Hamlet of Tuktoyaktuk, Town of Inuvik
Government of Northwest Territories

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SUPPLEMENTAL CUMULATIVE EFFECTS ASSESSMENT DOCUMENTATION ENVIRONMENTAL IMPACT REVIEW BOARD FOR CONSTRUCTION OF THE INUVIK TO TUKTOYAKTUK HIGHWAY, NWT

EIRB FILE NO. 02/10-05

September 04, 2012

Introduction

As a result of some of the cumulative effects-related concerns raised at the recently completed Technical Sessions held in Inuvik,August 22-23,2012, the Developer is pleased to provide the following more quantitative supplemental Cumulative Effects Assessment documentation for consideration by the Environmental Impact Review Board and participants in the ongoing environmental review process for the Inuvik to Tuktoyaktuk Highway Project.

Supplemental Cumulative Effects Assessment Documentation

Cumulative effects are changes to the environment that "are likely to result from the project in combination with other projects or activities that have been or will be carried out" (Canadian Environmental Assessment Agency 2003). Overall cumulative effects are effects of all land or water uses on a Valued Ecosystem Component (VEC) or Valued Socio-economic component (VSC), including effects caused by the Project.

Typically, cumulative effects assessments address effects that:

- Extend over a larger area;
- Are of longer term duration;
- Act in conjunction with other projects/activities on the same VECs; and
- Are reasonably probable, considering possible future projects/activities and impacts.

As noted in the Environmental Effects and Mitigation Measures section of this Environmental Impact Statement (Section 4.0 and 6.0, respectively), it has been determined that, with the application of proposed mitigation measures, for all environmental and socio-economic VCs, the residual environmental effects associated with the construction and future operation of the Inuvik to Tuktoyaktuk Highway are anticipated to be low in magnitude and local in extent.

However, while individually no significant effects are anticipated, the purpose of the cumulative effects assessment (CEA) is to consider the potential additive and synergistic effects of overall residual effects, in combination with past, existing or known planned activities in the vicinity of the proposed Inuvik to Tuktoyaktuk Highway.

The proposed Inuvik to Tuktoyaktuk Highway will be constructed in an area that has had very few activities that have resulted in environmental effects that have extended beyond their local project footprint areas. The key activities that have resulted in project footprints that could potentially interact in a cumulative manner with the Highway include former hydrocarbon exploration activities in the vicinity of Parsons Lake, the buried Ikhil natural gas pipeline and the existing Tuktoyaktuk to Source 177 Access Road.

Proposed projects that may still occur at some time in the future include the Mackenzie Gas Project, the recently proposed South Parsons Lake Gas Supply Project and the proposed Tuktoyaktuk Harbour Project.

To gain a more quantitative understanding of the spatial proximity of these past and proposed future projects relative to the Inuvik to Tuktoyaktuk Highway and associated borrow sites, and the potential for these past and proposed projects to operate in a possibly cumulative manner with the Highway, the Developer is pleased to provide a series of figures depicting potential disturbance zones (conservatively set at 1 km around all past and proposed projects assessed), and a complementary series of tables which summarize the estimated hectares and types of vegetation cover (based on the EOSD land cover classes developed by the Canadian Forest Service – Wulder et al. 2004).

Due to the submittal deadline of September 4th set by the EIRB, explanatory text to accompany the figures cannot be provided at this time but the Developer will be pleased to discuss the cumulative iimplications associated with the documentation provided during the upcoming public hearings scheduled for Inuvik and Tuktoyaktuk later in the month. The figures and tables provided for the public record are as follows.

Figures

Figure 1: I km Zone of Influence of Past and Proposed Future Projects Assessed in the Cumulative Effects Study Area.

Figure 2: Boreal Caribou Northern Range Relative to the 1 km Zone of Influence of Past and Proposed Future Projects Assessed in the Cumulative Effects Study Area.

Figure 3: Winter Caribou Observations and Herd Ranges (December to March 31).

Figure 4: Spring, Spring Migration and Pre-Calving Caribou Observations and Herd Ranges (April 1 to May 31).

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Figure 11: Grizzly and Polar Bear Denning Areas.

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FIGURES

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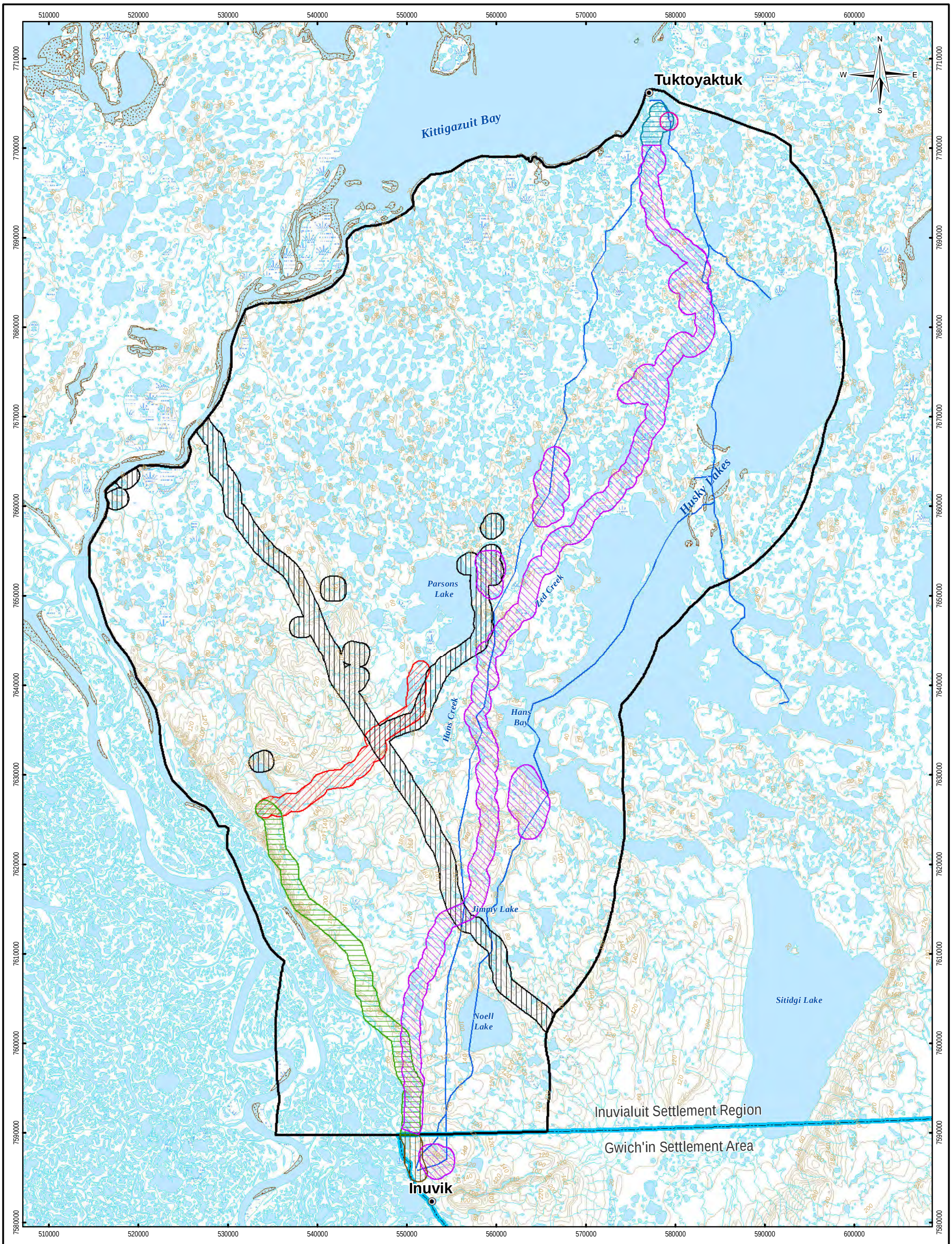

LEGEND

- Zone of Influence (1 km buffer)
- Preferred Route (Alternative 3)
- Mackenzie Gas Project
- IKHIL Gas Pipeline
- Proposed South Parsons Lake Gas Supply Project
- Tuktoyaktuk Harbour Project
- Tuktoyaktuk to 177 Access Road
- Navy Road
- Cumulative Effects Study Area
- Gwich'in / Inuvialuit Boundary
- Snowmobile Trails
- Contour
- Watercourse
- Waterbody
- Wetland
- Sand

NOTES

1. Zone of Influence was determined by a 1 km buffer on either side of the respective project footprint.
2. Alternative 3 buffer includes the alignment and the primary borrow sources.
3. Mackenzie Gas Project buffer includes the pipeline, MGP infrastructure and MGP borrow sources.
4. Tuktoyaktuk Harbour Project location is approximate.
5. The pipeline route of the Proposed South Parsons Lake Gas Supply Project is approximate, based on Appendix A, Figure 1 of the EIA (2012).
6. The former NCPC power pole (removed) is not shown.
7. Some buffer areas overlap, as noted by the cross-hatching.
8. Base data source: NTS 1:250,000

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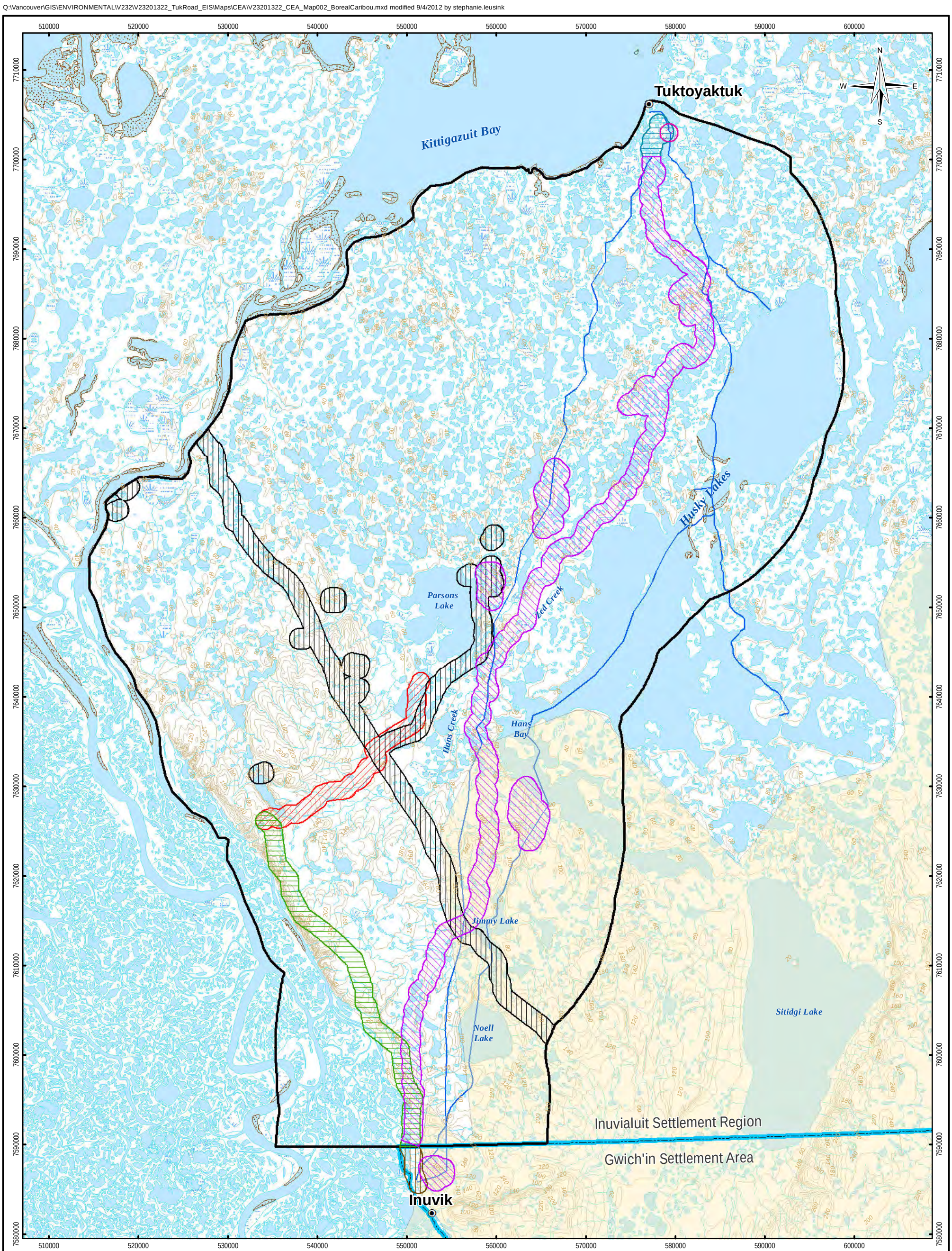
PROPOSED INUVIK-TUKTOYAKTUK HIGHWAY

