



# Keeyask Generation Project Environmental Impact Statement

## Response to EIS Guidelines



June 2012

# CHAPTER 7

## CUMULATIVE EFFECTS ASSESSMENT

# CHAPTER 7

## TABLE OF CONTENTS

	Page
<b>7.0 CUMULATIVE EFFECTS ASSESSMENT .....</b>	<b>7-1</b>
7.1 INTRODUCTION .....	7-1
7.2 APPROACH .....	7-1
7.3 PAST, CURRENT AND FUTURE PROJECTS AND ACTIVITIES .....	7-4
7.3.1 Past and Current Projects and Activities Considered in the Cumulative Effects Assessment .....	7-4
7.3.2 Summary of Project Physical Effects with Past and Current Projects/Activities .....	7-4
7.3.3 Future Projects and Activities Considered in the Cumulative Effects Assessment of the Project .....	7-6
7.3.4 Summary of Project Physical Effects with Future Projects/Activities .....	7-6
7.4 ASSESSMENT OF CUMULATIVE EFFECTS.....	7-11
7.5 BIOPHYSICAL ENVIRONMENT .....	7-11
7.5.1 Aquatic Environment .....	7-16
7.5.1.1 Effects of Past and Current Projects and Activities.....	7-16
7.5.1.1.1 Water Quality .....	7-17
7.5.1.1.2 Fish .....	7-17
7.5.1.2 Summary of Cumulative Effects of the Project with Past and Current Projects and Activities.....	7-18
7.5.1.2.1 Water Quality .....	7-19
7.5.1.2.2 Fish .....	7-19
7.5.1.3 Cumulative Effects of the Project including Future Projects and Activities .....	7-21
7.5.1.3.1 Water Quality .....	7-22
7.5.1.3.2 Fish .....	7-22
7.5.2 Terrestrial Environment.....	7-23
7.5.2.1 Effects of Past and Current Projects and Activities.....	7-23
7.5.2.1.1 Habitat, Ecosystems and Plants.....	7-23
7.5.2.1.2 Birds and Waterfowl .....	7-24

	7.5.2.1.3 Mammals.....	7-26
7.5.2.2	Summary of Cumulative Effects of the Project with Past and Current Projects/Activities .....	7-27
	7.5.2.2.1 Habitat, Ecosystems and Plants .....	7-27
	7.5.2.2.2 Birds and Waterfowl.....	7-28
	7.5.2.2.3 Mammals.....	7-29
7.5.2.3	Cumulative Effects of the Project including Future Projects/Activities .....	7-31
	7.5.2.3.1 Habitat, Ecosystems and Plants .....	7-32
	7.5.2.3.2 Birds and Waterfowl.....	7-33
	7.5.2.3.3 Mammals.....	7-34
7.6	SOCIO-ECONOMIC ENVIRONMENT .....	7-36
7.6.1	Effects of Past and Current Projects and Activities.....	7-40
	7.6.1.1 Infrastructure and Services .....	7-40
	7.6.1.2 Personal Family and Community Life.....	7-41
	7.6.1.3 Heritage Resources.....	7-42
7.6.2	Summary of Cumulative Effects of the Project with Past and Current Projects and Activities .....	7-42
	7.6.2.1 Infrastructure and Services .....	7-42
	7.6.2.2 Personal Family and Community Life.....	7-44
	7.6.2.3 Heritage Resources.....	7-45
7.6.3	Cumulative Effects of the Project including Future Projects and Activities .....	7-45
	7.6.3.1 Infrastructure and Services .....	7-46
	7.6.3.2 Personal Family and Community Life.....	7-48
	7.6.3.3 Heritage Resources.....	7-51

# APPENDICES

APPENDIX 7A: Relevant Other Projects and Activities



## LIST OF TABLES

	<b>Page</b>
Table 7-1: Past and Current Projects and Activities Considered in the Cumulative Effects Assessment of the Project.....	7-5
Table 7-2: Future Projects and Activities in the Vicinity of Gillam Considered in the Cumulative Effects Assessment of the Project .....	7-7
Table 7-3: Application of Cumulative Effects Assessment Criteria to Biophysical VECs.....	7-12
Table 7-4: Application of Cumulative Effects Assessment Criteria to Socio-Economic VECs .....	7-38

