



Environmental Impact Statement

Volume I of V

Boat Harbour Remediation Project
Pictou Landing, Nova Scotia

Nova Scotia Lands Inc.

November 17, 2020



Table of Contents

- 1. Introduction and Overview..... 1-1
 - 1.1 The Proponent..... 1-2
 - 1.2 Project Overview..... 1-3
 - 1.3 Project Location..... 1-7
 - 1.3.1 Project Coordinates 1-7
 - 1.3.2 Current Land Use in the Area..... 1-7
 - 1.3.3 Environmentally Sensitive Areas 1-8
 - 1.3.4 Local Communities 1-8
 - 1.3.5 Use of Aboriginal Lands 1-8
 - 1.4 Regulatory Framework and the Role of Government..... 1-9
 - 1.4.1 Federal..... 1-9
 - 1.4.1.1 Federal Financial Support 1-9
 - 1.4.1.2 Federal Lands..... 1-10
 - 1.4.1.3 Federal Legislative and Regulatory Requirements 1-10
 - 1.4.1.4 Federal Scientific, Regulatory and Technical Advice 1-13
 - 1.4.2 Provincial 1-13
 - 1.4.2.1 Provincial Legislative and Regulatory Requirements 1-13
 - 1.4.3 Municipal..... 1-17
- 2. Project Justification and Alternatives Considered..... 2-1
 - 2.1 Project Purpose 2-1
 - 2.2 Alternative Means..... 2-5
 - 2.2.1 Alternative Means Process 2-5
 - 2.2.1.1 Identification of Alternative Means..... 2-6
 - 2.2.1.2 Summary of Approaches and Alternative Means Considered 2-9
 - 2.2.1.2.1 Waste Management..... 2-9
 - 2.2.1.2.2 Sediment Management (Dredging) 2-10
 - 2.2.1.2.3 Wetland Management..... 2-11
 - 2.2.1.2.4 Water Management 2-11
 - 2.2.1.2.5 Bridge at Highway 348..... 2-12
 - 2.2.1.2.6 Infrastructure Decommissioning 2-12
 - 2.2.1.2.6.1 Pipeline 2-12
 - 2.2.1.2.6.2 Treatment Buildings..... 2-13
 - 2.2.1.2.6.3 Dam 2-13
 - 2.2.2 Alternative Means by Project Component 2-13
 - 2.3.1 Waste Management..... 2-13
 - 2.3.2 Dredging 2-22
 - 2.3.3 Wetland Management..... 2-32
 - 2.3.4 Water Management 2-40
 - 2.3.4.1 Bulk Water Management 2-40
 - 2.3.4.2 Leachate Management..... 2-40
 - 2.3.5 Bridge at Highway 348..... 2-48
 - 2.3.6 Infrastructure Decommissioning 2-56
 - 2.3.6.1 Pipeline Decommissioning – On Land..... 2-56
 - 2.3.6.2 Pipeline Decommissioning – Under Water 2-66
 - 2.3.6.3 Treatment Buildings..... 2-72

2.3.6.4	Dam	2-73
2.3.7	Remediation Infrastructure	2-73
2.3.7.1	Water Supply	2-74
2.3.7.2	Site Access	2-74
2.3.7.3	Permanent and Temporary Linear Infrastructure	2-74
2.3.7.4	Energy	2-75
2.3.8	Summary of Preferred Alternative Means for All Project Components	2-76
3.	Project Description	3-1
3.1	Project Components	3-1
3.1.1	Waste Management.....	3-2
3.1.2	Dredging	3-9
3.1.3	Wetland Management.....	3-11
3.1.4	Water Management	3-14
3.1.5	Bridge at Highway 348.....	3-15
3.1.6	Infrastructure Decommissioning	3-19
3.1.7	Remediation Infrastructure	3-27
3.2	Project Activities	3-31
3.2.1	Site Preparation and Construction.....	3-33
3.2.1.1	Waste Management.....	3-34
3.2.1.2	Dredging	3-38
3.2.1.3	Wetland Management.....	3-38
3.2.1.4	Bridge at Highway 348.....	3-39
3.2.1.5	Infrastructure Decommissioning	3-39
3.2.2	Operation	3-40
3.2.2.1	Waste Management.....	3-40
3.2.2.2	Dredging	3-43
3.2.2.3	Wetland Management.....	3-45
3.2.2.4	Bridge at Highway 348.....	3-45
3.2.2.5	Infrastructure Decommissioning	3-46
3.2.3	Decommissioning and Abandonment.....	3-46
3.2.3.1	Waste Management.....	3-46
3.2.3.2	Dredging	3-47
3.2.3.3	Wetland Management.....	3-47
3.2.3.4	Bridge at Highway 348.....	3-48
3.2.3.5	Infrastructure Decommissioning	3-48
4.	Public and Agency Participation and Concerns	4-1
4.1	Persons and Organizations Consulted With.....	4-3
4.2	Methods of Communication and Consultation.....	4-3
4.2.1	Public Stakeholder Meetings	4-4
4.2.2	Boat Harbour Environmental Advisory Committee Meetings	4-4
4.2.3	Public Open Houses	4-5
4.2.4	Project Specific Website and Email.....	4-5
4.2.5	Media	4-5
4.2.6	Social Media and Radio.....	4-5
4.3	Distribution of Information and Materials	4-6
4.3.1	Notice of Commencement	4-6
4.3.2	Public Open Houses	4-6
4.3.2.1	Public Open House #1.....	4-6
4.3.2.2	Public Open House #2.....	4-9
4.3.3	IAAC's Public Notice to Invite Comments on EIS.....	4-11

4.3.4	Agency Consultation.....	4-11
4.3.5	Consultation with Local Organizations	4-13
4.3.6	Boat Harbour Environmental Advisory Committee.....	4-14
4.4	Consideration of Key Issues Raised.....	4-15
4.4.1	Issues Raised and Proponent Responses	4-15
4.4.1.1	Public Open House #1.....	4-15
4.4.1.2	Public Open House #2.....	4-19
4.4.2	Summary of Key Project Related Issues Raised and their Consideration.....	4-21
4.5	Addressing Outstanding Issues and Ongoing Engagement and Consultation	4-23
5.	Engagement with the Mi'kmaq of Nova Scotia and Concerns Raised.....	5-1
5.1	Informal Consultation and Community Engagement Prior to the Initiation of the Federal Environmental Impact Assessment Process	5-2
5.1.1	Identification, Preservation and Protection of Mi'kmaw Burial Grounds.....	5-3
5.1.2	Community Focus Groups on the Future of Boat Harbour.....	5-6
5.1.3	Community Liaison Coordinator	5-6
5.1.4	Boat Harbour Clean-up Committee	5-8
5.1.5	Strategic Planning Support and Accommodation During and Post Remediation.....	5-8
5.1.6	Community Meetings.....	5-9
5.1.7	Boat Harbour Environmental Advisory Committee.....	5-11
5.1.8	Land Use Planning and Future Site Use	5-13
5.1.9	Cultural Awareness and Engagement.....	5-14
5.1.10	Training and Opportunities	5-16
5.1.11	Independent Air Monitoring Contractor.....	5-17
5.1.12	Consultation with PLFN Regarding Pilot Scale Testing	5-18
5.1.13	Assessment of Wetlands Adjacent to Boat Harbour	5-20
5.1.14	Communications Materials	5-20
5.1.15	Summary of Issues Raised and Actions Taken.....	5-21
5.2	Formal Consultation Prior to CEA Agency/IAAC Notice of Determination of Requirement for Federal Environmental Impact Assessment.....	5-30
5.3	Engagement with the Mi'kmaq of Nova Scotia and Concerns Raised During the Federal Environmental Impact Assessment	5-40
5.3.1	Mi'kmaq of Nova Scotia Groups Consulted.....	5-44
5.3.2	Engagement Activities Undertaken	5-45
5.3.2.1	Boat Harbour Clean-up Committee	5-46
5.3.2.2	Boat Harbour Environmental Advisory Committee.....	5-47
5.3.2.3	Community Liaison Coordinator	5-49
5.3.2.4	Community Meetings.....	5-49
5.3.2.5	Mi'kmaq Ecological Knowledge Study.....	5-50
5.3.2.6	PLFN Open Houses.....	5-50
5.3.2.6.1	PLFN Open House #1	5-51
5.3.2.6.2	PLFN Open House #2	5-53
5.3.2.7	Agency Meeting Involvement	5-55
5.3.2.8	Well Being Baseline Study	5-56
5.3.2.9	Decision Regarding Pipeline Removal at Indian Cross Point.....	5-57
5.3.2.10	Meeting with PLFN to Review the Draft EIS.....	5-58
5.3.2.11	Plain Language Summary of Draft EIS.....	5-58
5.4	Consideration of Key Issues Raised.....	5-58
5.4.1	Issues Raised and Proponent Responses	5-58

5.5	Ongoing Engagement and Consultation	5-68
6.	Impacts to Potential or Established Aboriginal or Treaty Rights	6-1
6.1	Identifying Potential or Established Aboriginal and Treaty Rights.....	6-1
6.2	Use and Importance of Lands and Resources for Traditional Purposes.....	6-3
6.2.1	Historical Relationship with Lands and Resources	6-4
6.2.2	Current Relationship with Lands and Resources	6-5
6.3	Land Management, Use, and Planning	6-5
6.3.1	Current Land Ownership	6-6
6.3.2	Land Transfers Undertaken and Funded, Committed and Contemplated	6-8
6.3.2.1	Land Transfers Undertaken.....	6-8
6.3.2.2	Land Transfers Committed	6-10
6.3.2.3	Land Transfers Contemplated	6-10
6.3.3	Land Use Planning	6-12
6.4	Potential Adverse Effects on Potential or Established Aboriginal or Treaty Rights (includes direct, residual, and cumulative impacts).....	6-13
6.4.1	General	6-13
6.4.2	Containment Cell	6-13
6.4.2.1	Perceived Limitations.....	6-13
6.4.2.2	Proposed Use	6-14
6.4.3	Wetlands.....	6-15
6.4.4	Health and Socio Economic Conditions, Including Mental and Social Well Being.....	6-16
6.4.5	Community Access During Bridge Construction	6-17
6.5	Accommodations for Potential Effects on Aboriginal and Treaty Rights	6-18
6.5.1	General	6-18
6.5.2	Containment Cell	6-19
6.5.3	Accommodation for Wetlands.....	6-19
6.6	Residual Impacts of the Project on PLFN's Aboriginal or Treaty Rights	6-19
7.	Effects Assessment.....	7-1
7.1	Baseline Assessment	7-1
7.1.1	Valued Components	7-1
7.1.1.1	Valued Component Spatial Boundaries.....	7-5
7.1.2	Atmospheric Environment	7-8
7.1.2.1	Air Quality and Odour	7-8
7.1.2.2	Greenhouse Gases.....	7-12
7.1.2.3	Climate Change Resilience Assessment.....	7-15
7.1.2.4	Noise.....	7-18
7.1.2.5	Light	7-21
7.1.2.6	Meteorological	7-22
7.1.3	Geology, Geochemistry and Soil	7-23
7.1.3.1	Physiography and Topography.....	7-23
7.1.3.2	Surficial and Bedrock Geology	7-23
7.1.3.3	Geomorphology, Topography, Geotechnical (proposed construction areas).....	7-28
7.1.3.4	Geologic Hazards (Site Study Area).....	7-28
7.1.3.5	Shoreline Instability.....	7-31
7.1.3.6	Project Contaminants of Concern (local, regional, downstream)	7-32

7.1.3.7	Geochemistry Characterization of Leaching Potential (containment cell)	7-35
7.1.3.8	Soil	7-36
7.1.4	Groundwater and Surface Water	7-44
7.1.4.1	Groundwater	7-44
7.1.4.1.1	Methodology	7-44
7.1.4.1.2	Hydrogeology	7-45
7.1.4.1.3	Groundwater Quality	7-73
7.1.4.2	Surface Water	7-77
7.1.4.2.1	Water Quantity	7-81
7.1.4.2.2	Water Quality	7-86
7.1.4.1	Surface and Groundwater Interactions	7-93
7.1.5	Riparian, Wetland and Terrestrial Environments	7-94
7.1.5.1	Terrestrial Habitat & Vegetation	7-94
7.1.5.2	Wetlands	7-97
7.1.5.3	Mammals and Wildlife	7-109
7.1.6	Aquatic Environments	7-110
7.1.6.1	Marine Environment	7-110
7.1.6.1.1	Estuary and Pictou Road Shoreline (Northumberland Strait)	7-112
7.1.6.1.2	Northumberland Strait/East River Marine Pipeline Corridor	7-123
7.1.6.1.3	Northumberland Strait East of the Confederation Bridge to the Eastern Coast of Prince Edward Island	7-126
7.1.6.2	Fish and Aquatic Habitat	7-130
7.1.6.2.1	Fish and Aquatic Productivity Summary (Site Study Area)	7-139
7.1.7	Migratory Birds	7-141
7.1.8	Species at Risk Act Listed Species	7-148
7.1.9	Mi'kmaq of Nova Scotia	7-153
7.1.9.1	Baseline Program Methodology	7-153
7.1.9.1.1	Mi'kmaq Ecological Knowledge Study	7-154
7.1.9.2	Baseline Conditions	7-156
7.1.9.2.1	Overview of Mi'kmaq Organizations and Populations	7-156
7.1.9.3	Health and Socio Economic Conditions	7-171
7.1.9.3.1	Socio Economic	7-171
7.1.9.3.2	Health	7-173
7.1.9.4	Physical and Cultural Heritage	7-176
7.1.9.5	Aboriginal Land and Resource Use	7-177
7.1.10	Human Environment	7-183
7.1.10.1	Economic and Social	7-183
7.1.10.2	Archaeological/Cultural Heritage Resources	7-190
7.1.10.3	Human Health	7-197
7.2	Environmental Effects Methodology	7-201
7.2.1	Project Boundaries	7-201
7.2.1.1	Temporal Boundaries	7-201
7.2.1.2	Spatial Boundaries	7-202
7.2.1.3	Administrative Boundaries	7-205
7.2.1.4	Technical Boundaries	7-205
7.2.2	Thresholds for Characterizing and Determining Significance of Effects	7-205
7.2.3	Anticipated Project Environment Interaction	7-205
7.2.4	Effects Prediction	7-212
7.2.5	Mitigation Measures	7-212
7.2.6	Residual Effects and the Determination of Significance	7-214
7.3	Valued Components Environmental Effects Assessment	7-217
7.3.1	Air Quality and Odour	7-225
7.3.1.1	Predicted Changes to Air Quality and Odour	7-225

7.3.1.2	Air Quality and Odour Boundaries.....	7-233
7.3.1.3	Air Quality and Odour Standards or Thresholds for Determination of Significance	7-234
7.3.1.4	Project Activities and Air Quality and Odour Interactions and Effects and Mitigation Measures	7-235
7.3.1.4.1	Waste Management – Project Activities and Air Quality and Odour Interactions and Effects and Mitigation Measures.....	7-235
7.3.1.4.2	Dredging – Project Activities and Air Quality and Odour Interactions and Effects and Mitigation Measures	7-240
7.3.1.4.3	Wetland Management – Project Activities and Air Quality and Odour Interactions and Effects and Mitigation Measures.....	7-243
7.3.1.4.4	Bridge at Highway 348 – Project Activities and Air Quality and Odour Interactions and Effects and Mitigation Measures.....	7-245
7.3.1.4.5	Pipeline Decommissioning – Project Activities and Air Quality and Odour Interactions and Effects and Mitigation Measures.....	7-246
7.3.1.4.6	Treatment Buildings – Project Activities and Air Quality and Odour Interactions and Effects and Mitigation Measures.....	7-247
7.3.1.4.7	Dam – Project Activities and Air Quality and Odour Interactions and Effects and Mitigation Measures	7-250
7.3.1.5	Air Quality and Odour Monitoring	7-251
7.3.1.6	Air Quality and Odour Significance of Residual Effects	7-252
7.3.2	Greenhouse Gas	7-255
7.3.2.1	Predicted Changes to Greenhouse Gas Emissions	7-255
7.3.2.2	Greenhouse Gas Boundaries	7-258
7.3.2.3	Greenhouse Gas Standards or Thresholds for Determination of Significance	7-258
7.3.2.4	Project Activities and Greenhouse Gas Interactions and Effects and Mitigation Measures.....	7-259
7.3.2.4.1	Waste Management – Project Activities, Greenhouse Gas Interactions and Effects, and Mitigation Measures	7-259
7.3.2.4.2	Dredging – Project Activities and Greenhouse Gas Interactions and Effects and Mitigation Measures	7-261
7.3.2.4.3	Wetland Management – Project Activities and Greenhouse Gas Interactions and Effects and Mitigation Measures.....	7-263
7.3.2.4.4	Bridge Works at Highway 348 – Project Activities and Greenhouse Gas Interactions and Effects and Mitigation Measures.....	7-264
7.3.2.4.5	Pipeline Decommissioning – Project Activities and Air Greenhouse Gas Interactions and Effects and Mitigation Measures.....	7-265
7.3.2.4.6	Treatment Buildings – Project Activities and Greenhouse Gas Interactions and Effects and Mitigation Measures.....	7-266
7.3.2.4.7	Dam – Project Activities and Greenhouse Gas Interactions and Effects and Mitigation Measures	7-267
7.3.2.5	Greenhouse Gas Monitoring	7-268
7.3.2.6	Greenhouse Gas Significance of Residual Effects.....	7-268
7.3.3	Noise.....	7-270
7.3.3.1	Noise Boundaries	7-270
7.3.3.2	Predicted Changes to Noise.....	7-271
7.3.3.3	Predicted Changes to Noise.....	7-271
7.3.3.4	Noise Standards or Thresholds for Determination of Significance.....	7-275
7.3.3.5	Project Activities and Noise Interactions and Effects and Mitigation Measures	7-275
7.3.3.5.1	Waste Management – Project Activities and Noise Interactions and Effects and Mitigation Measures	7-275
7.3.3.5.2	Dredging – Project Activities and Noise Interactions and Effects and Mitigation Measures.....	7-278

7.3.3.5.3	Wetland Management – Project Activities and Noise Interactions and Effects and Mitigation Measures	7-279
7.3.3.5.4	Bridge at Highway 348 – Project Activities and Noise Interactions and Effects and Mitigation Measures	7-281
7.3.3.5.5	Pipeline Decommissioning – Project Activities and Noise Interactions and Effects and Mitigation Measures	7-284
7.3.3.5.6	Treatment Buildings – Project Activities and Noise Interactions and Effects and Mitigation Measures	7-284
7.3.3.5.7	Dam – Project Activities and Noise Interactions and Effects and Mitigation Measures.....	7-286
7.3.3.6	Noise Monitoring.....	7-288
7.3.3.7	Noise Significance of Residual Effects	7-289
7.3.4	Light	7-293
7.3.4.1	Predicted Changes to Night-Time Light Levels	7-293
7.3.4.2	Light Boundaries.....	7-295
7.3.4.3	Light Standards or Thresholds for Determination of Significance	7-295
7.3.4.4	Project Activities and Light Interactions and Effects and Mitigation Measures	7-295
7.3.4.4.1	Waste Management – Project Activities and Light Interactions and Effects and Mitigation Measures	7-296
7.3.4.4.2	Dredging – Project Activities and Light Interactions and Effects and Mitigation Measures.....	7-298
7.3.4.4.3	Wetland Management – Project Activities and Light Interactions and Effects and Mitigation Measures	7-301
7.3.4.4.4	Bridge at Highway 348 – Project Activities and Light Interactions and Effects and Mitigation Measures	7-303
7.3.4.4.5	Pipeline Decommissioning – Project Activities and Light Interactions and Effects and Mitigation Measures	7-304
7.3.4.4.6	Treatment Buildings – Project Activities and Light Interactions and Effects and Mitigation Measures	7-305
7.3.4.4.7	Dam – Project Activities and Light Interactions and Effects and Mitigation Measures.....	7-306
7.3.4.5	Light Monitoring	7-308
7.3.4.6	Light Significance of Residual Effects	7-308
7.3.5	Geology, Geochemistry and Soil	7-310
7.3.5.1	Geology, Geochemistry, and Soil Boundaries.....	7-310
7.3.5.2	Geology, Geochemistry, and Soil Standards or Thresholds for Determination of Significance.....	7-310
7.3.5.3	Project Activities and Geology, Geochemistry and Soil Interactions and Effects and Mitigation Measures	7-311
7.3.5.3.1	Waste Management – Project Activities and Geology, Geochemistry and Soil Interactions and Effects and Mitigation Measures.....	7-311
7.3.5.3.2	Dredging – Project Activities and Geology, Geochemistry and Soil Interactions and Effects and Mitigation Measures.....	7-313
7.3.5.3.3	Wetland Management – Project Activities and Geology, Geochemistry and Soil Interactions and Effects and Mitigation Measures.....	7-316
7.3.5.3.4	Bridge at Highway 348 – Project Activities and Geology, Geochemistry and Soil Interactions and Effects and Mitigation Measures.....	7-318
7.3.5.3.5	Pipeline Decommissioning – Project Activities and Geology, Geochemistry and Soil Interactions and Effects and Mitigation Measures	7-319
7.3.5.3.6	Treatment Buildings – Project Activities and Geology, Geochemistry and Soil Interactions and Effects and Mitigation Measures.....	7-321
7.3.5.3.7	Dam – Project Activities and Geology, Geochemistry and Soil Interactions and Effects and Mitigation Measures.....	7-322
7.3.5.4	Geology, Geochemistry, and Soil Monitoring	7-323