1 km Zone of Influence of Past and Proposed Future Projects Assessed in the Cumulative Effects Study Area

PROJECTION: UTM Zone 8	DATUM: NAD83
Scale: 1:400,000 (5 2.5 0 5 10 Kilometres)	
FILE NO.: V23201322_CEA_Map001_OverviewZOI.mxd	
PROJECT NO.: V23201322	DWN: SL / CKD: TS / REV: 0
OFFICE: EBA-VANC	DATE: September 4, 2012

Figure 1

Q:\Vancouver\GIS\ENVIRONMENTAL\V232\V23201322_TukRoad_EIS\Maps\CEA\V23201322_CEA_Map002_BorealCaribou.mxd modified 9/4/2012 by stephanie.leusink



LEGEND

- Boreal Caribou Northern Range
- Zone of Influence (1 km buffer)
- Preferred Route (Alternative 3)
- Mackenzie Gas Project
- IKHIL Gas Pipeline
- Proposed South Parsons Lake Gas Supply Project
- Tuktoyaktuk Harbour Project
- Tuktoyaktuk to 177 Access Road
- Navy Road
- Cumulative Effects Study Area
- Gwich'in / Inuvialuit Boundary
- Snowmobile Trails
- Contour
- Watercourse
- Waterbody
- Wetland
- Sand

NOTES
1. For Zone of Influence notes, please see Figure 1, Notes 1-7.
2. Boreal Caribou Northern Range from NWT Species at Risk Committee Draft. March 2012.
3. Base data source: NTS 1:250,000

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PROPOSED INUVIK-TUKTOYAKTUK HIGHWAY

Boreal Caribou Northern Range Relative to 1 km Zone of Influence of Past and Proposed Future Projects Assessed in the Cumulative Effects Study Area

PROJECTION	DATUM
UTM Zone 8	NAD83

Scale: 1:400,000
5 2.5 0 5 10
Kilometres

FILE NO.: V23201322_CEA_Map002_BorealCaribou.mxd

PROJECT NO.	DWN	CKD	REV
V23201322	SL	TS	0

OFFICE	DATE
EBA-VANC	September 4, 2012

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Figure 2

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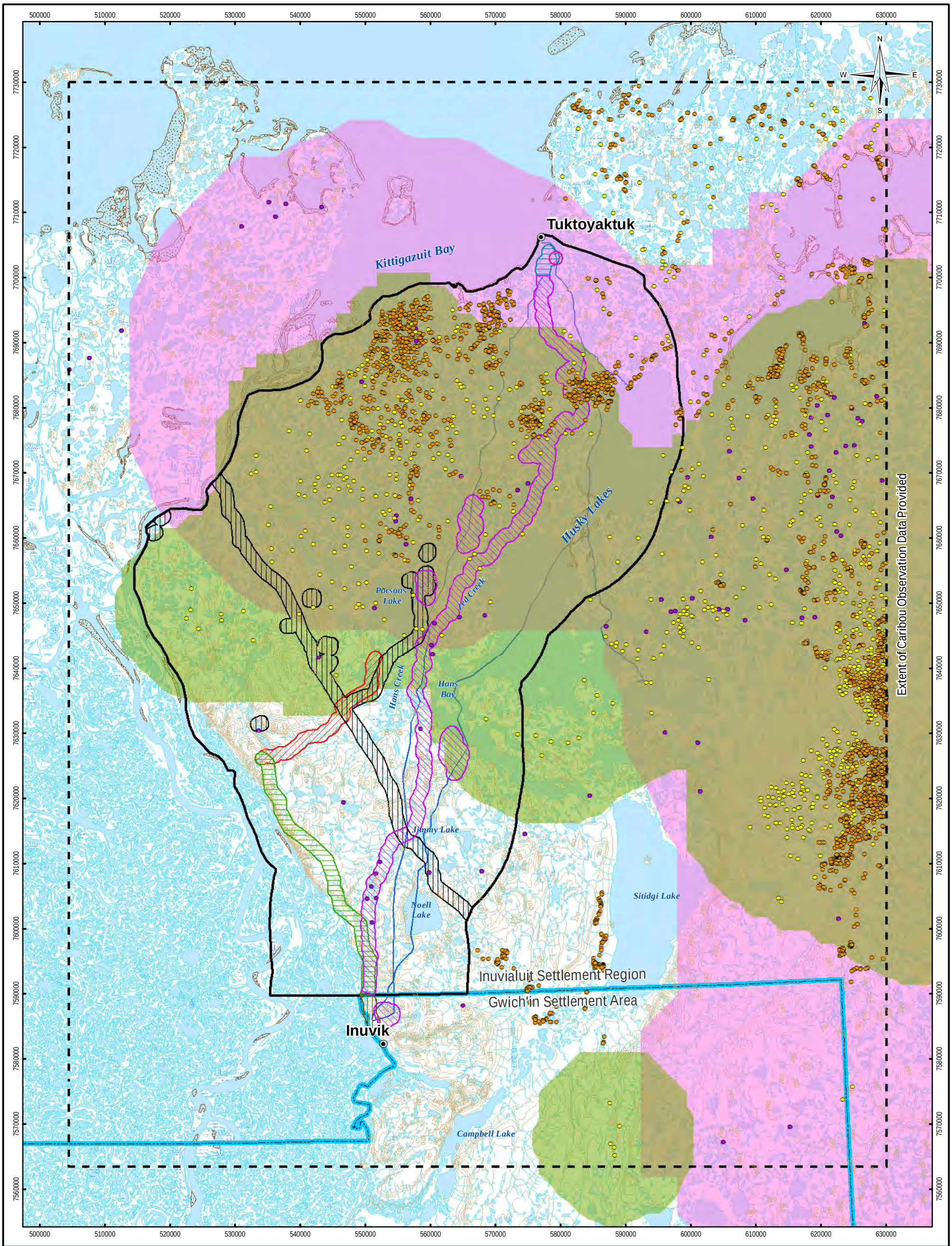

LEGEND

- Bluenose West Herd
- Cape Bathurst Herd
- Both Herds

Barren-ground Caribou Observations

- GPS Telemetry
- Satellite Telemetry
- Spring Composition Surveys
- Extent of Caribou Observation Data

Zone of Influence (1 km buffer)

- Preferred Route (Alternative 3)
- Mackenzie Gas Project
- IKHIL Gas Pipeline
- Proposed South Parsons Lake Gas Supply Project
- Tuktoyaktuk Harbour Project
- Tuktoyaktuk to 177 Access Road
- Navy Road

- Cumulative Effects Study Area
- Gwich'in / Inuvialuit Boundary
- Snowmobile Trails
- Contour
- Watercourse
- Waterbody
- Wetland
- Sand

NOTES

1. For Zone of Influence notes, please see Figure 1, Notes 1-7.
2. Caribou Herd Ranges: GNWT ENR, February 2011.
3. Caribou Observations: GNWT ENR 2011. NWT Wildlife Management Information System (Projects 02, 44 & 46).
4. Base data source: NTS 1:250,000

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PROPOSED INUVIK-TUKTOYAKTUK HIGHWAY

Winter Caribou Observations and Herd Ranges (December 1 to March 31)

PROJECTION: UTM Zone 8	DATUM: NAD83
Scale: 1:550,000 (5 2.5 0 5 10 15 Kilometres)	
FILE NO.: V23201322_CEA_Map003_CaribouWinter.mxd	
PROJECT NO.: V23201322	DWN: SL; CKD: TS; REV: 0
OFFICE: EBA-VANC	DATE: August 30, 2012

