

ALASKA LNG PROJECT	DOCKET NO. CP17-___-000 RESOURCE REPORT NO. 3 APPENDIX L PART 9 OF 10	Doc No: USAKE-PT-SRREG-00- 000006-000 APRIL 14, 2017 REVISION: 0
	PUBLIC	

**Part 9 of 10 of Appendix L of Resource Report No. 3**



**P\_F86T1029\_001\_US**  
**LOOKING US AT PLX**

**7/6/2015 NK151.5**



**P\_F86T1029\_002\_DS**  
**LOOKING DS AT PLX**

**7/6/2015 NK151.5**





P\_F86T1029\_003\_LB

7/6/2015 NK151.5

LOOKING AT LB AT PLX



P\_F86T1029\_004\_RB

7/6/2015 NK151.5

LOOKING AT RB AT PLX





**P\_F86TI029\_005\_AERIAL**  
**AERIAL PHOTO**

**7/6/2015**

**NK151.5**



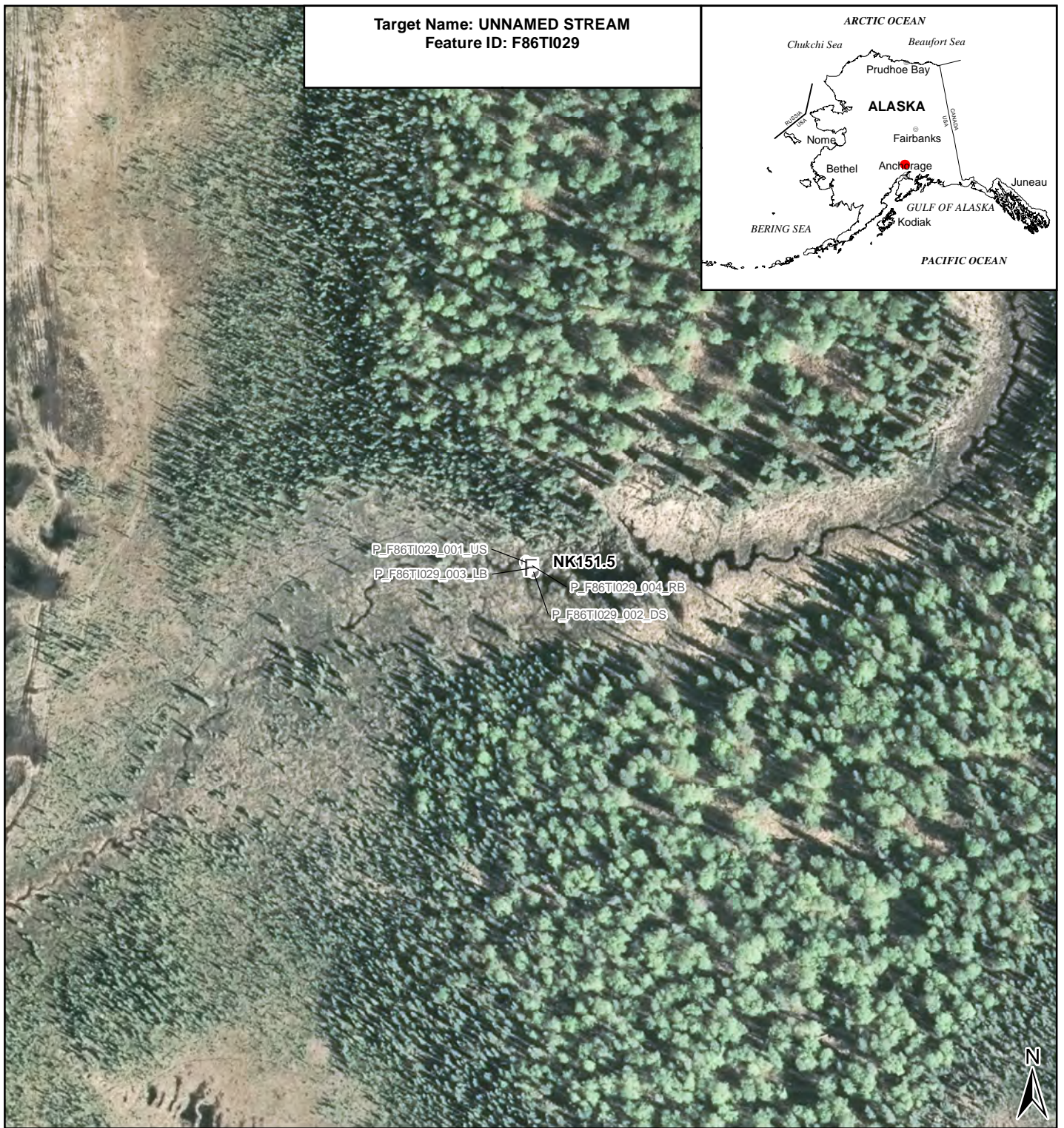
**P\_F86TI029\_006\_AERIAL**  
**AERIAL PHOTO**

**7/6/2015**

**NK151.5**



Target Name: UNNAMED STREAM  
Feature ID: F86TI029



#### LEGEND

##### 2015 Fish Survey Location

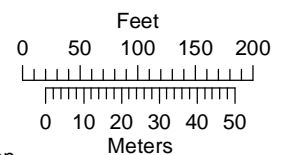
- F** Fish Observed
- F** No Fish Observed
- Photo Point

##### Species Observed

- AB** Alaska Blackfish
- AG** Arctic Grayling

- BU** Burbot
- CH** Chinook Salmon
- CO** Coho Salmon
- DV** Dolly Varden
- NS** Ninespine Stickleback
- O** Other Species Not Listed
- RT** Rainbow Trout

- SA(U)** Salmonid (Unspecified)
- SC(U)** Sculpin (Unspecified)
- SS** Slimy Sculpin
- ST(U)** Stickleback (Unspecified)
- TS** Threespine Stickleback
- OBS** Fish Observation, No Species Information



#### ALASKA LNG

NOTES:  
Concept Information - Confidential. Produced by Alaska LNG team. The information used to create this product is based on the collected data on the date of issue; it is considered reliable only at the scale at which the data was created and the scale at which the map was published. This drawing is solely prepared for use by the contractual Alaska LNG team partners and the Alaska LNG team assumes no liability to any other party for any representations contained in these drawings. This map must be printed/viewed at full scale (100%) in order for the scale to remain correct.

DESIGN  
ICS

CHECK

DESIGN  
TCS

APPROVE

#### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 34 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	

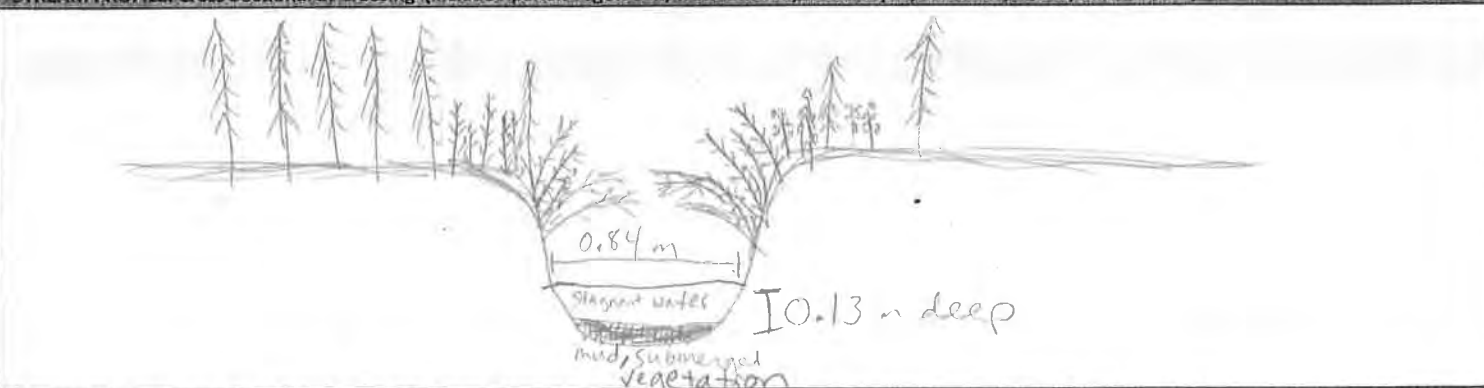


# STREAM FISH INVESTIGATION DATA FORM

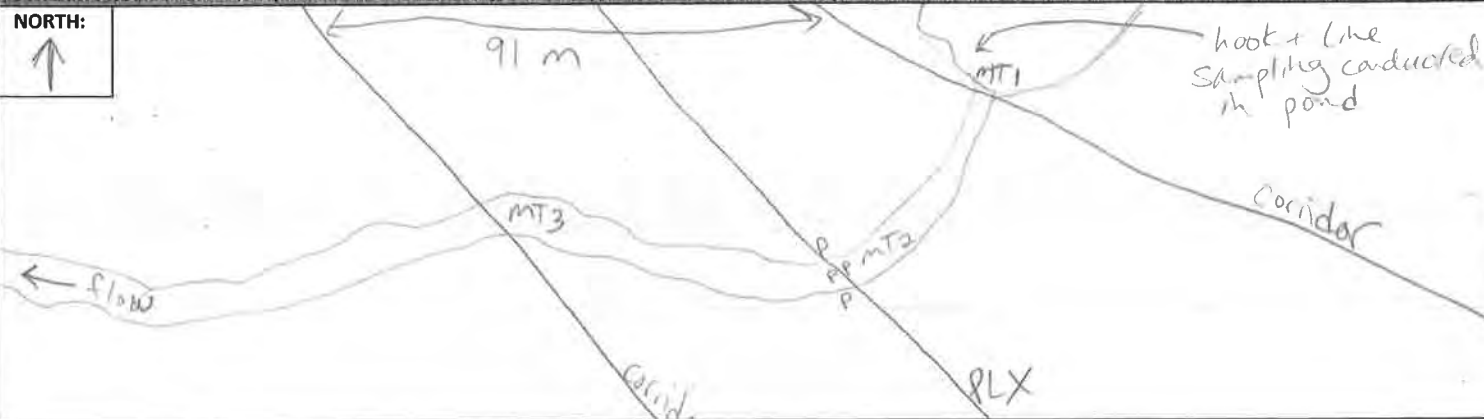
SITE DESCRIPTION					
Date: 7/7/2015	Investigators: SCS NISS KAH	Team No.: F86	Feature ID: F86T030		
Stream Name: Unnamed Stream			Stream ID: NK 151.1		
Pipeline Milepost: 679.2	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): heli		
Latitude: 62° 07' 21.4420" N		Longitude: 150° 13' 59.9371" W			
Logbook No.: 1	Logbook Page No.: 48-49	Total Fish Caught: 6 frogs	Fish Mortalities: 0	Total Photos: 11	
US @ CL Pic No.: P-F86T030-001-US	DS @ CL Pic No.: P-F86T030-002-DS	RB to LB @ CL Pic No.: P-F86T030-003-LB	LB to RB @ CL Pic No.: P-F86T030-004-RB		
Other Pic No(s): P-F86T030-005-AERIAL P-F86T030-007-AERIAL P-F86T030-006-AERIAL					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): cloudy overcast		Precipitation (Describe): light rain			
Water Temperature (°C): 16.57	Air Temperature (°C): 17	pH: 4.60	Dissolved Oxygen (mg/l): 1.05		
Specific Conductance (µS/cm): 35	Turbidity (NTU): 3.1	ORP (mV): 200.0	Dissolved Oxygen (%): 10.9		
Ambient Conductance (µS/cm): 30	Odor: none	Sheen (Y/N): N	Color: clear	Last date of Calibration: 7/6/2015	
Defined Channel (Y/N): Y	Notes: narrow + hidden under willows			Wetted Width (m): .84	
Flow (Y/N): N	Notes: outflow from small lake			Thalweg Depth @ CL (m): .13	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
20 Grass/Sedge (%)		20 Grass/Sedge (%)		30 Organics (%)	
90 Shrubs (%)		90 Shrubs (%)		70 Silt (%)	
50 Trees (%)		1 Trees (%)		0 Sand (%)	
3 Diameter DBH (in.)		3 Diameter DBH (in.)		0 Gravel (%)	
				0 Cobble (%)	
				0 Boulders (%)	
Stream Type:		Aquatic Habitats			
<input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral		<input type="checkbox"/> Sand Bar <input type="checkbox"/> Large Woody Debris <input type="checkbox"/> Mud Bar <input checked="" type="checkbox"/> Overhanging vegetation <input type="checkbox"/> Gravel Bar <input type="checkbox"/> Contiguous Wetlands <input type="checkbox"/> Riffles <input checked="" type="checkbox"/> Emergent Plants <input checked="" type="checkbox"/> Pools <input checked="" type="checkbox"/> Submerged Plants <input checked="" type="checkbox"/> Undercut Banks			

STREAM PROFILE: Cross Sectional at Crossing (Include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)



STREAM PROFILE: Plan View (Include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)





# STREAM FISH INVESTIGATION DATA FORM

Feature ID: F867030

METHODS ATTRIBUTES				
Minnow Traps (Y/N): <u>Y</u>	Hook and Line (Y/N): <u>Y</u>	Beach Seine (Y/N): <u>NA</u>	Fyke Net (Y/N): <u>NA</u>	Hoop Net (Y/N): <u>NA</u>
No. of Minnow Traps Set: <u>3</u>	Date & Time in: <u>7/7/2015</u> (mm/dd/yyyy) <u>1215-1240</u>	Date & Time in: <u>/</u> (mm/dd/yyyy)	Date & Time in: <u>/</u> (mm/dd/yyyy)	Date & Time in: <u>/</u> (mm/dd/yyyy)
Date & Time in: <u>7/6/2015</u> (mm/dd/yyyy) <u>1545</u>	No. of lines in water: <u>2</u>	No. of passes: <u>1</u>	Date & Time out: <u>/</u> (mm/dd/yyyy)	Date & Time out: <u>/</u> (mm/dd/yyyy)
Date & Time out: <u>7/7/2015</u> (mm/dd/yyyy) <u>1115</u>	Time lines in water: <u>50</u>	Reach Length (m): <u>/</u>		

ELECTROFISHING ATTRIBUTES				
EF (Y/N): <u>NA</u>	EF Start Time: <u>/</u>	EF End Time: <u>/</u>	EF Time (seconds): <u>/</u>	EF Reach Length (m): <u>/</u>
Duty Cycle: <u>/</u>	Frequency (Hz): <u>/</u>	Waveform: <u>/</u>	Sampling Efficiency (% of sample reach): <u>/</u>	
Current (A): <u>/</u>	Volts (V): <u>/</u>	Power (W): <u>/</u>	(amp x volts)	

FISH OBSERVATIONS						
ID (Seq. Num)	Gear Type	Species	Total Length (mm)	Life Stage (Juvenile or Adult)	Disposition (Dead or Alive)	Picture No.
001	vis. obs	wood frog	n/a	juvenile	alive	*P-F867030-008-WF
002						N/A
003						*P-F867030-009-WF
004						N/A
005						*P-F867030-010-WF
006	MT2					*P-F867030-011-WF
/	/	/	/	/	/	/
/	/	/	/	/	/	/
/	/	/	/	/	/	/
/	/	/	/	/	/	/
/	/	/	/	/	/	/
/	/	/	/	/	/	/

NOTES (any additional information)
<ul style="list-style-type: none"> <li>- several frogs observed and one caught in minnow trap</li> <li>- Stream connects two small lakes</li> <li>- no flow</li> <li>- fly fished in small lake NS of MT2 + adjacent to MT1</li> </ul>

MISCELLANEOUS POINTS (if applicable)	
Point ID: <u>NA</u>	Description: <u>NA</u>
Point ID: <u>NA</u>	Description: <u>NA</u>

Field Crew Chief: SS Field Scientist/Technician: Quen Smith Technical Lead: /

**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F867030

FT # NK151.1

Date: 7/7/2015

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☐ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500
- ☒ If outside expected ranges, was sample re-taken?
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?



Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F8671030

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?

NA ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

X Neal Smith

Fisheries Biologist (print)

X Neal Smith

Signature

X Sam Simpson

Field Crew Chief (print)

X [Signature]

Signature



**P\_F86TI030\_001\_US**  
**LOOKING UP AT PLX**

**7/7/2015 NK151.1**



**P\_F86TI030\_002\_DS**  
**LOOKING DS AT PLX**

**7/7/2015 NK151.1**





P\_F86T1030\_003\_LB  
LOOKING AT LB AT PLX

7/7/2015 NK151.1



P\_F86T1030\_004\_RB  
LOOKING AT RB AT PLX

7/7/2015 NK151.1





**P\_F86TI030\_005\_AERIAL**  
**AERIAL PHOTO**

**7/7/2015**

**NK151.1**



**P\_F86TI030\_006\_AERIAL**  
**AERIAL PHOTO**

**7/7/2015**

**NK151.1**





**P\_F86TI030\_007\_AERIAL**  
**AERIAL PHOTO**

**7/7/2015**

**NK151.1**



**P\_F86TI030\_008\_WF**  
**PHOTO OF WOOD FROG**

**7/7/2015**

**NK151.1**





**P\_F86TI030\_009\_WF**  
**PHOTO OF WOOD FROG**

**7/7/2015 NK151.1**



**P\_F86TI030\_010\_WF**  
**PHOTO OF WOOD FROG**

**7/7/2015 NK151.1**



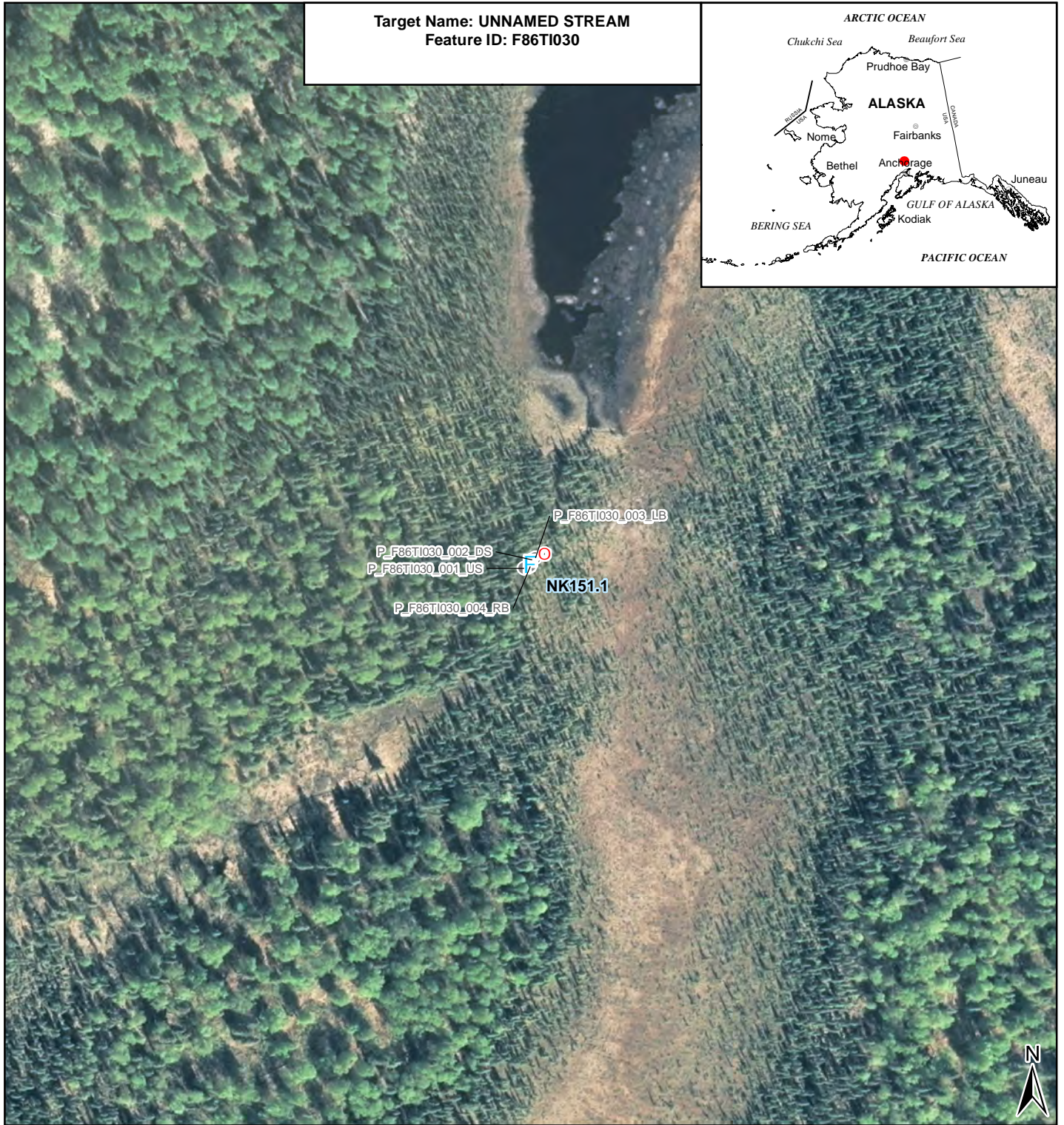
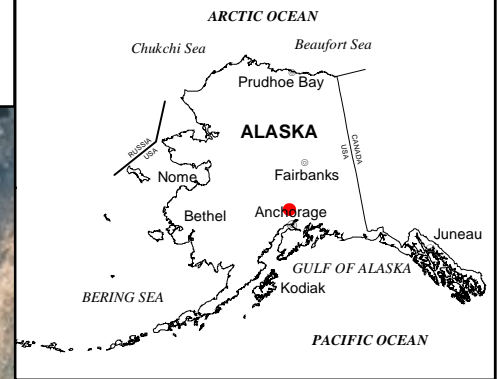


P\_F86TI030\_011\_WF  
PHOTO OF WOOD FROG

7/7/2015 NK151.1



Target Name: UNNAMED STREAM  
Feature ID: F86TI030



#### LEGEND

##### 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

##### Species Observed

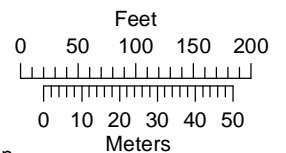
- AB Alaska Blackfish
- AG Arctic Grayling

- BU
- CH
- CO
- DV
- NS
- O
- RT

- Burbot
- Chinook Salmon
- Coho Salmon
- Dolly Varden
- Ninespine Stickleback
- Other Species Not Listed
- Rainbow Trout

- SA(U)
- SC(U)
- SS
- ST(U)
- TS
- OBS

- Salmonid (Unspecified)
- Sculpin (Unspecified)
- Slimy Sculpin
- Stickleback (Unspecified)
- Threespine Stickleback
- Fish Observation, No Species Information



#### ALASKA LNG

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ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS					
DESIGN ICS	PROJECTION AK 4	DATUM NAD83	CONTRACTOR NAME AECOM	MAP NUMBER Page 35 of 86	REV. A
DESIGN TCS	SCALE 1:2,000	DATE 15 Oct 2015	PROJECT NUMBER 26221392	ORIG PAGE SIZE 8.5 X 11	
APPROVE					



# STREAM FISH INVESTIGATION DATA FORM

<b>SITE DESCRIPTION</b>					
Date: 9/6/2015	Investigators: SCS NJS ADF	Team No.: F86	Feature ID: F86HT005		
Stream Name: Unnamed Tributary to Chulitna River			Stream ID: NK122.2		
Pipeline Milepost: 615.9	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): 161.6		
Latitude: 62° 52' 47.0726" N			Longitude: 149° 48' 30.3009" W		
Logbook No.: 3	Logbook Page No.: 47-49	Total Fish Caught: 17	Fish Mortalities: 0	Total Photos: 9	
US @ CL Pic No.: P-F86HT005-001-US	DS @ CL Pic No.: P-F86HT005-002-DS	RB to LB @ CL Pic No.: P-F86HT005-003-LB	LB to RB @ CL Pic No.: P-F86HT005-004-RB		
Other Pic No(s): P-F86HT005-005-BEAVER POND + 4 fish photos					

<b>PHYSICAL/CHEMICAL ATTRIBUTES</b>					
Weather (Describe): overcast			Precipitation (Describe): nme		
Water Temperature (°C): 10.13	Air Temperature (°C): 16	pH: ★ 9.57	Dissolved Oxygen (mg/l): 9.62		
Specific Conductance (µS/cm): 61	Turbidity (NTU): 2.56	ORP (mV): 195.1	Dissolved Oxygen (%): 86.3		
Ambient Conductance (µS/cm): 43	Odor: none	Sheen (Y/N): N	Color: clear	Last date of Calibration: 9/4/2016	
Defined Channel (Y/N): Y	Notes: at valley between upland ridges			Wetted Width (m): 1.6	
Flow (Y/N): Y	Notes: moderate w/ riffles/pools			Thalweg Depth @ CL (m): .25	
<b>Riparian Veg at 0-5 m at LB:</b> 30 Grass/Sedge (%) 40 Shrubs (%) 30 Trees (%) 12 Diameter DBH (in.)		<b>Riparian Veg at 0-5 m at RB:</b> 20 Grass/Sedge (%) 70 Shrubs (%) 10 Trees (%) 10 Diameter DBH (in.)		<b>Stream Substrate:</b> 3 Organics (%) 0 Silt (%) 0 Sand (%) 10 Gravel (%) 80 Cobble (%) 10 Boulders (%)	
<b>Aquatic Habitats</b> Sand Bar Mud Bar Gravel Bar <input checked="" type="checkbox"/> Riffles <input checked="" type="checkbox"/> Pools Undercut Banks		Large Woody Debris <input checked="" type="checkbox"/> Overhanging vegetation Contiguous Wetlands Emergent Plants Submerged Plants			
<b>Stream Type:</b> <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral					

**STREAM PROFILE: Cross Sectional at Crossing** (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

**STREAM PROFILE: Plan View** (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)



# STREAM FISH INVESTIGATION DATA FORM

Feature ID: F86HT005

METHODS ATTRIBUTES				
Minnow Traps (Y/N): <u>Y</u>	Hook and Line (Y/N): <u>N</u>	Beach Seine (Y/N): <u>N</u>	Fyke Net (Y/N): <u>N</u>	Hoop Net (Y/N): <u>N</u>
No. of Minnow Traps Set: <u>3</u>	Date & Time in: (mm/dd/yyyy) <u>1</u>	Date & Time in: (mm/dd/yyyy) <u>1</u>	Date & Time in: (mm/dd/yyyy) <u>1</u>	Date & Time in: (mm/dd/yyyy) <u>1</u>
Date & Time in: <u>9/5/2015</u> (mm/dd/yyyy) <u>1600</u>	No. of lines in water: <u>1</u>	No. of passes: <u>1</u>	Date & Time out: (mm/dd/yyyy) <u>1</u>	Date & Time out: (mm/dd/yyyy) <u>1</u>
Date & Time out: <u>9/6/2015</u> (mm/dd/yyyy) <u>1500</u>	Time lines in water: <u>1</u>	Reach Length (m): <u>1</u>		

ELECTROFISHING ATTRIBUTES				
EF (Y/N): <u>N/A</u>	EF Start Time: <u>N/A</u>	EF End Time: <u>N/A</u>	EF Time (seconds): <u>N/A</u>	EF Reach Length (m): <u>N/A</u>
Duty Cycle: <u>N/A</u>	Frequency (Hz): <u>N/A</u>	Waveform: <u>N/A</u>	Sampling Efficiency (% of sample reach): <u>N/A</u>	
Current (A): <u>N/A</u>	Volts (V): <u>N/A</u>	Power (W): <u>N/A</u>	(amp x volts)	

FISH OBSERVATIONS						
ID (Seq. Num)	Gear Type	Species	Total Length (mm)	Life Stage (Juvenile or Adult)	Disposition (Dead or Alive)	Picture No.
001	MT3	slimy sculpin	90	juv/adult	Alive	n/a
002	MT3	"	57	juv/adult	"	n/a
003	MT3	"	70	juv/adult	"	n/a
004	"	coho	80	juvenile	"	* P-F86HT005-006-coho
005	"	coho	72	"	"	n/a
006	"	coho	70	"	"	n/a
007	"	coho	68	"	"	* P-F86HT005-007-coho
008	MT3	coho	68	"	"	n/a
009	MT3	coho	64	"	"	n/a
010	MT3	coho	61	"	"	n/a
011	MT1	coho	130	"	"	* P-F86HT005-008-coho
012	MT1	coho	126	"	"	* P-F86HT005-009-coho

NOTES (any additional information)
<p>- caught coho salmon + slimy sculpin in MT</p> <p>* pH was not reading accurately when calibrated</p> <p>- original target was located on upland - moved target approx 240' NE, where stream crosses <sup>see map</sup> PLX</p> <p>- stream well defined + contained within steep banks.</p> <p>- located DS of beaver pond complex</p>

MISCELLANEOUS POINTS (if applicable)	
Point ID: <u>MA</u>	Description: <u>N/A</u>
Point ID: <u>MA</u>	Description: <u>N/A</u>

Field Crew Chief: [Signature] Field Scientist/Technician: [Signature] Technical Lead:



# STREAM FISH INVESTIGATION DATA FORM

Feature ID: F86H1T005

[illegible]







**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86 HTOOS FT # NK122.2 Date: 9/6/15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500

N/A ☐ If outside expected ranges, was sample re-taken?

☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- N/A ☐ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☐ Are units correct?



Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86HT005

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☐ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

By signing below, I verify that all field data for this site has been verified for accuracy and completeness.