7.3.5.5	Geology, Geochemistry, and Soil Significance of Residual Effects	7-324
7.3.6	Groundwater	7-328
7.3.6.1	Predicted Changes to Groundwater	7-328
7.3.6.2	Groundwater Boundaries.....	7-331
7.3.6.3	Groundwater Standards or Thresholds for Determination of Significance	7-331
7.3.6.4	Project Activities and Groundwater Interactions and Effects and Mitigation Measures.....	7-332
7.3.6.4.1	Waste Management – Project Activities and Groundwater Interactions and Effects and Mitigation Measures	7-332
7.3.6.4.2	Dredging – Project Activities and Groundwater Interactions and Effects and Mitigation Measures	7-338
7.3.6.4.3	Wetland Management – Project Activities and Groundwater Interactions and Effects and Mitigation Measures.....	7-341
7.3.6.4.4	Bridge at Highway 348 – Project Activities and Groundwater Interactions and Effects and Mitigation Measures.....	7-343
7.3.6.4.5	Pipeline Decommissioning – Project Activities and Groundwater Interactions and Effects and Mitigation Measures.....	7-345
7.3.6.4.6	Treatment Buildings – Project Activities and Groundwater Interactions and Effects and Mitigation Measures	7-346
7.3.6.4.7	Dam – Project Activities and Groundwater Interactions and Effects and Mitigation Measures.....	7-347
7.3.6.5	Groundwater Monitoring	7-349
7.3.6.6	Groundwater Significance of Residual Effects	7-350
7.3.7	Surface Water.....	7-353
7.3.7.1	Predicted Changes to Surface Water	7-353
7.3.7.2	Surface Water Boundaries	7-353
7.3.7.3	Surface Water Standards or Thresholds for Determination of Significance	7-354
7.3.7.4	Project Activities and Surface Water Interactions and Effects and Mitigation Measures.....	7-355
7.3.7.4.1	Waste Management – Project Activities and Surface Water Interactions and Effects and Mitigation Measures	7-356
7.3.7.4.2	Dredging – Project Activities and Surface Water Interactions and Effects and Mitigation Measures	7-363
7.3.7.4.3	Wetland Management – Project Activities and Surface Water Interactions and Effects and Mitigation Measures.....	7-367
7.3.7.4.4	Bridge at Highway 348 – Project Activities and Surface Water Interactions and Effects and Mitigation Measures.....	7-370
7.3.7.4.5	Pipeline Decommissioning – Project Activities and Surface Water Interactions and Effects and Mitigation Measures.....	7-374
7.3.7.4.6	Treatment Buildings – Project Activities and Surface Water Interactions and Effects and Mitigation Measures	7-375
7.3.7.4.7	Dam – Project Activities and Surface Water Interactions and Effects and Mitigation Measures	7-376
7.3.7.5	Surface Water Monitoring.....	7-379
7.3.7.6	Surface Water Significance of Residual Effects	7-381
7.3.8	Terrestrial Habitat and Vegetation.....	7-386
7.3.8.1	Predicted Changes to Terrestrial Habitat and Vegetation	7-386
7.3.8.2	Terrestrial Habitat and Vegetation Boundaries	7-386
7.3.8.3	Terrestrial Habitat and Vegetation Standards or Thresholds for Determination of Significance.....	7-386
7.3.8.4	Project Activities and Terrestrial Habitat and Vegetation Interactions and Effects and Mitigation Measures	7-387
7.3.8.4.1	Waste Management – Project Activities and Terrestrial Habitat and Vegetation Interactions and Effects and Mitigation Measures	7-387

7.3.8.4.2	Dredging – Project Activities and Terrestrial Habitat and Vegetation Interactions and Effects and Mitigation Measures.....	7-393
7.3.8.4.3	Wetland Management – Project Activities and Terrestrial Habitat and Vegetation Interactions and Effects and Mitigation Measures	7-397
7.3.8.4.4	Bridge at Highway 348 – Project Activities and Terrestrial Habitat and Vegetation Interactions and Effects and Mitigation Measures	7-401
7.3.8.4.5	Pipeline Decommissioning – Project Activities and Terrestrial Habitat and Vegetation Interactions and Effects and Mitigation Measures	7-404
7.3.8.4.6	Treatment Buildings – Project Activities and Terrestrial Habitat and Vegetation Interactions and Effects and Mitigation Measures	7-408
7.3.8.4.7	Dam – Project Activities and Terrestrial Habitat and Vegetation Interactions and Effects and Mitigation Measures.....	7-409
7.3.8.5	Terrestrial Habitat and Vegetation Monitoring.....	7-413
7.3.8.6	Terrestrial Habitat and Vegetation Significance of Residual Effects	7-413
7.3.9	Wetlands.....	7-416
7.3.9.1	Predicted Changes to Wetlands	7-416
7.3.9.2	Wetlands Boundaries.....	7-416
7.3.9.3	Wetlands Standards or Thresholds for Determination of Significance...	7-417
7.3.9.4	Project Activities and Wetlands Interactions and Effects and Mitigation Measures	7-417
7.3.9.4.1	Waste Management – Project Activities and Wetlands Interactions and Effects and Mitigation Measures	7-418
7.3.9.4.2	Dredging – Project Activities and Wetlands Interactions and Effects and Mitigation Measures	7-422
7.3.9.4.3	Wetland Management – Project Activities and Wetlands Interactions and Effects and Mitigation Measures	7-423
7.3.9.4.4	Bridge at Highway 348 – Project Activities and Wetlands Interactions and Effects and Mitigation Measures	7-435
7.3.9.4.5	Pipeline Decommissioning – Project Activities and Wetlands Interactions and Effects and Mitigation Measures.....	7-436
7.3.9.4.6	Treatment Buildings – Project Activities and Wetlands Interactions and Effects and Mitigation Measures	7-437
7.3.9.4.7	Dam – Project Activities and Wetlands Interactions and Effects and Mitigation Measures.....	7-438
7.3.9.5	Wetlands Monitoring.....	7-441
7.3.9.6	Wetlands Significance of Residual Effects	7-442
7.3.10	Mammals and Wildlife.....	7-446
7.3.10.1	Predicted Changes to Mammals and Wildlife.....	7-446
7.3.10.2	Mammals and Wildlife Boundaries	7-446
7.3.10.3	Mammals and Wildlife Standards or Thresholds for Determination of Significance	7-446
7.3.10.4	Project Activities and Mammals and Wildlife Interactions and Effects and Mitigation Measures	7-447
7.3.10.4.1	Waste Management – Project Activities and Mammals and Wildlife Interactions and Effects and Mitigation Measures.....	7-447
7.3.10.4.2	Dredging – Project Activities and Mammals and Wildlife Interactions and Effects and Mitigation Measures	7-450
7.3.10.4.3	Wetland Management – Project Activities and Mammals and Wildlife Interactions and Effects and Mitigation Measures.....	7-453
7.3.10.4.4	Bridge at Highway 348 – Project Activities and Mammals and Wildlife Interactions and Effects and Mitigation Measures.....	7-456
7.3.10.4.5	Pipeline Decommissioning – Project Activities and Mammals and Wildlife Interactions and Effects and Mitigation Measures.....	7-458
7.3.10.4.6	Treatment Buildings – Project Activities and Mammals and Wildlife Interactions and Effects and Mitigation Measures.....	7-460

7.3.10.4.7	Dam – Project Activities and Mammals and Wildlife Interactions and Effects and Mitigation Measures	7-461
7.3.10.5	Mammals and Wildlife Monitoring.....	7-463
7.3.10.6	Mammals and Wildlife Significance of Residual Effects.....	7-464
7.3.11	Marine Environment.....	7-467
7.3.11.1	Marine Environment Boundaries	7-467
7.3.11.2	Marine Environment Standards or Thresholds for Determination of Significance	7-468
7.3.11.3	Project Activities and Marine Environment Interactions and Effects and Mitigation Measures.....	7-468
7.3.11.3.1	Waste Management – Project Activities and Marine Environment Interactions and Effects and Mitigation Measures.....	7-468
7.3.11.3.2	Dredging – Project Activities and Marine Environment Interactions and Effects and Mitigation Measures	7-469
7.3.11.3.3	Wetland Management – Project Activities and Marine Environment Interactions and Effects and Mitigation Measures.....	7-471
7.3.11.3.4	Bridge at Highway 348 – Project Activities and Marine Environment Interactions and Effects and Mitigation Measures.....	7-478
7.3.11.3.5	Pipeline Decommissioning – Project Activities and Marine Environment Interactions and Effects and Mitigation Measures.....	7-479
7.3.11.3.6	Treatment Buildings – Project Activities and Marine Environment Interactions and Effects and Mitigation Measures.....	7-480
7.3.11.3.7	Dam – Project Activities and Marine Environment Interactions and Effects and Mitigation Measures	7-481
7.3.11.4	Marine Environment Monitoring.....	7-485
7.3.11.5	Marine Environment Significance of Residual Effects.....	7-485
7.3.12	Fish and Aquatic Habitat	7-489
7.3.12.1	Fish and Aquatic Habitat Boundaries	7-489
7.3.12.2	Fish and Aquatic Habitat Standards or Thresholds for Determination of Significance	7-489
7.3.12.3	Project Activities and Fish and Aquatic Habitat Interactions and Effects and Mitigation Measures	7-490
7.3.12.3.1	Waste Management – Project Activities and Fish and Aquatic Habitat Interactions and Effects and Mitigation Measures.....	7-492
7.3.12.3.2	Dredging – Project Activities and Fish and Aquatic Habitat Interactions and Effects and Mitigation Measures	7-494
7.3.12.3.3	Wetland Management – Project Activities and Fish and Aquatic Habitat Interactions and Effects and Mitigation Measures.....	7-497
7.3.12.3.4	Bridge at Highway 348 – Project Activities and Fish and Aquatic Habitat Interactions and Effects and Mitigation Measures	7-501
7.3.12.3.5	Pipeline Decommissioning – Project Activities and Fish and Aquatic Habitat Interactions and Effects and Mitigation Measures	7-503
7.3.12.3.6	Treatment Buildings – Project Activities and Fish and Aquatic Habitat Interactions and Effects and Mitigation Measures.....	7-504
7.3.12.3.7	Dam – Project Activities and Fish and Aquatic Habitat Interactions and Effects and Mitigation Measures	7-505
7.3.12.4	Fish and Aquatic Habitat Monitoring.....	7-508
7.3.12.5	Fish and Aquatic Habitat Significance of Residual Effects.....	7-508
7.3.13	Migratory Birds.....	7-514
7.3.13.1	Migratory Birds Boundaries	7-514
7.3.13.2	Migratory Birds Standards or Thresholds for Determination of Significance	7-515
7.3.13.3	Project Activities and Migratory Birds Interactions and Effects and Mitigation Measures.....	7-515
7.3.13.3.1	Waste Management – Project Activities and Migratory Birds Interactions and Effects and Mitigation Measures.....	7-515

7.3.13.3.2	Dredging – Project Activities and Migratory Birds Interactions and Effects and Mitigation Measures	7-519
7.3.13.3.3	Wetland Management – Project Activities and Migratory Birds Interactions and Effects and Mitigation Measures.....	7-522
7.3.13.3.4	Bridge at Highway 348 – Project Activities and Migratory Birds Interactions and Effects and Mitigation Measures.....	7-526
7.3.13.3.5	Pipeline Decommissioning – Project Activities and Migratory Birds Interactions and Effects and Mitigation Measures.....	7-528
7.3.13.3.6	Treatment Buildings – Project Activities and Migratory Birds Interactions and Effects and Mitigation Measures.....	7-530
7.3.13.3.7	Dam – Project Activities and Migratory Birds Interactions and Effects and Mitigation Measures	7-532
7.3.13.4	Migratory Birds Monitoring.....	7-535
7.3.13.5	Migratory Birds Significance of Residual Effects.....	7-536
7.3.14	Species at Risk.....	7-540
7.3.14.1	Species at Risk Boundaries.....	7-540
7.3.14.2	Species at Risk Standards or Thresholds for Determination of Significance	7-540
7.3.14.3	Project Activities and Species at Risk Interactions and Effects and Mitigation Measures.....	7-541
7.3.14.3.1	Waste Management – Project Activities and Species at Risk Interactions and Effects and Mitigation Measures.....	7-542
7.3.14.3.2	Dredging – Project Activities and Species at Risk Interactions and Effects and Mitigation Measures	7-546
7.3.14.3.3	Wetland Management – Project Activities and Species at Risk Interactions and Effects and Mitigation Measures.....	7-549
7.3.14.3.4	Bridge at Highway 348 – Project Activities and Species at Risk Interactions and Effects and Mitigation Measures.....	7-551
7.3.14.3.5	Pipeline Decommissioning – Project Activities and Species at Risk Interactions and Effects and Mitigation Measures.....	7-554
7.3.14.3.6	Treatment Buildings – Project Activities and Species at Risk Interactions and Effects and Mitigation Measures.....	7-556
7.3.14.3.7	Dam – Project Activities and Species at Risk Interactions and Effects and Mitigation Measures	7-557
7.3.14.4	Species at Risk Monitoring.....	7-560
7.3.14.5	Species at Risk Significance of Residual Effects	7-560
7.3.15	Mi'kmaq of Nova Scotia.....	7-566
7.3.15.1	Mi'kmaq of Nova Scotia Boundaries.....	7-566
7.3.15.2	Mi'kmaq of Nova Scotia Standards or Thresholds for Determination of Significance	7-567
7.3.15.3	Mi'kmaq of Nova Scotia - Human Health.....	7-567
7.3.15.3.1	Human Health and Ecological Risk Assessment	7-567
7.3.15.3.2	Human Health Risk Assessment.....	7-570
7.3.15.4	Project Activities and Mi'kmaq of Nova Scotia Interactions and Effects and Mitigation Measures	7-572
7.3.15.4.1	Waste Management – Project Activities and Mi'kmaq of Nova Scotia Interactions and Effects and Mitigation Measures.....	7-572
7.3.15.4.2	Dredging – Project Activities and Mi'kmaq of Nova Scotia Interactions and Effects and Mitigation Measures	7-576
7.3.15.4.3	Wetland Management – Project Activities and Mi'kmaq of Nova Scotia Interactions and Effects and Mitigation Measures.....	7-578
7.3.15.4.4	Bridge at Highway 348 – Project Activities and Mi'kmaq of Nova Scotia Interactions and Effects and Mitigation Measures.....	7-579
7.3.15.4.5	Pipeline Decommissioning – Project Activities and Mi'kmaq of Nova Scotia Interactions and Effects and Mitigation Measures.....	7-582

7.3.15.4.6	Treatment Buildings – Project Activities and Mi'kmaq of Nova Scotia Interactions and Effects and Mitigation Measures.....	7-583
7.3.15.4.7	Dam – Project Activities and Mi'kmaq of Nova Scotia Interactions and Effects and Mitigation Measures	7-584
7.3.15.5	Mi'kmaq of Nova Scotia Monitoring	7-585
7.3.15.6	Mi'kmaq of Nova Scotia Significance of Residual Effects	7-586
7.3.16	Economic and Social	7-590
7.3.16.1	Economic and Social Boundaries.....	7-590
7.3.16.2	Predicted Changes to Economic and Social Environment.....	7-590
7.3.16.3	Economic and Social Spatial Boundaries.....	7-590
7.3.16.4	Economic and Social Standards or Thresholds for Determination of Significance	7-591
7.3.16.5	Project Activities and Economic and Social Interactions and Effects and Mitigation Measures	7-592
7.3.16.5.1	Waste Management – Project Activities and Economic and Social Interactions and Effects and Mitigation Measures.....	7-592
7.3.16.5.2	Dredging – Project Activities and Economic and Social Interactions and Effects and Mitigation Measures	7-595
7.3.16.5.3	Wetland Management – Project Activities and Economic and Social Interactions and Effects and Mitigation Measures.....	7-598
7.3.16.5.4	Bridge at Highway 348 – Project Activities and Economic and Social Interactions and Effects and Mitigation Measures.....	7-600
7.3.16.5.5	Pipeline Decommissioning – Project Activities and Economic and Social Interactions and Effects and Mitigation Measures.....	7-602
7.3.16.5.6	Treatment Buildings – Project Activities and Economic and Social Interactions and Effects and Mitigation Measures.....	7-604
7.3.16.5.7	Dam – Project Activities and Economic and Social Interactions and Effects and Mitigation Measures	7-605
7.3.16.6	Economic and Social Monitoring	7-608
7.3.16.7	Economic and Social Significance of Residual Effects	7-608
7.3.17	Archaeological/Cultural Heritage Resources.....	7-613
7.3.17.1	Archaeological/Cultural Heritage Resources Boundaries	7-613
7.3.17.2	Archaeological/Cultural Heritage Resources Standards or Thresholds for Determination of Significance.....	7-613
7.3.17.3	Project Activities and Archaeological/Cultural Heritage Resources Interactions and Effects and Mitigation Measures.....	7-613
7.3.17.3.1	Waste Management – Project Activities Archaeological/Cultural Heritage Resources Interactions and Effects and Mitigation Measures.	7-614
7.3.17.3.2	Dredging – Project Activities and Archaeological/Cultural Heritage Resources Interactions and Effects and Mitigation Measures	7-616
7.3.17.3.3	Wetland Management – Project Activities and Archaeological/Cultural Heritage Resources Interactions and Effects and Mitigation Measures.	7-619
7.3.17.3.4	Bridge at Highway 348 – Project Activities and Archaeological/Cultural Heritage Resources Interactions and Effects and Mitigation Measures.	7-622
7.3.17.3.5	Pipeline Decommissioning – Project Activities and Archaeological/Cultural Heritage Resources Interactions and Effects and Mitigation Measures	7-624
7.3.17.3.6	Treatment Buildings – Project Activities and Archaeological/Cultural Heritage Resources Interactions and Effects and Mitigation Measures.	7-626
7.3.17.3.7	Dam – Project Activities and Archaeological/Cultural Heritage Resources Interactions and Effects and Mitigation Measures	7-627
7.3.17.4	Archaeological/Cultural Heritage Resources Monitoring.....	7-629
7.3.17.5	Archaeological/Cultural Heritage Resources Significance of Residual Effects	7-630
7.3.18	Human Health.....	7-633
7.3.18.1	Human Health Boundaries	7-633

7.3.18.2	Human Health Standards or Thresholds for Determination of Significance	7-633
7.3.18.3	Project Activities and Human Health Interactions and Effects and Mitigation Measures.....	7-634
7.3.18.3.1	Waste Management – Project Activities Human Health Interactions and Effects and Mitigation Measures	7-635
7.3.18.3.2	Dredging – Project Activities and Human Health Interactions and Effects and Mitigation Measures	7-638
7.3.18.3.3	Wetland Management – Project Activities and Human Health Interactions and Effects and Mitigation Measures.....	7-641
7.3.18.3.4	Bridge at Highway 348 – Project Activities and Human Health Interactions and Effects and Mitigation Measures.....	7-643
7.3.18.3.5	Pipeline Decommissioning – Project Activities and Human Health Interactions and Effects and Mitigation Measures.....	7-645
7.3.18.3.6	Treatment Buildings – Project Activities and Human Health Interactions and Effects and Mitigation Measures	7-647
7.3.18.3.7	Dam – Project Activities and Human Health Interactions and Effects and Mitigation Measures	7-648
7.3.18.4	Human Health Monitoring.....	7-649
7.3.18.5	Human Health Significance of Residual Effects	7-650
7.4	Other Effects to Consider	7-654
7.4.1	Effects of Potential Accidents or Malfunctions	7-654
7.4.1.1	Assessment Methodology	7-654
7.4.1.2	Accidents and Malfunctions Identification.....	7-656
7.4.1.2.1	Credible Accidents and Malfunctions	7-657
7.4.1.3	Accidents and Malfunctions Effects Assessment	7-660
7.4.1.3.1	Accidental Discharges of Contaminated Sediments during Dredging....	7-660
7.4.1.3.2	Erosion and Sediment Control Failure.....	7-661
7.4.1.3.2.1	Marine and Fish/Aquatic Environment.....	7-663
7.4.1.3.2.2	Determination of Significance.....	7-664
7.4.1.3.3	Containment Cell Failure	7-664
7.4.1.3.4	Leachate Storage Tank Failure/Tanker Truck Leachate Spill	7-666
7.4.1.3.5	On Site Hazardous Material Spill.....	7-667
7.4.1.3.5.1	Groundwater/Surface Water	7-669
7.4.1.3.5.2	Determination of Significance.....	7-670
7.4.1.3.6	Failure of a Surface Water Management Pond	7-670
7.4.1.3.7	Bridge Failure	7-671
7.4.1.3.8	Off Site Trucking Accident	7-673
7.4.1.3.8.1	Groundwater and Surface Water	7-675
7.4.1.3.8.2	Fish and Aquatic Habitat	7-676
7.4.1.3.8.3	Determination of Significance.....	7-677
7.4.1.3.9	Vehicle Collisions.....	7-677
7.4.1.3.10	Fire.....	7-679
7.4.1.4	Overall Summary and Determination of Significance.....	7-681
7.4.2	Effects of Environment on the Project	7-681
7.4.2.1	Existing Conditions	7-682
7.4.2.1.1	Climate Change and Extreme Weather Conditions.....	7-682
7.4.2.1.2	Seismic Conditions	7-685
7.4.2.2	Potential Effects and Mitigation	7-688
7.4.2.2.1	Extreme Weather and Climate Change.....	7-688
7.4.2.2.1.1	Extreme Weather and Climate Change – Bridge Design.....	7-694
7.4.2.2.2	Seismic Events	7-700
7.4.2.3	Additional Mitigation Measures.....	7-700

7.4.2.4	Residual Effects	7-701
7.4.2.4.1	Extreme Weather and Climate Change	7-701
7.4.2.4.2	Seismic Events	7-701
7.4.2.5	Summary	7-701
7.4.3	Cumulative Effects Assessment	7-702
7.4.3.1	Types of Cumulative Effects	7-702
7.4.3.2	Cumulative Assessment Methodology	7-702
7.4.3.2.1	Scoping Approach	7-703
7.4.3.2.2	Assessment Approach	7-707
7.4.3.2.3	Consideration of Consultation and Engagement Results and Aboriginal Traditional Knowledge	7-708
7.4.3.3	Scoping of the Valued Components	7-708
7.4.3.3.1	Identification of the Valued Components	7-708
7.4.3.3.2	Determining the Spatial and Temporal Boundaries	7-715
7.4.3.3.3	Identification, Selection and Description of Projects in the Area Past, Present and Future Physical Activities	7-716
7.4.3.3.3.1	Past Physical Activities	7-718
7.4.3.3.3.2	Present Physical Activities	7-718
7.4.3.3.3.3	Future Physical Activities (Certain, Reasonably Foreseeable or Hypothetical)	7-719
7.4.3.3.3.4	Confirmation of Valued Components to be Carried Forward Cumulative Effects Assessment	7-724
7.4.3.4	Cumulative Effects Assessment of the Valued Components	7-735
7.4.3.4.1	Air Quality and Odour	7-735
7.4.3.4.1.1	Residual Effects of Proposed Project	7-735
7.4.3.4.1.2	Effects of Other Projects in the Area	7-735
7.4.3.4.1.3	Cumulative Effects on Air Quality and Odour	7-736
7.4.3.4.1.4	Mitigation	7-737
7.4.3.4.1.5	Residual Cumulative Effects and Significance Assessment	7-737
7.4.3.4.1.6	Follow up and monitoring Programs	7-739
7.4.3.4.2	Surface Water	7-739
7.4.3.4.2.1	Residual Effects of Proposed Project	7-739
7.4.3.4.2.2	Effects of Other Projects in the Area	7-739
7.4.3.4.2.3	Cumulative Effects on Surface Water	7-740
7.4.3.4.2.4	Mitigation	7-740
7.4.3.4.2.5	Residual Cumulative Effects and Significance Assessment	7-740
7.4.3.4.2.6	Follow up and monitoring Programs	7-740
7.4.3.4.3	Wetlands	7-740
7.4.3.4.3.1	Residual Effects of Proposed Project	7-740
7.4.3.4.3.2	Effects of Other Projects in the Area	7-741
7.4.3.4.3.3	Cumulative Effects on Wetlands	7-742
7.4.3.4.3.4	Mitigation	7-742
7.4.3.4.3.5	Residual Cumulative Effects and Significance Assessment	7-742
7.4.3.4.3.6	Follow up and monitoring Programs	7-745
7.4.3.4.4	Mammals and Wildlife	7-745
7.4.3.4.4.1	Residual Effects of Proposed Project	7-745
7.4.3.4.4.2	Effects of Other Projects in the Area	7-745
7.4.3.4.4.3	Cumulative Effects on Mammals and Wildlife	7-746
7.4.3.4.4.4	Mitigation	7-746
7.4.3.4.4.5	Residual Cumulative Effects and Significance Assessment	7-746
7.4.3.4.4.6	Follow up and Monitoring Programs	7-748
7.4.3.4.5	Marine Environment	7-748
7.4.3.4.5.1	Residual Effects of Proposed Project	7-748
7.4.3.4.5.2	Effects of Other Projects in the Area	7-748