Figure 3

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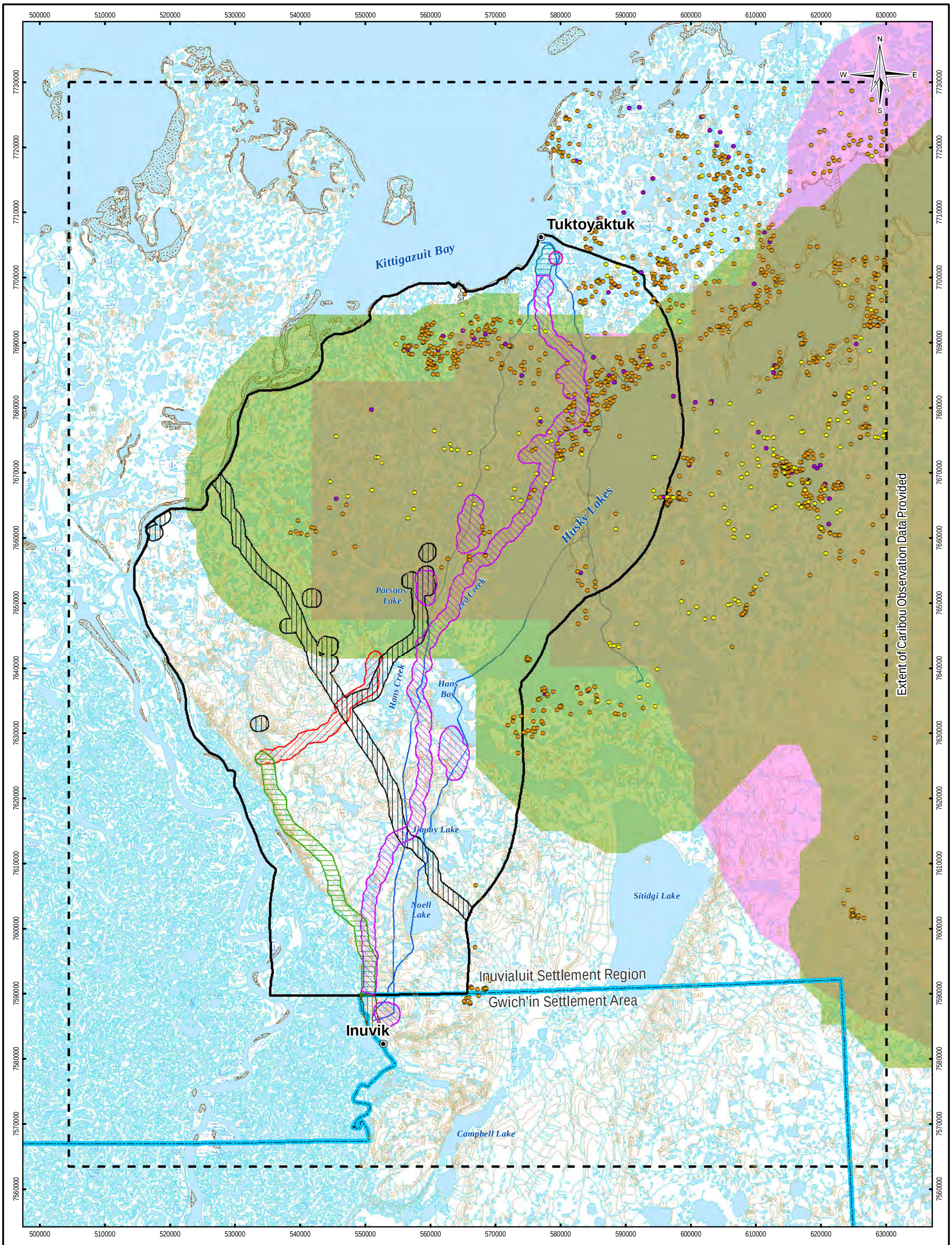

LEGEND

- Bluenose West Herd
- Cape Bathurst Herd
- Both Herds

Barren-ground Caribou Observations

- GPS Telemetry
- Satellite Telemetry
- Spring Composition Surveys
- Extent of Caribou Observation Data

Zone of Influence (1 km buffer)

- Preferred Route (Alternative 3)
- Mackenzie Gas Project
- IKHIL Gas Pipeline
- Proposed South Parsons Lake Gas Supply Project
- Tuktoyaktuk Harbour Project
- Tuktoyaktuk to 177 Access Road
- Navy Road

- Cumulative Effects Study Area
- Gwich'in / Inuvialuit Boundary
- Snowmobile Trails
- Contour
- Watercourse
- Waterbody
- Wetland
- Sand

NOTES

1. For Zone of Influence notes, please see Figure 1, Notes 1-7.
2. Caribou Herd Ranges: GNWT ENR, February 2011.
3. Caribou Observations: GNWT ENR 2011. NWT Wildlife Management Information System (Projects 44, 46, 133 & 191).
4. Base data source: NTS 1:250,000

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PROPOSED INUVIK-TUKTOYAKTUK HIGHWAY

Spring, Spring Migration and Pre-Calving Caribou Observations and Herd Ranges (April 1 to May 31)

PROJECTION	DATUM
UTM Zone 8	NAD83

Scale: 1:550,000

10 5 0 10

Kilometres

FILE NO. V23201322_CEA_Map004_CaribouSpring.mxd

PROJECT NO.	DWN	CKD	REV
V23201322	SL	TS	0

OFFICE	DATE
EBA-VANC	August 30, 2012

Figure 4

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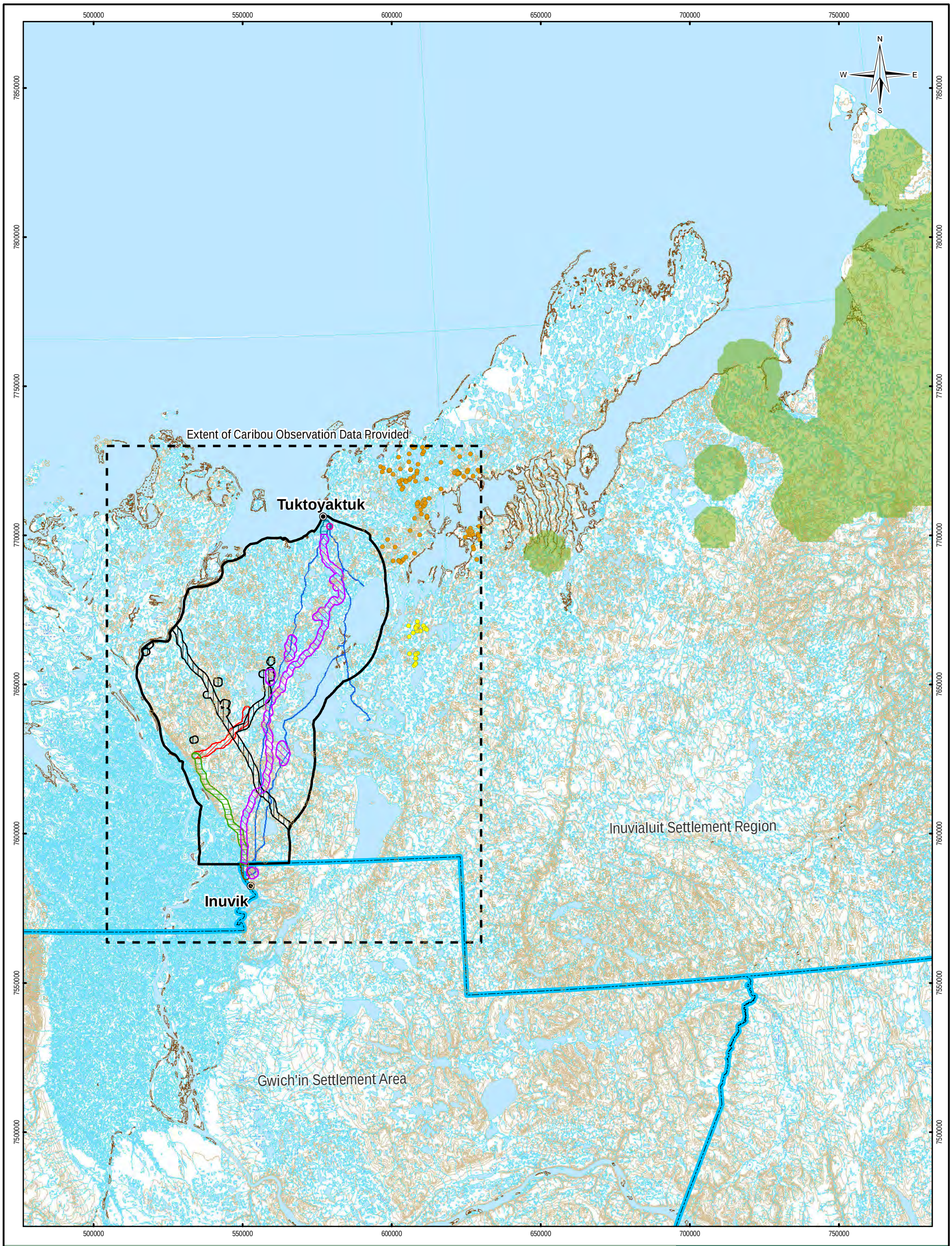

LEGEND

- Cape Bathurst Herd
- Barren-ground Caribou Observations
  - GPS Telemetry
  - Satellite Telemetry
  - Extent of Caribou Observation Data
- Zone of Influence (1 km buffer)
  - Preferred Route (Alternative 3)
  - Mackenzie Gas Project
  - IKHIL Gas Pipeline
  - Proposed South Parsons Lake Gas Supply Project
  - Tuktoyaktuk Harbour Project
  - Tuktoyaktuk to 177 Access Road
  - Navy Road
- Cumulative Effects Study Area
- Gwich'in / Inuvialuit Boundary
- Snowmobile Trails
- Contour
- Watercourse
- Waterbody
- Wetland
- Sand

NOTES

1. For Zone of Influence notes, please see Figure 1, Notes 1-7.
2. Caribou Herd Ranges: GNWT ENR, February 2011.
3. Caribou Observations: GNWT ENR 2011. NWT Wildlife Management Information System (Projects 44 & 46).
4. Base data source: NTS 1:250,000

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PROPOSED INUVIK-TUKTOYAKTUK HIGHWAY

Calving/Post Calving Caribou Observations and Herd Ranges (June 1 to 25)

PROJECTION: UTM Zone 8	DATUM: NAD83
Scale: 1:1,200,000 (20 10 0 20 Kilometres)	
FILE NO.: V23201322_CEA_Map005_CaribouCalving.mxd	
PROJECT NO.: V23201322	DWN: SL / CKD: TS / REV: 0
OFFICE: EBA-VANC	DATE: August 30, 2012

