parts of the community together, including elders, youth and organizations, to share ideas and to create practical solutions to community problems (Section 5.1.1.5 and Volume IV, Section 4.10)
- a policy mandating a drug- and alcohol-free work place, which was supported by many community members who view such problems as a major threat to traditional lifestyles (Sections 2.10.2, 2.10.6 and 4.6.6).

To further strengthen good relations and enhance mutual learning, the Proponent has sponsored familiarization trips for Treaty 8 and Treaty 11 council members to BHP's operations on the Navajo Nation in New Mexico. These visits were arranged to demonstrate by example how BHP incorporates traditional culture in its operations on Indian-owned land and its willingness to develop a similar mutually cooperative relationship with Aboriginal people of the NWT. The Proponent has also sponsored many field trips to the Koala mine site to view operations, to discuss any potential concerns and to provide an opportunity to talk with Aboriginal employees working in the camp (Section 5.1.1.3).

The Proponent believes that these programs and methods of incorporating traditional knowledge and culture into the development phase of the mine are only the beginning of a relationship of cooperation and mutual respect.

1.2.8 Traditional Knowledge Study

"...One of the most important components of the study is Traditional Knowledge. We believe strongly that the proponent must make money available for us to do our own studies. Currently, there is a lack of funding available which can delay the process and cause further mistrust. Persons and families whose territory is being infringed upon need to be identified. Information they possess has been passed along for generations which includes gathering data on burial, historical, and sacred sites which is confidential and unrecorded. Researchers can in no way expect to thoroughly gather traditional knowledge from our communities in a 70-day period. This is because it is crucial that elders are involved and it takes time to set up meetings and interviews. This is not to mention that this process is sometimes time-consuming for the elders and requires professionalism. Many communities already are in the process of creating a traditional knowledge policy. These policies outline the conditions of which traditional knowledge can be obtained, used and protected. We do not want our information to be turned and used against us in the future" (Bill Erasmus, Dene National Chief, written submission to EARP Panel, April 5, 1995).

Although traditional knowledge may contribute significantly to an overall understanding of environmental management and socioeconomic considerations, the Proponent has learned and now recognizes that the documentation of

traditional knowledge in a careless and insensitive manner may contribute to the alienation of Aboriginal people from the very systems of knowledge, social practices and cultural frameworks they seek to preserve. The success of gathering new information will depend to a large extent on the cooperation of the Aboriginal people in the study area.

To facilitate the study, the Proponent is offering funding to the peoples of Treaty 8, Treaty 11, the Inuit and the Metis to undertake extensive studies to assist the Proponent in its efforts to give full and equal consideration to traditional knowledge in more specific ways and to continue the process of incorporating traditional knowledge into the project operations (Appendix I-A5).

Based on what the Proponent heard from its ongoing consultations with the Aboriginal people and communities, the Proponent has implemented the policy that recognizes

- the proprietary and confidential nature of the gathered traditional knowledge
- the desire by the Aboriginal peoples to conduct the interviews themselves, or at least under their direction and guidelines to ensure cultural integrity
- the Aboriginal wish to have control over the methods in which the information is collected, interpreted and used.

It is hoped that this new approach will lead to a heightened sensitivity to and awareness of traditional culture and provide more meaningful contributions to the project.

The Proponent has proposed a two-phase study program to identify specific Aboriginal concerns, address those concerns and prepare a traditional knowledge baseline for use in future monitoring of environmental and socioeconomic impacts. Time deadlines originally set out in the agreement have been relaxed to afford the parties more time to complete their studies (Appendix I-A5).

1.2.8.1 Phase One

Phase One is ongoing and consists of defining the roles of participating parties and initiating consultations/workshops in the communities to document the environmental and socioeconomic concerns that Aboriginal people might have with respect to the project. While useful traditional ecological knowledge may be collected in the process, the Proponent's main objective is to document Aboriginal concerns, as well as the bases of these concerns, so it can attempt to address them. Local Aboriginal researchers were hired to conduct the study. The roles of the Aboriginal institutions such as the DCI are determined by the communities or respective councils conducting the study. Information collected

during Phase One has been integrated throughout the EIS, as its primary purpose is to highlight concerns and address them in accordance with the EIS guidelines.

1.2.8.2 Phase Two

Phase Two will be offered to the Aboriginal groups to assist them in preparation of a baseline of traditional knowledge to assist the Proponent in future environmental and socioeconomic monitoring of impacts. Phase Two will be designed jointly with Aboriginal organizations on the basis of information collected and knowledge gaps identified during Phase One and in consultation with the Aboriginal peoples. All the proprietary information obtained by the groups during this phase of the program will be kept confidential and will not be disclosed to each other or to third parties during or after the program, unless the group who supplied the information to the program agrees to disclose its portion of the study. Therefore, each group will determine the extent of its future participation and the inclusion of its own expertise and knowledge.

1.2.8.3 Current Status of the Traditional Study Program

Aboriginal concerns that have been documented and addressed thus far under Phase One have been derived from a variety of sources. These include the literature review, the Proponent's community meetings and consultations, presentations to the Environmental Assessment Panel during the scoping meetings, land use and occupancy information/maps provided by the Dene Nation and interviews with Aboriginal representatives from several communities.

Generally, the interviews attempted to focus on key individuals who could speak to the issues of the environmental and socioeconomic effects of the project. In some cases these interviews included elders with land-use experience in the project area. In other cases current resource users, social and health care workers, current mine employees and young people were selected. Interviews were tape-recorded and subsequently transcribed. An interview guide was prepared and shared with individuals conducting these interviews (Appendix I-A6). This guide was designed to inform local residents about the project and its potential impacts, and to solicit and document baseline information and knowledge. The interviews were intended to identify the valued ecosystem components from an Aboriginal perspective. This guide was later modified by the interviewers according to the responses and needs of the people being interviewed.

The Dogrib Treaty 11 Council representing the communities of Rae-Edzo, Snare Lake, Rae Lakes and Wha Ti, in coordination with the DCI, used its own method of interviewing, called participatory action research (PAR). This method accommodates community ownership and involvement and ensures that the local researchers become more knowledgeable about both Dene traditions and the

approaches used by social scientists. PAR is one method that allows communities to collect data that reflect the assumptions, perceptions and knowledge relevant to the community rather than those of the dominant society. The first phase of their study has been completed and may be seen in its entirety in Appendix I-A7.

As part of Phase One, the Inuit have conducted interviews with Inuit residents of Coppermine. With the assistance of the Kitikmeot Inuit Association and the Hamlet of Coppermine, an individual fluent in both English and Innuniatun and with experience in conducting oral history interviews was hired. Key individuals interviewed included youth, elders, women and hunters and trappers. The Metis Heritage Association was also contracted to undertake interviews with several of its members who have lived or worked in the Lac de Gras area. Quotes from these interviews have been included in Volume IV, Section 4.1.

To date, the Treaty 8 Dene have not accepted a proposal similar to the one offered to the Dogrib. It is hoped that differences in opinion about the proposal will soon be resolved. A copy of their guidelines for information gathering has been provided to the Proponent to ensure that cultural considerations are adhered to (Appendix I-A8).

In addition, Aboriginal employees working at the project site were also interviewed to assist in documenting their concerns during this initial phase of the traditional knowledge study. As these individuals have already experienced the Proponent's operations and activities, it was felt that they could offer some unique insights in assessing the effects of the project. A summary of these interviews is included in Volume IV, Section 4.2.

1.2.9 Benefits Agreements – Future Steps

“First Nations’ corporations are at the early stages of development and, in spite of many obstacles, our economies are just emerging. Many interesting opportunities, for residents and other large and small businesses, can present themselves for joint ventures and partnerships. But we hope that, when seeking First Nations as partners, industry will approach us with offers that are equitable and balanced. This may require industry to demonstrate a generosity beyond current business practice. To ensure effective and mutual profitability in later years, industrial partners might be wise to protect their investments by supporting the advancement of their Dene partners’ business and human resource capabilities. The satisfaction of conducting respectful and sincere collaboration in business may produce more than financial benefits for both industry and Dene governments...” (Chief Darrell Beaulieu, Information Package for Prospectors and Developers Association of Canada Convention, March 5-10, 1995, Treaty 8).

Methods of future collaboration with Aboriginal people are detailed in Section 5.4. As stated therein, the development of appropriate techniques to

identify existing and future concerns, and how best to integrate traditional culture, will be addressed by advisory committees, which will be set up under the Benefits Agreements. Four committees are foreseen at present: Employment and Training, Business Opportunities, Culture and Education, and Joint Implementation. The Joint Implementation Committee will monitor the overall implementation of the programs in all the committees. Composition of the advisory committees will reflect the diversity of all the Aboriginal interest groups contacted under the Benefits Agreements.

The Proponent also proposes to establish a separate Environmental Advisory Committee to address traditional land-based concerns.

The process of consultation will not cease when the project's operations begin, but rather the committee composition and structure will provide the necessary framework for an evolving relationship so that project activities may be adjusted, potential problems resolved and beneficial results achieved

1.2.10 Conclusion

The Proponent believes that the NWT Diamonds Project will provide a significant contribution to the local Aboriginal people. In turn, traditional culture and knowledge can provide significant contributions to the Proponent's operations. Some conflicts are inevitable. Nonetheless, the Proponent is committed to a compatible policy of respect for traditional knowledge and lifestyles, co-existence with the Aboriginal people and the protection of their land. Through listening and learning, workshops, studies, agreements and committees, this process and policy will continue into the future.

1.3 Project Economic Analysis

The economic impact of the NWT Diamonds Project will be substantial. The project is likely to be one of the major new influences on the economy of the Northwest Territories for at least the next five years, and possibly the next 25 years. The bases for this prediction are as follows:

- The economy of the NWT is small and heavily dependent upon imported goods and government subsidies. Thus, even a small mining project by world standards can have a sizeable impact.
- The NWT Diamonds Project will be a major project for the NWT, with substantial revenue, employment and supplier expenditures over an extended period of time.
- The nature of diamond mining is such that related costs to the government as a result of industrial and social infrastructure and social programs are minimal compared to most other large economic ventures.

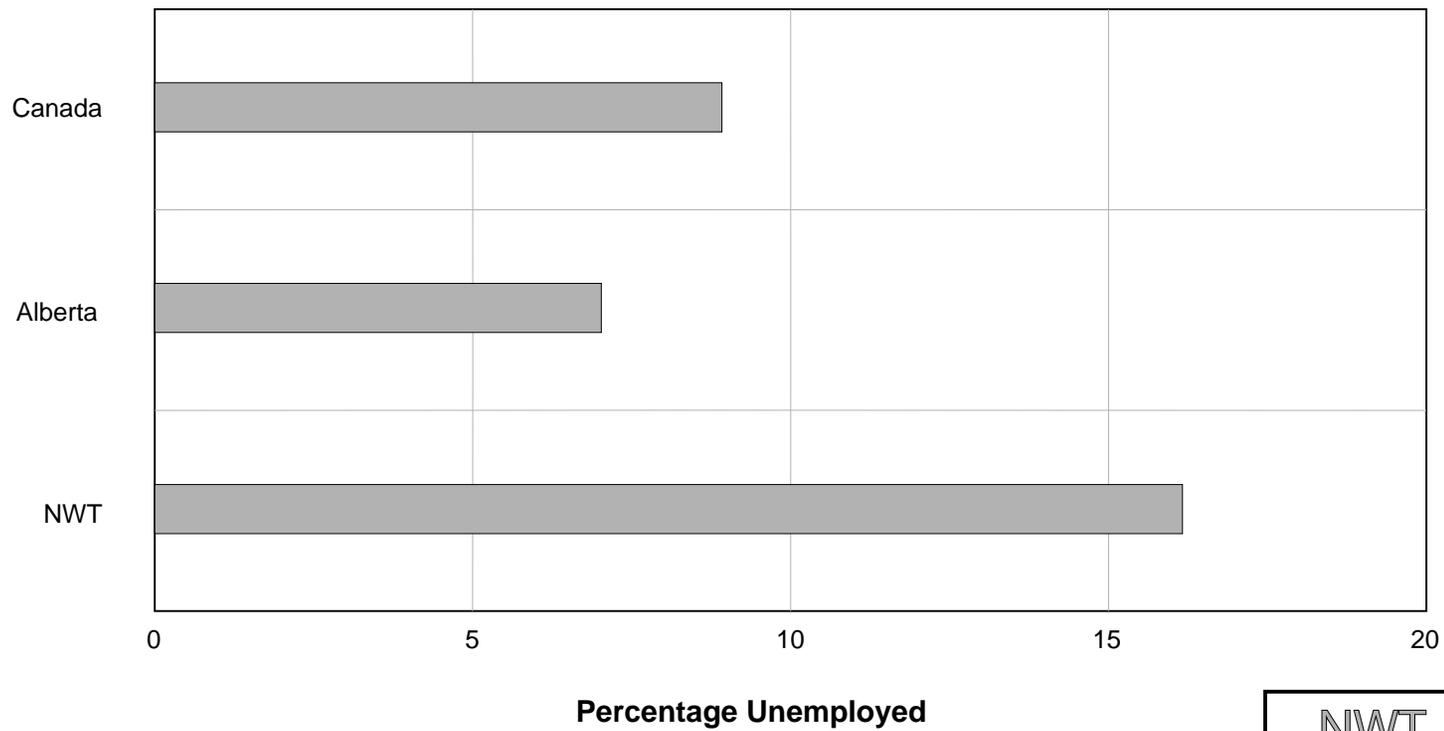
- The project has been designed to encourage participation by the local communities, thereby providing direct economic benefits to these communities and the NWT.
- Beyond its direct economic impacts, the project has significant strategic importance to the longer-term economy of the NWT and the rest of Canada.

Each of these points is discussed in detail in subsequent sections. In the following paragraphs, the project's key potential results are highlighted and used to illustrate the overall point: that this venture is of critical importance to the economy of the NWT.

1.3.1 Context: The NWT Economy

The economy of the Northwest Territories is the smallest and most fragile of the Canadian provinces and territories. With a permanent population of only 65,000, and a Gross Domestic Product (GDP) in 1994 of \$1,544 million, the NWT has historically supported only a small number of industries, and its communities often lack the infrastructure and services available in towns in other provinces. As a result, the NWT depends heavily upon government support to maintain basic facilities and services. It also imports the vast majority of its consumer and capital goods, at considerable cost. Finally, as a result of both its geographic situation and its economy, the NWT bears very high social costs, including the highest unemployment in the nation ([Figure 1.3-1](#)), particularly for its Aboriginal peoples in more remote communities, as well as high costs of law and order, social care and other communal services.

On the supply side, the NWT economy does not have the breadth and depth of the economies of other provinces. Lacking a substantial manufacturing industry, many industrial services are not available and must be imported from other provinces. The NWT relies upon government for 46% of its employment, the highest proportion of any province. In the small private sector, the mining industry is by far the major contributor, providing approximately 20% of the private sector GDP in the NWT in 1994. The NWT mining sector consists of a relatively small number of mines, which make up a large proportion of revenue, employment and Northern purchases. Few of these mines are expected to last beyond another ten years. With the relative maturity of the NWT mining sector



NWT
DIAMONDS
P R O J E C T

Figure 1.3-1
Unemployment Rates, 1994
NWT, Canada and Alberta

and with the governments of Canada practicing fiscal restraint, new mining projects like the NWT Diamonds Project are of increasing importance to the economy of the NWT.

1.3.2 NWT Diamonds: A Major Mining Project for the Territories

The NWT Diamonds Project will be one of the largest, if not the largest, industrial operations in the NWT for the next decade. A project such as this would have an appreciable impact on many countries around the world, even though it would be considered a medium-sized mining operation on a world scale.

The project will employ between 650 and 850 people in each year of full production and is expected to generate revenues of between \$400 million and \$500 million per year (1994 \$) through most of its 25-year operating life. Contrary to popular perception, this level of revenue is not due to the high intrinsic worth of diamonds, as the estimated value per tonne of ore mined is roughly the same as for other NWT mines. Rather, the level of revenue generation is due to the larger scale of the proposed mine versus other existing operations in the NWT. Preliminary estimates, based on reasonable expectations of the remainder of the NWT mining industry, indicate that at full production, this project will increase the total NWT mining wage bill by over 50% and will double the total revenue from mining in the NWT (Figure 1.3-2).

