



FLIR Survey of Maternal Polar Bear (*Ursus Maritimus*) Denning Habitat



Winter 2011/2012

FINAL

Prepared for:



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Survey conducted by ConocoPhillips Alaska, Inc.

Winter 2011/2012

Introduction

Between December 13, 2011 and December 17, 2011 ConocoPhillips Alaska Inc. (CPAI) conducted Forward Looking Infrared (FLIR) surveys on the North Slope of Alaska within a one-mile buffer around proposed activities planned for the winter of 2011/2012. The proposed activities include:

- Alpine oil field operations in the Colville River Delta and CD5 area;
- Operations in the Sharktooth #1 Appraisal Area;
- Operations in the vicinity of Oliktok Point and Kalubik Creek areas;
- Hemi Springs State 1 wellsite plug and abandonment;
- Ignik Sikumi 1 Gas Hydrates Project; and
- Inspection of the North Staines River #1 Well.

The FLIR surveys were conducted to identify the potential location of maternal polar bear dens in accordance with protocols developed by the United States Fish and Wildlife Service (USFWS). The specific survey areas were identified by the USFWS during a pre-flight meeting. This report summarizes the results of the surveys.

Methodology

The surveys were conducted using the Shared Services Twin Otter (DHC-6) equipped with a Star SAFIRE® III FLIR unit. Survey times, crews, and locations are shown in Table 1.

Surveys were flown between 400 and 1,000 feet above ground level (agl) depending on weather conditions. The crew used Global Positioning Satellite (GPS) coordinates, computer mapping software, and visual ground reference to navigate the drainages and bluffs. The survey coordinator interfaced with the pilots and the FLIR operator to capture clear images of the target areas. Repeated transects were flown to ensure adequate coverage.

Results

Weather conditions for the surveys are shown on Table 2. The visibility was good during all surveys.

On December 13, 2011 the survey began on the Colville River Delta. Various channels and locations were examined in anticipation of ice road construction and tundra travel. Areas around proposed CD5 locations were also surveyed. No potential dens were identified in these areas. The survey transects are shown on Figure 1.

The December 14, 2011 survey covered the Sharktooth 1 Appraisal Area (Figure 2), the Oliktok Point Area (Figure 3), and Hemi Springs State 1 (Figure 4). No potential dens were identified in these areas

The final December 17, 2011 survey concentrated on the Ignik Sikumi 1 Gas Hydrate project (Figure 5) and the area around North Staines River 1 (Figure 6). No potential dens were identified in these areas.

All video footage was reviewed after the flights for verification.