X Neal Smith

Fisheries Biologist (print)

X [Signature]

Signature

X Sam Simpson

Field Crew Chief (print)

X [Signature]

Signature

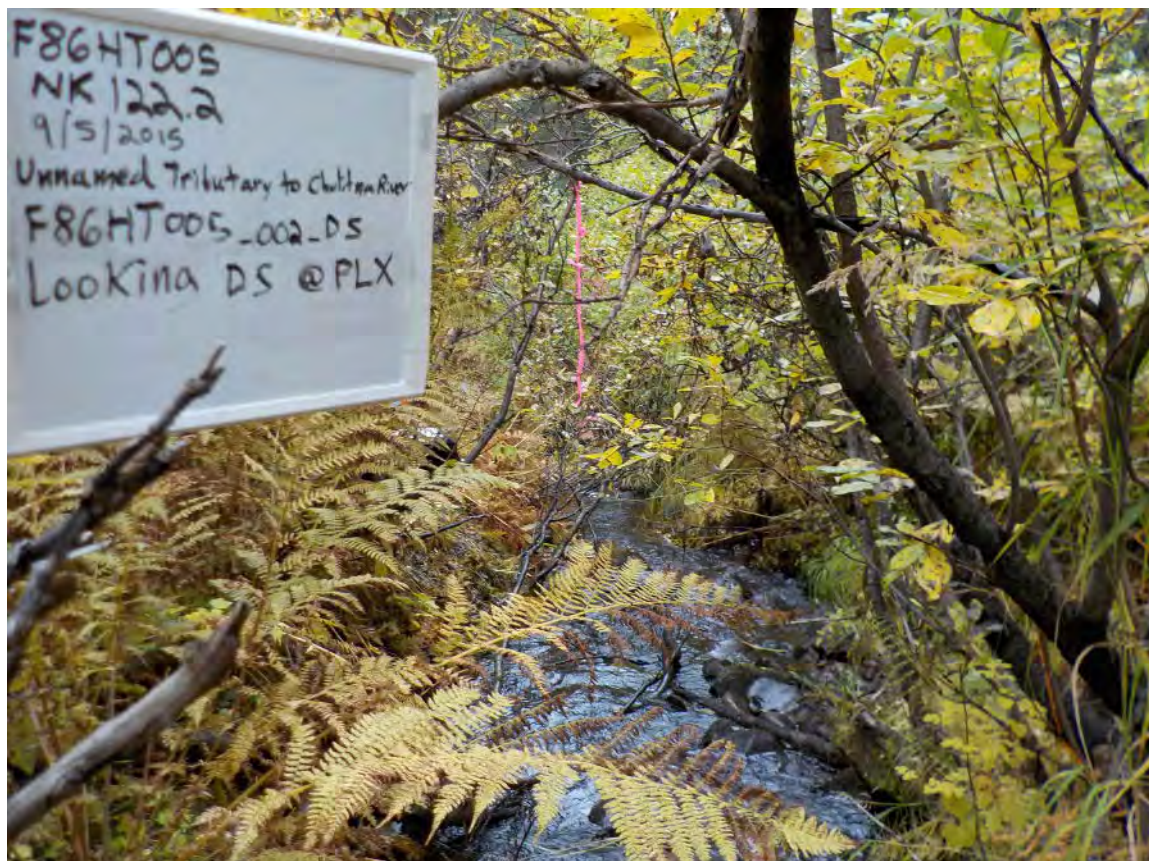
NO, but pH was  
not reading accurately  
when calibrated





**P\_F86HT005\_001\_US**  
**LOOKING US AT PLX**

**9/5/2015 NK122.2**



**P\_F86HT005\_002\_DS**  
**LOOKING DS AT PLX**

**9/5/2015 NK122.2**





**P\_F86HT005\_003\_LB**  
**LOOKING AT LB AT PLX**

**9/5/2015 NK122.2**



**P\_F86HT005\_004\_RB**  
**LOOKING AT RB AT PLX**

**9/5/2015 NK122.2**





**P\_F86HT005\_005\_BEAVER POND**      **9/5/2015**      **NK122.2**  
**LOOKING AT BEAVER POND COMPLEX US OF PLX**



**P\_F86HT005\_006\_COHO**      **9/5/2015**      **NK122.2**  
**PHOTO OF COHO SALMON**





P\_F86HT005\_007\_COHO  
PHOTO OF COHO SALMON

9/5/2015 NK122.2



P\_F86HT005\_008\_COHO  
PHOTO OF COHO SALMON

9/5/2015 NK122.2





P\_F86HT005\_009\_COHO  
PHOTO OF COHO SALMON

9/5/2015 NK122.2



Target Name: UNNAMED TRIBUTARY TO  
CHULITNA RIVER  
Feature ID: F86HT005



P\_F86HT005\_001\_US  
P\_F86HT005\_003\_LB  
NK122-2  
P\_F86HT005\_004\_RB  
P\_F86HT005\_002\_DS  
CO, SS

## LEGEND

### 2015 Fish Survey Location

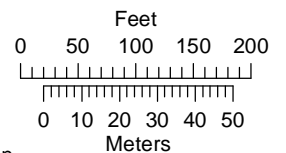
- F Fish Observed
- F No Fish Observed
- Photo Point

### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

- BU Burbot
- CH Chinook Salmon
- CO Coho Salmon
- DV Dolly Varden
- NS Ninespine Stickleback
- O Other Species Not Listed
- RT Rainbow Trout

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
- TS Threespine Stickleback
- OBS Fish Observation, No Species Information



## ALASKA LNG

NOTES:  
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DESIGN  
ICS

CHECK

DESIGN  
TCS

APPROVE

### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 36 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 9/6/2015	Investigators: SCS NSS ADF	Team No.: F86	Feature ID: F86HT004		
Stream Name: Unnamed Stream			Stream ID: NK122.1		
Pipeline Milepost: 614.7	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): 162.8		
Latitude: 62° 53' 12.1403" N		Longitude: 149° 46' 42.5673" W			
Logbook No.: 3	Logbook Page No.: 47-48	Total Fish Caught: 0	Fish Mortalities: N/A	Total Photos: 4	
US @ CL Pic No.: P-F86HT004-001-US	DS @ CL Pic No.: P-F86HT004-002-DS	RB to LB @ CL Pic No.: P-F86HT004-003-LB	LB to RB @ CL Pic No.: P-F86HT004-004-RB		
Other Pic No(s): N/A					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): overcast		Precipitation (Describe): none			
Water Temperature (°C): 9.96	Air Temperature (°C): 15	pH: ★ 9.14	Dissolved Oxygen (mg/l): 3.34		
Specific Conductance (µS/cm): 238	Turbidity (NTU): 1.74	ORP (mV): 279.9	Dissolved Oxygen (%): 29.6%		
Ambient Conductance (µS/cm): 186	Odor: anoxic	Sheen (Y/N): N	Color: brown tint	Last date of Calibration: 9/4/2015	
Defined Channel (Y/N): N	Notes: channel present but spreads onto adjacent grasses			Wetted Width (m): 8.95	
Flow (Y/N): N	Notes: feature is ponded w/ no apparent flow			Thalweg Depth @ CL (m): .83	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
100 Grass/Sedge (%)		90 Grass/Sedge (%)		40 Organics (%)	
0 Shrubs (%)		5 Shrubs (%)		40 Silt (%)	
0 Trees (%)		5 Trees (%)		0 Sand (%)	
N/A Diameter DBH (in.)		10 Diameter DBH (in.)		20 Gravel (%)	
				0 Cobble (%)	
				0 Boulders (%)	
Stream Type:		Aquatic Habitats			
<input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral		<input type="checkbox"/> Sand Bar <input type="checkbox"/> Large Woody Debris <input type="checkbox"/> Mud Bar <input type="checkbox"/> Overhanging vegetation <input type="checkbox"/> Gravel Bar <input checked="" type="checkbox"/> Contiguous Wetlands <input type="checkbox"/> Riffles <input checked="" type="checkbox"/> Emergent Plants <input checked="" type="checkbox"/> Pools <input checked="" type="checkbox"/> Submerged Plants <input type="checkbox"/> Undercut Banks			

**STREAM PROFILE: Cross Sectional at Crossing (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)**

**STREAM PROFILE: Plan View (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)**



Feature ID: F86H7004

[illegible]

Field Crew Chief: [Signature] Field Scientist/Technician: [Signature] Technical Lead: \_\_\_\_\_



**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86+T004

FT # NK122.1

Date: 9/6/15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500

☒ N/A If outside expected ranges, was sample re-taken?

- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ N/A Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☐ Are units correct?

Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86HT004

6. Fish Observations

- NA*
- ☒ Are all fish captured/observed recorded in the Fish Observation table?
  - ☒ Are units correct? (Total Length (mm))
  - ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☐ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*No, but pH was not reading properly when calibrated*

By signing below, I verify that all field data for this site has been verified for accuracy and completeness.

**X** Neal Smith

Fisheries Biologist (print)

**X** *Neal Smith*

Signature

**X** Sam Simpson

Field Crew Chief (print)

**X** *SS*

Signature





**P\_F86HT004\_001\_US**  
**LOOKING US AT OFF-ROW TARGET**

**9/5/2015 NK122.1**



**P\_F86HT004\_002\_DS**  
**LOOKING DS AT OFF-ROW TARGET**

**9/5/2015 NK122.1**





P\_F86HT004\_003\_LB

9/5/2015

NK122.1

LOOKING AT LB AT OFF-ROW TARGET



P\_F86HT004\_004\_RB

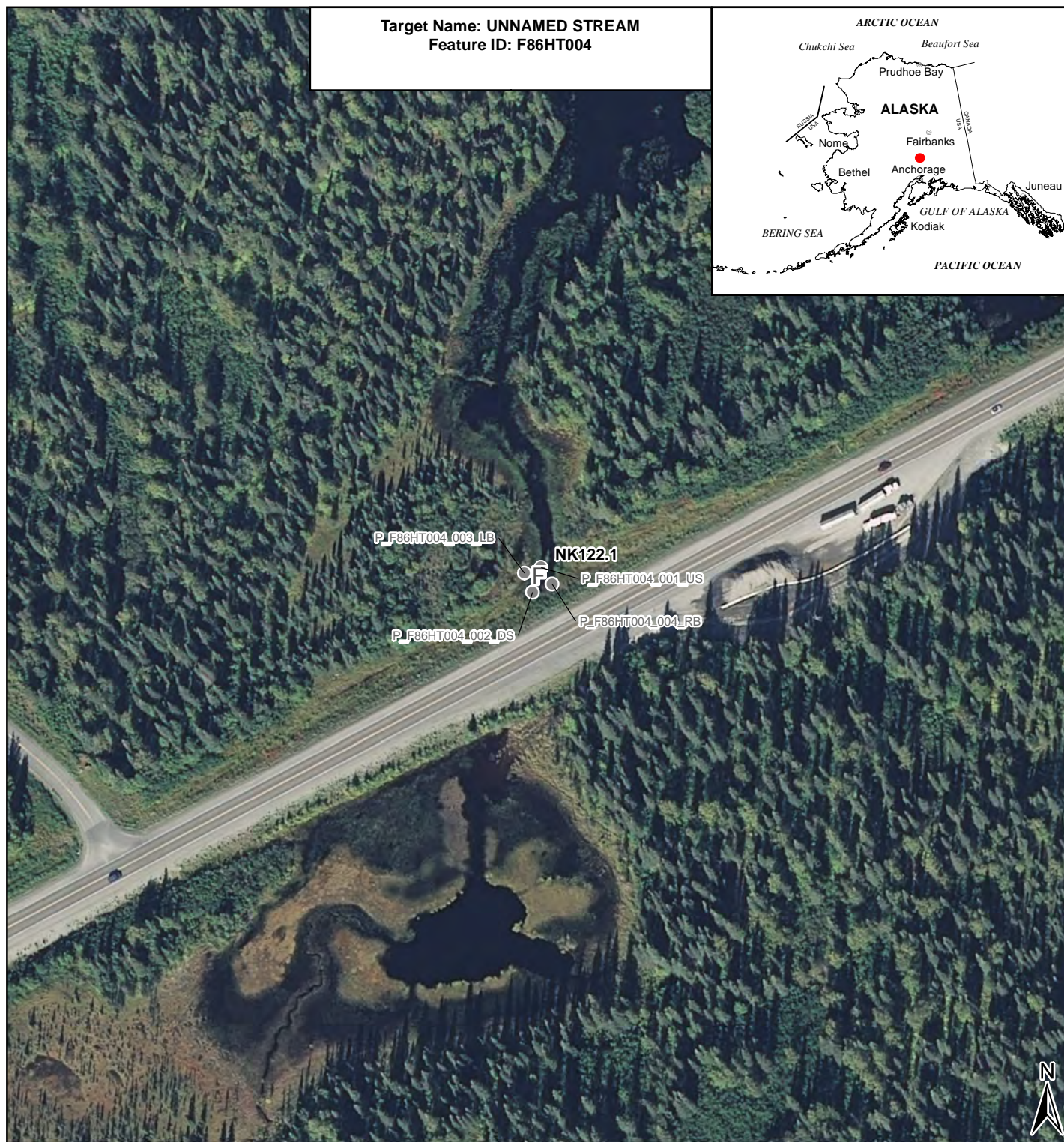
9/5/2015

NK122.1

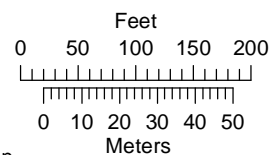
LOOKING AT RB AT OFF-ROW TARGET



A map of Alaska with major cities labeled: Nome, Bethel, Fairbanks, Anchorage, Kodiak, and Juneau. Surrounding bodies of water include the Arctic Ocean, Chukchi Sea, Beaufort Sea, Bering Sea, and Gulf of Alaska. The map also shows the Canadian border to the east and the Russian border to the west.



SA(U)	Salmonid (Unspecified)
SC(U)	Sculpin (Unspecified)
SS	Slimy Sculpin
ST(U)	Stickleback (Unspecified)
TS	Threespine Stickleback
OBS	Fish Observation, No Species Information



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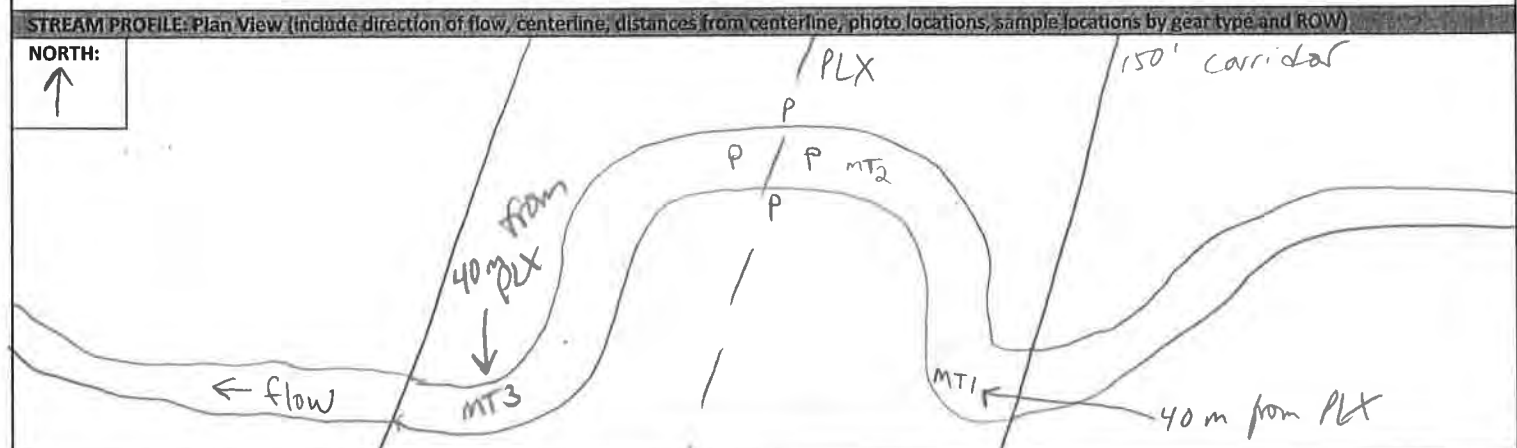
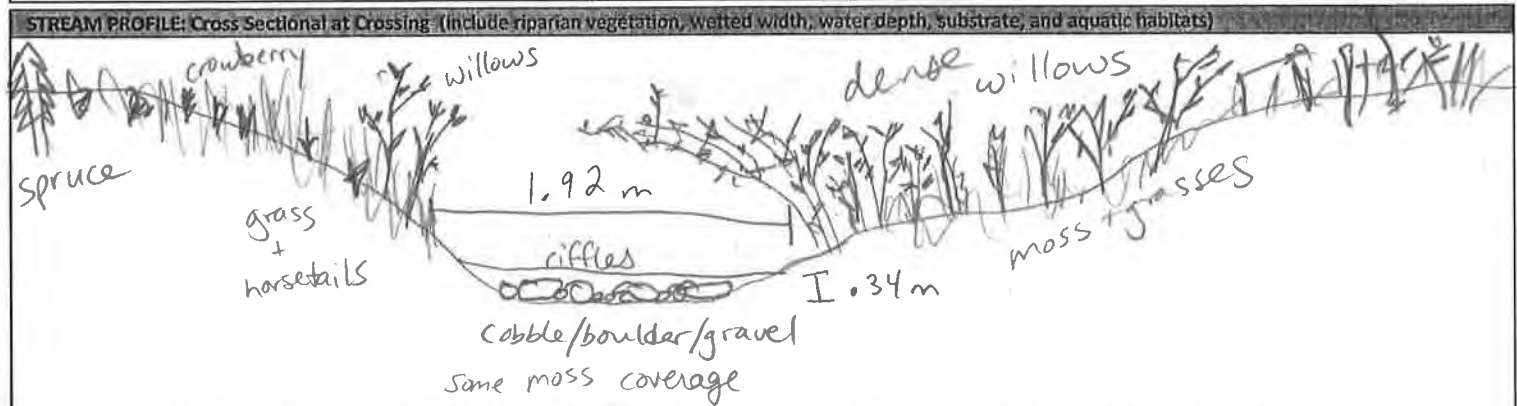
DESIGN ICS	ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS					
CHECK						
DESIGN TCS	PROJECTION AK 4	DATUM NAD83	CONTRACTOR NAME AECOM		MAP NUMBER Page 37 of 86	REV. A
APPR.	SCALE 1:2,000	DATE 15 Oct 2015	PROJECT NUMBER 26221392	ORIG PAGE SIZE 8.5 X 11		



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 9/4/2015	Investigators: SCS NJS ADF	Team No.: F86	Feature ID: F86HT002		
Stream Name: Unnamed Tributary to East Fork Chulitna River			Stream ID: NK112		
Pipeline Milepost: 593.9	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): heli		
Latitude: 63°07'26.0610" N		Longitude: 149°25'58.1923" W			
Logbook No.: 3	Logbook Page No.: 42-45	Total Fish Caught: 0	Fish Mortalities: N/A	Total Photos: 6	
US @ CL Pic No.: P-F86HT002-001-US	DS @ CL Pic No.: P-F86HT002-002-DS	RB to LB @ CL Pic No.: P-F86HT002-003-LB	LB to RB @ CL Pic No.: P-F86HT002-004-RB		
Other Pic No(s): P-F86HT002-005-AERIAL P-F86HT002-006-AERIAL					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): overcast		Precipitation (Describe): light rain			
Water Temperature (°C): 2.62	Air Temperature (°C): 12	pH: 8.95	Dissolved Oxygen (mg/l): 14.01		
Specific Conductance (µS/cm): 238	Turbidity (NTU): 0.52	ORP (mV): 210.3	Dissolved Oxygen (%): 103.1		
Ambient Conductance (µS/cm): 136	Odor: none	Sheen (Y/N): N	Color: clear	Last date of Calibration: 9/4/2015	
Defined Channel (Y/N): Y	Notes: contained within steep banks			Wetted Width (m): 1.92	
Flow (Y/N): Y	Notes: high gradient; ripples			Thalweg Depth @ CL (m): .34	
<b>Riparian Veg at 0-5 m at LB:</b> 90 Grass/Sedge (%) 10 Shrubs (%) 1 Trees (%) 5 Diameter DBH (in.)		<b>Riparian Veg at 0-5 m at RB:</b> 5 Grass/Sedge (%) 95 Shrubs (%) 0 Trees (%) N/A Diameter DBH (in.)		<b>Stream Substrate:</b> 3 Organics (%) 0 Silt (%) 5 Sand (%) 10 Gravel (%) 50 Cobble (%) 35 Boulders (%)	
<b>Aquatic Habitats</b> <input type="checkbox"/> Sand Bar <input type="checkbox"/> Mud Bar <input type="checkbox"/> Gravel Bar <input checked="" type="checkbox"/> Ripples <input type="checkbox"/> Pools <input type="checkbox"/> Undercut Banks		<input type="checkbox"/> Large Woody Debris <input checked="" type="checkbox"/> Overhanging vegetation <input type="checkbox"/> Contiguous Wetlands <input type="checkbox"/> Emergent Plants <input type="checkbox"/> Submerged Plants			
<b>Stream Type:</b> <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral					





Feature ID: F86HT002

Field Scientist/  
Crew Chief: \_\_\_\_\_ Technician: \_\_\_\_\_ Technical  
Lead: \_\_\_\_\_

**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86HT002 FT # NK113 Date: 9/4/15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500

N/A ☐ If outside expected ranges, was sample re-taken?

☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- N/A ☐ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☐ Are units correct?



Stream Fish Investigations Field Form

QA/QC Checklist

Feature ID:

~~8641002~~ <sup>N.S.</sup> F8641002

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- N/A ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?

but pH was not ☒ NO ☐ Was any gear missing/damaged for this survey or did you have any problems reading properly during calibration? that should require resampling of this stream for an adequate survey effort?

By signing below, I verify that all field data for this site has been verified for accuracy and completeness.

X Neal Smith

Fisheries Biologist (print)

X 

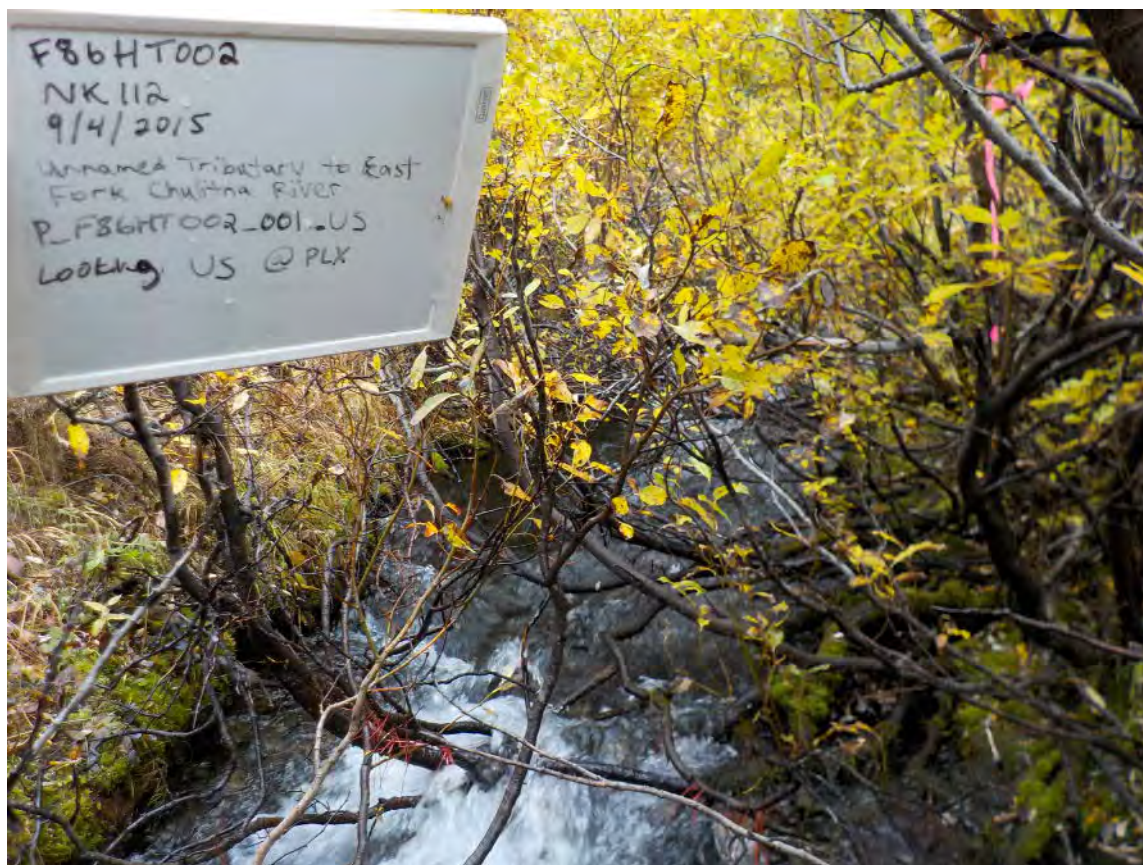
Signature

X Sam Simpson

Field Crew Chief (print)

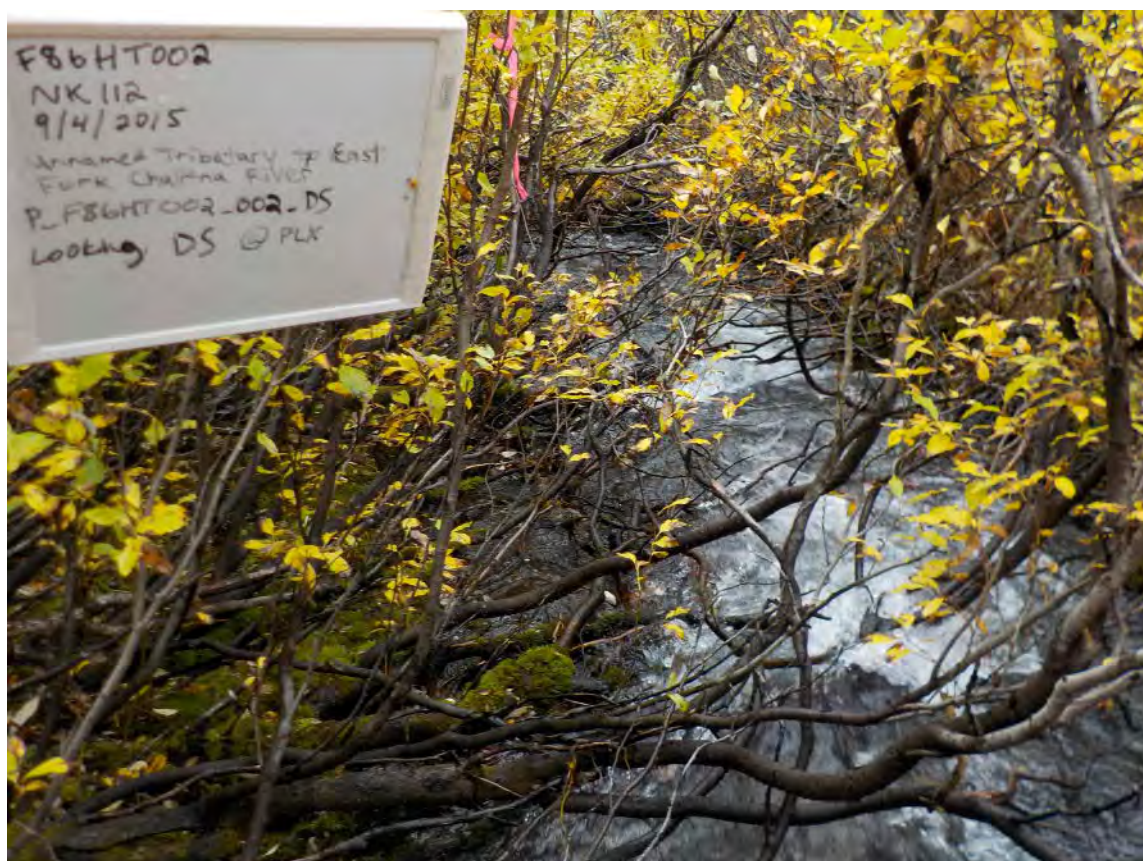
X 

Signature



P\_F86HT002\_001\_US  
LOOKING US AT PLX

9/4/2015 NK112



P\_F86HT002\_002\_DS  
LOOKING DS AT PLX

9/4/2015 NK112





**P\_F86HT002\_003\_LB**  
**LOOKING AT LB AT PLX**

**9/4/2015 NK112**



**P\_F86HT002\_004\_RB**  
**LOOKING AT RB AT PLX**

**9/4/2015 NK112**





**P\_F86HT002\_005\_AERIAL  
AERIAL PHOTO**

**9/4/2015**

**NK112**



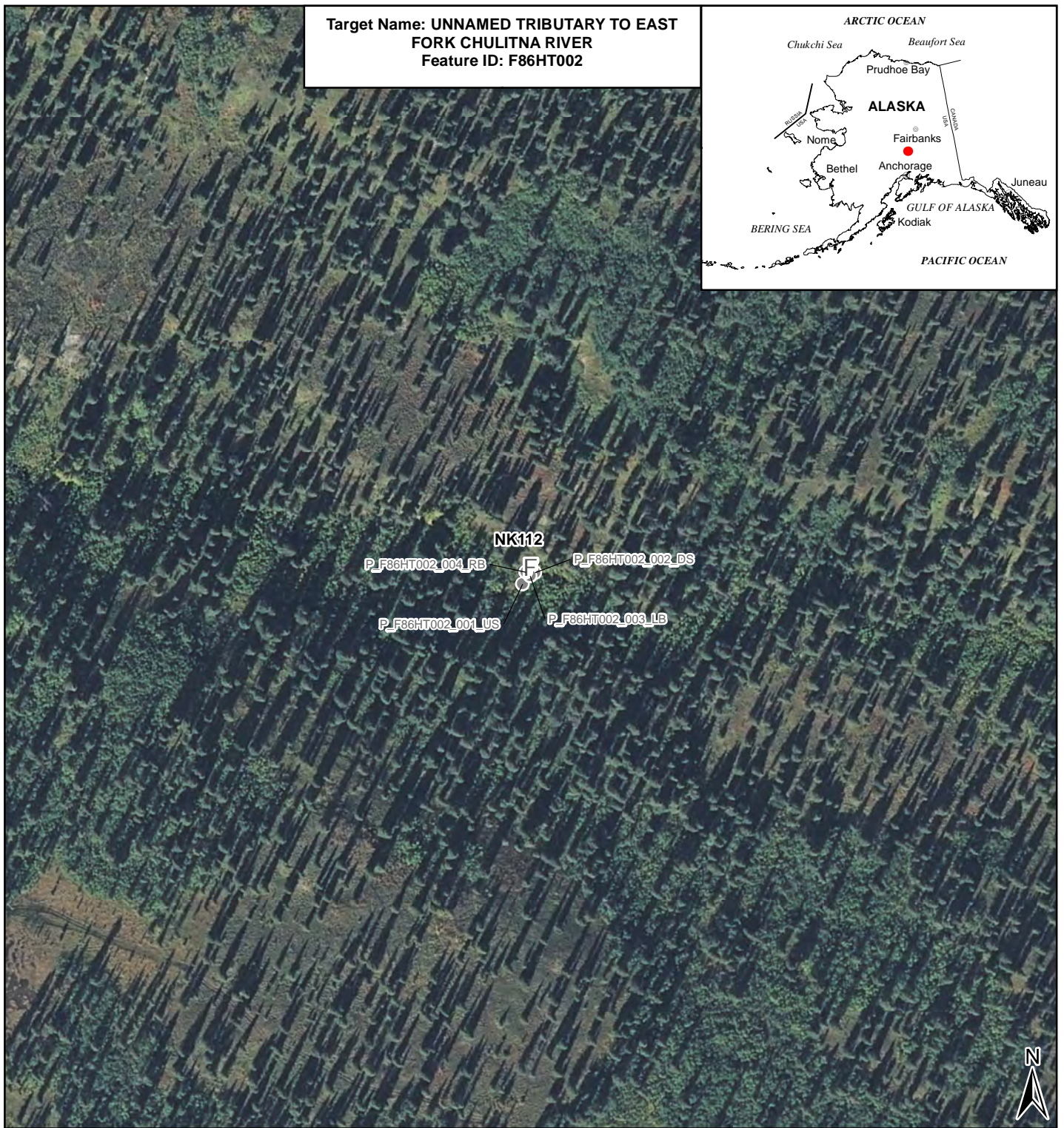
**P\_F86HT002\_006\_AERIAL  
AERIAL PHOTO**

**9/4/2015**

**NK112**



Target Name: UNNAMED TRIBUTARY TO EAST  
FORK CHULITNA RIVER  
Feature ID: F86HT002



#### LEGEND

##### 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

##### Species Observed

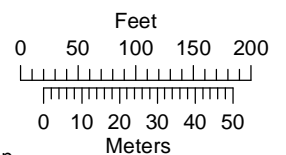
- AB Alaska Blackfish
- AG Arctic Grayling

- BU
- CH
- CO
- DV
- NS
- O
- RT

- Burbot
- Chinook Salmon
- Coho Salmon
- Dolly Varden
- Ninespine Stickleback
- Other Species Not Listed
- Rainbow Trout

- SA(U)
- SC(U)
- SS
- ST(U)
- TS
- OBS

- Salmonid (Unspecified)
- Sculpin (Unspecified)
- Slimy Sculpin
- Stickleback (Unspecified)
- Threespine Stickleback
- Fish Observation, No Species Information



#### ALASKA LNG

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ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS					
DESIGN ICS	PROJECTION AK 4	DATUM NAD83	CONTRACTOR NAME AECOM	MAP NUMBER Page 38 of 86	REV. A
CHECK TCS	SCALE 1:2,000	DATE 15 Oct 2015	PROJECT NUMBER 26221392	ORIG PAGE SIZE 8.5 X 11	
APPROVE					



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 9/4/2015	Investigators: SCS NJS ADF	Team No.: F86	Feature ID: F86HT001		
Stream Name: Hardage Creek			Stream ID: NK111		
Pipeline Milepost: 593.5	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): heli		
Latitude: 63° 07' 45.4783" N		Longitude: 149° 25' 36.3075" W			
Logbook No.: 3	Logbook Page No.: 42-44	Total Fish Caught: 0	Fish Mortalities: N/A	Total Photos: 6	
US @ CL Pic No.: P-F86HT001-001-US	DS @ CL Pic No.: P-F86HT001-002-DS	RB to LB @ CL Pic No.: P-F86HT001-003-LB	LB to RB @ CL Pic No.: P-F86HT001-004-RB		
Other Pic No(s): P-F86HT001-005-AERIAL P-F86HT001-006-AERIAL					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): overcast		Precipitation (Describe): light rain			
Water Temperature (°C): 4.85	Air Temperature (°C): 11	pH: 8.9/4	Dissolved Oxygen (mg/l): 13.13		
Specific Conductance (µS/cm): 306	Turbidity (NTU): 0.45	ORP (mV): 190	Dissolved Oxygen (%): 102.4		
Ambient Conductance (µS/cm): 189	Odor: none	Sheen (Y/N): N	Color: clear	Last date of Calibration: 9/4/2015	
Defined Channel (Y/N): Y	Notes: contained w/in mountainous valley			Wetted Width (m): 5.43	
Flow (Y/N): Y	Notes: rapid, high gradient stream			Thalweg Depth @ CL (m): 0.30	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
3 Grass/Sedge (%)		3 Grass/Sedge (%)		0 Organics (%)	
80 Shrubs (%)		80 Shrubs (%)		0 Silt (%)	
20 Trees (%)		20 Trees (%)		5 Sand (%)	
3 Diameter DBH (in.)		5 Diameter DBH (in.)		10 Gravel (%)	
				50 Cobble (%)	
				35 Boulders (%)	
Stream Type:		Aquatic Habitats			
<input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral		<input type="checkbox"/> Sand Bar <input type="checkbox"/> Large Woody Debris <input type="checkbox"/> Mud Bar <input checked="" type="checkbox"/> Overhanging vegetation <input type="checkbox"/> Gravel Bar <input type="checkbox"/> Contiguous Wetlands <input checked="" type="checkbox"/> Riffles <input type="checkbox"/> Emergent Plants <input type="checkbox"/> Pools <input type="checkbox"/> Submerged Plants <input type="checkbox"/> Undercut Banks			

**STREAM PROFILE: Cross Sectional at Crossing** (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

**STREAM PROFILE: Plan View** (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)



Feature ID: F86 H/T 001

METHODS ATTRIBUTES				
Minnow Traps (Y/N): <i>Y</i>	Hook and Line (Y/N): <i>N</i>	Beach Seine (Y/N): <i>N</i>	Fyke Net (Y/N): <i>N</i>	Hoop Net (Y/N): <i>N</i>
No. of Minnow Traps Set: <i>3</i>	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)
Date & Time in: (mm/dd/yyyy) <i>9/3/15</i> <i>1600</i>	No. of lines in water:	No. of passes:	Date & Time out: (mm/dd/yyyy)	Date & Time out: (mm/dd/yyyy)
Date & Time out: (mm/dd/yyyy) <i>9/4/2015</i> <i>1330</i>	Time lines in water:	Reach Length (m):		

ELECTROFISHING ATTRIBUTES				
EF (Y/N):	EF Start Time:	EF End Time:	EF Time (seconds):	EF Reach Length (m):
Duty Cycle:	Frequency (Hz) :	Waveform:	Sampling Efficiency (% of sample reach):	
Current (A):	Volts (V):	Power (W):	(amp x volts)	

[illegible]

- ☆ - pH was not reading accurate when calibrating
- No fish caught
- Stream is high gradient + contained w/in mountainous valley - Rapid flow
- Cobble/boulder substrate dominate

MISCELLANEOUS POINTS (if applicable)	
Point ID: N/A	Description: N/A
Point ID: N/A	Description: N/A

Field Crew Chief:	Field Scientist/ Technician:	Technical Lead:
----------------------	---------------------------------	--------------------

**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: E86HT001

FT # NK111

Date: 9/4/15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☐ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500
- ☒ N/A If outside expected ranges, was sample re-taken?
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ N/A Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?



Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86H1001

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- N/A ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☐ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

but pH was not reading accurately during calibration

By signing below, I verify that all field data for this site has been verified for accuracy and completeness.

X Neal Smith

Fisheries Biologist (print)

X 

Signature

X Sam Simpson

Field Crew Chief (print)

X

Signature 



**P\_F86HT001\_001\_US**  
**LOOKING US AT PLX**

**9/4/2015 NK111**



**P\_F86HT001\_002\_DS**  
**LOOKING DS AT PLX**

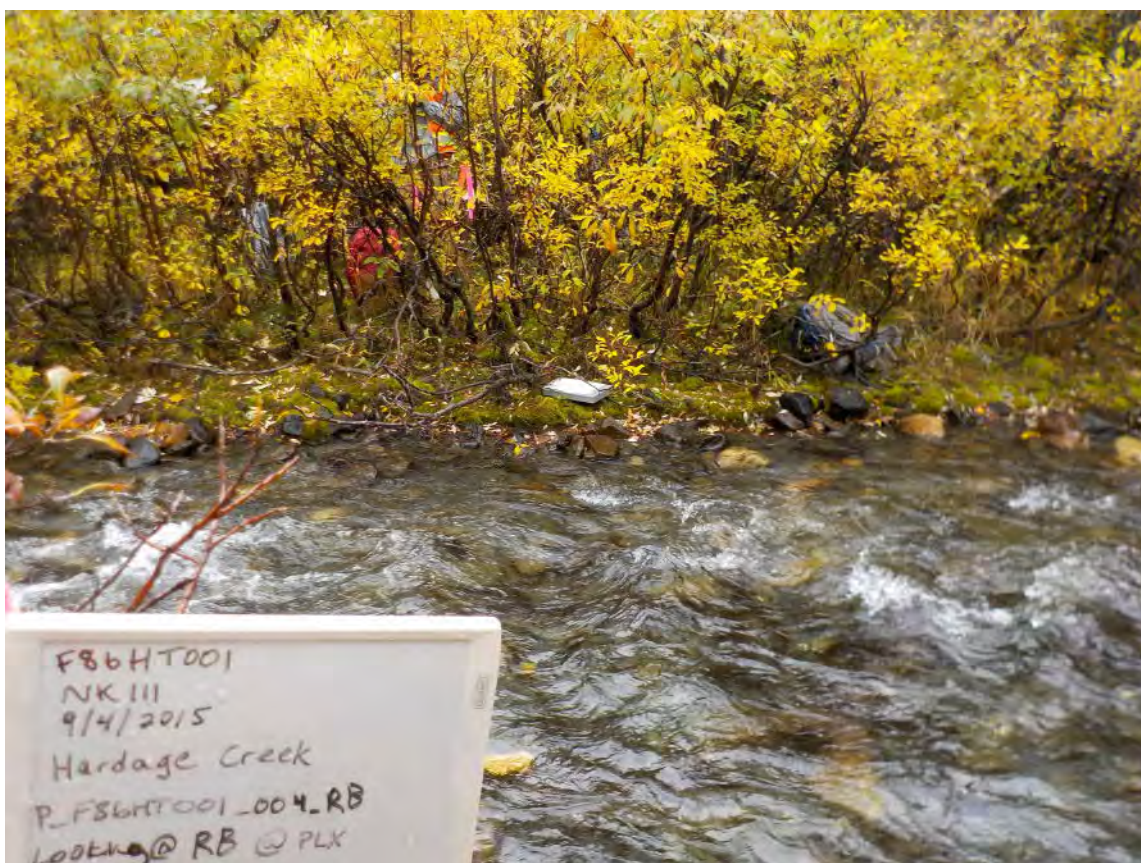
**9/4/2015 NK111**





**P\_F86HT001\_003\_LB**  
**LOOKING AT LB AT PLX**

**9/4/2015 NK111**



**P\_F86HT001\_004\_RB**  
**LOOKING AT RB AT PLX**

**9/4/2015 NK111**

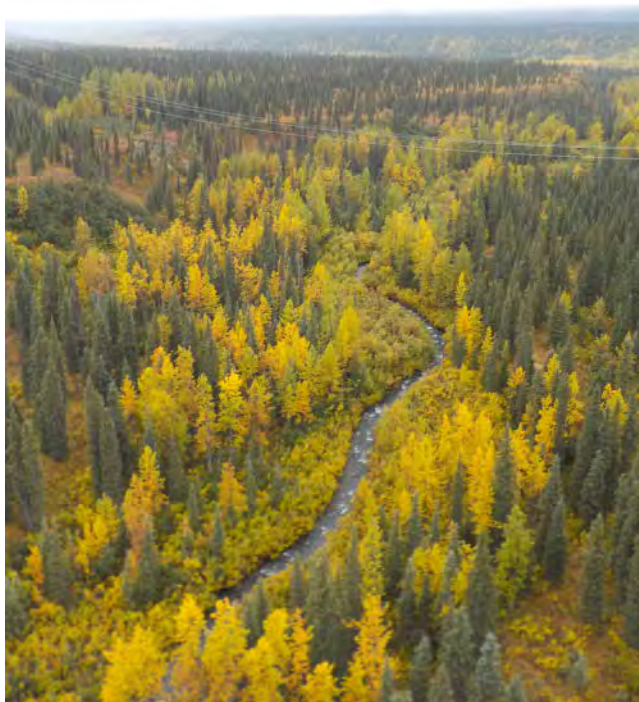




**P\_F86HT001\_005\_AERIAL  
AERIAL PHOTO**

**9/4/2015**

**NK111**



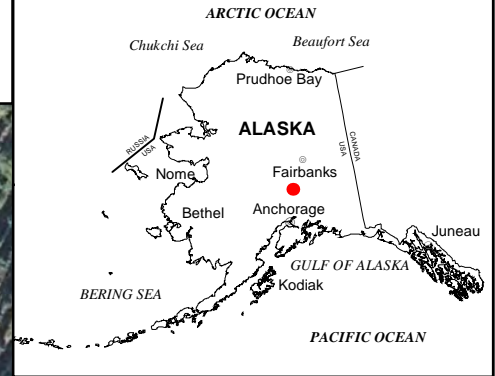
**P\_F86HT001\_006\_AERIAL  
AERIAL PHOTO**

**9/4/2015**

**NK111**



Target Name: HARDAGE CREEK  
Feature ID: F86HT001



#### LEGEND

##### 2015 Fish Survey Location

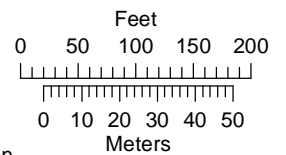
- F Fish Observed
- F No Fish Observed
- Photo Point

##### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

- BU Burbot
- CH Chinook Salmon
- CO Coho Salmon
- DV Dolly Varden
- NS Ninespine Stickleback
- O Other Species Not Listed
- RT Rainbow Trout

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
- TS Threespine Stickleback
- OBS Fish Observation, No Species Information



#### ALASKA LNG

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DESIGN  
ICS

CHECK

DESIGN  
TCS

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#### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 39 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 9/4/2015	Investigators: SCS NJS ADF	Team No.: F86	Feature ID: F86HT003		
Stream Name: Unnamed Tributary to East Fork Chulitna River			Stream ID: NK110.2		
Pipeline Milepost: 590.5	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): heli		
Latitude: 63° 09' 43.1469" N		Longitude: 149° 22' 11.9833" W			
Logbook No.: 3	Logbook Page No.: 43-45	Total Fish Caught: 0	Fish Mortalities: N/A	Total Photos: 6	
US @ CL Pic No.: P-F86HT003-001-US	DS @ CL Pic No.: P-F86HT003-002-DS	RB to LB @ CL Pic No.: P-F86HT003-003-LB	LB to RB @ CL Pic No.: P-F86HT003-004-RB		
Other Pic No(s): P-F86HT003-005-AERIAL P-F86HT003-006-AERIAL					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): mostly cloudy		Precipitation (Describe): none			
Water Temperature (°C): 7.60	Air Temperature (°C): 13	pH: 8.36	Dissolved Oxygen (mg/l): 11.97		
Specific Conductance (µS/cm): 43	Turbidity (NTU): 4.74	ORP (mV): 179.3	Dissolved Oxygen (%): 100.1		
Ambient Conductance (µS/cm): 29	Odor: none	Sheen (Y/N): N	Color: clear	Last date of Calibration: 9/4/2015	
Defined Channel (Y/N): Y	Notes: contained w/ steep eroding banks			Wetted Width (m): 2.14	
Flow (Y/N): Y	Notes: rapid, cascading riffles			Thalweg Depth @ CL (m): 0.13	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
1 Grass/Sedge (%)		10 Grass/Sedge (%)		0 Organics (%)	
90 Shrubs (%)		90 Shrubs (%)		0 Silt (%)	
10 Trees (%)		0 Trees (%)		10 Sand (%)	
8 Diameter DBH (in.)		N/A Diameter DBH (in.)		60 Gravel (%)	
				20 Cobble (%)	
				10 Boulders (%)	
Stream Type:				Aquatic Habitats	
X Perennial		Intermittent		Ephemeral	
				X Sand Bar	
				Mud Bar	
				Gravel Bar	
				X Riffles	
				Pools	
				X Undercut Banks	
				X Large Woody Debris	
				X Overhanging vegetation	
				Contiguous Wetlands	
				Emergent Plants	
				Submerged Plants	

**STREAM PROFILE: Cross Sectional at Crossing** (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

**STREAM PROFILE: Plan View** (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)



Feature ID: F86HT003

[illegible]

★ PH readings were not accurate during calibration

- No fish caught
- Dense surrounding vegetation
- Stream has high gradient w/ steep sloped banks + very little water - Hardly enough depth to place traps.
- Flow rapid

MISCELLANEOUS POINTS (if applicable)	
Point ID: <u>N/A</u>	Description: <u>N/A</u>
Point ID: <u>N/A</u>	Description: <u>N/A</u>

Field Crew Chief: [Signature] Field Scientist/Technician: [Signature] Technical Lead: \_\_\_\_\_

**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86HT003 FT # NK110.2 Date: 9/4/15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☐ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500

☒ N/A If outside expected ranges, was sample re-taken?

- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ N/A Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☐ Are units correct?



Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86HT003

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- N/A ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?

- ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

but pH was not  
reading properly  
during calibration

By signing below, I verify that all field data for this site has been verified for accuracy and completeness.

X Neal Smith

Fisheries Biologist (print)

X 

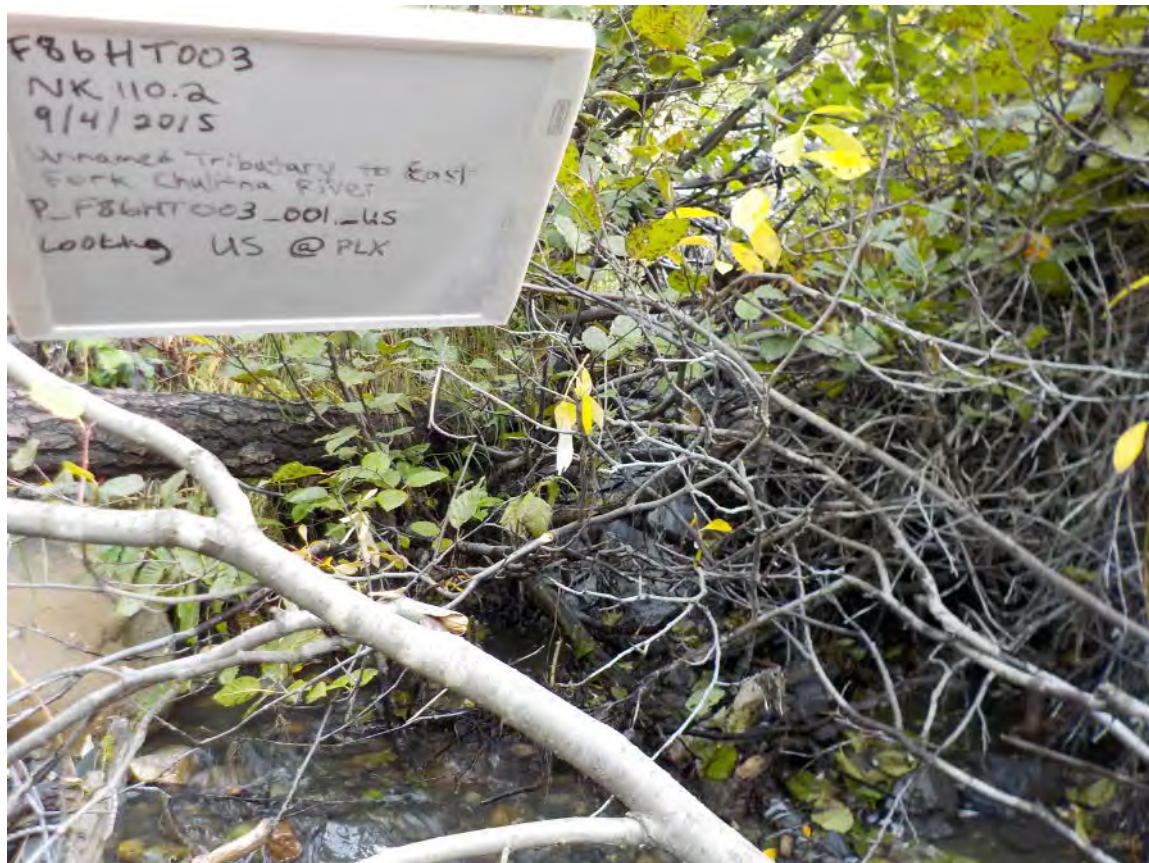
Signature

X Sam Simpson

Field Crew Chief (print)

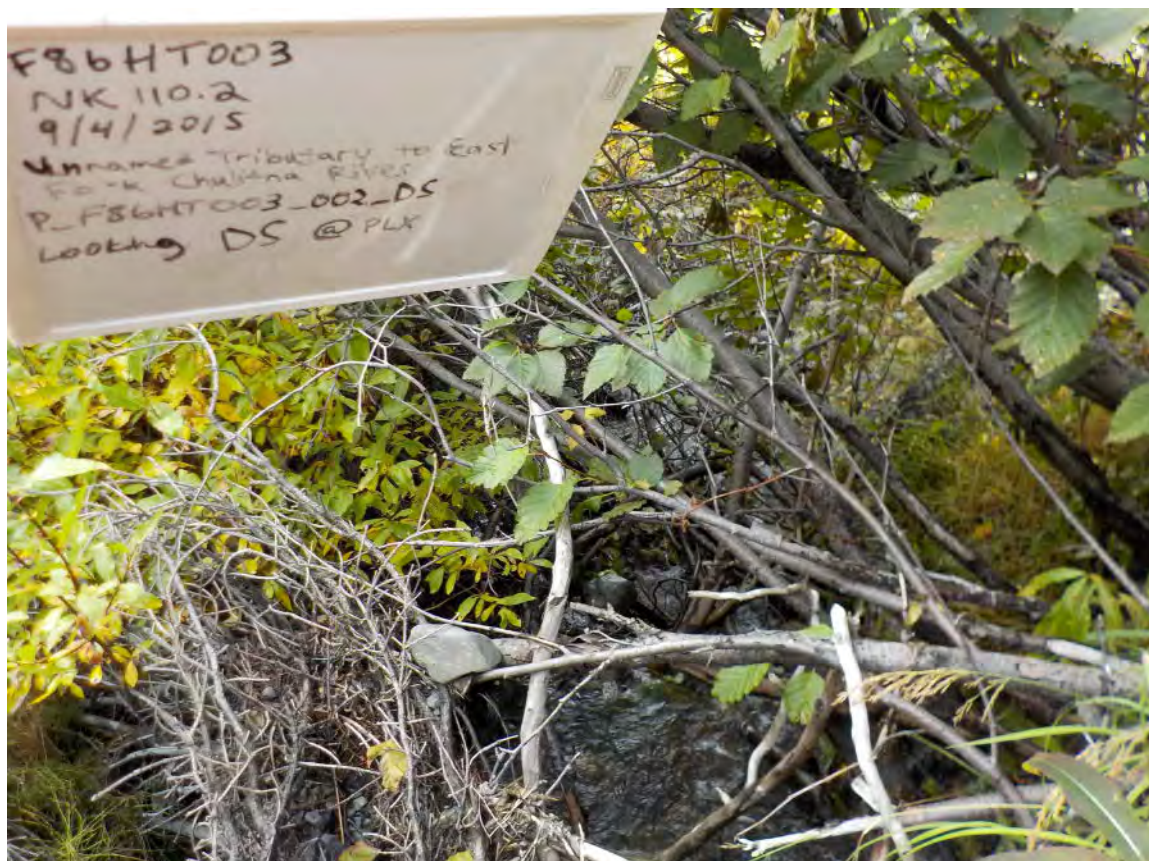
X 

Signature



P\_F86HT003\_001\_US  
LOOKING US AT PLX

9/4/2015 NK110.2



P\_F86HT003\_002\_DS  
LOOKING DS AT PLX

9/4/2015 NK110.2





P\_F86HT003\_003\_LB  
LOOKING AT LB AT PLX

9/4/2015 NK110.2



P\_F86HT003\_004\_RB  
LOOKING AT RB AT PLX

9/4/2015 NK110.2





**P\_F86HT003\_005\_AERIAL**  
**AERIAL PHOTO**

**9/4/2015**

**NK110.2**



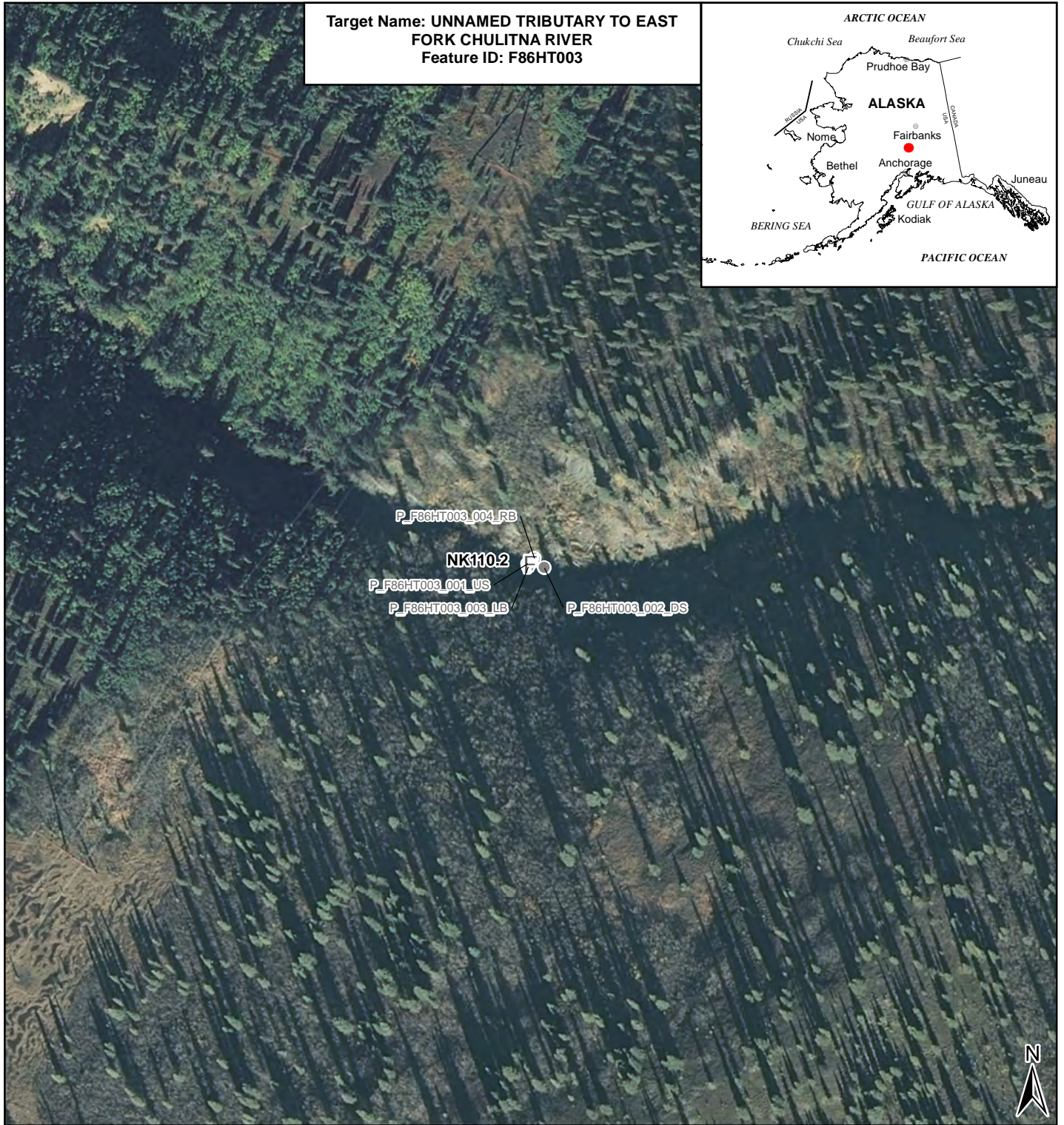
**P\_F86HT003\_006\_AERIAL**  
**AERIAL PHOTO**

**9/4/2015**

**NK110.2**



Target Name: UNNAMED TRIBUTARY TO EAST  
FORK CHULITNA RIVER  
Feature ID: F86HT003



## LEGEND

### 2015 Fish Survey Location

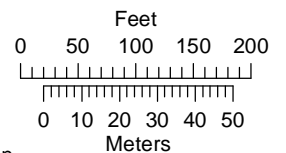
- F Fish Observed
- F No Fish Observed
- Photo Point

### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

- BU Burbot
- CH Chinook Salmon
- CO Coho Salmon
- DV Dolly Varden
- NS Ninespine Stickleback
- O Other Species Not Listed
- RT Rainbow Trout

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
- TS Threespine Stickleback
- OBS Fish Observation, No Species Information



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### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 40 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 9/6/2015	Investigators: SCS NSS ADF	Team No.: F86	Feature ID: F86LH001		
Stream Name: Unnamed Tributary to Nenana River			Stream ID: NK064		
Pipeline Milepost: 508.1	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): 266.6		
Latitude: 64° 05' 51.4278" N			Longitude: 149° 13' 00.6005" W		
Logbook No.: 3	Logbook Page No.: 46-48	Total Fish Caught: 3	Fish Mortalities: 0	Total Photos: 5	
US @ CL Pic No.: P-F86LH001-001-US	DS @ CL Pic No.: P-F86LH001-002-DS	RB to LB @ CL Pic No.: P-F86LH001-003-LB	LB to RB @ CL Pic No.: P-F86LH001-004-RB		
Other Pic No(s): P-F86LH001-005-SCUPIN					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): overcast			Precipitation (Describe): none		
Water Temperature (°C): 5.98	Air Temperature (°C): 12	pH: 9.32	Dissolved Oxygen (mg/l): 10.22		
Specific Conductance (µS/cm): 200	Turbidity (NTU): 1.22	ORP (mV): 172.2	Dissolved Oxygen (%): 82.1		
Ambient Conductance (µS/cm): 127	Odor: none	Sheen (Y/N): N	Color: clear	Last date of Calibration: 9/4/2015	
Defined Channel (Y/N): Y	Notes: contained w/in vegetated banks			Wetted Width (m): 3.9	
Flow (Y/N): Y	Notes: moderate velocity w/ riffles			Thalweg Depth @ CL (m): .43	
<b>Riparian Veg at 0-5 m at LB:</b> 10 Grass/Sedge (%) 70 Shrubs (%) 20 Trees (%) 5 Diameter DBH (in.)		<b>Riparian Veg at 0-5 m at RB:</b> 20 Grass/Sedge (%) 60 Shrubs (%) 20 Trees (%) 5 Diameter DBH (in.)		<b>Stream Substrate:</b> 5 Organics (%) 0 Silt (%) 0 Sand (%) 0 Gravel (%) 5 Cobble (%) 90 Boulders (%)	
<b>Aquatic Habitats</b> <input type="checkbox"/> Sand Bar <input type="checkbox"/> Mud Bar <input type="checkbox"/> Gravel Bar <input checked="" type="checkbox"/> Riffles <input checked="" type="checkbox"/> Pools <input type="checkbox"/> Undercut Banks		<input type="checkbox"/> Large Woody Debris <input checked="" type="checkbox"/> Overhanging vegetation <input type="checkbox"/> Contiguous Wetlands <input type="checkbox"/> Emergent Plants <input type="checkbox"/> Submerged Plants			
<b>Stream Type:</b> <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral					

**STREAM PROFILE: Cross Sectional at Crossing** (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

**STREAM PROFILE: Plan View** (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)



Feature ID: <sup>4H</sup>~~F8644~~ 001

METHODS ATTRIBUTES				
Minnow Traps (Y/N): <i>Y</i>	Hook and Line (Y/N): <i>N</i>	Beach Seine (Y/N): <i>N</i>	Fyke Net (Y/N): <i>N</i>	Hoop Net (Y/N): <i>N</i>
No. of Minnow Traps Set: <i>3</i>	Date & Time in: (mm/dd/yyyy) <i>1</i>	Date & Time In: (mm/dd/yyyy) <i>1</i>	Date & Time in: (mm/dd/yyyy) <i>1</i>	Date & Time In: (mm/dd/yyyy) <i>1</i>
Date & Time in: <i>9/5/2016</i> (mm/dd/yyyy) <i>1115</i>	No. of lines in water:	No. of passes:	Date & Time out: (mm/dd/yyyy) <i>1</i>	Date & Time out: (mm/dd/yyyy) <i>1</i>
Date & Time out: <i>9/6/2016</i> (mm/dd/yyyy) <i>1045</i>	Time lines in water:	Reach Length (m):		

ELECTROFISHING ATTRIBUTES										
EF (Y/N):	Y	EF Start Time:	1100	EF End Time:	1125	EF Time (seconds):	202	EF Reach Length (m):	91 m	
Duty Cycle:	25	Frequency (Hz):	60	Waveform:	PDC	Sampling Efficiency (% of sample reach):				90
Current (A):	1.0	Volts (V):	350	Power (W):	350	(amp x volts)				

[illegible]

- No fish caught w/ MT; 3 slimy sculpin caught w/ EF
- \* pH was not reading accurately when calibrated
- boulder substrate dominates
- moderate flow w/ riffles/pools
- stream contained within upland banks

MISCELLANEOUS POINTS (if applicable)	
Point ID: N/A	Description: N/A
Point ID: N/A	Description: N/A

Field Crew Chief: [Signature] Field Scientist/Technician: [Signature] Technical Lead: \_\_\_\_\_

**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86LH001

FT # NK064

Date: 9/6/2015

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500

☒ If outside expected ranges, was sample re-taken?

☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?



Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86LH 001

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☐ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

By signing below, I verify that all field data for this site has been verified for accuracy and completeness.