7.4.3.4.5.3	Cumulative Effects on Marine Environment	7-749
7.4.3.4.5.4	Mitigation	7-750
7.4.3.4.5.5	Residual Cumulative Effects and Significance Assessment	7-750
7.4.3.4.5.6	Follow up and Monitoring Programs.....	7-752
7.4.3.4.6	Fish and Aquatic Habitat	7-752
7.4.3.4.6.1	Residual Effects of Proposed Project.....	7-752
7.4.3.4.6.2	Effects of Other Projects in the Area	7-753
7.4.3.4.6.3	Cumulative Effects on Fish and Aquatic Habitat	7-753
7.4.3.4.6.4	Mitigation	7-754
7.4.3.4.6.5	Residual Cumulative Effects and Significance Assessment	7-754
7.4.3.4.6.6	Follow up and Monitoring Programs.....	7-754
7.4.3.4.7	Migratory Birds.....	7-754
7.4.3.4.7.1	Residual Effects of Proposed Project.....	7-754
7.4.3.4.7.2	Effects of Other Projects in the Area	7-755
7.4.3.4.7.3	Cumulative Effects on Migratory Birds	7-756
7.4.3.4.7.4	Mitigation	7-756
7.4.3.4.7.5	Residual Cumulative Effects and Significance Assessment	7-756
7.4.3.4.7.6	Follow up and Monitoring Programs.....	7-759
7.4.3.4.8	Species at Risk.....	7-759
7.4.3.4.8.1	Residual Effects of Proposed Project.....	7-759
7.4.3.4.8.2	Effects of Other Projects in the Area	7-759
7.4.3.4.8.3	Cumulative Effects on Species at Risk.....	7-760
7.4.3.4.8.4	Mitigation	7-761
7.4.3.4.8.5	Residual Cumulative Effects and Significance Assessment	7-761
7.4.3.4.8.6	Follow up and monitoring Programs.....	7-761
7.4.3.4.9	Mi'kmaq of Nova Scotia	7-761
7.4.3.4.9.1	Residual Effects of Proposed Project.....	7-761
7.4.3.4.9.2	Effects of Other Projects in the Area	7-762
7.4.3.4.9.3	Cumulative Effects on Mi'kmaq of Nova Scotia.....	7-762
7.4.3.4.9.4	Mitigation	7-763
7.4.3.4.9.5	Residual Cumulative Effects and Significance Assessment	7-763
7.4.3.4.9.6	Follow up and Monitoring Programs.....	7-763
7.4.3.4.10	Cumulative Effects Summary	7-763
8.	Summary of Environmental Effects Assessment	8-1
9.	Follow up and Monitoring Programs.....	9-1
9.1	Follow up Programs.....	9-3
9.1.1	Complaint Response Protocol	9-7
9.2	Monitoring Programs	9-8
10.	References	10-1
10.1	References Available Online	10-1
10.2	References Available for Download on the Project Website.....	10-1

Figure Index

Figure 1.1-1	Project Organizational Chart	1-3
Figure 1.2-1	Study Area.....	1-5
Figure 2.1-1	Boat Harbour Effluent Treatment Facility Site Schematic.....	2-3
Figure 3.1-1	Containment Cell and Temporary Leachate Treatment Facility Location	3-3

Figure 3.1-2	Proposed Containment Cell Final Contours.....	3-7
Figure 3.1-3	Cross Sections	3-8
Figure 3.1-4	Digital Rendering of the Proposed Final Containment Cell.....	3-9
Figure 3.1-5	Areas to be Dredged and Access Points	3-10
Figure 3.1-6	Wetlands to be Remediated and Access Points	3-13
Figure 3.1-7	Limit of Disturbance of the Bridge at Highway 348 and Temporary By-Pass Causeway.....	3-18
Figure 3.1-8	Pipeline.....	3-20
Figure 3.1-9	Treatment Buildings	3-22
Figure 3.1-10	Dam	3-24
Figure 3.1-11	Berms	3-26
Figure 3.1-12	Access Road and Limit of Disturbance	3-29
Figure 3.2-1	Virtual rendering of the cross section of the Containment Cell	3-36
Figure 5.1-1	Pictou Landing First Nation Property	5-5
Figure 5.3-1	Methods of Engagement with PLFN during the EIA	5-46
Figure 5.3-2	PLFN OH Event on Facebook.....	5-51
Figure 5.3-3	Rendering of the Containment Cell after Closure	5-54
Figure 6.3-1	Pictou Landing First Nation Property	6-7
Figure 6.3-2	Lands to be Transferred to PLFN Following Completion of the Project.....	6-11
Figure 7.1-1	Project Study Areas (General)	7-7
Figure 7.1-2	Sound Pressure Monitoring Locations	7-20
Figure 7.1-3	Geologic Cross Sections in Study Area	7-25
Figure 7.1-4	Cross Section A-A'	7-26
Figure 7.1-5	Cross Section B-B'	7-27
Figure 7.1-6	Distribution and Magnitude of Earthquakes Recorded in Eastern Canada (1630 2016)	7-30
Figure 7.1-7	Phase II ESA/Supplemental Phase II ESA Sediment Sampling Locations	7-39
Figure 7.1-8	Phase II ESA/Supplemental Phase II ESA Soil Sampling Locations.....	7-41
Figure 7.1-9	Subsurface Investigation Test Pit Locations	7-43
Figure 7.1-10	Shallow/Overburden Groundwater Elevation Contours	7-49
Figure 7.1-11	Deep/Bedrock Groundwater Elevation Contours	7-52
Figure 7.1-12	Containment Cell Monitoring Network.....	7-55
Figure 7.1-13	Groundwater Elevations Associated with the Containment Cell Versus Time.....	7-56

Figure 7.1-14	PLFN Well Field Location of Water Supply and Monitoring Wells	7-59
Figure 7.1-15	PLFN Overburden Groundwater Elevations Versus Time	7-60
Figure 7.1-16	PLFN Shallow Bedrock Groundwater Elevations Versus Time	7-61
Figure 7.1-17	0 to 5 m Hydrograph.....	7-63
Figure 7.1-18	2 to 6 m Hydrograph.....	7-64
Figure 7.1-19	3 to 9 m Hydrograph.....	7-65
Figure 7.1-20	11 to 16 m Hydrograph.....	7-66
Figure 7.1-21	15 to 19 m Hydrograph.....	7-67
Figure 7.1-22	18 to 22 m Hydrograph.....	7-68
Figure 7.1-23	21 to 25 m Hydrograph.....	7-69
Figure 7.1-24	29 to 33 m Hydrograph.....	7-70
Figure 7.1-25	Boat Harbour Sub catchments	7-79
Figure 7.1-26	PCSWMM Model Setup and Sub Catchments Delineation	7-80
Figure 7.1-27	Total Inflow at the Estuary (Point D) Simulated by the PCSWMM Model.....	7-83
Figure 7.1-28	Wetland and Watercourse Classification Surface Water Quality Seasonal Analysis	7-88
Figure 7.1-29	NSDLF Land Classification	7-95
Figure 7.1-30	Wetland and Watercourse Classification	7-105
Figure 7.1-31	Soil Classification	7-106
Figure 7.1-32	Water Level Gauge Locations	7-108
Figure 7.1-33	Marine Environment Study Area	7-111
Figure 7.1-34	Depth Normalized Intensity Model (for bathymetry only) draped over the CSR, rotated 36° to the north.....	7-113
Figure 7.1-35	Depth Normalized Intensity Model (for bathymetry only) draped over the CSR...	7-114
Figure 7.1-36	Orthophoto Mosaic for Boat Harbour (rotated 36° to the north), and with insets showing smaller features.....	7-115
Figure 7.1-37	Orthophoto Mosaic for Boat Harbour, scaled to show bathymetry relief for the Southern section of Local Study Area.....	7-116
Figure 7.1-38	Orthophoto mosaic showing the plume of dark water near the mouth of Boat Harbour, outlined in black.....	7-117
Figure 7.1-39	Marine Pipeline Bathymetry and Endobenthic Characterization.....	7-125
Figure 7.1-40	Observation of Aquatic Species at Risk in the Study Area	7-128
Figure 7.1-41	Observations of Other Marine Mammals in the Study Area.....	7-129
Figure 7.1-42	Watercourse Potential for Fish Habitat	7-138

Figure 7.1-43	Avian Survey Locations.....	7-147
Figure 7.1-44	Mi'kmaq Traditional and Current Use Areas	7-155
Figure 7.1-45	Mi'kmaq Reserve Lands in Nova Scotia.....	7-157
Figure 7.1-46	Mi'kmaq Traditional and Current Hunting Areas	7-180
Figure 7.1-47	Mi'kmaq Traditional and Current Fishing Areas	7-181
Figure 7.1-48	Mi'kmaq Traditional and Current Gathering Areas.....	7-182
Figure 7.1-49	Economic and Social Environment Study Area.....	7-184
Figure 7.1-50	Archaeological Sites and Archaeological Potential.....	7-193
Figure 7.1-51	GPR Survey Grid Locations	7-195
Figure 7.1-52	Archaeological Reconnaissance Results	7-196
Figure 7.1-53	Human Health and Ecological Risk Assessment Study Area	7-198
Figure 7.1-54	Human Health Risk Assessment Study Area Boundaries	7-200
Figure 7.3-1	Modelling Scenario Source Areas.....	7-228
Figure 7.3-2	Point of Reception and Operation Location Plan	7-274
Figure 7.3-3	Noise Contour Plot –Site Preparation and Construction Phase.....	7-290
Figure 7.3-4	Noise Contour Plot – Operation Phase	7-291
Figure 7.3-5	Project Activities and Sensitive Receptors.....	7-294
Figure 7.3-6	Phase II ESA/Supplemental Phase II ESA Soil Sample Locations.....	7-330
Figure 7.3-7	Shallow/Overburden Groundwater Elevation Contours	7-340
Figure 7.3-8	Subwatershed and Conveyance of Containment Cell	7-358
Figure 7.3-9	Projected Bridge Soffit Elevation Title.....	7-372
Figure 7.3-10	Proposed Water Quality Monitoring Locations.....	7-380
Figure 7.3-11	Limit of Disturbance to Vegetation from Upgrades to the Containment Cell	7-390
Figure 7.3-12	Access Roads and Limit of Disturbance	7-391
Figure 7.3-13	Access Points Associated with Dredging Activities.....	7-395
Figure 7.3-14	Access Points Associated with Wetland Management Activities	7-399
Figure 7.3-15	Limit of Disturbance of the Bridge at Highway 348 and Temporary By Pass Causeway.....	7-403
Figure 7.3-16	Limit of Disturbance for Removal of the Pipeline Section at Indian Cross Point ..	7-406
Figure 7.3-17	Limit of Disturbance of the Project Activities Associated with the Dam	7-411
Figure 7.3-18	Impacted Wetlands from the Access Road	7-420
Figure 7.3-19	Remediation Area– Risk Management Area 1.....	7-427

Figure 7.3-20	Remediation Area – Risk Management Area 2.....	7-428
Figure 7.3-21	Remediation Area – Risk Management Area 3.....	7-429
Figure 7.3-22	Remediation Area – Risk Management Area 4.....	7-430
Figure 7.3-23	Remediation Area– Risk Management Area 5.....	7-431
Figure 7.3-24	Remediation Area – Risk Management Area 6a and 6b.....	7-473
Figure 7.3-25	Remediation Area– Risk Management Area 7.....	7-474
Figure 7.3-26	Location of Remediation Works and the Proposed Post-remediation Site Layout.....	7-491
Figure 7.4-1	Distribution and Magnitude of Earthquakes Recorded in Eastern Canada (1630 - 2016).....	7-687
Figure 7.4-2	Water Levels in Chart Datum (CD) Recorded at Pictou Tide Station Between 1957 and 1996	7-695
Figure 7.4-3	Projected Bridge Soffit Elevation.....	7-699
Figure 7.4-4	Generic Approach to Scoping for Cumulative Effects Assessment Adapted from the Technical Guidance for Assessing Cumulative Environmental Effects under the CEAA 2012.....	7-704
Figure 7.4-5	Known Present and Future Projects	7-717

Table Index

Table 1.4-1	Anticipated Federal Legislative and Regulatory Requirements	1-11
Table 1.4-2	Anticipated Provincial Legislative and Regulatory Requirements.....	1-14
Table 1.4-3	Anticipated Municipal Legislative and Regulatory Requirements	1-18
Table 2.3-1	Comparative Evaluation of the Alternative Means for Waste Management	2-16
Table 2.3-2	Comparative Evaluation of the Alternative Means for Dredging	2-25
Table 2.3-3	Comparative Evaluation of the Alternative Means for Wetland Management	2-34
Table 2.3-4	Comparative Evaluation of the Alternative Means for Leachate Management.....	2-43
Table 2.3-5	Comparative Evaluation of the Alternative Means for the Bridge at Highway 348 .	2-51
Table 2.3-6	Comparative Evaluation of the Alternative Means for the Pipe Decommissioning – On Land.....	2-59
Table 2.3-7	Comparative Evaluation of the Alternative Means for the Pipe Decommissioning – Under Water	2-67
Table 2.3-8	Alternative Means for Energy Component Screening.....	2-75
Table 3.1-1	Service Life Design Requirements.....	3-5
Table 3.2-1	Site Specific Target Levels.....	3-44

Table 4.1-1	Objectives of Public Consultation.....	4-2
Table 4.3-1	Engagements with Facebook Ad for POH #1	4-7
Table 4.3-2	Information Presented at POH #1	4-8
Table 4.3-3	Engagements with Facebook Ad for POH #2	4-9
Table 4.3-4	Information Presented at POH #2.....	4-10
Table 4.3-5	IAAC/TAC Meetings	4-12
Table 4.4-1	Comment and Responses from POH #1.....	4-15
Table 4.4-2	Comment and Responses from POH #2.....	4-20
Table 5.1-1	Documentation of Actions Taken: Rights Holder/Stakeholder Input Received.....	5-22
Table 5.2-1	Summary of Issues Raised by PLFN and Proponent Response and Commitments	5-31
Table 5.3-1	Roles Related to Engagement and Formal s. 35 Consultation with PLFN Concerning the BHRP, September 2019	5-41
Table 5.3-2	Objectives of Consultation During the EIA.....	5-44
Table 5.3-3	Summary of BHCC Meetings During EIA.....	5-47
Table 5.3-4	Summary of BHEAC Meetings During EIA	5-48
Table 5.3-5	Information Presented at OH #1	5-52
Table 5.3-6	Information Presented at OH #2	5-54
Table 5.3-7	IAAC/TAC Meetings	5-56
Table 5.4-1	PLFN Issues/Comments and NSLI Responses During the EIA and how they were Considered in the EIA.....	5-60
Table 6.3-1	BHETF Parcels owned by NS TIR	6-10
Table 6.3-2	Parcel Ownership – NS TIR and Nova Scotia Department of Lands and Forestry	6-12
Table 6.6-1	Accommodation Analysis for Potential Effects to Aboriginal or Treaty Rights.....	6-20
Table 7.1-1	Valued Components.....	7-1
Table 7.1-2	Summary of Nova Scotia Air Quality Standards ⁽¹⁾	7-9
Table 7.1-3	Summary of Ontario's Ambient Air Quality Criteria (AAQC) ⁽¹⁾	7-9
Table 7.1-4	Summary of Canadian Ambient Air Quality Standards (CAAQS) ⁽¹⁾	7-10
Table 7.1-5	Summary of the results of the IAAMP Post-Kraft Pulp Mill Closure (Stantec 2020)	7-12
Table 7.1-6	Baseline Scenario GHG Emissions (2018-2043).....	7-14
Table 7.1-7	Remediation Project Emissions (2018-2043).....	7-15
Table 7.1-8	Lyons Brook Climate Indices.....	7-15

Table 7.1-9	Climate Matrix	7-16
Table 7.1-10	Climate Change Resilience Assessments	7-17
Table 7.1-11	Analytical Results Summary Sediment	7-34
Table 7.1-12	Analytical Results Summary Soil	7-35
Table 7.1-13	Historic (1994) Hydraulic Conductivity Test Results	7-47
Table 7.1-14	Historic (2016) Hydraulic Conductivity Test Results	7-47
Table 7.1-15	Historic (2007) Hydraulic Conductivity Test Results	7-50
Table 7.1-16	Historic (2016) Hydraulic Conductivity Test Results	7-51
Table 7.1-17	Groundwater Elevation Data	7-53
Table 7.1-18	Groundwater Elevation Range in the Peninsula Well Field	7-57
Table 7.1-19	Groundwater Elevation Range in the PLFN Well Field Overburden Monitoring Wells.....	7-58
Table 7.1-20	Groundwater Elevation Range in the PLFN Well Field Shallow Bedrock Monitoring Wells.....	7-58
Table 7.1-21	Groundwater Elevation Range in the PLFN Well Field Bedrock Monitoring Wells.	7-62
Table 7.1-22	Groundwater Recoveries at the PLFN Well Monitoring Wells	7-72
Table 7.1-23	Recent Background Manganese Concentrations (ug/L)	7-74
Table 7.1-24	2019 MW4A/B Indicator Parameter Results	7-75
Table 7.1-25	Range of Concentrations of Selected Parameters Peninsula Wellfield	7-76
Table 7.1-26	PLFN Well Field Groundwater Quality Monitoring Data from 2006 to 2010	7-76
Table 7.1-27	Average Monthly and Annual Flows in Litres per Second (L/s) Estimated from Hourly Flows Simulated by the Model.....	7-84
Table 7.1-28	Average Seasonal Flows for all Sub Catchments, Dam Node, Estuary, and Point C.....	7-85
Table 7.1-29	Seasonal Parameter Exceedance.....	7-89
Table 7.1-30	Description of Wetlands and Summary of Ratings for Grouped Functions, Wetland Condition and Wetland Risk.....	7-100
Table 7.1-31	List of Fish Species Captured in Boat Harbour and Boat Harbour Wetlands and Watercourses	7-120
Table 7.1-32	List of Fish and Shellfish Species Identified in Pictou Road (Northumberland Strait), 2004.....	7-131
Table 7.1-33	List of Fish Species Captured in Boat Harbour and Boat Harbour Wetlands and Watercourses	7-134
Table 7.1-34	Habitat Available within Site Study Areas for Priority Fish Species.....	7-135

Table 7.1-35	Diversity and Abundance of Shorebird Species at all Watch Count Stations	7-146
Table 7.1-36	Atlantic Canada Conservation Data Centre (ACCDC)S Rank Definitions	7-148
Table 7.1-37	Priority Species Observed in Site Study Area.....	7-150
Table 7.1-38	Presence of Marine SAR in the Regional Study Area.....	7-152
Table 7.1-39	Mi'kmaq Community Profiles (as referenced in Husky 2018)	7-158
Table 7.1-40	Labour Force Characteristics	7-185
Table 7.1-41	Employment by Major Industry.....	7-186
Table 7.1-42	Median and Average Household Income	7-187
Table 7.1-43	Educational Attainment	7-187
Table 7.1-44	Educational Attainment for Those with a Post-Secondary Certificate, Diploma or Degree.....	7-188
Table 7.2-1	Applicable Phases for Project Components and Expected Timing/Duration	7-202
Table 7.2-2	Spatial Boundary Assessment by Valued Component	7-203
Table 7.2-3	Potential Project Component Interactions with Valued Components.....	7-207
Table 7.2-4	Characterization Criteria for Residual Environmental Effects	7-214
Table 7.3-1	Mitigation Measures and Best Management Practices.....	7-219
Table 7.3-2	Air Quality Modelling Scenarios	7-227
Table 7.3-3	Summary of Air Quality Modelling Results.....	7-229
Table 7.3-4	Summary of Airborne Metals Modelling Results	7-230
Table 7.3-5	Comparison of Anticipated Air Quality Concentrations to Canadian Ambient Air Quality Standards (CAAQS) ⁽¹⁾	7-232
Table 7.3-6	Ambient Air Quality Standards for this Assessment	7-235
Table 7.3-7	Potential Interactions Between Waste Management Activities and Air Quality and Odour and the Significance of the Resulting Potential Effects from the Interactions.....	7-235
Table 7.3-8	Direct and Indirect Impacts of Waste Management Activities on Air Quality and Odour.....	7-238
Table 7.3-9	Mitigation Measures for the Effects of Waste Management Activities on Air Quality and Odour	7-240
Table 7.3-10	Potential Interactions Between Dredging Activities and Air Quality and Odour and the Significance of the Resulting Potential Effects from the Interactions.....	7-240
Table 7.3-11	Direct and Indirect Impacts of Dredging Activities on Air Quality and Odour.....	7-242
Table 7.3-12	Mitigation Measures for Effects of Dredging on Air Quality and Odour	7-242