Figure 5

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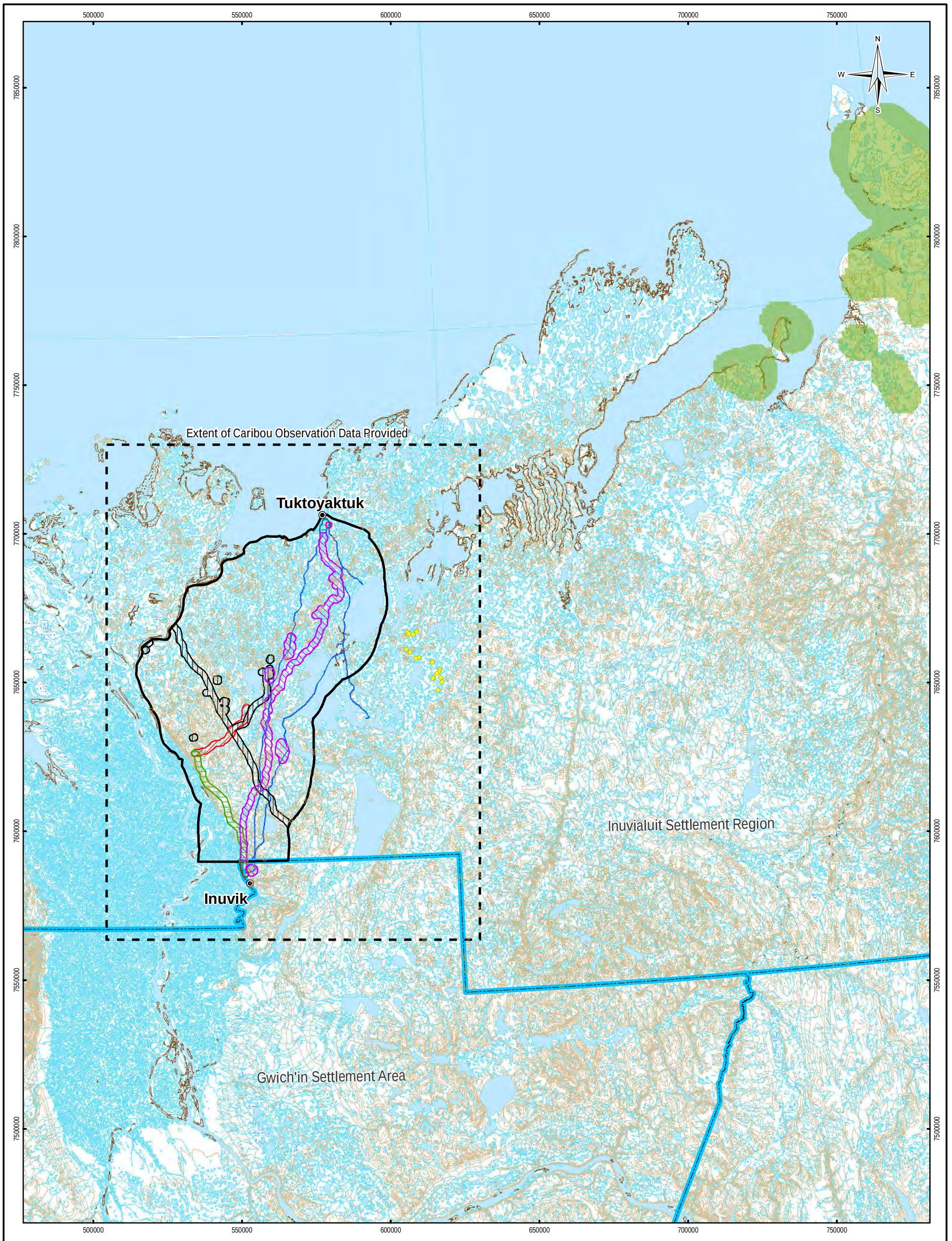

LEGEND

- Cape Bathurst Herd
- Barren-ground Caribou Observations
  - Satellite Telemetry
  - Extent of Caribou Observation Data
- Zone of Influence (1 km buffer)
  - Preferred Route (Alternative 3)
  - Mackenzie Gas Project
  - IKHIL Gas Pipeline
  - Proposed South Parsons Lake Gas Supply Project
  - Tuktoyaktuk Harbour Project
  - Tuktoyaktuk to 177 Access Road
  - Navy Road
- Cumulative Effects Study Area
- Gwich'in / Inuvialuit Boundary
- Snowmobile Trails
- Contour
- Watercourse
- Waterbody
- Wetland
- Sand

NOTES
1. For Zone of Influence notes, please see Figure 1, Notes 1-7.
2. Caribou Herd Ranges: GNWT ENR, February 2011.
3. Caribou Observations: GNWT ENR 2011. NWT Wildlife Management Information System (Project 44).
4. Base data source: NTS 1:250,000

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PROPOSED INUVIK-TUKTOYAKTUK HIGHWAY

Early Summer Caribou Observations and Herd Ranges (June 26 to July 15)

PROJECTION: UTM Zone 8	DATUM: NAD83
Scale: 1:1,200,000 (20 10 0 20 Kilometres)	
FILE NO.: V23201322_CEA_Map006_CaribouEarlySum.mxd	
PROJECT NO.: V23201322	DWN: SL / CKD: TS / REV: 0
OFFICE: EBA-VANC	DATE: August 30, 2012

Figure 6

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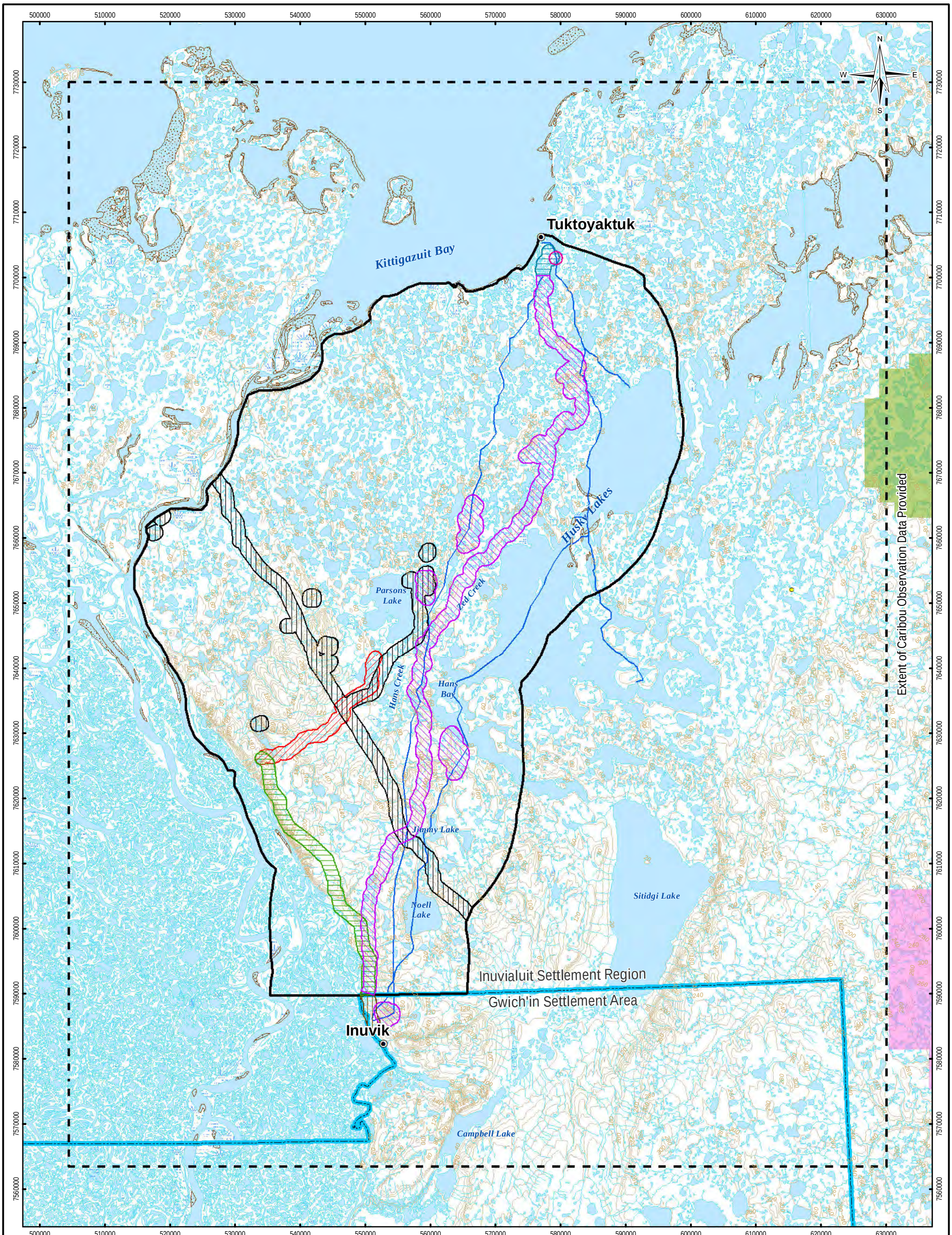

LEGEND

- Bluenose West Herd
- Cape Bathurst Herd

Barren-ground Caribou Observations

- Satellite Telemetry
- Extent of Caribou Observation Data

Zone of Influence (1 km buffer)

- Preferred Route (Alternative 3)
- Mackenzie Gas Project
- IKHIL Gas Pipeline
- Proposed South Parsons Lake Gas Supply Project
- Tuktoyaktuk Harbour Project
- Tuktoyaktuk to 177 Access Road
- Navy Road

- Cumulative Effects Study Area
- Gwich'in / Inuvialuit Boundary
- Snowmobile Trails
- Contour
- Watercourse
- Waterbody
- Wetland
- Sand

NOTES

1. For Zone of Influence notes, please see Figure 1, Notes 1-7.
2. Caribou Herd Ranges: GNWT ENR, February 2011.
3. Caribou Observations: GNWT ENR 2011. NWT Wildlife Management Information System (Project 44).
4. Base data source: NTS 1:250,000

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PROPOSED INUVIK-TUKTOYAKTUK HIGHWAY

Mid Summer Caribou Observations and Herd Ranges (July 16 to August 7)

PROJECTION: UTM Zone 8	DATUM: NAD83
Scale: 1:550,000 (10 5 0 10 Kilometres)	
FILE NO.: V23201322_CEA_Map007_CaribouMidSum.mxd	
PROJECT NO.: V23201322	DWN: SL / CKD: TS / REV: 0
OFFICE: EBA-VANC	DATE: August 30, 2012

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Figure 7

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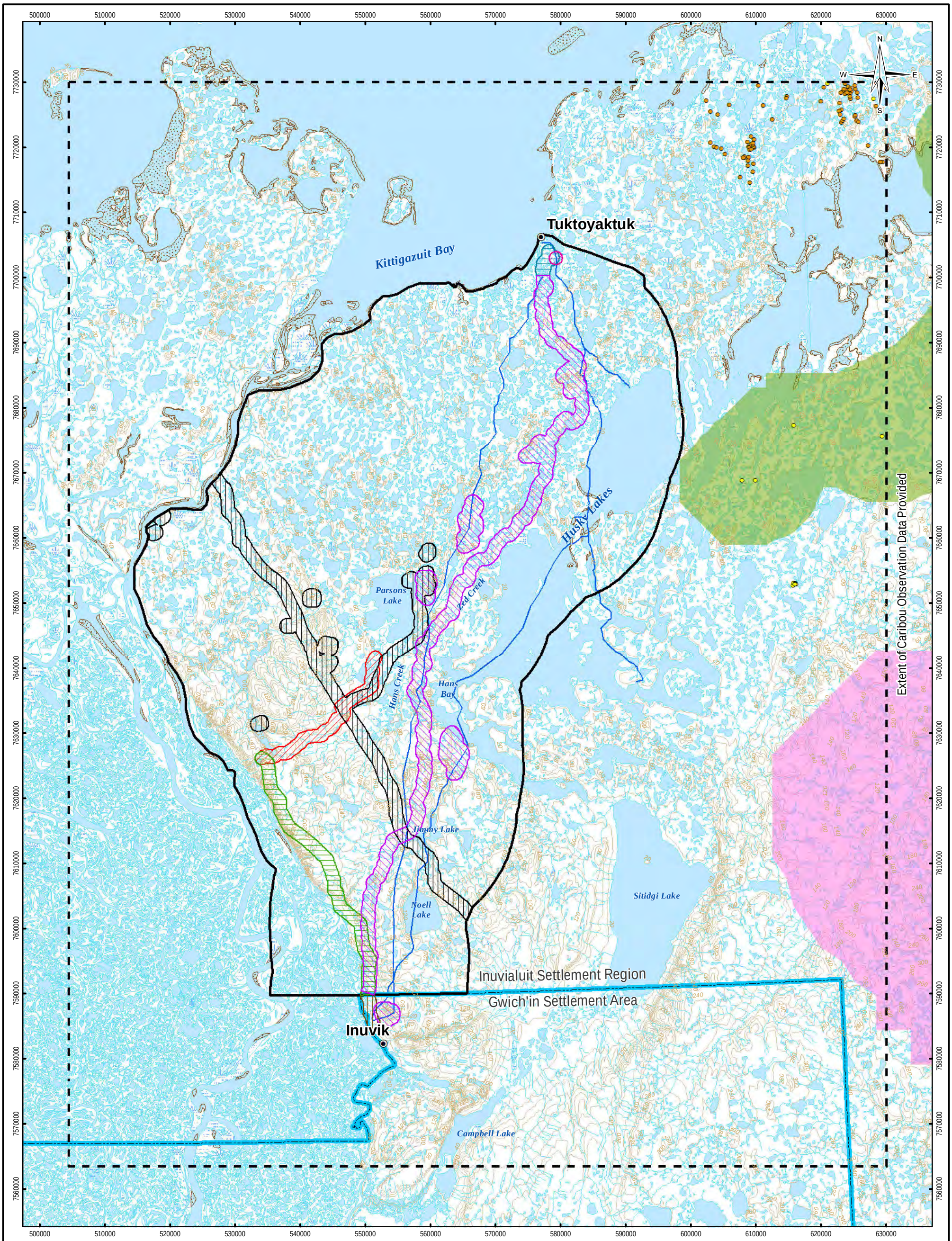