Summary

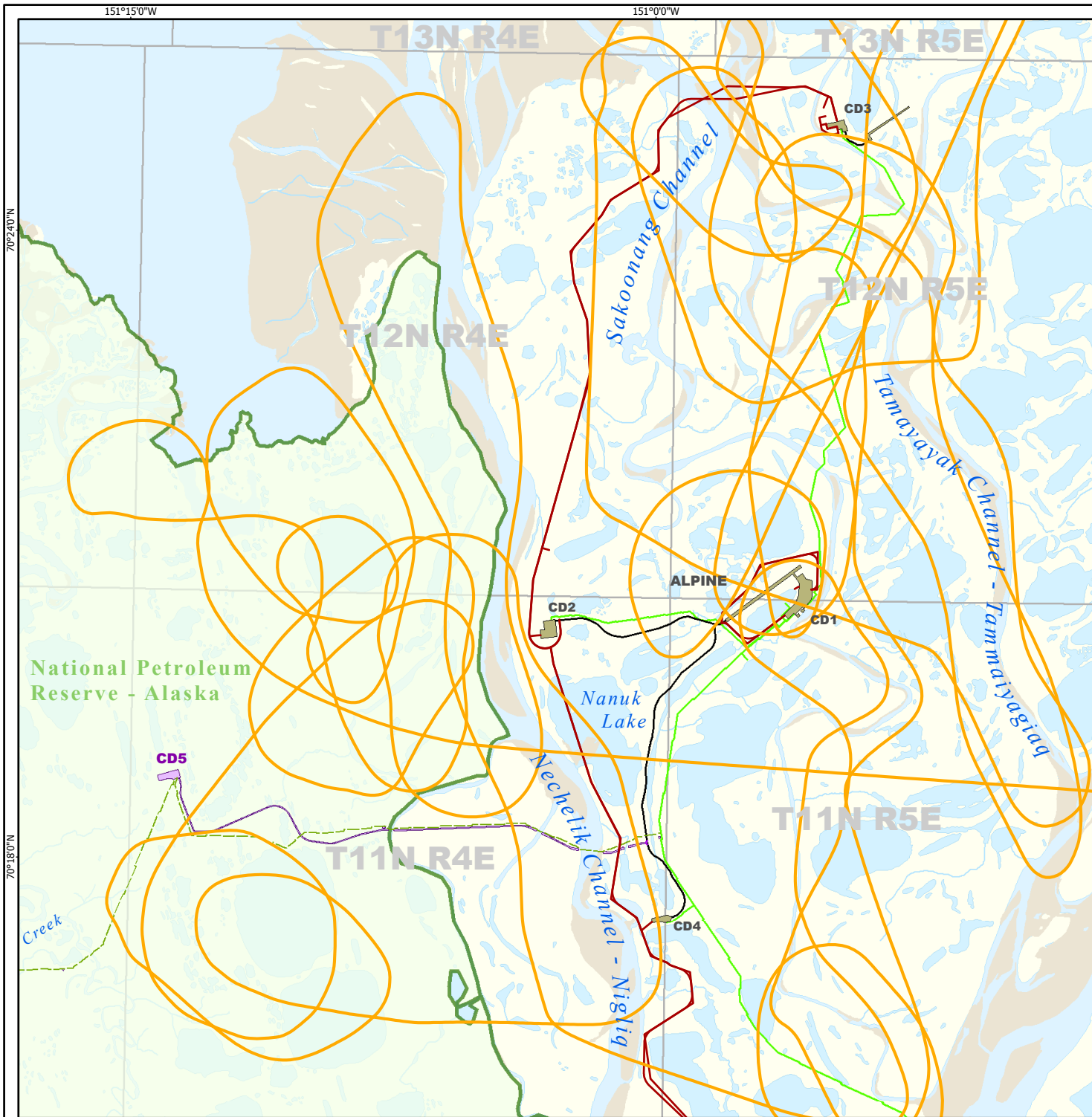
FLIR technology, while a prudent methodology for assessing potential polar bear den locations, may not locate 100% of the dens in the survey area. With this in mind, work and travel should be done with caution in all areas following the guidelines listed in CPAI's Polar Bear/Human Interaction Plan. USFWS will advise on any supplemental findings (e.g. locations of collared bear den locations) once they are obtained.

Table 1 Winter 2011-2012 CPAI Polar Bear Den FLIR Survey Details

	Survey 1: December 13, 2011	Survey 2: December 14, 2011	Survey 3: December 17, 2011
Departed	20:30	20:34	18:38
Landed	23:28	23:22	21:46
Pilot	Mike Mercier	Mike Mercier	Mike Mercier
Co-Pilot	Rich Mallowney	Rich Mallowney	Rich Mallowney
FLIR Operator	Ross Bennett	Terry Kaas	Terry Kaas
Survey Coordinator	Justin Blank	Justin Blank	Justin Blank
Observer	Christopher Putnam (USFWS)	Christopher Putnam (USFWS)	-