Table 7.3-13	Potential Interactions Between Wetland Management Activities and Air Quality and Odour and the Significance of the Resulting Potential Effects from the Interactions	7-243
Table 7.3-14	Direct and Indirect Impacts of Wetland Management Activities on Air Quality and Odour.....	7-244
Table 7.3-15	Mitigation Measures for Effects of Wetland Management Activities on Air Quality and Odour.....	7-244
Table 7.3-16	Potential Interactions Between the Bridge works at Highway 348 and Air Quality and Odour and the Significance of the Resulting Potential Effects from the Interactions	7-245
Table 7.3-17	Direct and Indirect Impacts of the Bridge works at Highway 348 on Air Quality and Odour.....	7-246
Table 7.3-18	Potential Interactions Between Pipeline Decommissioning and Air Quality and Odour and the Significance of the Resulting Potential Effects from the Interactions	7-247
Table 7.3-19	Potential Interactions Between Treatment Buildings and Air Quality and Odour and the Significance of the Resulting Potential Effects from the Interactions.....	7-248
Table 7.3-20	Direct and Indirect Impacts of Treatment Buildings on Air Quality and Odour	7-249
Table 7.3-21	Mitigation Measures for Effects of Treatment Buildings on Air Quality and Odour.....	7-249
Table 7.3-22	Potential Interactions Between the Dam and Air Quality and Odour and the Significance of the Resulting Potential Effects from the Interactions.....	7-250
Table 7.3-23	Residual Environmental Effects for Air Quality and Odour	7-253
Table 7.3-24	Provincial, Federal, and International Context of Projected GHG Emissions	7-255
Table 7.3-25	Global Warming Potential Values	7-257
Table 7.3-26	Potential Interactions Between Waste Management Activities and GHG and the Significance of the Resulting Potential Effects from the Interactions.....	7-259
Table 7.3-27	Direct and Indirect Impacts of Waste Management Activities on GHG.....	7-261
Table 7.3-28	Mitigation Measures for the Effects of Waste Management Activities on GHG....	7-261
Table 7.3-29	Potential Interactions Between Dredging Activities and GHG and the Significance of the Resulting Potential Effects from the Interactions.....	7-262
Table 7.3-30	Potential Interactions Between Wetland Management Activities and GHG and the Significance of the Resulting Potential Effects from the Interactions.....	7-263
Table 7.3-31	Potential Interactions Between Bridge at Highway 348 and GHG and the Significance of the Resulting Potential Effects from the Interactions.....	7-264
Table 7.3-32	Potential Interactions Between Pipeline Decommissioning and GHG and the Significance of the Resulting Potential Effects from the Interactions.....	7-265

Table 7.3-33	Potential Interactions Between Treatment Buildings and GHG and the Significance of the Resulting Potential Effects from the Interactions.....	7-266
Table 7.3-34	Potential Interactions Between the Dam and GHG and the Significance of the Resulting Potential Effects from the Interactions	7-267
Table 7.3-35	Residual Environmental Effects for GHG.....	7-269
Table 7.3-36	Acoustic Modelling Parameter.....	7-272
Table 7.3-37	Potential Interactions Between Waste Management Activities and Noise and the Significance of the Resulting Potential Effects from the Interactions.....	7-275
Table 7.3-38	Direct and Indirect Impacts of Waste Management Activities on Noise	7-277
Table 7.3-39	Mitigation Measures for the Effects of Waste Management Activities on Noise...	7-277
Table 7.3-40	Potential Interactions Between Dredging Activities and Noise and the Significance of the Resulting Potential Effects from the Interactions.....	7-278
Table 7.3-41	Direct and Indirect Impacts of Dredging Activities on Noise	7-279
Table 7.3-42	Mitigation Measures for Effects of the Dredging on Noise.....	7-279
Table 7.3-43	Potential Interactions Between Wetland Management Activities and Noise and the Significance of the Resulting Potential Effects from the Interactions.....	7-280
Table 7.3-44	Direct and Indirect Impacts of Wetland Management Activities on Noise	7-280
Table 7.3-45	Mitigation Measures for Effects of Wetland Management Activities on Noise.....	7-281
Table 7.3-46	Potential Interactions Between Bridge works at Highway 348 and Noise and the Significance of the Resulting Potential Effects from the Interactions.....	7-282
Table 7.3-47	Direct and Indirect Impacts of the Bridge works at Highway 348 on Noise	7-283
Table 7.3-48	Mitigation Measures for Effects of the Bridge works at Highway 348 on Noise....	7-283
Table 7.3-49	Potential Interactions Between Pipeline Decommissioning and Noise and the Significance of the Resulting Potential Effects from the Interactions.....	7-284
Table 7.3-50	Potential Interactions Between Treatment Buildings and Noise and the Significance of the Resulting Potential Effects from the Interactions.....	7-285
Table 7.3-51	Direct and Indirect Impacts of Treatment Buildings on Noise	7-285
Table 7.3-52	Mitigation Measures for Effects of Treatment Buildings on Noise	7-286
Table 7.3-53	Potential Interactions Between the Dam and Noise and the Significance of the Resulting Potential Effects from the Interactions	7-286
Table 7.3-54	Direct and Indirect Impacts of the Dam on Noise.....	7-288
Table 7.3-55	Mitigation Measures for Effects of Dam and Noise.....	7-288
Table 7.3-56	Site Preparation and Construction and Operation	7-289
Table 7.3-57	Residual Environmental Effects for Noise.....	7-292

Table 7.3-58	Potential Interactions Between Waste Management Activities and Light and the Significance of the Resulting Potential Effects from the Interactions.....	7-296
Table 7.3-59	Direct and Indirect Impacts of Waste Management Activities on Light.....	7-298
Table 7.3-60	Mitigation Measures for the Effects of Waste Management Activities on Light	7-298
Table 7.3-61	Potential Interactions Between Dredging Activities and Light and the Significance of the Resulting Potential Effects from the Interactions.....	7-299
Table 7.3-62	Comparison of Light Levels at Receptors During Dredging Activities Post Curfew Operations	7-300
Table 7.3-63	Direct and Indirect Impacts of Dredging Activities on Light.....	7-300
Table 7.3-64	Mitigation Measures for Effects of the Dredging on Light	7-301
Table 7.3-65	Potential Interactions Between Wetland Management Activities and Light and the Significance of the Resulting Potential Effects from the Interactions.....	7-301
Table 7.3-66	Direct and Indirect Impacts of Wetland Management Activities on Light.....	7-302
Table 7.3-67	Mitigation Measures for Effects of Wetland Management Activities on Light	7-302
Table 7.3-68	Potential Interactions Between Bridge works at Highway 348 and Light and the Significance of the Resulting Potential Effects from the Interactions.....	7-303
Table 7.3-69	Direct and Indirect Impacts of the Bridge at Highway 348 on Light	7-304
Table 7.3 70	Mitigation Measures for Effects of the Bridge works at Highway 348 on Light	7-304
Table 7.3-71	Potential Interactions Between Pipeline Decommissioning and Light and the Significance of the Resulting Potential Effects from the Interactions.....	7-305
Table 7.3-72	Potential Interactions Between Treatment Buildings and Light and the Significance of the Resulting Potential Effects from the Interactions.....	7-306
Table 7.3-73	Potential Interactions Between the Dam and Light and the Significance of the Resulting Potential Effects from the Interactions	7-307
Table 7.3-74	Direct and Indirect Impacts of the Dam on Light.....	7-307
Table 7.3-75	Mitigation Measures for Effects of Dam and Light	7-308
Table 7.3-76	Residual Environmental Effects for Light	7-309
Table 7.3-77	Potential Interactions Between Waste Management Activities and Geology, Geochemistry and Soil and the Significance of the Resulting Potential Effects from the Interactions.....	7-311
Table 7.3-78	Direct and Indirect Impacts of Waste Management Activities on Geology, Geochemistry, and Soil	7-313
Table 7.3-79	Mitigation Measures for the Effects of Waste Management Activities on Geology, Geochemistry and Soil.....	7-313

Table 7.3-80	Potential Interactions Between Dredging Activities and Geology, Geochemistry and Soil and the Significance of the Resulting Potential Effects from the Interactions.....	7-314
Table 7.3-81	Direct and Indirect Impacts of Dredging Activities on Geology, Geochemistry, and Soil.....	7-315
Table 7.3-82	Mitigation Measures for Effects of the Dredging on Geology, Geochemistry, and Soil.....	7-315
Table 7.3-83	Potential Interactions Between Wetland Management Activities and Geology, Geochemistry, and Soil and the Significance of the Resulting Potential Effects from the Interactions.....	7-316
Table 7.3-84	Direct and Indirect Impacts of Wetland Management Activities on Geology, Geochemistry, and Soil.....	7-317
Table 7.3-85	Mitigation Measures for Effects of Wetland Management Activities on Geology, Geochemistry, and Soil.....	7-317
Table 7.3-86	Potential Interactions Between Bridge works at Highway 348 and Geology, Geochemistry and Soil and the Significance of the Resulting Potential Effects from the Interactions.....	7-318
Table 7.3-87	Direct and Indirect Impacts of the Bridge works at Highway 348 on Geology, Geochemistry, and Soil.....	7-319
Table 7.3-88	Mitigation Measures for Effects of the Bridge works at Highway 348 on Geology, Geochemistry and Soil.....	7-319
Table 7.3-89	Potential Interactions Between Pipeline Decommissioning and Geology, Geochemistry and Soil and the Significance of the Resulting Potential Effects from the Interactions.....	7-320
Table 7.3-90	Potential Interactions Between Treatment Buildings and Geology, Geochemistry and Soil and the Significance of the Resulting Potential Effects from the Interactions.....	7-321
Table 7.3-91	Potential Interactions Between the Dam and Geology, Geochemistry and Soil and the Significance of the Resulting Potential Effects from the Interactions.....	7-322
Table 7.3-92	Direct and Indirect Impacts of the Dam on Geology, Geochemistry, and Soil.....	7-323
Table 7.3-93	Mitigation Measures for Effects of Dam and Geology, Geochemistry and Soil	7-323
Table 7.3-94	Residual Environmental Effects for Geology, Geochemistry and Soil.....	7-325
Table 7.3-95	Potential Interactions Between Waste Management Activities and Groundwater and the Significance of the Resulting Potential Effects from the Interactions.....	7-332
Table 7.3-96	HELP Model Results - Containment Cell Leachate Generation.....	7-335
Table 7.3-97	Direct and Indirect Impacts of Waste Management Activities on Groundwater....	7-336
Table 7.3-98	Mitigation Measures for the Effects of Waste Management Activities on Groundwater.....	7-337

Table 7.3-99	Potential Interactions Between Dredging Activities and Groundwater and the Significance of the Resulting Potential Effects from the Interactions.....	7-338
Table 7.3-100	Direct and Indirect Impacts of Dredging Activities on Groundwater.....	7-341
Table 7.3-101	Potential Interactions Between Wetland Management Activities and Groundwater and the Significance of the Resulting Potential Effects from the Interactions	7-342
Table 7.3-102	Direct and Indirect Impacts of Wetland Management Activities on Groundwater.	7-343
Table 7.3-103	Mitigation Measures for Effects of Wetland Management Activities on Groundwater.....	7-343
Table 7.3-104	Potential Interactions Between Bridge works at Highway 348 and Groundwater and the Significance of the Resulting Potential Effects from the Interactions.....	7-344
Table 7.3-105	Potential Interactions Between Pipeline Decommissioning and Groundwater and the Significance of the Resulting Potential Effects from the Interactions.....	7-345
Table 7.3-106	Direct and Indirect Impacts of Pipeline Decommissioning Activities on Groundwater.....	7-346
Table 7.3-107	Mitigation Measures for Effects of Pipeline Decommissioning Activities on Groundwater.....	7-346
Table 7.3-108	Potential Interactions Between Treatment Buildings and Groundwater and the Significance of the Resulting Potential Effects from the Interactions.....	7-347
Table 7.3-109	Potential Interactions Between the Dam and Groundwater and the Significance of the Resulting Potential Effects from the Interactions	7-348
Table 7.3-110	Direct and Indirect Impacts of the Dam on Groundwater.....	7-349
Table 7.3-111	Residual Environmental Effects for Groundwater	7-351
Table 7.3-112	Potential Interactions Between Waste Management Activities and Surface Water and the Significance of the Resulting Potential Effects from the Interactions	7-356
Table 7.3-113	Direct and Indirect Impacts of Waste Management Activities on Surface Water..	7-361
Table 7.3-114	Mitigation Measures for the Effects of Waste Management Activities on Surface Water	7-362
Table 7.3-115	Potential Interactions Between Dredging Activities and Surface Water and the Significance of the Resulting Potential Effects from the Interactions.....	7-364
Table 7.3-116	Direct and Indirect Impacts of Dredging Activities on Surface Water	7-366
Table 7.3-117	Mitigation Measures for Effects of the Dredging on Surface Water	7-367
Table 7.3-118	Potential Interactions Between Wetland Management Activities and Surface Water and the Significance of the Resulting Potential Effects from the Interactions	7-367
Table 7.3-119	Direct and Indirect Impacts of Wetland Management Activities on Surface Water	7-369

Table 7.3-120	Mitigation Measures for Effects of Wetland Management Activities on Surface Water	7-369
Table 7.3-121	Potential Interactions Between Bridge works at Highway 348 and Surface Water and the Significance of the Resulting Potential Effects from the Interactions.....	7-370
Table 7.3-122	Direct and Indirect Impacts of the Bridge at Highway 348 on Surface Water	7-373
Table 7.3-123	Mitigation Measures for Effects of the Bridge works at Highway 348 on Surface Water	7-373
Table 7.3-124	Potential Interactions Between Pipeline Decommissioning and Surface Water and the Significance of the Resulting Potential Effects from the Interactions.....	7-374
Table 7.3-125	Direct and Indirect Impacts of Pipeline Decommissioning Activities on Surface Water	7-375
Table 7.3-126	Mitigation Measures for Effects of Pipeline Decommissioning Activities on Surface Water	7-375
Table 7.3-127	Potential Interactions Between Treatment Buildings and Surface Water and the Significance of the Resulting Potential Effects from the Interactions.....	7-376
Table 7.3-128	Potential Interactions Between the Dam and Surface Water and the Significance of the Resulting Potential Effects from the Interactions	7-377
Table 7.3-129	Direct and Indirect Impacts of the Dam on Surface Water.....	7-378
Table 7.3-130	Mitigation Measures for Effects of Dam and Surface Water	7-379
Table 7.3-131	Residual Environmental Effects for Surface Water	7-382
Table 7.3-132	Potential Interactions Between Waste Management Activities and Terrestrial Habitat and Vegetation and the Significance of the Resulting Potential Effects from the Interactions.....	7-387
Table 7.3-133	Direct and Indirect Impacts of Waste Management Activities on Terrestrial Habitat and Vegetation.....	7-392
Table 7.3-134	Mitigation Measures for the Effects of Waste Management Activities on Terrestrial Habitat and Vegetation	7-393
Table 7.3-135	Potential Interactions Between Dredging Activities and Terrestrial Habitat and Vegetation and the Significance of the Resulting Potential Effects from the Interactions	7-394
Table 7.3-136	Direct and Indirect Impacts of Dredging Activities on Terrestrial Habitat and Vegetation	7-396
Table 7.3-137	Mitigation Measures for Effects of the Dredging on Terrestrial Habitat and Vegetation	7-396
Table 7.3-138	Potential Interactions Between Wetland Management Activities and Terrestrial Habitat and Vegetation and the Significance of the Resulting Potential Effects from the Interactions.....	7-397

Table 7.3-139	Direct and Indirect Impacts of Wetland Management Activities on Terrestrial Habitat and Vegetation.....	7-400
Table 7.3-140	Mitigation Measures for Effects of Wetland Management Activities on Terrestrial Habitat and Vegetation.....	7-401
Table 7.3-141	Potential Interactions Between Bridge works at Highway 348 and Terrestrial Habitat and Vegetation and the Significance of the Resulting Potential Effects from the Interactions.....	7-401
Table 7.3-142	Direct and Indirect Impacts of the Bridge works at Highway 348 on Terrestrial Habitat and Vegetation.....	7-404
Table 7.3-143	Mitigation Measures for Effects of the Bridge works at Highway 348 on Terrestrial Habitat and Vegetation	7-404
Table 7.3-144	Potential Interactions Between Pipeline Decommissioning and Terrestrial Habitat and Vegetation and the Significance of the Resulting Potential Effects from the Interactions.....	7-405
Table 7.3-145	Direct and Indirect Impacts of Pipeline Decommissioning on Terrestrial Habitat and Vegetation	7-407
Table 7.3-146	Mitigation Measures for Effects of the Pipeline Decommissioning on Terrestrial Habitat and Vegetation.....	7-407
Table 7.3-147	Potential Interactions Between Treatment Buildings and Terrestrial Habitat and Vegetation and the Significance of the Resulting Potential Effects from the Interactions.....	7-408
Table 7.3-148	Potential Interactions Between the Dam and Terrestrial Habitat and Vegetation and the Significance of the Resulting Potential Effects from the Interactions.....	7-409
Table 7.3-149	Direct and Indirect Impacts of the Dam on Terrestrial Habitat and Vegetation.....	7-412
Table 7.3-150	Mitigation Measures for Effects of Dam and Terrestrial Habitat and Vegetation..	7-412
Table 7.3-151	Residual Environmental Effects for Terrestrial Habitat and Vegetation.....	7-414
Table 7.3-152	Potential Interactions between Waste Management Activities and Wetlands and the Significance of the Resulting Potential Effects from the Interactions.....	7-418
Table 7.3-153	Direct and Indirect Impacts of Waste Management Activities on Wetlands.....	7-421
Table 7.3-154	Mitigation Measures for the Effects of Waste Management Activities on Wetlands.....	7-422
Table 7.3-155	Potential Interactions Between Dredging Activities and Wetlands and the Significance of the Resulting Potential Effects from the Interactions.....	7-422
Table 7.3-156	Direct and Indirect Impacts of Dredging Activities on Wetlands	7-423
Table 7.3-157	Mitigation Measures for the Effects of Dredging Activities on Wetlands.....	7-423
Table 7.3-158	Potential Interactions Between Wetland Management Activities and Wetlands and the Significance of the Resulting Potential Effects from the Interactions.....	7-424

Table 7.3-159	Area and Volume of Sediment Impacts Requiring Remediation in Freshwater Wetlands.....	7-425
Table 7.3-160	Direct and Indirect Impacts of Wetland Management Activities on Wetlands.....	7-432
Table 7.3-161	Mitigation Measures for Effects of Wetland Management Activities on Wetlands	7-434
Table 7.3-162	Potential Interactions Between the Bridge works at Highway 348 and Wetlands and the Significance of the Resulting Potential Effects from the Interactions.....	7-435
Table 7.3-163	Potential Interactions Between Pipeline Decommissioning and Wetlands and the Significance of the Resulting Potential Effects from the Interactions.....	7-437
Table 7.3-164	Potential Interactions Between Treatment Buildings and Wetlands and the Significance of the Resulting Potential Effects from the Interactions.....	7-438
Table 7.3-165	Potential Interactions Between the Dam and Wetlands and the Significance of the Resulting Potential Effects from the Interactions	7-439
Table 7.3-166	Direct and Indirect Impacts of the Dam on Wetlands.....	7-440
Table 7.3-167	Mitigation Measures for Effects of Dam Activities and Wetlands.....	7-441
Table 7.3-168	Residual Environmental Effects for Wetlands	7-443
Table 7.3-169	Potential Interactions Between Waste Management Activities and Mammals and Wildlife and the Significance of the Resulting Potential Effects from the Interactions	7-447
Table 7.3-170	Direct and Indirect Impacts of Waste Management Activities on Mammals and Wildlife	7-449
Table 7.3-171	Mitigation Measures for the Effects of Waste Management Activities on Mammals and Wildlife	7-450
Table 7.3-172	Potential Interactions Between Dredging Activities and Mammals and Wildlife and the Significance of the Resulting Potential Effects from the Interactions.....	7-451
Table 7.3-173	Direct and Indirect Impacts of Dredging Activities on Mammals and Wildlife	7-452
Table 7.3-174	Mitigation Measures for Effects of the Dredging on Mammals and Wildlife.....	7-453
Table 7.3-175	Potential Interactions Between Wetland Management Activities and Mammals and Wildlife and the Significance of the Resulting Potential Effects from the Interactions	7-454
Table 7.3-176	Direct and Indirect Impacts of Wetland Management Activities on Mammals and Wildlife	7-455
Table 7.3-177	Mitigation Measures for Effects of Wetland Management Activities on Mammals and Wildlife	7-456
Table 7.3-178	Potential Interactions Between the Bridge works at Highway 348 and Mammals and Wildlife and the Significance of the Resulting Potential Effects from the Interactions	7-456

Table 7.3-179	Direct and Indirect Impacts of the Bridge works at Highway 348 on Mammals and Wildlife	7-457
Table 7.3-180	Mitigation Measures for Effects of the Bridge works at Highway 348 on Mammals and Wildlife	7-458
Table 7.3-181	Potential Interactions Between Pipeline Decommissioning and Mammals and Wildlife and the Significance of the Resulting Potential Effects from the Interactions	7-459
Table 7.3-182	Direct and Indirect Impacts of Pipeline Decommissioning on Mammals and Wildlife	7-459
Table 7.3-183	Potential Interactions Between Treatment Buildings and Mammals and Wildlife and the Significance of the Resulting Potential Effects from the Interactions.....	7-461
Table 7.3-184	Potential Interactions Between the Dam and Mammals and Wildlife and the Significance of the Resulting Potential Effects from the Interactions.....	7-462
Table 7.3-185	Direct and Indirect Impacts of the Dam on Mammals and Wildlife	7-463
Table 7.3-186	Residual Environmental Effects for Mammals and Wildlife.....	7-465
Table 7.3-187	Potential Interactions between Waste Management Activities and Marine Environment and the Significance of the Resulting Potential Effects from the Interactions	7-468
Table 7.3-188	Potential Interactions Between Dredging Activities and Marine Environment and the Significance of the Resulting Potential Effects from the Interactions.....	7-470
Table 7.3-189	Potential Interactions Between Wetland Management Activities and Marine Environment and the Significance of the Resulting Potential Effects from the Interactions	7-471
Table 7.3-190	Area and Volume of Sediment Impacts Requiring Remediation the Estuary	7-472
Table 7.3-191	Description of Wetland and Expected Area of Impact	7-475
Table 7.3-192	Direct and Indirect Impacts of Wetland Management Activities on Marine Environment	7-476
Table 7.3-193	Mitigation Measures for Effects of Wetland Management Activities on the Marine Environment	7-478
Table 7.3-194	Potential Interactions Between Bridge works at Highway 348 and Marine Environment and the Significance of the Resulting Potential Effects from the Interactions	7-479
Table 7.3-195	Potential Interactions Between Pipeline Decommissioning and Marine Environment and the Significance of the Resulting Potential Effects from the Interactions	7-480
Table 7.3-196	Potential Interactions Between Treatment Buildings and Marine Environment and the Significance of the Resulting Potential Effects from the Interactions.....	7-481