LEGEND

- Bluenose West Herd
- Cape Bathurst Herd

Barren-ground Caribou Observations

- GPS Telemetry
- Satellite Telemetry
- Extent of Caribou Observation Data

Zone of Influence (1 km buffer)

- Preferred Route (Alternative 3)
- Mackenzie Gas Project
- IKHIL Gas Pipeline
- Proposed South Parsons Lake Gas Supply Project
- Tuktoyaktuk Harbour Project
- Tuktoyaktuk to 177 Access Road
- Navy Road

- Cumulative Effects Study Area
- Gwich'in / Inuvialuit Boundary
- Snowmobile Trails
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- Watercourse
- Waterbody
- Wetland
- Sand

NOTES

1. For Zone of Influence notes, please see Figure 1, Notes 1-7.
2. Caribou Herd Ranges: GNWT ENR, February 2011.
3. Caribou Observations: GNWT ENR 2011. NWT Wildlife Management Information System (Projects 44 & 46).
4. Base data source: NTS 1:250,000

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PROPOSED INUVIK-TUKTOYAKTUK HIGHWAY

Late Summer Caribou Observations and Herd Ranges (August 8 to October 7)

PROJECTION	DATUM
UTM Zone 8	NAD83

Scale: 1:550,000

10 5 0 10

Kilometres

FILE NO.			
V23201322_CEA_Map008_CaribouLateSum.mxd			
PROJECT NO.	DWN	CKD	REV
V23201322	SL	TS	0
OFFICE	DATE		
EBA-VANC	August 30, 2012		

Figure 8

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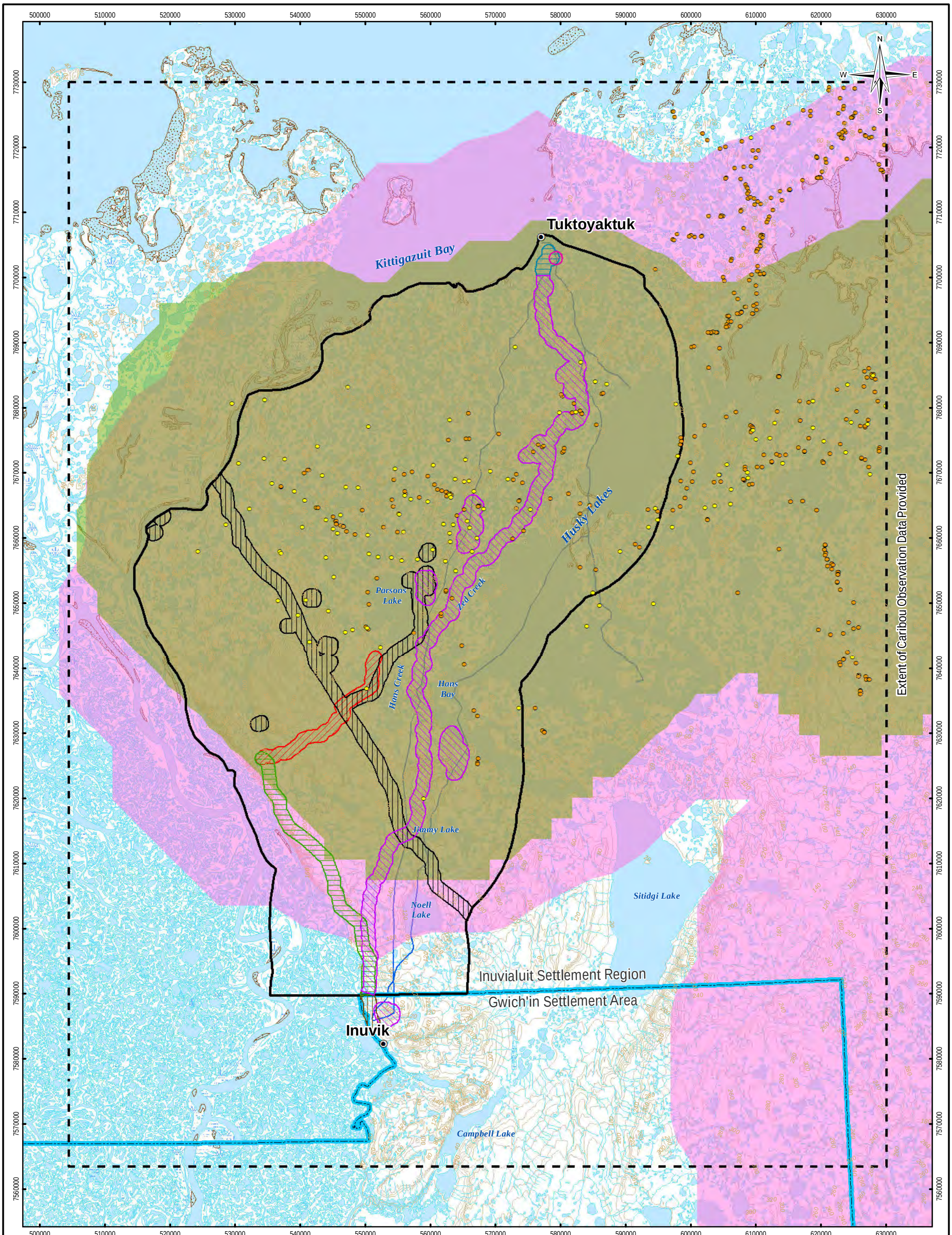

LEGEND

- Bluenose West Herd
- Cape Bathurst Herd
- Both Herds

Barren-ground Caribou Observations

- GPS Telemetry
- Satellite Telemetry
- Extent of Caribou Observation Data

Zone of Influence (1 km buffer)

- Preferred Route (Alternative 3)
- Mackenzie Gas Project
- IKHIL Gas Pipeline
- Proposed South Parsons Lake Gas Supply Project
- Tuktoyaktuk Harbour Project
- Tuktoyaktuk to 177 Access Road
- Navy Road

- Cumulative Effects Study Area
- Gwich'in / Inuvialuit Boundary
- Snowmobile Trails
- Contour
- Watercourse
- Waterbody
- Wetland
- Sand

NOTES

1. For Zone of Influence notes, please see Figure 1, Notes 1-7.
2. Caribou Herd Ranges: GNWT ENR, February 2011.
3. Caribou Observations: GNWT ENR 2011. NWT Wildlife Management Information System (Projects 44 & 46).
4. Base data source: NTS 1:250,000

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PROPOSED INUVIK-TUKTOYAKTUK HIGHWAY

Fall/Rut Caribou Observations and Herd Ranges (October 8 to 31)

PROJECTION: UTM Zone 8	DATUM: NAD83
Scale: 1:550,000 (10 5 0 10 Kilometres)	
FILE NO.: V23201322_CEA_Map009_CaribouFallRut.mxd	
PROJECT NO.: V23201322	DWN: SL / CKD: TS / REV: 0
OFFICE: EBA-VANC	DATE: August 30, 2012

Figure 9

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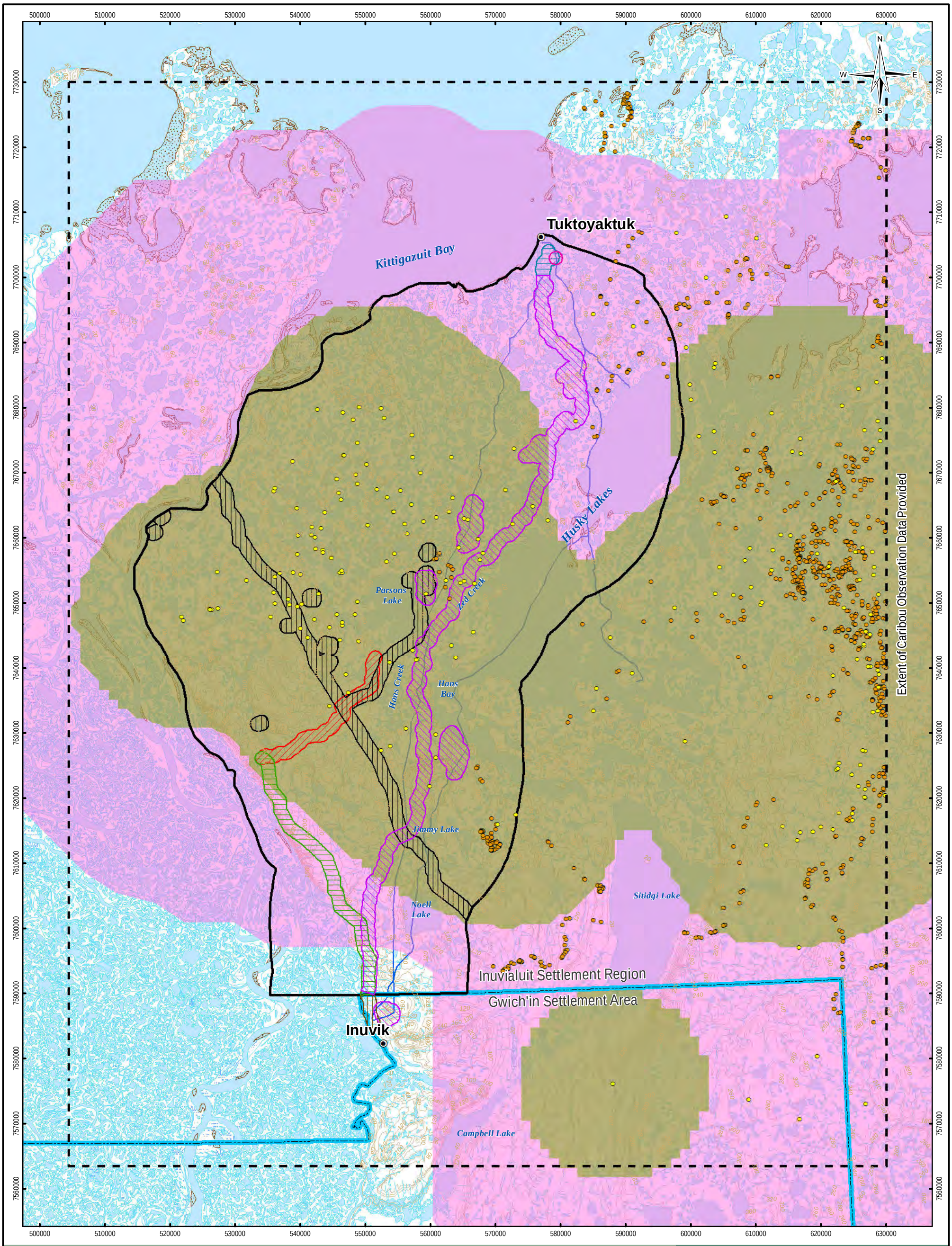