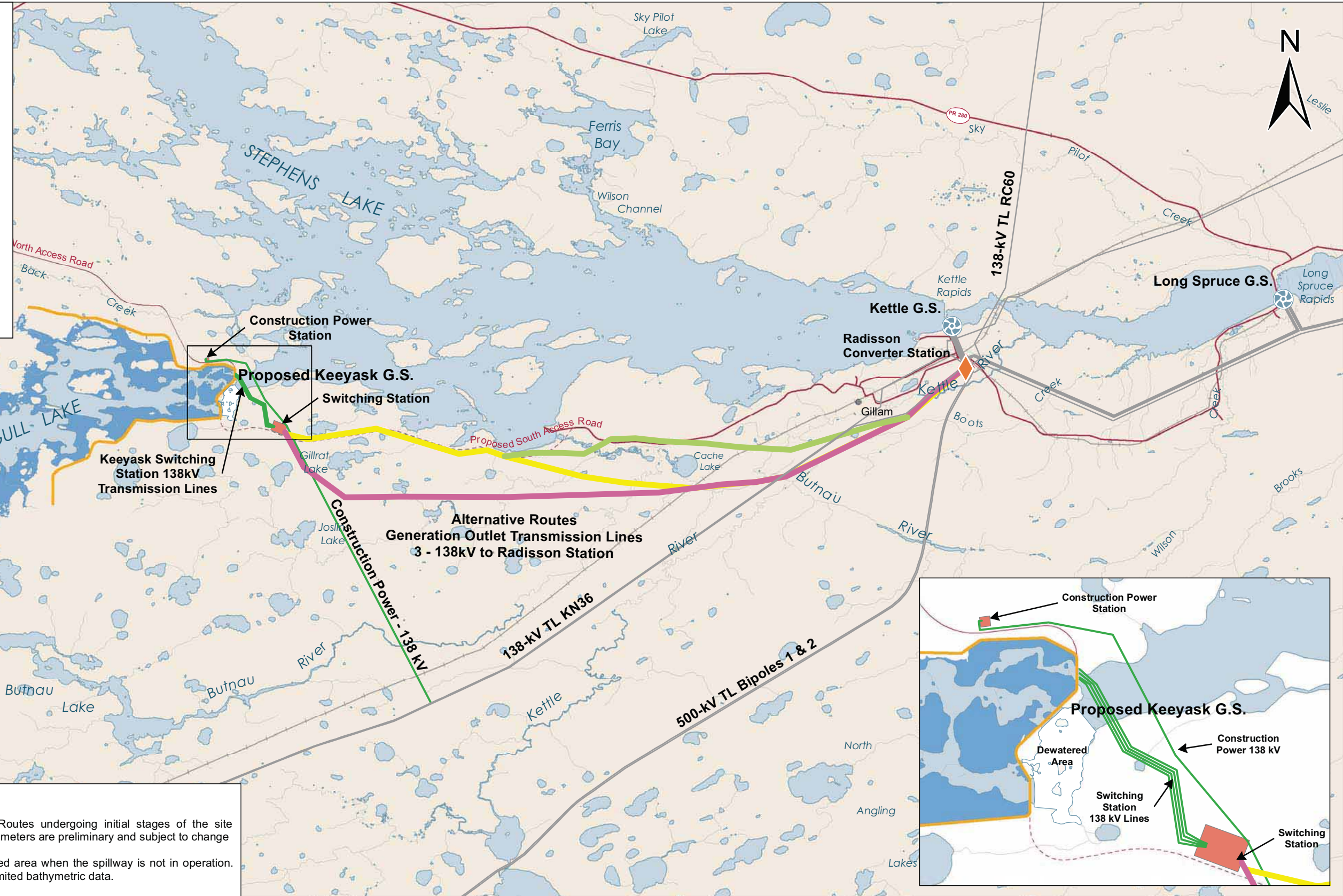
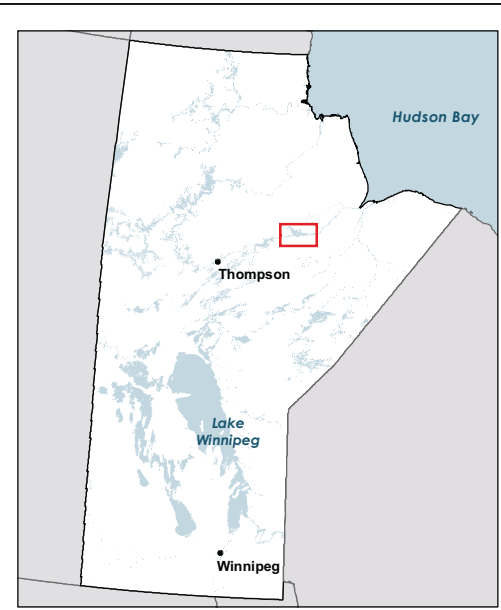
## LIST OF FIGURES