Table 7.3-197	Potential Interactions Between the Dam and Marine Environment and the Significance of the Resulting Potential Effects from the Interactions.....	7-482
Table 7.3-198	Direct and Indirect Impacts of the Dam on the Marine Environment	7-483
Table 7.3-199	Mitigation Measures for Effects of Dam and the Marine Environment.....	7-485
Table 7.3-200	Residual Environmental Effects for the Marine Environment.....	7-487
Table 7.3-201	Potential Interactions between Waste Management Activities and Fish and Aquatic Habitat and the Significance of the Resulting Potential Effects from the Interactions	7-492
Table 7.3-202	Direct and Indirect Impacts of Waste Management Activities on Fish and Aquatic Habitat	7-493
Table 7.3-203	Mitigation Measures for the Effects of Waste Management Activities on Fish and Aquatic Habitat	7-493
Table 7.3-204	Potential Interactions Between Dredging Activities and Fish and Aquatic Habitat and the Significance of the Resulting Potential Effects from the Interactions.....	7-494
Table 7.3-205	Direct and Indirect Impacts of Dredging Activities on Fish and Aquatic Habitat ...	7-496
Table 7.3-206	Mitigation Measures for Effects of the Dredging on Fish and Aquatic Habitat.....	7-497
Table 7.3-207	Potential Interactions between Wetland Management Activities and Fish and Aquatic Habitat and the Significance of the Resulting Potential Effects from the Interactions	7-498
Table 7.3-208	Direct and Indirect Impacts of Wetland Management Activities on Fish and Aquatic Habitat	7-499
Table 7.3-209	Mitigation Measures for Effects of Wetland Management Activities on Fish and Aquatic Habitat	7-500
Table 7.3-210	Potential Interactions Between Bridge works at Highway 348 and Fish and Aquatic Habitat and the Significance of the Resulting Potential Effects from the Interactions	7-501
Table 7.3-211	Direct and Indirect Impacts of the Bridge works at Highway 348 on Fish and Aquatic Habitat	7-502
Table 7.3-212	Mitigation Measures for Effects of the Bridge works at Highway 348 on Fish and Aquatic Habitat	7-503
Table 7.3-213	Potential Interactions Between Pipeline Decommissioning and Fish and Aquatic Habitat and the Significance of the Resulting Potential Effects from the Interactions	7-504
Table 7.3-214	Potential Interactions Between Treatment Buildings and Fish and Aquatic Habitat and the Significance of the Resulting Potential Effects from the Interactions	7-505
Table 7.3-215	Potential Interactions Between the Dam and Fish and Aquatic Habitat and the Significance of the Resulting Potential Effects from the Interactions.....	7-506

Table 7.3-216	Direct and Indirect Impacts of the Dam on Fish and Aquatic Habitat	7-507
Table 7.3-217	Mitigation Measures for Effects of Dam and Fish and Aquatic Habitat.....	7-508
Table 7.3-218	Residual Environmental Effects for Fish and Aquatic Habitat.....	7-510
Table 7.3-219	Potential Interactions Between Waste Management Activities and Migratory Birds and the Significance of the Resulting Potential Effects from the Interactions	7-515
Table 7.3-220	Direct and Indirect Impacts of Waste Management Activities on Migratory Birds	7-517
Table 7.3-221	Mitigation Measures for the Effects of Waste Management Activities on Migratory Birds	7-519
Table 7.3-222	Potential Interactions Between Dredging Activities and Migratory Birds and the Significance of the Resulting Potential Effects from the Interactions.....	7-520
Table 7.3-223	Direct and Indirect Impacts of Dredging Activities on Migratory Birds	7-521
Table 7.3-224	Mitigation Measures for Effects of the Dredging on Migratory Birds.....	7-522
Table 7.3-225	Potential Interactions Between Wetland Management Activities and Migratory Birds and the Significance of the Resulting Potential Effects from the Interactions	7-523
Table 7.3-226	Direct and Indirect Impacts of Wetland Management Activities on Migratory Birds	7-524
Table 7.3-227	Mitigation Measures for Effects of Wetland Management Activities on Migratory Birds	7-526
Table 7.3-228	Potential Interactions Between Bridge works at Highway 348 and Migratory Birds and the Significance of the Resulting Potential Effects from the Interactions	7-526
Table 7.3-229	Direct and Indirect Impacts of the Bridge works at Highway 348 on Migratory Birds	7-528
Table 7.3-230	Potential Interactions Between Pipeline Decommissioning and Migratory Birds and the Significance of the Resulting Potential Effects from the Interactions.....	7-529
Table 7.3-231	Direct and Indirect Impacts of Pipeline Decommissioning on Migratory Birds.....	7-529
Table 7.3-232	Potential Interactions Between Treatment Buildings and Migratory Birds and the Significance of the Resulting Potential Effects from the Interactions.....	7-530
Table 7.3-233	Direct and Indirect Impacts of Treatment Buildings on Migratory Birds	7-531
Table 7.3-234	Mitigation Measures for Effects of Treatment Buildings on Migratory Birds	7-532
Table 7.3-235	Potential Interactions Between the Dam and Migratory Birds and the Significance of the Resulting Potential Effects from the Interactions.....	7-533
Table 7.3-236	Direct and Indirect Impacts of the Dam on Migratory Birds	7-534
Table 7.3-237	Mitigation Measures for Effects of the Dam on Migratory Birds.....	7-535

Table 7.3-238	Residual Environmental Effects for Migratory Birds.....	7-537
Table 7.3-239	Potential Interactions Between Waste Management Activities and Species at Risk and the Significance of the Resulting Potential Effects from the Interactions.....	7-542
Table 7.3-240	Direct and Indirect Impacts of Waste Management Activities on Species at Risk.....	7-544
Table 7.3-241	Mitigation Measures for the Effects of Waste Management Activities on SAR.....	7-545
Table 7.3-242	Potential Interactions Between Dredging Activities and SAR and the Significance of the Resulting Potential Effects from the Interactions.....	7-546
Table 7.3-243	Direct and Indirect Impacts of Dredging Activities on SAR	7-547
Table 7.3-244	Mitigation Measures for Effects of the Dredging on SAR.....	7-548
Table 7.3-245	Potential Interactions Between Wetland Management Activities and SAR and the Significance of the Resulting Potential Effects from the Interactions.....	7-549
Table 7.3-246	Direct and Indirect Impacts of Wetland Management Activities on SAR	7-550
Table 7.3-247	Mitigation Measures for Effects of Wetland Management Activities on SAR.....	7-551
Table 7.3-248	Potential Interactions Between Bridge works at Highway 348 and SAR and the Significance of the Resulting Potential Effects from the Interactions.....	7-551
Table 7.3-249	Direct and Indirect Impacts of the Bridge at Highway 348 on SAR.....	7-553
Table 7.3-250	Mitigation Measures for Effects of the Bridge at Highway 348 on SAR	7-553
Table 7.3-251	Potential Interactions Between Pipeline Decommissioning and SAR and the Significance of the Resulting Potential Effects from the Interactions.....	7-554
Table 7.3-252	Direct and Indirect Impacts of Pipeline Decommissioning Activities on SAR	7-555
Table 7.3-253	Mitigation Measures for Effects of Pipeline Decommissioning Activities on Marine Environment	7-555
Table 7.3-254	Potential Interactions Between Treatment Buildings and SAR and the Significance of the Resulting Potential Effects from the Interactions.....	7-556
Table 7.3-255	Direct and Indirect Impacts of Treatment Buildings on SAR.....	7-556
Table 7.3-256	Mitigation Measures for Effects of Treatment Buildings on SAR	7-557
Table 7.3-257	Potential Interactions Between the Dam and SAR and the Significance of the Resulting Potential Effects from the Interactions	7-558
Table 7.3-258	Direct and Indirect Impacts of the Dam on SAR	7-559
Table 7.3-259	Mitigation Measures Effects of Dam on SAR	7-560
Table 7.3-260	Residual Environmental Effects for SAR.....	7-561
Table 7.3-261	Potential Interactions Between Waste Management Activities and Mi'kmaq of Nova Scotia and the Significance of the Resulting Potential Effects from the Interactions.....	7-573

Table 7.3-262	Direct and Indirect Impacts of Waste Management Activities on Mi'kmaq of Nova Scotia.....	7-575
Table 7.3-263	Mitigation Measures for Potential Effects to Mi'kmaq of Nova Scotia Resulting from Waste Management Activities.....	7-575
Table 7.3-264	Potential Interactions Between Dredging Activities and Mi'kmaq of Nova Scotia and the Significance of the Resulting Potential Effects from the Interactions.....	7-576
Table 7.3-265	Direct and Indirect Impacts of Dredging Activities on Mi'kmaq of Nova Scotia.....	7-577
Table 7.3-266	Mitigation Measures for Potential Effects to Mi'kmaq of Nova Scotia Resulting from Dredging.....	7-577
Table 7.3-267	Potential Interactions Between Wetland Management Activities and Mi'kmaq of Nova Scotia and the Significance of the Resulting Potential Effects from the Interactions.....	7-578
Table 7.3-268	Direct and Indirect Impacts of Wetland Management Activities on Mi'kmaq of Nova Scotia.....	7-579
Table 7.3-269	Mitigation Measures for Potential Effects to Mi'kmaq of Nova Scotia from Wetland Management Activities.....	7-579
Table 7.3-270	Potential Interactions Between Bridge Works at Highway 348 and Mi'kmaq of Nova Scotia and the Significance of the Resulting Potential Effects from the Interactions.....	7-580
Table 7.3-271	Direct and Indirect Impacts of the Bridge Works at Highway 348 on Mi'kmaq of Nova Scotia.....	7-581
Table 7.3-272	Mitigation Measures for Potential Effects to Mi'kmaq of Nova Scotia Resulting from the Bridge Works at Highway 348.....	7-581
Table 7.3-273	Potential Interactions Between Pipeline Decommissioning and Mi'kmaq of Nova Scotia and the Significance of the Resulting Potential Effects from the Interactions.....	7-582
Table 7.3-274	Direct and Indirect Impacts of Pipeline Decommissioning Activities on Mi'kmaq of Nova Scotia.....	7-583
Table 7.3-275	Mitigation Measures for Potential Effects to Mi'kmaq of Nova Scotia Resulting from Pipeline Decommissioning.....	7-583
Table 7.3-276	Potential Interactions Between Treatment Buildings and Mi'kmaq of Nova Scotia and the Significance of the Resulting Potential Effects from the Interactions.....	7-584
Table 7.3-277	Potential Interactions Between the Dam and Mi'kmaq of Nova Scotia and the Significance of the Resulting Potential Effects from the Interactions.....	7-585
Table 7.3-278	Residual Environmental Effects for the Mi'kmaq of Nova Scotia.....	7-588
Table 7.3-279	Potential Interactions Between Waste Management Activities and Economic and Social Environment and the Significance of the Resulting Potential Effects from the Interactions.....	7-592

Table 7.3-280	Direct and Indirect Impacts of Waste Management Activities on Economic and Social Environment	7-594
Table 7.3-281	Mitigation Measures for Potential Economic and Social Effects Resulting from Waste Management Activities	7-595
Table 7.3-282	Potential Interactions Between Dredging Activities and Economic and Social Environment and the Significance of the Resulting Potential Effects from the Interactions	7-595
Table 7.3-283	Direct and Indirect Impacts of Dredging Activities on Economic and Social Environment	7-597
Table 7.3-284	Mitigation Measures for Potential Economic and Social Effects Resulting from Dredging	7-597
Table 7.3-285	Potential Interactions Between Wetland Management Activities and Economic and Social Environment and the Significance of the Resulting Potential Effects from the Interactions.....	7-598
Table 7.3-286	Direct and Indirect Impacts of Wetland Management Activities on Economic and Social Environment	7-599
Table 7.3-287	Potential Interactions Between Bridge Works at Highway 348 and Economic and Social Environment and the Significance of the Resulting Potential Effects from the Interactions.....	7-600
Table 7.3-288	Direct and Indirect Impacts of the Bridge works at Highway 348 on Economic and Social Environment	7-601
Table 7.3-289	Mitigation Measures for Potential Economic and Social Effects Resulting from the Bridge Works at Highway 348.....	7-602
Table 7.3-290	Potential Interactions Between Pipeline Decommissioning and Economic and Social Environment and the Significance of the Resulting Potential Effects from the Interactions.....	7-602
Table 7.3-291	Direct and Indirect Impacts of Pipeline Decommissioning Activities on Economic and Social Environment	7-604
Table 7.3-292	Mitigation Measures for Potential Economic and Social Effects Resulting from Pipeline Decommissioning	7-604
Table 7.3-293	Potential Interactions Between Treatment Buildings and Economic and Social Environment and the Significance of the Resulting Potential Effects from the Interactions	7-605
Table 7.3-294	Potential Interactions Between the Dam and Economic and Social Environment and the Significance of the Resulting Potential Effects from the Interactions.....	7-606
Table 7.3-295	Direct and Indirect Impacts of the Dam on Economic and Social Environment....	7-607
Table 7.3-296	Mitigation Measures for Potential Economic and Social Effects Resulting from the Dam	7-607

Table 7.3-297	Residual Environmental Effects for the Economic and Social Environment.....	7-609
Table 7.3-298	Potential Interactions between Waste Management Activities and Archaeological/Cultural Heritage Resources and the Significance of the Resulting Potential Effects from the Interactions	7-614
Table 7.3-299	Direct and Indirect Impacts of Waste Management Activities on Archaeological/Cultural Heritage Resources	7-616
Table 7.3-300	Mitigation Measures for Effects of Waste Management Activities on Archaeological/Cultural Heritage Resources	7-616
Table 7.3-301	Potential Interactions Between Dredging Activities and Archaeological/Cultural Heritage Resources.....	7-617
Table 7.3-302	Direct and Indirect Impacts of Dredging Activities on Archaeological/Cultural Heritage Resources.....	7-618
Table 7.3-303	Mitigation Measures for Effects of Dredging on Archaeological/Cultural Heritage Resources	7-618
Table 7.3-304	Potential Interactions Between Wetland Management Activities and Archaeological/Cultural Heritage Resources	7-619
Table 7.3-305	Direct and Indirect Impacts of Wetland Management Activities on Archaeological/Cultural Heritage Resources	7-621
Table 7.3-306	Mitigation Measures for Effects of Wetland Management Activities on Archaeological/Cultural Heritage Resources	7-621
Table 7.3-307	Potential Interactions Between Bridge Works at Highway 348 and Archaeological/Cultural Heritage Resources	7-622
Table 7.3-308	Direct and Indirect Impacts of the Bridge Works at Highway 348 on Archaeological/Cultural Heritage Resources	7-623
Table 7.3-309	Mitigation Measures for Effects of the Bridge Works at Highway 348 on Archaeological/Cultural Heritage Resources	7-624
Table 7.3-310	Potential Interactions Between Pipeline Decommissioning and Archaeological/Cultural Heritage Resources	7-624
Table 7.3-311	Direct and Indirect Impacts of Pipeline Decommissioning Activities on Archaeological/Cultural Heritage Resources	7-626
Table 7.3-312	Mitigation Measures for Effects of Pipeline Decommissioning Activities on Archaeological/Cultural Heritage Resources	7-626
Table 7.3-313	Potential Interactions Between Treatment Buildings and Archaeological/Cultural Heritage Resources.....	7-627
Table 7.3-314	Potential Interactions Between the Dam and Archaeological/Cultural Heritage Resources	7-628
Table 7.3-315	Direct and Indirect Impacts of the Dam on Archaeological/Cultural Heritage Resources	7-629

Table 7.3-316	Mitigation Measures for Effects of Dam and Archaeological/Cultural Heritage Resources	7-629
Table 7.3-317	Residual Environmental Effects for Archaeological/Cultural Heritage Resources	7-631
Table 7.3-318	Exposure Pathway Summary	7-634
Table 7.3-319	Potential Interactions Between Waste Management Activities and Human Health and the Significance of the Resulting Potential Effects from the Interactions	7-635
Table 7.3-320	Direct and Indirect Impacts of Waste Management Activities on Human Health..	7-637
Table 7.3-321	Mitigation Measures for the Effects of Waste Management Activities on Human Health	7-637
Table 7.3-322	Potential Interactions Between Dredging Activities and Human Health and the Significance of the Resulting Potential Effects from the Interactions.....	7-638
Table 7.3-323	Direct and Indirect Impacts of Dredging Activities on Human Health	7-640
Table 7.3-324	Mitigation Measures for Effects of the Dredging on Human Health	7-640
Table 7.3-325	Potential Interactions Between Wetland Management Activities and Human Health and the Significance of the Resulting Potential Effects from the Interactions	7-641
Table 7.3-326	Direct and Indirect Impacts of Wetland Management Activities on Human Health	7-642
Table 7.3-327	Mitigation Measures for Effects of Wetland Management Activities on Human Health	7-643
Table 7.3-328	Potential Interactions Between Bridge Works at Highway 348 and Human Health and the Significance of the Resulting Potential Effects from the Interactions	7-644
Table 7.3-329	Direct and Indirect Impacts of the Bridge Works at Highway 348 on Human Health	7-645
Table 7.3-330	Mitigation Measures for Effects of the Bridge Works at Highway 348 on Human Health	7-645
Table 7.3-331	Potential Interactions Between Pipeline Decommissioning and Human Health and the Significance of the Resulting Potential Effects from the Interactions.....	7-646
Table 7.3-332	Direct and Indirect Impacts of Pipeline Decommissioning Activities on Human Health	7-646
Table 7.3-333	Mitigation Measures for Effects of Pipeline Decommissioning Activities on Human Health	7-647
Table 7.3-334	Potential Interactions Between Treatment Buildings and Human Health and the Significance of the Resulting Potential Effects from the Interactions.....	7-648
Table 7.3-335	Potential Interactions Between the Dam and Human Health and the Significance of the Resulting Potential Effects from the Interactions	7-649

Table 7.3-336	Residual Environmental Effects for Human Health	7-651
Table 7.4-1	Credible Accidents and Malfunctions	7-657
Table 7.4-2	Credible Accidents and Malfunctions	7-661
Table 7.4-3	Potential Interactions Between Erosion and Sediment Control Failure and VCs .	7-662
Table 7.4-4	Potential Interactions Between a Containment Cell Failure and VCs	7-665
Table 7.4-5	Potential Interactions Between a Leachate Storage Tank Failure/Tanker Truck Leachate Spill and VCs	7-666
Table 7.4-6	Potential Interactions Between On-Site Hazardous Material Spill and VCs	7-668
Table 7.4-7	Potential Interactions Between Surface Water Management Pond Failure and VCs	7-671
Table 7.4-8	Potential Interactions Between Bridge Failure and VCs	7-672
Table 7.4-9	Potential Interactions Between Off-Site Trucking Accidents and the VCs	7-674
Table 7.4-10	Potential Interactions Between Vehicle Collisions and VCs	7-678
Table 7.4-11	Potential Interactions Between Project Related Fires and VCs	7-680
Table 7.4-12	Climate Normals Data Sources (1981 – 2010)	7-683
Table 7.4-13	Lyons Brook Climate Indices	7-684
Table 7.4-14	Precipitation records (Lyons Brook Station)	7-685
Table 7.4-15	Climate Risk Matrix	7-688
Table 7.4-16	Climate Risk Matrix	7-692
Table 7.4-17	Climate Resilience Assessment	7-693
Table 7.4-18	Tidal Datum at Pictou CHS Tide Station (#1630)	7-695
Table 7.4-19	Extreme Storm Surges at Pictou Extracted by Richard and Daigle (2011) from Published Results by Bernier (2005)	7-696
Table 7.4-20	Sea level Allowance for Pictou Estimated by Fisheries and Oceans Canada (2014) for Two Greenhouse Gas Concentration Projection Scenarios (RCP4.5 and RCP8.5)	7-696
Table 7.4-21	Extreme Water Levels at Pictou for Different Return Periods and Design Lifespan Horizons	7-697
Table 7.4-22	Boat Harbour Peak Storm Discharge Inflow	7-697
Table 7.4-23	Summary of the Environmental Effects Assessment and Initial Screening of Valued Components	7-710
Table 7.4-24	Applicable Phases for Project Components and Timing/Duration	7-715
Table 7.4-25	Matrix of Interaction for Current and Future Activities with the Project	7-721
Table 7.4-26	Selection of Valued Components for the Cumulative Effects Assessment	7-725

Table 7.4-27	2017 Emissions from the Trenton Power Plant.....	7-736
Table 7.4-28	Residual Cumulative Environmental Effects on Air Quality and Odour	7-738
Table 7.4-29	Residual Cumulative Environmental Effects on Wetlands	7-743
Table 7.4-30	Residual Cumulative Environmental Effects on Mammals and Wildlife.....	7-747
Table 7.4-31	Residual Cumulative Environmental Effects on Marine Environment.....	7-751
Table 7.4-32	Residual Cumulative Environmental Effects on Migratory Birds.....	7-757
Table 7.4-33	Summary of Cumulative Effects Assessment	7-766
Table 8.1-1	Mitigation Measures and Best Management Practices	8-3
Table 8.1-2	Summary Table of Environmental Impact Assessment	8-10
Table 8.1-3	Summary of Key Mitigation Measures Preventing Significant Adverse Project Effects.....	8-43
Table 9.1-1	Summary of the Preliminary Follow-up Programs Proposed for the Boat Harbour Remediation Project	9-5
Table 9.2-1	Summary of the Preliminary Monitoring Programs Proposed for the Boat Harbour Remediation Project	9-10

Appendix Index

Appendix A	Human Health and Ecological Risk Assessment
Appendix B	Environmental Management and Control Documents
Appendix C	Public Meeting Minutes
Appendix D	Boat Harbour Environmental Advisory Committee Terms of Reference
Appendix E	Public Open House # 1 Documentation
Appendix F	Public Open House # 2 Documentation
Appendix G	Agency Meeting Minutes
Appendix H	Public Correspondence
Appendix I	Documentation of Informal PLFN Consultation
Appendix J	Documentation of Formal PLFN Consultation Prior to Determination of Requirement for Federal Environmental Assessment
Appendix K	Correspondence with the Assembly of Nova Scotia Mi'kmaq Chiefs and the Native Council of Nova Scotia
Appendix L	Minutes from BHCC Meetings During EIA and Meeting with PLFN to Review Draft EIS
Appendix M	Boat Harbour Environmental Advisory Committee Meeting Action Items during the EIA
Appendix N	A'se'k News – Project Update
Appendix O	Remedial Action Plan Presentation
Appendix P	Independent Ambient Air Monitoring Program Presentation

