



Environmental Impact Statement

Volume 7: Environmental Management

Submitted to:
National Energy Board
and the Joint Review Panel

Submitted by:
Imperial Oil Resources Ventures Limited

IPRCC.PR.2004.07



August 2004

Table of Contents

1	Introduction	1-1
1.1	Overview.....	1-1
1.2	Plans.....	1-3
1.3	Environmental Management System	1-4
2	Environmental Design and Planning Considerations	2-1
2.1	Introduction.....	2-1
2.1.1	Potential Environmental Impacts	2-1
2.1.2	Applicable Publications	2-1
2.1.3	Mitigation by Design and Planning	2-2
3	Environmental Management Plans	3-1
3.1	Introduction.....	3-1
3.1.1	Roles and Responsibilities	3-1
3.2	Emissions Management	3-2
3.2.1	Scope.....	3-2
3.2.2	Guiding Principles	3-3
3.2.3	Controlled Air Emissions.....	3-5
3.2.4	Uncontrolled Air Emissions.....	3-5
3.2.5	Controlled Noise Emissions.....	3-6
3.2.6	Uncontrolled Noise Emissions.....	3-6
3.3	Water Management.....	3-6
3.3.1	Scope.....	3-6
3.3.2	Guiding Principles	3-7
3.3.3	Water Demand	3-9
3.3.4	Water Sources	3-9
3.3.5	Water Quality.....	3-10
3.3.6	Water Withdrawal.....	3-11
3.3.7	Water Delivery and Storage.....	3-11

3.3.8	Raw Water Treatment.....	3-11
3.3.9	Water Disposal.....	3-13
3.4	Waste Management.....	3-14
3.4.1	Scope.....	3-14
3.4.2	Guiding Principles	3-14
3.4.3	Integrated Waste Management	3-16
3.4.4	Waste Identification and Classification	3-18
3.4.5	Waste Handling and Storage.....	3-22
3.4.6	Waste Transportation.....	3-24
3.4.7	Waste Reduction and Treatment.....	3-24
3.4.8	Waste Disposal.....	3-27
3.4.9	Waste Tracking and Documentation.....	3-28
3.5	Hazardous Materials Management	3-28
3.5.1	Scope.....	3-29
3.5.2	Guiding Principles	3-30
3.5.3	Training.....	3-31
3.5.4	Classifying and Labelling Hazardous Materials.....	3-32
3.5.5	Security and Right of Access.....	3-33
3.5.6	Emergency Preparedness and Response	3-33
3.5.7	Storage	3-33
3.5.8	Spill Contingency Plans.....	3-34
3.5.9	Handling and Transportation	3-36
3.5.10	Release Response and Reporting Requirements.....	3-37
3.5.11	Enforcement.....	3-37
3.6	Transportation and Logistics Management.....	3-38
3.6.1	Scope.....	3-38
3.6.2	Guiding Principles	3-39
3.6.3	Transportation and Logistics Guidelines	3-42
3.7	Wildlife Management	3-47
3.7.1	Scope.....	3-47

3.7.2	Guiding Principles	3-47
3.7.3	Wildlife Management Initiatives	3-51
3.7.4	Wildlife Management in the Inuvialuit Settlement Region.....	3-56
3.8	Reclamation Management	3-56
3.8.1	Scope.....	3-56
3.8.2	Guiding Principles	3-57
3.8.3	Reclamation Strategy	3-58
3.8.4	Revegetation Guidelines	3-59
3.9	Operations Management Plans	3-60
3.9.1	Scope.....	3-60
3.9.2	Guiding Principles	3-61
3.9.3	Operations.....	3-62
3.9.4	Decommissioning and Abandonment.....	3-62
4	Environmental Protection Plan.....	4-1
4.1	Introduction.....	4-1
4.2	Notification of Concerned Parties.....	4-2
4.3	General Environmental Protection Measures	4-3
4.3.1	Conceptual Wildlife Mitigation	4-12
4.3.2	Conceptual Heritage Resources Mitigation	4-14
4.4	Handling Waste.....	4-15
4.5	Preparing Rights-of-Way and Construction Sites.....	4-17
4.5.1	Narrowing Down and Fencing.....	4-22
4.5.2	Conceptual Rare and Uncommon Plant Community Mitigation.....	4-23
4.5.3	Using Rollback and Slash Berms.....	4-26
4.5.4	Salvaging Timber and Developing Deck Sites	4-26
4.5.5	Conceptual Right-of-Way Configurations.....	4-29
4.5.6	Grading	4-31
4.5.7	Surface Levelling.....	4-34