Area Surveyed	Colville River Delta, CD5 Area	Sharktooth #1 Appraisal Area, Oliktok Point and Kalibuk Creek Area, Hemi Springs State 1	Ignik Sikumi 1, North Staines River 1

Table 2 Weather Conditions Reported by CPAI Air Traffic Advisory Centers

	December 13, 2011	December 14, 2011	December 17, 2011
Alpine Weather Conditions			
Time of Observation	20:46	17:49	17:46
Wind Direction (magnetic)	020	360	040
Wind Speed (knots)	12	6	15
Visibility (miles)	10	10	3
Cloud Cover	Few@21000 ft.	Clear	Broken @ 12000 ft.
Temp (Celsius)	-28	-32	-25
Dew Point (Celsius)	-31	-35	-28
Altimeter	3008	3017	2974
Notes	-	-	Blowing Snow
Kuparuk Weather Conditions			
Time of Observation	18:45	18:45	18:45
Wind Direction (magnetic)	340	Variable	030
Wind Speed (knots)	4	3	11
Visibility (miles)	10	10	4
Cloud Cover	Few @ 23000 ft.	Few @ 23000 ft.	Scattered @ 1000ft.
Temp (Celsius)	-33	-33	-27
Dew Point (Celsius)	-36	-36	-39
Altimeter	3020	3021	2970
Notes	-	-	Ice Crystals, Mist