Appendix Q	PLFN Open House No. 1 Summary Report
Appendix R	PLFN Open House No. 2 Summary Report
Appendix S	Pictou Landing First Nation Well-Being Baseline Study
Appendix T	Mi'kmaq of Nova Scotia Ecological Knowledge Study
Appendix U	Air Quality and Odour Assessment Documentation
Appendix V	Greenhouse Gas Assessment and Climate Change Resilience Documentation
Appendix W	Noise Assessment Documentation
Appendix X	Light Assessment Documentation
Appendix Y	Geology and Geochemistry Assessment Documentation
Appendix Z	Groundwater and Surface Water Assessment Documentation
Appendix AA	Riparian, Wetland and Terrestrial Environments Assessment Documentation
Appendix BB	Aquatic Environments Assessment Documentation
Appendix CC	Avian Assessment Documentation
Appendix DD	Socio-Economic Assessment Documentation
Appendix EE	Archaeological and Cultural Heritage Resources Assessment Documentation

Boat Harbour Remediation Project – Table of Concordance

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
1	4	Preparation and Presentation of the Environmental Impact Statement (EIS)	4.5	Summary of the Environmental Impact Statement	<p>The proponent will prepare a summary of the EIS in both of Canada's official languages (French and English) to be provided to the Agency at the same time as the EIS that will include the followings:</p> <ul style="list-style-type: none"> • A concise description of all key components of the project and related activities. • A summary of the engagement with the Mi'kmaq of Nova Scotia, and the participation of the public and government agencies, including a summary of the issues raised and the proponent's responses; – an overview of expected changes to the environment. • An overview of the key environmental effects of the project, as described under Section 5 of CEAA 2012, and proposed technically and economically feasible mitigation measures. • An overview of how factors under paragraph 19(1) of CEAA 2012 were considered; the proponent's conclusions on the residual environmental effects of the project, and the significance of those effects, after taking into account the mitigation measures. 	NA	Summary of the Environmental Impact Statement		
2	1	Introduction and Overview	1.1	The Proponent	In the EIS, the proponent will: provide contact and legal identification information; describe corporate and management structures; specify the mechanism used to ensure that corporate policies will be implemented and respected for the project; and identify key personnel, and contractors responsible for preparing the EIS.	1	Introduction and Overview	1.1	The Proponent
			1.2	Project Overview	The EIS will describe the project, key project components, associated activities, scheduling details, timing of each phase, and other key features. If the project is part of a larger sequence of projects, the EIS will outline the larger context.			1.2	Project Overview
			1.3	Project Location	<p>The EIS will contain a description of the geographical setting in which the project will take place focused on those aspects of the project and its settings that are important in order to understand the potential environmental effects of the project. The following information will be included:</p> <ul style="list-style-type: none"> • UTM projection coordinates of the main project site. • Current land use in the area. • Distance of the project facilities and components to any federal lands. • Environmental significance and value of the geographical setting in which the project will take place and the surrounding area. • Environmentally sensitive areas, including protected areas, designated areas (e.g., Important Bird Areas), wetlands, estuaries, mature and interior forest habitat of migratory birds, habitats of federally or provincially listed designated Species at Risk. • Description of local communities. • Traditional territories and/or consultation areas, treaty lands and Indian Reserve lands. 			1.3	Project Location
			1.4	Regulatory Framework and the Role of Government	<p>The EIS will identify:</p> <ul style="list-style-type: none"> • Any federal power, duty or function that may be exercised that would permit the carrying out of the project or associated activities. • Legislation and other regulations that are applicable to the project at the federal, provincial, regional and municipal levels. • Government policies, resource management plans, planning or study initiatives pertinent to the project and/or EA and their implications. • Any treaty, self-government or other agreements between federal or provincial governments and the Mi'kmaq of Nova Scotia that are pertinent to the project and/or EA. • Any relevant land use plans, land zoning, or community plans. • Information on land lease agreement or land tenure, when applicable. 			1.4	Regulatory Framework and the Role of Government

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
					<ul style="list-style-type: none"> Regional, provincial and/or national objectives, standards or guidelines that have been used by the proponent to assist in the evaluation of any predicted environmental effects. 				
	2	Project Justification and Alternatives Considered	2.1	Purpose of the Project	<p>The EIS will describe the purpose of the project by:</p> <ul style="list-style-type: none"> Providing the rationale for the project, explaining the background, the problems or opportunities that the project is intended to satisfy and the stated objectives from the perspective of the proponent. If the objectives of the project are related to broader private or public sector policies, plans or programs, this information will also be included. The EIS will also describe the predicted environmental, economic and social benefits of the project. 	2	Project Justification and Alternatives Considered	2.1	Purpose of the Project
	2.2		Alternative Means of Carrying Out the Project	<p>The EIS will identify and consider the environmental effects of alternative means of carrying out the project that are technically and economically feasible.</p> <p>The analysis will address:</p> <ul style="list-style-type: none"> Remediation and disposal options for hazardous waste (solid and liquid); Dredging methods. Access to the project site; location of key project components. Energy sources to power the project site. Management of water supply and wastewater. Water management. 	2.2			Alternative Means	
			2.3					2.3	Alternative Means by Project Component
	3	Project Description	3.1	Project Components	<p>The EIS will describe the project, by presenting the project components (as identified in Part 1, Section 3.1), associated and ancillary works, and other characteristics that will assist in understanding the environmental effects. This will include:</p> <ul style="list-style-type: none"> Maps, at an appropriate scale, of the project location, the project components, boundaries of the proposed site with UTM coordinates, the major existing infrastructure, proponent lands properties or leased lands used for the project, adjacent land uses and any important environmental features. Information on the care and control of project components. Sludge disposal cell facility (footprint, location and preliminary designs, (including proposed design standards [e.g., CCME National Guidelines for Hazardous Waste Landfills]). Sandy substrate along the Pictou Road section of the Northumberland Strait. Management of proposed control, collection, treatment, and discharge of surface drainage and groundwater seepage to the receiving environment from all key components of the project infrastructure (e.g., residual mill effluent, sludge disposal cell effluent and wetland effluent). Permanent and temporary linear infrastructures (roads, pipelines and hoses, power supply), identifying the route of each of these linear infrastructures, the location and types of any structure used for stream crossings. Storage areas for fuels wastes. Drinking and industrial water requirements (source, quantity required, need for water treatment). Energy supply (source, quantity). Waste disposal (types of waste, methods of disposal, quantity). <p>For project components in the marine environment, the EIS will describe:</p> <ul style="list-style-type: none"> Dredging work (including any maintenance dredging anticipated), specifying the nature and volume of sediment, dredging methods (type of dredge, duration, frequency, etc.), surface. 	3	Project Description	3.1	Project Components

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
			3.2	Project Activities	<p>The EIS will include descriptions of the construction, operation, decommissioning and reclamation associated with the proposed project. This will include descriptions of the activities to be carried out during each phase, the location of each activity, expected outputs and an indication of the activity's magnitude and scale.</p> <p>The EIS will include a summary of the changes that have been made to the project since originally proposed, including the benefits of these changes to the environment, the Mi'kmaq of Nova Scotia, and the public.</p> <p>The EIS will include a schedule including time of year, frequency, and duration for all project activities.</p> <p>The information will include a description of:</p> <p>Site Preparation and Construction</p> <ul style="list-style-type: none"> • Site clearing, earthmoving, leveling, and drilling excavation. • Construction and upgrading of access roads. • Borrow materials requirement (source and quantity). • Sludge disposal cell modifications. • Water management, including water diversions, dewatering or deposition activities required (location, methods, timing). • Equipment requirements (type, quantity); Administrative buildings, garages, other ancillary facilities. • Number of employees and transportation of employees. • Storage and management of hazardous materials, fuels and residues. <p>Operation</p> <ul style="list-style-type: none"> • Dewatering of project components (e.g., effluent pipe, ditches, basins). • Dredging of contaminated sludge/sediment, storage, handling and transport of hazardous materials. • Residual mill effluent. • Water management on the project site including, storm water, process water, wastewater, water recycling and effluent treatment (quantity, treatment requirements, release point[s]). • Storage and handling of reagents, petroleum products, chemical products, hazardous materials and residual materials (quantity and quality, treatment requirements, release point[s]); Characterization and management of impacted sludge and sediment. • QA/QC program for dredging (e.g., confirmatory sampling plan to assess efficiency of sediment removal; including presentation of proposed end point criteria for each contaminant in all affected media. • Characterization and management of workforce, including transportation, work schedules and lodging. <p>Decommissioning and Abandonment</p> <ul style="list-style-type: none"> • Preliminary outline of a decommissioning and reclamation plan for any components associated with the project. • Ownership, transfer and control of the different project components. • Clearing and demolition of buildings. • Dam demolition. • Bridge demolition. • Responsibility for monitoring and maintaining the integrity of the remaining structures; and – for permanent facilities, a conceptual discussion on how decommissioning and abandonment could occur. 			3.2	Project Activities

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement				
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title	
4		Public Participation and Concerns			<p>The EIS will describe the ongoing and proposed public participation activities that the proponent will undertake or that it has already conducted on the project. It will provide a description of efforts made to distribute project information and provide a description of information and materials that were distributed during the consultation process. The EIS will indicate the methods used, where the consultation was held, the persons and organizations consulted, the concerns voiced and the extent to which this information was incorporated in the design of the project as well as in the EIS. The EIS will provide a summary of key issues raised related to the project and its potential effects to the environment as well as describe any outstanding issues and ways to address them.</p>	4	Public Participation and Concerns	4.1	Persons and Organizations Consulted With Appendix C	
								4.2	Methods of Communication and Consultation Appendix E	
								4.3	Distribution of Information and Materials Appendix E, F, H	
								4.4	Consideration of Key Issues Raised	
								4.5	Addressing Outstanding Issues and Ongoing Consultation Appendix D, G, H	
5		Engagement with the Mi'kmaq of Nova Scotia and Concerns Raised			<p>The proponent is expected to engage with potentially affected Mi'kmaq of Nova Scotia. For the purposes of developing the EIS, the proponent will engage with the Mi'kmaq of Nova Scotia that may be affected by the project, to obtain their views on:</p> <ul style="list-style-type: none"> • The project. • Effects of changes to the environment on Aboriginal peoples (health and socio-economic conditions; physical and cultural heritage, including any structure, site or thing that is of historical, archaeological, paleontological or architectural significance; and current use of lands and resources for traditional purposes) pursuant to paragraph 5(1)(c) of CEAA 2012, and – potential adverse impacts of the project on potential or established Aboriginal or Treaty rights, in respect of the Crown's duty to consult, and where appropriate, accommodate Aboriginal peoples. <p>In order to allow the Mi'kmaq of Nova Scotia to engage and provide views on the above, the proponent will provide the Mi'kmaq of Nova Scotia with the following timely and relevant:</p> <ul style="list-style-type: none"> • Opportunities to learn about the project including providing information about the proposed project (including but not limited to project design, location, potential effects, mitigation measures and follow-up and monitoring programs). • Opportunities to provide input on the overall project; effects of changes to the environment on Aboriginal peoples pursuant to paragraph 5 (1)(c) of CEAA, 2012 and potential adverse impacts of the project on potential or established Aboriginal or Treaty rights. <p>The proponent will structure its engagement activities to provide adequate time for groups to review and comment on the relevant information. Engagement activities are to be appropriate to the groups' needs, arranged through discussions with the groups and in keeping with established consultation protocols, where available. The EIS will describe all efforts, successful or not, taken to solicit the information required from groups to support the preparation of the EIS. With respect to engagement activities, the EIS will document:</p> <ul style="list-style-type: none"> • The engagement activities undertaken with each group prior to the submission of the EIS, including the date and means of engagement (e.g., meeting, mail, telephone). • The main issues and comments raised during the engagement activities by each group and the proponent's responses (effort should be made to collating like issues together along VCs identified in the EIS). • Any future planned engagement activities. 	5	Engagement with the Mi'kmaq of Nova Scotia and Concerns Raised	5.1	Informal Consultation and Community Engagement Prior to the Initiation of the Federal Environmental Impact Assessment Process Appendix I	
								5.2	Formal Consultation Prior to CEA Agency/IAAC Notice of Determination of Requirement for Federal Environmental Impact Assessment Appendix I	
								5.3	Engagement with the Mi'kmaq of Nova Scotia and Concerns Raised During the Federal Environmental Impact Assessment Appendix I	
								5.4	Consideration of Key Issues Raised Appendix I, J, Q, R	
								5.5	Ongoing Consultation Appendix I, J, K, L, M, O, P	

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
					<ul style="list-style-type: none"> Where and how Mi'kmaq of Nova Scotia's perspectives were integrated into and/or contributed to decisions regarding the project, design, construction, operation, decommissioning, abandonment, maintenance, follow-up and monitoring and associated potential effects (paragraph 5[1][c]) and the associated mitigation utilized to manage those effects. The effects and mitigation measures should be clearly linked to VCs in the EIS as well as to specific project components or activities. How engagement activities by the proponent allowed groups to understand the project and evaluate its impacts on their communities, activities, potential or established Aboriginal or Treaty rights. Where impacts are identified, provide a discussion of how those would be managed or mitigated (and provide this information for each Mi'kmaq of Nova Scotia group separately). 				
	6	Impacts to Potential or Established Aboriginal or Treaty Rights			<p>With respect to potential adverse impacts of the project on potential or established Aboriginal or Treaty rights, the EIS will document for each group identified in Part 2, Section 5 of these guidelines (or in subsequent correspondence from the Agency):</p> <ul style="list-style-type: none"> Potential or established Aboriginal or Treaty rights, when this information is directly provided by a group to the proponent, the Agency or is available through public records, including but not limited to: <ul style="list-style-type: none"> Location of the right being practiced or exercised Context in which the right is practiced or exercised (including information about which groups of Mi'kmaq of Nova Scotia practice the right (women, elders, youth), how the right was practiced historically), How the Mi'kmaq of Nova Scotia's cultural traditions, laws and governance systems inform the manner in which they exercise their rights (the who, what, when, how, where and why) The Mi'kmaq of Nova Scotia's perspectives on the importance of the land on which the Project is located and how it intersects with any land management uses and/or plans they may have How often the right is practiced or exercised and timing or seasonality of the practice or exercise of the right Maps and data sets (e.g., fish catch numbers) Potential adverse impacts of each of the project components and physical activities, in all phases, on potential or established Aboriginal or Treaty rights, including those raised by the Mi'kmaq of Nova Scotia. Measures identified to accommodate potential adverse impacts of the project on the potential or established Aboriginal or Treaty rights. These measures will clearly describe how the proponent intends to implement them and may go beyond mitigation measures that are developed to address potential adverse environmental effects. Include perspectives and specific suggestions raised of potentially impacted Mi'kmaq of Nova Scotia; as well as any views of Mi'kmaq of Nova Scotia on the effectiveness of mitigation measures. Potential adverse impacts on potential or established Aboriginal or Treaty rights that have not been fully mitigated or accommodated as part of the EA and associated engagement with the Mi'kmaq of Nova Scotia. Include perspective of potentially impacted Mi'kmaq of Nova Scotia. Potential adverse impacts that may result from the residual and cumulative environmental effects. Include the perspectives of potentially impacted Mi'kmaq of Nova Scotia. 	6	Impacts to Potential or Established Aboriginal or Treaty Rights	6.1	Identifying Potential or Established Aboriginal or Treaty Rights Appendix J, K
								6.2	Use and Importance of Lands and Resources for Traditional Purposes
								6.3	Land Management, Use, and Planning
								6.4	Potential Adverse Effects on Potential or Established Aboriginal or Treaty Rights (includes direct, residual, and cumulative impacts)
								6.5	Accommodations for Potential Effects on Aboriginal and Treaty Rights
								6.6	Residual Impacts of the Project on PLFN's Aboriginal or Treaty Rights
	7	Effects Assessment	7.1	Project Setting and Baseline Conditions	Based on the scope of the project described in Section 3 (Part 1), the EIS will present baseline information in sufficient detail to enable the identification of how the project could affect the VCs and an analysis of those effects.	7	Effects Assessment	7.1	Baseline Assessment

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
			7.1.1	Atmospheric Environment	<ul style="list-style-type: none"> A baseline survey of ambient air quality in the project areas and in the air shed likely to be affected by the project by identifying and quantifying emission sources for, but not limited to, the following contaminants and odorous emissions: total suspended particulates, fine particulates smaller than 2.5 microns (PM2.5), respirable particulates of less than 10 microns (PM10), carbon monoxide (CO), sulphur oxides (SOx), nitrogen oxides (NOx), volatile organic compounds (VOCs), hydrogen sulfide (H2S) and all other toxic air pollutants (mobile and stationary sources). Identify and quantify existing greenhouse gas emissions by individual pollutant measured as kilotonnes of CO² equivalent per year in the project study areas. Direct and indirect sources of air emissions. Current provincial/territorial/federal limits for greenhouse gas emission targets. Current ambient noise levels at key receptor points (e.g., Mi'kmaq of Nova Scotia or communities), including the results of a baseline ambient noise survey. Information on typical sound sources, geographic extent and temporal variations will be included. Existing ambient night-time light levels at the project site and at any other areas where project activities could have an effect on light levels. The EIS will describe night-time illumination levels during different weather conditions and seasons. Historical records of relevant meteorological information (e.g., total precipitation (rain and snow); mean, maximum and minimum temperatures; and typical wind speed and direction). 			7.1.2	Atmospheric Environment Appendix U, V, W, X
			7.1.2	Geology and Geochemistry	<ul style="list-style-type: none"> Bedrock and host rock geology of the project area, including a table of geologic descriptions, geological maps and cross-sections of appropriate scale. The geomorphology, topography and geotechnical characteristics of areas proposed for construction of major project components. Geological hazards that exist in the areas planned for the project facilities and infrastructure, including: history of seismic activity in the area; isostatic rise or subsidence; landslides, slope erosion and the potential for ground and rock instability, and subsidence during and following project activities. Baseline concentrations of project contaminants of concern within the local, regional and downstream receiving environments. Geochemical characterization of leaching potential of the landfill during and after remediation work is completed and landfill is capped. 			7.1.3	Geology, Geochemistry and Soil Appendix Y
			7.1.3	Topography and Soil	<ul style="list-style-type: none"> Baseline mapping and description of landforms and soils within the local and regional project areas. Maps depicting soil depth by horizon and soil order within the project area to support soil salvage and reclamation efforts, and to potential for soil erosion. Suitability of topsoil and overburden for use in the rehabilitation of disturbed areas. 			7.1.3	Geology, Geochemistry and Soil
			7.1.4	Riparian, Wetland and Terrestrial Environments	<ul style="list-style-type: none"> Characterization of soils in the excavation area, in terrestrial and riparian environments, with a description of their past use. Topography, drainage, geology and hydrogeology, and the physicochemical characteristics of potential on-land sediment or soil disposal sites. Characterization of the shoreline, banks, current and future flood risk areas, and wetlands (fens, marshes, peatlands, mudflats and eelgrass beds, etc.), including the location and extent of wetlands likely to be affected by project activities according to their size, type (class and form), the description of their ecological function (ecological, hydrological, wildlife, socioeconomic, etc.) and species composition. 			7.1.5	Riparian, Wetland and Terrestrial Environments Appendix AA

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
					<ul style="list-style-type: none"> Plant, lichen, and animal species (abundance, distribution and diversity) and their habitats, with a focus on species at risk, species of conservation concern, and species that are of social, economic, cultural or scientific significance, as well as invasive alien species. 				
			7.1.5	Groundwater and Surface Water	<ul style="list-style-type: none"> Hydrogeology, including: <ul style="list-style-type: none"> Hydrogeological context (e.g., hydrostratigraphy with aquifers and aquitards, major faults, etc.), including the delineation of key stratigraphic and hydrogeologic boundaries Physical properties of the hydrogeological units (e.g., hydraulic conductivity, transmissivity, saturated thickness, storativity, porosity, specific yield); groundwater flow patterns and rates A discussion of the hydrogeologic, hydrologic, geomorphic, climatic and anthropogenic controls on groundwater flow Temporal changes in groundwater flow (e.g., seasonal and long term changes in water levels) A delineation and characterization of groundwater - surface water interactions including temperature and the locations of groundwater discharge to surface water and surface water recharge to groundwater Temperature changes in surface water as a result of groundwater-surface water interactions Changes to surface water quality, including seasonal changes in runoff entering watercourses Hydrogeological maps and cross-sections for the project area to outline the extent of aquifers and aquitards, including bedrock fracture and fault zones, locations and depths of wells and strainers, groundwater types springs, surface waters, and project facilities. Groundwater levels, potentiometric contours, flow directions, groundwater divides and areas of recharge and discharge should be included. All groundwater monitoring wells, including their location, in respect to the project area, including geologic, hydrostratigraphic, piezometric and construction data (e.g., depths of surficial rock and bedrock, bedrock quality, fracture zones, piezometric levels, hydraulic conductivity, diameter and screen depth and intercepted aquifer unit). Monitoring protocol for collection of existing groundwater and surface water data; – an appropriate hydrogeologic model for the project area, which discusses the hydrostratigraphy and groundwater flow systems; a sensitivity analysis will be performed to test model sensitivity to climatic variations (e.g., recharge) and hydrogeologic parameters (e.g., hydraulic conductivity); surface water and groundwater quality, including lab analytical results for metals, major ions, other contaminants of concern, and physical parameters, including temperature, with the interpretation of results for any anomalous values and for contaminants of concern. Graphs or tables indicating the seasonal variations in groundwater levels, flow regime, and quality. Local and regional potable groundwater supplies, including their current use and potential for future use. Bedrock fracture sizes and orientations in relation to groundwater flow. The delineation of drainage basins, at appropriate scales (water bodies and watercourses), including intermittent streams, flood risk areas and wetlands, boundaries of the watershed and subwatersheds, overlaid by key project components. Hydrological regimes, including monthly, seasonal and annual water flow (discharge) data. 			7.1.4	Groundwater and Surface Water Appendix Z