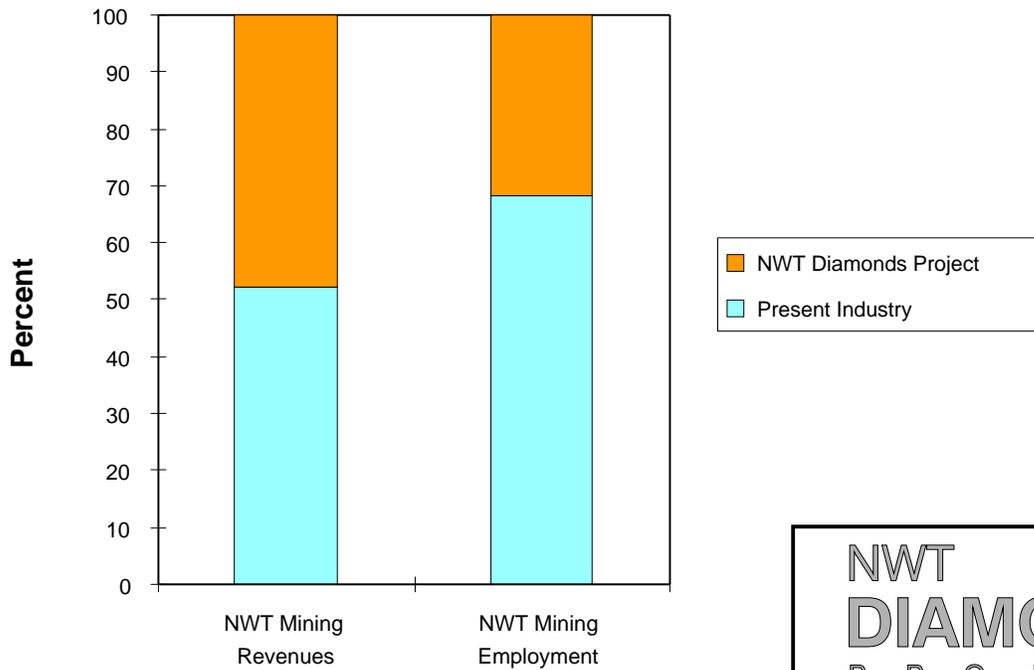
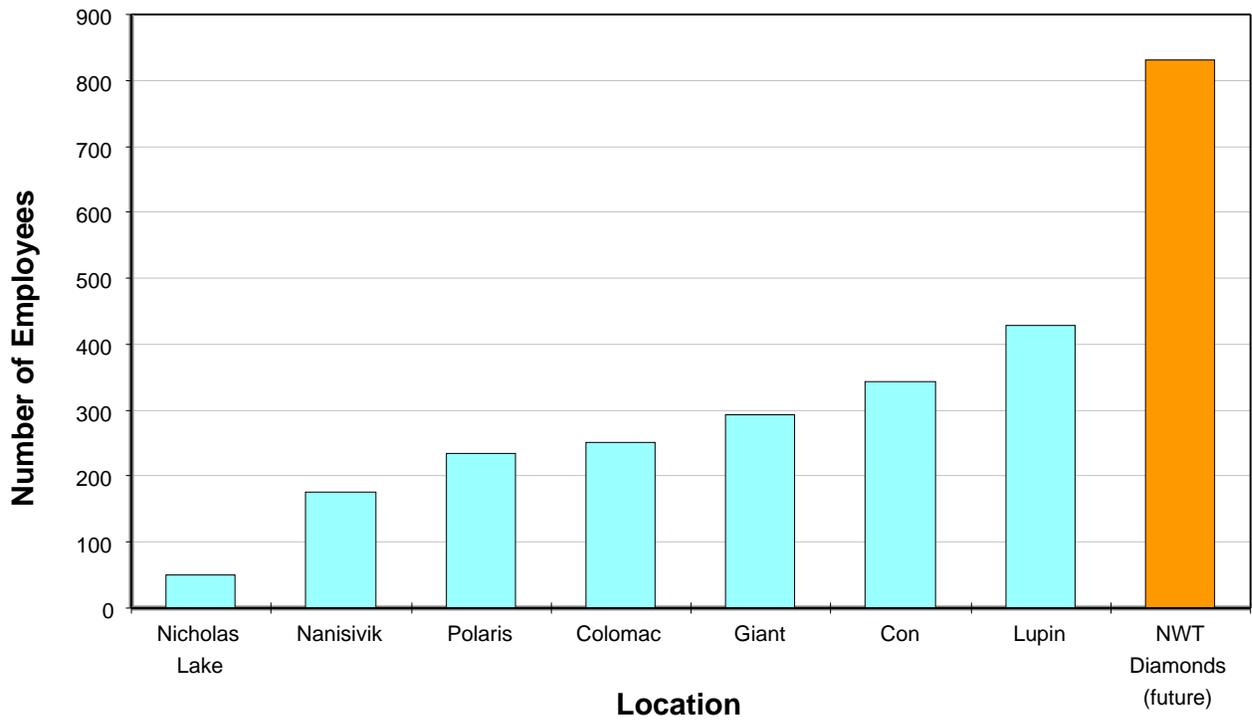
The five open pit mines proposed for the NWT Diamonds Project are collectively expected to last longer than many other mines of the region, most of which are projected to have depleted their reserves after another 10 to 15 years of production. The NWT Diamonds Project is expected to produce diamonds for 20 to 25 years after its initial two-year construction phase.

The project will also be one of the largest purchasers of goods and services in the NWT. The way in which these purchases are distributed, largely to the benefit of local suppliers and communities, is discussed in Volume IV, Section 4.3. It is clear that for many supplying industries and companies in the NWT, this project will provide a customer larger than any they currently serve.

1.3.3 Economic Benefits to the NWT and Local Communities

The project will provide substantial economic benefits to the NWT and to Canada as a whole. These include jobs and the associated wages and benefits; the purchase of capital and consumable goods and services by the mines; and revenues paid directly to territorial and federal governments as taxes and royalties.

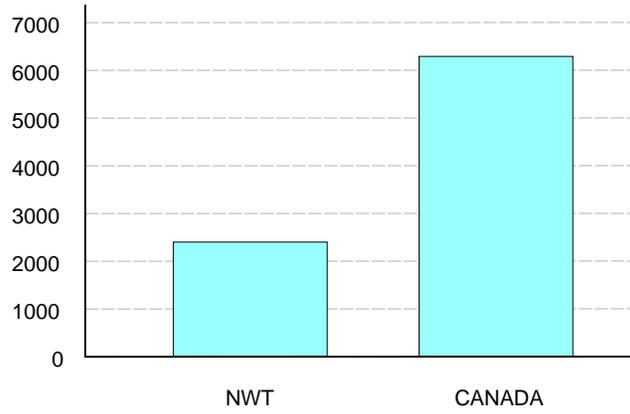
For the NWT, the total benefits of the project (direct, indirect and induced) will contribute \$2.5 billion to the GDP (1994 \$) over the life of the project (Figure 1.3-3a). The project's contribution to the NWT economy will consist of



**NWT
DIAMONDS
PROJECT**

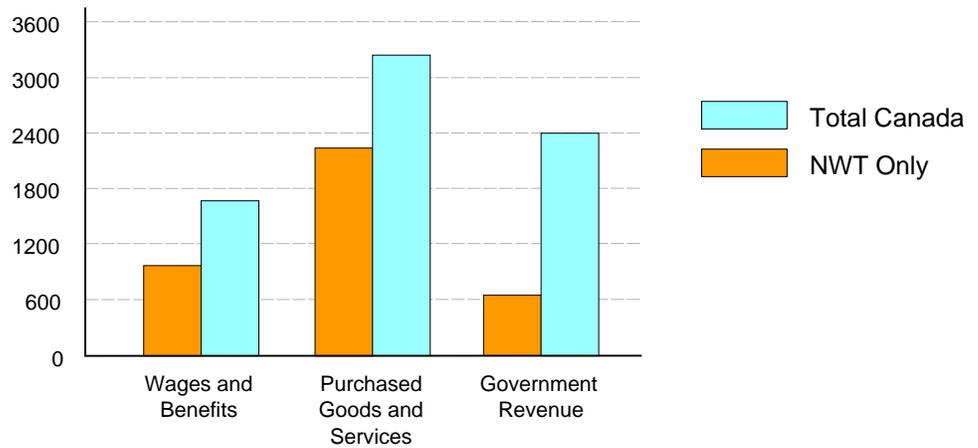
**Figure 1.3-2
Project Contribution to
NWT Mining Economics**

1.3-3a



GDP Contribution of Project
\$Millions, including direct, indirect and induced

1.3-3b



Direct Impacts of the Project
\$Millions

NWT
DIAMONDS
P R O J E C T

Figure 1.3-3a, b
Potential Economic Benefits
of the Project

over \$1 billion in wages and benefits to NWT workers, over \$2 billion in purchases from NWT suppliers and over \$600 million in revenues of various kinds to the NWT government. (Note: The individual contributions to wages, purchase and taxes are not additive.) The scale of these benefits is well in excess of those provided by any other industrial project in the NWT.

Although the size of the project is a factor, this project is also unique because of its hiring policies and preferential local purchasing schemes. It is projected that by the year 2000 approximately 60% of employees will be NWT residents, three-quarters of these being people now living in the NWT. This estimate increases to around 70% in the expanded production phase of the project.

During the operations phase of the project, approximately 70% of purchases are expected to be made in the NWT. This proportion would be higher than for any other mine in the NWT. This higher percentage of Northern content is largely due to the nature of diamond mining, which does not require smelting or refining operations conducted outside of the NWT. In terms of Northern content, the proposed NWT Diamonds Project also has the advantage of primarily requiring equipment or consumables that are available through and accessible from Northern suppliers.

In a national context, the total benefits provided are similarly substantial, with a contribution (direct, indirect and induced) of approximately \$6.2 billion (1994 \$) to the GDP of Canada over the life of the project. The majority of benefits are in supplier purchases of approximately \$3.3 billion over 25 years. Wages and benefits amount to approximately \$1.7 billion, and government revenues through taxation are nearly \$2.4 billion. Of the government revenues, approximately \$1.7 billion goes to the federal government, approximately \$0.6 billion to the NWT government and the remaining \$60 million is distributed to provincial governments ([Figure 1.3-3b](#)).

The benefits seen outside the NWT will typically be indirect or induced benefits arising from the respending of wages and benefits and the growth of supplier companies and industries.

One feature of the benefits distribution is that the bulk of those benefits to the NWT will accrue during the operational life of the mines, rather than merely during its construction phase. This is to the NWT's advantage in that it will not receive a short-term "pump-priming" spurt of investment and jobs, followed by a skeletal operation with few sustained benefits. Instead, the employment, purchasing and revenue flows to the region will be spread over the 25 years of operation, allowing the development of a longer-term pool of skills in the community and allowing supplier industries to develop and mature.

These numbers indicate the size of the project's impact and the nature of the resulting benefits. However, they give little indication of the importance of these contributions to the NWT economy in terms of regional employment.

Specifically, the NWT Diamonds Project will have a significant impact on those Northern communities that typically fail to benefit from other major industries and suffer from unemployment well above the national and NWT averages. While Yellowknife, with the largest population in the region, will be a major beneficiary in terms of new jobs, the smaller First Nations communities, as well as Coppermine and Hay River, can also expect significant employment benefits.

Because of the size and economic strength of the Yellowknife, the net effect on unemployment in the city will be about 2%. In contrast, the NWT Diamonds Project has the potential to have a major effect on the way of life in the local Aboriginal communities. Hiring by the project could reduce the current unemployment levels in the First Nations communities from almost 40% to the 30% level. Estimated project-related employment for the different communities is shown in [Figure 1.3-4](#).

1.3.4 Government Costs

The NWT Diamonds Project has a number of unique characteristics that will minimize the cost of the project to the existing social support system. The project will impose a very small cost upon the existing system, for the following reasons:

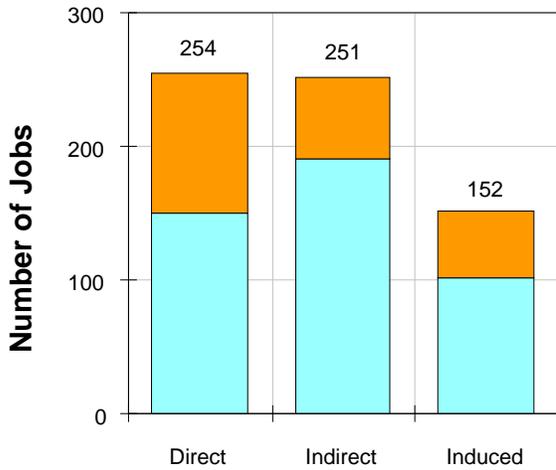
- It occupies a small proportion of the land area.
- It uses no chemicals in its on-site processing, other than flocculants.
- It requires no large movement of product off site.
- It is located at a remote site with limited access.

A comparison with more traditional mining operations, in terms of costs imposed upon the supporting system, is shown in [Table 1.3-1](#).

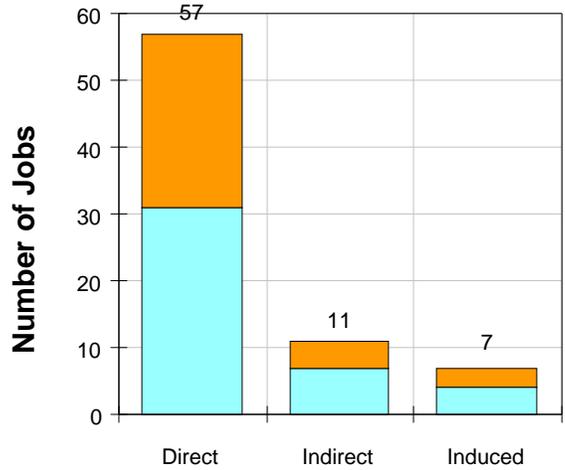
A broad analysis of the potential costs in infrastructure and public services borne by the community to support the project confirms that the cost is small compared to the expected benefits. The cost to the government (federal and territorial) is estimated as the variable cost component of government services associated with the moving of people to the NWT as a result of the NWT Diamonds Project. These variable costs include expenditures associated with more schools, health services, regulatory personnel and funding for social agencies. Based on an estimated project-related population growth of 1,000 people, the additional cost to governments is estimated at \$14 million per year.

To offset these costs, the increased employment generated by the project will lessen the welfare burden upon government, providing an effective savings

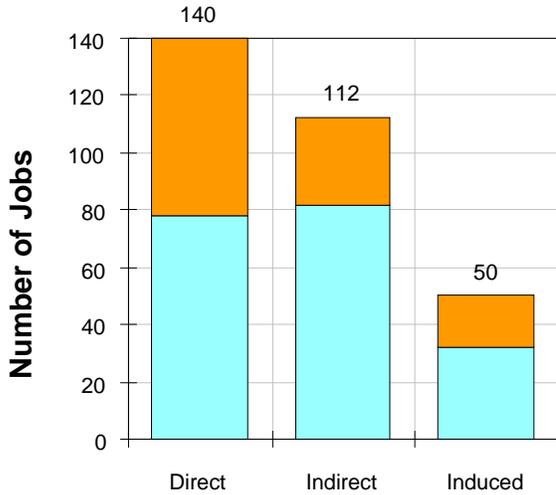
Yellowknife



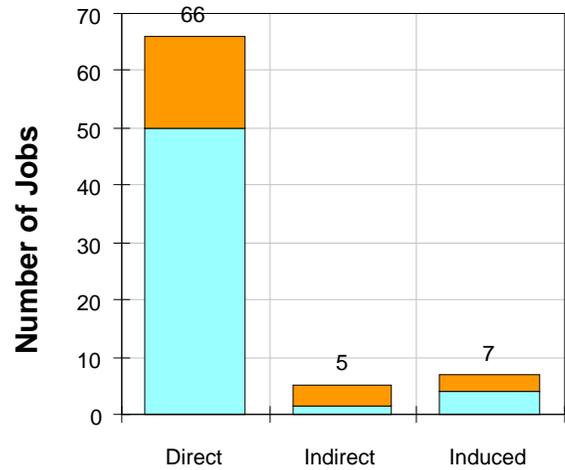
Coppermine



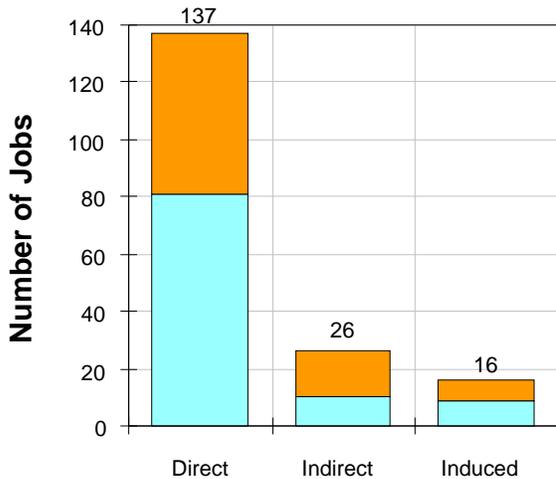
Hay River



Rest of NWT



First Nations



Additional Requirement at 18 000 tonnes per day (year 2007)



Requirement at 9 000 tonnes per day (year 2007)

NWT DIAMONDS PROJECT

Figure 1.3-4
Project Employment in Year
2007 - NWT Communities

**Table 1.3-1
Comparison of Drivers of Community Costs**

Cost Element	Commodity Mining Projects (coal, base metals, ferrous mine)	NWT Diamonds Project
Product Movement	Roads, ports, railways, large conveyors to move tonnes of product	No permanent roads to site due to small volume of product (can be airfreighted)
Waste Materials	Storage, use and disposal for mill/processing chemicals	No chemicals other than flocculants; tailings impoundment and waste rock dumps
Employee Accommodations and Requirements	Permanent facilities for workers: houses, sports facilities, etc.	Minimal: employees will be housed off-site, in their home communities
Emissions	Gas/particulate/fumes emissions from smelters, furnaces, refineries, scrubbers	Diesel gas and particulate emissions

estimated at around \$3 million per year. The result is an additional net cost to government of less than \$11 million annually. In other words, for every \$1 of economic benefit accrued by Canada for the project, the federal and territorial governments will together have net costs of less than \$0.05.

1.3.5 Strategic Considerations

The NWT Diamonds Project is of strategic importance to the NWT. It is a major business and, once operational, will generate more employment and a higher wage bill than any other NWT business. Employment benefits will be particularly significant for Northerners and local Aboriginal communities.