FLIR Flight Lines

FIGURE 1

Colville River Delta

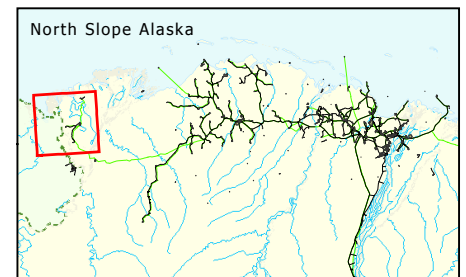
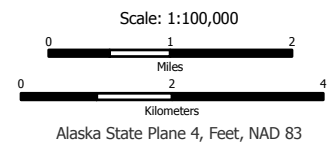
Legend

-  Road
-  Pipeline
-  Gravel Pad
-  2010-12 Ice Road
-  NPR-A Boundary
-  FLIR Mission Dec 13, 2011
-  Proposed Pad
-  Proposed Road
-  Proposed Pipeline

Data source:
2008 63k CPAI Vectors
ADNR Unit Boundaries 11/2011

**Proposed road, pipeline, and pad locations valid as of December 2011.*

FLIR_COLVILLE_RIVER_DELTA.mxd



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FLIR Flight Lines

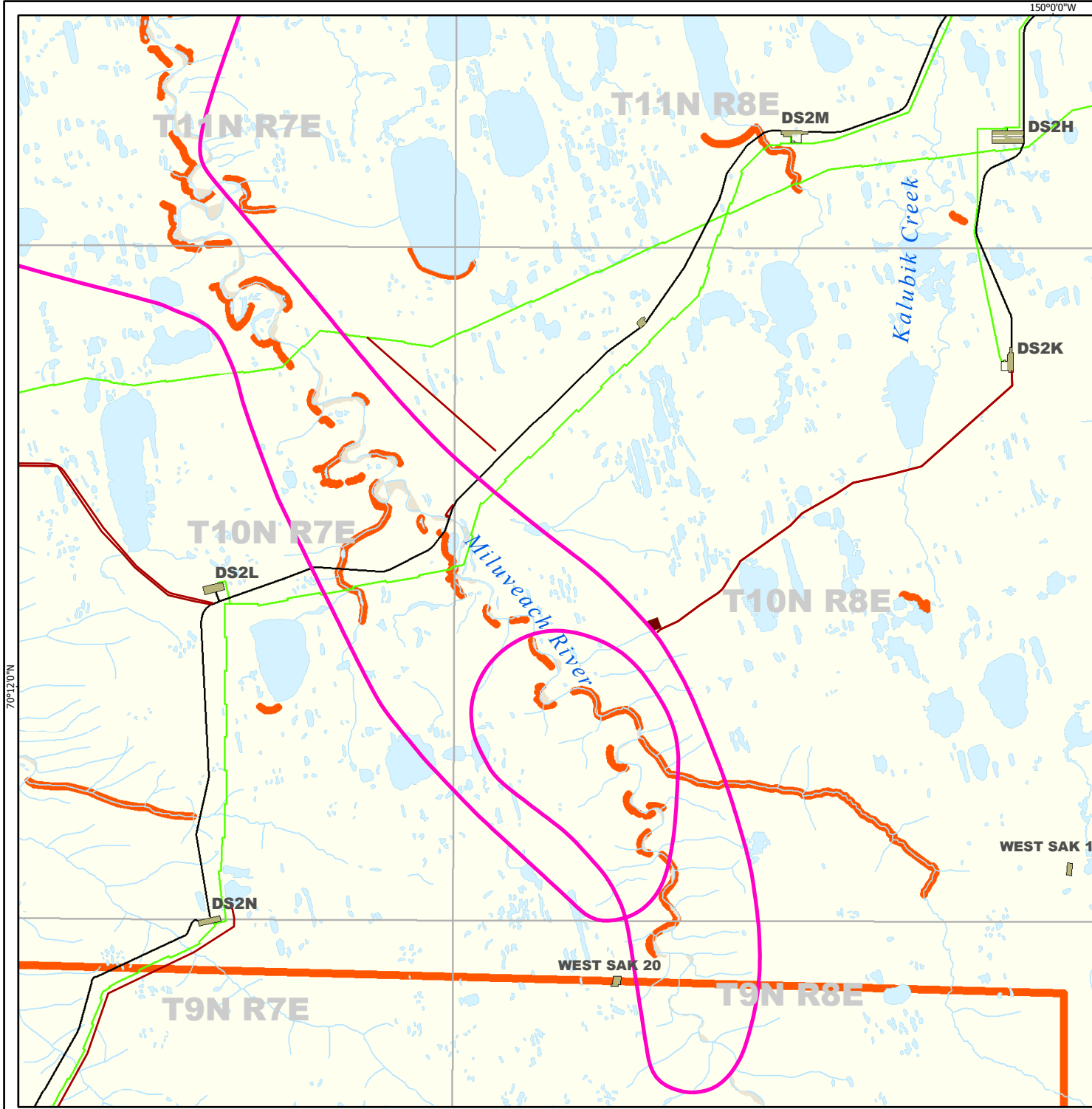
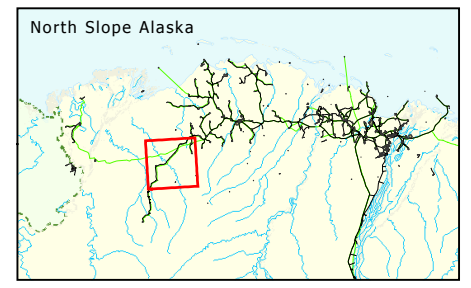
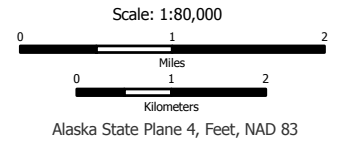
FIGURE 2