	<b>Page</b>
Figure 7-1: Major Construction Activity in the Gillam Area During Construction of the Keeyask Generation Project.....	7-9

## LIST OF MAPS

In print version, Appendix 7A Maps can be found in the accompanying Map and Figure Folio

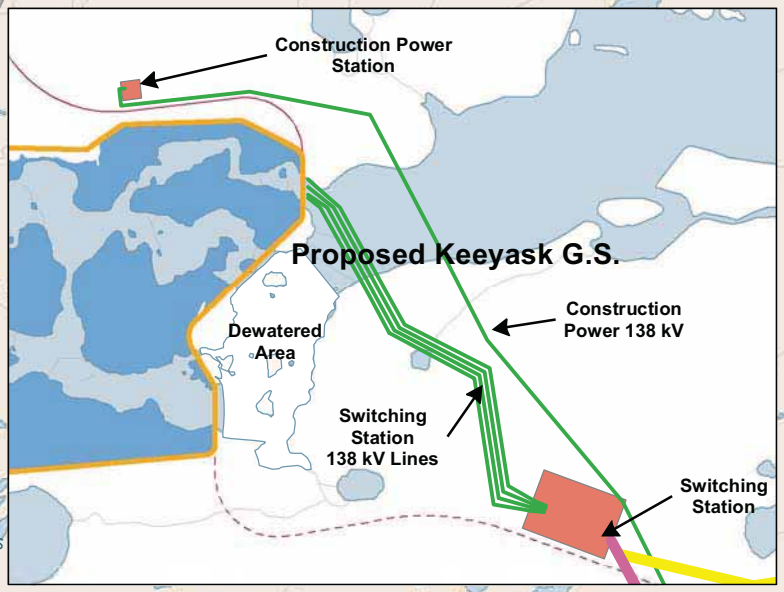
Map 7A-1:	Hydro Development in Northern Manitoba
Map 7A-2:	Wuskwatim Transmission Project
Map 7A-3:	Manitoba Hydro Transmission Line Network
Map 7A-4:	Keeyask Infrastructure Project Site
Map 7A-5:	Provincial Road 280 Upgrade
Map 7A-6:	Northern Extents of Bipole III Transmission Project
Map 7A-7:	Keeyask Construction Power Project - Preliminary Transmission Corridors During Construction
Map 7A-8:	Keeyask Transmission Project - Preliminary Transmission Corridors During Operation



**Notes:**

All proposed Transmission Lines are Alternative Routes undergoing initial stages of the site selection process. Alignment and other design parameters are preliminary and subject to change

Map illustrates the estimated extent of the dewatered area when the spillway is not in operation. The true extent of this area is uncertain due to the limited bathymetric data.



<b>DATA SOURCE:</b> Manitoba Hydro; Government of Manitoba; Government of Canada; Manitoba Hydro - Transmission; Manitoba Hydro - Water Resource Engineering (PP_95perc_4327_159_shore_rev5)		
<b>CREATED BY:</b> Manitoba Hydro - Hydro Power Planning - GIS & Special Studies		
<b>COORDINATE SYSTEM:</b> UTM NAD 1983 Z15N	<b>DATE CREATED:</b> 13-FEB-12	<b>REVISION DATE:</b> 22-MAY-12
	<b>VERSION NO.:</b> 2.0	<b>QA/QC:</b> APPROVED

<b>Legend</b>		
Transmission Line (Existing)	Generating Station (Existing)	Potential Dewatered Area
Transmission Line (Proposed)	Converter Station (Existing)	Initial Flooded Area (159 m)
<b>Generation Outlet Transmission Lines</b>		
Route Alternative Option A	Keyask Principal Structures	Existing Water Level
Route Alternative Option B	Transmission Substation (Proposed)	Highway
Route Alternative Option C		Access Road
		Proposed Access Road

## Keyask Transmission Project

### Preliminary Transmission Corridors During Operation