Existing large mine reserves in the NWT are becoming depleted, and no major new mines have been announced. The renewed confidence in Canada shown by international investors such as BHP has provided a resurgence in mining interest and activity in the NWT and in the entire Canadian mining industry. Canada’s Minister of Natural Resources, Ann McLellan, shared this optimism in a speech delivered on March 29, 1995, in Miami to the Investing in the Americas Conference, when she said:

“It is likely that our unprecedented diamond exploration activity will result in Canada soon joining the ranks of the world’s leading diamond producing countries.”

The NWT Diamonds Project will be the first major diamond mine in North America, launching a new industry for Canada. To support this industry, new NWT businesses will likely be established and existing NWT companies will expand, hiring more workers to service the project. The new industry will contribute to GDP through export income, without detracting from or competing with existing industries.

This high-profile project is notable for its approaches to mining and to the care and responsibility for people, the environment and the socioeconomic setting.

1.4 Project Setting

The NWT Diamonds Project is situated in the central portion of the Northwest Territories in the tundra environment. The low relief of the terrain has resulted in relatively diffuse watersheds with numerous lakes interspersed among boulder fields, eskers and the occasional bedrock outcrop. Vegetation is sparse due to the harsh climate and poor soil development. The project site provides habitat for a number of large and small mammals, some of which migrate through the area seasonally. Although aquatic productivity is relatively low, the lakes within the claim block sustain modest fish populations.

Project development would take place in the area known as the Barren Grounds. This land is within the traditional use areas of the Dene and the Inuit, both of whom have used and seasonally occupied the Lac de Gras area for many centuries. During this century, use by Yellowknives and Dogrib Dene and the Inuit of lands surrounding the project area has been confined to spring and fall caribou hunting and fur trapping. The closest community to the project site is the Dogrib community of Snare Lake, 180 km to the west. The Barren Grounds are currently used seasonally by outfitters for sport hunting and fishing trips.

The project lies within the Dogrib comprehensive claim settlement area as defined by the federal government in the Interim Protection Agreement. Settlement of this comprehensive claim could result in the transfer of substantial amounts of land in fee simple ownership to the Dogrib Treaty 11 Council or its designate. Metis of Dogrib descent are eligible to participate in the Dogrib claim. Canada has also offered to enter into comprehensive land claims negotiations with the Yellowknives Dene, the Dene of Lutsel K'e and other adherents to Treaty 8 in the Northwest Territories. The NWT Treaty 8 Tribal Corporation is scheduled to begin Treaty Land Entitlement negotiations with the federal government in 1995. The Corporation has adopted a resolution defining the Akaitcho Traditional Territory, which they claim stretches from Fort Chipewyan in Alberta to just south of Coppermine, and which overlaps the Dogrib Treaty 11 settlement area and includes the project.

Project development will involve a variety of approvals from federal and territorial agencies, Aboriginal organizations and other stakeholders. Regulatory approvals for the project will include consideration of environmental assessment processes, a variety of permits and licences and compliance with international conventions and agreements.

1.4.1 Regional Context

The NWT Diamonds Project is located in a remote, tundra region near Lac de Gras in the Northwest Territories, approximately 200 km south of the Arctic Circle. The project site is 300 km northeast of Yellowknife and is accessible only by airplane or winter road (Figure 1.1-1). The Lupin gold mine, owned by Echo Bay Mines Ltd., is 100 km to the north.

The project area is characterized by continuous permafrost, low relief and vegetation and wildlife typical of the tundra. The region has experienced at least three major intervals of glaciation during the Quaternary period, the most pervasive being 12,000 years ago. Glacial till deposits are widespread. The surface is covered by numerous small and large lakes, and bedrock outcroppings are abundant among the muskeg, boulder fields and eskers (Plate 1.4-1).

The mineral claim block lies within the Coppermine River drainage basin. The watersheds in the claim area drain into Lac de Gras, which comprises the headwaters of the Coppermine River (Figure 1.4-1). The Coppermine River flows northwest and then north to the Arctic Ocean near the community of Coppermine on Coronation Gulf.

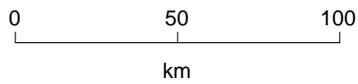
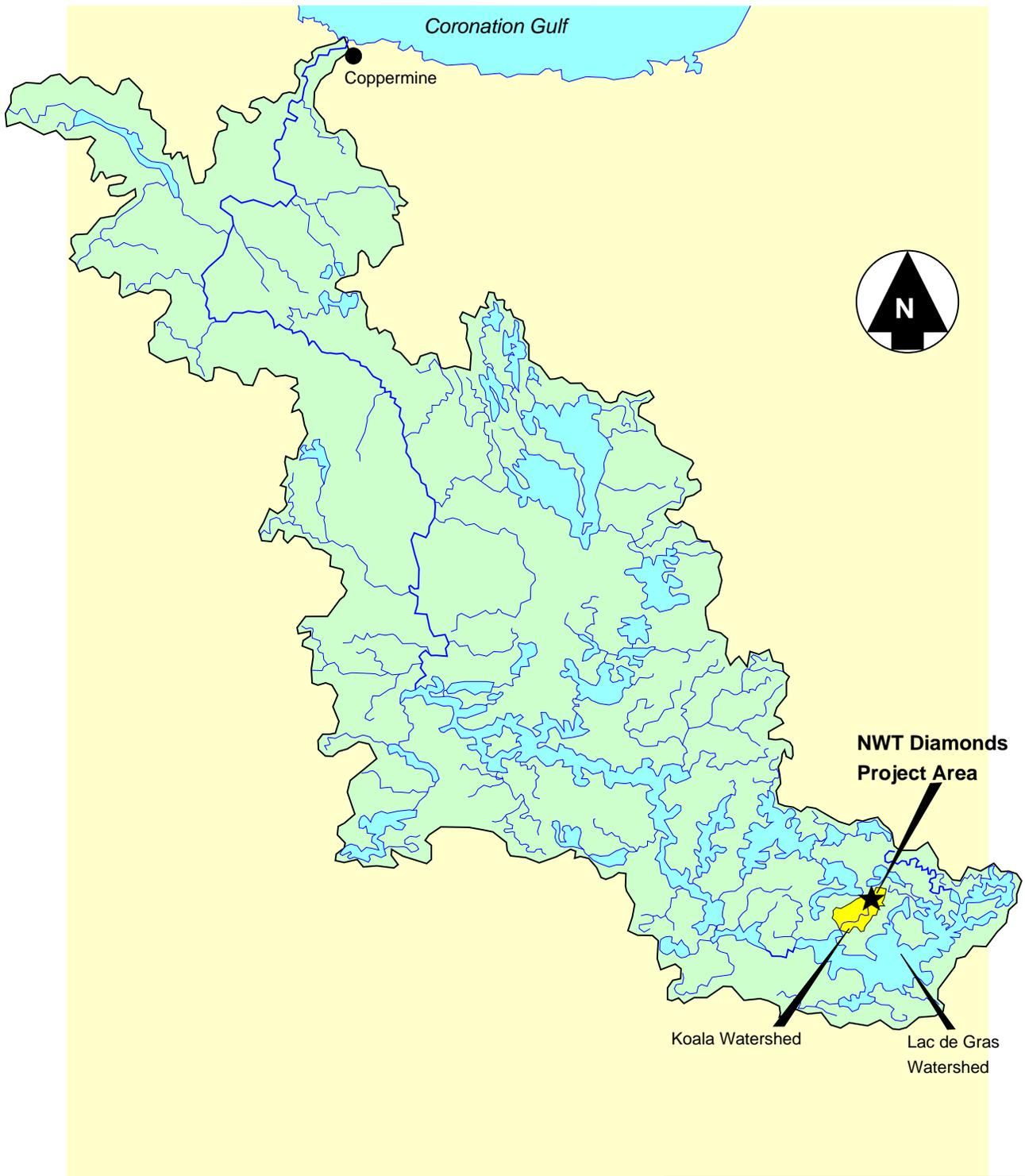
Mine development will involve four sites within the Koala Lake watershed, which drains into the western arm of Lac de Gras, and one site approximately 29 km to the southeast at Misery Lake (Figure 1.1-2). Sequential open pits will be developed after the lake above each ore deposit has been dewatered. Underground mining is also planned beneath the pit limits in two areas. Surface development will include a process plant, a permanent camp, an airstrip and ancillary facilities, all immediately to the southwest of Koala Lake, as well as access roads to the mine areas.

The climate in the Lac de Gras area is very severe. Summers are generally short and cool, while winters are long and extremely cold. Precipitation is sparse and consists of relatively equal portions of rain and snow. Winds are moderate and are predominately from the northwest.

The project site is approximately 100 km north of the tree line in an area of continuous permafrost. Due to harsh physiographic conditions, there has been little soil development and relatively little vegetation establishment. The small



Plate 1.4-1: *Aerial photo of Koala Lake, Panda Lake and environs*



**NWT
DIAMONDS
PROJECT**

**Figure 1.4-1
Coppermine River
Drainage Basin**

Source: Rescan

amount of soil development that has occurred is along the sides of eskers and around the shores of lakes adjacent to wetlands. Vegetation is typically low in stature and dominated by lichens, mosses, herbs and low shrubs. Most plant species are perennials with low annual growth rates. Little aquatic vegetation is present.

The site of the NWT Diamonds Project provides habitat for a number of large and small mammals. The Bathurst caribou herd migrates through the area during spring and fall. Grizzly bears, wolves, wolverines, arctic foxes and red foxes forage and den in the area. Small mammals such as ground squirrels, arctic hares and snowshoe hares are important sources of food for the larger carnivores.

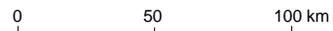
Bird populations are typically low, although the ptarmigan inhabits the Lac de Gras area year-round. Raptors such as bald and golden eagles, owls and hawks have been observed, and nesting of peregrine falcons has been confirmed. Waterfowl and perching birds nest in areas of suitable habitat during spring and summer.

Aquatic productivity is relatively low in arctic lakes. However, sufficient nutrients are present in the lakes within the NWT Diamonds Project claim block to support the phytoplanktonic food base for populations of zooplankton and aquatic macroinvertebrates and to sustain modest fish populations consisting of lake trout, round whitefish, arctic grayling, slimy sculpin and longnose sucker.

Although there are no permanent human settlements within the project claim block, the Dene and Inuit have intermittently occupied the Lac de Gras area for many centuries. Human use of the area may, in fact, extend back several thousand years. During this century, use of the lands surrounding the project area by Yellowknives and Dogrib Dene and the Inuit has been limited to spring and fall caribou hunting and fur trapping.

The Dogrib Treaty 11 Band, which represents the communities of Wha Ti, Snare Lake, Rae Lakes and Rae-Edzo ([Figure 1.4-2](#)), views the Lac de Gras area as crucial to their continued existence as a people. This band is in the process of negotiating a land claim with the federal government for an area that includes the project site. The Yellowknives are also currently negotiating with the federal government to have their treaty rights and entitlements recognized, including acknowledgment of their land rights in the project area.

At present, several outfitting operations conduct seasonal sport hunting, fishing and wildlife observation excursions around the Lac de Gras area. The closest outfitting operation to the project site is owned by Qaivvik Ltd., which has two camps within the boundaries of the claim block, on the northeastern and northwestern shores of Lac de Gras.



**NWT
DIAMONDS
PROJECT**

**Figure 1.4-2
Communities Near the NWT
Diamonds Project**

Source: Rescan

1.4.2 Land Claims

Aboriginal peoples in Canada's north have lived in organized societies long before the arrival of other peoples. The Aboriginal peoples led a lifestyle centred on hunting, trapping, fishing and gathering. With this history of reliance on the land, they developed a profound spiritual relationship with respect to the land. This spiritual relationship with the land is an integral part of most Aboriginal cultures today. In this relationship, management and use of the land cannot be separated from responsibilities to cherish, protect and nurture the land. The present-day Dene of Lutsel K'e have succinctly expressed this relationship by stating that they consider themselves to be "guardians" of the land rather than being merely "landlords."

This spiritual relationship between Aboriginal people and the land does not easily join with modern Canadian property law. The solution that has been handed down from colonial times is the written treaty. Treaties were intended to provide a flexible mechanism to devise lasting agreements on a nation-to-nation basis between Aboriginal peoples and the Government of Canada. Since the treaties in this part of Canada failed, however, the Government of Canada in 1973, through the Department of Indian Affairs and Northern Development (DIAND), agreed to a new form of treaty-making, the comprehensive land claims agreement. Canada's commitment to the recognition of the rights of Aboriginal peoples was further strengthened by the 1982 amendment to the Canadian Constitution, which included the protection of "existing Aboriginal and treaty rights." Since that time, Canadian courts have begun to define Aboriginal rights and have affirmed that Aboriginal people whose ancestors were living in organized societies to the exclusion of others at the time of the establishment of British or Canadian sovereignty enjoy the Aboriginal right to continue to use and occupy the land in a manner similar to that of their ancestors. These rights can be, and in some circumstances have been, extinguished by treaties. One of the federal government's objectives of modern treaties or comprehensive land claim agreements with Aboriginal peoples is to remove the uncertainty of land ownership caused by existing Aboriginal rights in areas of the country where those rights have not been extinguished.

As described in DIAND's Comprehensive Land Claims Policy booklet, comprehensive claim settlements in Canada have five objectives:

- to establish certainty of ownership over land and resources
- to stimulate economic development
- to encourage Aboriginal people to participate in government
- to ensure recognition of continuing interest of Aboriginal groups in renewable resource management and environment protection
- to ensure that Aboriginal groups share in the benefits of development.

When the federal government accepts that the claimant group (Aboriginal nation, regional group, etc.) has a claim to Aboriginal title, it agrees to negotiate a comprehensive settlement. The claims process begins when the claimant group prepares a statement of claim and supporting materials. The subsequent process of a comprehensive claim settlement has six stages:

- initial negotiation – when issues are identified for discussion
- substantive negotiation – when issues are discussed to produce the Agreement in Principle (AIP) that contains all the features of the eventual settlement
- finalization – when all parties formalize the agreements needed in the AIP to produce a Final Agreement
- Aboriginal ratification and Cabinet approval
- enactment to settlement legislation – which brings the agreement into force
- implementation of settlement legislation – when the terms of the agreement are carried out by all parties.

In order to reach a comprehensive claims agreement, the federal government must be prepared to commit certain rights and benefits to the claimant group. The rights are protected by the Canadian Constitution, and agreement of the claimant group is required before they can be altered. Comprehensive agreements usually include

- financial compensation
- surface and subsurface/land rights
- hunting and trapping rights; the right to representation on land and water management and environmental protection boards
- the right to share in revenues derived from resources
- some self-government provisions.

DIAND's Comprehensive Claims Branch in Ottawa has the mandate to lead comprehensive land claim negotiations and is responsible for

- developing the federal government's negotiating position for comprehensive land claims
- negotiating claims

- seeking legislation to enact comprehensive claim settlements
- advising the Minister of Indian Affairs and Northern Development on comprehensive claims policy issues.

In the Lac de Gras area of the Northwest Territories, the land claims issues are complex and are continually evolving. The history of the land claims settlements dates back to 1899 with the signing of Treaty 8 at Fort Resolution and to 1921 with the signing of Treaty 11 in the Mackenzie Valley communities and by the Dogrib at Fort Rae. These original treaties sparked controversy regarding the overall intent, the boundaries of the treaty area and the issue of extinguishment of Aboriginal title. Many of these issues remain unresolved.

Since the 1970s, the Inuit, Dene and Metis people of the NWT have been working towards an equitable settlement of their land claims with the federal government. Over the past decade, progress has been made on the negotiations and settlement of comprehensive land claims throughout the NWT, as outlined below.

Inuvialuit Settlement

The first comprehensive settlement reached in the NWT was with the Inuvialuit of the Western Arctic. The Inuvialuit signed their final comprehensive land claim agreement in 1983. The Inuvialuit Settlement Region is approximately 520 km northwest of the NWT Diamonds Project.

Nunavut Final Agreement

The Inuit of the Eastern Arctic, the Tungavik Federation of Nunavut (TFN), signed the Nunavut comprehensive land claim Final Agreement in 1993. The Nunavut Final Agreement covers an area of 353,610 km². While the NWT Diamonds Project is 25 km southwest of the lands included in the Final Agreement, the proposed development is situated within the headwaters of the Coppermine River drainage system. The communities of Coppermine, Umingmaktok and Cambridge Bay were, therefore, included in the Proponent's consultation area; the Aboriginal consultation process is described in Section 5. As discussed in Volume III, Section 3, the project will not substantially affect the quality of water flowing through Inuit-owned lands or the quantity of such water in the Coppermine drainage system.

Dene/Metis Claim Negotiations

The Dene/Metis negotiators in the Northwest Territories initialled an agreement with the governments of Canada and the NWT on the Dene/Metis claim in April 1990. In July 1990, the 16-year negotiation process ended when the Dene/Metis assembly rejected the provisions, which called for the extinguishment of Aboriginal title.

The federal government discontinued negotiations on the overall Dene/Metis claim and offered the five affected regions the option of negotiating separate regional settlements based on the April 1990 agreement. Following this change in direction and approach, several developments have taken place:

Gwich'in Final Agreement – The Gwich'in Final Agreement was the first of the regional comprehensive land claims to be settled following the break-off of negotiations on the overall Dene/Metis claim. The Final Agreement was signed by the Gwich'in in 1992, with legislation being passed the same year. The project is 820 km to the southeast of the eastern boundary of the lands in the Gwich'in Final Agreement.