X Neal Smith

Fisheries Biologist (print)

X

Signature

X Sam Simpson

Field Crew Chief (print)

X

Signature

NO, but pH was  
not reading  
accurately when  
calibrated



**P\_F86LH001\_001\_US  
 LOOKING US AT PLX**

**9/5/2015 NK064**



**P\_F86LH001\_002\_DS  
 LOOKING DS AT PLX**

**9/5/2015 NK064**

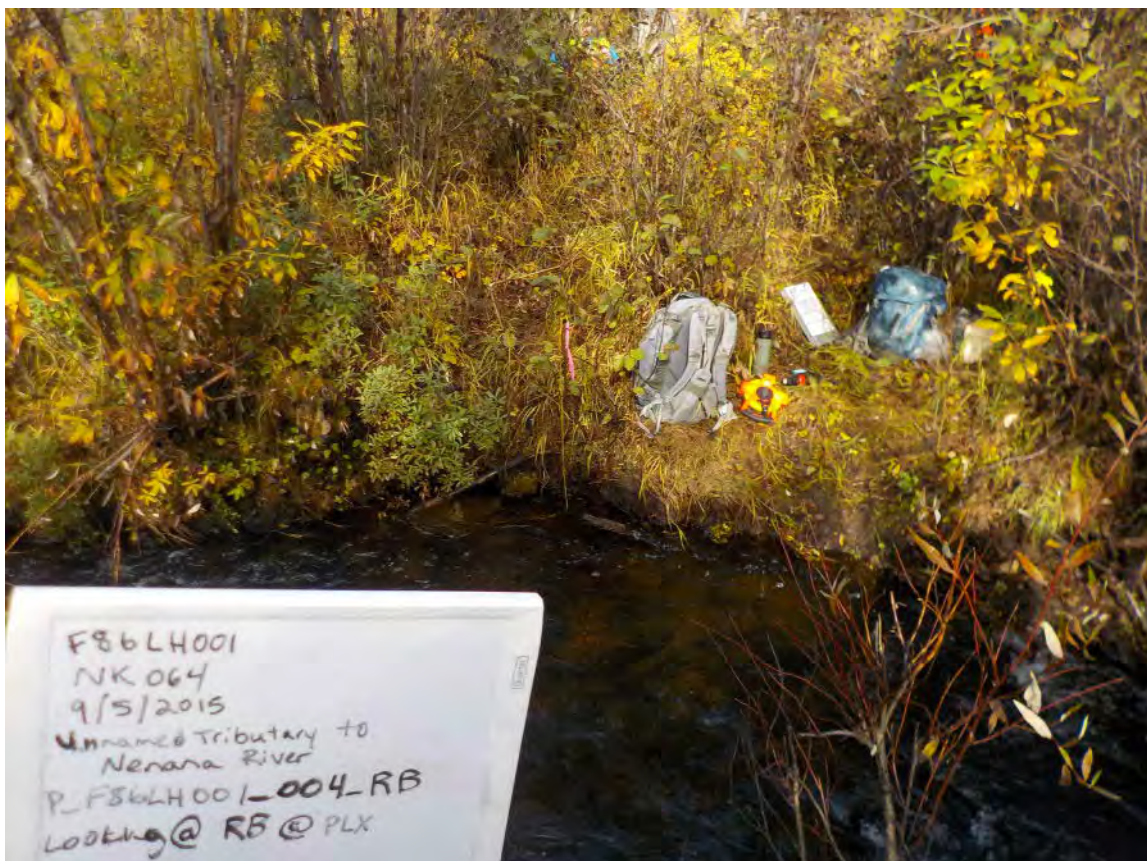




F86LH001  
NK064  
9/5/2015  
Unnamed Tributary to  
Nerana River  
P\_F86LH001-003-LB  
Looking@ LB @ PLX

**P\_F86LH001\_003\_LB**  
**LOOKING AT LB AT PLX**

**9/5/2015 NK064**



F86LH001  
NK064  
9/5/2015  
Unnamed Tributary to  
Nerana River  
P\_F86LH001-004-RB  
Looking@ RB @ PLX

**P\_F86LH001\_004\_RB**  
**LOOKING AT RB AT PLX**

**9/5/2015 NK064**



**P\_F86LH001\_005\_SCULPIN**  
**PHOTO OF SLIMY SCULPIN**

**9/5/2015 NK064**



Target Name: UNNAMED TRIBUTARY TO NENANA RIVER  
Feature ID: F86LH001



NK064  
P\_F86LH001\_003\_LB  
P\_F86LH001\_002\_DS  
P\_F86LH001\_001\_US  
P\_F86LH001\_004\_RB



## LEGEND

### 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

BU

Burbot

CH

Chinook Salmon

CO

Coho Salmon

DV

Dolly Varden

NS

Ninespine Stickleback

O

Other Species Not Listed

RT

Rainbow Trout

SA(U)

Salmonid (Unspecified)

SC(U)

Sculpin (Unspecified)

SS

Slimy Sculpin

ST(U)

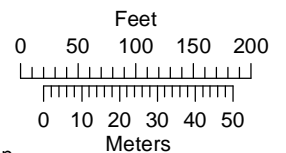
Stickleback (Unspecified)

TS

Threespine Stickleback

OBS

Fish Observation, No Species Information



## ALASKA LNG

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DESIGN  
ICS

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DESIGN  
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### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 41 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION							
Date: 8-24-15	Investigators: FAH, KRV, MPB		Team No.: F94		Feature ID: F94LH013		
Stream Name: Unnamed Stream					Stream ID: NK059		
Pipeline Milepost: 495.5	Stream found as expected (Y/N): Y				Hwy MP (N/A if heli accessed): Heli		
Latitude: 64° 16' 14.9393" N				Longitude: 149° 18' 07.3318" W			
Logbook No.: 1	Logbook Page No.: 12-17	Total Fish Caught: 0	Fish Mortalities: N/A		Total Photos: 6		
US @ CL Pic No.: P-F94LH013-001-LHS	DS @ CL Pic No.: P-F94LH012-002-DS	RB to LB @ CL Pic No.: N/A		LB to RB @ CL Pic No.: P-F94LH013-003-RB			
Other Pic No(s): P-F94LH013-004-AERIAL-006-AERIAL							

PHYSICAL/CHEMICAL ATTRIBUTES							
Weather (Describe): Partly cloudy				Precipitation (Describe): None			
Water Temperature (°C): 12.37		Air Temperature (°C): 14		pH: 8.08		Dissolved Oxygen (mg/l): 13.11	
Specific Conductance (µS/cm): 472		Turbidity (NTU): 33.4		ORP (mV): 484.41		Dissolved Oxygen (%): 122.9%	
Ambient Conductance (µS/cm): 358		Odor: N		Sheen (Y/N): N		Color: Silty	
Last date of Calibration: 8-22-15							
Defined Channel (Y/N): Y		Notes: Stream constricted to general channel but poorly defined				Wetted Width (m): ~15' (4.5m)	
Flow (Y/N): Y		Notes: Flow throughout				Thalweg Depth @ CL (m): 21" (0.5m)	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:		Aquatic Habitats	
50 Grass/Sedge (%)		50 Grass/Sedge (%)		5 Organics (%)		X Large Woody Debris	
60 Shrubs (%)		40 Shrubs (%)		70 Silt (%)		X Mud Bar	
45 Trees (%)		65 Trees (%)		25 Sand (%)		Gravel Bar	
12 Diameter DBH (in.)		12 Diameter DBH (in.)		Gravel (%)		X Riffles	
				Cobble (%)		X Pools	
				Boulders (%)		Submerged Plants	
Stream Type:							
Perennial		Intermittent		X Ephemeral			

**STREAM PROFILE: Cross Sectional at Crossing** (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

Silty, muddy banks  
High water overflowing poorly defined banks  
~15' (4.5m) unwadeable after rains  
21" (0.5m)

**STREAM PROFILE: Plan View** (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)

NORTH:

CONSTRUCTION CORRIDOR

MT1

MT2

MT3

CONSTRUCTION CORRIDOR

Flooded Area

Logging Rd



Feature ID: F9424613

[illegible]

Field Crew Chief: [Signature] Field Scientist/Technician: Katelyn Valpey Technical Lead: \_\_\_\_\_

**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F94LH013

FT # NK059

Date: 8.24.15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500
- ☒ If outside expected ranges, was sample re-taken?
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?



Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: P94LH013

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?  
☒ Are units correct? (Total Length (mm))  
☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?  
☒ All additional data in logbook captured on data form and additional photos noted?  
☒ Were all additional comments on stream habitat, etc. recorded on data form?  
☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

X

Fisheries Biologist (print)

Kaley Volper

X

Signature

Kaley Volper

X

Field Crew Chief (print)

Kim Holmes

X

Signature

Kim Holmes



P\_F94LH013\_001\_US  
LOOKING US AT PLX

8/27/2015 NK059



P\_F94LH013\_002\_DS  
LOOKING DS AT PLX

8/27/2015 NK059





P\_F94LH013\_003\_RB  
LOOKING AT RB AT PLX

8/27/2015 NK059



P\_F94LH013\_004\_AERIAL  
AERIAL PHOTO

8/27/2015 NK059





**P\_F94LH013\_005\_AERIAL  
AERIAL PHOTO**

**8/27/2015 NK059**



**P\_F94LH013\_006\_AERIAL  
AERIAL PHOTO**

**8/27/2015 NK059**



Target Name: UNNAMED STREAM  
Feature ID: F94LH013



P\_F94LH013\_001\_US  
P\_F94LH013\_002\_DS  
P\_F94LH013\_003\_RB  
NK059



## LEGEND

### 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

### Species Observed

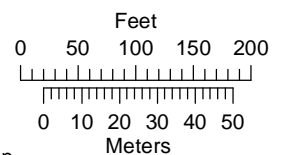
- AB Alaska Blackfish
- AG Arctic Grayling

- BU
- CH
- CO
- DV
- NS
- O
- RT

- Burbot
- Chinook Salmon
- Coho Salmon
- Dolly Varden
- Ninespine Stickleback
- Other Species Not Listed
- Rainbow Trout

- SA(U)
- SC(U)
- SS
- ST(U)
- TS
- OBS

- Salmonid (Unspecified)
- Sculpin (Unspecified)
- Slimy Sculpin
- Stickleback (Unspecified)
- Threespine Stickleback
- Fish Observation, No Species Information



## ALASKA LNG

NOTES:  
Concept Information - Confidential. Produced by Alaska LNG team. The information used to create this product is based on the collected data on the date of issue; it is considered reliable only at the scale at which the data was created and the scale at which the map was published. This drawing is solely prepared for use by the contractual Alaska LNG team partners and the Alaska LNG team assumes no liability to any other party for any representations contained in these drawings. This map must be printed/viewed at full scale (100%) in order for the scale to remain correct.

DESIGN  
ICS

CHECK

DESIGN  
TCS

APPROVE

### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 42 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	

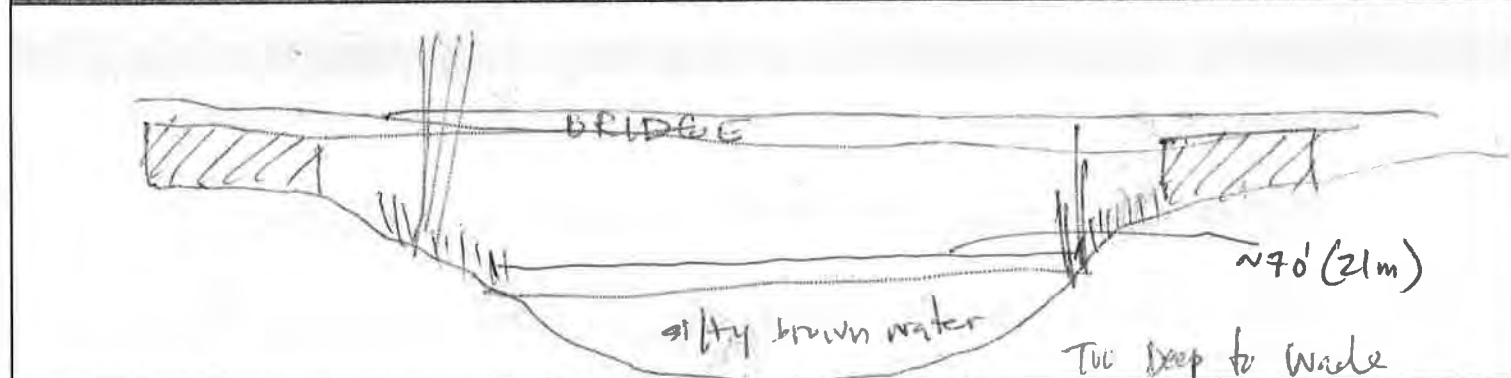


# STREAM FISH INVESTIGATION DATA FORM

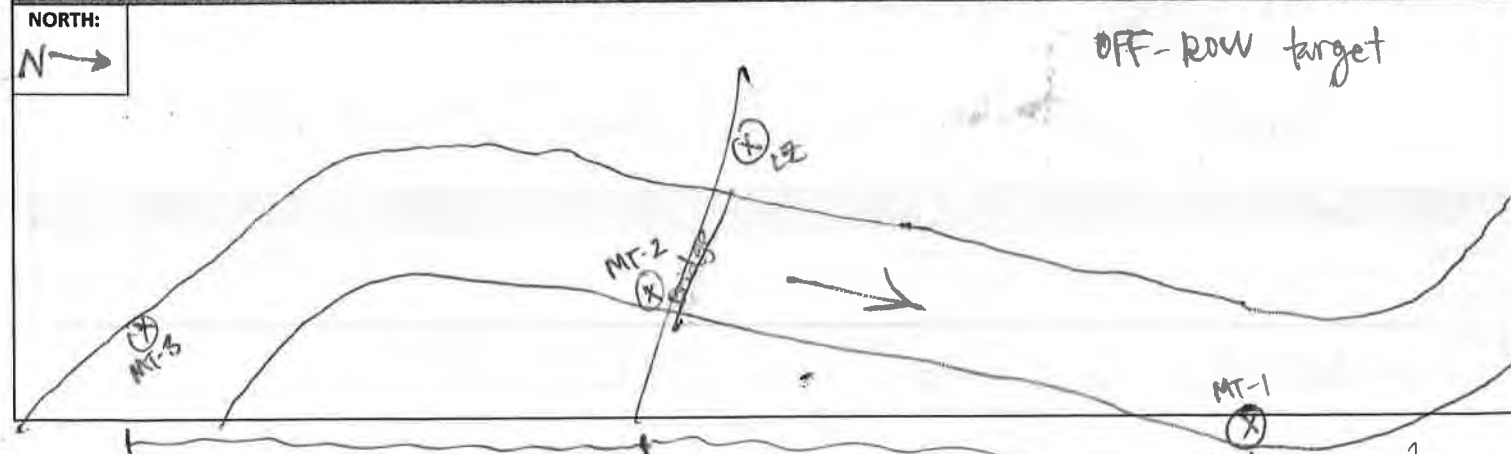
<b>SITE DESCRIPTION</b>					
Date: 8-24-15	Investigators: KAH, KRV, MPB	Team No.: P94	Feature ID: F94LH012		
Stream Name: East Middle River			Stream ID: NK052		
Pipeline Milepost: off-row	Stream found as expected (Y/N): Y		Hwy MP (N/A if hell accessed): Hel		
Latitude: 64° 33' 37.1254" N		Longitude: 149° 11' 07.5603" W			
Logbook No.: 1	Logbook Page No.: 12-17	Total Fish Caught: 0	Fish Mortalities: N/A	Total Photos: 6	
US @ CL Pic No.: P-F94LH012-001-LB	DS @ CL Pic No.: P-F94LH012-002-DS	RB to LB @ CL Pic No.: P-F94LH012-003-LB	LB to RB @ CL Pic No.: P-F94LH012-004-RB		
Other Pic No(s): P-F94LH012-005-AERIAL - 006-AERIAL					

<b>PHYSICAL/CHEMICAL ATTRIBUTES</b>					
Weather (Describe): Partly cloudy			Precipitation (Describe): None		
Water Temperature (°C): 9.47	Air Temperature (°C): 14	pH: 8.08	Dissolved Oxygen (mg/l): 12.01		
Specific Conductance (µS/cm): 478	Turbidity (NTU): 191	ORP (mV): 22.7	Dissolved Oxygen (%): 105.3%		
Ambient Conductance (µS/cm): 330	Odor: N	Sheen (Y/N): N	Color: Silty	Last date of Calibration: 8-22-15	
Defined Channel (Y/N): Y	Notes: wide, well-defined channel			Wetted Width (m): UNKNOWN	
Flow (Y/N): Y	Notes: steady flow throughout			Thalweg Depth @ CL (m): UNKNOWN	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
85 Grass/Sedge (%)		85 Grass/Sedge (%)		Organics (%)	
90 Shrubs (%)		90 Shrubs (%)		Silt (%)	
20 Trees (%)		20 Trees (%)		Sand (%)	
60 Diameter DBH (in.)		10 Diameter DBH (in.)		Gravel (%)	
				Cobble (%)	
				Boulders (%)	
Stream Type:				Aquatic Habitats	
<input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral				<input type="checkbox"/> Sand Bar <input type="checkbox"/> Mud Bar <input type="checkbox"/> Gravel Bar <input checked="" type="checkbox"/> Riffles <input checked="" type="checkbox"/> Pools <input type="checkbox"/> Undercut Banks	
<input checked="" type="checkbox"/> Large Woody Debris <input checked="" type="checkbox"/> Overhanging vegetation <input type="checkbox"/> Contiguous Wetlands <input checked="" type="checkbox"/> Emergent Plants <input checked="" type="checkbox"/> Submerged Plants					

## STREAM PROFILE: Cross Sectional at Crossing (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)



## STREAM PROFILE: Plan View (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)





Feature ID: 5944H012

**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F94LH012

FT # NK052

Date: 8-24-15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500
- ☒ If outside expected ranges, was sample re-taken?
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?



Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: 494LH012

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?  
☒ Are units correct? (Total Length (mm))  
☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?  
☒ All additional data in logbook captured on data form and additional photos noted?  
☒ Were all additional comments on stream habitat, etc. recorded on data form?  
☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

X

Kately Volper  
Fisheries Biologist (print)

X

Kately Volper  
Signature

X

Jim Holmes  
Field Crew Chief (print)

X

Jim Holmes  
Signature



P\_F94LH012\_001\_US  
LOOKING US AT OFF ROW TARGET

8/27/2015 NK052



P\_F94LH012\_002\_DS  
LOOKING DS AT OFF ROW TARGET

8/27/2015 NK052





P\_F94LH012\_003\_LB

8/27/2015 NK052

LOOKING AT LB AT OFF ROW TARGET



P\_F94LH012\_004\_RB

8/27/2015 NK052

LOOKING AT RB AT OFF ROW TARGET





**P\_F94LH012\_005\_AERIAL  
AERIAL PHOTO**

**8/27/2015 NK052**

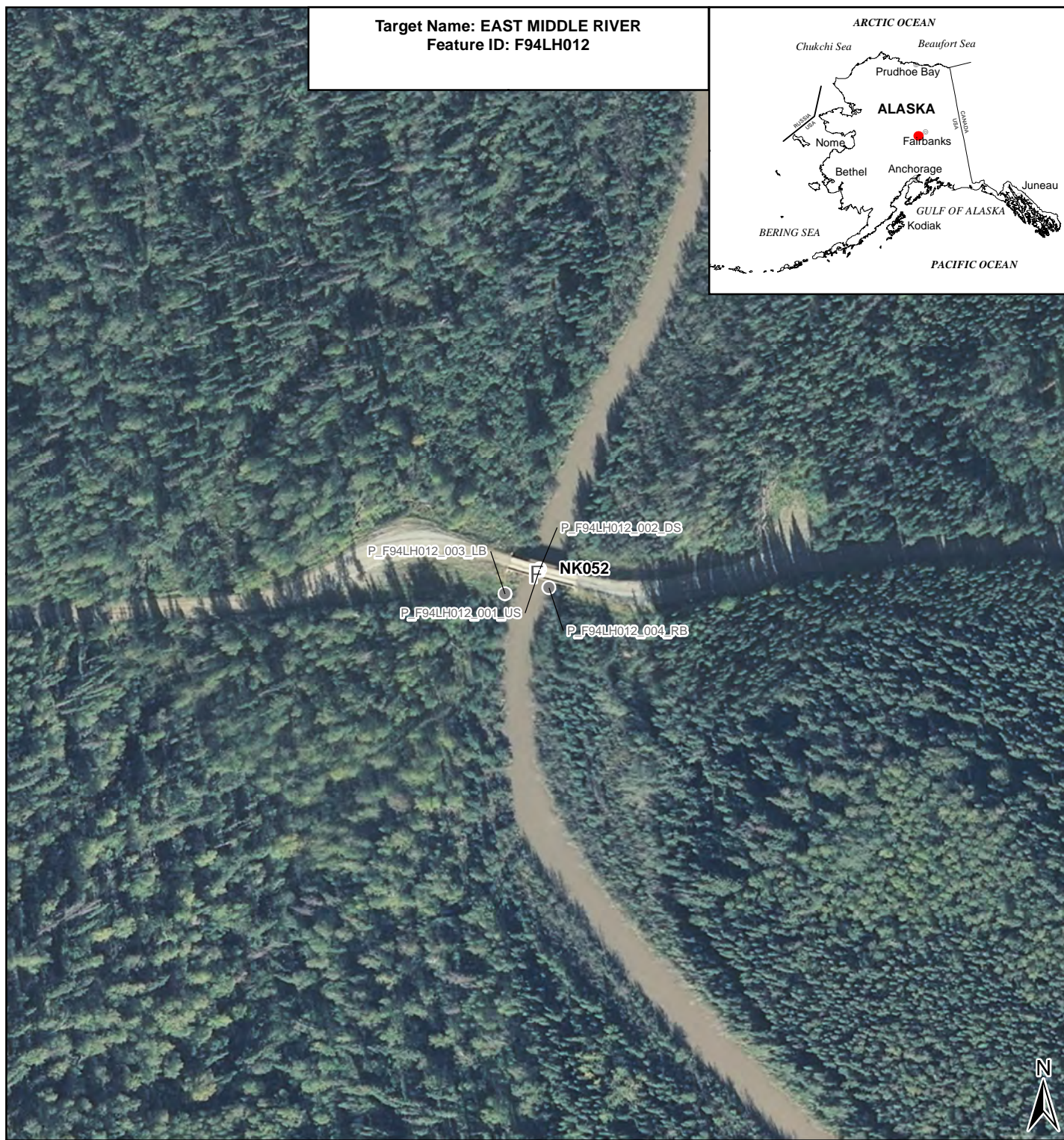
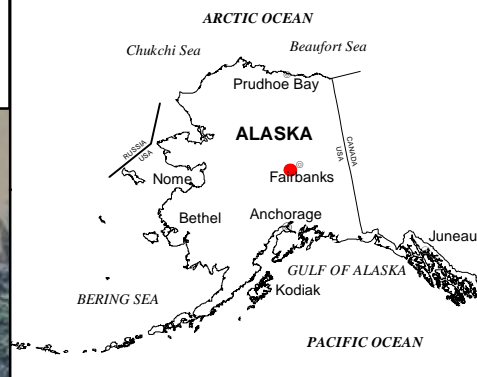


**P\_F94LH012\_006\_AERIAL  
AERIAL PHOTO**

**8/27/2015 NK052**



Target Name: EAST MIDDLE RIVER  
Feature ID: F94LH012



# LEGEND

## 2015 Fish Survey Location

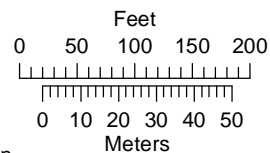
- F** Fish Observed
- F** No Fish Observed
- Photo Point

## Species Observed

- AB** Alaska Blackfish
- AG** Arctic Grayling

- BU** Burbot
- CH** Chinook Salmon
- CO** Coho Salmon
- DV** Dolly Varden
- NS** Ninespine Stickleback
- O** Other Species Not Listed
- RT** Rainbow Trout

- SA(U)** Salmonid (Unspecified)
- SC(U)** Sculpin (Unspecified)
- SS** Slimy Sculpin
- ST(U)** Stickleback (Unspecified)
- TS** Threespine Stickleback
- OBS** Fish Observation, No Species Information



## ALASKA LNG

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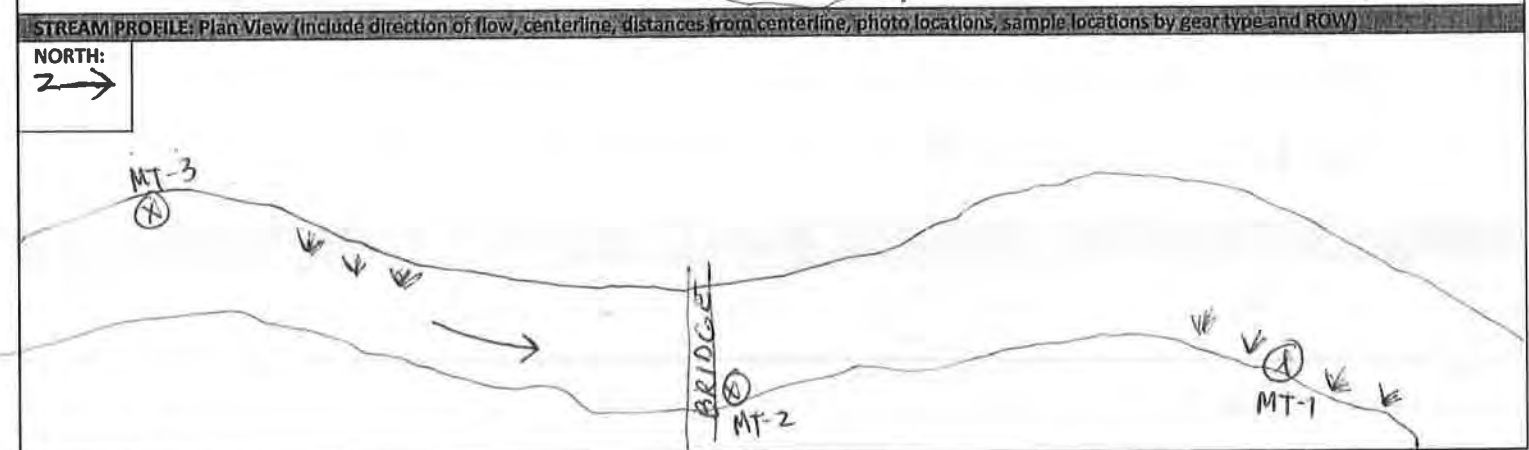
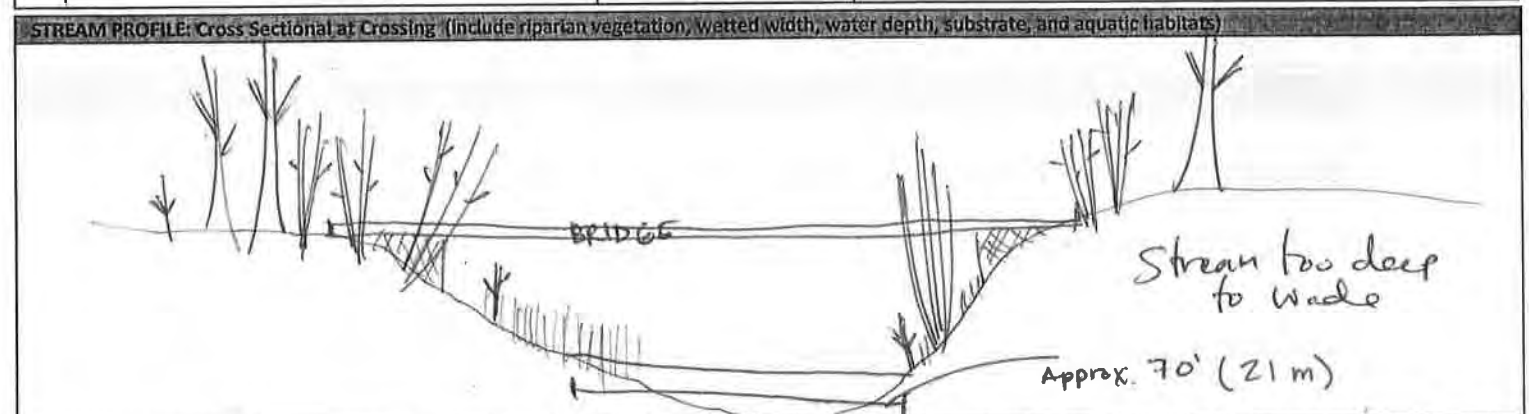
ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS					
DESIGN ICS	PROJECTION AK 4	DATUM NAD83	CONTRACTOR NAME AECOM	MAP NUMBER Page 44 of 86	REV. A
DESIGN TCS	SCALE 1:2,000	DATE 15 Oct 2015	PROJECT NUMBER 26221392	ORIG PAGE SIZE 8.5 X 11	
APPR					



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 8-24-15	Investigators: KAT, KRV, MPB	Team No.: F94	Feature ID: F94LH01		
Stream Name: West Middle River			Stream ID: NK051.2		
Pipeline Milepost: OFF-ROW	Stream found as expected (Y/N): Y		Hwy MP (N/A if hell accessed): Heli		
Latitude: 64° 33' 36.8363" N		Longitude: 149° 13' 2.1490" W			
Logbook No.: 1	Logbook Page No.: 12-17	Total Fish Caught: 35	Fish Mortalities: 0	Total Photos: 10	
US @ CL Pic No.: P-F94LH01-001-US	DS @ CL Pic No.: P-F94LH01-002-DS	RB to LB @ CL Pic No.: P-F94LH01-003-LB	LB to RB @ CL Pic No.: P-F94LH01-004-RB		
Other Pic No(s): P-F94LH01-005-AERIAL-007-AERIAL P-F94LH01-008-BLACKFISH-010-BLACKFISH					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): Partly cloudy			Precipitation (Describe): None		
Water Temperature (°C): 8.57-8.78		Air Temperature (°C): 14	pH: 6.95	Dissolved Oxygen (mg/l): 5.92	
Specific Conductance (µS/cm): 475		Turbidity (NTU): 9.27	ORP (mV): 98.4	Dissolved Oxygen (%): 51.7	
Ambient Conductance (µS/cm): 328		Odor: N	Sheen (Y/N): N	Color: Yellow/Brown	
Defined Channel (Y/N): Y		Notes: wide defined channel			Wetted Width (m): UNKNOWN
Flow (Y/N): Y		Notes: slow steady flow throughout			Thalweg Depth @ CL (m): UNKNOWN
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
85 Grass/Sedge (%)		85 Grass/Sedge (%)		Organics (%)	
90 Shrubs (%)		90 Shrubs (%)		Silt (%)	
5 Trees (%)		5 Trees (%)		Sand (%)	
12 Diameter DBH (in.)		12 Diameter DBH (in.)		Gravel (%)	
				Cobble (%)	
				Boulders (%)	
Stream Type:		Aquatic Habitats			
<input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral		<input type="checkbox"/> Sand Bar <input type="checkbox"/> Mud Bar <input type="checkbox"/> Gravel Bar <input type="checkbox"/> Riffles <input checked="" type="checkbox"/> Pools <input type="checkbox"/> Undercut Banks			
		<input checked="" type="checkbox"/> Large Woody Debris <input checked="" type="checkbox"/> Overhanging vegetation <input type="checkbox"/> Contiguous Wetlands <input checked="" type="checkbox"/> Emergent Plants <input checked="" type="checkbox"/> Submerged Plants			





# STREAM FISH INVESTIGATION DATA FORM

Feature ID: F94LH011

METHODS ATTRIBUTES				
Minnow Traps (Y/N): <u>Y</u>	Hook and Line (Y/N):	Beach Seine (Y/N):	Fyke Net (Y/N):	Hoop Net (Y/N):
No. of Minnow Traps Set: <u>3</u>	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)
Date & Time in: <u>8.27.15</u> (mm/dd/yyyy) <u>12:40</u>	No. of lines in water:	No. of passes:	Date & Time out: (mm/dd/yyyy) <u>N/A</u>	Date & Time out: (mm/dd/yyyy)
Date & Time out: <u>8.27.15</u> (mm/dd/yyyy) <u>13:45</u>	Time lines in water:	Reach Length (m):		

ELECTROFISHING ATTRIBUTES				
EF (Y/N):	EF Start Time:	EF End Time:	EF Time (seconds):	EF Reach Length (m):
Duty Cycle:	Frequency (Hz):	Waveform:	Sampling Efficiency (% of sample reach):	
Current (A):	Volts (V):	Power (W):	(amp x volts)	

FISH OBSERVATIONS						
ID (Seq. Num)	Gear Type	Species	Total Length (mm)	Life Stage (Juvenile or Adult)	Disposition (Dead or Alive)	Picture No.
001	MT-3	Blackfish	70	Juvenile/Adult		* P-F94LH011-008-BLACKFISH
002	MT-3		90			* P-F94LH011-009-BLACKFISH
003	<del>MT-3</del> MT-1		95			
004			95			
005			85			
006			95			
007			110			
008			85			
009			65			
010			65			
011			55			
012			95			

NOTES (any additional information)
<p>Meandering stream w/wide channel, mucky banks and yellow/brown water - can't see bottom</p> <p>Bridge crosses stream - connected to developed dirt road</p> <p>Stream too deep to wade</p> <p>Blackfish captured in all 3 minnow traps</p>

MISCELLANEOUS POINTS (if applicable)	
Point ID:	Description:
Point ID:	Description:

Field Crew Chief: [Signature] Field Scientist/Technician: Kalvin Valer Technical Lead: \_\_\_\_\_

# STREAM FISH INVESTIGATION DATA FORM

Feature ID: F94LH01


FISH OBSERVATIONS (continued)						
ID (Seq. Num)	Gear Type	Species	Total Length (mm)	Life Stage (Juvenile or Adult)	Disposition (Dead or Alive)	Picture No.
013	<del>MT-2</del> MT-1	Blackfish	65	Juvenile/Adult	Alive	
014	↓	↓	85	↓	↓	
015			85			
016	↓		105			
017	MT-2 MT-1		85			
018	MT-2		65			
019	↓		65			
020			75			
021			85			
022			85			
023			75			
024			85			
025			85			
026			65			
027			95			
028			85			
029			65			
030			85			
031			85			
032			75			
033			85			
034			115			
035	↓	↓	85	↓	↓	
<p><i>[Large handwritten 'X' and signature across the bottom half of the table]</i></p>						

\*P\_F94LH01\_010\_BLACKFISH



# STREAM FISH INVESTIGATION DATA FORM

Feature ID: F94LH011

FISH OBSERVATIONS (continued)													
ID (Seq. Num)	Gear Type	Species	Total Length (mm)	Life Stage (Juvenile or Adult)	Disposition (Dead or Alive)	Picture No.							
													

**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F94LH011

FT # NK051.2

Date: 8.24.15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500

☒ If outside expected ranges, was sample re-taken?

☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)

☒ Are units correct?



Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: f94LH011

**6. Fish Observations**

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

**7. General**

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

X

Kaley Volper  
Fisheries Biologist (print)

X

Kaley Volper  
Signature

X

Kim Holmes  
Field Crew Chief (print)

X

Kim Holmes  
Signature

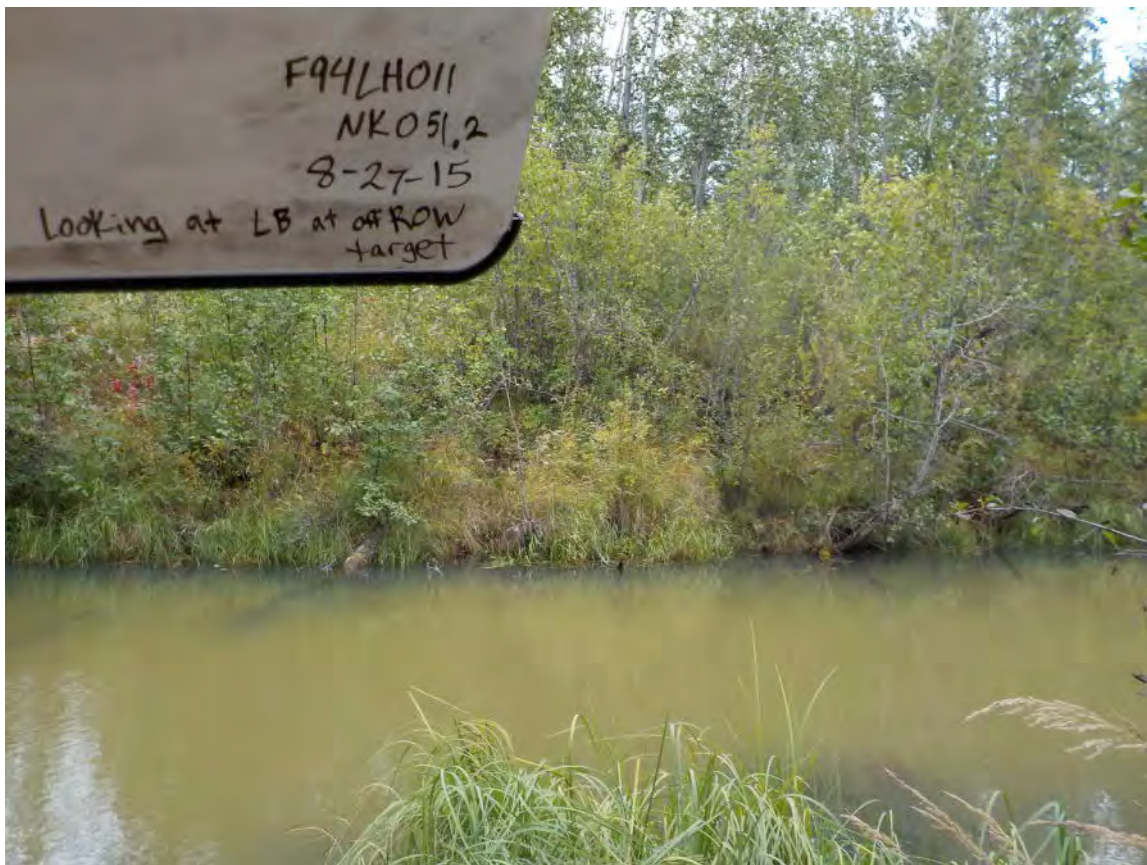


P\_F94LH011\_001\_US 8/27/2015 NK051.2  
LOOKING US FROM BRIDGE AT OFF ROW TARGET



P\_F94LH011\_002\_DS 8/27/2015 NK051.2  
LOOKING DS FROM BRIDGE AT OFF ROW TARGET





P\_F94LH011\_003\_LB

8/27/2015 NK051.2

LOOKING AT LB AT OFF ROW TARGET



P\_F94LH011\_004\_RB

8/27/2015 NK051.2

LOOKING AT RB AT OFF ROW TARGET





**P\_F94LH011\_005\_AERIAL  
AERIAL PHOTO**

**8/27/2015 NK051.2**



**P\_F94LH011\_006\_AERIAL  
AERIAL PHOTO**

**8/27/2015 NK051.2**





**P\_F94LH011\_007\_AERIAL  
AERIAL PHOTO**

**8/27/2015 NK051.2**



**P\_F94LH011\_008\_BLACKFISH  
PHOTO OF ALASKA BLACKFISH**

**8/27/2015 NK051.2**





**P\_F94LH011\_009\_BLACKFISH**  
**PHOTO OF ALASKA BLACKFISH**

**8/27/2015 NK051.2**



**P\_F94LH011\_010\_BLACKFISH**  
**PHOTO OF ALASKA BLACKFISH**

**8/27/2015 NK051.2**



Target Name: WEST MIDDLE RIVER  
Feature ID: F94LH011



#### LEGEND

##### 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

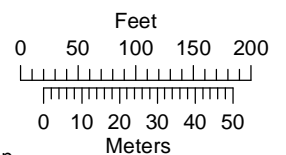
##### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

- BU
- CH
- CO
- DV
- NS
- O
- RT

- Burbot
- Chinook Salmon
- Coho Salmon
- Dolly Varden
- Ninespine Stickleback
- Other Species Not Listed
- Rainbow Trout

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
- TS Threespine Stickleback
- OBS Fish Observation, No Species Information



#### ALASKA LNG

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DESIGN  
ICS

CHECK

DESIGN  
TCS

APPROVE

#### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 43 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 8-21-15	Investigators: KAH, KRV, MPB	Team No.: F94	Feature ID: F94LH010		
Stream Name: Goldstream CK			Stream ID: NK047		
Pipeline Milepost: OFF ROW	Stream found as expected (Y/N): Y		Hwy MP (N/A if hell accessed): HeLi		
Latitude: 64° 45' 51.8237" N		Longitude: 148° 46' 35.4177" W			
Logbook No.: 1	Logbook Page No.: 8-11	Total Fish Caught: 0	Fish Mortalities: N/A	Total Photos: 76	
US @ CL Pic No.: P-F94LH010-001-US	DS @ CL Pic No.: P-F94LH010-002-DS	RB to LB @ CL Pic No.: N/A	LB to RB @ CL Pic No.: P-F94LH010-003-RB		
Other Pic No(s): P-F94LH010-004-006-AERIAL					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): Partly cloudy		Precipitation (Describe): None			
Water Temperature (°C): 11.27	Air Temperature (°C): 12	pH: 7.66	Dissolved Oxygen (mg/l): 10.64		
Specific Conductance (µS/cm): 280	Turbidity (NTU): 5.31	ORP (mV): -2.6	Dissolved Oxygen (%): 97.47%		
Ambient Conductance (µS/cm): 206	Odor: N	Shen (Y/N): N	Color: clear	Last date of Calibration: 8-18-15	
Defined Channel (Y/N): Y	Notes: Well-defined meandering channel lightly yellow			Wetted Width (m): UNKNOWN	
Flow (Y/N): Y	Notes: Steady Flow throughout			Thalweg Depth @ CL (m): UNKNOWN	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
85 Grass/Sedge (%)	90 Grass/Sedge (%)	UNKNOWN		AQUATIC HABITATS	
60 Shrubs (%)	35 Shrubs (%)	Organics (%)		Sand Bar	
10 Trees (%)	10 Trees (%)	Silt (%)		X Mud Bar	
12 Diameter DBH (in.)	12 Diameter DBH (in.)	Sand (%)		Gravel Bar	
		Gravel (%)		Riffles	
		Cobble (%)		X Pools	
		Boulders (%)		X Undercut Banks	
Stream Type:					
X Perennial		Intermittent			
		Ephemeral			

STREAM PROFILE: Cross Sectional at Crossing (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)	
STREAM PROFILE: Plan View (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)	



Feature ID: f94LH010

FISH OBSERVATIONS						
ID (Seq. Num)	Gear Type	Species	Total Length (mm)	Life Stage (Juvenile or Adult)	Disposition (Dead or Alive)	Picture No.
NO FISH						

Field Crew Chief: W. A. H. Field Scientist/ Technician: Valery Valer Technical Lead: \_\_\_\_\_

**Stream Fish Investigations Field Form  
QA/QC Checklist**

***This form is to be completed before leaving the field site.***

Feature ID: F94LH010

FT # NK047

Date: 8-21-15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500
- ☒ If outside expected ranges, was sample re-taken?
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?



**Stream Fish Investigations Field Form  
QA/QC Checklist**

Feature ID: F94Ltl010

**6. Fish Observations**

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

**7. General**

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

**X** Naley Volper  
Fisheries Biologist (print)

**X** Naley Volper  
Signature

**X** Jim Holmes  
Field Crew Chief (print)

**X** [Signature]  
Signature



**P\_F94LH010\_001\_US** **8/22/2015 NK047**  
**LOOKING US AT OFF-ROW TARGET. FT MOVED ~500 FT DS**



**P\_F94LH010\_002\_DS** **8/22/2015 NK047**  
**LOOKING DS AT OFF-ROW TARGET. FT MOVED ~500 FT DS**





**P\_F94LH010\_003\_RB** **8/22/2015 NK047**  
**LOOKING AT RB AT OFF ROW TARGET. FT MOVED ~500 FT DS**



**P\_F94LH010\_004\_AERIAL** **8/22/2015 NK047**  
**AERIAL PHOTO**





**P\_F94LH010\_005\_AERIALN**  
**AERIAL PHOTO LOOKING NORTH**

**8/22/2015 NK047**



**P\_F94LH010\_006\_AERIALS**  
**AERIAL PHOTO LOOKING SOUTH**

**8/22/2015 NK047**



Target Name: GOLDSTREAM CREEK  
Feature ID: F94LH010



P\_F94LH010\_001\_US  
P\_F94LH010\_003\_RB  
P\_F94LH010\_002\_DS  
NK047



#### LEGEND

##### 2015 Fish Survey Location

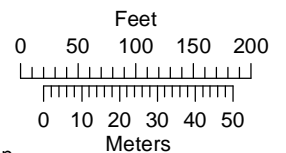
- F** Fish Observed
- F** No Fish Observed
- Photo Point

##### Species Observed

- AB** Alaska Blackfish
- AG** Arctic Grayling

- BU** Burbot
- CH** Chinook Salmon
- CO** Coho Salmon
- DV** Dolly Varden
- NS** Ninespine Stickleback
- O** Other Species Not Listed
- RT** Rainbow Trout

- SA(U)** Salmonid (Unspecified)
- SC(U)** Sculpin (Unspecified)
- SS** Slimy Sculpin
- ST(U)** Stickleback (Unspecified)
- TS** Threespine Stickleback
- OBS** Fish Observation, No Species Information



#### ALASKA LNG

NOTES:  
Concept Information - Confidential. Produced by Alaska LNG team. The information used to create this product is based on the collected data on the date of issue; it is considered reliable only at the scale at which the data was created and the scale at which the map was published. This drawing is solely prepared for use by the contractual Alaska LNG team partners and the Alaska LNG team assumes no liability to any other party for any representations contained in these drawings. This map must be printed/viewed at full scale (100%) in order for the scale to remain correct.

DESIGN  
ICS

CHECK

DESIGN  
TCS

APPROVE

#### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 45 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 8-21-15	Investigators: EAH, KRV, MPB		Team No.: F94	Feature ID: F94LH009	
Stream Name: Washington creek			Stream ID: NK027		
Pipeline Milepost: 432.7	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): Heli		
Latitude: 65° 04' 09.4848" N			Longitude: 148° 40' 08.6719" W		
Logbook No.: 1	Logbook Page No.: 8-10	Total Fish Caught: 23	Fish Mortalities: 0	Total Photos: 1	
US @ CL Pic No.: P-F94LH009-001-US	DS @ CL Pic No.: P-F94LH009-002-DS	RB to LB @ CL Pic No.: N/A	LB to RB @ CL Pic No.: P-F94LH009-003-RB		
Other Pic No(s): P-F94LH009-004-AERIAL - P-F94LH009-005-AERIAL W P-F94LH009-007-009-BURBOT P-F94LH009-010-WOODPROM P-F94LH009-011-WO					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): Partly cloudy			Precipitation (Describe): NONE		
Water Temperature (°C): 9.80	Air Temperature (°C): 12	pH: 7.37	Dissolved Oxygen (mg/l): 12.4		
Specific Conductance (µS/cm): 174	Turbidity (NTU): 8.64	ORP (mV): 150.6	Dissolved Oxygen (%): 106.57		
Ambient Conductance (µS/cm): 121	Odor: N	Sheen (Y/N): N	Color: brown	Last date of Calibration: 8-20-15	
Defined Channel (Y/N): Y	Notes: well-defined meandering stream			Wetted Width (m): UNKNOWN	
Flow (Y/N): Y	Notes: steady flow through reach			Thalweg Depth @ CL (m): UNKNOWN	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
60 Grass/Sedge (%)		60 Grass/Sedge (%)		Organics (%)	
70 Shrubs (%)		50 Shrubs (%)		Silt (%)	
10 Trees (%)		10 Trees (%)		Sand (%)	
10 Diameter DBH (in.)		10 Diameter DBH (in.)		Gravel (%)	
				Cobble (%)	
				Boulders (%)	
Stream Type:		Aquatic Habitats			
<input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral		<input type="checkbox"/> Sand Bar <input checked="" type="checkbox"/> Mud Bar <input type="checkbox"/> Gravel Bar <input type="checkbox"/> Riffles <input checked="" type="checkbox"/> Pools <input type="checkbox"/> Undercut Banks			
		<input checked="" type="checkbox"/> Large Woody Debris <input checked="" type="checkbox"/> Overhanging vegetation <input type="checkbox"/> Contiguous Wetlands <input type="checkbox"/> Emergent Plants <input checked="" type="checkbox"/> Submerged Plants			

STREAM PROFILE: Cross Sectional at Crossing (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)	
STREAM PROFILE: Plan View (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)	



# STREAM FISH INVESTIGATION DATA FORM

Feature ID: F94LH009

METHODS ATTRIBUTES				
Minnow Traps (Y/N): <u>Y</u>	Hook and Line (Y/N):	Beach Seine (Y/N):	Fyke Net (Y/N):	Hoop Net (Y/N):
No. of Minnow Traps Set: <u>3</u>	Date & Time In: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)	Date & Time In: (mm/dd/yyyy)
Date & Time In: <u>8-21-15</u> (mm/dd/yyyy)	No. of lines in water: <u>N/A</u>	No. of passes:	Date & Time out: (mm/dd/yyyy)	Date & Time out: (mm/dd/yyyy)
Date & Time out: <u>8/22/15</u> (mm/dd/yyyy)	Time lines in water:	Reach Length (m):		

ELECTROFISHING ATTRIBUTES				
EF (Y/N):	EF Start Time:	EF End Time:	EF Time (seconds):	EF Reach Length (m):
Duty Cycle:	Frequency (Hz):	Waveform:	Sampling Efficiency (% of sample reach):	
Current (A):	Volts (V):	Power (W):	(amp x volts)	

FISH OBSERVATIONS						
ID (Seq. Num)	Gear Type	Species	Total Length (mm)	Life Stage (Juvenile or Adult)	Disposition (Dead or Alive)	Picture No.
001	Minnow Trap-3	Burbot	100	Juvenile/Adult	Alive	
002	Minnow Trap-3	Burbot	190	Juvenile/Adult	Alive	P-F94LH009-007-009 BURBOT
003	Vis Obs	Wood Frog	N/A			P-F94LH009-010-WOODFROG

NOTES (any additional information)
<p>Meandering stream with steep, well-defined banks</p> <p>Silty, mucky banks &amp; brown, silty water</p> <p>stream too deep to wade &amp; bottom can't be observed</p> <p><del>no fish caught or observed</del> <sup>back</sup></p> <p>2 burbot captured in minnow traps &amp; 1 wood frog observed on bank</p>

MISCELLANEOUS POINTS (if applicable)	
Point ID:	Description:
Point ID:	Description:

Field Crew Chief: <u>[Signature]</u>	Field Scientist/Technician: <u>Kathy Valper</u>	Technical Lead: _____
--------------------------------------	---	-----------------------

**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F94LH009 FT # NK027 Date: 8.21.15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500

~~N/A~~ If outside expected ranges, was sample re-taken?

☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ~~N/A~~ Are units correct?



**Stream Fish Investigations Field Form  
QA/QC Checklist**

Feature ID: F94LH009

**6. Fish Observations**

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

**7. General**

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

**X** Kaley Volper  
Fisheries Biologist (print)

**X** Kaley Volper  
Signature

**X** Kim Holmes  
Field Crew Chief (print)

**X** Kim Holmes  
Signature



P\_F94LH009\_001\_US  
LOOKING US AT PLX

8/22/2015 NK027



P\_F94LH009\_002\_DS  
LOOKING DS AT PLX

8/22/2015 NK027





**P\_F94LH009\_003\_RB**  
**LOOKING AT RB AT PLX**

**8/22/2015 NK027**



**P\_F94LH009\_004\_AERIAL**  
**AERIAL PHOTO**

**8/22/2015 NK027**





**P\_F94LH009\_005\_AERIALE**  
**AERIAL PHOTO LOOKING EAST**

**8/22/2015 NK027**



**P\_F94LH009\_006\_AERIALW**  
**AERIAL PHOTO LOOKING WEST**

**8/22/2015 NK027**





**P\_F94LH009\_007\_BURBOT**  
**PHOTO OF BURBOT**

**8/22/2015 NK027**



**P\_F94LH009\_008\_BURBOT**  
**PHOTO OF BURBOT**

**8/22/2015 NK027**





**P\_F94LH009\_009\_BURBOT**  
**PHOTO OF BURBOT**

**8/22/2015 NK027**



**P\_F94LH009\_010\_WOODFROG**  
**PHOTO OF WOOD FROG**

**8/22/2015 NK027**





P\_F94LH009\_011\_WQ

8/22/2015 NK027

PHOTO OF FIELD CREW COLLECTING WATER QUALITY DATA



Target Name: WASHINGTON CREEK  
Feature ID: F94LH009



P\_F94LH009\_002\_DS  
P\_F94LH009\_003\_RB  
P\_F94LH009\_001\_US  
BU, O  
NK027

## LEGEND

### 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

BU

Burbot

CH

Chinook Salmon

CO

Coho Salmon

DV

Dolly Varden

NS

Ninespine Stickleback

O

Other Species Not Listed

RT

Rainbow Trout

SA(U)

Salmonid (Unspecified)

SC(U)

Sculpin (Unspecified)

SS

Slimy Sculpin

ST(U)

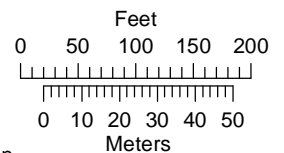
Stickleback (Unspecified)

TS

Threespine Stickleback

OBS

Fish Observation, No Species Information



## ALASKA LNG

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DESIGN  
ICS

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DESIGN  
TCS

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### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 46 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 8.21.15	Investigators: KAH, KRV, MPB	Team No.: F94	Feature ID: F94LH008		
Stream Name: Unnamed Stream			Stream ID: NK026		
Pipeline Milepost: 432.1	Stream found as expected (Y/N): Y		Hwy MP (N/A if hell accessed): Heli		
Latitude: 65° 04' 42.5748" N		Longitude: 148° 40' 28.5678" W			
Logbook No.: 1	Logbook Page No.: 8-10	Total Fish Caught: 18	Fish Mortalities: 3	Total Photos: 10	
US @ CL Pic No.: P-F94LH008-001-US	DS @ CL Pic No.: P-F94LH008-002-DS	RB to LB @ CL Pic No.: P-F94LH008-003-RB	LB to RB @ CL Pic No.: P-F94LH008-004-RB		
Other Pic No(s): P-F94LH008-005-AERIAL		P-F94LH008-007-AERIAL		P-F94LH008-009-MINNOWTRAP	
P-F94LH008-006-AERIAL		P-F94LH008-008-BLACKFISH		P-F94LH008-009-BLACKFISH	
PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): Mostly cloudy		Precipitation (Describe): None			
Water Temperature (°C): 11.18	Air Temperature (°C): 12	pH: 5.47	Dissolved Oxygen (mg/l): 1.88		
Specific Conductance (µS/cm): 44	Turbidity (NTU): 2.78	ORP (mV): 179.8	Dissolved Oxygen (%): 17.2%		
Ambient Conductance (µS/cm): 33	Odor: N	Sheen (Y/N): N	Color: Yellowish	Last date of Calibration: 8.18.15	
Defined Channel (Y/N): Y	Notes: Defined channel w/ grassy banks & emergent scrub			Wetted Width (m): 21' 6.4m	
Flow (Y/N): N	Notes: No flow - stagnant water w/ pond scum			Thalweg Depth @ CL (m): 20" 6.1m	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
90 Grass/Sedge (%)		90 Grass/Sedge (%)		100 Organics (%)	
50 Shrubs (%)		50 Shrubs (%)		Silt (%)	
80 Trees (%)		60 Trees (%)		Sand (%)	
14 Diameter DBH (in.)		14 Diameter DBH (in.)		Gravel (%)	
				Cobble (%)	
				Boulders (%)	
Stream Type:		Aquatic Habitats			
<input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral		<input type="checkbox"/> Sand Bar <input checked="" type="checkbox"/> Large Woody Debris <input type="checkbox"/> Mud Bar <input checked="" type="checkbox"/> Overhanging vegetation <input type="checkbox"/> Gravel Bar <input type="checkbox"/> Contiguous Wetlands <input type="checkbox"/> Riffles <input checked="" type="checkbox"/> Emergent Plants <input checked="" type="checkbox"/> Pools <input checked="" type="checkbox"/> Submerged Plants <input type="checkbox"/> Undercut Banks			
STREAM PROFILE: Cross Sectional at Crossing (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)					
STREAM PROFILE: Plan View (include direction of flow, center line, distances from center line, photo locations, sample locations by gear type and ROW)					

# STREAM FISH INVESTIGATION DATA FORM

Feature ID: F94LH008

METHODS ATTRIBUTES				
Minnow Traps (Y/N): <u>Y</u>	Hook and Line (Y/N): <u>N/A</u>	Beach Seine (Y/N): <u>N/A</u>	Fyke Net (Y/N): <u>N/A</u>	Hoop Net (Y/N): <u>N/A</u>
No. of Minnow Traps Set: <u>3</u>	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)
Date & Time in: <u>8-21-15</u> <u>10:35</u>	No. of lines in water: <u>N/A</u>	No. of passes: <u>N/A</u>	Date & Time out: (mm/dd/yyyy)	Date & Time out: (mm/dd/yyyy)
Date & Time out: <u>8-22-15</u> <u>1150</u>	Time lines in water:	Reach Length (m):		

ELECTROFISHING ATTRIBUTES				
EF (Y/N):	EF Start Time:	EF End Time:	EF Time (seconds):	EF Reach Length (m):
Duty Cycle:	Frequency (Hz): <u>N/A</u>	Waveform:	Sampling Efficiency (% of sample reach):	
Current (A):	Volts (V):	Power (W):	(amp x volts)	

FISH OBSERVATIONS						
ID (Seq. Num)	Gear Type	Species	Total Length (mm)	Life Stage (Juvenile or Adult)	Disposition (Dead or Alive)	Picture No.
001	Minnow Trap-1	Blackfish	115	Juvenile/Adult	Mortality	P-F94LH008-008-BLACKFISH
002	"	"	110		"	
003	"	"	105		"	
004	"	"	75		Alive	P-F94LH008-009-BLACKFISH
005	Minnow Trap-2		105			
006			115			
007			95			
008			105			
009			90			
010			100			
011	Minnow Trap 3		105			
012			100			

NOTES (any additional information)
<p>Backwater slough dammed off us by beavers at construction corridor edge</p> <p>Dark water w/ pond scum &amp; algae but relatively solid bottom-organic</p> <p>Noticable low water (no' on each bank) from normal wetted width w/change of vegetation-no grass, wet thin branches of scrub shrub</p> <p>3 blackfish in us trap dead - when pulled - possibly low DO?</p>

MISCELLANEOUS POINTS (if applicable)	
Point ID:	Description:
Point ID:	Description:

Field Crew Chief: [Signature] Field Scientist/Technician: Nancy Valpey Technical Lead: \_\_\_\_\_

Minnow Trap 3 (Cont.)



**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: I94LH008

FT # NK026

Date: 8-21-15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500
- ☒ If outside expected ranges, was sample re-taken?
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?

**Stream Fish Investigations Field Form  
QA/QC Checklist**

Feature ID: F94LH008

**6. Fish Observations**

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

**7. General**

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

**X** Kaley Volper  
Fisheries Biologist (print)

**X** Kaley Volper  
Signature

**X** Jim Holmes  
Field Crew Chief (print)

**X** [Signature]  
Signature





P\_F94LH008\_001\_US  
LOOKING US AT PLX

8/21/2015 NK026



P\_F94LH008\_002\_DS  
LOOKING DS AT PLX

8/21/2015 NK026





**P\_F94LH008\_003\_LB**  
**LOOKING AT LB AT PLX**

**8/21/2015 NK026**



**P\_F94LH008\_004\_RB**  
**LOOKING AT RB AT PLX**

**8/21/2015 NK026**





**P\_F94LH008\_005\_AERIAL  
AERIAL PHOTO**

**8/21/2015 NK026**



**P\_F94LH008\_006\_AERIAL  
AERIAL PHOTO**

**8/21/2015 NK026**





**P\_F94LH008\_007\_AERIALW  
AERIAL PHOTO**

**8/21/2015 NK026**



**P\_F94LH008\_008\_BLACKFISH  
PHOTO OF ALASKA BLACKFISH**

**8/21/2015 NK026**





**P\_F94LH008\_009\_BLACKFISH**  
**PHOTO OF ALASKA BLACKFISH**

**8/21/2015 NK026**



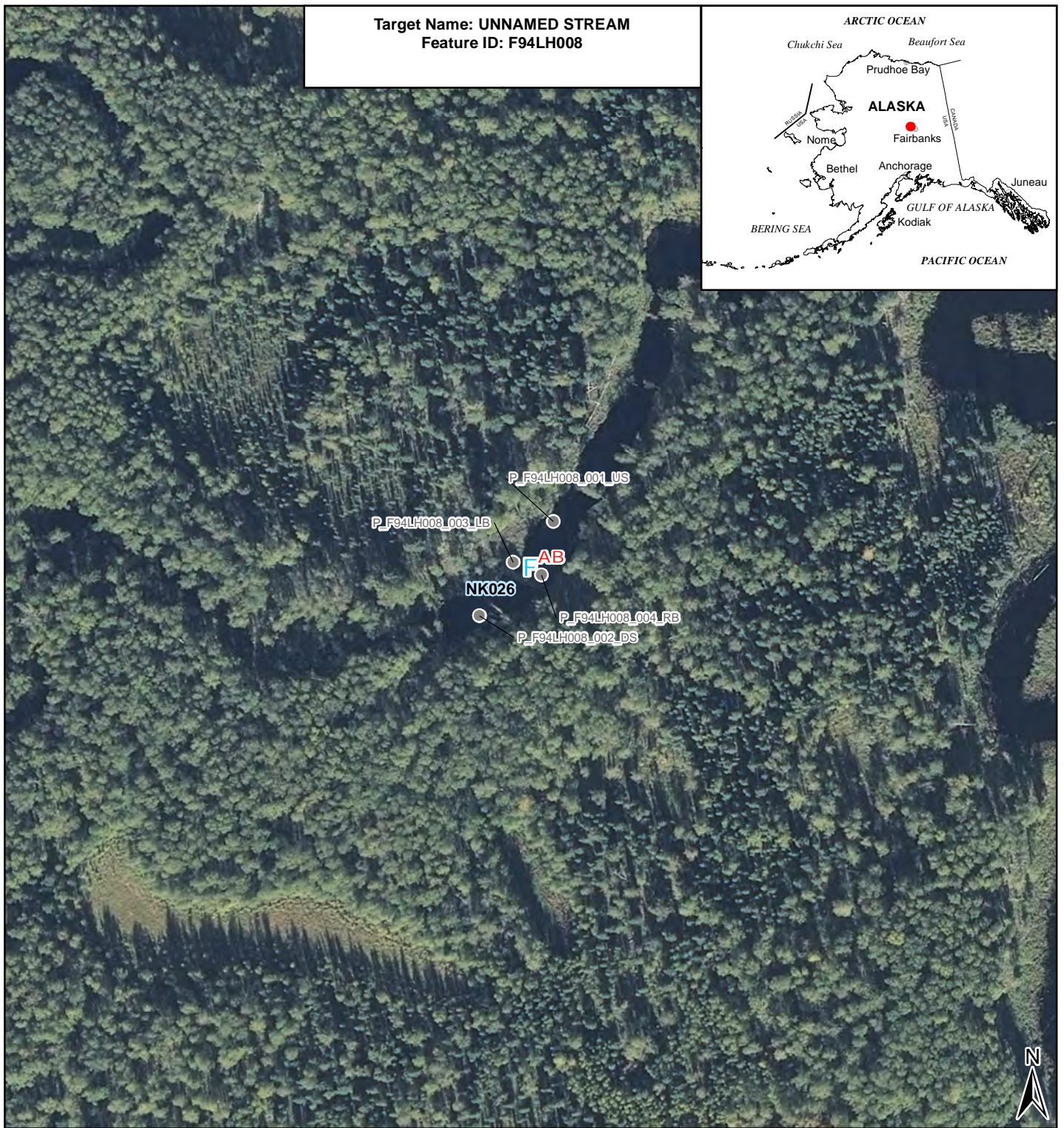
**P\_F94LH008\_010\_MINNOWTRAP**

**8/21/2015 NK026**

**PHOTO OF FIELD CREW RETRIEVING MINNOW TRAP**



Target Name: UNNAMED STREAM  
Feature ID: F94LH008



#### LEGEND

##### 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

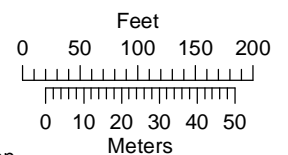
##### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

- BU
- CH
- CO
- DV
- NS
- O
- RT

- Burbot
- Chinook Salmon
- Coho Salmon
- Dolly Varden
- Ninespine Stickleback
- Other Species Not Listed
- Rainbow Trout

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
- TS Threespine Stickleback
- OBS Fish Observation, No Species Information



#### ALASKA LNG

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DESIGN  
ICS

CHECK

DESIGN  
TCS

APPROVE

#### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 47 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 8-28-15	Investigators: EAT, KRU, MPD	Team No.: F94	Feature ID: F94LH015		
Stream Name: Unnamed Trib to Tatalina			Stream ID: NK025		
Pipeline Milepost: 430.8	Stream found as expected (Y/N): N - No defined channel or water @ PLX		Hwy MP (N/A if heli accessed): Heli		
Latitude: 65° 05' 51.868" N		Longitude: 140° 40' 37.2684" W			
Logbook No.: 1	Logbook Page No.: 18-21	Total Fish Caught: 12	Fish Mortalities: 0	Total Photos: 13	
US @ CL Pic No.: P-F94LH015-001-US	DS @ CL Pic No.: P-F94LH015-002-US	RB to LB @ CL Pic No.: P-F94LH015-003-LB	LB to RB @ CL Pic No.: P-F94LH015-004-RB		
Other P-F94LH015-005-MISC		P-F94LH015-009-BLACK PISH - OIL B			
P-F94LH015-006-AERIAL - 008-AERIAL		P-F94LH015-012-SAMPLING P-F94LH015-013			

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): Mostly cloudy		Precipitation (Describe): None			
Water Temperature (°C): 6.19	Air Temperature (°C): 7	pH: 5.68	Dissolved Oxygen (mg/l): 0.91		
Specific Conductance (µS/cm): 166	Turbidity (NTU): 6.57	ORP (mV): 88.1	Dissolved Oxygen (%): 7.4%		
Ambient Conductance (µS/cm): 106	Odor: Y-Sulfur	Sheen (Y/N): N	Color: BROWN	Last date of Calibration: 8-24-15	
Defined Channel (Y/N): N	Notes: No defined channel @ PLX - Pond system at channel from culow			Wetted Width (m): N/A	
Flow (Y/N): N	Notes: No Flow - No water @ PLX			Thalweg Depth @ CL (m): N/A	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
90 Grass/Sedge (%)		90 Grass/Sedge (%)		100 Organics (%)	
80 Shrubs (%)		80 Shrubs (%)		Silt (%)	
0 Trees (%)		10 Trees (%)		Sand (%)	
N/A Diameter DBH (in.)		4 Diameter DBH (in.)		Gravel (%)	
				Cobble (%)	
				Boulders (%)	
Stream Type:		Aquatic Habitats			
Perennial Intermittent <input checked="" type="checkbox"/> Ephemeral		<input type="checkbox"/> Sand Bar <input type="checkbox"/> Mud Bar <input type="checkbox"/> Gravel Bar <input type="checkbox"/> Riffles <input type="checkbox"/> Pools <input type="checkbox"/> Undercut Banks <input checked="" type="checkbox"/> Large Woody Debris <input checked="" type="checkbox"/> Overhanging vegetation <input checked="" type="checkbox"/> Contiguous Wetlands <input type="checkbox"/> Emergent Plants <input type="checkbox"/> Submerged Plants			

STREAM PROFILE: Cross Sectional at Crossing (Include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

Water quality parameters collected in channel from ORBOW ~ 100 SW of PLX

STREAM PROFILE: Plan View (Include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)

NORTH: N ↑



# STREAM FISH INVESTIGATION DATA FORM

Feature ID: P94EH015

METHODS ATTRIBUTES				
Minnow Traps (Y/N): <u>Y</u>	Hook and Line (Y/N):	Beach Seine (Y/N):	Fyke Net (Y/N):	Hoop Net (Y/N):
No. of Minnow Traps Set: <u>3</u>	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)
Date & Time in: <u>8-28-15</u> (mm/dd/yyyy)	No. of lines in water: <u>N/A</u>	No. of passes: <u>N/A</u>	Date & Time out: (mm/dd/yyyy)	Date & Time out: (mm/dd/yyyy)
Date & Time out: <u>8-28-15</u> (mm/dd/yyyy)	Time lines in water:	Reach Length (m):		
ELECTROFISHING ATTRIBUTES				
EF (Y/N):	EF Start Time:	EF End Time:	EF Time (seconds):	EF Reach Length (m):
Duty Cycle:	Frequency (Hz):	Waveform:	Sampling Efficiency (% of sample reach):	
Current (A):	Volts (V):	Power (W):	(amp x volts)	

FISH OBSERVATIONS						
ID (Seq. Num)	Gear Type	Species	Total Length (mm)	Life Stage (Juvenile or Adult)	Disposition (Dead or Alive)	Picture No.
001	MT-3	Blackfish	85	Juvenile/Adult	Alive	
002			145			
003			150	Adult		
004			65			
005			70			
006			150	Adult		
007	✓		85			
008	MT-3		80			
009	MT-2		150	Adult		
010			100			
011			125			
012	✓	✓	120	✓	✓	

## NOTES (any additional information)

Wetland complex w/ no defined channel at PLX & intermittent pockets w/ surface water  
 old oxbow ponds to the SW (also to defined channel connected to oxbow)  
 and to the NE (this oxbow connected to totaline but further from PLX)

Connection between the two seems unlikely except for possibly during very high water episodes.