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
					<ul style="list-style-type: none"> For each affected water body, the total surface area, bathymetry, maximum and mean depths, water level fluctuations, type of substrate (sediments). Seasonal surface water quality, including analytical results (e.g., water temperature, turbidity, pH, dissolved oxygen profiles) and interpretation for representative tributaries and water bodies including all sites to receive effluents or runoff. Any local and regional potable surface water resource. Sediment quality analysis for key sites likely to receive effluents. 				
			7.1.6	Marine Environment	<ul style="list-style-type: none"> In the estuary and along the strait shoreline immediately outside the mouth of Boat Harbour: marine water quality; Bottom sediments, including quality, thickness, grain size and mobility. Available bathymetric information for the site. Marine plants, including all benthic and detached algae, marine flowering plants, brown algae, red algae, green algae and phytoplankton; Marine fauna, including benthic organisms, fish, marine mammals, and sea turtles, and their associated habitat. Federally and provincially listed marine species at risk. 			7.1.6	Aquatic Environments Appendix BB
			7.1.7	Fish and Fish Habitat	<ul style="list-style-type: none"> A characterization of fish populations on the basis of species and life stage, including information on the surveys carried out and the source of data available (e.g., location of sampling stations, catch methods, date of catches, species, catch-per-unit effort). A description of primary and secondary productivity in affected water bodies with a characterisation of season variability. A list of any fish or invertebrate species at risk that are known to be present. A description of the habitat by homogeneous section, including the length of the section, width of the channel from the high water mark (bankful width), water depths, type of substrate (sediments), aquatic and riparian vegetation, and photos. A description of natural obstacles (e.g., falls, beaver dams) or existing structures (e.g., water crossings) that hinder the free passage of fish. Maps, at a suitable scale, indicating the surface area of potential or confirmed fish habitat for spawning, rearing, nursery, feeding, overwintering, migration routes, etc. Where appropriate, this information should be linked to water depths (bathymetry) to identify the extent of a water body's littoral zone. The description and location of suitable habitats for fish species at risk that appear on federal and provincial lists and that are found or are likely to be found in the study area. Note that certain intermittent streams or wetlands may constitute fish habitat or contribute indirectly to fish habitat. The absence of fish at the time of the survey does not irrefutably indicate an absence of fish habitat. 			7.1.6	Aquatic Environments Appendix BB
			7.1.8	Migratory Birds and Their Habitat	<ul style="list-style-type: none"> Birds and their habitats that are found or are likely to be found in the study area. This description may be based on existing sources, but supporting evidence is required to demonstrate that the data used are representative of the avifauna and habitats found in the study area. The existing data must be supplemented by surveys, if required. Abundance, distribution, and life stages of migratory and non-migratory birds (including waterfowl, raptors, shorebirds, marsh birds and other land birds) likely to be affected in the project area based on existing information, or surveys, as appropriate, to provide current field data; Characterization of various ecosystems found in the project area, likely to be affected, based on existing information (land cover types, vegetation). Year-round migratory bird use of the area (e.g., winter, spring migration, breeding season, fall migration), based on preliminary data from existing sources and surveys to provide current field data if appropriate. Results of any baseline surveys and a description of methodology used. 			7.1.7	Migratory Birds Appendix CC

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
					<ul style="list-style-type: none"> In addition to information obtained from previous environmental assessments in the area, naturalists and Indigenous peoples, other relevant datasets should be consulted, such as those available from government departments and the Atlantic Canada Conservation Data Centre; consideration to areas of concentration of birds, such as breeding, staging and/or wintering areas; species at risk and species of conservation concern; as well as breeding areas of species low in number and high in the food chain. The description of the existing environment will include consideration of existing or proposed protected areas, special management areas, and conservation areas in the regional study area. 				
			7.1.9	Species at Risk	<ul style="list-style-type: none"> A list of all species at risk listed under the Species at Risk Act (fauna and flora) that may be affected by the project, using existing data and literature as well as surveys to provide current field data; A list of all species assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as extirpated, endangered, threatened and of special concern. Any published studies that describe the regional importance, abundance and distribution of species at risk including recovery strategies or plans. The existing data must be supplemented by surveys, as required. Information on residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable) and general life history of species at risk that may occur in the project area, or be affected by the project. 			7.1.8	<i>Species at Risk Act</i> Listed Species
			7.1.10	Mi'kmaq of Nova Scotia	<p>The proponent shall gather and document baseline information in the EIS for each Mi'kmaq of Nova Scotia group identified in Part 2, Section 5 of these guidelines (and any groups identified after these guidelines are finalized). The baseline information will:</p> <ul style="list-style-type: none"> Describe and characterize the elements in paragraph 5(1)(c) of CEAA 2012 based on the spatial and temporal scope selected for the EA according to the factors outlined in Part 1, Section 3.2.3 of this document. Characterize the regional context of each of the elements of paragraph 5(1)(c) of CEAA 2012 to support the assessment of project related effects, including consideration of the differences of experiences by sub-populations within a Mi'kmaq of Nova Scotia group, as appropriate (for example, women, youth, elders, families) and cumulative effects. Be sufficient to provide a comprehensive understanding of the current state of each VC related to effects of changes to the environment on Aboriginal peoples. Each of the VCs for effects of changes to the environment on Aboriginal peoples is interrelated and therefore baseline information will often overlap. 			7.1.9	Mi'kmaq of Nova Scotia Appendix A, S, T
			7.1.11	Other Changes to the Environment Arising as a Result of a Federal Decision or Due to Changes on Federal Lands, in Another Province or Outside Canada	Should there be the potential for a change to the environment arising as a result of a federal decision(s), or on federal lands, lands in another province or lands outside Canada, the EIS will include baseline information on the environmental component likely to be affected (if this information is not already covered in other subsections of these guidelines). For example, if an authorization provided under the Fisheries Act was to result in the flooding of key wildlife habitat, baseline information should be provided on the wildlife species likely to be affected.				No other changes to the Environment Arising as a Result of a Federal Decision or Due to Changes on Federal Lands, in Another Province or Outside Canada were identified.

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
			7.1.12	Human Environment	<ul style="list-style-type: none"> The rural and urban settings likely to be affected by the project. Any federal lands, lands located outside the province or Canada that may be affected by the project. The current use of land in the study area, including a description of hunting, recreational and commercial fishing, trapping, gathering, outdoor recreation, use of seasonal cabins, outfitters. Current use of all waterways and water bodies that will be directly affected by the project, including recreational uses, where available. Location of and proximity of any permanent, seasonal or temporary residences or camps. Health and socio-economic conditions, including the functioning and health of the socioeconomic environment, encompassing a broad range of matters that affect communities in the study area in a way that recognizes interrelationships, system functions and vulnerabilities. Physical and cultural heritage, including structures, sites or things of historical, archaeological, paleontological, or architectural significance. 			7.1.10	Human Environment Appendix DD, EE
			7.2	Predicted Changes to the Physical Environment	The EA will include a consideration of the predicted changes to the environment as a result of the project being carried out or as a result of any powers, duties or functions that are to be exercised by the federal government in relation to the project. These predicted changes to the environment are to be considered in relation to each phase of the project (construction, operation, decommissioning, and abandonment) and are to be described in terms of the magnitude, geographic extent, duration and frequency, and whether the environmental changes are reversible or irreversible. As changes to various parts of the physical environment, listed below, may be inter-related as part of an ecosystem, the EIS will explain and describe the connections between the changes described.			7.3	Valued Components Environmental Effects Assessment
			7.2.1	Changes to the Atmospheric Environment	<ul style="list-style-type: none"> Completion of an atmospheric dispersion modelling of the main contaminants and odorous compounds in order to estimate the concentrations present in the entire area that could potentially be affected by atmospheric emissions (Section 7.1.1, above) resulting from various project-related activities (sources), including dredging, hazardous waste storage, the use of heavy machinery during construction and road transportation, and water and wastewater treatment and retention. Comparison of anticipated air quality concentration against the Canadian Ambient Air Quality Standards (CAAQS) for fine particulate matter, SO₂, and NO₂. 			7.3.1.1	Predicted Changes to Air Quality and Odour <i>{{Atmospheric dispersion modelling is currently being completed – once complete a comparison of anticipated air quality concentration against the CAAQS will be made and included in the EIS}}</i>
					<ul style="list-style-type: none"> Description of all methods and practices that will be implemented to minimize and control atmospheric emissions throughout the project life cycle. If the best available technologies are not included in the project design, the proponent will need to provide a rationale for the technologies selected. An estimate of the direct greenhouse gas emissions associated with all phases of the project as well as any mitigation measures proposed to minimize greenhouse gas emissions. This information is to be presented by individual pollutant and should also be summarized in CO₂ equivalent per year. The proponent is responsible for the following: <ul style="list-style-type: none"> Provide an estimate of the contribution of the project emissions at the local, provincial and federal scale, and indicate the category into which the project falls in terms of the relative magnitude of its contribution to greenhouse gas emissions (project with low, medium or high emission rates) Justify all estimates and emission factors used in the analysis 			7.3.2.1	Predicted Changes to Greenhouse Gas Emissions

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
					<ul style="list-style-type: none"> - Provide the estimation or derivation method, and disclose and describe all assumptions and emission intensity factors used - Provide the methods and calculations used for the analysis - Compare and assess the level of estimated emissions of greenhouse gases to the regional, provincial and federal emission targets - Provide information related to the project's electrical demand and sources of electrical power for facilities and equipment (i.e., the project's main source and any other additional sources [generators, etc.], as appropriate) 				
					<ul style="list-style-type: none"> • Changes in ambient noise levels. 			7.3.3.1	Predicted Changes to Noise
					<ul style="list-style-type: none"> • Changes in night-time light levels. 			7.3.4.1	Predicted Changes to Night-Time Light Levels
			7.2.2	Changes to Groundwater and Surface Water	<ul style="list-style-type: none"> • Changes to groundwater flow patterns, fluxes, and divides based on the results of groundwater flow modelling that incorporates changes related to the project. • Changes to turbidity, oxygen level, water temperature, ice regime, water quality; – changes in surface water quality associated with any project effluent releases or surface runoff. • Changes to the hydrological and hydrometric conditions. • Changes to groundwater recharge/discharge areas and any changes to groundwater infiltration areas. • Changes to community water supplies. • Changes to groundwater quality associated with storage or release of any project effluents or drainage including surface runoff: <ul style="list-style-type: none"> - Quantity and quality of residual mill effluent to be released from the site into the Northumberland Strait receiving waters - Seepage water quality from the landfill during remediation and long-term storage 			7.3.6 7.3.7	Groundwater Surface Water
			7.2.3	Changes to Riparian, Wetland and Terrestrial Environments	<ul style="list-style-type: none"> • Overall description of changes related to landscape disturbance. • Changes to the habitat of migratory and non-migratory birds, with a distinction made between the two birds category, including losses, structural changes and fragmentation of riparian habitat (aquatic grass beds, intertidal marshes) of terrestrial environments and wetlands frequented by birds (types of cover, ecological unit of the area in terms of quality, quantity, diversity, distribution and functions). • Changes to critical habitat for federally listed species at risk. • Changes to key habitat for species important to current use of lands and resources for traditional purposes. • Changes to critical habitat for federally listed species at risk. 			7.3.8 7.3.9	Terrestrial Habitat and Vegetation Wetlands
			7.3	Predicted Effects on Valued Components	Based on the predicted changes to the environment identified in Section 7.1, the proponent is to assess the environmental effects of the project on the following VCs. All interconnections between VCs and between changes to multiple VCs will be described.			7.3.10 7.3	Mammals and Wildlife Valued Components Environmental Effects Assessment
			7.3.1	Fish and Fish Habitat	<ul style="list-style-type: none"> • The identification of any potential adverse effects to fish and fish habitat as defined in subsection 2(1) of the Fisheries Act, including the calculations of any potential habitat loss (temporary or permanent) in terms of surface areas (e.g., spawning grounds, fry-rearing areas, feeding), and in relation to watershed availability and significance. The assessment will include a consideration of: <ul style="list-style-type: none"> - Geomorphological changes and their effects on hydrodynamic conditions and fish habitats (e.g., modification of substrates, dynamic imbalance, silting of spawning beds) 			7.3.12	Fish and Aquatic Habitat

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
					<ul style="list-style-type: none"> - Modifications of hydrological and hydrometric conditions on fish habitat and on the fish species' life cycle activities (e.g., reproduction, fry-rearing, movements) - Potential effects on riparian areas that could affect aquatic biological resources and productivity taking into account any anticipated modifications to fish habitat - Any potential imbalances in the food web in relation to baseline conditions - Effects on the primary and secondary productivity of water bodies and how project-related effects may affect fish food sources • The effects of changes to the aquatic environment on fish and their habitat, including: <ul style="list-style-type: none"> - Anticipated changes in the composition and characteristics of the populations of various fish species, including shellfish and forage fish - Any modifications in migration or local movements (upstream and downstream migration, and lateral movements) following the construction and operation of works (physical and hydraulic barriers) - Any reduction in fish populations as a result of potential overfishing due to increased access to the project area - Any modifications and use of habitats by federally or provincially listed fish species; a discussion of how project construction timing correlates to key fisheries windows for freshwater and anadromous species, and any potential effects resulting from overlapping periods 				
			7.3.2	Wetlands	All direct and indirect effects on wetland functions, including hydrological functions, anticipated as a result of the project.			7.3.9	Wetlands
			7.3.3	Marine Environment	<ul style="list-style-type: none"> • Physical effects on the estuarine and marine environment, including changes to water quality, chemical composition, temperature, oceanographic conditions, etc. • Effects to the use of the marine environment, including estuarine, floodplain and marine habitats by fish, invertebrates and marine mammals with regard to their life cycles (e.g., migration, spawning, emergence). • Any effects resulting from overlapping periods between construction periods and key fisheries (e.g., commercial salmon fishery) windows for marine species. • Any effects to marine organisms, including marine fish, marine mammals, marine birds, sea turtles, benthic organisms, etc. 			7.3.11	Marine Environment
			7.3.4	Marine Plants	Marine plants, including all benthic and detached algae, marine flowering plants, brown algae, red algae, green algae and phytoplankton.			7.3.11	Marine Environment
			7.3.5	Migratory Birds	<ul style="list-style-type: none"> • Direct and indirect adverse effects on migratory birds, including population level effects that could be caused by all project activities, including but not limited to: <ul style="list-style-type: none"> - Site preparation - Deposit of harmful substances in waters that are frequented by migratory birds • Risk of collision of migratory birds with any project infrastructure and vehicles; indirect effects caused by increased disturbance (e.g., noise, light, presence of workers), relative abundance movements, and losses or changes in migratory bird habitat, considering the critical breeding and migration periods for the birds. 			7.3.13	Migratory Birds
			7.3.6	Species At Risk	<ul style="list-style-type: none"> • Potential adverse effects of the project on species at risk listed under the Species at Risk Act and, where appropriate, it's critical habitat; i.e., direct and indirect effects on the survival or recovery of species listed under the Species at Risk Act. • Potential adverse effects of the project on species listed by the Committee on the Status of Endangered Wildlife in Canada classified as extirpated, endangered, threatened or of special concern (flora and fauna) and their habitat. 			7.3.14	Species at Risk

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
			7.3.7	Mi'kmaq of Nova Scotia	With respect to the Mi'kmaq of Nova Scotia, including the Native Council of Nova Scotia, provide a description and analysis, for each Mi'kmaq of Nova Scotia group, of how changes to the environment caused by the project will affect the health and socio-economic conditions, physical and cultural heritage including any structure, site or thing of historical, archaeological or paleontological importance, and current use of lands and resources for traditional purposes.			7.3.15	Mi'kmaq of Nova Scotia Appendix R Appendix S
			7.3.8	Other valued components that may be affected as a result of a federal decision or due to effects on federal lands, another province or outside Canada	The EIS should include a description of the specific project components for which a federal authorization/decision is required, and an assessment of any other VCs (not already covered in other subsections of these guidelines) that may be affected by the changes to the environment caused by these specific project components. If there is the potential for the project to result in environmental changes on federal lands, another province, or another country, then VCs of importance not already identified should be included. For example, if the project will result in the generation of greenhouse gas emissions, the EIS should include a description of the project's greenhouse gas emissions in a regional, provincial, national or international context, if applicable.			NA	No other valued components that may be affected as a result of a federal decision or due to effects on federal lands, another province or outside Canada were identified.
			7.4	Mitigation Measures	Every EA conducted under CEAA 2012 will consider measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project. The EIS will describe the standard mitigation practices, policies and commitments that constitute technically and economically feasible mitigation measures and that will be applied as part of standard practice regardless of location. The EIS will then describe the project's environmental protection plan and its environmental management system, through which the proponent will deliver this plan.			7.2.5	Environmental Effects Methodology – Mitigation Measures
								7.3	Valued Components Environmental Effects Assessment Appendix B - Draft Project Environmental Protection Plan (PEPP) and Environmental Management Plan (EMP)
			7.5	Significance of Residual Effects	The EIS will present any residual environmental effects of the project on the VCs identified in Section 6.3. Where significant adverse effects are identified, the EIS will set out the probability (likelihood) that they will occur and describe the degree of scientific uncertainty related to the data and methods used within the framework of this environmental analysis.			7.2.6	Environmental Effects Methodology – Residual Effects and Determination of Significance
								7.3	Valued Components Environmental Effects Assessment
			7.6	Other Effects to Consider				7.4	Other Effects to Consider
			7.6.1	Effects of Potential Accidents or Malfunctions	The failure of certain works caused by human error or exceptional natural events (e.g., flooding, earthquake, forest fire) could cause major effects. The proponent will therefore conduct an analysis of the risks of accidents and malfunctions, determine their effects, and present preliminary emergency response measures. Taking into account the lifespan of different project components, the proponent will identify the probability of potential accidents and malfunctions related to the project, including an explanation of how those events were identified, potential consequences (including the environmental effects as defined in Section 5 of CEAA 2012), the plausible worst case scenarios and the effects of these scenarios.			7.4.1	Effects of Potential Accidents or Malfunctions
			7.6.2	Effects of the Environment on the Project	The EIS will take into account how local conditions and natural hazards, such as sea level rise, severe and/or extreme weather conditions, and external events (e.g., flooding, drought, ice jams, landslides, avalanches, erosion, subsidence, fire, outflow conditions, and seismic events), could adversely affect the project and how this in turn could result in effects to the			7.4.2	Effects of the Environment on the Project

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
					environment (e.g., extreme environmental conditions result in malfunctions and accidental events).				
			7.6.3	Cumulative Effects Assessment	<p>The proponent will identify and assess the project's cumulative effects using the approach described in the Agency's guidance documents related to cumulative environmental effects. In its EIS, the proponent will:</p> <ul style="list-style-type: none"> Identify and provide a rationale for the VCs that will constitute the focus of the cumulative effects assessment, focussing the cumulative effects assessment on the VCs most likely to be affected by the project and other project and activities. To this end, the proponent must consider, without limiting itself thereto, the following components likely to be affected by the project: fish and fish habitat, including salmon and other valued fish species; migratory birds; species at risk; Indigenous peoples; and any VCs associated with Subsection 5(2) of CEAA 2012. Identify and justify the spatial and temporal boundaries for the cumulative effect assessment for each VC selected. The boundaries for the cumulative effects assessments will generally be different for each VC considered. These cumulative effects boundaries will also generally be larger than the boundaries for the corresponding project effects. Identify the sources of potential cumulative effects. Specify other projects or activities that have been or that are likely to be carried out that could cause effects on each selected VC within the boundaries defined, and whose effects would act in combination with the residual effects of the project. This assessment may consider the results of any relevant study conducted by a committee established under Section 73 or 74 of CEAA 2012. Assess the cumulative effects on each VC selected by comparing the future scenario with the project and without the project. Effects of past activities (activities that have been carried out) will be used to contextualize the current state of the VC. In assessing the cumulative effects on current use of lands and resources for traditional purposes, the assessment will focus on the cumulative effects on the relevant activity (e.g., hunting, fishing, trapping, plant harvesting). Describe the mitigation measures that are technically and economically feasible. The proponent shall assess the effectiveness of the measures applied to mitigate the cumulative effects. In cases where measures exist that are beyond the scope of the proponent's responsibility that could be effectively applied to mitigate these effects, the proponent will identify these effects and the parties that have the authority to act. In such cases, the EIS will summarize the discussions that took place with the other parties in order to implement the necessary measures over the long term. Determine the significance of the cumulative effects. Develop a follow-up program to verify the accuracy of the assessment or to dispel the uncertainty concerning the effectiveness of mitigation measures for certain cumulative effects. 			7.4.3	Cumulative Effects Assessment
	8	Summary of Environmental Effects Assessment			<p>The EIS will contain a table summarizing the following key information:</p> <ul style="list-style-type: none"> Potential environmental effects on VCs. Proposed mitigation measures to address the effects identified above. Potential residual effects and the significance of the residual environmental effects. <p>In a second table, the EIS will summarize all key mitigation measures and commitments made by the proponent which will more specifically mitigate any significant adverse effects of the project on VCs (i.e., those measures that are essential to ensure that the project will not result in significant adverse environmental effects).</p>	8	Summary of Environmental Effects Assessment		

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
	9	Follow-up and Monitoring Programs	9.1	Follow-up Program	<p>A follow-up program is designed to verify the accuracy of the effects assessment and to determine the effectiveness of the measures implemented to mitigate the adverse effects of the project.</p> <p>The EIS shall present a preliminary follow-up program and shall include:</p> <ul style="list-style-type: none"> • Objectives of the follow-up program and the VCs targeted by the program. • List of elements requiring follow-up. • Number of follow-up studies planned as well as their main characteristics (list of parameters to be measured, planned implementation timetable, etc.). • Intervention mechanism used in the event that an unexpected deterioration of the environment is observed. • Mechanism to disseminate follow-up results among the concerned populations. • Accessibility and sharing of data for the general population. • Opportunity for the proponent to include the participation of the Mi'kmaq of Nova Scotia and stakeholders on the affected territory, during the development and implementation of the program. • Involvement of local and regional organizations in the design, implementation and evaluation of the follow-up results as well as any updates, including a communication mechanism between these organizations and the proponent. 	9	Follow-up and Monitoring Programs	9.1	Follow-up Programs Appendix B - EMP
			9.2	Monitoring	<p>The proponent will prepare an environmental monitoring program for all phases of the project. Specifically, the environmental impact statement shall present an outline of the preliminary environmental monitoring program, including the:</p> <ul style="list-style-type: none"> • Identification of the interventions that pose risks to one or more of the environmental and/or VCs and the measures and means planned to protect the environment. • Identification of regulatory instruments that include a monitoring program requirement for the VCs • Description of the characteristics of the monitoring program where foreseeable (e.g., location of interventions, planned protocols, list of measured parameters, analytical methods employed, schedule, human and financial resources required). • Description of the proponent's intervention mechanisms in the event of the observation of non-compliance with the legal and environmental requirements or with the obligations imposed on contractors by the environmental provisions of their contracts. • Description of the responsibilities for monitoring and maintaining the integrity of remaining structures. • Management of disposal cell leachate and groundwater monitoring (including frequency and parameters to be monitored). • Guidelines for preparing monitoring reports (number, content, frequency, format) that will be sent to the authorities concerned. • Plans to engage the Mi'kmaq of Nova Scotia in monitoring, where appropriate. 			9.2	Monitoring Programs Appendix B - EMP