Sahtu Final Agreement – The second regional claim to be settled was the Sahtu comprehensive land claim. The Sahtu Dene and Metis Final Agreement was signed in September 1993, and legislation implementing it was passed in June 1994. The project is 270 km to the southeast of the easternmost border of the lands in that final agreement.

Deh Cho Tribal Council – The Deh Cho Tribal Council, which includes the Hay River Dene Reserve and communities in the southwestern NWT, has recently started discussions with the federal government. The Deh Cho lands border on Treaty 11 Dogrib, Sahtu and Treaty 8 claims.

Metis – The federal government has also started exploratory discussions with the Metis who are descended from the original inhabitants of the Mackenzie Valley and who are not involved in Treaty 8, Treaty 11 or other negotiations. These discussions include land and economic benefits, programs and services.

Treaty 11 and Treaty 8 Lands

The balance of the Treaty 11 and Treaty 8 lands remains under negotiation. In 1994, the Dogrib Treaty 11 Council entered into negotiations for a comprehensive land claims agreement. The Dogrib claim includes much of the land staked by mining companies in the 1990s. The NWT Diamonds Project lies within the Dogrib comprehensive claim settlement area as defined by the federal government in the Interim Protection Agreement. Metis of Dogrib descent are eligible to participate in the Dogrib claim. Settlement of this comprehensive claim could result in the transfer of substantial amounts of land in fee simple ownership to the Council or its designate. An agreement could also result in the integration of the Dogrib communities at Rae-Edzo, Snare Lake, Wha Ti, Rae Lakes and the Dogrib Council into the regulatory processes for land, water and environmental review.

Canada has also offered to enter into comprehensive land claims negotiations with the Yellowknives Dene, the Dene of Lutsel K'e and other adherents to Treaty 8 in the Northwest Territories. The NWT Treaty 8 Tribal Corporation has elected not to enter into comprehensive land claims negotiations but instead to pursue treaty land entitlements to fulfill what they regard as the unfulfilled obligations of Canada based

on the Treaty 8 of 1899. The Yellowknives Dene, the Dene of Lutsel K'e and Canada currently do not agree on the extent of Canada's obligation under Treaty 8 or the degree to which its obligations have not been honoured. A Protocol Agreement has been negotiated between Canada and the Yellowknives Dene and other Dene First Nations for determining the entitlement of the Dene First Nations to land and economic benefits that Canada agrees it has not fulfilled under Treaty 8. The NWT Treaty 8 Tribal Corporation is scheduled to begin Treaty Land Entitlement negotiations with the federal government in 1995. The Corporation includes the Yellowknives communities of Lutsel K'e, Dettah and N'dilo as well as other communities. The Corporation has adopted a resolution defining the Akaitcho Traditional Territory, which they claim stretches from Fort Chipewyan in Alberta to just south of Coppermine, and which overlaps the Dogrib Treaty 11 settlement area and includes the NWT Diamonds Project.

This current uncertainty arising from the conflicting Aboriginal land claims places the Proponent in a difficult situation. There must be mechanisms to facilitate responsible resource development in the Northwest Territories that also respect the contested claims of the Aboriginal peoples. Further complications arise from the different routes by which the Treaty 8 Dene and the Dogrib Treaty 11 Council are seeking redress of their separate land claims, i.e., Treaty Land Entitlement versus a Comprehensive Land Claim Agreement, respectively. The outcome of each negotiation approach affects the land location in question and the framework of rights that would flow from each resolution. Despite the inherent uncertainty of this situation, the Proponent has developed a process by which it hopes to gain the support of all parties.

Government guidance and advice regarding the lands claims has been sought and implemented where possible. It is important to note at the outset that the Proponent can only address issues arising from settled land claims, however, as opposed to those dealing with unsettled land claims. Therefore, discussion of royalties, lease payments and land access fees must necessarily come from the federal government and the results of its negotiations with the claimant groups. The federal government has a fiduciary responsibility to the Aboriginal peoples requiring the government to consult them prior to undertaking actions that will affect their Aboriginal rights. The Proponent has taken the position that it would be inappropriate to speculate on the nature or outcome of any land claim settlement, nor would it be appreciated by the parties involved.

The Proponent believes that the project will generate significant economic opportunities and benefits for all the affected Aboriginal peoples. Given that lease payments and royalties are in the domain of the federal government, the Proponent is relying on other significant benefits for the affected Aboriginal peoples. These include employment, education, business opportunities and other forms of beneficial participation in the project.

This multi-faceted approach is being achieved through cooperation and consultation with the Aboriginal peoples. The consultation process is well documented, but the level of involvement by both the Dogrib Treaty 11 Council and the Treaty 8 Dene reflects the steps taken by the Proponent to avoid conflicts with Aboriginal claims and rights and to focus on areas where the Proponent can make a difference. A brief overview of this approach is included here to illustrate the process; an in-depth discussion of these examples is contained in Section 5.

Beginning in 1992, the Proponent travelled to the Treaty 11 Dogrib communities and subsequently to the communities of the Treaty 8 Dene to make presentations about the project. Many more visits, meetings and open houses followed (Section 5, [Figure 5.1.-2](#)). In 1994, the geographical area of communities to be contacted was expanded to include Inuit communities in Nunavut.

In addition, the Proponent sponsored trips to BHP's (the Operator's) New Mexico coal mine for members of the Treaty 11 Dogrib in December 1993 and the Treaty 8 Dene in October 1994. (Follow-up trips are scheduled for summer 1995.) The Navajo Mine is located on lands leased from the Navajo Indian Tribe. These familiarization trips were designed to better introduce the NWT Aboriginal representatives to BHP's operations and to demonstrate by example how BHP can operate on Indian owned lands. The operations in New Mexico have been successful both in terms of reclamation awards and in achieving a work force where more than 80% of the employees are Native Americans. It was hoped that in this spirit, the Treaty 8 and Treaty 11 leaders would observe the Proponent's willingness to develop a similar mutually cooperative relationship.

In August 1994, BHP/Dia Met announced two scholarship programs at the Treaty 11 Dogrib General Assembly. In order for Aboriginal students to become a valued part of the work force, the scholarships are to be made available to university undergraduates and to high school students who are completing Grade 10 and who intend to continue through to Grade 12. Leaders of the communities help pick the scholarship candidates. Traditional values is one of the prerequisites of the candidates. The same programs are to be implemented with the Treaty 8 Dene as their agreement discussions progress (see below).

The Proponent recognizes that social problems existing within the Aboriginal communities may be compounded by an increase in wages. Additional expendable income can lead to alcohol and drug abuse and intensify existing problems such as violence. "Community Mobilization" is a method of helping the communities deal with these problems, and the Proponent has retained the services of Community Development Associates to assist in this process. The entire procedure is community driven. The issues, problems and vision for change are set up by the communities themselves through workshops. Partnerships are then formed within the community and outside as well, with potential partners including leaders, members and representatives of various agencies. The Proponent has offered to

form one of the many outside partnerships. The eventual goal of the program is to empower communities to take positive action and then link them to local resources to carry on with the process. It is hoped that through this process of building strengths, skills, experiences and culture, a community can slowly turn itself around and reduce its social problems.

The Proponent has made a deliberate effort to encourage the hiring of Aboriginal people to work at the project site, either directly for the Proponent or as employees of its contractors or subcontractors. The Proponent requires its contractors to take a pro-active approach to hiring Aboriginal people. During the exploration phase, Aboriginal employees have made up approximately 25% of the total site work force.

The Proponent has also sought advice from Aboriginal elders on traditional knowledge and included Aboriginal peoples in its environmental baseline work and archaeological surveys of the project area. This participation, through observation or actual hiring, allows the elders to observe first-hand the Proponent's operations and also allows the Proponent to learn about the history and the care of the land from an Aboriginal perspective.

The Proponent has voluntarily commenced negotiations on a Benefits Agreement. The confidential negotiations with both the Treaty 11 Dogrib and the Treaty 8 Dene are currently at different stages, with similar provisions and arrangements being part of the anticipated final agreements. The Inuit and Metis will be contacted to start discussions on their agreements in the near future.

Benefits Agreements are necessitated wherever Aboriginal peoples have land or water claims within the immediate area of a project that could be affected by current or future development of a project, in this case the NWT Diamonds Project. The objectives of the agreements are to ensure that the Treaty 11 Dogrib, the Treaty 8 Dene, the Inuit and Metis derive direct and indirect social and economic benefits during the developmental and operational phases of the NWT Diamonds Project. Not all social and economic impacts can be foreseen, however; therefore the agreements will provide for the monitoring of the impacts that go beyond those initially anticipated. The agreements also provide mechanisms for Aboriginal involvement and participation via the creation of several joint advisory committees, including an employment and training committee, a business opportunities committee, a culture and education committee and a joint implementation committee. All Aboriginal groups affected by the project will be represented on each committee as appropriate to ensure their needs and concerns are addressed. It is hoped that the Benefits Agreements will ensure an ongoing working relationship between the Proponent and the Aboriginal peoples as well as facilitate their support for the development of the project in an environmentally and culturally beneficial manner.

In addition, the proposed agreements offered by the Proponent would create a number of specific policies and programs, as follows:

- preferential hiring
- employment training and apprenticeship
- student summer employment
- Aboriginal employment coordinator
- preferential business opportunities and notification procedures with regard to competitive tendering on supply and service contracts
- advice as to development of business capabilities
- drug and alcohol rehabilitation programs
- money management programs
- agreement to allow reasonable and safe use of the mine airstrip and roads
- environmental rehabilitation and in some cases protection of heritage resources
- establishment of heritage funds, education and scholarships.

The Proponent is optimistic that these arrangements will be mutually advantageous and will be supported by the Aboriginal peoples. Historically, the Proponent has developed an appreciation for Aboriginal peoples, created economic opportunities and had extensive experience building positive relationships, whether in New Mexico, or other parts of the world, or the NWT. The current hiring policy, the traditional knowledge collection and the community mobilization program reflect the Proponent's commitment to Aboriginal involvement without any negotiated agreement. Finally, with an uncertain land claim settlement still being negotiated, the Proponent has chosen a policy of inclusion of all affected Aboriginal peoples rather than presupposing an outcome and choosing one group over another.

1.4.3 Regulatory Environment

The exploration, construction, operation, monitoring and decommissioning phases of the NWT Diamonds Project will require a variety of approvals. The project will be located on territorial lands, which are federal crown lands under the control of the Minister of the Department of Indian Affairs and Northern Development (DIAND). The federal government currently owns and controls approximately 96% of the lands and resources in the NWT (GNWT 1991). Control over wildlife and forests has been devolved to the Government of the Northwest Territories (GNWT), but the federal government still controls land and water. As some of the activities associated with the project have the potential to

affect land and water, most, although not all, of the required approvals are the responsibility of DIAND. Even in the areas of DIAND's responsibility, most of the applications for authorizations are considered by boards and advisory groups, which most often include representatives from the GNWT, federal agencies, Aboriginal organizations and other stakeholders.

Regulatory approvals for the project will include consideration of

- environmental assessment processes
- a variety of required permits and licences
- compliance with international conventions and agreements.

1.4.3.1 Environmental Assessment Review Process

The EIS has been prepared to satisfy the requirements of the federal Environmental Assessment Review Process (EARP). The EARP was established by the EARP Guidelines Order (1984), issued as an Order-in-Council under the *Government Organization Act*. The *Canadian Environmental Assessment Act* (CEAA) was enacted in January 1995 and replaces the EARP. However, projects initiated before the CEAA, such as the NWT Diamonds Project, are subject to review according to the previous requirements of the EARP Guidelines Order.

The EARP Guidelines apply to all federal projects and any other projects that may have an environmental effect on an area of federal responsibility, or for which the federal government makes a financial commitment, or that are on lands administered by the federal government. The EARP is administered by the Canadian Environmental Assessment Agency, formerly the Federal Environmental Assessment Review Office (FEARO). According to EARP, federal agencies receiving an application for an approval must perform an initial screening to identify potentially significant adverse environmental and socioeconomic impacts and mitigative measures to reduce or eliminate those impacts.

In the Northwest Territories, project proposals are assigned one of three screening levels depending on the size and complexity of the development, the potential environmental and related socioeconomic impacts, and the amount of public concern. In the case of the project, exploration activities have been reviewed through the first two screening levels. The construction and mining development phase is being reviewed according to a Level III screening, known as a public environmental review. Level III is the level of screening required for major project proposals with potential for significant public concern.

Early exploration phase authorizations for the project were reviewed according to a Level I screening. Since the environmental impact of early exploration was determined to be insignificant, land use permits were obtained and exploration

activities began. Advanced exploration activities, primarily related to bulk sampling, were later reviewed through a Level II screening.

The Department of Indian Affairs and Northern Development (DIAND) referred the application for advanced exploration activities to the Regional Environmental Review Committee (RERC) for Level II screening. The RERC consists of federal, territorial and First Nations representatives and assists federal government departments in making EARP screening decisions. After reviewing the RERC's recommendations, DIAND concluded that the proposal should undergo a public environmental review. In July 1994, the Minister of Indian Affairs and Northern Development referred the project proposal to the Minister of Environment for public review by a federally appointed Environmental Assessment Panel (Panel).

The federal Environment Minister appointed a Panel to conduct a public review of the environmental and socioeconomic effects directly associated with the Proponent's proposed diamond mine, on December 9, 1994. The Project Description Report (BHP 1994) was the first document submitted for the review. The Panel published draft guidelines for the EIS on January 31, 1995.

Scoping meetings were held in the Northwest Territories during a three week period from late March until early April. The Panel received presentations on the draft EIS guidelines in Coppermine, Umingmaktok, Rae Lakes, Wha Ti, Dettah, Snare Lake and Rae-Edzo, Lutsel K'e and Yellowknife. After consideration of the submissions made, the Panel issued final EIS Guidelines on May 23, 1995.

The EIS will be submitted to the Panel and distributed publicly. After reviewing the document, the Panel will conduct public hearings in various communities throughout the NWT to assess the environmental and socioeconomic effects of the project. The Panel will submit an advisory report to the Ministers of Environment Canada and DIAND.

In addition to the appointment of a federal Panel to examine the potential effects of the project, a major regional study of mineral development was announced in December 1994. The Ministers of DIAND and of GNWT Renewable Resources initiated a multi-party study of environmental, social and economic issues related to mineral development in the Slave Geological Province due to the high level of exploration activity and promising mineral potential of the region. While the Panel may contribute to the regional study, its review of the NWT Diamonds Project proposal will not be dependent on the completion of this study.

1.4.3.2 Permits and Licences

The regulatory requirements applicable to the project are reviewed generally in order of the sequence of requirements as development proceeds from exploration to construction, operation, and decommissioning. Appendix I-A9 lists applicable and potentially applicable laws, regulations, policies and guidelines, as well as the

entities responsible for their administration. The Proponent has not addressed fiscal regimes, since no funding has been sought from government sources.

Claim Acquisition and Exploration

Prospector licences, prospecting permits for specific areas and mineral claim staking, recording and maintenance, already secured in the case of the project, are administered by DIAND's Mining Recorder's Office in Yellowknife. These approvals as well as mining leases, permitting mining of the claims, are obtained under the Canada Mining Regulations pursuant to the *Territorial Lands Act*.

A mining lease will be issued to a claimholder if the title to the claim is not disputed, if the claimholder has done certain work on the claims and if the claimholder submits a survey of the claims and applicable fees and application forms not later than 30 days following the expiration of the tenth anniversary of the recording of the claim. A mining lease is for a term of 21 years, but may be renewed for a further term of 21 years with the Minister's approval. The Canada Mining Regulations impose royalty payments and a number of reporting requirements on an owner, manager, tenant, lessee, occupier or operator of a mine. The mining lease grants the exclusive right to mine and produce minerals within the boundaries of the lease, but it does not grant the right to use the surface of the land where the claims are located, nor the right to use water or to affect other resources in the area.

Exploration activities such as constructing access roads, airstrips and exploration camps, establishing fuel caches and vehicle facilities, drilling for diamond ore and bulk sampling and processing require applications for land use permits and water licences.

Land Use Permits

Short-term permits to conduct activities on territorial lands in the NWT are administered by DIAND under the Territorial Land Use Regulations pursuant to the federal *Territorial Lands Act*. Permits may be issued for a maximum term of two years, but extensions of up to another year can be granted if the request for the extension is made before expiration of the original permit and if the project has not changed significantly from the original permit.

Permits are usually issued 30 to 42 days from the date of the application, but may be delayed up to one year if there are issues of community interest and/or a sensitive area is involved and if further information is required (DIAND undated). A Class "B" permit is appropriate for smaller operations, while a Class "A" permit is required for larger operations. The Proponent requires a Class "A" permit for the project.

Consideration of either class of permit may take up to 42 days if the area Land Use Engineer (LUEng) declares, under Section 25(1)(b) of the Territorial Land Use Regulations, that further time is required to consider the permit application if the area is of community interest and/or is a sensitive area. The LUEng may also declare, under Section 28, that the application for a Class “B” permit will be considered as an application for a Class “A” permit. At the end of 42 days, the LUEng must either issue the permit, refuse the application with reasons, or require further information as follows. A Class “A” permit may take up to one year if the LUEng declares, under Section 25(1)(c), that further studies and investigations are required. After one year has elapsed from a Section 25(1)(c) declaration, the LUEng must either issue the permit or notify the applicant that his or her application is refused.