LEGEND

- Bluenose West Herd
- Cape Bathurst Herd
- Both Herds

Barren-ground Caribou Observations

- GPS Telemetry
- Satellite Telemetry
- Extent of Caribou Observation Data

Zone of Influence (1 km buffer)

- Preferred Route (Alternative 3)
- Mackenzie Gas Project
- IKHIL Gas Pipeline
- Proposed South Parsons Lake Gas Supply Project
- Tuktoyaktuk Harbour Project
- Tuktoyaktuk to 177 Access Road
- Navy Road

- Cumulative Effects Study Area
- Gwich'in / Inuvialuit Boundary
- Snowmobile Trails
- Contour
- Watercourse
- Waterbody
- Wetland
- Sand

NOTES

1. For Zone of Influence notes, please see Figure 1, Notes 1-7.
2. Caribou Herd Ranges: GNWT ENR, February 2011.
3. Caribou Observations: GNWT ENR 2011. NWT Wildlife Management Information System (Projects 44 & 46).
4. Base data source: NTS 1:250,000

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PROPOSED INUVIK-TUKTOYAKTUK HIGHWAY

Fall/Post Rut Caribou Observations and Herd Ranges (November 1 to 30)

PROJECTION: UTM Zone 8	DATUM: NAD83
Scale: 1:550,000 (10 5 0 10 Kilometres)	
FILE NO.: V23201322_CEA_Map010_CaribouPostRut.mxd	
PROJECT NO.: V23201322	DWN: SL / CKD: TS / REV: 0
OFFICE: EBA-VANC	DATE: August 30, 2012

Figure 10

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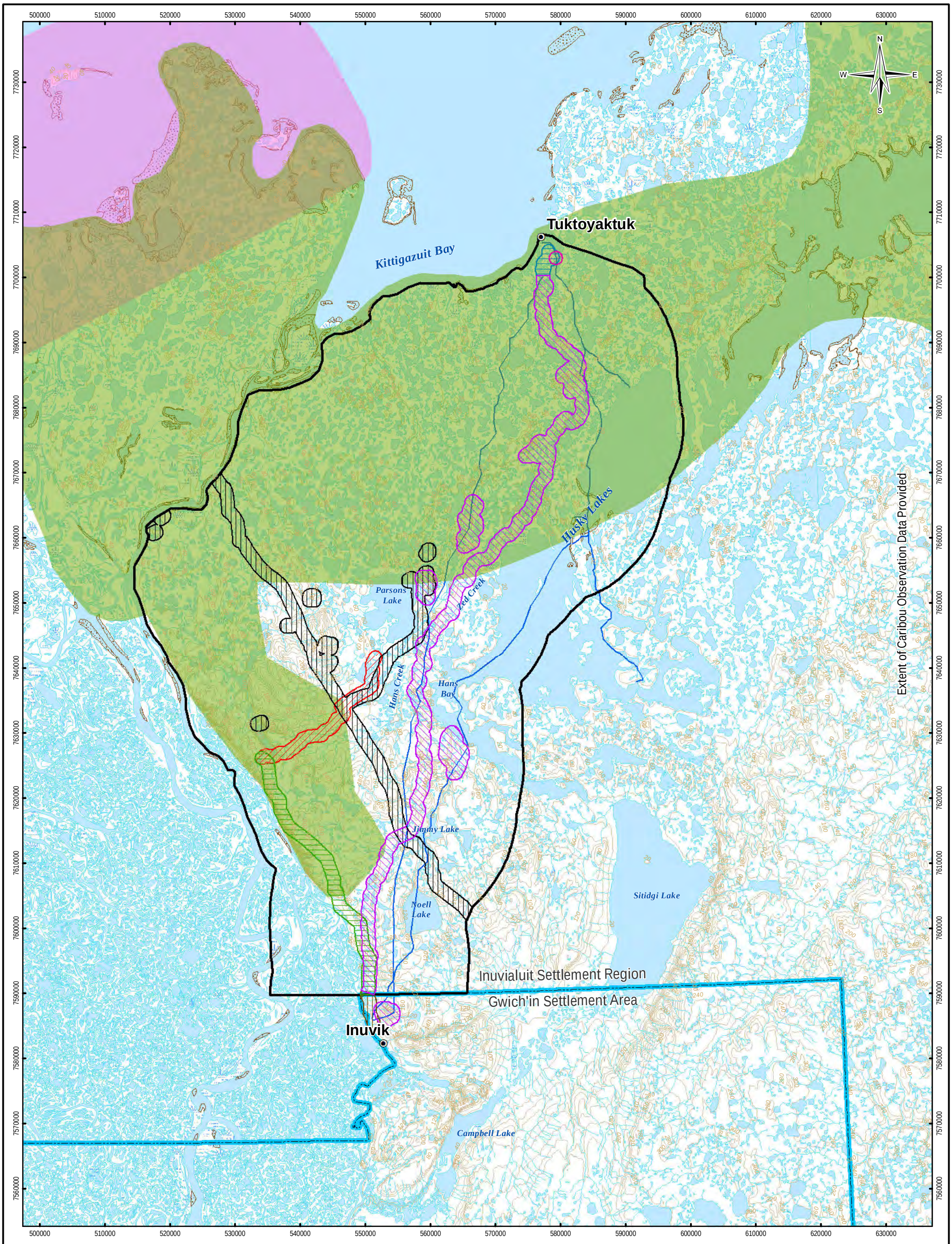

LEGEND

- Mainland Coastal Polar Bear Denning Area
- Critical Grizzly Bear Denning Area
- Both Denning Areas

Zone of Influence (1 km buffer)

- Preferred Route (Alternative 3)
- Mackenzie Gas Project
- IKHIL Gas Pipeline
- Proposed South Parsons Lake Gas Supply Project
- Tuktoyaktuk Harbour Project
- Tuktoyaktuk to 177 Access Road
- Navy Road

- Cumulative Effects Study Area
- Gwich'in / Inuvialuit Boundary
- Snowmobile Trails
- Contour
- Watercourse
- Waterbody
- Wetland
- Sand

NOTES
1. For Zone of Influence notes, please see Figure 1, Notes 1-7.
2. Bear Denning Areas: GNWT ENR, February 2011.
3. Base data source: NTS 1:250,000

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PROPOSED INUVIK-TUKTOYAKTUK HIGHWAY

Grizzly and Polar Bear Denning Areas

PROJECTION: UTM Zone 8	DATUM: NAD83		
Scale: 1:550,000 (10 5 0 10 Kilometres)			
FILE NO.: V23201322_CEA_Map011_BearDenAreas.mxd			
PROJECT NO.: V23201322	DWN: SL	CKD: TS	REV: 0
OFFICE: EBA-VANC	DATE: August 30, 2012		

Figure 11

TABLES

Table 1: All Projects - Inside Cumulative Effects Study Area

	All Projects (project footprint; no overlaps)		All Projects ZOI (1 km buffer; no overlaps)		Cumulative Effects Study Area	
	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area
Broadleaf Dense	24.59	0.31	2,121.18	27.06	7,839.53	1.34
Broadleaf Open	6.54	0.25	660.68	25.06	2,636.80	0.45
Bryoids	1,106.17	0.91	20,570.74	16.88	121,865.61	20.76
Not Classified	1.51	0.03	958.86	21.40	4,480.70	0.76
Coniferous Dense	2.92	0.05	285.58	5.17	5,524.19	0.94
Coniferous Open	39.49	0.47	912.57	10.87	8,398.39	1.43
Coniferous Sparse	55.91	0.20	3,722.91	13.38	27,816.67	4.74
Exposed/Barren Land	136.76	0.56	4,138.09	16.87	24,530.40	4.18
Herbs	143.77	1.20	2,114.66	17.70	11,948.96	2.04
Mixedwood Dense	20.35	0.17	1,649.30	14.12	11,683.16	1.99
Mixedwood Open	4.29	0.25	148.75	8.58	1,734.62	0.30
Rock/Rubble	39.36	1.23	633.08	19.73	3,208.02	0.55
Shrub Low	676.18	0.75	13,662.08	15.14	90,253.20	15.38
Shrub Tall	298.43	0.70	5,821.79	13.69	42,520.72	7.24
Water	328.91	0.18	11,186.76	6.11	183,237.79	31.22
Wetland-Herb	186.93	0.93	2,171.67	10.76	20,174.71	3.44
Wetland-Shrub	51.98	0.35	1,799.76	11.99	15,005.99	2.56
Wetland-Treed	29.35	0.71	406.04	9.80	4,142.51	0.71
Snow/Ice	0.00	0.00	0.94	100.00	0.94	0.00
Total	**3,153.44**	**0.54**	**72,965.45**	**12.43**	**587,002.91**	**100.00**

Table 2: Alternative 3 (Preferred Route) Footprint Components and Zone of Influence (1 km buffer)