List of Acronyms

A

- AAQC** | Ambient Air Quality Criteria
- AAQMP** | Ambient Air Quality Monitoring Program
- ACCDC** | Atlantic Canada Conservation Data Centre
- AFDD** | Accumulated Freezing Degree-Days
- ANSMC** | Assembly of Nova Scotia Mi'kmaq Chiefs
- ASB** | Aeration Stabilization Basin

B

- bgs** | Below ground surface
- BHA** | *Boat Harbour Act*
- BHEAC** | Boat Harbour Environmental Advisory Committee
- BHETF** | Boat Harbour Effluent Treatment Facility
- BHRP** | Boat Harbour Remediation Project
- BHSL** | Boat Harbour Stabilization Lagoon
- BMPs** | Best Management Practices
- BOD** | Biochemical Oxygen Demand

C

- C&D** | Construction and Demolition
- CAAQS** | Canadian Ambient Air Quality Standards
- CBHDC** | Canadian Bridge Highway Design Code
- CCME** | Canadian Council of Ministers of the Environment
- CD** | Chart Datum
- CEA Agency** | Canadian Environmental Assessment Agency
- CEAA 2012** | Canadian Environmental Assessment Act, 2012
- CHBDC** | Canadian Highway Bridge Design Code
- CLC** | Community Liaison Coordinator
- CO** | Carbon Monoxide

CO₂ | Carbon Dioxide

CO_{2e} | Carbon Dioxide equivalent

COCs | Contaminants of Concern

COPCs | Chemicals or (Contaminants) of Potential Concern

COSEWIC | Committee on the Status of Endangered Wildlife in Canada

CRP | Complaint Response Protocol

CSM | Conceptual Site Models

CTD-Tu | Conductivity, temperature and turbidity

D

D/F TEQ | Dioxins and Furans Total Equivalent

DEFRA | Department of Environment Food and Rural Affairs

DFO | Department of Fisheries and Oceans

E

EBSA | Ecologically and Biologically Significant Area

ECCC | Environment & Climate Change Canada

EGSPA | Environmental Goals and Sustainable Prosperity Act

EIA | Environmental Impact Assessment

EIS | Environmental Impact Statement

EMP | Environmental Management Plan

EPP | Environmental Protection Plan

EPA | Environmental Protection Agency

EQS | Environmental Quality Standards

ERA | Ecological Risk Assessment

ERP | Emergency Response Plan

ESA | Endangered Species Act

ESL | Ecological Screening Levels

F

FHWA | Federal Highway Administration

FML | Flexible membrane liner

FPTCCCEA | Federal-Provincial Guidance for Considering Climate Change in Environmental Assessment

FSC | Food, Social and Ceremonial

G

GAC | Granular Activated Carbon

GCL | Geosynthetic Clay Liner

GCM | Global Climate Models

GHG | Greenhouse Gas

GPR | Ground Penetrating Radar

H

H₂S | Hydrogen Sulphide

HADD | Harmful Alteration, Disruption or Destruction

HC | Health Canada

HCN | Hydrogen Cyanide

HD | High Disturbance

HDPE | High Density Polyethylene

HELP | Hydrologic Evaluation of Landfill Performance

HHERA | Human Health and Ecological Risk Assessment

HHRA | Human Health Risk Assessment

HHWLT | Highest High-Water Large Tide

HQ | Hazard Quotient

I

IA | Industrial Approval

IAAC | Impact Assessment Agency of Canada

IAAMP | Independent Ambient Air Monitoring Program

ICIP | Investing in Canada Infrastructure Program

ICS | Indigenous Services Canada

IDF | Intensity-duration-frequency

ILE | Institution of Lighting Engineers

INAC | Indigenous and Northern Affairs Canada

IPCC | Intergovernmental Panel on Climate Change

IR | Irreversible

ISC | Indigenous Services Canada

ISO | International Organization for Standards

ISQGs | Interim Sediment Quality Guidelines

K

KMKNO | Kwilmu'kw Maw-klusuaq Negotiations Office

L

LCP | Late Carboniferous non-marine sediments of the Pictou Group

LD | Low Disturbance

LFG | Landfill gas

LSA | Local Study Area

M

MAL | Marine aquatic life

MBCA | Migratory Birds Convention Act

MCG | Mi'kmaw Conservation Group

MEKS | Mi'kmaq Ecological Knowledge Study

MGS | Membertou Geomatics Solution

mTPH | Modified Total Petroleum Hydrocarbons

N

N/L | No/Low

NA | Not applicable

NAPS | National Air Pollution Surveillance

NO₂ | Nitrogen Dioxide

NO_x | Nitric Oxide

NPRI | National Pollutant Release Inventory

NS ESA | Nova Scotia Endangered Species Act

NSLI | Nova Scotia Lands Inc.

NSTIR | Nova Scotia Department of Transportation and Infrastructure Renewal

NSDLF | Nova Scotia Department of Lands and Forestry

NSDNR | Nova Scotia Department of Natural Resources

NSE | Nova Scotia Environment

NSEQSs | Nova Scotia Environmental Quality Standards

O

O₃ | Ozone

OH | Open House

OIT | Oxidative Induction Time

OU | Odour Unit

O&M | Operation and Maintenance

P

PAHs | Polycyclic Aromatic Hydrocarbons

PCBs | Polychlorinated Biphenyls

PELs | Probable Effect Levels

PEPP | Project Environmental Protection Plan

Phase I ESA | Phase I Environmental Site Assessment

Phase II ESA | Phase II Environmental Site Assessment

PHC | Petroleum Hydrocarbons

PLFN | Pictou Landing First Nation

PM₁₀ | Particulate Matter less than 10 microns in diameter

PM₂₅ | Particulate Matter less than or equal to 2.5 microns

POH | Public Open House

PPER | Pulp and Paper Effluent Regulation

pphmv | Parts per hundred million by volume

PR | Partially Reversible

Province | Province of Nova Scotia

PVC | Polyvinyl Chloride

R

RFP | Request for Proposal

RODD | Remedial Option Decision Document

RPP | Reinforced Plastic Pipe

RSA | Regional Study Area

S

SARA | Species at Risk Act

SAR | Species at Risk

SDG | Sustainable Development Goals

SNSMR | Service Nova Scotia and Municipal Relations

SO₂ | Sulfur Dioxide

SOCC | Species of Conservation Concern

SSA | Site Study Area

SSEPP | Site-specific Environmental Protection Plan

SSI | Supplemental Site Investigation

SSTL | Site Specific Target Levels

ST | Short-Term

STPCORP | Sydney Tar Ponds and Coke Ovens Remediation Project

Su | Shulie Association

SWMP | Stormwater Management Ponds

T

TAC | Technical Advisory Committee

TC | Transport Canada

tCO_{2e} | Emissions

TEQ | Toxic Equivalence

TLTF | Temporary Leachate Treatment Facility

TOR | Terms of Reference

TPH | Total Petroleum Hydrocarbons

TRS | Total Reduced Sulphur

TRV | Toxicity Reference Values

TSP | Total Suspended Particulate

TDS | Total Dissolved Solids

TSS | Total Suspended Solids

TVOCs | Total Volatile Organic Compounds

U

UCLM | Upper Confidence Level of the Mean

UNDRIP | United Nations Declaration on the Rights of Indigenous Peoples

USEPA | United States Environmental Protection Agency

V

VC | Valued Component

VOC | Volatile Organic Compound

W

WC | Watercourse

Well-Being Study | Well-Being Baseline Study

WSS | Wetland of Special Significance

WWTP | Wastewater Treatment Plant

List of Measurements

Measurement Units

% | Percent

°C | Degrees Celsius

cm | Centimetre

cm/s | Centimetres Per Second

cm²/sec | Centimetres Squared Per Second

g/L | Grams Per Litre

ha | Hectares

hr | Hour

km | Kilometres

kt | Kilotonnes

kWh | Kilowatt Per Hour

L/s | Litres Per Second

m | Metres

m³ | Cubic Metres

mAMSL | Metres Above Mean Sea Level

mASL | Metres Above Sea Level

mg | Milligrams

mm | Millimetres

Mt | Megatonnes

MT | Metric Tonnes

MW | Megawatts

pg TEQ/m³ | Picogram Toxicity Equivalent Per Cubic Metre

µS/cm | Micro Siemens Per Centimeter

µg/m³ | Microgram Per Cubic Metre

Glossary of Terms

Activated Sludge | A biological wastewater treatment process that uses aeration and a biological flocculant composed of bacteria, fungi and protozoa to remove organic (carbonaceous) pollution from wastewaters. The term 'activated' comes from the fact that some of the settled biological flocculants, after treatment, are returned to the beginning of the treatment process to "activate" it, and the process is initiated again.

Aeration Stabilization Basin | A holding and/or treatment pond provided with artificial aeration to promote the biochemical of wastewaters.

Anadramous | Describes the migration pattern of certain fish, such as Atlantic Salmon, that spend most of their life in saltwater before travelling to shallow fresh water to reproduce.

Anthropogenic | Resulting from the influence of humans on nature.

Approval | Permission granted by an authorized individual or organization for an undertaking to proceed.

Aquifer | A geological formation, group of formations or part of a formation that contains sufficient saturated permeable material to yield groundwater .

Avian | Pertaining to or derived from birds.

Baseline | The conditions prior to initiating a project.

Bedrock | A general term for rock that underlies soil or other unconsolidated material.

Bench Scale Testing | Small scale testing of a technology in lab conditions.

Benthic | Of, or relating to, the bottom or floor of a water body.

Berm | A constructed shelf that breaks the continuity of a slope, or artificial ridge of earth, with the purpose of reducing erosion, or to increase the thickness of the embankment at a point of change in a slope or defined water surface elevation, or to direct surface water runoff.

Bioaccumulation | A term used to describe the process by which chemicals are accumulated in the tissues of an organism directly from exposure to water or soil.

Biodiversity | The number and variety of organisms found within a specified geographic region.

Biota | The organisms, including animals, plants, fungi, and micro-organisms, found in a given area.

Boat Harbour | Formerly known as A'se'k in Mi'kmaq, was originally a tidal estuary connected to the Northumberland Strait in Nova Scotia.

Boat Harbour Act, 2015 | Legislation passed by the Government of Nova Scotia in 2015, committing to the cessation of the reception and treatment of new effluent to the Boat Harbour Effluent Treatment by January 31, 2020.

Boat Harbour Effluent Treatment Facility | Constructed by the Province of Nova Scotia in 1967 to treat effluent from industrial sources, including a chlor-alkali plant and a bleached Kraft Pulp Mill.

Catadromous | Describes the migration pattern of certain fish, such as American eel, that spend most of their life in freshwater before travelling to oceanic waters to reproduce.

Climate | The statistical averages of precipitation, temperature, humidity, sunshine, wind velocity, and other phenomena such as fog, frost, and hailstorms for a particular region and time period, generally taken over a 30-year period (Climate normal).

Climate Change | Changes in the earth's climate, which can be caused both by natural forces and human activities. Most commonly associated with global warming and the global greenhouse effect, which highlight discernable changes to the earth's climate, (i.e., increasing temperatures, due to man-made activities and processes).

Commercial, Recreational, and Aboriginal Fisheries | Fish that are part of commercial, recreational, or Aboriginal fisheries are interpreted to be those fish that fall within the scope of applicable federal or provincial fisheries regulations, as well as those that can be fished by Aboriginal organizations or their members for food, social or ceremonial purposes or for purposes set out in a land claims agreement. The prohibition against "serious harm" to fish applies to fish and fish habitat that are part of or support commercial recreational or Aboriginal fisheries.

Complaint Response Procedure | The Complaint Response Protocol (CRP) outlines the process that will be undertaken upon receipt of a complaint from residents to ensure a swift and sure response to any and all complaints from area residents and business owners regarding this Project.

Compensation | A mitigation method that counterbalances or makes up in part or in whole for an adverse effect.

Containment Cell | An engineered facility to contain wastes and manage leachate, if any. In terms of this Project, the pre-existing sludge disposal cell on-site that will be used for long-term storage of impacted sediment and material.

Contaminant | A biological, chemical, physical or radiological substance that becomes harmful for humans or living organisms, when accidentally or deliberately introduced to air, water, soil, or food.

Contingency Plan | A set of predetermined actions to be taken in the event of an accident, malfunction or unplanned event.

Cumulative Effects | As defined in the draft Technical Guidance for Assessing Cumulative Environmental Effects under CEAA 2012 (2014), cumulative effects can include the following:

- a) "An additive cumulative effect is the sum of individual effects of two or more physical activities"
- b) "A synergistic cumulative effect occurs as a result of the interaction between two or more effects when, the resultant combination is greater or different than the simple addition of the effects"
- c) "Compensatory cumulative effects are effects from two or more physical activities that "offset" each other"
- d) Masking cumulative effects are "the effects of one project might mask the effects of another in the field"

Deleterious Substance | A substance that is harmful to the environment it is released to.

Dilution | The process of making weaker or less concentrated most often pertaining to water.

Disturbance | A temporary or permanent alteration of the physical structure or arrangement of biotic and abiotic elements.

Dredge | To remove a portion (e.g., trench), of a waterbody or substrate in a waterbody with a machine usually by buckets on an endless chain or a suction tube.

Ecosystem | A spatially defined system including all biological organisms and abiotic media.

Effect | As defined under *Impact Assessment Act*, effect means, unless the context requires otherwise: "changes to the environment or to health, social or economic conditions and the positive and negative consequences of these changes."

Emergency Response Plan | A plan that describes roles, decision-making and communication processes, expertise and capacity so that the response to an environmental emergency is quick and effective.

Emissions | All solid, liquid, or gaseous discharges from equipment or facility, but normally referring to gaseous and particulate air emissions (typically solids are referred to as residue and liquids as effluent).

Endangered | A species facing imminent extirpation or extinction.

Engineered | Designed and build using scientific and engineering principles.

Environment | As defined by the *Impact Assessment Act*, environment means "the components of the earth, including:

- (i) land, water and air, including all layers of the atmosphere;
- (ii) all organic and inorganic matter and living organisms; and
- (iii) the interacting natural systems that include components referred to in paragraphs (a) and (b)."

Environmental Effect | Shouldn't we use federal? As defined under *Nova Scotia's Environment Act*, environmental effect means:

Any change, whether negative or positive, that the undertaking may cause in the environment, including any effect on socio-economic conditions, on environmental health, physical and cultural heritage or on any structure, site or thing including those of historical, archaeological, paleontological or architectural significance.

and

Any changes to the undertaking that may be caused by the environment, whether the change occurs inside or outside the Province.

Environmental Impact Assessment (EIA) | Planning and decision-making tool, where the environmental effects of an undertaking are predicted and evaluated, and a subsequent decision is made based on the acceptability of the undertaking. The objectives of an EIA are to minimize or avoid environmental effects before they occur and incorporate environmental factors into decision making.

Environmental Management Plan | It is a living document that ensures that Project will be reflective of legislative and environmental responsibilities but is sensitive to any changes that might arise during its implementation. It describes at high level each Project component and the plan to protect and mitigate/manage/minimize any negative environmental effects throughout the project. The Environmental

Management Plan (EMP) serves as an early warning system through implementation of the Environmental Effects Monitoring Plan and forms an important cornerstone in all contractual phases of the Project such that all Project participants (Contractor(s) and stakeholders) will be responsible for adherence to the EMP; under the accountability of Nova Scotia Lands Inc.

Environmental Quality Standards | Environmental quality standards (EQS) are guidelines against which the acceptability of the presence and concentration of substances in soil, surface water, ground water, vapour and sediment are determined. EQS aid in improving the assessment of the equality of the environment.

Effluent | Usually referring to liquid releases from a facility or structure.

Estuary | The part of a river or stream or other body of water having unimpaired connection with the open sea, where the sea water is typically measurably diluted with freshwater derived from land drainage. The estuarine environment is typically defined as the aquatic environment where a river meets the sea.

Existing Conditions | Existing conditions are studied as part of the environmental assessment process to understand baseline conditions against which to assess anticipated environmental change.

Extinction | In biology and ecology, extinction is the ceasing of existence of a species or group of taxon's. The moment of extinction is generally considered to be the death of the last individual of that species.

Extirpation | To eliminate completely a species from a region.

Fauna | Animal species.

Fish | Under Section 2 of the *Fisheries Act*, includes:

- a) Part of fish
- b) Shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals
- c) The eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals

Fish Habitat | As fined under the *Fisheries Act*, fish habitat includes the spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes.

Flora | Plant species.

Greenhouse Gases (GHGs) | Gaseous compounds that inhibit the release of heat from the atmosphere. The primary greenhouse gases considered in this Project are carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O).

Geotube® | For the purpose of this Project, a geotextile tube used to hold the dredged material, made of a permeable but soil-tight geotextile material.

Ground Penetrating Radar (GPR) | Geophysical remote sensing method to determine variances below the ground surface as a result of chemical or physical change. This is often used to survey selected areas as part of archaeological and environmental investigative work.

Hazardous Material | A hazardous material is any items or agent (biological, chemical, radiological, and/or physical), which has the potential to cause harm to humans, animals or the environment, either by itself or through interactions with other factors.

Herptile | A reptile or amphibian.

Human Health and Ecological Risk Assessment (HHERA) | A process used to assess the potential risks to human and ecological receptors as a result of environmental stressors.

Hydrogeology | Study of the properties, distribution and circulation of water below the ground surface.

Hydrology | Study of the properties, distribution and circulation of water on the ground surface.

Illuminance | The total luminous flux (the perceived power of light) incident on a surface per unit area.

Important Bird Areas | Discrete sites that support specific groups of birds: threatened birds, large groups of birds, and birds restricted by range or by habitat as defined through surveys and research

Infiltration | The movement of water from the land surface into the soil.

Intertidal | The region between the high tide mark and the low tide mark.

Invertebrates | Animals lacking a backbone or spinal column.

Leachate | For the purpose of this Project, water that comes in contact with impacted material within the sludge disposal cell.

Mitigation | Action(s) that remove or alleviate to some degree the potential negative effects associated with an activity.

Monitoring | Periodic or continuous surveillance and/or testing to determine the characteristics of a substance or the level of compliance with statutory requirements and/or contaminant levels in various media or in humans, plants, and animals.

Noise | Noise is defined as an unwanted, undesired, or unpleasant sound.

Non-vascular Plant | Non-vascular plants include mosses, hornworts and liverworts, and some algae. They are generally small plants limited in size by poor transport methods for water, gases, and other compounds. They reproduce via spores rather than seeds and do not produce flowers, fruit or wood.

Northern Bleached Softwood Kraft | Northern Bleached Softwood Kraft pulp in its finished form is made up of long slender fibres that provide excellent bonding and tensile properties. The pulp is used for manufacturing a variety of paper products including printing and writing paper, specialty grades and a range of tissue products.

Outfall | In the context of the project, outfall describes the location where the effluent pipeline terminates, and treated effluent is released into the Northumberland Strait.

Parameter | A variable that defines a system and can be varied in an experiment to determine its behavior.

Pilot Scale Testing | Small scale testing of a technology in real world conditions.

Potable Water | Water that is fit for drinking by humans and animals.

Potential Effect | An effect that is deemed possible to result from an activity.

Project Environmental Protection Plan | An overall comprehensive strategy for the protection of the natural environment throughout the Project. It is a living document that will be updated throughout the Project which provides a strategic environmental framework that facilitates further development at the detailed construction stage of the Project through more element-specific environmental documentation. The Project Environmental Protection Plan includes all the general construction and mitigation measures found in the Site-Specific Environmental Protection Plans, plus additional environmental effects monitoring programs.

Proponent | A person who; carries out or proposed to carry out an undertaking; or is the owner or person having charge, management, or control of an undertaking.

Remediation | In the case of this Project, remediation is defined as the action of reversing or stopping environmental damage.

Residual Environmental Effect | An environmental effect that remains, or is predicted to remain, even after mitigation measures have been applied.

Right of Way | A term used to describe the legal right, established by usage or grant, to pass along a specific route through grounds or property belongings to another.

Run-Off | The portion of precipitation that does not infiltrate into the ground surface and flows to surface water bodies.

Sediment | Fragmented material from weathered rocks and organic material that is suspended in, transported by and eventually deposited by water or air.

Serious Harm | For the purposes of the *Fisheries Act*, serious harm to fish is the death of fish or any permanent alteration to, or destruction of, fish habitat.

Service Life | The period of time during which the components of a properly designed and maintained engineered facility will function and perform as designed.

Shovel Test | Typically a small shallow hole, dug in areas of elevated archaeological potential, to confirm the presence or absence of archaeological resources.

Significance | A defined threshold of acceptability. The significance of adverse environmental effects is determined by a combination of scientific data, regulated thresholds, standards, social values and professional judgement.

Site Study Area | In the context of this Project, spans from the first standpipe on the Kraft Pulp Mill property, through the effluent pipeline, described above, through existing and historic BHETF lands, Boat Harbour and its banks, extending to Northumberland Strait, and PLFN, located between Boat Harbour and Northumberland Strait.

Sites of Ecological Significance | Sites hosting organisms of ecological significance as defined by legislation.

Species at Risk | An extirpated, endangered or threatened species or a species of a special concern as defined by legislation.

Species Rank | A provincial rarity ranking assigned for the purpose of setting protection priorities for a species and/or ecological community. This ranking system is used by conservation data centres and natural heritage programs.

Spill | An accidental release of a substance, most often liquids.

Standpipe | A high vertical pipe or reservoir that is used to secure a uniform pressure in a water-supply system.

Threatened Species | A species that is likely to become an endangered species if nothing is done to reverse the factors leading to extirpation or extinction as defined by legislation.

Tidal Estuary | Partially enclosed coastal body of water, having an open connection with the ocean, where freshwater from inland is mixed with saltwater from the sea.

Topographic | The configuration of a surface including its relief and the position of its natural and man-made features.

Valued Component | Valued Component (VC) refers to environmental, biophysical or human features that may be impacted by a project.

Vascular plant | Plants that have specialized tissues for conducting water, including ferns, flowering plants, and conifers.

Vegetation | Plants in general or plants that are found in a particular area.

UTM | Universal Transverse Mercator. A mapping grid developed by the National Imagery and Mapping Agency (USA). The globe is divided into numbered zones, and within each zone northing and easting values are used to locate any point on the Earth's surface.

Watercourse | A natural or artificial channel through which water flows.

Wetland | Wetlands are areas where water covers the soil or is presented either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season. Nova Scotia Environment (1989) defines wetlands as "land commonly referred as marsh, swamp, fen, or bog that either periodically or permanently has a water table at, near or above the land's surface or that is saturated with water, and sustains aquatic processes as indicated by the presence of poorly drained soils, hydrophytic vegetation and biological activities adapted to wet conditions".

Wildlife Management Area | Areas designated by the Province of Nova Scotia for the protection of wildlife, such as the Abercrombie Wildlife Management Area.