

## TABLE OF CONTENTS

<b>1.</b>	<b>INTRODUCTION .....</b>	<b>1</b>
1.1	Purpose of this Document .....	1
1.2	Purpose and Need.....	2
1.3	Supporting Project Documents.....	5
1.4	Avoidance and Minimization of Impacts .....	6
1.5	References .....	6
<b>2.</b>	<b>PROJECT DESCRIPTION REVISIONS .....</b>	<b>7</b>
2.1	Project Overview.....	7
2.2	Project Conceptual Design Changes .....	9
2.2.1	Gas Composition .....	13
2.2.2	West Dock at Prudhoe Bay .....	13
2.3	Design Refinements .....	14
2.4	Gas Conditioning Facility .....	15
2.5	Pipe Characteristics .....	16
2.5.1	Pipe Diameter, Pressure, and Operating Capacity .....	16
2.5.2	Pipe Wall Thickness .....	16
2.5.3	Pipe Burial .....	17
2.5.4	Anticipated Pipe Operating Temperature .....	17
2.5.5	Route Refinements.....	18
2.5.5.1	A Shorter, Straighter Route .....	18
2.5.5.2	Minimal Collocation with Existing Rights-of-Way .....	18
2.5.5.3	North Slope Western Shift .....	18
2.5.5.4	Western Side of the Nenana River .....	19
2.5.5.5	Nancy Lake State Recreation Area Western Bypass.....	19
2.5.5.6	Fairbanks Lateral.....	19
2.6	Support Facilities .....	19
2.7	Stream Crossings.....	19
2.8	Material Sites and Volume.....	20
2.9	Camps and Pipe Storage Yards .....	20
2.10	Access Roads .....	20
2.11	Project Footprint.....	21
2.12	References .....	21
<b>3.</b>	<b>CONNECTED ACTIONS .....</b>	<b>23</b>
3.1	Connected Actions Listed in the Final Environmental Impact Statement .....	23
3.2	Connected Actions in the Revised Alaska Stand Alone Pipeline Design .....	23
3.3	Reasonably Foreseeable Actions in the Final Environmental Impact Statement.....	24
3.4	Reasonably Foreseeable Actions the Revised Alaska Stand Alone Pipeline Design.....	24
3.5	References .....	25
<b>4.</b>	<b>ALTERNATIVES.....</b>	<b>26</b>
4.1	Alternative Measures Considered in the Final Environmental Impact Statement....	26