Inside the Cumulative Effects Study Area

	Alternative 3 (28 m)		Borrow Sources[1]		Total Alternative 3 Footprint[2]		Alternative 3 ZOI[3] (1 km buffer)		Cumulative Effects Study Area	
	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area
Broadleaf Dense	24.13	0.31	0.07	0.00	24.20	0.31	1,220.29	15.57	7,839.53	1.34
Broadleaf Open	5.33	0.20	0.50	0.02	5.83	0.22	321.71	12.20	2,636.80	0.45
Bryoids	119.34	0.10	793.79	0.65	913.14	0.75	8,770.63	7.20	121,865.61	20.76
Not Classified	0.04	0.00	0.00	0.00	0.04	0.00	123.57	2.76	4,480.70	0.76
Coniferous Dense	0.48	0.01	1.45	0.03	1.92	0.03	144.84	2.62	5,524.19	0.94
Coniferous Open	2.82	0.03	33.11	0.39	35.93	0.43	454.44	5.41	8,398.39	1.43
Coniferous Sparse	15.53	0.06	16.41	0.06	31.94	0.11	1,266.59	4.55	27,816.67	4.74
Exposed/Barren Land	18.42	0.08	80.54	0.33	98.97	0.40	1,515.18	6.18	24,530.40	4.18
Herbs	9.39	0.08	114.11	0.95	123.50	1.03	1,092.64	9.14	11,948.96	2.04
Mixedwood Dense	11.90	0.10	4.25	0.04	16.16	0.14	779.55	6.67	11,683.16	1.99
Mixedwood Open	0.78	0.04	2.50	0.14	3.28	0.19	50.82	2.93	1,734.62	0.30
Rock/Rubble	3.23	0.10	26.65	0.83	29.88	0.93	279.87	8.72	3,208.02	0.55
Shrub Low	117.18	0.13	477.35	0.53	594.52	0.66	7,552.34	8.37	90,253.20	15.38
Shrub Tall	36.46	0.09	221.75	0.52	258.21	0.61	3,298.42	7.76	42,520.72	7.24
Water	0.25	0.00	325.27	0.18	325.51	0.18	6,685.09	3.65	183,237.79	31.22
Wetland-Herb	3.50	0.02	160.15	0.79	163.64	0.81	1,333.24	6.61	20,174.71	3.44
Wetland-Shrub	9.70	0.06	39.38	0.26	49.08	0.33	1,060.39	7.07	15,005.99	2.56
Wetland-Treed	0.20	0.00	28.40	0.69	28.59	0.69	182.90	4.42	4,142.51	0.71
Snow/Ice	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.94	0.00
Total	**378.67**	**0.06**	**2,325.67**	**0.40**	**2,704.34**	**0.46**	**36,132.50**	**6.16**	**587,002.91**	**100.00**

[1]Borrow Sources included are 170, 174, 177, 309 and 325/314 inside the CEA

[2]The Alternative 3 footprint overlaps with the Mackenzie Gas Project and the IKHIL Gas Pipeline footprints inside the CEA

[3]The Alternative 3 ZOI overlaps with the Mackenzie Gas Project and the IKHIL Gas Pipeline ZOIs inside the CEA

Table 3: Tuktoyaktuk to 177 Access Road Footprint and Zone of Influence (1 km buffer)

Inside the Cumulative Effects Study Area

	Tuk to 177 Access Road (28 m)		Tuk to 177 Access Road ZOI[1] (1 km buffer)		Cumulative Effects Study Area	
	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area
Broadleaf Dense	0.00	0.00	0.00	0.00	7,839.53	1.34
Broadleaf Open	0.00	0.00	0.00	0.00	2,636.80	0.45
Bryoids	0.93	0.00	109.82	0.09	121,865.61	20.76
Not Classified	0.00	0.00	0.00	0.00	4,480.70	0.76
Coniferous Dense	0.00	0.00	0.00	0.00	5,524.19	0.94
Coniferous Open	0.00	0.00	0.00	0.00	8,398.39	1.43
Coniferous Sparse	0.02	0.00	12.82	0.05	27,816.67	4.74
Exposed/Barren Land	10.74	0.04	327.58	1.34	24,530.40	4.18
Herbs	0.00	0.00	1.99	0.02	11,948.96	2.04
Mixedwood Dense	0.00	0.00	0.00	0.00	11,683.16	1.99
Mixedwood Open	0.00	0.00	0.00	0.00	1,734.62	0.30
Rock/Rubble	0.60	0.02	8.07	0.25	3,208.02	0.55
Shrub Low	0.95	0.00	65.91	0.07	90,253.20	15.38
Shrub Tall	0.14	0.00	22.49	0.05	42,520.72	7.24
Water	0.07	0.00	538.44	0.29	183,237.79	31.22
Wetland-Herb	1.56	0.01	41.70	0.21	20,174.71	3.44
Wetland-Shrub	0.05	0.00	20.12	0.13	15,005.99	2.56
Wetland-Treed	0.00	0.00	0.38	0.01	4,142.51	0.71
Snow/Ice	0.00	0.00	0.87	93.33	0.94	0.00
Total	**15.07**	**0.00**	**1,150.19**	**0.20**	**587,002.91**	**100.00**

[1]The Tuktoyaktuk to 177 Access Road ZOI overlaps with the Tuktoyaktuk Harbour Project ZOI inside the CEA

Table 4: IKHIL Pipeline Footprint and Zone of Influence (1 km buffer)

Inside the Cumulative Effects Study Area

	IKHIL Pipeline[1] (1 m)		IKHIL Pipeline ZOI[2] (1 km buffer)		Cumulative Effects Study Area	
	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area
Broadleaf Dense	0.33	0.00	1,506.44	19.22	7,839.53	1.34
Broadleaf Open	0.22	0.01	424.25	16.09	2,636.80	0.45
Bryoids	0.87	0.00	1,321.53	1.08	121,865.61	20.76
Not Classified	0.56	0.01	951.99	21.25	4,480.70	0.76
Coniferous Dense	0.01	0.00	95.67	1.73	5,524.19	0.94
Coniferous Open	0.04	0.00	82.14	0.98	8,398.39	1.43
Coniferous Sparse	0.75	0.00	943.71	3.39	27,816.67	4.74
Exposed/Barren Land	0.27	0.00	353.18	1.44	24,530.40	4.18
Herbs	0.02	0.00	220.61	1.85	11,948.96	2.04
Mixedwood Dense	0.44	0.00	766.68	6.56	11,683.16	1.99
Mixedwood Open	0.00	0.00	43.74	2.52	1,734.62	0.30
Rock/Rubble	0.01	0.00	5.09	0.16	3,208.02	0.55
Shrub Low	0.67	0.00	1,029.95	1.14	90,253.20	15.38
Shrub Tall	0.08	0.00	382.85	0.90	42,520.72	7.24
Water	0.00	0.00	286.30	0.16	183,237.79	31.22
Wetland-Herb	0.00	0.00	73.68	0.37	20,174.71	3.44
Wetland-Shrub	0.01	0.00	117.42	0.78	15,005.99	2.56
Wetland-Treed	0.00	0.00	84.43	2.04	4,142.51	0.71
Snow/Ice	0.00	0.00	0.00	0.00	0.94	0.00
Total	**4.28**	**0.00**	**8,689.64**	**1.48**	**587,002.91**	**100.00**

[1]The IKHIL Gas Pipeline footprint overlaps with the Alternative 3 and Navy Road footprints inside the CEA

[2]The IKHIL Gas Pipeline ZOI overlaps with the Alternative 3, Navy Road, and South Parsons Lake Gas Supply Project ZOIs inside the CEA

Table 5: Mackenzie Gas Project Footprint Components and Zone of Influence (1 km buffer)

Inside the Cumulative Effects Study Area

	Pipeline[1]		Borrow Sources[2]		Infrastructure[3]		Total MGP Footprint[4]		MGP ZOI[5] (1 km buffer)		Cumulative Effects Study Area	
	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area
Broadleaf Dense	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.01	0.36	7,839.53	1.34
Broadleaf Open	0.18	0.01	0.31	0.01	0.00	0.00	0.49	0.02	102.45	3.89	2,636.80	0.45
Bryoids	19.29	0.02	196.87	0.16	6.40	0.01	222.56	0.18	9,213.66	7.56	121,865.61	20.76
Not Classified	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.04	4,480.70	0.76
Coniferous Dense	0.08	0.00	0.91	0.02	0.00	0.00	0.99	0.02	81.03	1.47	5,524.19	0.94
Coniferous Open	0.66	0.01	3.69	0.04	0.54	0.01	4.89	0.06	412.58	4.91	8,398.39	1.43
Coniferous Sparse	3.30	0.01	19.56	0.07	0.31	0.00	23.18	0.08	1,497.27	5.38	27,816.67	4.74
Exposed/Barren Land	4.30	0.02	25.13	0.10	1.50	0.01	30.93	0.13	1,629.17	6.64	24,530.40	4.18
Herbs	1.09	0.01	25.43	0.21	1.56	0.01	28.08	0.24	779.70	6.53	11,948.96	2.04
Mixedwood Dense	1.02	0.01	2.72	0.02	0.00	0.00	3.74	0.03	455.46	3.90	11,683.16	1.99
Mixedwood Open	0.07	0.00	1.07	0.06	0.00	0.00	1.15	0.07	57.15	3.29	1,734.62	0.30
Rock/Rubble	0.28	0.01	8.72	0.27	0.19	0.01	9.18	0.29	284.26	8.86	3,208.02	0.55
Shrub Low	8.59	0.01	82.09	0.09	10.00	0.01	100.68	0.11	4,791.25	5.31	90,253.20	15.38
Shrub Tall	3.19	0.01	44.78	0.11	9.10	0.02	57.07	0.13	2,198.64	5.17	42,520.72	7.24
Water	0.04	0.00	6.37	0.00	0.00	0.00	6.42	0.00	3,597.20	1.96	183,237.79	31.22
Wetland-Herb	0.31	0.00	27.88	0.14	0.25	0.00	28.44	0.14	736.64	3.65	20,174.71	3.44
Wetland-Shrub	0.45	0.00	2.96	0.02	0.00	0.00	3.42	0.02	595.69	3.97	15,005.99	2.56
Wetland-Treed	0.06	0.00	1.84	0.04	0.00	0.00	1.90	0.05	151.27	3.65	4,142.51	0.71
Snow/Ice	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.94	0.00
Total	**42.91**	**0.01**	**450.35**	**0.08**	**29.84**	**0.01**	**523.09**	**0.09**	**26,613.02**	**4.53**	**587,002.91**	**100.00**

[1]Parsons Lake Lateral Route was assigned a footprint of 1 m wide; all other routes were assigned a footprint of 5 m wide

[2]Borrow Sources included originated from Imperial Oil and were provided by GNWT

[3]Infrastructure includes estimated footprints for Storm Hills Pigging Facility and Parsons Lake North and South Pads, based on the MGP EIS (2004)

[4]The MGP footprint overlaps with the Alternative 3 and South Parsons Lake Gas Supply Project footprints inside the CEA

[5]The MGP ZOI overlaps with the Alternative 3 and South Parsons Lake Gas Supply Project ZOIs inside the CEA

Table 6: South Parsons Lake Gas Supply Project Pipeline Footprint and Zone of Influence (1 km buffer)