When a LUEng accepts the application for a permit, he or she refers it to the Lands Advisory Committee and local stakeholder groups for advice on whether or not to issue the permit and on evaluating the environmental impact of the proposed land use. The Lands Advisory Committee includes representatives from EC’s Environmental Protection, GNWT’s Renewable Resources, DIAND’s Water Resources, DFO, GNWT’s Department of Energy, Mines and Petroleum Resources, GNWT’s Municipal and Community Affairs and GNWT’s Archaeology unit. Aboriginal peoples and community organizations are consulted. The Lands Advisory Committee makes recommendations to the LUEng, or to the Regional Manager of Land Resources, who may issue the permit with conditions for environmental protection, or may return the application with reasons, or may refer the application to Level II or Level III for further environmental assessment. Conditions for caribou protection may be appended to land use permits pursuant to the Caribou Protection Measures under the *Territorial Lands Act*.

Once a permit is issued, Land Use Inspectors conduct field inspections to ensure compliance with the terms of the permit, the Territorial Land Use Regulations and the *Territorial Lands Act*. Security deposits are not normally required for land use permits but may be required in some cases (DIAND 1981). If permit conditions are not met, the operation can be suspended, the permit cancelled and fines and costs of remediation may be imposed under the *Territorial Lands Act*. Final inspections are also carried out on completion of the permitted activities and restoration of the site. If all conditions have been met, the LUEng will issue a Letter of Clearance.

Land Leases

Land leases, also termed Land Tenure Agreements, will be required to use the surface of the land to develop the project over a longer term. The term of such leases cannot be longer than 30 years, but renewals can be granted. Land leases

are administered by DIAND under the Territorial Lands Regulations, which are also pursuant to the *Territorial Lands Act*.

Land leases cover specific areas for specific activities within those areas. A number of leases will likely be required for the project, since it entails activities in a number of different areas and a variety of uses. Leases include covenants as to environmental protection and requirements on decommissioning to restore the lands to their former condition. Leases require security deposits. The legislation provides for cost recovery for any necessary DIAND remedial expenditures exceeding the security.

The regulatory process for land leases is similar to that described above for land use permits. Applications are accepted, or rejected and returned to the applicant with reasons, by the Regional Manager of Lands. If accepted, the application is subjected to review by the Lands Advisory Committee, which makes recommendations to the Regional Manager to help determine if the lease should be issued, if any further information is required, which conditions should be attached to the lease, and to assess the environmental impact of the proposed operations. The Regional Manager of Lands may then approve the application, approve it subject to modification, reserve a decision pending additional information, or reject the application. The *Territorial Lands Act* specifies that surface leases to any one person in excess of 640 acres require Governor in Council approval.

Once a land lease is granted, the operation is subject to inspections by DIAND to monitor for compliance with the terms of the lease, the Territorial Lands Regulations and the *Territorial Lands Act*. The lessee receives copies of the inspection reports. Lack of compliance may lead to cancellation of the lease and/or litigation.

Quarry Permit

Quarry permits authorize a person to remove a specific amount of quarry materials (sand, gravel, stone, soil, peat, etc.) from specified territorial lands. Quarry permits are issued by DIAND under the Territorial Quarrying Regulations, pursuant to the *Territorial Lands Act*. Permits expire one year from the date of issue of the permit or when the amount of quarry material specified in the permit is removed if this occurs before the end of the one-year period. Processing of the applications, conditions, security, inspections, and compliance and enforcement provisions are similar to those involved in land leases and land use permits.

Water Licence

The project requires use of water, altering watercourses and the disposal of wastes to inland waters, all of which require licensing under the *Northwest Territories Waters Act* and its regulations. The current legislation replaced the

earlier *Northern Inland Waters Act*. The *Northwest Territories Waters Act* authorizes the NWT Water Board (the Water Board) to issue, amend and cancel licences for water use and waste disposal into inland waters. A water licence may be issued for a term up to 25 years, depending on factors such as the expected life of the project, need for public review, results of major studies and any major planned changes to the development.

The Water Board is a semi-autonomous administrative tribunal whose members are appointed by the Minister of DIAND, who also appoints a Chair and Vice Chair from the current members. The Water Board is composed of at least three members nominated by the GNWT (the Commissioner in Council) and three nominated by the Ministers of DIAND, Environment Canada (EC) and National Health (NH). The Water Board is semi-autonomous in the sense that it issues smaller scale water licences without approval from the Minister of DIAND and develops water licences for larger scale operations, which do require approval by the Minister of DIAND. However, the Minister can only approve or reject the second class of licence and conditions as recommended by the Water Board; the Minister does not have the authority to alter the conditions of the water licence.

Water licence applications are classed into type “A,” for larger operations or those that will have greater impacts on inland waters; type “B,” for more modest operations; or those not requiring a water licence. Criteria used to decide the classification include the number of tonnes of ore milled per day or the number of cubic metres of water used per day, the presence of watercourse crossings, and the rate of milling in tonnes of ore per day from which wastes will be deposited directly or indirectly to surface waters (Schedule IV, for Mining and Milling Undertakings, annexed to the Northwest Territories Waters Regulations). Use of water for the camps will be regulated as “Municipal Undertakings” under the Northwest Territories Waters Regulations. The Proponent requires a type “A” licence for the project.

Applications received by the Water Board are assigned to one of the three licensing types. Any information deficiencies must be corrected by the applicant. A type “B” licence is usually issued within 42 days, unless the scope of the proposal and/or required field studies delay the process. Type “A” water licences are usually issued within six months to one year after receipt of the application. Type “A” or “B” applications undergo a technical review by the Water Board’s Technical Advisory Committee, environmental screening by DIAND’s Water Resources, notifications in local papers and, in cases with mandatory hearings, in the Canada Gazette. If the licence is type “A,” the public notice includes the date and location of a proposed public hearing. The Water Board may cancel the public hearing if no submissions have been received by ten days before the scheduled hearing.

The Water Board's Technical Advisory Committee (WBAC), working with the Water Board, prepares a draft licence. The WBAC is chaired by the Controller of Water Rights for the NWT and its members, who have technical expertise, are appointed by the Water Board. Government agencies, industry, Aboriginal peoples and special interest groups are represented on the WBAC. For type "B" licences, the draft licence is discussed with the applicant, reviewed and/or revised by the Water Board and approved or rejected by the Water Board.

For type "A" licences, the Water Board distributes the draft licence to the applicant and any intervenors; after the public hearing, the application is reviewed again by the WBAC. The Water Board also reviews the draft licence again, finalizes it with conditions and makes recommendations to the Minister of DIAND, who can approve or reject it.

A water licence places conditions, related to expected effects on water, on the development and may require a security deposit. However, the amount of security may not be greater than the sum of the costs of abandonment, site restoration and site monitoring and maintenance after abandonment. DIAND Water Resources inspectors inspect the development during construction, operation and abandonment to ensure the conditions of the licence and the legislated requirements are met. The inspector can suspend the operation or issue cleanup orders. The legislation provides for the possibility of fines up to \$100,000 and terms of imprisonment up to one year, or both, on conviction for an offence under the *Northwest Territories Waters Act*.

The NWT Water Board also has issued the Guidelines for Tailings Impoundment in the Northwest Territories.

Fisheries Protection from Pollution

If it is determined that any of the project's proposals involve discharging deleterious substances into waters frequented by fish, the water licences discussed above will require consideration of authorizing such discharges or treatment of effluent. As DOE administers the deleterious substances provisions of Section 36 of the *Fisheries Act*, and related regulations, under a Memorandum of Understanding between DFO and DOE dated May 1985, its input to the Water Board will be sought so that any water licence that is ultimately issued will meet DOE standards.

Those standards for mining are the Metal Mining Liquid Effluent Regulations passed pursuant to Section 36 of the *Fisheries Act*. However, they apply to metal mining, while diamond mining involves a non-metallic mineral. The metal mining regulations regulate seven substances as deleterious substances, including some that will be present in the project's effluents (e.g., several metals, total suspended matter and level of pH). DOE requires "best practicable technology," including pH adjustment of effluents, and best practicable removal of tailings and metal

precipitates in their administration of the metal mining regulations. A number of monitoring and reporting requirements are described in DOE publications listed in Appendix I-A9.

While the Metal Mining Liquid Effluent Regulations may not, strictly speaking, be applicable to diamond mining, they may be applied, much like guidelines, to set standards that the Water Board may feel, in the exercise of its discretion, are appropriate.

With regard to the project's use of glycol antifreeze compounds, which are deleterious to fish in certain concentrations, waste glycols will be collected and rehabilitated as much as possible for on-site reuse then sent to an off-site waste disposal facility when on-site glycol rehabilitation is not practical. If any unavoidable release of glycols occurs, the Proponent will ensure compliance with federal guidelines for glycol concentrations promulgated under the *Canadian Environmental Protection Act*.

Fish Habitat

The proposed dewatering of six lakes, raising of the level of another through tailings disposal, disposal of waste rock into the tailings disposal lake and other proposed works (e.g., any camp or transportation developments affecting lakes, rivers and streams) may affect fish habitats in a number of ways. Since harmful alteration, disruption or destruction of fish habitat is prohibited by Section 35(1) of the *Fisheries Act*, the project proposals will require authorization under Section 35(2), pursuant to which the federal government has enacted Part IX (Section 58) of the Fishery (General) Regulations. Section 58 of the regulations provides that:

Any person who proposes to carry out any work or undertaking that is likely to result in the harmful alteration, disruption or destruction of fish habitat and who wishes to have the means or conditions of that work or undertaking authorized by the Minister under Subsection 35(2) of the Act shall apply to the Minister in the form set out in Schedule VI.

An authorization given under Subsection 35(2) of the Act shall be in the form set out in Schedule VII.

Schedules VI and VII to the regulations are forms that should be used to apply for and to issue an authorization, respectively.

Authorizations of this type usually require a habitat compensation agreement between the applicant and DFO pursuant to DFO's "no net habitat loss" policy. The principle of "No Net Loss of the Productive Capacity of Habitats" is described in the Department of Fisheries and Oceans (1986) Policy for the

Management of Fish Habitat. Authorizations to harmfully alter, disrupt or destroy fish habitat are usually issued conditional on creating an equivalent amount of fish habitat in a nearby area, or mitigating the effects of the project on fish habitat, or, less frequently, on payment to finance the creation of an equivalent amount of fish habitat in other locations.

The terms of a habitat compensation agreement are highly site-specific and will require detailed negotiation with DFO. The Proponent proposes to establish a habitat loss compensation fund based on biological, social and economic criteria. The disposition of this fund would be decided in consultation with regulatory agencies and stakeholders.

Construction of any water crossings or gravel removal will comply with the Northwest Territories Fishery Regulations under the *Fisheries Act*.

Projects Affecting Navigable Waters

The federal *Navigable Waters Protection Act* prohibits construction of works in, on, over, under, through or across any navigable water, or doing anything affecting navigation, without approval of the Minister of Transport. The Canadian Coast Guard publication entitled “Aids and Waterways: *Navigable Waters Protection Act* Application Guide” contains instructions and a sample letter format for applying for approval. The application guide gives a definition of navigable waters that is not contained in the act and that does not agree with the one adopted by the courts. The guide states that navigable waters “...includes any body of water capable ... of being navigated by floating vessels of any description for the purpose of transportation, recreation or commerce” and that “... navigability is a matter of fact and not of law. The authority to determine navigability of waterways rests with the Minister of Transport.”

The *Navigable Waters Protection Act* itself only defines the term (Section 2) as follows: “...‘navigable water’ includes a canal and any other body of water created or altered as a result of the construction of any work.” The definition of navigable waters has therefore fallen to be determined by the courts, which have ruled that the determination of whether a specific body of water is navigable is a mixed question of fact and law. Navigability in law requires that the body of water be a public aqueous highway used, or realistically capable of use, by the public, and it need not be so at all times. However, the fact that a body of water will carry a canoe or other vessel is not in itself enough to consider the waters navigable.

As a result, it is not clear whether the lakes to be affected by the project are “navigable waters.” This determination would depend on whether the lakes can be realistically used as a public aqueous highway for any purpose.

Transportation of Dangerous Goods

Dangerous goods to be transported in connection with the project will probably include explosives, gases, fuels, lubricants, solvents, paints and batteries. Transport by air or water is regulated by Transport Canada under the federal *Transportation of Dangerous Goods Act*. Transport by road, including ice roads, is regulated by the GNWT under the territorial *Transportation of Dangerous Goods Act*, which incorporates the provisions of the federal *Transportation of Dangerous Goods Act*. The legislation prohibits the handling, offering for transport or transporting of any dangerous goods unless all applicable prescribed safety requirements, standards for packaging, containers, means of transport and display of prescribed safety marks are complied with. There are nine different classes of dangerous goods, and detailed requirements are described for each. The project will include a thorough determination of all dangerous goods to be transported, handled or stored as well as a compliance and training program including appropriate licensing, declaring, manifesting, labelling, placarding, handling, storage, contingency planning and reporting.

Toxic Substances

The *Canadian Environmental Protection Act* (CEPA) regulates toxic substances, using a “cradle to grave” approach. The two environmental guidelines that pertain to glycol compounds have already been discussed in the context of the *Fisheries Act*. One guideline, issued in February 1994 under Section 53, Part IV, of CEPA, applies to discharges immediately before deposit into water bodies. It applies to discharges into surface waters resulting from aircraft de-icing and anti-icing activities at federally owned and operated airports. The second guideline, issued by the Canadian Council of Ministers of the Environment (CCME) in May 1994 as Appendix XVI to the Canadian Water Quality Guidelines, applies to surface waters that receive discharges that may contain glycols. The Glycol Bulletin, which began publication in October 1994, is a joint Environment Canada-Transport Canada publication advising on management of glycols used in air transport.

The CEPA lists of toxic substances in Schedule I and regulations made under Section 34 and other sections will be checked in detail for any that will be used in the project to identify any other substances requiring compliance with CEPA provisions. CEPA provisions requiring reporting and remedial measures on release of or reasonable likelihood of release of toxic substances (Sections 36 to 40, Part II, and Sections 57 to 60, Part IV) will be strictly adhered to and form part of the environmental management system.

The Canada Labour Code, the *Hazardous Products Act* and the *Hazardous Materials Information Review Act* together provide for control of hazardous materials and provision of information about hazardous materials, including toxic substances, in and out of the workplace.

Explosives

The federal *Explosives Act*, formerly administered by the Department of Energy, Mines and Resources, regulates explosives sale, importation, transportation, packaging, and storage. The Department of Energy, Mines and Resources was merged with the Department of Forestry to form the Department of Natural Resources on January 25, 1995, by the implementation of the *Department of Natural Resources Act*. Although the GNWT's *Mining Safety Act* regulates storage and use of explosives at mine sites, a federal permit under the *Explosives Act* is required to transport more than 2,000 kg of explosives, to import explosives or to assemble and blend ammonium nitrate and fuel oil or any two component blasting explosives in open pits and quarries.

If quantities of explosives purchased, stored or in possession exceed 75 kg of blasting explosives and 100 detonators, a federal magazine licence is required. The Explosives Regulation includes forms for applications and licences for plants and magazines and applications and permits for the purchase, possession and importation of explosives and for vehicles used for the transportation of explosives.

The requirements for safe transport of explosives without a permit, for up to 2,000 kg of explosives, are in the *Transportation of Dangerous Goods Act*.

The GNWT's *Mining Safety Act* regulates storage and use of explosives at mine sites, as well as the safe development and operation of mines in general (see below). Explosives stored or kept on a mine site must be used only for the purpose of the mine and must be stored in a licensed magazine. The site of the magazine and the style of the structure must be approved by an inspector. After this preliminary approval, the inspector may issue an explosives magazine permit. Blasting procedures are regulated by the Mining Safety Regulations as well as the Blasting Certificate Regulations under the act.

The GNWT's *Explosives Use Act* and its regulations apply to explosives used at areas that are not mine sites, i.e., those not regulated by the *Mining Safety Act*, for activities such as geophysical operations, trenching or sampling. Except for those activities regulated by the *Mining Safety Act*, a permit under the *Explosives Use Act* is required to explode or cause to be exploded any explosives in the NWT.

Health and Safety

The Canada Labour Code regulates occupational safety and health in general and sets standards for workers' safety. Regulations under the code include the Canada Noise Control Regulations and the Canada Sanitation Regulations.

The GNWT's *Mining Safety Act* imposes personal responsibility on mine managers, foremen, shift bosses, mine captains and department heads for compliance with the provisions of the Act. Mine owners are required to appoint a

Mine Manager and an Acting Mine Manager for purposes of the *Mining Safety Act* and to ensure that the Manager has all the resources to comply with the Act's requirements. Managers are required to provide all employees with a copy of the Act and its regulations. There are a variety of regulations under the act, including those governing certification of shift bosses and hoist operators, mine occupational and safety boards, blasting certificates and environmental and medical monitoring. In addition, the Mining Safety Regulations have been enacted pursuant to the *Mining Safety Act*; these regulations include a large number of provisions for building requirements, fire safety, safety equipment and procedures, blasting, operation of machinery, ventilation, first aid, etc. The Mining Safety Regulations include forms for Mine Safety Monthly Mine Progress Reports; Monthly Accident Summaries; Explosives Magazine Permits and Applications; Applications and Permits to Operate a Diesel Engine Underground; and Reports of Free Fall Test.