4.2 New Alternative Measures Considered for Alaska Stand Alone Pipeline ..... 27

4.3 References ..... 28

**5. ENVIRONMENTAL ANALYSIS..... 29**

5.1 Soils and Geology ..... 30

5.1.1 Affected Environment ..... 30

5.1.2 Environmental Consequences..... 30

5.1.2.1 Construction ..... 30

5.1.2.2 Operations ..... 33

5.1.2.3 Yukon River Crossing Variations and Denali National Park and Preserve Route Variation ..... 33

5.1.3 References ..... 33

5.2 Water Resources..... 35

5.2.1 Affected Environment ..... 35

5.2.2 Environmental Consequences..... 35

5.2.2.1 Construction ..... 35

5.2.3 Gas Conditioning Facility to Mile Post 533.5 ..... 46

5.2.3.1 Mile Post 533.5 to Mile Post 548.5 ..... 46

5.2.3.2 Mile Post 548.5 to Mile Post 727 ..... 46

5.2.3.3 Fairbanks Lateral..... 46

5.2.3.4 Aboveground Facilities ..... 46

5.2.4 Operation ..... 47

5.2.5 References ..... 47

5.3 Terrestrial vegetation..... 49

5.3.1 Affected Environment ..... 49

5.3.1.1 Northern Ecoregion ..... 49

5.3.1.2 Interior Ecoregion ..... 50

5.3.1.3 Southcentral Ecoregion ..... 50

5.3.2 Environmental Consequences..... 51

5.3.2.1 Construction ..... 52

5.3.2.2 Operations ..... 58

5.3.3 References ..... 59

5.4 Wetlands..... 61

5.4.1 Affected Environment ..... 61

5.4.1.1 Regulatory Setting ..... 61

5.4.1.2 Analysis Methodology ..... 61

5.4.2 Wetlands Analysis ..... 62

5.4.2.1 Ten-Mile-Wide Corridor ..... 64

5.4.2.2 Non-native and Invasive Plants..... 64

5.4.2.3 Rare and Sensitive Plants ..... 64

5.4.2.4 Access Roads ..... 65

5.4.2.5 Dust Deposition..... 65

5.4.2.6 Material Sites ..... 65

5.4.2.7 Denali National Park and Preserve Route Variation ..... 65

5.4.2.8 Climate Change..... 65

5.4.2.9 2,000-Foot-Wide Planning Corridor ..... 67

5.4.2.10 Temporary Extra Work Spaces ..... 68

	5.4.2.11	Construction Right-of-Way.....	69
	5.4.2.1	Grading and Trenching.....	74
	5.4.2.2	Backfilling.....	74
	5.4.2.3	Rehabilitation.....	74
	5.4.2.4	Fragmentation.....	74
	5.4.2.5	Soil Compaction and Erosion.....	74
	5.4.2.6	Permanent Right-of-Way.....	74
	5.4.2.7	Mowing.....	77
	5.4.2.8	Aboveground Facilities.....	77
	5.4.2.9	Fragmentation.....	77
5.4.3		Environmental Consequences.....	77
5.4.4		Ten-Mile-Wide Corridor.....	78
	5.4.4.1	Access Roads.....	78
	5.4.4.2	Material Sites.....	78
	5.4.4.3	Gas Conditioning Facility.....	79
	5.4.4.4	Dust Deposition.....	79
5.4.5		2,000-Foot-Wide Corridor.....	79
5.4.6		Construction Right-of-Way.....	80
5.4.7		Permanent Right-of-Way.....	80
5.4.8		References.....	80
5.5		Terrestrial Wildlife.....	82
	5.5.1	Affected Environment.....	82
	5.5.1.1	Regulatory Setting.....	84
	5.5.2	Environmental Consequences.....	84
	5.5.2.1	West Dock Modifications.....	84
	5.5.2.2	Buried Pipeline.....	85
	5.5.2.3	Pipeline Alignment Modifications.....	85
	5.5.2.4	Right-of-Way Width Modifications.....	85
	5.5.2.5	Material Sites, Access Roads, and Facilities.....	86
	5.5.2.6	Construction Seasons.....	86
	5.5.3	References.....	87
5.6		Fish.....	89
	5.6.1	Affected Environment.....	89
	5.6.1.1	Regulatory Setting.....	89
	5.6.1.2	Project Area.....	90
	5.6.2	Environmental Consequences.....	92
	5.6.2.1	Construction.....	102
	5.6.2.2	Operations and Maintenance.....	105
	5.6.3	References.....	105
5.7		Marine Mammals.....	108
	5.7.1	Affected Environment.....	108
	5.7.1.1	Regulatory Setting.....	108
	5.7.2	Environmental Consequences.....	109
	5.7.2.1	Construction.....	109
	5.7.2.2	Operations.....	109
	5.7.3	References.....	110

5.8 Threatened and Endangered Species ..... 111

5.8.1 Affected Environment ..... 111

5.8.1.1 Regulatory Setting ..... 111

5.8.1.2 Summary of Endangered Species Act Protected and Candidate  
Species in Proposed Project Area..... 111

5.8.1.3 Species Descriptions ..... 113

5.8.2 Environmental Consequences..... 115

5.8.2.1 Construction ..... 116

5.8.2.2 Species Descriptions ..... 116

5.8.2.3 Operations ..... 118

5.8.3 References ..... 118

5.9 Land Use ..... 121

5.9.1 Affected Environment ..... 121

5.9.2 Environmental Consequences..... 123

5.9.2.1 Construction ..... 123

5.9.2.2 Operations ..... 125

5.9.1 References ..... 127

5.10 Recreation ..... 128

5.10.1 Affected Environment ..... 128

5.10.1.1 Regulatory Setting ..... 129

5.10.2 Environmental Consequences..... 129

5.10.2.1 Construction ..... 130

5.10.2.2 Operations ..... 131

5.10.3 References ..... 131

5.11 Visual Resources..... 133

5.11.1 Affected Environment ..... 133

5.11.2 Environmental Consequences..... 134

5.11.2.1 Construction ..... 134

5.11.2.2 Operations ..... 135

5.11.3 References ..... 137

5.12 Socioeconomics..... 138

5.12.1 Communities that could Access Natural Gas via a Spur Line Tie-in ..... 138

5.12.2 Communities that could Access Natural Gas via the Fairbanks Lateral Line  
Tie-in or Beluga Pipeline Tie-in ..... 140