Sharktooth # 1 Appraisal Area

Legend

-  Road
-  Pipeline
-  Gravel Pad
-  2010-12 Ice Road
-  2010-12 Ice Pad
-  FLIR Mission Dec 14, 2011
-  Potential Polar Bear Den Habitat

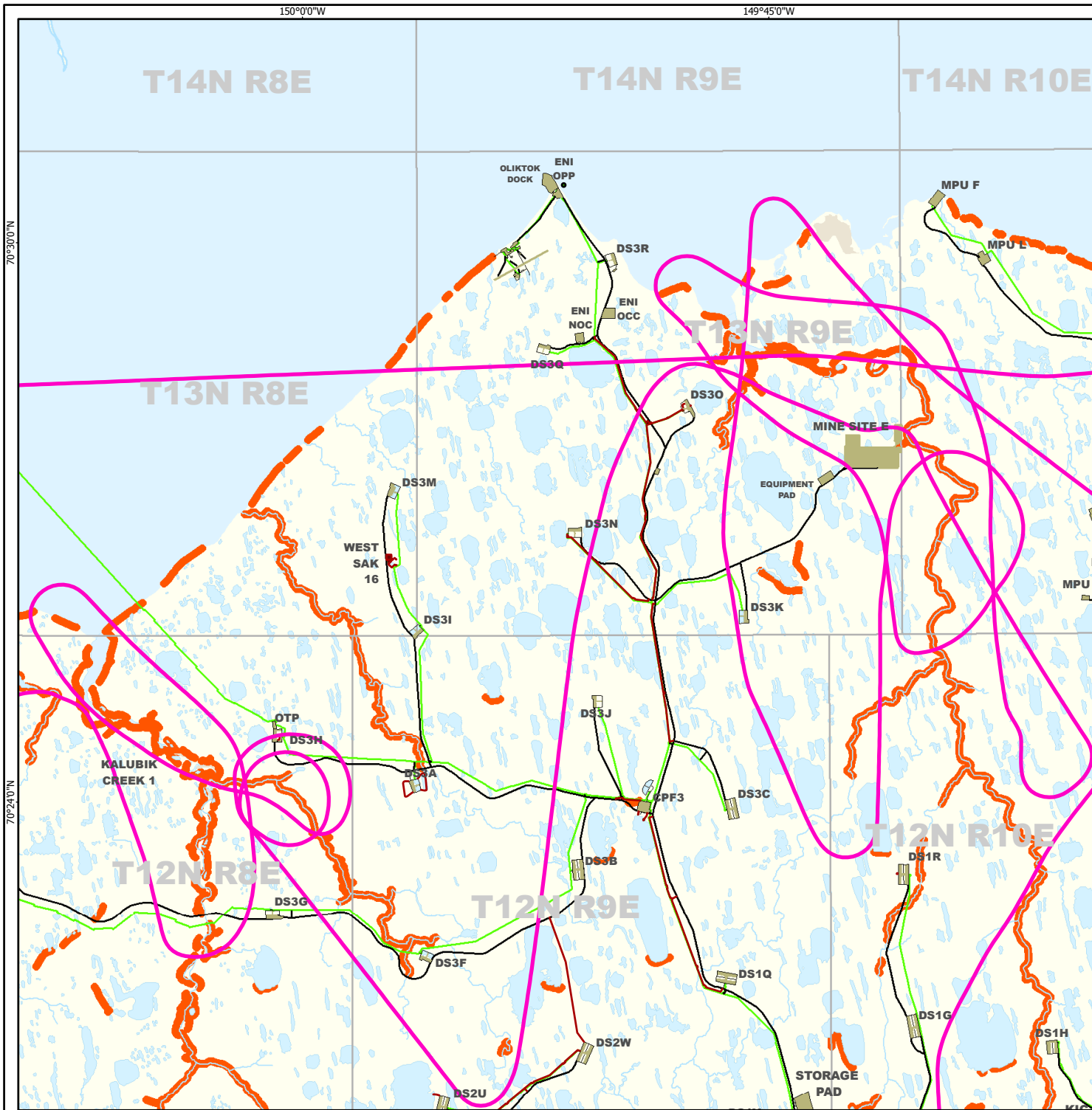
Data source:
 2008 63k CPAI Vectors
 ADNRM Unit Boundaries 11/2011
**Proposed road, pipeline, and pad
 locations valid as of December 2011.*
 FLIR_SHARK_TOOTH.mxd