The territorial *Safety Act* imposes obligations on both workers and employers to ensure the safety and health of employees with respect to safety procedures, clothing, emergency equipment, machinery, excavations, etc. The *Safety Act's* Worksite Hazardous Materials Information System (WHMIS) applies to storing and handling controlled substances in workplaces in the NWT. The *Safety Act* controls substances not regulated under the federal and territorial acts dealing with transportation of dangerous goods or under the federal *Explosives Act*. The WHMIS requires worker education, labelling of controlled products and material safety sheets. The Mine Hazardous Materials Information System Regulations are pursuant to the GNWT's *Mining Safety Act*. Protection of health of workers from hazardous substances is also regulated by the Canada Labour Code: Part II, Occupational Health and Safety, provides for hazardous materials information.

The territorial *Workers' Compensation Act* regulates compensation benefits for injury or death by accident arising out of and during the course of employment. The act sets up an administrative Board of Directors and an adjudicative Appeals Tribunal, as well as an accident fund and accident notification requirements.

The GNWT's Department of Health has jurisdiction over water supply and sewage disposal by administering the *Public Health Act* (PHA). The project's mining camps will comply with the PHA's detailed requirements for public health, sanitation and medical care. Inspectors under the PHA may enter camps and conduct inspections at any time. The GNWT's *Emergency Medical Aid Act* regulates provision of first aid, where there are no proper medical facilities, and the *Fatal Accidents Act* and the *Coroner's Act* deal with fatalities.

The territorial *Labour Standards Act* and its regulations apply to most private sector workers and employers in the NWT and would apply to the project's labour force. It regulates maximum hours of work and minimum rest periods, minimum wage, vacations and termination of employment.

Fire prevention for the above ground part of a mining operation is regulated by the territorial *Fire Prevention Act*, while underground fire safety is prescribed under the territorial *Mining Safety Act* and its Fire Safety Regulations and Propane Cylinder Storage Regulations. Other safety measures are prescribed by the territorial *Boiler and Pressure Vessels Act* and *Gas Protection Act*.

The territorial *All Terrain Vehicles Act* covers the operation of all-terrain vehicles in municipalities, regulated areas, or outside a municipality or regulated areas. The Proponent, generally speaking, does not support use of all-terrain vehicles.

Other Approvals and Applicable Legislation

Archaeological studies for the project have been undertaken in compliance with the Northwest Territories Archaeological Sites Regulations made pursuant to the federal *Northwest Territories Act*. Archaeological field work was conducted under Northwest Territories Archaeologists Permit #94-768. The territorial *Historical Resources Act* protects heritage resources and regulates archaeological studies. The federal *Archaeological Heritage Protection Act* clearly assigns responsibility to mining or exploration companies for conserving archaeological sites in consultation with the Prince of Wales Northern Heritage Centre in Yellowknife. The Culture and Communications unit of the GNWT has issued Guidelines for Developers for the Protection of Archaeological Resources in the Northwest Territories and Archaeological Sites in the Northwest Territories – A Notice to Individuals or Companies Conducting Land-use Operations in the Northwest Territories.

The GNWT's *Scientists Act* licenses all scientific research carried out in the NWT. The act does not apply to research on wildlife or the collection of specimens of wildlife as defined in the *Wildlife Act*, or if the research consists solely of archaeological work for which a permit has been issued under the Northwest Territories Archaeological Sites Regulations. Wildlife research was carried out in 1994 under Wildlife Research Permit #001114 and in 1995 under Wildlife Research Permit #001120. Migratory birds were collected under Migratory Bird Salvage Permit NWT S20 issued by the Canadian Wildlife Service. The *Engineering, Geological and Geophysical Professions Act* requires registration of individuals providing those professional services in the NWT.

A number of other territorial statutes include environmental provisions that will apply to the project. These include the *Environmental Protection Act*, which regulates air quality, hazardous substances and environmental protection; the *Environmental Rights Act*, which provides for residents of NWT to access information, to request investigations and to initiate private prosecutions to preserve the environment; and the *Wildlife Act*, through which the GNWT has responsibility for wildlife management in the NWT. Compliance with provisions of the acts will be incorporated through the participation of the GNWT in the permit and licence approval and environmental assessment processes described

above. Provisions of the *Wildlife Act* are especially relevant to the project's camps, where contact with bears and other wildlife may occur. Provisions of the act will be complied with and recommendations in guides and references published by GNWT and listed in Appendix I-A4 will be followed.

The GNWT's *Public Highways Act* regulates load and dimension limits on primary highways, construction of access roads to or from primary highways and structures near primary highways.

A number of territorial statutes apply in Commissioner's Lands, which are lands transferred to the NWT by the federal government's Order in Council and which are generally in and around communities. The project is not expected to require any significant development on Commissioner's Lands. However, all roads, streets, lanes and trails on public lands are Commissioner's Lands and are governed by the *Commissioner's Lands Act*. Use, possession or occupation of such lands requires authorization from the GNWT's Municipal and Community Affairs.

Closure and Reclamation

The reclamation plan has the key objectives of minimizing disturbances to the environment and to attempt to restore the site and water bodies (where possible) to original undisturbed conditions. The project will follow DIAND's "Reclamation Guidelines for Northern Canada" and the NWT Water Board (1990) "Guidelines for Abandonment and Restoration Planning for Mines in the Northwest Territories."

As mentioned under the heading Land Leases, leases include covenants as to requirements on decommissioning to restore the lands to their former condition. Leases require security deposits, and the legislation provides for cost recovery for any necessary DIAND remedial expenditures exceeding the security. Similarly, conditions for restoration and security will be involved in quarry permits, water licences and fish habitat compensation agreements.

1.4.3.3 International Agreements and Conventions

Canada is signatory to a number of international agreements and conventions that could be relevant to the project. In some cases the federal government has enacted implementing legislation, the provisions of which are reviewed below.

The *Migratory Birds Convention Act* is the federal Canadian implementing statute for the Convention Between the United Kingdom and the United States for the Protection of Migratory Birds in Canada and the United States (Washington, August 16, 1916). Migratory birds are defined and protected under the act and its regulations by establishing sanctuaries and protecting habitats and prohibiting the disturbance of migratory birds, eggs and nests, or access to sensitive areas during

certain times of the year. There are no migratory bird sanctuaries or protected areas in the project area. Migratory birds are discussed in Volume II.

The Vienna Convention for the Protection of the Ozone Layer (Vienna, March 22, 1985) and the Montreal Protocol on Substances that Deplete the Ozone Layer (Montréal, September 16, 1987, and amendments) both impose obligations on the Government of Canada to limit the emissions of substances that deplete the ozone layer. Specific detailed regulations have been enacted under CEPA, including ozone depleting substances regulations to control the release, manufacture and importation of chlorofluorocarbons and other substances and products, many of which were previously commonly used, and are still being used in some other countries, in refrigeration, air conditioning and fire extinguishers. The Proponent will carefully screen any products planned for use for the presence of banned ozone layer active substances listed in the regulations.

The Convention on Wetlands of International Importance (Ramsar, February 2, 1971, and amendments) aims to stop the encroachment on and loss of wetlands. Wetlands do not appear to be specifically protected by the Canadian government except indirectly through the provisions of the *Fisheries Act*, where wetlands are fish habitats, and the *Migratory Birds Convention Act*, where wetlands are protected migratory bird habitats.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington, March 3, 1973, and amendments) protects specific endangered species from over exploitation by means of import/export control and permits. The convention includes detailed provisions for control of trade in three categories of species, listed in Appendices I, II and III of the convention. The three appendices, respectively, list species now threatened with extinction, species that may become threatened with extinction unless trade in them is strictly regulated and species that must be regulated in order that trade in the previous category can be effectively controlled (this latter appendix does not seem to exist, although it is provided for in the convention). Appendix IV of the convention provides a form for export permits. The convention calls for establishment of a Secretariat under the United Nations Environment Program, a Conference of the Parties to the Convention at least every two years and the designation of a Management Authority and a Scientific Authority by every Party, and provides details of measures to be taken to enforce the convention.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora was ratified by Canada on April 10, 1995, and has been implemented in Canada for a number of years. It is administered and enforced by Environment Canada's Canadian Wildlife Service. *The Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act* is a federal act, formally implementing the convention and assented to in 1992, that has not yet come into force. No endangered species covered by the convention have been

identified in the project area. The Proponent will ensure that project development minimizes any disturbance of any vulnerable or threatened species.

The Convention on the Conservation of Migratory Species of Wild Animals (and Convention Annex I: List of Animals Forbidden to be Taken) (Bonn, June 23, 1979) aims to protect those species of wild animals that migrate across or outside national boundaries. None of the migratory species considered to be “endangered” according to this convention occur within the project area.

The Convention on Long Range Transboundary Air Pollution (and NO_x Protocol and other protocols to Convention on LRTAP) (Geneva, November 13, 1979) limits, gradually reduces and prevents air pollution, including long-range transboundary air pollution. It is doubtful that the project would raise concerns with respect to Canada’s obligations under this convention.

The United Nations Framework Convention on Climate Change (New York, May 9, 1992) aims to stabilize the concentration of greenhouse gases in the earth’s atmosphere to prevent dangerous modification of climate systems. The version of the convention signed did not contain specific timetables or targets for limiting the emission of greenhouse gases.

The Convention on Biological Diversity (Rio de Janeiro, June 5, 1992) commits Canada to develop a plan for conservation and sustainable use of biological diversity. Among a number of other provisions, those potentially relevant to the project are the requirement that Canada adopt regulations to conserve its biological resources, and that it has a legal responsibility for the environmental impact that its private companies might have in other countries. Each nation is urged to set up a network of protected areas where the first beneficiaries of conservation and sustainable use are indigenous peoples and rural communities.

An initial National Biodiversity Strategy for Canada is discussed in the April 1993 Report of the House of Commons’ Standing Committee on Environment, A Global Partnership: Canada and the Conventions of the United Nations Conference on Environment and Development (UNCED). The report recommends development of legislation to conserve biological diversity within Canada and that the Government of Canada take whatever steps are necessary to ensure that its environmental assessments take full account of Canada’s obligations under the Convention on Biological Diversity. The *Endangered and Threatened Species Act* (Bill C-275) has been proposed as a private member’s bill and received first reading on September 28, 1994. It includes provisions protecting endangered or threatened species, including listings of species needing protection. These species are addressed in the biophysical setting sections of the EIS.

The *International Covenant on Economic, Social and Cultural Rights* and the *International Covenant on Civil and Political Rights* declare a large number of

civil and other associated rights of all peoples, and state that the States which are Parties to the covenants shall promote the realization of the enunciated rights and respect those rights. Further, each State Party undertakes to take steps to achieve the full realization of the rights recognized by all appropriate means and to guarantee that the rights will be exercised without discrimination. In both covenants, the State Parties undertake to submit reports on the measures they have adopted and the progress that could be considered relevant to the project relate to the right of self-determination.

Both of the above covenants declare that all peoples have a right to self-determination, including to freely determine their potential status and freely pursue their economic, social and cultural development; to freely dispose of their natural wealth and resources without prejudice to any obligations arising out of international economic co-operation; and in no case may a people be deprived of its own means of substance. Although the usual meaning of “peoples” in international agreements refers to a Nation which is a Party to the agreement, this covenant could be interpreted to mean that Canada must ensure these rights for its Aboriginal people. It could be argued that Canada is ensuring the project does not encroach on these rights by its extensive consultation with, and by ensuring participation by, Aboriginal people in the EIA. Further, Canada is ensuring these rights in respect to the project by considering concerns regarding land claims in the project area.

1.5 The Proponent

This section provides background information on BHP Diamonds Inc. and its Canadian joint venture partner, the Blackwater Group, which consists of Dia Met Minerals, Charles E. Fipke and Dr. Stewart L. Blusson. An outline of the principal consultants follows.

1.5.1 BHP

The Broken Hill Proprietary Company Limited (BHP) is the parent company of BHP Diamonds Inc. BHP is Australia’s largest industrial and natural resources company, with approximately 48,000 employees based in more than 50 countries. BHP was incorporated in 1885 to mine the lead/zinc/silver discovery at Broken Hill, in New South Wales, Australia. It has grown from its mining origins to become a world-class producer of steel and petroleum, as well as one of the world’s largest mining companies. Its global assets are valued at more than \$26 billion, with annual sales exceeding \$16 billion.

BHP Minerals

BHP is comprised of three main business groups: Minerals, Steel and Petroleum. It also has a services group that includes transport, engineering and information

technology activities. BHP Minerals, of which BHP Diamonds is a part, is one of the world's largest and most diverse mining enterprises. BHP Minerals operates mines in nine countries, on the continents of Australia, North America, South America, Asia and Africa. It has representative offices in an additional 11 countries and sells its product in 57 countries. Key activities include the following:

- *Copper mining:* BHP owns 57.5% of and manages the Escondida Mine in Chile. The mine is currently producing at a rate of 500,000 t/a of fine copper and is being expanded to produce 800,000 t/a by 1997, when it will become the world's largest copper mine. BHP also manages and is majority owner of the Ok Tedi copper and gold mine in the Star Mountains of Western Papua New Guinea and Island Copper Mine in British Columbia, Canada. BHP is the world's second largest producer of copper in concentrate.
- *Iron ore mining:* BHP is one of the largest producers of iron ore, supplying the steelmaking industries of Australia, Asia, North America and Europe from its operations in Western Australia. BHP also owns a 49% share in Samarco of Brazil, a major iron ore concentrate and pellet producer.
- *Coal mining:* BHP operates seven coal mines in Australia and is the world's largest exporter of metallurgical coal. It also has substantial thermal coal operations, supplying domestic and export markets from the Western USA, Indonesia and Australia.
- *Manganese mining:* BHP is the third largest producer of manganese ore, from its mines at Groote Eylandt, off the northern coast of Australia. BHP Manganese also smelts manganese ore to produce manganese alloys and processes ore fines to make electrolytic manganese dioxide, used in batteries.

BHP has a number of investments and exploration activities in other minerals, including gold, base metals (lead and zinc), nickel, titanium minerals, platinum, potash and diamonds.

BHP Minerals employs 15,000 people in 30 countries. It has exceeded \$500 million in after-tax profit for the last five years and invested over \$900 million per year in capital and investment projects. In 1994, the company invested more than \$200 million in exploration. BHP Minerals' Canadian exploration offices are located in Toronto, Kelowna and Vancouver.

BHP Diamonds Inc.

BHP Diamonds Inc. is the BHP Minerals vehicle for diamonds exploration and development. It is an incorporated company based in Vancouver, B.C. BHP

Diamonds has assumed the responsibility within the joint venture agreement for matters pertaining to the NWT Diamonds Project in Canada. An office was opened in Yellowknife, NWT, specifically for the NWT Diamonds Project development in December 1993. BHP Diamonds currently employs seven permanent workers at the Yellowknife office and 20 at the Koala exploration camp, plus another 12 at the Minerals office in Vancouver. Most of BHP Diamonds' current activity is development drilling and sampling, environmental research, interaction with the communities influenced by the project and the preparation of documentation for the approvals process.

1.5.1.1 BHP's Policies and Philosophies

BHP Minerals' policies and philosophies can be described in terms of the four key responsibilities it carries in its businesses:

- to shareholders
- to the environment
- to employees
- to local communities.

BHP makes every effort to be a good corporate citizen. Protection and the well-being of the environment, its employees, local communities and the host nation are priorities in all its activities and operations. BHP Minerals is striving to maintain a reputation for excellence in health, safety and environmental performance.

In the most general form, BHP defines its business as one that meets society's needs by providing materials and products that maintain or increase people's standard of living, without compromising the above responsibilities.

Environmental Responsibility

Company Policy

BHP adheres to a company wide Environmental Policy that stipulates the company's commitment to achieving a high standard of environmental care as it conducts its business. BHP's approach to environmental management seeks continuous improvement in performance by taking account of evolving scientific knowledge and community needs. Components of the policy specify the following:

- legal compliance, and, in the absence of adequate legal protection for the environment, application of standards that minimize adverse impacts from operations
- open communication with governments and communities, and contribution to policy and regulatory development
- clear communication of employee and supplier responsibilities
- establishment and maintenance of control and monitoring systems, ensuring management of environmental risk
- establishment of research and conservation programs to improve processes and protect the environment.

The BHP Environmental Policy applies to all businesses for which BHP has operating responsibility. The company also endeavours to ensure that in those businesses where it does not have operating responsibility, comparable environmental policies will be applied. Before any joint ventures, mergers, acquisitions or divestitures are effected, BHP investigates potential environmental liabilities to ensure compliance with legislation and good industry standards, or to accurately appraise the costs and actions necessary to ensure compliance. The specific application of this policy to the NWT Diamonds Project will be discussed in the relevant sections of this document.

BHP reports on environmental matters directly to its Board. The Board's Environment Committee requires monthly reports and annual summaries of performance, identification of emerging issues and key plans for the coming year. The Board requires BHP to develop strategies for addressing major issues such as global climate change, management of hazardous waste and international transport of waste.

BHP Minerals places priority on maintaining the integrity of its environmental performance. Regulatory systems vary greatly among the countries, provinces and states in which BHP operates, requiring careful consideration of each operation's compliance on an individual basis. BHP Minerals' operations have never resulted in a significant environmental breach, release to the environment or default to a regulatory body.