5.12.3 Communities that could Access Compressed Natural Gas via Truck or  
Barge..... 144

5.12.4 Affected Environment ..... 145

5.12.5 Environmental Consequences..... 161

5.12.5.1 Communities that could Access Natural Gas via a Spur Line Tie-  
in..... 161

5.12.5.2 Communities that could Access Natural Gas via the Fairbanks  
Lateral Line Tie-in or Beluga Pipeline Tie-in ..... 168

5.12.5.3 Communities that could Access Compressed Natural Gas via  
Truck or Barge ..... 169

5.12.6 References ..... 170

5.13 Cultural Resources ..... 176

5.13.1 Affected Environment ..... 176

	5.13.1.1	Previously Documented Cultural Resources– North Slope Region .....	176
5.13.2		Environmental Consequences.....	184
	5.13.2.1	Pipeline Facilities .....	184
	5.13.2.1.1	Mainline .....	184
	5.13.2.2	Support Facilities .....	187
5.13.3		References .....	188
5.14		Subsistence.....	190
	5.14.1	Affected Environment .....	190
	5.14.2	North Slope Region .....	191
	5.14.2.1	Subsistence Use Areas .....	191
	5.14.2.2	Subsistence Harvest Patterns.....	191
5.14.3		Interior Region.....	194
	5.14.3.1	Seasonal Round.....	194
	5.14.3.2	Subsistence Use Areas .....	194
	5.14.3.2.1	Subsistence Harvest Patterns.....	195
	5.14.3.3	Seasonal Round.....	198
5.14.4		Southcentral Region.....	198
	5.14.4.1	Subsistence Use Areas .....	198
	5.14.4.2	Subsistence Harvest Patterns.....	199
5.14.5		Seasonal Round .....	202
5.14.6		Environmental Consequences.....	202
	5.14.6.1	Construction .....	203
	5.14.6.2	Operations and Maintenance .....	205
	5.14.6.3	Alaska National Interest Lands Conservation Act (810 Subsistence Finding.....	205
5.14.7		References .....	205
5.15		Public Health.....	207
	5.15.1	Affected Environment .....	207
	5.15.2	Environmental Consequences.....	209
	5.15.2.1	Construction .....	209
	5.15.2.2	Water and Sanitation .....	210
	5.15.2.3	Scoring .....	210
	5.15.2.4	Accidents and Injuries.....	210
	5.15.2.5	Scoring .....	211
	5.15.2.6	Other Public Health Factors .....	211
	5.15.2.7	Operations .....	212
5.15.3		References .....	213
5.16		Air Quality .....	214
	5.16.1	Affected Environment .....	214
	5.16.1.1	Regulatory Setting.....	214
5.16.2		Environmental Consequences.....	215
	5.16.2.1	Construction .....	215
	5.16.2.2	Operations .....	217
5.16.3		References .....	223
5.17		Noise .....	224

5.17.1 Affected Environment ..... 224

5.17.2 Environmental Consequences..... 224

    5.17.2.1 Construction ..... 224

    5.17.2.2 Operations ..... 225

5.17.3 References ..... 225

5.18 Navigation Resources..... 226

    5.18.1 Affected Environment ..... 226

        5.18.1.1 Regulatory Setting..... 226

            5.18.1.1.1 Federal Regulations..... 226

            5.18.1.1.2 State Regulations..... 227

            5.18.1.1.3 Local Agencies..... 227

        5.18.1.2 Navigational Resources Crossed by the Project..... 227

    5.18.2 Environmental Consequences..... 229

        5.18.2.1 Construction ..... 229

        5.18.2.2 Operations ..... 230

    5.18.3 References ..... 230

5.19 Reliability and Safety..... 232

    5.19.1 References ..... 233

5.20 Cumulative Effects..... 234

    5.20.1.1 Key Assumptions of the Cumulative Effects Analysis ..... 234

    5.20.1.2 Issues Relevant to the Cumulative Effects Analysis ..... 235

    5.20.1.3 Geographic and Temporal Scope ..... 236

    5.20.1.4 Cumulative Effects Analysis ..... 236

    5.20.2 References ..... 242

5.21 Short-term Use Versus Long-term Productivity of the Environment ..... 243

    5.21.1 References ..... 245

5.22 Irreversible and Irretrievable Commitment of Resources ..... 246

    5.22.1 References ..... 247

5.23 Mitigation..... 248

    5.23.1 Affected Environment ..... 248

        5.23.1.1 Regulatory Setting..... 248

    5.23.2 Environmental Consequences..... 248

    5.23.3 References ..... 249