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FIGURE 3

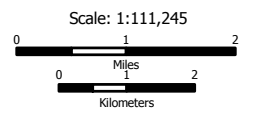
Oliktok Point

Legend

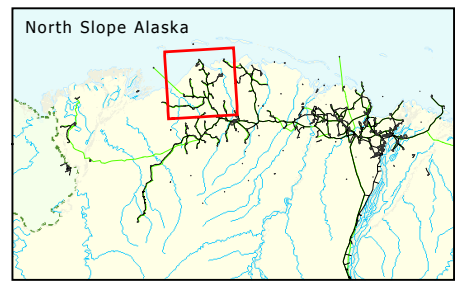
- Road
- Pipeline
- Gravel Pad
- 2010-12 Ice Road
- 2010-12 Ice Pad
- FLIR Mission Dec 14, 2011
- Potential Polar Bear Den Habitat

Data source:
 2008 63k CPAI Vectors
 ADNR Unit Boundaries 11/2011
**Proposed road, pipeline, and pad
 locations valid as of December 2011.*

FLIR_OLIKTOK.mxd

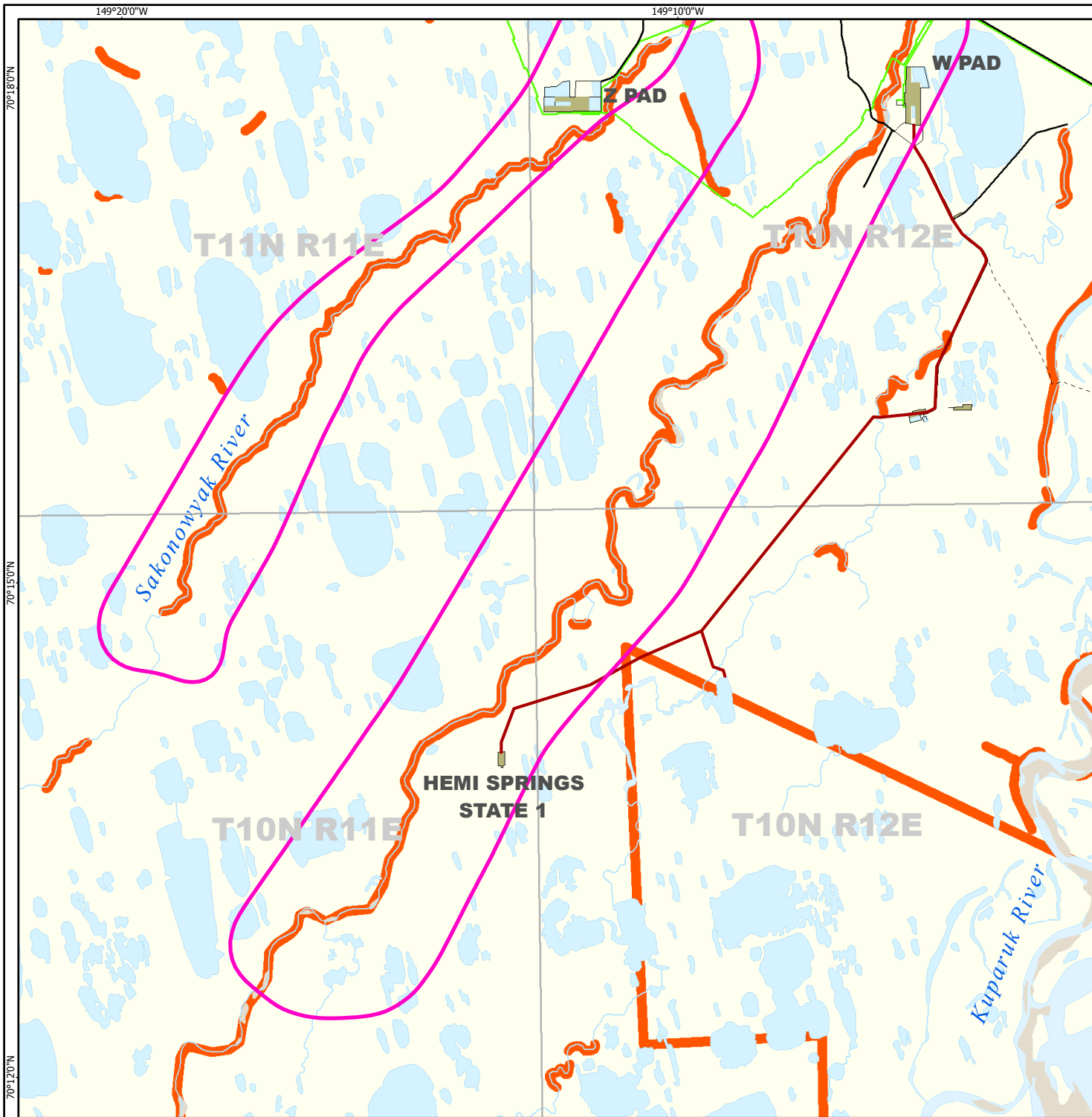


Alaska State Plane 4, Feet, NAD 83



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FLIR Flight Lines

FIGURE 4

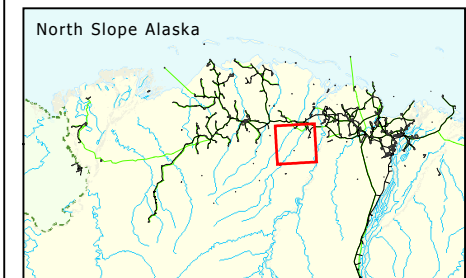
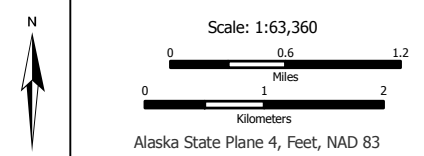
HEMI SPRINGS ST. 1

- Legend**
- Road
 - Pipeline
 - Gravel Pad
 - 2010-12 Ice Road
 - FLIR Mission Dec 14, 2011
 - Potential Polar Bear Den Habitat