BHP Minerals has been subject to a number of minor citations at its three coal mines in the State of New Mexico, USA. Under U.S. law, coal mines are subject to extraordinarily detailed regulatory prescription and monthly inspection. Minor violations are common to mines of all companies. Of approximately 20 minor incidents at BHP's U.S. coal mines in the last three years, three-fourths were settled without penalty and the remaining with no fine in excess of \$3,000.

BHP Minerals has recently been involved in litigation concerning the disposal of tailings by Ok Tedi Mines Limited (OTML) in the Papua New Guinea highlands. OTML is a large-scale producer of copper concentrates that has been operating since 1984. OTML is operated by BHP on behalf of its joint venture partners, including the Government of Papua New Guinea, and BHP has held a controlling interest in the mine since 1993. OTML directly employs approximately 1,850 people and more than 1,000 contract employees.

The litigation, filed on behalf of 71 local villagers, seeks damages for the tailings effect on the Ok Tedi River. A fishing company claims the operation has affected its business by harming the fish in the Ok Tedi River. OTML complies with the Acceptable Particulate Level (APL) set by government, with the mine's contribution to sediment levels at about half the allowable limit. The claimants have based their charges on customary Papua New Guinea law and are asking for monetary compensation and injunctions. The suit was filed in Melbourne, Australia.

The Ok Tedi Mine is one of Papua New Guinea's (PNG) most important export earners and a major contributor to the country's economy. In 1993, OTML contributed more than \$30 million directly to PNG revenue and another \$70 million indirectly to the national economy through purchases of goods and services in PNG. OTML sourced 58% of its supplies in PNG in 1993 and invested \$11 million in education and training over the period 1981 to 1993.

There is indirect evidence that OTML has also contributed to the well-being of the people of the North Fly region. Public health has improved significantly over the last ten years, with infant mortality reduced from 33% to less than 3%, the average life span increased from 30 years to over 50 years, and the incidence of malaria down to less than 15% from 70% among village children and to 6% from 35% among adults.

OTML and BHP are proud of their work on the project and are defending the action vigorously. However, no further comment on the merits of the case can be made, as the argument is now before the Supreme Court of Victoria, Australia. The timing of the trial has yet to be determined.

Awards

BHP Minerals has won a number of environmental awards for responsible stewardship of the lands it mines in both the Americas and Australia. Three significant Canadian awards for achievements at the Island Copper Mine are as follows:

- Citation for Most Outstanding Program of Environmental Protection and Reclamation for a Metal Mining Company in British Columbia (1979)

- Award for Environmental Reclamation (1980 and 1983)
- Citation for Metal Mining (1986).

All of the above were awarded by the Ministry of Energy, Mines and Petroleum Resources and the Mining Association of British Columbia.

BHP Minerals is a founding member of the International Council on Metals and the Environment (ICME) whose purpose is "...to promote sound environmental and health policies to ensure the safe production, use recycling and disposal of metals." Membership consists of 27 of the largest non-ferrous metal companies around the world.

BHP Minerals has been an active participant in ICME activities, and most recently participated in the International Conference on Development, Environment and Mining (June 1994) jointly sponsored by the World Bank, United Nations Environment Program (UNEP), the United Nations Conference on Trade and Development (UNCTAD) and ICME. Other activities have included the UNEP/ICME Environmental Protection Working Group on Mining and Metallurgy and the Environmental Management seminar held in Kazakhstan, CIS.

Rehabilitation Record

BHP Minerals has an impressive record in mine site rehabilitation. BHP adopts practices to ensure that the surface environment is returned to a condition as close as practical to its original state or, as agreed with the regulators and/or current landowners, to an alternative use such as farming, forestry, urban development or a special conservation use (such as a wetland habitat). Extensive baseline studies of fauna and flora are now carried out as a normal feature of BHP projects before construction and mining commence. Rehabilitation processes must also be tailored to local conditions, and substantial scientific work is conducted to ensure the successful reintroduction of native plants and animals. For example, after closure of the iron ore operations at Goldsworthy in Western Australia in 1992, BHP Minerals undertook a major rehabilitation project that included not only the treatment of 180 ha of overburden stockpiles and facilities on the original mine site, but also removal of the entire town. This involved the sale and disposal of 130 houses, various shops and office facilities and a wide variety of plant equipment. In recognition of this work, BHP Iron Ore received the Special Minister's Award in the 1993 Western Australian Department of Minerals and Energy Awards for Environmental Excellence.

BHP Minerals' Bridge Hill Ridge titanium minerals mine in New South Wales (NSW), Australia, was presented the 1991 Award for Environmental Excellence in the NSW Minerals Industry. Bridge Hill Ridge now forms part of the Myall Lakes National Park. Most recently, Navajo Mine was awarded the Riparian Achievement Award by the New Mexico Riparian Council in November 1994 for

the reclamation of 1,000 ha of mined land. This reclamation featured the development of a rich diversity of water and drainage habitats in an arid area.

Responsibility to Host Nations, Local Communities and Aboriginal Peoples

BHP recognizes both its legal obligations and the expectations and concerns of host governments and local communities where it operates. BHP places a high priority on respecting the rights of the local people and providing opportunities for their economic development.

The New Mexico mines demonstrate how the economic benefits of mining can be shared with landowners and neighbours in a setting that enables them to preserve their culture and achieve economic development. BHP operates three mines in New Mexico near or on the Navajo reservation: Navajo, La Plata and San Juan. Native Americans make up 75% of the 1,000 person work force at these mines (Appendix I-A10). In addition to a payroll that totals approximately \$64 million, the New Mexico operations generate significant benefits in the regional and local economies. Federal, state and tribal taxes and royalties exceed \$135 million per year. The mines also purchase many of their goods and services from local vendors.

Other examples of employment opportunities for nationals or Aboriginal peoples (including contractors) at mines that BHP operates throughout the world are as follows:

<u>Mine</u>	<u>Country</u>	<u>Total Personnel</u>	<u>Nationals or Aboriginal Peoples</u>	<u>% Nationals or Aboriginal Peoples</u>
Syama	Mali	428	345	81
Hartley	Zimbabwe	82	64	78
Kalimantan	Indonesia	2,572	2,538	99
Ok Tedi	Papua New Guinea	1,860	1,665	90

Responsibility to Employees

BHP places the highest value on operating as a responsible and caring employer, with total quality safety performance the number one goal. BHP Minerals seeks continual improvement in safety and is working to achieve the world's best practices. This commitment is an integral part of the Business Plan on the philosophy of "Safety First – Production Will Follow."

In 1993, BHP Minerals' San Juan Coal Mine was awarded the jointly sponsored American Mining Congress (AMC) and U.S. Mine Safety and Health Administration (MSHA) Sentinels of Safety award for its outstanding safety performance. San Juan was also a runner-up for this award in 1994. The mining department at Ok Tedi has just passed 12 months and one million working hours without a lost-time accident.

Typically, more than 80% of BHP or joint venture employees come from the country in which the mine is located. BHP operations place a high emphasis on career development for host country citizens. As an international operator, BHP has a pool of managers who are moved from site to site to meet project requirements and BHP needs as well as employee career objectives. Typically, mines have a mix of these managers from Canada, Chile, Australia or wherever BHP has operations.

BHP is also aware of its responsibility to its work force and the local economy when operations are closed at the end of their economic life. At the Island Copper Mine on Vancouver Island, which is scheduled to cease mining operations by the end of 1995, the company has implemented two programs to assist employees. First, the Industrial Assistance Committee (IAC), a joint committee of management, unions and federal and provincial governments, was created to provide employee assistance and training programs and to monitor the impacts of mine closure. The committee identifies job and educational opportunities with participants and is currently working with 420 of Island Copper's employees. Second, the company coordinates the Enhanced Educational Assistance Program that provides career counseling advice and educational subsidies (100% of approved courses) for employees. A total of 188 Island Copper employees applied for the program in 1994 and 155 have completed their courses to date.

1.5.1.2 BHP Experience

BHP Minerals' experience in mining operations and its commitment to incorporating environmental, local population and employee considerations into its operational design in a wide variety of situations are illustrated in the following examples of recent ventures:

- Hartley Platinum (Zimbabwe)
- Syama Gold (Mali)
- Escondida Copper (Chile)
- Pilbara Power (Western Australia)
- Crinum Coal (Queensland)
- La Plata Coal (USA)
- Kalimantan Coal (Indonesia)
- Cannington Lead/Zinc (Queensland, Australia).

A brief summary of each operation is provided below, with the relevance to the NWT Diamonds Project highlighted. Further details of these operations, or other BHP operations, are available upon request.

Hartley Platinum

BHP is a 67% owner and operating partner in the development of a platinum group metals mine in Zimbabwe, Africa. This mine, for which pre-development has been completed, is now under construction, with production due to start in 1997. Total investment will be in the order of \$280 million.

The mine will employ 2,500 workers in the initial development, with further expansions planned, which will increase direct employment. The majority of the workers will come from communities located within 40 km of the mine site. Programs are already underway to recruit and train local staff. The project will be, by far, the largest mining project in Zimbabwe. This may eventually give Zimbabwe a platinum mining industry of international significance.

The Hartley project incorporates a housing scheme for workers in the neighbouring towns of Norton and Chegutu. This has not only boosted urban housing construction (239 residences in Chegutu, 136 in Norton and 15 in Harare) but also increased other local business activity. These residences are deliberately situated away from the project site at Seleous to avoid creating a town whose useful life will end when reserves are eventually exhausted in 20 years' time. The confidence generated by the project in Norton and Chegutu has prompted an expansion of council facilities, including office accommodation, clinics, upgrading of roads and sewage treatment. Commercial activity is also expected to expand to service the new residential areas.

Syama Gold

BHP is a 65% partner and operator of the Syama gold mine in the West African Republic of Mali. BHP's partners are the Malian Government (20%) and the

International Finance Corporation (15%). Mine construction was completed in 1989, and Syama now produces more than 2,835 kg of gold dore per year. The dore is air freighted to Europe for refining and sale.

BHP Minerals has used new technology to control sulphur emissions in the roasting process. A circulating fluidized bed system for roasting ore, instead of concentrate is being introduced; this system which was not previously available, captures up to 85% of the sulphur. The use of cyanide in the carbon-in-leach concentrating circuit is carefully monitored and managed to prevent undesired discharges. As a precaution, the groundwater adjacent to the site is tested regularly for the presence of cyanide. None has been detected to date.

Escondida Copper

In Northern Chile, BHP Minerals operates and owns 57.5% of the world's second largest copper mine, at Escondida in the Atacama Desert. The Escondida operation, producing since 1990, includes a 164 km pipeline to the port of Coloso and a new cathode plant and materials handling facilities at Coloso. With current expansion plans, Escondida will be producing more than 800,000 tonnes of copper in concentrate by 1996, including 80,000 tonnes of copper metal from the cathode plant. Escondida currently employs a total of 1,500 people, including 1,200 at the mine site and mill, 100 at the nearest city of Antofagasta, 160 at the Coloso port and cathode plant and 50 in Santiago. Long-term direct employment will be about 1,800 employees. On average, several thousand people work for Escondida contractors and are expected to do so for the life of the mine. Escondida operations provide about 3,000 indirect jobs in Chile.

Escondida is committed to protecting the environment in the areas affected by the development. Before production start-up, oceanographers, biologists, archaeologists and other scientists from Chile and abroad studied the environment extensively. Their findings were used to help design production processes that incorporate modern technology while complying with the highest of either Chilean or international standards for environmental protection. These early environmental studies also allowed Escondida to design a complete monitoring and control program to ensure environmentally sound operations. The environmental program at Escondida includes the mine area, the port of Coloso and the vicinity of the salar from where groundwater for mine operations is obtained. At the latter site, an ongoing research program ensures that groundwater extraction does not harm the area, as it provides habitat for a species of flamingo.

Pilbara Power

BHP is currently involved in the development of major new energy infrastructure in the Pilbara region of Western Australia. Pilbara Power will provide natural gas

and electric power for future industrial ventures in the region. BHP is constructing 215 km of buried pipeline from the coastal town of Karratha to the iron ore port of Port Hedland, and a 105 MW gas turbine power station at Port Hedland. In addition, BHP is a participant in the Goldfields Gas Transmission Project, which will transport gas via a 140 km long buried pipeline from a location close to Karratha to the inland gold mining centre of Kalgoorlie. BHP will utilize gas transported via this pipeline to power a second 105 MW power station under construction at its Mt. Newman mine site. The total cost of the project to BHP is \$300 million.

The major issue that confronted the project managers was the physical impact of the pipeline itself on the local environment and communities. Considerable evaluation and consultation were undertaken before selecting a route. It was decided to bury the pipeline for its entire length. The final route chosen minimizes potential social and environmental impacts: it avoids all parks, Aboriginal reservations, townships and roads, and poses no identifiable threat to flora and fauna. Burial of the pipeline, which crosses seven major rivers and passes through a variety of terrains, provides several benefits. It protects the pipeline from damage by vandalism and animals and prevents obstruction of animal movement.

During construction of the pipeline, every effort was made to minimize environmental effects. Following excavation of a trench and installation of the pipeline, the soil was reinstated to the original contours. Care was also taken to minimize dust and the creation of barrier effects. Only vegetation that was required to be removed for construction purposes was affected. No road will be built along the pipeline for inspection and maintenance; these activities will be performed using four-wheel-drive vehicles and along existing tracks.

Crinum Coal

The development of the new underground coal mine at Crinum in Central Queensland, as part of the Gregory Joint Venture (BHP ownership 58%), exemplifies an innovative approach to water management in mining. The Crinum mine, expected to be commissioned in 1996, is one of a series of new underground developments in this region.. The mine workings cut through three major aquifers, considerable volumes of water – between 1,500 and 3,500 million litres – will need to be pumped from the mine each year. As a result of research and development conducted over recent years, BHP is installing a wetlands-based system for water cleansing. This consists of a series of shallow, slow-flowing water impoundments in which biological action is induced in the mine water to break down and adsorb wastes. The cleansed water is then stored and recycled for use in other industrial functions such as coal washing and road watering for dust suppression.

This wetlands system has several significant benefits. First, it reduces the amount of water imported for the mine and ancillary operations, virtually all the water pumped from the mine can be used. Second, it eliminates the need for discharge of dirty water into the environment and the associated risks to local flora and fauna and downstream users of the water.

La Plata Coal

BHP Minerals is the 100% owner and operator of the La Plata Mine in New Mexico, which supplies thermal coal to the San Juan Power Generating Station. BHP has produced coal at the mine since late 1986 and now ships about 1.6 million t/a. The La Plata mine has a work force of 140. A preferential hiring agreement is in place with the Ute Mountain Tribe of the Navajo Nation.

The La Plata mine property includes sites of human occupation dating back about 4,000 years. An extensive archaeological program costing some \$945,000 was undertaken to excavate and recover data from the most significant of these sites before full-scale expansion could proceed. This program has resulted in new insights into the early Navajo phase of occupation in the 14th Century AD.

Another important condition of the permit granted by the New Mexico Mining and Minerals Division is the restoration of mature pinyon and juniper trees. A trial transplantation program is underway. The latest renegotiation of the mining permits allow La Plata to plant local shrub species in clumps to restore mined areas, thus enhancing habitat topography value. The company is also experimenting with a range of techniques to restore a stable, post-mining topography in the prevailing steeply sloping topography.

Kalimantan Coal

BHP Minerals' 80% owned subsidiaries, PT Arutmin Indonesia and PT Kendilo Coal Indonesia, have carried out exploration and development work on coal reserves in South and East Kalimantan, Indonesia, since 1981. These mines, operating since 1989, currently produce about 6 million t/a of thermal coal for industrial users and power generating plants throughout Asia. The mines are open pit, with product transported by truck to port loadout where the coal is loaded onto self-discharging barges and transported to the North Pulau Laut Coal Terminal. The terminal can handle ships up to 120,000 deadweight tonnes. A recently completed expansion of production facilities will allow the operation to export up to 7 million t/a. The total work force for PT Arutmin and PT Kendilo Indonesia is more than 1,100 people. Most of the mining and marine equipment is operated by contractors. At current and proposed extraction rates, the current mines are expected to last nearly 20 years and to provide a substantial ongoing contribution to the local economy. Coal reserves for PT Arutmin Indonesia and PT Kendilo Indonesia are of the order of 190 million tonnes.

PT Arutmin and PT Kendilo Coal Indonesia have each secured and implemented an Environmental Impact Assessment (ANDAL), an Environmental Management Plan (RKL) and an Environmental Monitoring Plan (RPL) to protect each area in which they operate. Professional staff members at each site implement these programs to monitor environmental features such as surface water run off and the condition of local marine life.

Both companies comply with their respective permits in performing contemporaneous reclamation, including revegetation of the rainforests. The staff at Senakin is currently determining whether reforestation can be enhanced by re-establishing native hardwood species instead of the pulpwoods currently required by the permit. An active research program is underway.

Cannington Silver/Lead/Zinc

BHP Minerals is the owner of the silver/lead/zinc deposit on the Cannington pastoral station in North Queensland, Australia. A feasibility study for development of a major underground mine has just been completed. As one of BHP Minerals' newest projects, Cannington illustrates the kind of comprehensive environmental programs and planning that are put in place before any mining or construction work commences.