Inside the Cumulative Effects Study Area

	SPL Pipeline[1] (1 m)		SPL Pipeline ZOI[2] (1 km buffer)		Cumulative Effects Study Area	
	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area
Broadleaf Dense	0.00	0.00	1.02	0.01	7,839.53	1.34
Broadleaf Open	0.00	0.00	5.72	0.22	2,636.80	0.45
Bryoids	1.38	0.00	2,559.06	2.10	121,865.61	20.76
Not Classified	0.00	0.00	5.91	0.13	4,480.70	0.76
Coniferous Dense	0.00	0.00	3.35	0.06	5,524.19	0.94
Coniferous Open	0.01	0.00	32.58	0.39	8,398.39	1.43
Coniferous Sparse	0.16	0.00	257.50	0.93	27,816.67	4.74
Exposed/Barren Land	0.29	0.00	537.04	2.19	24,530.40	4.18
Herbs	0.10	0.00	128.82	1.08	11,948.96	2.04
Mixedwood Dense	0.02	0.00	30.81	0.26	11,683.16	1.99
Mixedwood Open	0.00	0.00	4.25	0.25	1,734.62	0.30
Rock/Rubble	0.07	0.00	107.33	3.35	3,208.02	0.55
Shrub Low	0.44	0.00	784.93	0.87	90,253.20	15.38
Shrub Tall	0.10	0.00	264.29	0.62	42,520.72	7.24
Water	0.02	0.00	646.11	0.35	183,237.79	31.22
Wetland-Herb	0.05	0.00	148.73	0.74	20,174.71	3.44
Wetland-Shrub	0.08	0.00	150.47	1.00	15,005.99	2.56
Wetland-Treed	0.00	0.00	15.13	0.37	4,142.51	0.71
Snow/Ice	0.00	0.00	0.00	0.00	0.94	0.00
Total	**2.70**	**0.00**	**5,683.07**	**0.97**	**587,002.91**	**100.00**

[1]The SPL Gas Supply Project footprint overlaps with the Mackenzie Gas Project footprint inside the CEA

[2]The SPL Gas Supply Project ZOI overlaps with the Mackenzie Gas Project and IKHIL Pipeline ZOIs inside the CEA

Table 7: Tuktoyaktuk Harbour Project Zone of Influence (1 km buffer)

Inside the Cumulative Effects Study Area

	Tuk Harbour ZOI[1] (1 km buffer)		Cumulative Effects Study Area	
	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area
Broadleaf Dense	0.00	0.00	7,839.53	1.34
Broadleaf Open	0.00	0.00	2,636.80	0.45
Bryoids	13.20	0.01	121,865.61	20.76
Not Classified	0.06	0.00	4,480.70	0.76
Coniferous Dense	0.00	0.00	5,524.19	0.94
Coniferous Open	0.00	0.00	8,398.39	1.43
Coniferous Sparse	2.39	0.01	27,816.67	4.74
Exposed/Barren Land	82.95	0.34	24,530.40	4.18
Herbs	0.11	0.00	11,948.96	2.04
Mixedwood Dense	0.00	0.00	11,683.16	1.99
Mixedwood Open	0.00	0.00	1,734.62	0.30
Rock/Rubble	0.88	0.03	3,208.02	0.55
Shrub Low	12.94	0.01	90,253.20	15.38
Shrub Tall	12.24	0.03	42,520.72	7.24
Water	175.81	0.10	183,237.79	31.22
Wetland-Herb	10.16	0.05	20,174.71	3.44
Wetland-Shrub	2.32	0.02	15,005.99	2.56
Wetland-Treed	0.11	0.00	4,142.51	0.71
Snow/Ice	0.94	100.00	0.94	0.00
Total	**314.12**	**0.05**	**587,002.91**	**100.00**

[1]The Tuktoyaktuk Harbour Project ZOI overlaps with the Tuktoyaktuk to 177 Access Road ZOI inside the CEA

Table 8a: Navy Road Footprint and Zone of Influence (1 km buffer)

Inside the Cumulative Effects Study Area

	Navy Road[1] (28 m)		Navy Road ZOI[2] (1 km buffer)		Cumulative Effects Study Area	
	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area
Broadleaf Dense	0.07	0.00	14.78	0.19	7,839.53	1.34
Broadleaf Open	0.00	0.00	2.33	0.09	2,636.80	0.45
Bryoids	0.00	0.00	1.43	0.00	121,865.61	20.76
Not Classified	0.95	0.02	53.51	1.19	4,480.70	0.76
Coniferous Dense	0.00	0.00	0.13	0.00	5,524.19	0.94
Coniferous Open	0.00	0.00	0.58	0.01	8,398.39	1.43
Coniferous Sparse	0.08	0.00	0.68	0.00	27,816.67	4.74
Exposed/Barren Land	0.00	0.00	1.64	0.01	24,530.40	4.18
Herbs	0.00	0.00	0.00	0.00	11,948.96	2.04
Mixedwood Dense	0.00	0.00	2.54	0.02	11,683.16	1.99
Mixedwood Open	0.00	0.00	0.00	0.00	1,734.62	0.30
Rock/Rubble	0.00	0.00	0.00	0.00	3,208.02	0.55
Shrub Low	0.00	0.00	0.24	0.00	90,253.20	15.38
Shrub Tall	0.00	0.00	0.00	0.00	42,520.72	7.24
Water	0.00	0.00	0.06	0.00	183,237.79	31.22
Wetland-Herb	0.00	0.00	0.06	0.00	20,174.71	3.44
Wetland-Shrub	0.00	0.00	0.00	0.00	15,005.99	2.56
Wetland-Treed	0.00	0.00	0.00	0.00	4,142.51	0.71
Snow/Ice	0.00	0.00	0.00	0.00	0.94	0.00
Total	**1.10**	**0.00**	**77.98**	**0.01**	**587,002.91**	**100.00**

[1]The Navy Road footprint overlaps with the IKHIL Pipeline footprint inside the CEA

[2]The Navy Road ZOI overlaps with the IKHIL Pipeline ZOI inside the CEA

Table 8b: Navy Road Footprint and Zone of Influence (1 km buffer)

Outside the Cumulative Effects Study Area

	Navy Road (28 m)	Navy Road ZOI[1] (1 km buffer)
	Area (ha)	Area (ha)
Broadleaf Dense	0.25	68.80
Broadleaf Open	0.17	16.81
Bryoids	0.41	11.63
Not Classified	6.75	558.81
Coniferous Dense	0.05	49.97
Coniferous Open	0.55	16.70
Coniferous Sparse	1.58	46.14
Exposed/Barren Land	0.46	58.32
Herbs	0.00	1.06
Mixedwood Dense	1.07	52.57
Mixedwood Open	0.00	5.57
Rock/Rubble	0.00	5.19
Shrub Low	0.63	51.16
Shrub Tall	0.45	8.48
Water	0.00	73.12
Wetland-Herb	0.04	13.18
Wetland-Shrub	0.00	19.04
Wetland-Treed	0.00	2.17
Snow/Ice	0.00	0.00
Total	**12.43**	**1,058.70**

[1]The Navy Road ZOI overlaps with the Alternative 3 ZOI outside the CEA

Table 9: Alternative 3 Overlaps with IKHIL Gas Pipeline

Inside the Cumulative Effects Study Area

	Footprint Overlaps with the IKHIL Gas Pipeline		ZOI (1 km buffer) Overlaps with the IKHIL Gas Pipeline		Cumulative Effects Study Area	
	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area
Broadleaf Dense	0.01	0.00	633.96	8.09	7,839.53	1.34
Broadleaf Open	0.00	0.00	189.59	7.19	2,636.80	0.45
Bryoids	0.00	0.00	6.81	0.01	121,865.61	20.76
Not Classified	0.00	0.00	122.86	2.74	4,480.70	0.76
Coniferous Dense	0.00	0.00	38.00	0.69	5,524.19	0.94
Coniferous Open	0.00	0.00	24.67	0.29	8,398.39	1.43
Coniferous Sparse	0.02	0.00	197.94	0.71	27,816.67	4.74
Exposed/Barren Land	0.00	0.00	2.53	0.01	24,530.40	4.18
Herbs	0.00	0.00	0.86	0.01	11,948.96	2.04
Mixedwood Dense	0.01	0.00	369.16	3.16	11,683.16	1.99
Mixedwood Open	0.00	0.00	1.76	0.10	1,734.62	0.30
Rock/Rubble	0.00	0.00	0.00	0.00	3,208.02	0.55
Shrub Low	0.00	0.00	9.02	0.01	90,253.20	15.38
Shrub Tall	0.00	0.00	1.95	0.00	42,520.72	7.24
Water	0.00	0.00	86.40	0.05	183,237.79	31.22
Wetland-Herb	0.00	0.00	6.40	0.03	20,174.71	3.44
Wetland-Shrub	0.00	0.00	23.00	0.15	15,005.99	2.56
Wetland-Treed	0.00	0.00	4.47	0.11	4,142.51	0.71
Snow/Ice	0.00	0.00	0.00	0.00	0.94	0.00
Total	**0.05**	**0.00**	**1,719.38**	**0.29**	**587,002.91**	**100.00**

Table 10: Alternative 3 Overlaps with Mackenzie Gas Project

Inside the Cumulative Effects Study Area

	Footprint Overlaps with the Mackenzie Gas Project		ZOI (1 km buffer) Overlaps with the Mackenzie Gas Project		Cumulative Effects Study Area	
	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area	Area (ha)	% of Cumulative Effects Area
Broadleaf Dense	0.00	0.00	0.75	0.01	7,839.53	1.34
Broadleaf Open	0.00	0.00	3.86	0.15	2,636.80	0.45
Bryoids	32.70	0.03	247.07	0.20	121,865.61	20.76
Not Classified	0.00	0.00	0.00	0.00	4,480.70	0.76
Coniferous Dense	0.00	0.00	1.31	0.02	5,524.19	0.94
Coniferous Open	1.38	0.02	37.28	0.44	8,398.39	1.43
Coniferous Sparse	0.19	0.00	57.09	0.21	27,816.67	4.74
Exposed/Barren Land	4.43	0.02	152.85	0.62	24,530.40	4.18
Herbs	7.93	0.07	79.29	0.66	11,948.96	2.04
Mixedwood Dense	0.00	0.00	14.04	0.12	11,683.16	1.99
Mixedwood Open	0.14	0.01	3.41	0.20	1,734.62	0.30
Rock/Rubble	0.37	0.01	1.91	0.06	3,208.02	0.55
Shrub Low	21.08	0.02	381.71	0.42	90,253.20	15.38
Shrub Tall	17.17	0.04	240.54	0.57	42,520.72	7.24
Water	3.12	0.00	335.25	0.18	183,237.79	31.22
Wetland-Herb	6.76	0.03	91.03	0.45	20,174.71	3.44
Wetland-Shrub	0.65	0.00	52.62	0.35	15,005.99	2.56
Wetland-Treed	1.14	0.03	18.14	0.44	4,142.51	0.71
Snow/Ice	0.00	0.00	0.00	0.00	0.94	0.00
Total	**97.06**	**0.02**	**1,718.16**	**0.29**	**587,002.91**	**100.00**