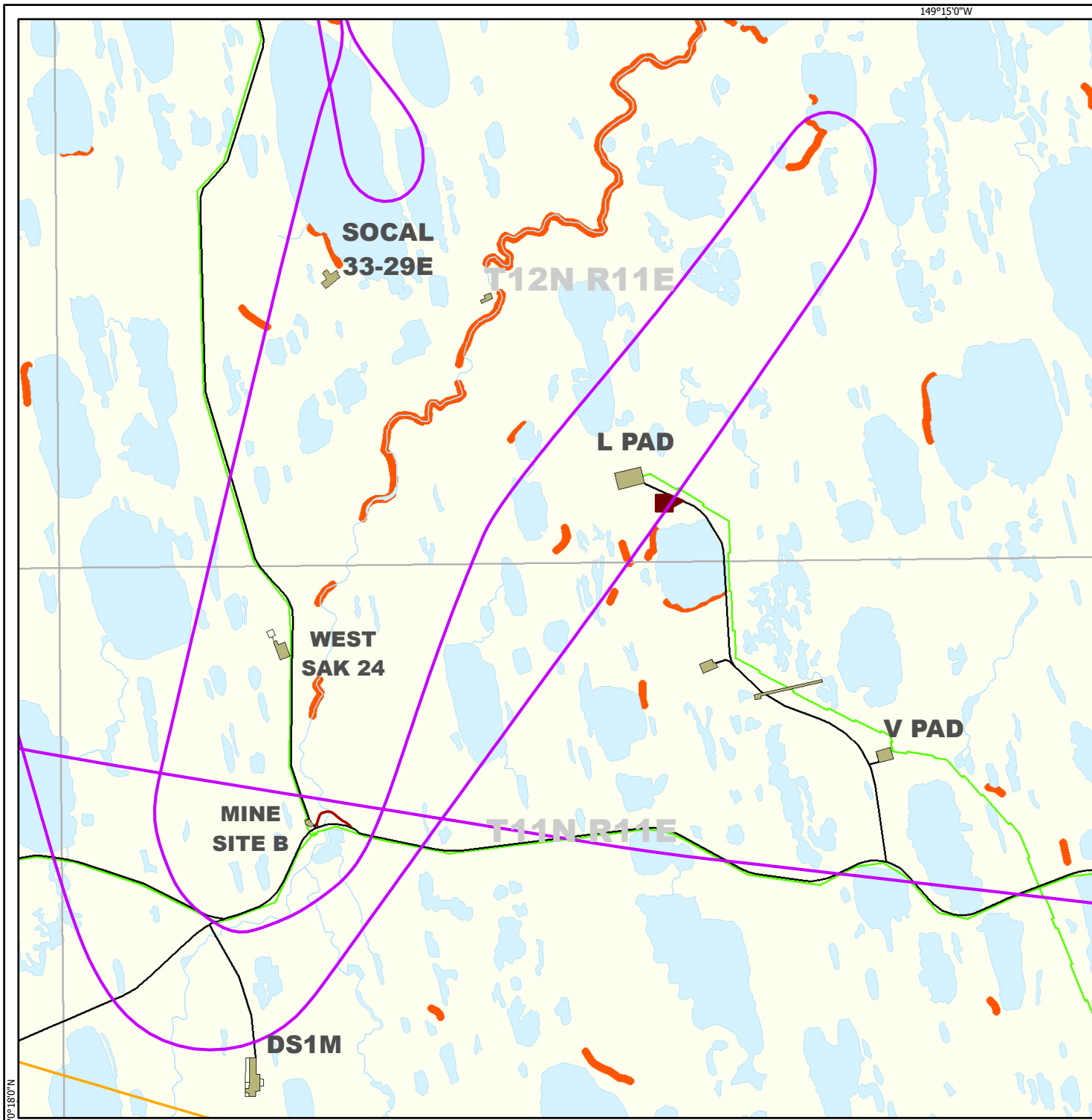
Data source:
 2008 63k CPAI Vectors
 ADNR Unit Boundaries 11/2011

**Proposed road, pipeline, and pad locations valid as of December 2011.*

FLIR_HEMI_SPRINGS.mxd



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FLIR Flight Lines

FIGURE 5

Ignik Sikumi 1 Gas Hydrate Project

- Legend**
- Road
 - Pipeline
 - Gravel Pad
 - Ice Pad
 - 2010-12 Ice Road
 - FLIR Mission Dec 13, 2011
 - FLIR Mission Dec 17, 2011
 - Potential Polar Bear Den Habitat

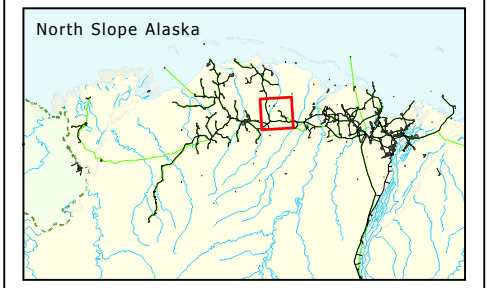
Data source:
 2008 63k CPAI Vectors
 ADNR Unit Boundaries 11/2011
**Proposed road, pipeline, and pad
 locations valid as of December 2011.*
 FLIR_L_PAD.mxd