From the time the potential of the deposit was understood, BHP Minerals has sought to minimize environmental effects as much as possible, consistent with safe and efficient operations. Consultation with landholders led to their providing assistance with earthworks for exploration drill site preparation and follow-up rehabilitation. Regulatory requirements, agreements and commitments relating to environmental protection have been documented, a site environmental policy developed and a comprehensive work force education program instituted. Specific environmental requirements have also been written into contract documentation. Regular consultations have been held with the local Aboriginal group since 1992, and its representatives have visited the project site on a number of occasions. Particular attention has been given to the management of wastes such as camp refuse, fuels and industrial waste, and to incorporating recycling wherever possible.

The Cannington Project was awarded the Premier's Award for Environmental Excellence in the Queensland Mining Industry in 1994 for its achievement in planning, design and implementation of environmental management programs in the exploration project.

1.5.1.3 BHP in Canada

BHP has operated in Canada for over 25 years, primarily through its Island Copper Mine on northern Vancouver Island. This deposit, discovered in 1963 and developed by Utah International in 1969, is the third largest copper mine in

Canada (Appendix IA-10). Utah was acquired by BHP in 1984 and has become the core of the BHP Minerals Group. Island Copper is located on Rupert Inlet, about 500 km north of Vancouver. It comprises an open pit mine, a minerals concentrator and port facilities. Island Copper currently employs approximately 460 people, most of whom live in nearby Port Hardy, a town of 5,500 people. It produces concentrates containing copper, gold, silver, molybdenum and rhenium, all of which are exported.

The mineable reserves of the Island Copper mine will be exhausted in 1995 and the mine will close. BHP Minerals has already performed extensive reclamation work and plans to return much of the surroundings to its former state. Reclamation using native flora has already enhanced the use of the site by native wildlife such as geese, deer, black bear and cougar. Island Copper has, in accordance with federal and provincial regulations and BHP policy, developed a formal closure plan that was submitted to the B.C. Provincial Ministry of Energy, Mines and Petroleum Resources in December 1994. The plan details rehabilitation and closure strategies for the plant site, land dumps, the beach dump, the open pit itself and the marine environment of Rupert and Holberg Inlets and Quatsino Sound. The main features of this plan are as follows:

- Buildings and other structures will be removed and the land contoured and revegetated. All waste and contaminated material will be removed from the site.
- The four waste rock dumps cover 193 ha. As of October 1994, contouring and reseeded had been completed on 170 ha; the remainder will be reclaimed in 1996, and roads will be reclaimed prior to final closure of the property.
- The beach dump, covering 260 ha, will also be recontoured, capped with glacial till and revegetated. More than half of the beach dump frontage along Rupert Inlet has been graded down to the low tide mark and allowed to recolonize naturally. Reclamation will be complete by the end of 1997.
- The open pit mine will be flooded with seawater and developed as a passive acid rock drainage (ARD) treatment system. The flooded pit will become meromictic, with the water column stratified into two or more stable layers based on variable density. Such water bodies are found naturally within British Columbia. Due to this passive treatment, discharge from the flooded pit will meet the current discharge levels for the water management pond. The efficacy of the system arises from its use of both short-term dilution with seawater and long-term reaction between dissolved heavy metals and sulphides. Monitoring of conditions in the flooded pit will provide information on the success of this model.

- Systematic monitoring since 1970 has shown no observable long-term impact on the marine environment in the Rupert/Holberg/Quatsino Sound system. This monitoring will continue for two years following closure.

Over the short term (up to five years), the vegetation on the waste rock dump areas will mature. The flooded pit will treat the water from site drainage, meeting the water quality parameters of the discharge permit. In the mid term (five to 20 years), vegetation will be well established and passive treatment of dump drainage will continue. The marine environment will show diminishing evidence of mine related effects. In the long term (more than 20 years), the favourable results of the Island Copper reclamation program will be apparent. A young forest will be re-established and growing over the site, drainage from the land dumps will continue to flow into the meromictic lake, discharge water quality from the lake will continue to meet the discharge permit, and the marine environment will show little or no evidence of mine related effects.

1.5.1.4 BHP in Arctic and Subarctic Regions

BHP Minerals has experience in operating in arctic and subarctic regions, primarily through its exploration activities. It has also established a reputation for being able to operate successfully in some of the most challenging operating environments without compromising the high standards it has set for itself in protecting the environment, the interests of the local communities and its employees.

BHP Minerals has operated in the arctic and subarctic regions of Canada for ten years now. In western Canada there have been four distinct initiatives:

- extensive exploration of the greenstone belt in the High Lake area for gold (the Ulu project) since 1985
- exploration for gold in the Hope Bay area, east of Bathurst Inlet, since 1991
- detailed exploration since 1985 of the Slave region for both gold and diamonds. BHP has probably been the most active of all explorers in this region during this period.
- most recently, exploration for base metals (lead, zinc and copper) in the Arctic Islands since last year.

Since 1985, BHP Minerals has maintained a total annual presence of between 30 to 50 exploration staff (including contractors) in the arctic regions of western Canada during the summer months. In eastern Canada, BHP Minerals has also been active sporadically since the early 1980s, searching principally for gold and base metals. Its major current activities in eastern Canada are at Rankin Inlet since 1993 and on Baffin Island since 1994.

BHP also has established a reputation for operating successfully in some of the most physically challenging mining environments in the world. These range from the Escondida Mine in northern Chile's Atacama desert, perched at over 3,000 m elevation and known as one of the driest places on earth, to the Ok Tedi Mine in the Star Mountains of New Guinea, which is one of the wettest, with 339 days of annual rainfall totaling about 10 m. BHP also has operations in the Australian arid region e.g., Cannington, and the remote Pilbara region of Western Australia, and is exploring and developing properties in Asia and Africa. This diversity of operating environments has given BHP an impressive array of skills and experience to bring to new projects in challenging locations.

1.5.2 The Blackwater Group

The Blackwater Group consists of Dia Met Minerals Ltd. (Dia Met), Charles E. Fipke and Dr. Stewart L. Blusson. The Blackwater Group controls 49% of the project.

1.5.2.1 Dia Met Minerals Ltd.

Dia Met is a Canadian diamond exploration company that pioneered the search for diamonds in Canada's Northwest Territories. Although Dia Met has many significant land holdings, the most advanced property is the NWT Diamonds Project. Dia Met is a Canadian mineral exploration company, with its head office in Kelowna, B.C. Dia Met is a public company whose shares are listed on the Toronto Stock Exchange. The Board of Directors are Canadians closely related to the mining industry.

Dia Met was formed by Chairman Mr. Charles E. Fipke and was listed on the Vancouver Stock Exchange in October 1984 to enable the company to finance exploration. Since incorporation, Dia Met has obtained permits in Alberta, British Columbia, Yukon and the Northwest Territories authorizing it to carry out exploration work on mineral claims.

By late 1989, Dia Met began staking mineral claims in the region and, after a significant indicator mineral find, sought out a major joint venture partner. This was required to provide both needed financing and experience with development of large mining projects. BHP was invited to participate based on its demonstrated expertise and past relationships with principals of the Blackwater Group. In 1991, Fipke and the BHP exploration team drilled and discovered the first diamond-bearing pipe under Point Lake. Since that time, a total of 44 kimberlite pipes have been found on the property.

Dia Met has had a history of compliance with government policies and regulations and has not breached any regulations governing the exploration permits. In

conducting its exploration work Dia Met has not had any major accidents, spills or emergencies and has not had any adverse relationships with Aboriginal peoples.

Dia Met is aggressively pursuing exploration elsewhere in Canada, as well as in South America and Europe. Other interests include a mineral processing plant near Fort Collins, Colorado, and the wholly owned subsidiary, Northern Air Support Ltd.

The Fort Collins processing plant was initially used for project bulk samples, but now generates revenue from custom processing contracts. Northern Air Support Ltd. owns a helicopter, based in the NWT, that is primarily used to conduct airborne geophysical surveys but is available for other charter work.

1.5.2.2 Charles Fipke

Mr. Charles Fipke was born in Edmonton, Alberta, and attended the University of British Columbia where he graduated with a Honors B.Sc. in Geology in 1970. Upon graduation, Mr. Fipke worked in many locations in Canada and overseas for major mineral exploration companies. Mr. Fipke is credited with the original discovery of diamonds in the NWT. In 1992, "The Northern Miner" newspaper named him its "Mining Man of the Year." It was a well-earned reward for his technical skills, hard work and dedication.

In 1977, Mr. Fipke founded CF Mineral Research Limited, which is based in Kelowna, B.C., and employs 36 people. He has obtained patents for heavy mineral processing techniques that are registered in Canada, United States, Australia and South Africa, and has completed projects funded by the National Research Council, the Geological Survey of Canada and other private sector interests.

Mr. Fipke and CF Minerals managed several multimillion dollar exploration programs, including the BHP/Dia Met NWT Diamonds Project and a large diamond exploration project in western Alberta. They have also managed programs in British Columbia, Ontario, Québec and Yukon. Mr. Fipke and CF Minerals have always complied with government policies and regulations and have not breached any requirements pertaining to exploration permits.

1.5.2.3 Dr. S.L. Blusson

Dr. S.L. Blusson has been a director and exploration vice-president of Pioneer Metals Corp., a public Toronto Stock Exchange listed company. He assisted on the Puffy Lake Gold Project, which achieved mine production of more than 1,000 t/d at the Puffy Lake site in southern Manitoba during the period 1987 to 1989. For economic reasons the project is now archived, but effluent from the tailings area is regularly monitored by the company in keeping with the operating permit. Until Dr. Blusson left the company in December 1992, he was personally

involved in sampling and reporting on tailings discharge. The guidelines were strictly adhered to, and to date no problems relating to environmental compliance have developed.

Being close to Sherridan, Manitoba, a small Aboriginal community, the company depended heavily on and specifically promoted Aboriginal labour. Friendly relationships were furthered by establishing living quarters and services to integrate outside and local labour for the community's benefit.

1.5.3 Proponent Obligations

The Proponent foresees no difficulty, under current law, in meeting a request to post a bond or other form of security, provided the amount is reasonable, to ensure payment of compensation in the event of accidents resulting in damage to the environment as well as for planned or premature decommissioning. Currently, bonding may be required by the Water Board as stipulated by the *Northwest Territories Waters Act* and Regulations. The regulation limits the amount of security to an amount not to exceed the aggregate of the costs of reclamation, decommissioning and closure. The regulation also outlines the form of the security and provides that it may be a promissory note guaranteed by a bank in Canada, a certified cheque, a performance bond approved by the Treasury Board, an irrevocable letter of credit from a bank in Canada, or cash. Security deposits may also be required with respect to the Surface Leases, the terms of which are generally negotiated.

1.5.4 Principal Contractors

Rescan Environmental Services Ltd. (Rescan) and the team of Fluor Daniel Wright Ltd. and Signet Engineering Pty. Ltd. (FDWS) are currently principal contractors on the NWT Diamonds Project. These contractors are described in the following subsections.

The project has used numerous quality contractors during the exploration and development sampling stages. When tendering contracts, preference has been given to firms with Northern experience. To date, work on the property has shown that the work force averages 25% Aboriginal peoples.

Examples of the Northern firms used or currently under contract are as follows:

- Nuna Logistics
- PCL Constructors Northern Inc.
- Braden-Burry Expediting
- Air Tindi Ltd.
- Buffalo Airways Ltd.
- First Air

- Robinson Enterprises Ltd.
- Sub-Arctic Surveys Ltd.
- Outcrop
- Office Compliments

A short list of other Canadian contractors used on the project:

- Tercon Contractors Ltd.
- Northmount Evergreen Services
- Specialized Drilling Services
- Canadian Mine Development
- EBA Engineering Ltd.
- Steffen Robertson & Kirsten

1.5.4.1 Rescan Environmental Services

Rescan Environmental Services Ltd. (Rescan) was contracted by BHP in 1993 to conduct environmental baseline research for the proposed NWT Diamonds Project and to coordinate the subsequent preparation of the NWT Diamonds EIS. Rescan staff performed extensive fieldwork during 1993 and 1994 that is ongoing in 1995 in the Lac de Gras area, and have been directly involved in the environmental management of exploration and proposed mine development activities.

The Rescan Group is a privately-owned consulting company with a staff of 130 people. It is headquartered in Vancouver, B.C., and has offices in Seattle, Washington and in Peru, Chile and the Caribbean. Since its inception in 1981, the company has grown from a Canadian operation to a global firm, with clients in North and South America, Middle East, Asia, Australia, Africa and Europe. In recognition of its excellence in the exporting of services, Rescan was awarded the B.C. Export Award in 1991 and the Canada Export Award in 1993. Rescan's experience in preparing environmental assessment and management programs both in Canada and internationally is evidenced by the following list of completed and ongoing projects:

- | | |
|--|---|
| • Snare Cascades Hydroelectric Project
Dogrib Power Corporation
Yellowknife, NWT, Canada | Preliminary Environmental
Appraisal, Biophysical Study
1994 |
| • Prairie Creek Project
San Andreas Resources Corp.
NWT, Canada | Environmental
Management Program
Ongoing |

- Windy Craggy Project
Commission on Resources and
Environment/Government of British Columbia
Northwest British Columbia, Canada
Environmental Risk
Assessment
1993
- Cinola Gold Project
Provincial and Federal Governments
Queen Charlotte Islands
British Columbia, Canada
Environmental Risk
Assessment
1989
- Faro Project
Curragh Inc.
Faro, Yukon, Canada
Environmental Evaluation of
Concentrate Haulage
1991
- Bell Mine Decommissioning and Closure Plan
Noranda Minerals Inc.
Granisle, British Columbia, Canada
Decommissioning and
Closure Assessment
Ongoing
- Tulsequah Chief Project
Redfern Resources Ltd.
Northwest British Columbia
Mine Development
Certificate Application
Ongoing
- Mine Environment Neutral Drainage Project
Hudson Bay Mining and Smelting Ltd./Placer
Dome Inc.
Flin Flon, Manitoba, Canada
Environmental
Management Studies
1994
- Coloso Cathode Copper Project
Minera Escondida Ltda.
Antofagasta, Chile
Environmental Impact
Assessment
1992
- Quebrada Blanca Copper Project
Compañía Minera Quebrada Blanca S.A.
Santiago, Chile
Environmental Impact
Assessment
1991
- La Granja Project
Sociedad Minera La Granja, S.A.
Lima, Peru
Environmental Impact
Assessment
1994
- Nevada Project
Barrick Chile Ltda.
Chile, South America
Environmental Impact
Assessment
1995
- Omai Gold Project
Cambior Inc.
Environmental Assessment
and Management

Rescan's extensive environmental knowledge and experience with industry, government and financial institutions has enabled the company to assess complex resource development problems through multi-disciplinary project teams. Rescan's professional staff consists of environmental managers, scientists and engineers with expertise in hydrology, water quality, climatology, wildlife and aquatic biology, chemistry and soil science. Rescan staff apply their technical, managerial and negotiating skills to the analysis and evaluation of environmental problems in an effort to minimize environmental disturbance and satisfy regulatory requirements.

Within Canada, Rescan has undertaken a wide range of environmental field work, management and project planning services for numerous mines in the North. The company has been consulted regarding mine operations in northern British Columbia, Yukon, Northwest Territories, northern Manitoba and northern Ontario, and has developed extensive professional experience in managing environmental problems in remote locations under harsh physiographic circumstances. Rescan has applied its environmental expertise in environmental impact assessment, corporate environmental strategies, subaqueous tailings disposal, environmental engineering waste management, hazardous waste treatment and risk assessment to ensure mining operations minimize environmental disturbance in the North.

Rescan has provided a wide range of environmental services for the NWT Diamonds Project. In addition to baseline field studies, professional staff have been involved in data analysis, computer simulation modelling, tailings management, government liaison, public consultation and Aboriginal relations. Rescan has also coordinated the preparation of this EIS document.

1.5.4.2 Fluor Daniel Wright Signet

The contract for engineering, procurement and construction management for the project has not yet been awarded. The firm, or firms, that will be chosen will be fully qualified companies with extensive experience designing and constructing similar mining projects in Arctic Canada and particular experience with diamond mining projects. Fluor Daniel Wright Signet was contracted to complete feasibility design work for the project and is typical of several companies capable of completing this project.

Fluor Daniel Wright Ltd. (FDW), part of the Fluor Daniel Mining and Metals Operating Company (MMOC), is a wholly-owned subsidiary of Fluor Daniel Canada Inc., with head offices in Calgary, Alberta. FDW and its predecessor, Wright Engineers Limited, have been providing engineering, procurement and construction services to the Canadian mining industry for over 50 years. FDW's offices in Vancouver, B.C., are the global headquarters of the Fluor Daniel

- Phillips Range Diamond Project
Freeport Australia
Western Australia
Engineering, Procurement,
Construction Management
1989
- Environmental Improvement Project
Hudson Bay Mining & Smelting Ltd.
Flin Flon, Manitoba, Canada
Engineering, Procurement,
Construction Management
1993
- Con Mine Autoclave
Nerco Minerals Inc.
Yellowknife, NWT, Canada
Engineering, Procurement,
Construction Management
1989
- Lupin Expansion Project
Echo Bay Mines Limited
Lupin, NWT, Canada
Engineering, Procurement,
Construction Management
1992/1994
- Colomac Mine
Northwest Gold
Indian Lake, NWT, Canada
Engineering, Procurement,
Construction Management
1990
- Windy Craggy Copper Project
Geddes Resources Ltd.
Northwest British Columbia, Canada
Prefeasibility and Feasibility
Studies
1991