4.5.8	Cross Slope Right-of-Way Configuration	4-35
4.5.9	Preparing Infrastructure Sites	4-37
4.6	Construction	4-37
4.6.1	Pipeline	4-37
4.6.2	Infrastructure Sites	4-48
4.6.3	Production and Pipeline Facility Sites	4-50
4.6.4	Borrow Sites.....	4-51
4.6.5	Access Roads	4-52
4.6.6	Production Drilling	4-54
4.7	Testing.....	4-55
4.7.1	Testing Pipelines and Facilities	4-55
4.7.2	Air Testing Pipelines.....	4-56
4.8	Watercourse Crossings.....	4-57
4.8.1	Equipment and Vehicle Crossings	4-60
4.8.2	Pipeline Watercourse Crossings	4-68
4.8.3	Spoil Berms.....	4-79
4.8.4	Protecting Streambanks	4-80
4.9	Cleanup and Reclamation	4-87
4.9.1	Installing Silt Fences.....	4-93
4.9.2	Cross Ditches and Diversion Berms	4-94
4.9.3	Access Control	4-96
4.9.4	Additional Streambank Protection.....	4-97
5	Contingency Plans.....	5-1
5.1	Introduction.....	5-1
5.2	Design and Construction Phase	5-1
5.2.1	Spills and Uncontrolled Releases.....	5-2
5.2.2	Wildfires	5-5
5.2.3	Heritage Resource Discovery	5-6
5.2.4	Rare or Endangered Wildlife or Rare Plant Discovery	5-7

5.2.5	Warm or Wet Conditions	5-8
5.2.6	Erosion of Soils by Water	5-10
5.2.7	Siltation of Watercourses	5-10
5.2.8	Horizontal Directional Drilling Mud Release.....	5-11
5.3	Operations Phase.....	5-16
6	Environmental Compliance and Effects Monitoring Plan.....	6-1
6.1	Introduction.....	6-1
6.2	Environmental Compliance	6-2
6.2.1	Environmental Inspection	6-2
6.2.2	Cultural and Environmental Training	6-4
6.2.3	Environmental As-Built Report	6-8
6.2.4	Construction Environmental Audits	6-9
6.2.5	Issue Resolution	6-10
6.3	Environmental Monitoring.....	6-11
6.3.1	Objectives	6-11
6.3.2	Environmental Monitors	6-11
6.3.3	Post-Construction Monitoring Program.....	6-12
6.3.4	Environmental Effects Monitoring	6-14
6.3.5	Reporting.....	6-15

References

Glossary

List of Figures

Figure 1-1: Regional Overview Map	1-2
Figure 3-1: Waste Management Plan Decision-Making Process	3-17
Figure 3-2: Waste Transfer and Storage Facilities	3-23
Figure 4-1: Conceptual Wildlife Mitigation – Breaks at Wildlife Trails	4-13
Figure 4-2: Conceptual Heritage Resource Mitigation – Reduce Area of Disturbance	4-14
Figure 4-3: Conceptual Narrow-Down	4-23
Figure 4-4: Conceptual Rare and Uncommon Plant Community Mitigation.....	4-25
Figure 4-5: Conceptual Rollback and Slash Berms	4-27
Figure 4-6: Conceptual Timber Deck Site.....	4-28
Figure 4-7: Conceptual Right-of-Way Configuration – NPS 26 and 30	4-29
Figure 4-8: Conceptual Right-of-Way Configuration – NPS 10, 16 and 18.....	4-30
Figure 4-9: Conceptual Right-of-Way Configuration – NPS 30 and 10	4-30
Figure 4-10: Conceptual Right-of-Way Configuration – NPS 36	4-31
Figure 4-11: Conceptual Right-of-Way Preparation – Graded.....	4-32
Figure 4-12: Conceptual Cut and Fill	4-34
Figure 4-13: Conceptual Surface Levelling.....	4-35
Figure 4-14: Conceptual Cross Slope Right-of-Way Configuration for Two Pipelines.....	4-36
Figure 4-15: Conceptual Cross Slope Right-of-Way Configuration for a Single Pipeline	4-36
Figure 4-16: Conceptual Surface Preparation at Infrastructure Sites	4-38
Figure 4-17: Conceptual Surface Preparation at Infrastructure Sites – Cut and Fill	4-39
Figure 4-18: Conceptual Trench Breaker Installation – Moderate and Steep Slopes.....	4-43
Figure 4-19: Conceptual Trench Breaker Installation – Watercourses with Organic Banks.....	4-44
Figure 4-20: Conceptual Subdrain Installation.....	4-46
Figure 4-21: Conceptual Use of Imported Backfill	4-47
Figure 4-22: Conceptual Temporary Bridge.....	4-61
Figure 4-23: Conceptual Temporary Portable Bridge	4-62
Figure 4-24: Conceptual Ramp and Culvert.....	4-63
Figure 4-25: Conceptual Ice Bridge.....	4-64
Figure 4-26: Conceptual Ford.....	4-65
Figure 4-27: Conceptual Clean Snowfill	4-66
Figure 4-28: Conceptual Logfill	4-67
Figure 4-29: Conceptual Trenchless Crossing – Horizontal Directional Drill.....	4-69
Figure 4-30: Conceptual Trenchless Crossing – Bore or Punch.....	4-70
Figure 4-31: Conceptual Isolated Crossing – Flume	4-72