Scale: 1:50,858

0 0.5 1
Miles

0 1 2
Kilometers

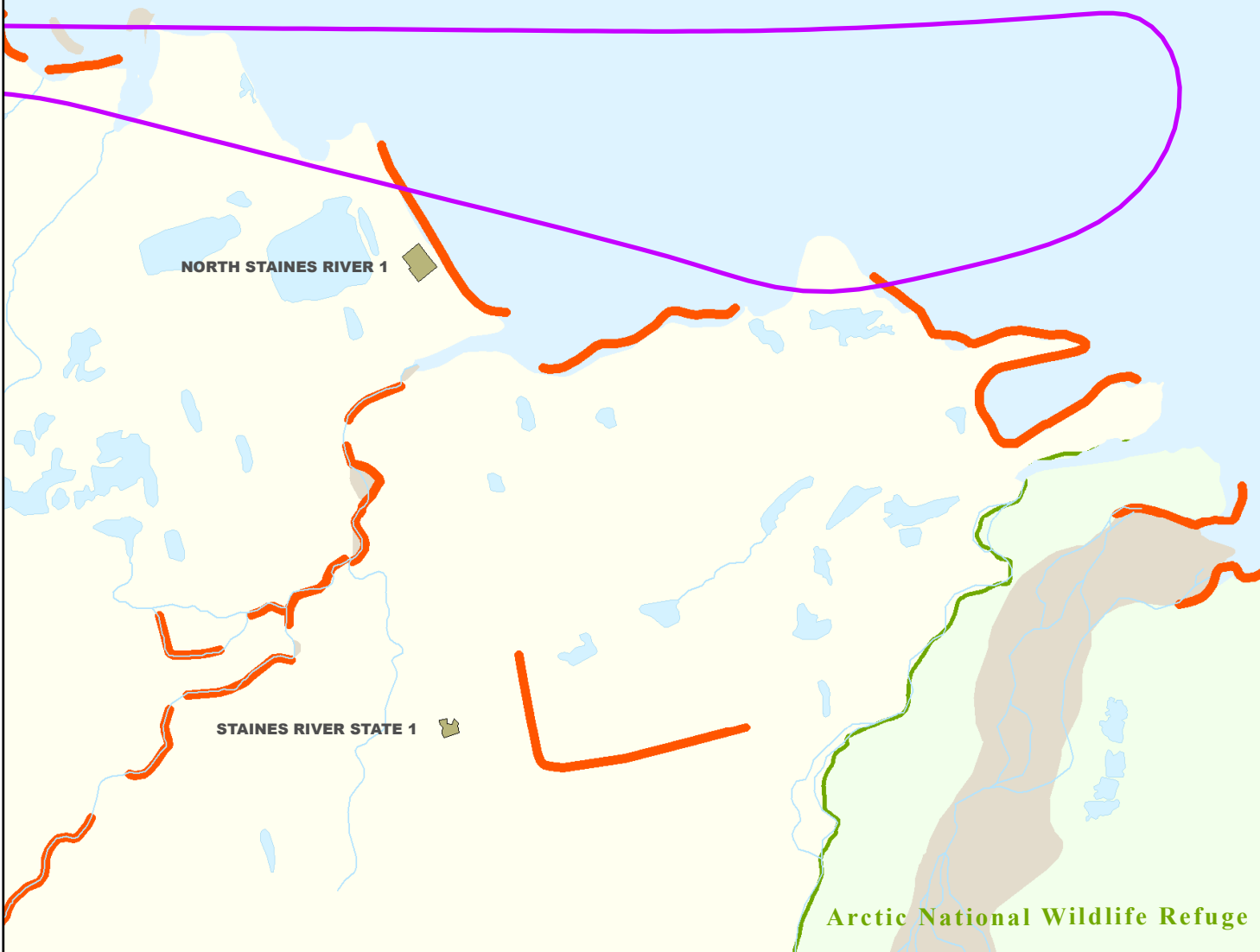
Alaska State Plane 4, Feet, NAD 83





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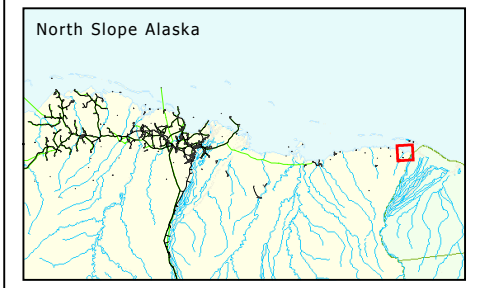
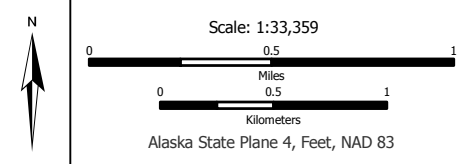
Lion Bay

FLIR Flight Lines FIGURE 6 North Staines River 1



- Legend**
-  Gravel Pad
 -  FLIR Mission Dec 17, 2011
 -  Potential Polar Bear Den Habitat

Data source:
2008 63k CPAI Vectors
ADNR Unit Boundaries 11/2011
**Proposed road, pipeline, and pad
locations valid as of December 2011.*
FLIR_NORTH_STAINES.mxd



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