Figure 4-32: Conceptual Isolated Crossing – Dam and Pump.....	4-74
Figure 4-33: Conceptual Isolated Crossing – High Volume Pump	4-76
Figure 4-34: Conceptual Open Cut – Small Watercourse	4-78
Figure 4-35: Conceptual Open Cut – Large Watercourse	4-79
Figure 4-36: Conceptual Spoil Berms	4-80
Figure 4-37: Conceptual Riprap Bank Armour	4-81
Figure 4-38: Conceptual Crib Wall	4-82
Figure 4-39: Conceptual Log Wall	4-83
Figure 4-40: Conceptual Tree Revetment.....	4-85
Figure 4-41: Conceptual Brush Layering	4-86
Figure 4-42: Conceptual Soil Wrap	4-88
Figure 4-43: Conceptual Silt Fence Installation	4-93
Figure 4-44: Conceptual Cross Ditch and Diversion Berms	4-94
Figure 4-45: Conceptual Access Control – Visual Screening	4-96
Figure 4-46: Conceptual Streambank Protection Using Willow Cuttings.....	4-98
Figure 4-47: Conceptual Streambank Protection – Planting Shrubs	4-99
Figure 6-1: Linkage Between Impact Assessment and Project Monitoring	6-2

List of Tables

Table 2-1:	National Publications	2-2
Table 2-2:	Territorial Publications	2-6
Table 2-3:	Regional Publications	2-8
Table 2-4:	Alberta Publications.....	2-10
Table 2-5:	Industry Publications	2-12
Table 2-6:	Environmental Design and Planning Considerations	2-13
Table 3-1:	Expected Specific Waste Types.....	3-19
Table 3-2:	Transportation and Logistics Management Acts, Regulations and Guidelines	3-40
Table 3-3:	Wildlife-Related Acts, Regulations and Guidelines	3-48
Table 3-4:	Wildlife-Related Community Concerns	3-51
Table 4-1:	Contacts and Notification Requirements	4-2
Table 4-2:	Project Activities and Associated Protection Measures.....	4-3
Table 4-3:	Sensitive Periods for Fish – Northwest Territories.....	4-9
Table 4-4:	Instream Restricted Activity Periods in Alberta	4-12
Table 4-5:	Waste Handling – Protection Measures.....	4-15
Table 4-6:	Disturbance of Rights-of-Way and Sites – Protection Measures	4-18
Table 4-7:	Construction Activities – Protection Measures.....	4-39
Table 4-8:	Development of Infrastructure Sites – Protection Measures	4-48
Table 4-9:	Development of Production and Pipeline Facilities – Protection Measures.....	4-50
Table 4-10:	Development of Borrow Sites – Protection Measures.....	4-52
Table 4-11:	Using and Developing Access Roads – Protection Measures	4-52
Table 4-12:	Drilling Activities – Protection Measures.....	4-54
Table 4-13:	Testing Pipelines and Facilities – Protection Measures.....	4-55
Table 4-14:	Air Testing Pipelines – Protection Measures.....	4-56
Table 4-15:	Construction Activities at Watercourse Crossings – Protection Measures.....	4-57
Table 4-16:	Protection Measures During Cleanup and Reclamation	4-89
Table 4-17:	Suitable Revegetation Grasses.....	4-92
Table 4-18:	Typical Diversion Berm Spacing.....	4-95