Minnow traps set in nearby water channel leading to oxbow to the SW

MISCELLANEOUS POINTS (if applicable)	
Point ID:	Description:
Point ID:	Description:

Field Crew Chief: [Signature] Field Scientist/ Technician: Kalvin Valer Technical Lead: \_\_\_\_\_



**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F9441015 FT # NK025 Date: 8-28-15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?

☒ pH: 4.0 – 10.0

☒ NTU: 0 – 3000

☒ DO (mg/L): 1.0 – 15.0 0.91 - explainable due to stagnant nature of system + floating + emergent veg

☒ Temp.: 1.0 – 19.0

☒ Specific Conductance: 20 - 1500

☒ If outside expected ranges, was sample re-taken?

☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

☒ Electrofishing attributes complete? (Every cell must have entry or N/A)

☒ Are units correct?

Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F94LH015

**6. Fish Observations**

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

**7. General**

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

**X**

Fisheries Biologist (print)

Kaley Volper

**X**

Signature

Kaley Volper

**X**

Field Crew Chief (print)

Kim Holmes

**X**

Signature

Kim Holmes





P\_F94LH015\_001\_US  
LOOKING US AT PLX

8/29/2015 NK025



P\_F94LH015\_002\_DS  
LOOKING DS AT PLX

8/29/2015 NK025





P\_F94LH015\_003\_LB  
LOOKING AT LB AT PLX

8/29/2015 NK025



P\_F94LH015\_004\_RB  
LOOKING AT RB AT PLX

8/29/2015 NK025





**P\_F94LH015\_005\_MISC** **8/29/2015 NK025**  
**LOOKING AT END OF WATER CHANNEL ~100 FT FROM PLX**



**P\_F94LH015\_006\_AERIAL** **8/29/2015 NK025**  
**AERIAL PHOTO**





**P\_F94LH015\_007\_AERIAL  
AERIAL PHOTO**

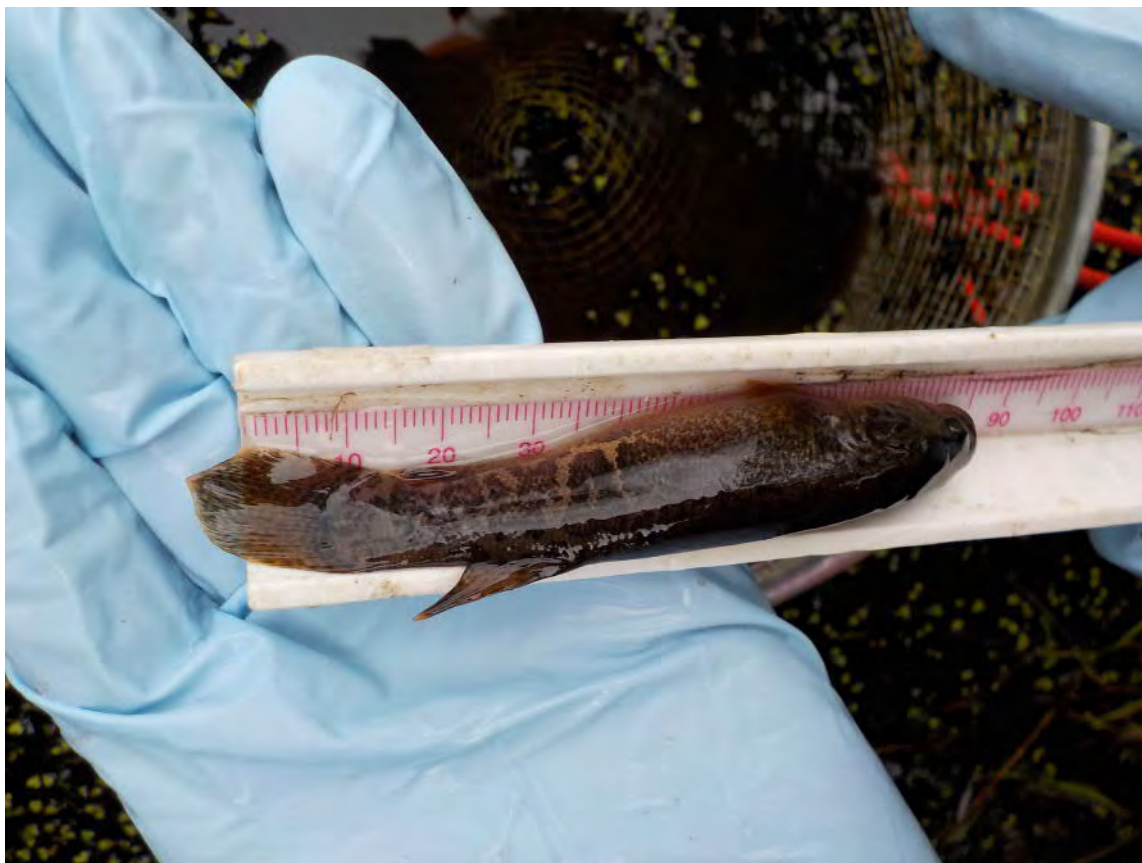
**8/29/2015 NK025**



**P\_F94LH015\_008\_AERIAL  
AERIAL PHOTO**

**8/29/2015 NK025**





P\_F94LH015\_009\_BLACKFISH  
PHOTO OF ALASKA BLACKFISH

8/29/2015 NK025



P\_F94LH015\_010\_BLACKFISH  
PHOTO OF ALASKA BLACKFISH

8/29/2015 NK025





**P\_F94LH015\_011\_BLACKFISH**  
**PHOTO OF ALASKA BLACKFISH**

**8/29/2015 NK025**



**P\_F94LH015\_012\_SAMPLING**

**8/29/2015 NK025**

**PHOTO OF FIELD CREW RETRIEVING FISH FROM MINNOW TRAP**



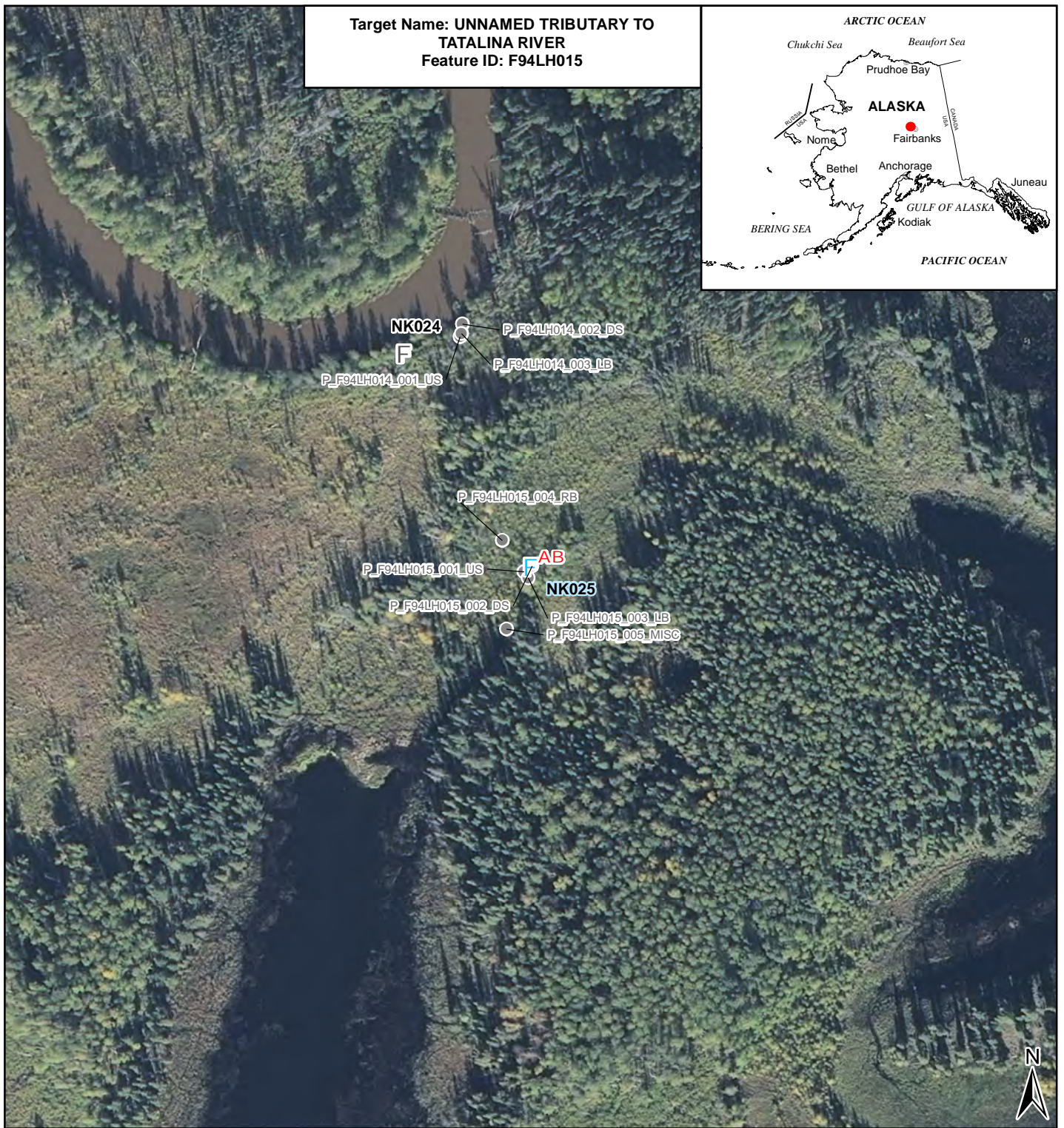


**P\_F94LH015\_013\_PHOTOS**  
**PHOTO OF FIELD CREW**

**8/29/2015 NK025**



Target Name: UNNAMED TRIBUTARY TO  
TATALINA RIVER  
Feature ID: F94LH015



## LEGEND

### 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

BU

Burbot

CH

Chinook Salmon

CO

Coho Salmon

DV

Dolly Varden

NS

Ninespine Stickleback

O

Other Species Not Listed

RT

Rainbow Trout

SA(U)

Salmonid (Unspecified)

SC(U)

Sculpin (Unspecified)

SS

Slimy Sculpin

ST(U)

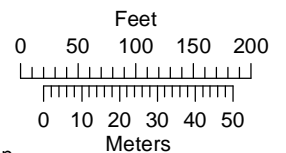
Stickleback (Unspecified)

TS

Threespine Stickleback

OBS

Fish Observation, No Species Information



## ALASKA LNG

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DESIGN  
ICS

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### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 48 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

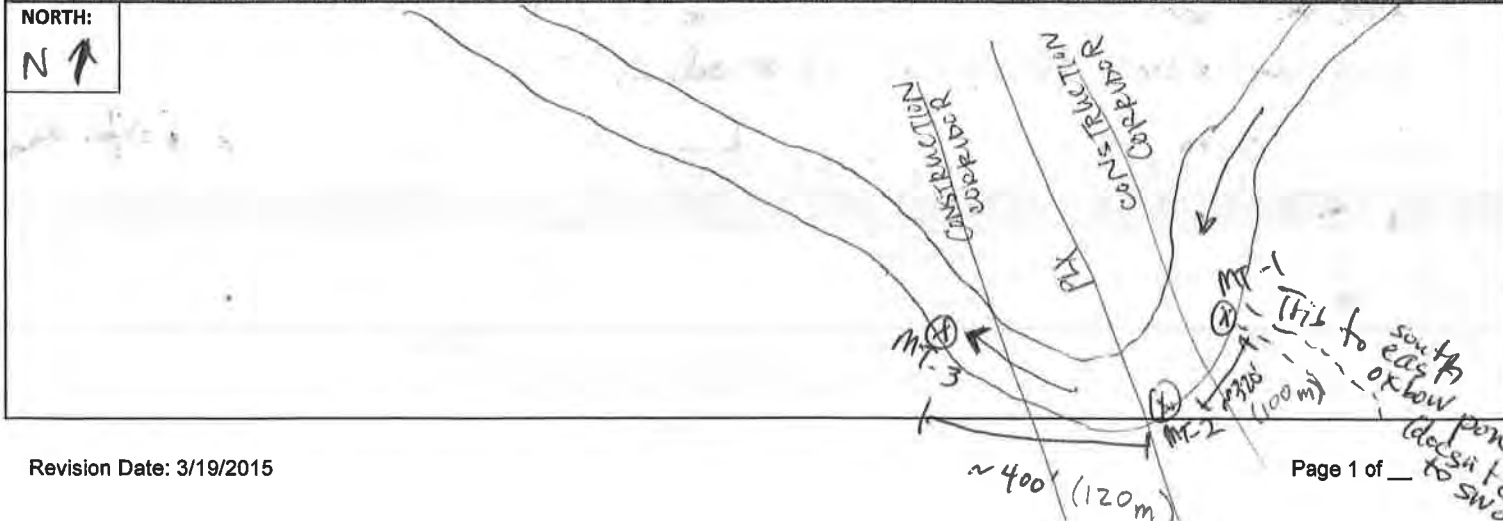
SITE DESCRIPTION					
Date: 8-28-15	Investigators: KAH, KRV, MPB	Team No.: F94	Feature ID: F94LH014		
Stream Name: Tatalina River	Stream ID: NK024				
Pipeline Milepost: 430.7	Stream found as expected (Y/N): Y	Hwy MP (N/A if heli accessed): Heli			
Latitude: 65° 05' 54.3886" N	Longitude: 148° 40' 40.3093" W				
Logbook No.: 1	Logbook Page No.: 18-21	Total Fish Caught: 0	Fish Mortalities: N/A	Total Photos: 6	
US @ CL Pic No.: P-F94LH014-001-US	DS @ CL Pic No.: P-F94LH014-002-DS	RB to LB @ CL Pic No.: P-F94LH014-003-RB	LB to RB @ CL Pic No.: N/A		
Other Pic No(s): P-F94LH014-004-AERIAL - 006-AERIAL					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): Partly cloudy		Precipitation (Describe): None			
Water Temperature (°C): 6.26	Air Temperature (°C): 7	pH: 6.12	Dissolved Oxygen (mg/l): 11.34		
Specific Conductance (µS/cm): 107	Turbidity (NTU): 264	ORP (mV): 161.6	Dissolved Oxygen (%): 91.7%		
Ambient Conductance (µS/cm): 69	Odor: N	Sheen (Y/N): N	Color: Brown	Last date of Calibration: 8-24-2015	
Defined Channel (Y/N): Y	Notes: Wide channel w/ high water @ time of survey			Wetted Width (m): UNKNOWN	
Flow (Y/N): Y	Notes: Steady flow throughout			Thalweg Depth @ CL (m): UNKNOWN	
Riparian Veg at 0-5 m at LB:	Riparian Veg at 0-5 m at RB:	Stream Substrate:	Aquatic Habitats		
90 Grass/Sedge (%)	60 Grass/Sedge (%)	Organics (%)	Sand Bar	X Large Woody Debris	
60 Shrubs (%)	80 Shrubs (%)	Silt (%)	Mud Bar	X Overhanging vegetation	
10 Trees (%)	40 Trees (%)	Sand (%)	Gravel Bar	Contiguous Wetlands	
10 Diameter DBH (In.)	10 Diameter DBH (In.)	Gravel (%)	X Riffles	X Emergent Plants	
		Cobble (%)	X Pools	X Submerged Plants	
		Boulders (%)	Undercut Banks		
Stream Type:					
X Perennial Intermittent Ephemeral					

## STREAM PROFILE: Cross Sectional at Crossing (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)



## STREAM PROFILE: Plan View (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)



Feature ID: 59424014

FISH OBSERVATIONS						
ID (Seq. Num)	Gear Type	Species	Total Length (mm)	Life Stage (Juvenile or Adult)	Disposition (Dead or Alive)	Picture No.
NONE						

Field Crew Chief: [Signature] Field Scientist/Technician: Nancy Valdes Technical Lead: \_\_\_\_\_



**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F94LH014

FT # NK024

Date: 8-28-15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

☒ Was ADF&G contacted before conducting any work in this area?

☒ Site Description complete? (Every cell must have entry or N/A)

☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

☒ Calibration performed prior to sampling?

☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)

☒ Water quality data within expected ranges?

☒ pH: 4.0 – 10.0

☒ NTU: 0 – 3000

☒ DO (mg/L): 1.0 – 15.0

☒ Temp.: 1.0 – 19.0

☒ Specific Conductance: 20 - 1500

☒ If outside expected ranges, was sample re-taken?

☒ Are units correct?

**3. Stream Profile**

☒ Stream profile view sketch included?

☒ Stream profile view captures water depth and wetted width?

☒ Stream profile view captures where efforts were made to capture fish?

☒ Plan view sketch included?

**4. Methods Attributes**

☒ Methods attributes complete? (Every cell must have entry or N/A)

☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

☒ Electrofishing attributes complete? (Every cell must have entry or N/A)

☒ Are units correct?

**Stream Fish Investigations Field Form  
QA/QC Checklist**

Feature ID: f94LH014

**6. Fish Observations**

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

**7. General**

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

**X** Kaley Volper  
Fisheries Biologist (print)

**X** Kaley Volper  
Signature

**X** Kim Holmes  
Field Crew Chief (print)

**X** [Signature]  
Signature





P\_F94LH014\_001\_US  
LOOKING US AT PLX

8/29/2015 NK024



P\_F94LH014\_002\_DS  
LOOKING DS AT PLX

8/29/2015 NK024





P\_F94LH014\_003\_LB  
LOOKING AT LB AT PLX

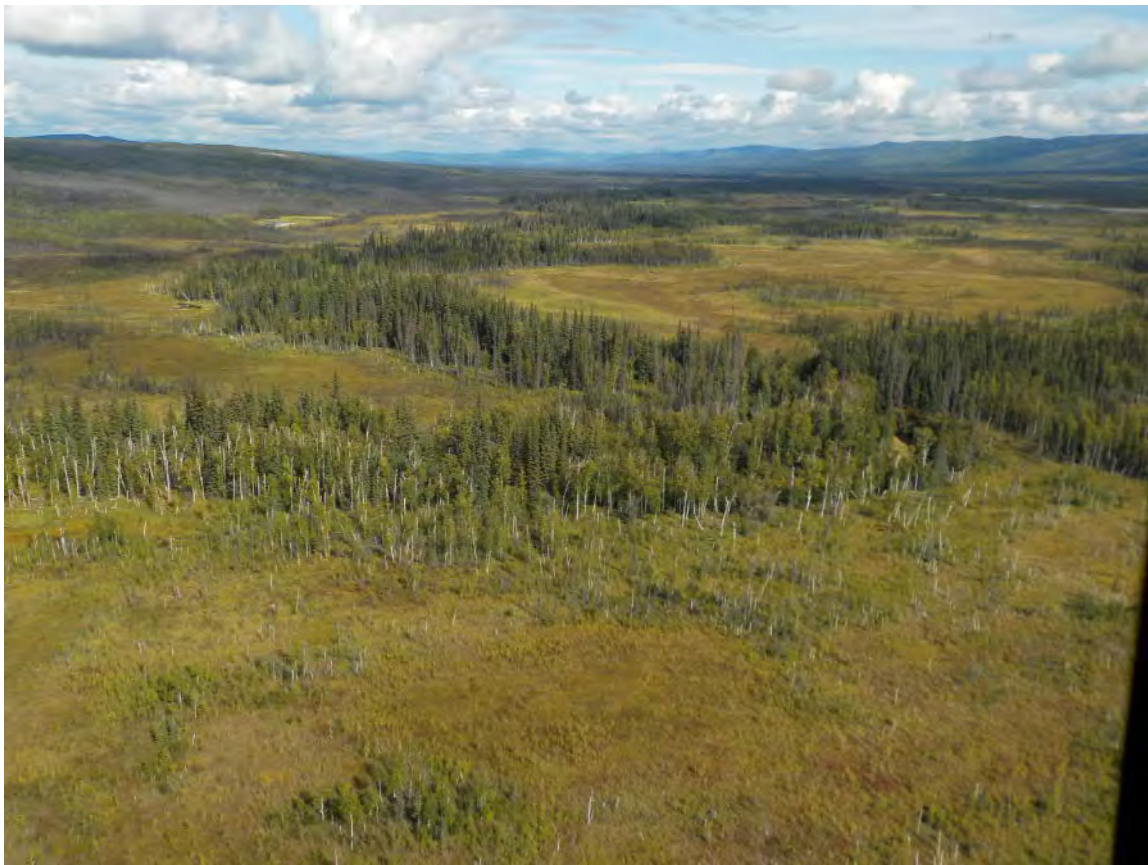
8/29/2015 NK024



P\_F94LH014\_004\_AERIAL  
AERIAL PHOTO

8/29/2015 NK024





**P\_F94LH014\_005\_AERIAL  
AERIAL PHOTO**

**8/29/2015 NK024**

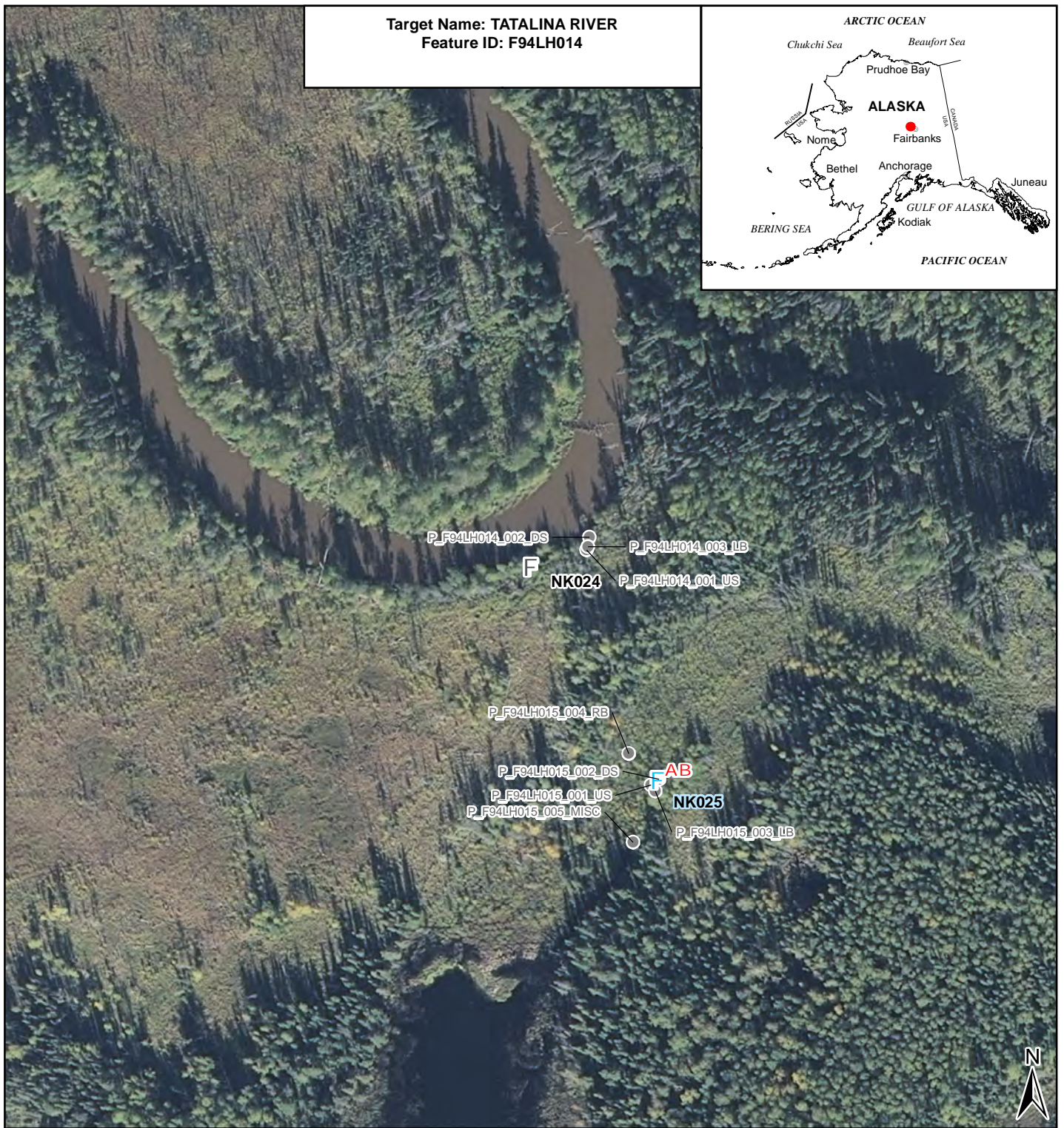


**P\_F94LH014\_006\_AERIAL  
AERIAL PHOTO**

**8/29/2015 NK024**



Target Name: TATALINA RIVER  
Feature ID: F94LH014



#### LEGEND

##### 2015 Fish Survey Location

- F** Fish Observed
- F** No Fish Observed
- Photo Point

##### Species Observed

- AB** Alaska Blackfish
- AG** Arctic Grayling

**BU**

Burbot

**CH**

Chinook Salmon

**CO**

Coho Salmon

**DV**

Dolly Varden

**NS**

Ninespine Stickleback

**O**

Other Species Not Listed

**RT**

Rainbow Trout

**SA(U)**

Salmonid (Unspecified)

**SC(U)**

Sculpin (Unspecified)

**SS**

Slimy Sculpin

**ST(U)**

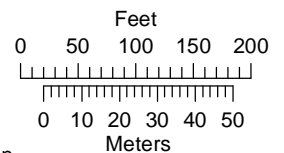
Stickleback (Unspecified)

**TS**

Threespine Stickleback

**OBS**

Fish Observation, No Species Information



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DESIGN  
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#### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECT	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 49 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	

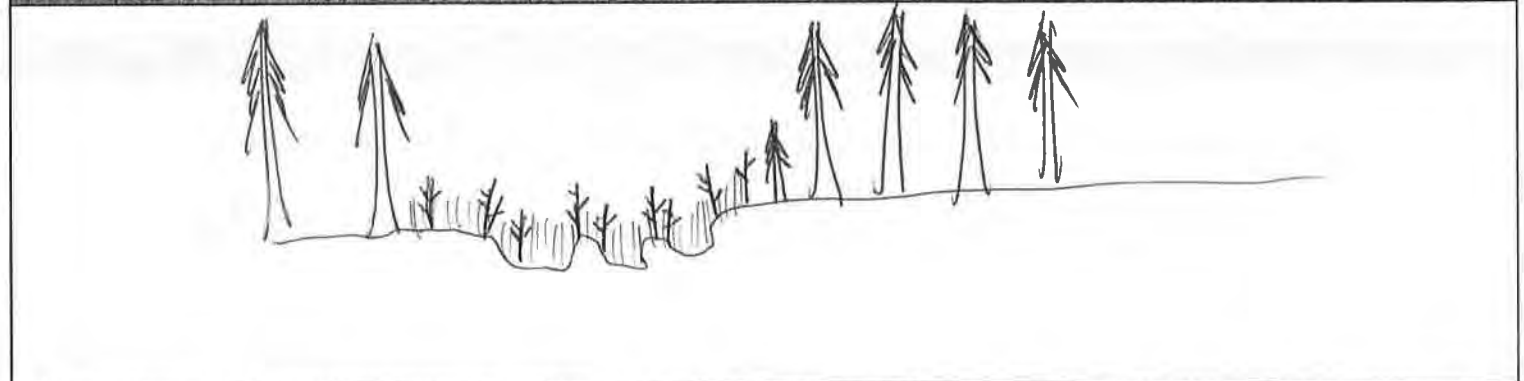


# STREAM FISH INVESTIGATION DATA FORM

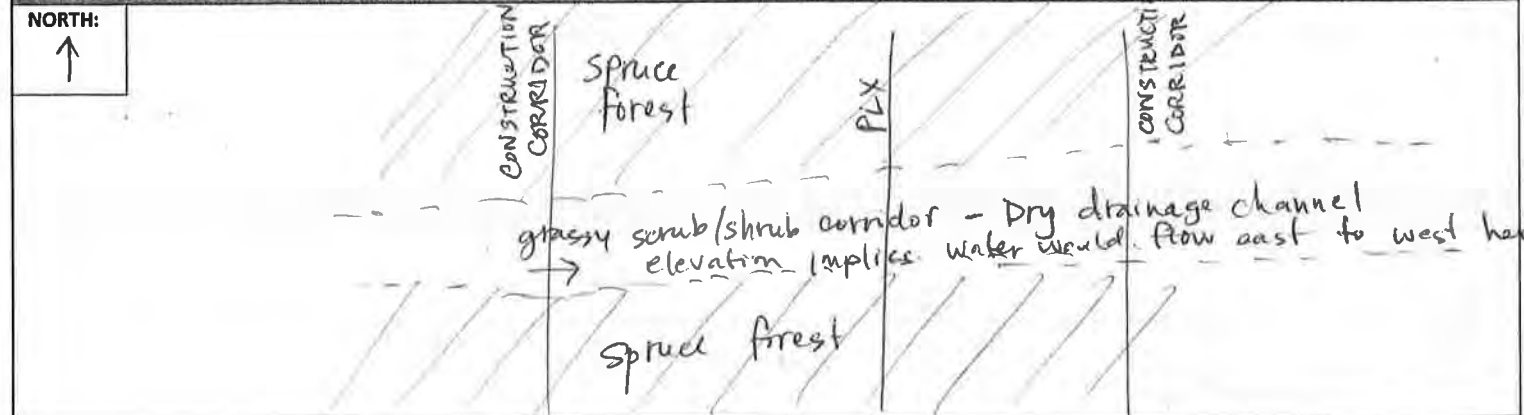
SITE DESCRIPTION					
Date: 8.20.15	Investigators: EAH, KRV, MPB	Team No.: F94	Feature ID: F94LH007		
Stream Name: Unnamed Trib to Tatalina River			Stream ID: NK020.1		
Pipeline Milepost: 426.7	Stream found as expected (Y/N): N - Dry		Hwy MP (N/A if hell accessed): Heli		
Latitude: 65° 09' 16.5263" N			Longitude: 148° 41' 19.9252" W		
Logbook No.: 1	Logbook Page No.: 6	Total Fish Caught: N/A	Fish Mortalities: N/A	Total Photos: 7	
US @ CL Pic No.: P-F94LH007-001-US	DS @ CL Pic No.: P-F94LH007-002-DS	RB to LB @ CL Pic No.: P-F94LH007-003-LB	LB to RB @ CL Pic No.: P-F94LH007-004-RB		
Other Pic No(s): P-F97LH007-005-AERIAL-007-AERIAL					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): Mostly cloudy			Precipitation (Describe): None		
Water Temperature (°C):	Air Temperature (°C): 12	pH:	Dissolved Oxygen (mg/l):		
Specific Conductance (µS/cm): N/A	Turbidity (NTU): N/A	ORP (mV): N/A	Dissolved Oxygen (%): N/A		
Ambient Conductance (µS/cm):	Odor:	Sheen (Y/N):	Color:	Last date of Calibration:	
Defined Channel (Y/N): Y	Notes: Poorly defined drainage channel				Wetted Width (m): N/A
Flow (Y/N): N	Notes: No water flow				Thalweg Depth @ CL (m):
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
90 Grass/Sedge (%)		90 Grass/Sedge (%)		100 Organics (%)	
60 Shrubs (%)		60 Shrubs (%)		Silt (%)	
40 Trees (%)		40 Trees (%)		Sand (%)	
4 Diameter DBH (in.)		4 Diameter DBH (in.)		Gravel (%)	
				Cobble (%)	
				Boulders (%)	
Stream Type:				Aquatic Habitats	
Perennial Intermittent <input checked="" type="checkbox"/> Ephemeral				Sand Bar	
				Mud Bar	
				Gravel Bar	
				Riffles	
				Pools	
				Undercut Banks	
				Large Woody Debris	
				Overhanging vegetation	
				Contiguous Wetlands	
				Emergent Plants	
				Submerged Plants	

## STREAM PROFILE: Cross Sectional at Crossing (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)



## STREAM PROFILE: Plan View (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)



Feature ID: F94LH007

METHODS ATTRIBUTES				
Minnow Traps (Y/N):	Hook and Line (Y/N):	Beach Seine (Y/N):	Fyke Net (Y/N):	Hoop Net (Y/N):
No. of Minnow Traps Set:	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)
Date & Time in: (mm/dd/yyyy)	No. of lines in water:	No. of passes:	Date & Time out: (mm/dd/yyyy)	Date & Time out: (mm/dd/yyyy)
Date & Time out: (mm/dd/yyyy)	Time lines in water:	Reach Length (m):		

ELECTROFISHING ATTRIBUTES				
EF (Y/N):	EF Start Time:	EF End Time:	EF Time (seconds):	EF Reach Length (m):
Duty Cycle:	Frequency (Hz):	Waveform:	Sampling Efficiency (% of sample reach):	
Current (A):	Volts (V):	Power (W):	(amp x volts)	

[illegible]

NOTES (any additional information)

Dry drainage w/poorly defined banks running through spruce forest in scrub/shrub corridor

Pooled water observed near LZ in connected system but no water within construction corridor

No notable change of substrate

System seems to be running west to east at PLX

Drainage seems to be used as game trail

MISCELLANEOUS POINTS (if applicable)	
Point ID:	Description:
Point ID:	Description:

Field  
Crew Chief:

Field Scientist/  
Technician:

Technical  
Lead:



**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F94LH007

FT # NK022 <sup>020-1</sup>

Date: 8-20-15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500
- ☒ If outside expected ranges, was sample re-taken?
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?

Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F94LH007

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☐ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☐ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

X

Kately Volper

Fisheries Biologist (print)

X

Kately Volper

Signature

X

bin Holmes

Field Crew Chief (print)

X

bin Holmes

Signature





P\_F94LH007\_001\_US  
LOOKING US AT PLX

8/20/2015 NK020.1



P\_F94LH007\_002\_DS  
LOOKING DS AT PLX

8/20/2015 NK020.1





**P\_F94LH007\_003\_LB**  
**LOOKING AT LB AT PLX**

**8/20/2015 NK020.1**



**P\_F94LH007\_004\_RB**  
**LOOKING AT RB AT PLX**

**8/20/2015 NK020.1**





**P\_F94LH007\_005\_AERIAL  
AERIAL PHOTO**

**8/20/2015 NK020.1**



**P\_F94LH007\_006\_AERIAL  
AERIAL PHOTO**

**8/20/2015 NK020.1**





**P\_F94LH007\_007\_AERIAL  
AERIAL PHOTO**

**8/20/2015 NK020.1**



Target Name: UNNAMED TRIBUTARY TO  
TATALINA RIVER  
Feature ID: F94LH007



P\_F94LH007\_001\_US  
P\_F94LH007\_003\_LB  
NK020.1  
P\_F94LH007\_002\_DS  
P\_F94LH007\_004\_RB



## LEGEND

### 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

### Species Observed

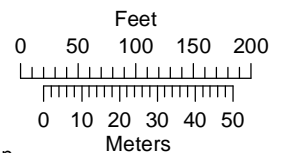
- AB Alaska Blackfish
- AG Arctic Grayling

- BU
- CH
- CO
- DV
- NS
- O
- RT

- Burbot
- Chinook Salmon
- Coho Salmon
- Dolly Varden
- Ninespine Stickleback
- Other Species Not Listed
- Rainbow Trout

- SA(U)
- SC(U)
- SS
- ST(U)
- TS
- OBS

- Salmonid (Unspecified)
- Sculpin (Unspecified)
- Slimy Sculpin
- Stickleback (Unspecified)
- Threespine Stickleback
- Fish Observation, No Species Information



## ALASKA LNG

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DESIGN  
ICS

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### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 50 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 8-19-15	Investigators: EAH, KRV, MPB	Team No.: F94	Feature ID: F94LH006		
Stream Name: Unnamed Trib to Tolovana River			Stream ID: NK004.4		
Pipeline Milepost: 407.7	Stream found as expected (Y/N): N - Dry drainage		Hwy MP (N/A if hell accessed): 1161		
Latitude: 65° 23' 30.7928" N		Longitude: 148° 36' 31.5446" W			
Logbook No.: 1	Logbook Page No.: 4-5	Total Fish Caught: N/A	Fish Mortalities: N/A	Total Photos: 7	
US @ CL Pic No.: P-F94LH006-001-US	DS @ CL Pic No.: P-F94LH006-002-DS	RB to LB @ CL Pic No.: P-F94LH006-003-LB	LB to RB @ CL Pic No.: P-F94LH006-004-RB		
Other Pic No(s): P-F94LH006-005-AERIAL - 007-AERIAL					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): Partly cloudy		Precipitation (Describe): Intermittent light rain			
Water Temperature (°C):	Air Temperature (°C): 11	pH:	Dissolved Oxygen (mg/l):		
Specific Conductance (µS/cm):	Turbidity (NTU): N/A	ORP (mV):	Dissolved Oxygen (%):		
Ambient Conductance (µS/cm):	Odor:	Sheen (Y/N):	Color:	Last date of Calibration:	
Defined Channel (Y/N): N	Notes: Poorly defined drainage area			Wetted Width (m):	
Flow (Y/N): N	Notes: No water or flow - Dry			Thalweg Depth @ CL (m):	
<b>Riparian Veg at 0-5 m at LB:</b> 90 Grass/Sedge (%) 10 Shrubs (%) 80 Trees (%) 5 Diameter DBH (in.)		<b>Riparian Veg at 0-5 m at RB:</b> 90 Grass/Sedge (%) 10 Shrubs (%) 80 Trees (%) 4 Diameter DBH (in.)		<b>Stream Substrate:</b> 100 Organics (%) Silt (%) Sand (%) Gravel (%) Cobble (%) Boulders (%)	
<b>Stream Type:</b> Perennial _____ Intermittent <input checked="" type="checkbox"/> Ephemeral		<b>Aquatic Habitats</b> Sand Bar _____ Large Woody Debris _____ Mud Bar _____ Overhanging vegetation _____ Gravel Bar _____ Contiguous Wetlands _____ Riffles _____ Emergent Plants _____ Pools _____ Submerged Plants _____ Undercut Banks _____			

STREAM PROFILE: Cross Sectional at Crossing (Include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

STREAM PROFILE: Plan View (Include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)
<p>NORTH: ↑</p>



Feature ID: F94LH006

**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F94LH006

FT # NK004.4

Date: 8.19.15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☐ NTU: 0 – 3000
  - ☐ DO (mg/L): 1.0 – 15.0
  - ☐ Temp.: 1.0 – 19.0
  - ☐ Specific Conductance: 20 - 1500
- ☒ If outside expected ranges, was sample re-taken?
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?



Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F94LH 006

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?  
☒ Are units correct? (Total Length (mm))  
☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?  
☒ All additional data in logbook captured on data form and additional photos noted?  
☒ Were all additional comments on stream habitat, etc. recorded on data form?  
☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

☒ Haley Volper  
Fisheries Biologist (print)

☒ Haley Volper  
Signature

☒ Kim Holmes  
Field Crew Chief (print)

☒ Kim Holmes  
Signature





**P\_F94LH006\_001\_US**  
**LOOKING US AT PLX**

**8/19/2015 NK004.4**



**P\_F94LH006\_002\_DS**  
**LOOKING DS AT PLX**

**8/19/2015 NK004.4**





**P\_F94LH006\_003\_LB**  
**LOOKING AT LB AT PLX**

**8/19/2015 NK004.4**



**P\_F94LH006\_004\_RB**  
**LOOKING AT RB AT PLX**

**8/19/2015 NK004.4**





**P\_F94LH006\_005\_AERIAL  
AERIAL PHOTO**

**8/19/2015 NK004.4**



**P\_F94LH006\_006\_AERIAL  
AERIAL PHOTO**

**8/19/2015 NK004.4**





**P\_F94LH006\_007\_AERIAL  
AERIAL PHOTO**

**8/19/2015 NK004.4**



Target Name: UNNAMED TRIBUTARY TO  
TOLOVANA  
Feature ID: F94LH006



P\_F94LH005\_004\_RB  
P\_F94LH005\_001\_US  
NK004.3  
P\_F94LH005\_002\_DS  
P\_F94LH005\_003\_LB

P\_F94LH006\_004\_RB  
P\_F94LH006\_001\_US  
NK004.4  
P\_F94LH006\_002\_DS  
P\_F94LH006\_003\_LB



#### LEGEND

##### 2015 Fish Survey Location

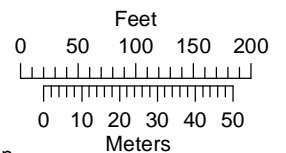
- F Fish Observed
- F No Fish Observed
- Photo Point

##### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

- BU Burbot
- CH Chinook Salmon
- CO Coho Salmon
- DV Dolly Varden
- NS Ninespine Stickleback
- O Other Species Not Listed
- RT Rainbow Trout

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
- TS Threespine Stickleback
- OBS Fish Observation, No Species Information



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#### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 51 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 8-19-15	Investigators: KAH ERV, MPB	Team No.: F94	Feature ID: F94LH005		
Stream Name: Unnamed Trib to Tolovana River			Stream ID: NK004.3		
Pipeline Milepost: 407.6	Stream found as expected (Y/N): N - Dry drainage		Hwy MP (N/A if hell accessed): 461		
Latitude: 65° 23' 34.0849" N		Longitude: 148° 36' 31.2807" W			
Logbook No.: 1	Logbook Page No.: 4-5	Total Fish Caught: N/A	Fish Mortalities: N/A	Total Photos: 7	
US @ CL Pic No.: P-F94LH005-001-US	DS @ CL Pic No.: P-F94LH005-002-DS	RB to LB @ CL Pic No.: P-F94LH005-003-LB	LB to RB @ CL Pic No.: P-F94LH005-004-RB		
Other Pic No(s): P-F94LH005-005-AERIAL-007-AERIAL					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): Partly cloudy		Precipitation (Describe): Intermittent light rain			
Water Temperature (°C):	Air Temperature (°C):	pH:	Dissolved Oxygen (mg/l):		
Specific Conductance (µS/cm):	Turbidity (NTU):	ORP (mV):	Dissolved Oxygen (%):		
Ambient Conductance (µS/cm):	Odor:	Sheen (Y/N):	Color:	Last date of Calibration:	
Defined Channel (Y/N): N	Notes: Poorly defined drainage w/no water				Wetted Width (m):
Flow (Y/N): N	Notes: Dry				Thalweg Depth @ CL (m): N/A
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
90 Grass/Sedge (%)		90 Grass/Sedge (%)		100 Organics (%)	
40 Shrubs (%)		40 Shrubs (%)		Silt (%)	
80 Trees (%)		80 Trees (%)		Sand (%)	
3 Diameter DBH (in.)		3 Diameter DBH (in.)		Gravel (%)	
				Cobble (%)	
				Boulders (%)	
Stream Type:				Aquatic Habitats	
Perennial Intermittent <input checked="" type="checkbox"/> Ephemeral				Sand Bar	
				Mud Bar	
				Gravel Bar	
				Riffles	
				Pools	
				Undercut Banks	
				Large Woody Debris	
				Overhanging Vegetation	
				Contiguous Wetlands	
				Emergent Plants	
				Submerged Plants	

STREAM PROFILE: Cross Sectional at Crossing (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

STREAM PROFILE: Plan View (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)

Feature ID: F94LH005



**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F94LH005 FT # NK004.3 Date: 8-19-15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☐ pH: 4.0 – 10.0
  - ☐ NTU: 0 – 3000
  - ☐ DO (mg/L): 1.0 – 15.0
  - ☐ Temp.: 1.0 – 19.0
  - ☐ Specific Conductance: 20 - 1500
- ☒ If outside expected ranges, was sample re-taken?
  - ☐ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?

**Stream Fish Investigations Field Form  
QA/QC Checklist**

Feature ID: F94LH005

**6. Fish Observations**

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

**7. General**

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

**X**

Kalery Volper

Fisheries Biologist (print)

**X**

Kalery Volper

Signature

**X**

Jim Holmes

Field Crew Chief (print)

**X**

[Signature]

Signature





**P\_F94LH005\_001\_US**  
**LOOKING US AT PLX**

**8/19/2015 NK004.3**



**P\_F94LH005\_002\_DS**  
**LOOKING DS AT PLX**

**8/19/2015 NK004.3**





**P\_F94LH005\_003\_LB**  
**LOOKING AT LB AT PLX**

**8/19/2015 NK004.3**



**P\_F94LH005\_004\_RB**  
**LOOKING AT RB AT PLX**

**8/19/2015 NK004.3**





**P\_F94LH005\_005\_AERIAL  
AERIAL PHOTO**

**8/19/2015 NK004.3**



**P\_F94LH005\_006\_AERIAL  
AERIAL PHOTO**

**8/19/2015 NK004.3**



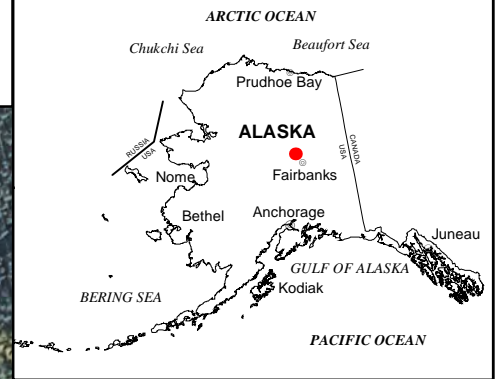


**P\_F94LH005\_007\_AERIAL  
AERIAL PHOTO**

**8/19/2015 NK004.3**



Target Name: UNNAMED TRIBUTARY TO  
TOLOVANA RIVER  
Feature ID: F94LH005



P\_F94LH005\_004\_RB  
P\_F94LH005\_001\_US  
NK004.3  
P\_F94LH005\_002\_DS  
P\_F94LH005\_003\_LB

P\_F94LH006\_004\_RB  
P\_F94LH006\_001\_US  
NK004.4  
P\_F94LH006\_002\_DS  
P\_F94LH006\_003\_LB



## LEGEND

### 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

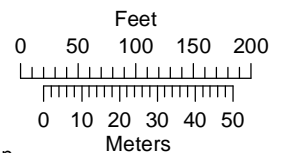
### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

- BU Burbot
- CH Chinook Salmon
- CO Coho Salmon
- DV Dolly Varden
- NS Ninespine Stickleback
- O Other Species Not Listed
- RT Rainbow Trout

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
- TS Threespine Stickleback
- OBS Fish Observation, No Species Information

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
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### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	AK 4	DATUM	NAD83	CONTRACTOR NAME	AECOM	MAP NUMBER	Page 52 of 86	REV.	A
SCALE	1:2,000	DATE	15 Oct 2015	PROJECT NUMBER	26221392	ORIG PAGE SIZE	8.5 X 11		



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 8.18.15	Investigators: KAH, KRV, MPB	Team No.: F94	Feature ID: F94LH004		
Stream Name: Unnamed Trib to Tolovana R			Stream ID: NK002.4		
Pipeline Milepost: 405	Stream found as expected (Y/N): Y		Hwy MP (N/A if hell accessed): Heli		
Latitude: 65° 25' 50.9029" N		Longitude: 148° 36' 37.2995" W			
Logbook No.: 1	Logbook Page No.: 2-4	Total Fish Caught: 0	Fish Mortalities: N/A	Total Photos: 7	
US @ CL Pic No.: P-F94LH004-001-US	DS @ CL Pic No.: P-F94LH004-002-DS	RB to LB @ CL Pic No.: P-F94LH004-003-LB	LB to RB @ CL Pic No.: P-F94LH004-004-RB		
Other Pic No(s): P-F94LH004-005-AERIAL-007-AERIAL					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): Cloudy		Precipitation (Describe): Light rain intermittent			
Water Temperature (°C): 8.82	Air Temperature (°C): 11	pH: 7.91	Dissolved Oxygen (mg/l): 10.90		
Specific Conductance (µS/cm): 853	Turbidity (NTU): 1.59	ORP (mV): -9.6	Dissolved Oxygen (%): 94.1		
Ambient Conductance (µS/cm): 589	Odor: N	Sheen (Y/N): N	Color: Clear	Last date of Calibration: TTT	
Defined Channel (Y/N): Y	Notes: Shallow stream w/ loosely defined muddy bank			Wetted Width (m): 128' 3.9m	
Flow (Y/N): Y	Notes: Flow throughout			Thalweg Depth @ CL (m): 4' 0.1m	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
80 Grass/Sedge (%)		80 Grass/Sedge (%)		10 Organics (%)	
70 Shrubs (%)		70 Shrubs (%)		20 Silt (%)	
15 Trees (%)		15 Trees (%)		70 Sand (%)	
4 Diameter DBH (in.)		4 Diameter DBH (in.)		Gravel (%)	
				Cobble (%)	
				Boulders (%)	
Stream Type:				Aquatic Habitats	
<input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral				<input type="checkbox"/> Sand Bar <input checked="" type="checkbox"/> Mud Bar <input type="checkbox"/> Gravel Bar <input type="checkbox"/> Riffles <input checked="" type="checkbox"/> Pools <input type="checkbox"/> Undercut Banks	
				<input checked="" type="checkbox"/> Large Woody Debris <input checked="" type="checkbox"/> Overhanging vegetation <input checked="" type="checkbox"/> Contiguous Wetlands <input checked="" type="checkbox"/> Emergent Plants <input checked="" type="checkbox"/> Submerged Plants	

STREAM PROFILE: Cross Sectional at Crossing (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)	
STREAM PROFILE: Plan View (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)	



Feature ID: F94LH004

METHODS ATTRIBUTES				
Minnow Traps (Y/N):	Hook and Line (Y/N):	Beach Seine (Y/N):	Fyke Net (Y/N):	Hoop Net (Y/N):
No. of Minnow Traps Set:	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)
Date & Time in: (mm/dd/yyyy)	No. of lines in water:	No. of passes:	Date & Time out: (mm/dd/yyyy)	Date & Time out: (mm/dd/yyyy)
Date & Time out: (mm/dd/yyyy)	Time lines in water:	Reach Length (m):		

ELECTROFISHING ATTRIBUTES				
EF (Y/N):	EF Start Time:	EF End Time:	EF Time (seconds):	EF Reach Length (m):
Duty Cycle:	Frequency (Hz):	Waveform:	Sampling Efficiency (% of sample reach):	
Current (A):	Volts (V):	Power (W):	(amp x volts)	

[illegible]

Shallow stream with sandy substrate and loosely defined muddy banks running through alder corridor in spruce forest  
split channels with flow in many places  
Vegetation is thicker DS from PLX

MISCELLANEOUS POINTS (if applicable)	
Point ID:	Description:
Point ID:	Description:

Field  
Crew Chief: [Signature]

Field Scientist/  
Technician: Nancy Volpert

Technical  
Lead:

**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F941H004

FT # NK002.4

Date: 8-18-15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500
- ☒ If outside expected ranges, was sample re-taken?
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?



Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F94LH004

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☐ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

☒ Haley Volper  
Fisheries Biologist (print)

☒ Haley Volper  
Signature

☒ Jim Holmes  
Field Crew Chief (print)

☒ [Signature]  
Signature



P\_F94LH004\_001\_US  
LOOKING US AT PLX

8/18/2015 NK002.4



P\_F94LH004\_002\_DS  
LOOKING DS AT PLX

8/18/2015 NK002.4





P\_F94LH004\_003\_LB  
LOOKING AT LB AT PLX

8/18/2015 NK002.4



P\_F94LH004\_004\_RB  
LOOKING AT RB AT PLX

8/18/2015 NK002.4





**P\_F94LH004\_005\_AERIAL  
AERIAL PHOTO**

**8/18/2015 NK002.4**



**P\_F94LH004\_006\_AERIAL  
AERIAL PHOTO**

**8/18/2015 NK002.4**





**P\_F94LH004\_007\_AERIAL  
AERIAL PHOTO**

**8/18/2015 NK002.4**



Target Name: UNNAMED TRIBUTARY TO  
TOLOVANA  
Feature ID: F94LH004



NK002.3  
P\_F94LH003\_004\_RB  
P\_F94LH003\_002\_DS  
P\_F94LH003\_003\_LB  
P\_F94LH003\_001\_US

NK002.4  
P\_F94LH004\_004\_RB  
P\_F94LH004\_001\_US  
P\_F94LH004\_002\_DS  
P\_F94LH004\_003\_LB



#### LEGEND

##### 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

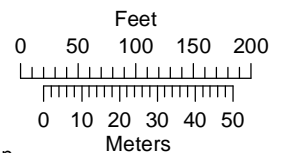
##### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

- BU
- CH
- CO
- DV
- NS
- O
- RT

- Burbot
- Chinook Salmon
- Coho Salmon
- Dolly Varden
- Ninespine Stickleback
- Other Species Not Listed
- Rainbow Trout

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
- TS Threespine Stickleback
- OBS Fish Observation, No Species Information



#### ALASKA LNG

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DESIGN  
ICS

CHECK

DESIGN  
TCS

APPROVE

#### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 53 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 8.18.15	Investigators: KAH, KRV, MPB	Team No.: P94	Feature ID: F94 LH003		
Stream Name: Unnamed Trib to Tolovana River			Stream ID: NK002.3		
Pipeline Milepost: 404.9	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): Heli		
Latitude: 65° 25' 54.8334" N		Longitude: 148° 36' 38.7524" W			
Logbook No.: 1	Logbook Page No.: 2-4	Total Fish Caught: 0	Fish Mortalities: N/A	Total Photos: 8	
US @ CL Pic No.: P-F94LH003-001-LS	DS @ CL Pic No.: P-F94LH003-002-DS	RB to LB @ CL Pic No.: P-F94LH003-003-LB	LB to RB @ CL Pic No.: P-F94LH003-004-RB		
Other Pic No(s): P-F94LH003-005 - AERIAL - 008 - AERIAL					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): Cloudy		Precipitation (Describe): Light Rain			
Water Temperature (°C): 9.87	Air Temperature (°C): 11	pH: 8.17	Dissolved Oxygen (mg/l): 10.48		
Specific Conductance (µS/cm): 1073	Turbidity (NTU): 2.04	ORP (mV): 7.7	Dissolved Oxygen (%): 92.9		
Ambient Conductance (µS/cm): 763	Odor: N	Sheen (Y/N): N	Color: Silty	Last date of Calibration: TTT	
Defined Channel (Y/N): Y	Notes: Grass lined channel			Wetted Width (m): 12' 3.6m	
Flow (Y/N): Y	Notes: Flow throughout reach			Thalweg Depth @ CL (m): 4" 0.1m	
<b>Riparian Veg at 0-5 m at LB:</b> 95 Grass/Sedge (%) 50 Shrubs (%) 20 Trees (%) 4 Diameter DBH (in.)		<b>Riparian Veg at 0-5 m at RB:</b> 95 Grass/Sedge (%) 50 Shrubs (%) 20 Trees (%) 4 Diameter DBH (in.)		<b>Stream Substrate:</b> 100% Organics (%) 10 Silt (%) Sand (%) Gravel (%) Cobble (%) Boulders (%)	
<b>Aquatic Habitats</b> Sand Bar Mud Bar Gravel Bar Riffles Pools Undercut Banks		Large Woody Debris Overhanging Vegetation Contiguous Wetlands Emergent Plants Submerged Plants			
<b>Stream Type:</b> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input checked="" type="checkbox"/>					

**STREAM PROFILE: Cross Sectional at Crossing** (Include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

**STREAM PROFILE: Plan View** (Include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)

NORTH:

Feature ID: F94LH003

[illegible]

Field Crew Chief: [Signature] Field Scientist/ Technician: Nancy Valpar Technical Lead: \_\_\_\_\_



**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F944003 FT # NK002.3 Date: 8-18-15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500
- ☒ If outside expected ranges, was sample re-taken?
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?

Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: P94LH003

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?  
☒ Are units correct? (Total Length (mm))  
☐ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?  
☒ All additional data in logbook captured on data form and additional photos noted?  
☒ Were all additional comments on stream habitat, etc. recorded on data form?  
☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

X

Kaley Volper  
Fisheries Biologist (print)

X

Kaley Volper  
Signature

X

Kim Holmes  
Field Crew Chief (print)

X

Kim Holmes  
Signature





P\_F94LH003\_001\_US  
LOOKING US AT PLX

8/18/2015 NK002.3



P\_F94LH003\_002\_DS  
LOOKING DS AT PLX

8/18/2015 NK002.3





P\_F94LH003\_003\_LB  
LOOKING AT LB AT PLX

8/18/2015 NK002.3



P\_F94LH003\_004\_RB  
LOOKING AT RB AT PLX

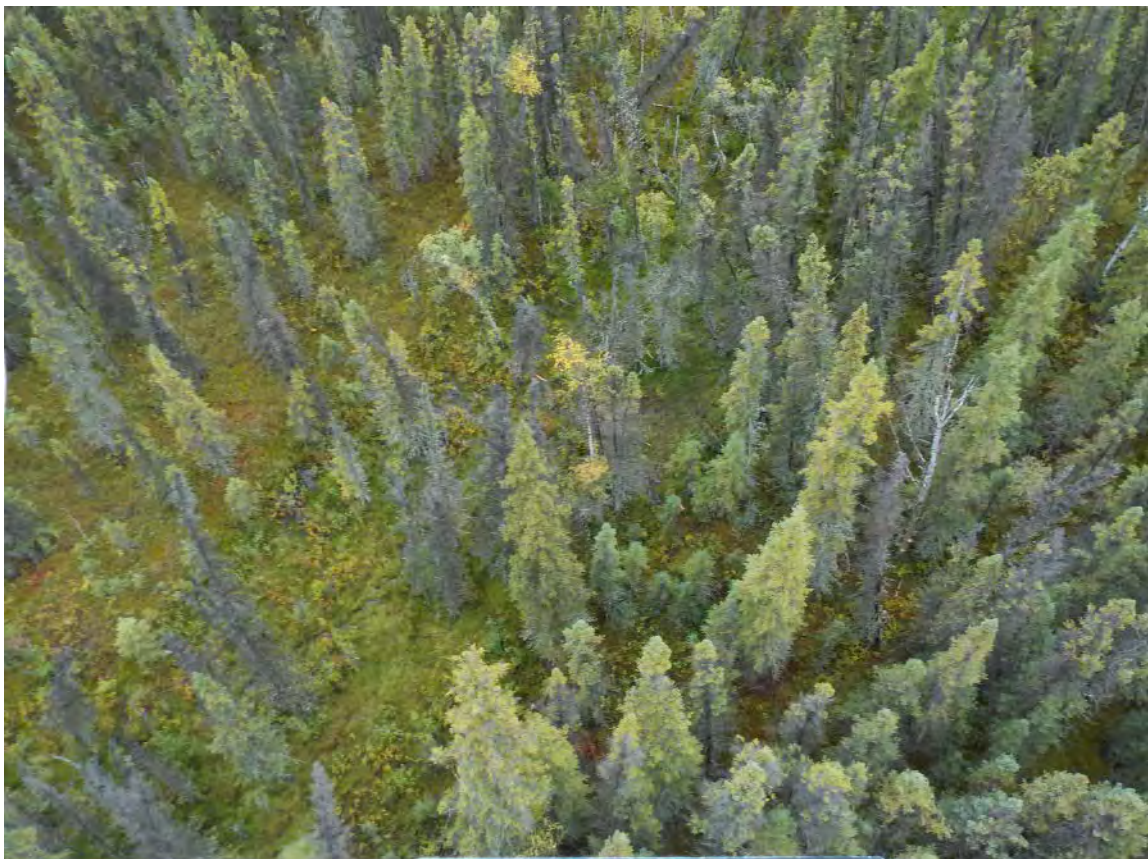
8/18/2015 NK002.3





**P\_F94LH003\_005\_AERIAL**  
**AERIAL PHOTO**

**8/18/2015 NK002.3**



**P\_F94LH003\_006\_AERIAL**  
**AERIAL PHOTO**

**8/18/2015 NK002.3**





**P\_F94LH003\_007\_AERIAL  
AERIAL PHOTO**

**8/18/2015 NK002.3**

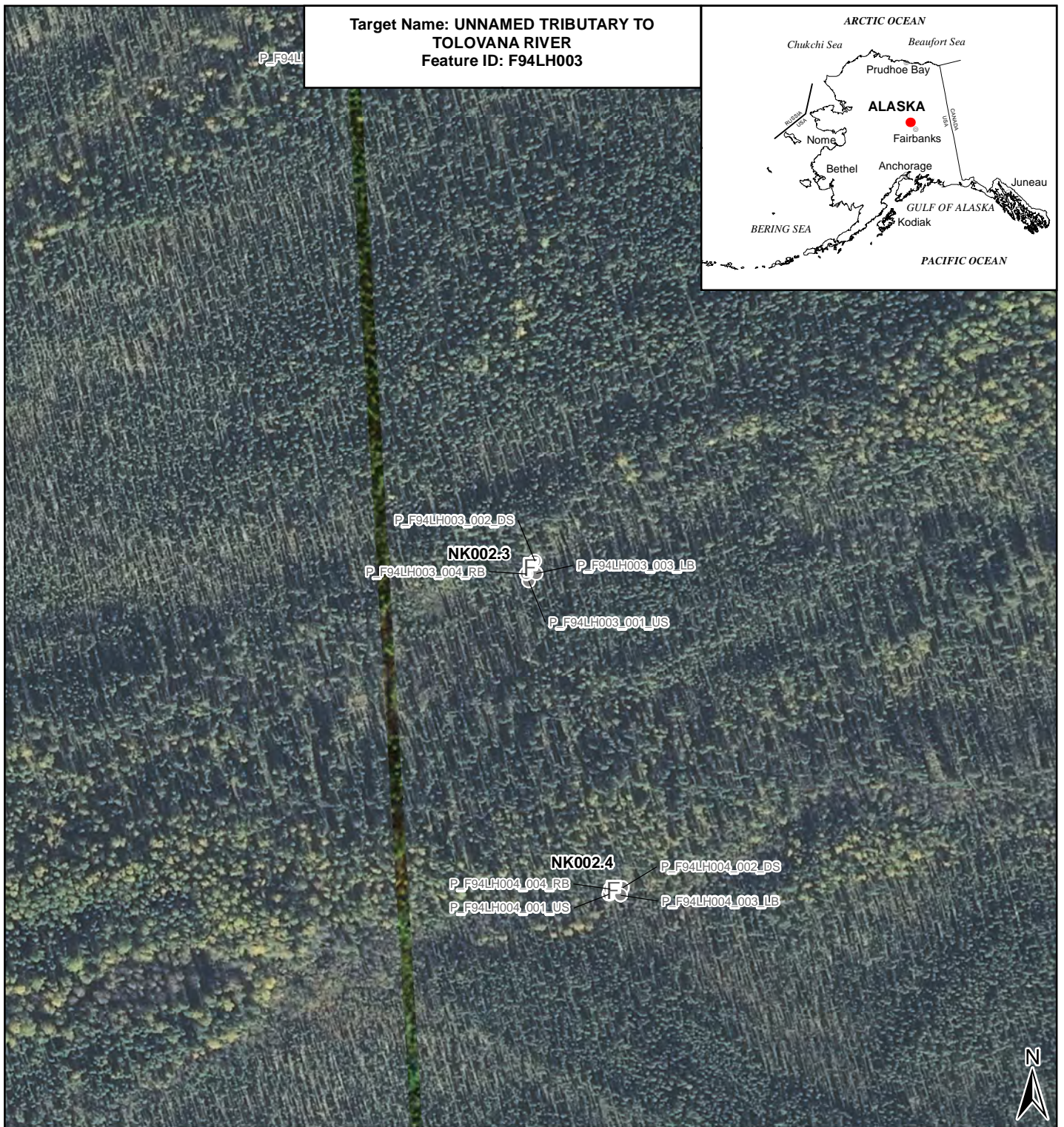


**P\_F94LH003\_008\_AERIAL  
AERIAL PHOTO**

**8/18/2015 NK002.3**



Target Name: UNNAMED TRIBUTARY TO  
TOLOVANA RIVER  
Feature ID: F94LH003



#### LEGEND

##### 2015 Fish Survey Location

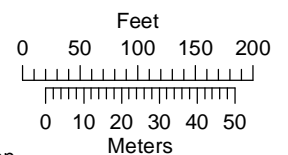
- F Fish Observed
- F No Fish Observed
- Photo Point

##### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

- BU Burbot
- CH Chinook Salmon
- CO Coho Salmon
- DV Dolly Varden
- NS Ninespine Stickleback
- O Other Species Not Listed
- RT Rainbow Trout

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
- TS Threespine Stickleback
- OBS Fish Observation, No Species Information



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DESIGN  
ICS

CHECK

DESIGN  
TCS

APPROVE

#### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 54 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

<b>SITE DESCRIPTION</b>					
Date: 8-18-15	Investigators: EAU, KRV, MPB	Team No.: F94	Feature ID: F94LH002		
Stream Name: Unnamed Tributary to Tolovana R			Stream ID: NK002.2		
Pipeline Milepost: 404.7	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): Heli		
Latitude: 65° 26' 01.3403" N			Longitude: 148° 36' 41.2827" W		
Logbook No.: 1	Logbook Page No.: 2-3	Total Fish Caught: 0 N/A	Fish Mortalities: N/A	Total Photos: 7	
US @ CL Pic No.: P-P94LH002-001-US	DS @ CL Pic No.: P-P94LH002-002-DS	RB to LB @ CL Pic No.: P-P94LH002-003-LB	LB to RB @ CL Pic No.: P-P94LH002-004-RB		
Other Pic No(s): P-P94LH002-005-AERIAL-007-AERIAL					

<b>PHYSICAL/CHEMICAL ATTRIBUTES</b>					
Weather (Describe): Cloudy			Precipitation (Describe): Light rain		
Water Temperature (°C): 6.91	Air Temperature (°C): 11	pH: 6.33	Dissolved Oxygen (mg/l): 6.78		
Specific Conductance (µS/cm): 132	Turbidity (NTU): 0.72	ORP (mV): 66.4	Dissolved Oxygen (%): 55.8		
Ambient Conductance (µS/cm): 89	Odor: N	Sheen (Y/N): N	Color: Lightly	Last date of Calibration: TTT	
Defined Channel (Y/N): Y	Notes: <del>Drainage</del> Poorly defined drainage channel			Wetted Width (m): 4.75 m	
Flow (Y/N): N	Notes: Intermittent pockets of water. No flow (yellow tint)			Thalweg Depth @ CL (m): 4" 0.1 m	
<b>Riparian Veg at 0-5 m at LB:</b> 50 Grass/Sedge (%) 70 Shrubs (%) 25 Trees (%) 5 Diameter DBH (in.)		<b>Riparian Veg at 0-5 m at RB:</b> 50 Grass/Sedge (%) 70 Shrubs (%) 25 Trees (%) 5 Diameter DBH (in.)		<b>Stream Substrate:</b> 100 Organics (%) Silt (%) Sand (%) Gravel (%) Cobble (%) Boulders (%)	
<b>Aquatic Habitats</b> Sand Bar Mud Bar Gravel Bar Riffles Pools Undercut Banks		Large Woody Debris Overhanging vegetation Contiguous Wetlands Emergent Plants Submerged Plants		N/A	
<b>Stream Type:</b> Perennial _____ Intermittent <input checked="" type="checkbox"/> Ephemeral _____					

**STREAM PROFILE: Cross Sectional at Crossing** (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

**STREAM PROFILE: Plan View** (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)

NORTH: ↑

Surface water & pockets of pooled throughout reach



Feature ID: F94LH002

Field Scientist/  
Crew Chief: [Signature] Technician: Nancy Valber Technical Lead: \_\_\_\_\_

**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F94LH002 FT # NK002.2 Date: 8.16.15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500
- ☒ If outside expected ranges, was sample re-taken?
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?



Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: P941H002

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☐ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

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☒ Kaley Volper  
Fishes Biologist (print)

☒ Kaley Volper  
Signature

☒ Kim Holmes  
Field Crew Chief (print)

☒ Kim Holmes  
Signature



P\_F94LH002\_001\_US  
LOOKING US AT PLX

8/18/2015 NK002.2



P\_F94LH002\_002\_DS  
LOOKING DS AT PLX

8/18/2015 NK002.2





**P\_F94LH002\_003\_LB**  
**LOOKING AT LB AT PLX**

**8/18/2015 NK002.2**



**P\_F94LH002\_004\_RB**  
**LOOKING AT RB AT PLX**

**8/18/2015 NK002.2**





**P\_F94LH002\_005\_AERIAL  
AERIAL PHOTO**

**8/18/2015 NK002.2**



**P\_F94LH002\_006\_AERIAL  
AERIAL PHOTO**

**8/18/2015 NK002.2**



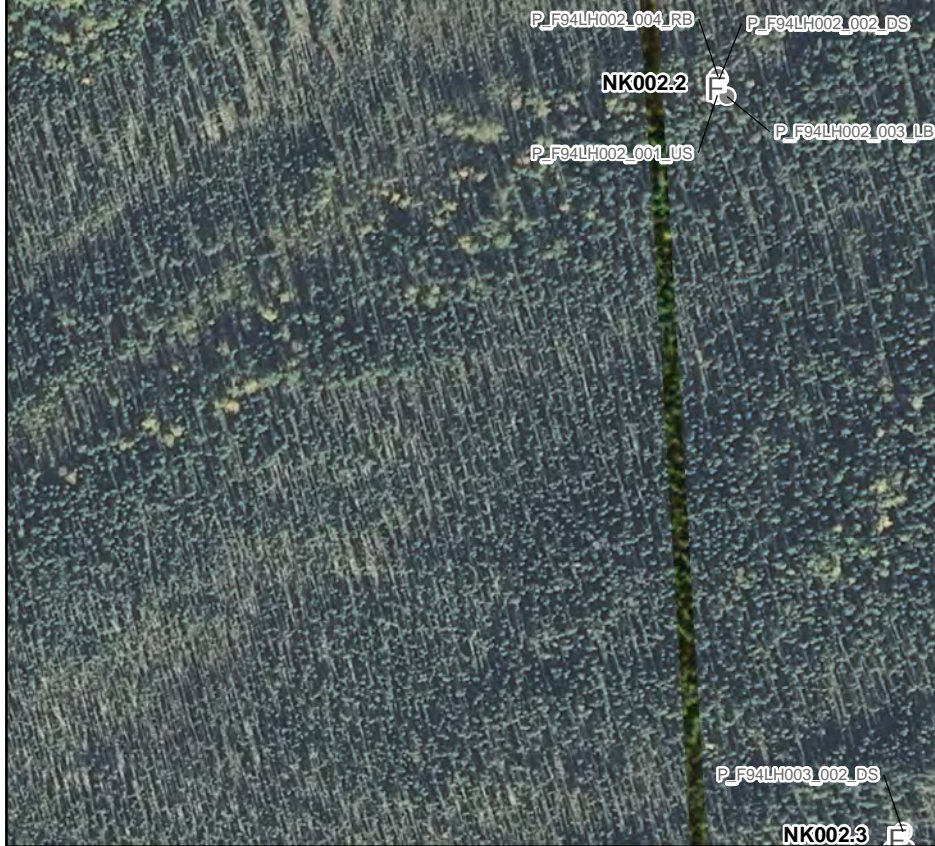


**P\_F94LH002\_007\_AERIAL  
AERIAL PHOTO**

**8/18/2015 NK002.2**



Target Name: UNNAMED TRIBUTARY TO  
TOLOVANA RIVER  
Feature ID: F94LH002



#### LEGEND

##### 2015 Fish Survey Location

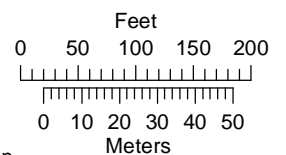
- F Fish Observed
- F No Fish Observed
- Photo Point

##### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

- BU Burbot
- CH Chinook Salmon
- CO Coho Salmon
- DV Dolly Varden
- NS Ninespine Stickleback
- O Other Species Not Listed
- RT Rainbow Trout

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
- TS Threespine Stickleback
- OBS Fish Observation, No Species Information



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DESIGN ICS	ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS				
CHECK	PROJECT AK 4	DATUM NAD83	CONTRACTOR NAME AECOM	MAP NUMBER Page 55 of 86	REV. A
DESIGN TCS	SCALE 1:2,000	DATE 15 Oct 2015	PROJECT NUMBER 26221392	ORIG PAGE SIZE 8.5 X 11	
APPV					



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 8-17-15	Investigators: KAH, KRV, MPB	Team No.: F94	Feature ID: F94LH001		
Stream Name: Unnamed Trib to Shorty Creek			Stream ID: NK002.1		
Pipeline Milepost: 404.2	Stream found as expected (Y/N): N - Dry drainage channel		Hwy MP (N/A if heli accessed): Heli		
Latitude: 65° 26' 32.0010		Longitude: 148° 36' 59.5265			
Logbook No.: 1	Logbook Page No.: 1	Total Fish Caught: N/A KH	Fish Mortalities: NA	Total Photos: 7	
US @ CL Pic No.: P-F94LH001-001-US	DS @ CL Pic No.: P-F94LH001-002-DS	RB to LB @ CL Pic No.: P-F94LH001-003-LB	LB to RB @ CL Pic No.: P-F94LH001-004-RB		
Other Pic No(s): P-F94LH001-005-AERIAL - 007-AERIAL					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): Partially cloudy			Precipitation (Describe): None		
Water Temperature (°C):	Air Temperature (°C):	pH:	Dissolved Oxygen (mg/l):		
Specific Conductance (µS/cm): N/A	Turbidity (NTU): N/A	ORP (mV): N/A	Dissolved Oxygen (%): N/A		
Ambient Conductance (µS/cm):	Odor:	Sheen (Y/N):	Color:	Last date of Calibration:	
Defined Channel (Y/N): N	Notes: Poorly defined				Wetted Width (m):
Flow (Y/N): N	Notes: No water - dry channel				Thalweg Depth @ CL (m):
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
70 Grass/Sedge (%)		70 Grass/Sedge (%)		100 Organics (%)	
60 Shrubs (%)		60 Shrubs (%)		Silt (%)	
80 Trees (%)		60 Trees (%)		Sand (%)	
6 Diameter DBH (in.)		4 Diameter DBH (in.)		Gravel (%)	
				Cobble (%)	
				Boulders (%)	
Stream Type:		Aquatic Habitats			
Perennial Intermittent <input checked="" type="checkbox"/> Ephemeral		<input type="checkbox"/> Sand Bar <input type="checkbox"/> Mud Bar <input type="checkbox"/> Gravel Bar <input type="checkbox"/> Riffles <input type="checkbox"/> Pools <input type="checkbox"/> Undercut Banks <input type="checkbox"/> Large Woody Debris <input type="checkbox"/> Overhanging vegetation <input type="checkbox"/> Contiguous Wetlands <input type="checkbox"/> Emergent Plants <input type="checkbox"/> Submerged Plants			

**STREAM PROFILE: Cross Sectional at Crossing** (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

Poorly-defined drainage feature - dry

**STREAM PROFILE: Plan View** (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)

NORTH: N ↑

drainage better downstream but generally poorly-defined w/intermittent pockets of water

POND

Feature ID: F94LH001

[illegible]

Field Crew Chief: [Signature] Field Scientist/ Technician: Kaleny Valdez Technical Lead: \_\_\_\_\_



**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F94LH001 FT# NK002.1 Date: 8-17-15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☐ pH: 4.0 – 10.0
  - ☐ NTU: 0 – 3000
  - ☐ DO (mg/L): 1.0 – 15.0
  - ☐ Temp.: 1.0 – 19.0
  - ☐ Specific Conductance: 20 - 1500
- ☒ If outside expected ranges, was sample re-taken?
- ☐ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?

Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F94LH001

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☐ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

☒ Kaley Volper  
Fisheries Biologist (print)

☒ Kaley Volper  
Signature

☒ Jim Holmes  
Field Crew Chief (print)

☒ [Signature]  
Signature





P\_F94LH001\_001\_US  
LOOKING US AT PLX

8/17/2015 NK002.1



P\_F94LH001\_002\_DS  
LOOKING DS AT PLX

8/17/2015 NK002.1





**P\_F94LH001\_003\_LB**  
**LOOKING AT LB AT PLX**

**8/17/2015 NK002.1**



**P\_F94LH001\_004\_RB**  
**LOOKING AT RB AT PLX**

**8/17/2015 NK002.1**





**P\_F94LH001\_005\_AERIAL  
AERIAL PHOTO**

**8/17/2015 NK002.1**



**P\_F94LH001\_006\_AERIAL  
AERIAL PHOTO**

**8/17/2015 NK002.1**





**P\_F94LH001\_007\_AERIAL  
AERIAL PHOTO**

**8/17/2015 NK002.1**



Target Name: UNNAMED TRIBUTARY TO SHORTY CREEK  
Feature ID: F94LH001



# LEGEND

## 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

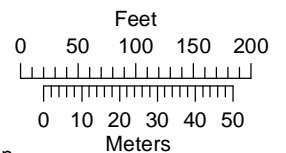
## Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

- BU Burbot
- CH Chinook Salmon
- CO Coho Salmon
- DV Dolly Varden
- NS Ninespine Stickleback
- O Other Species Not Listed
- RT Rainbow Trout

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
- TS Threespine Stickleback
- OBS Fish Observation, No Species Information

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
- TS Threespine Stickleback
- OBS Fish Observation, No Species Information



## ALASKA LNG

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DESIGN		CHECK		SCALE		DATE		PROJECT NUMBER		ORIG PAGE SIZE		MAP NUMBER		REV.	
DESIGN	ICS	CHECK	TCS	AK 4	NAD83	AECOM	Page 56 of 86	A	1:2,000	15 Oct 2015	26221392	8.5 X 11			



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION				
Date: 7/17/2015	Investigators: SCS NJS ADF	Team No.: F86	Feature ID: F86AY006	
Stream Name: unnamed tributary to Prospect creek		Stream ID: AL244.1		
Pipeline Milepost: <sup>scs</sup> 134.6	Stream found as expected (Y/N): Y		Hwy MP (N/A if hell accessed): 134.6	
Latitude: 66° 46' 46.2410" N		Longitude: 150° 42' 20.9168" W		
Logbook No.: 2	Logbook Page No.: 10-12	Total Fish Caught: 3	Fish Mortalities: 0	Total Photos: 7
US @ CL Pic No.: P-F86AY006-001-US	DS @ CL Pic No.: P-F86AY006-002-DS	RB to LB @ CL Pic No.: P-F86AY006-003-LB	LB to RB @ CL Pic No.: P-F86AY006-004-RB	
Other P-F86AY006-005-STREAM (general habitat photo of stream near MTA)				

PHYSICAL/CHEMICAL ATTRIBUTES				
Weather (Describe): overcast		Precipitation (Describe): none		
Water Temperature (°C): 5.29	Air Temperature (°C): 17	pH: 6.55	Dissolved Oxygen (mg/l): 12.61	
Specific Conductance (µS/cm): 103	Turbidity (NTU): 4.87	ORP (mV): 131.7	Dissolved Oxygen (%): 99.5	
Ambient Conductance (µS/cm): 65	Odor: none	Sheen (Y/N): N	Color: clear	Last date of Calibration: 7/16/2015
Defined Channel (Y/N): Y	Notes: contained within banks			Wetted Width (m): 1.05
Flow (Y/N): Y	Notes: steady riffle/pool flow			Thalweg Depth @ CL (m): 0.49
<b>Riparian Veg at 0-5 m at LB:</b> 30 Grass/Sedge (%) 80 Shrubs (%) 0 Trees (%) NA Diameter DBH (in.)		<b>Riparian Veg at 0-5 m at RB:</b> 10 Grass/Sedge (%) 90 Shrubs (%) 0 Trees (%) NA Diameter DBH (in.)		<b>Stream Substrate:</b> 0 Organics (%) 50 Silt (%) 20 Sand (%) 40 Gravel (%) 0 Cobble (%) 0 Boulders (%)
<b>Aquatic Habitats</b> Sand Bar <input checked="" type="checkbox"/> Mud Bar <input checked="" type="checkbox"/> Gravel Bar <input checked="" type="checkbox"/> Riffles <input checked="" type="checkbox"/> Pools <input checked="" type="checkbox"/> Undercut Banks		Large Woody Debris <input checked="" type="checkbox"/> Overhanging vegetation Contiguous Wetlands Emergent Plants Submerged Plants		
<b>Stream Type:</b> <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral				

STREAM PROFILE: Cross Sectional at Crossing (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)	
STREAM PROFILE: Plan View (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)	



Feature ID: F86AY006

NOTES (any additional information)

- one fish caught in net (slimy sculpin)
- Sulpin 003 (slimy) had a long recovery (5 min)
- stream is a tributary to anadromous Prospect Creek
- clearwater stream w/ steady flow + ripple pool habitat; gravel substrate w/ mud in some areas

Revision Date: 06/09/2015

**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86AY706

FT # AL244,1

Date: 7/19/2015

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☐ pH: 4.0 – 10.0
  - ☐ NTU: 0 – 3000
  - ☐ DO (mg/L): 1.0 – 15.0
  - ☐ Temp.: 1.0 – 19.0
  - ☐ Specific Conductance: 20 - 1500
- ☒ If outside expected ranges, was sample re-taken?
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?



Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86A4006

**6. Fish Observations**

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

**7. General**

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

**X** Neal Smith

Fisheries Biologist (print)

**X**

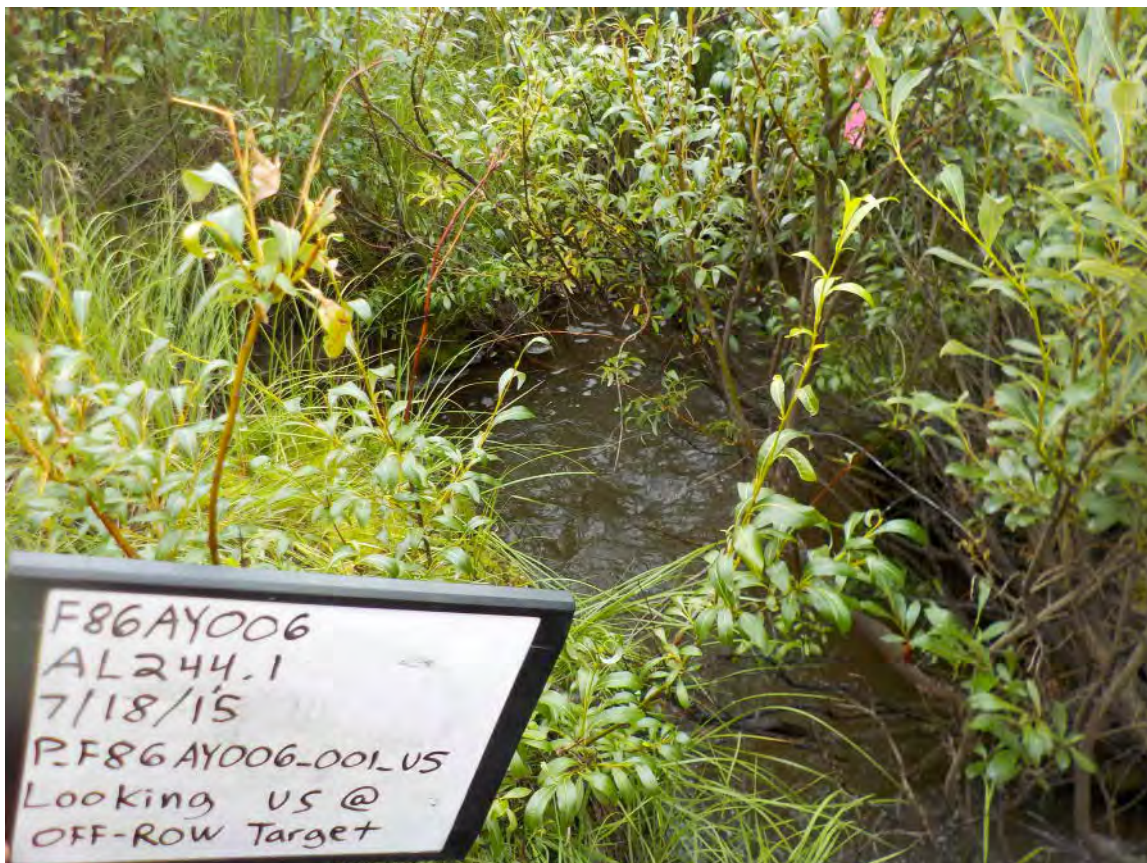
Signature

**X** Sam Simpson

Field Crew Chief (print)

**X**

Signature



P\_F86AY006\_001\_US

7/18/2015 AL244.1

LOOKING US AT OFF-ROW TARGET



P\_F86AY006\_002\_DS

7/18/2015 AL244.1

LOOKING DS AT OFF-ROW TARGET





**P\_F86AY006\_003\_LB**

**7/18/2015 AL244.1**

**LOOKING AT LB AT OFF-ROW TARGET**



**P\_F86AY006\_004\_RB**

**7/18/2015 AL244.1**

**LOOKING AT RB AT OFF-ROW TARGET**





**P\_F86AY006\_005\_STREAM** **7/18/2015** **AL244.1**  
**GENERAL HABITAT PHOTO OF STREAM NEAR MT 1**



**P\_F86AY006\_006\_SCULPIN** **7/18/2015** **AL244.1**  
**PHOTO OF SLIMY SCULPIN**





**P\_F86AY006\_007\_SCULPIN**

**7/18/2015 AL244.1**

**UNDERWATER PHOTO OF SLIMY SCULPIN**

Target Name: UNNAMED TRIBUTARY TO  
PROSPECT CREEK  
Feature ID: F86AY006



P\_F86AY006\_001\_US  
P\_F86AY006\_003\_LB  
P\_F86AY006\_002\_DS  
P\_F86AY006\_004\_RB  
SS  
AL244.1



## LEGEND

### 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

### Species Observed

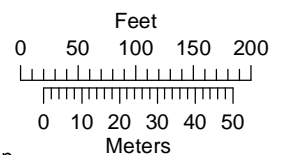
- AB Alaska Blackfish
- AG Arctic Grayling

- BU
- CH
- CO
- DV
- NS
- O
- RT

- Burbot
- Chinook Salmon
- Coho Salmon
- Dolly Varden
- Ninespine Stickleback
- Other Species Not Listed
- Rainbow Trout

- SA(U)
- SC(U)
- SS
- ST(U)
- TS
- OBS

- Salmonid (Unspecified)
- Sculpin (Unspecified)
- Slimy Sculpin
- Stickleback (Unspecified)
- Threespine Stickleback
- Fish Observation, No Species Information



## ALASKA LNG

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DESIGN  
ICS

CHECK

DESIGN  
TCS

APPROVE

### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 57 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION							
Date:	7/18/2015	Investigators:	SLS, MJS, ADF	Team No.:	F86	Feature ID:	F86AY005
Stream Name:	Clara Creek overflow				Stream ID:	AL209	
Pipeline Milepost:	240.4	Stream found as expected (Y/N):	Y	Hwy MP (N/A if heli accessed):	176.5		
Latitude:	67° 16' 12.8182" N			Longitude:	150° 10' 10.2789" W		
Logbook No.:	2	Logbook Page No.:	9-10	Total Fish Caught:	0	Fish Mortalities:	NA
US @ CL Pic No.: P-F86AY005-001-US		DS @ CL Pic No.: P-F86AY005-002-DS		RB to LB @ CL Pic No.: P-F86AY005-003-LB		LB to RB @ CL Pic No.: P-F86AY005-004-RB	
Other Pic No(s): P-F86AY005-005-DRY (photo of dry channel DS of target) P-F86AY005-006-US CULVERT (photo of culvert, looking US = location of MT1)							

PHYSICAL/CHEMICAL ATTRIBUTES							
Weather (Describe): overcast				Precipitation (Describe): none			
Water Temperature (°C):	7.5	Air Temperature (°C):	17	pH:	4.08	Dissolved Oxygen (mg/l):	5.43
Specific Conductance (µS/cm):	75	Turbidity (NTU):	0.97	ORP (mV):	154.6	Dissolved Oxygen (%):	45.7
Ambient Conductance (µS/cm):	50	Odor:	none	Sheen (Y/N):	N	Color:	clear
Defined Channel (Y/N):	Y	Notes: seems to be drying out - lots of moss				Wetted Width (m): 2 m	
Flow (Y/N):	N	Notes: dry channel w/ isolated pools				Thalweg Depth @ CL (m): 0.15 m	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:		Aquatic Habitats	
30 Grass/Sedge (%)		30 Grass/Sedge (%)		70 Organics (%)		Sand Bar	
80 Shrubs (%)		70 Shrubs (%)		20 Silt (%)		Mud Bar	
10 Trees (%)		5 Trees (%)		5 Sand (%)		Gravel Bar	
5 Diameter DBH (in.)		3 Diameter DBH (in.)		20 Gravel (%)		Riffles	
				Cobble (%)		Pools	
				Boulders (%)		Undercut Banks	
Stream Type:							
Perennial <input checked="" type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral <input type="checkbox"/>							

**STREAM PROFILE: Cross Sectional at Crossing** (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

**STREAM PROFILE: Plan View** (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)

Feature ID: F86AY005

- No fish caught
- moved target approx 50' Northeast (upstream) where there was actually enough water to sample.
- Stream channel is present but mostly dried out and limited to isolated pools
- moss + detritus layer cover gravel substrate

Field Crew Chief: <u>                    </u>	Field Scientist/Technician: <u>                    </u>	Technical Lead: <u>                    </u>
---	---	---



**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86AY005

FT # AL209

Date: 7/18/2015

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☐ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500
- ☒ If outside expected ranges, was sample re-taken?
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?

Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86AY005

**6. Fish Observations**

- NA ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

**7. General**

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- NO ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

X

Neal Smith

Fisheries Biologist (print)

X

Neal Smith

Signature

X

Sam Simpson

Field Crew Chief (print)

X

Sam Simpson

Signature





P\_F86AY005\_001\_US

7/18/2015 AL209

LOOKING US AT OFF-ROW TARGET



P\_F86AY005\_002\_DS

7/18/2015 AL209

LOOKING DS AT OFF-ROW TARGET





**P\_F86AY005\_003\_LB**

**7/18/2015 AL209**

**LOOKING AT LB AT OFF-ROW TARGET**



**P\_F86AY005\_004\_RB**

**7/18/2015 AL209**

**LOOKING AT RB AT OFF-ROW TARGET**





**P\_F86AY005\_005\_DRY**

**7/18/2015 AL209**

**PHOTO OF DRY CHANNEL DS OF OFF-ROW TARGET**



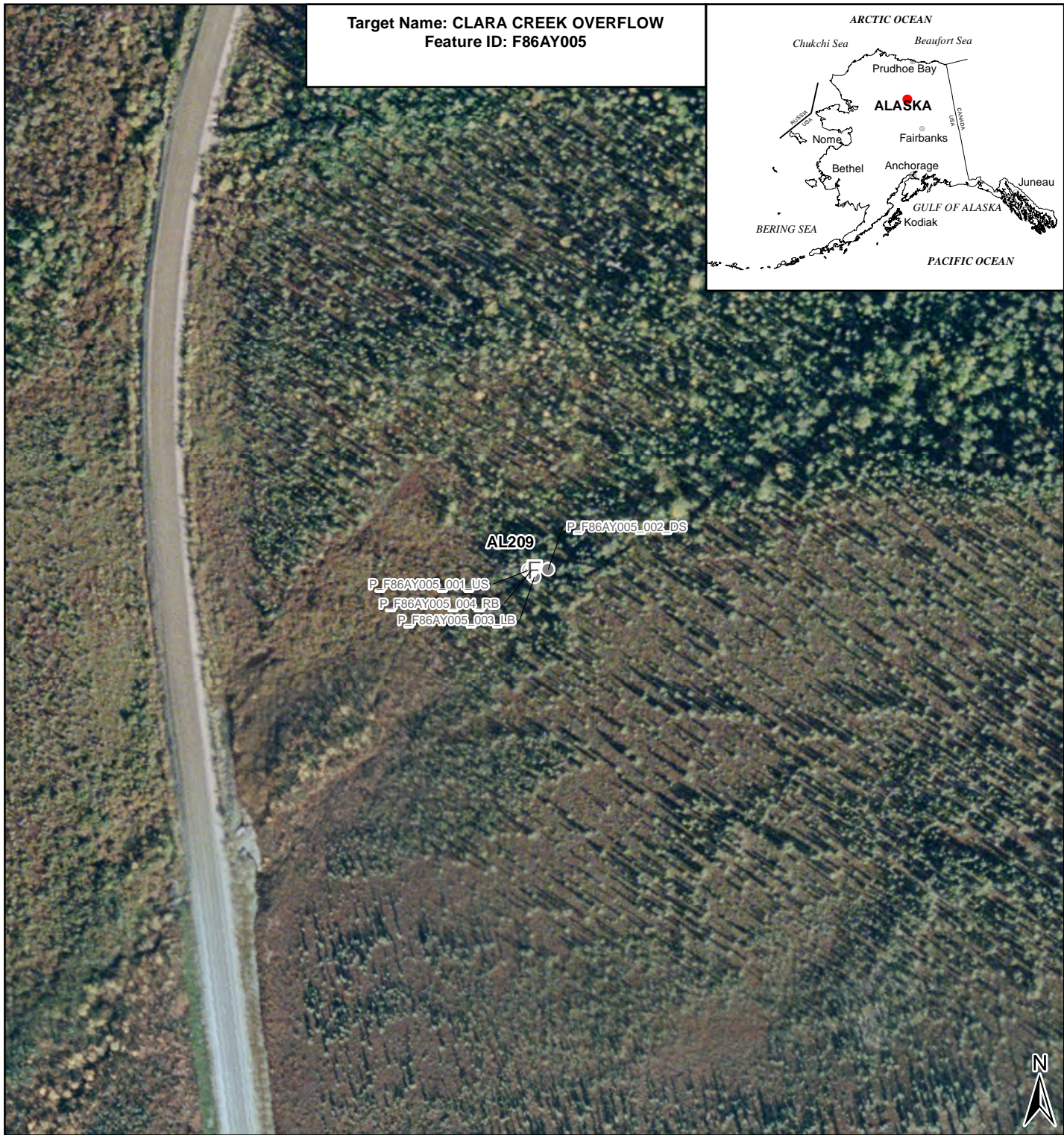
**P\_F86AY005\_006\_US CULVERT**

**7/18/2015 AL209**

**PHOTO OF CULVERT LOOKING US AT LOCATION OF MT 1**



Target Name: CLARA CREEK OVERFLOW  
Feature ID: F86AY005



LEGEND

2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

Species Observed

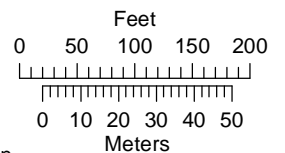
- AB Alaska Blackfish
- AG Arctic Grayling

- BU
- CH
- CO
- DV
- NS
- O
- RT

- Burbot
- Chinook Salmon
- Coho Salmon
- Dolly Varden
- Ninespine Stickleback
- Other Species Not Listed
- Rainbow Trout

- SA(U)
- SC(U)
- SS
- ST(U)
- TS
- OBS

- Salmonid (Unspecified)
- Sculpin (Unspecified)
- Slimy Sculpin
- Stickleback (Unspecified)
- Threespine Stickleback
- Fish Observation, No Species Information



ALASKA LNG

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DESIGN ICS		ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS			
DESIGN TCS	PROJECT	AK 4	DATUM	NAD83	CONTRACTOR NAME
	SCALE	1:2,000	DATE	15 Oct 2015	AECOM
APPR	PROJECT NUMBER	26221392	ORIG PAGE SIZE	8.5 X 11	MAP NUMBER
					Page 58 of 86
					REV. A



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 7/14/2015	Investigators: SCS NJS ADF	Team No.: F86	Feature ID: F86AY007		
Stream Name: Unnamed Tributary to Dietrich River			Stream ID: ALISI.1		
Pipeline Milepost: 181.5	Stream found as expected (Y/N): N - dry channel		Hwy MP (N/A if heli accessed): N/A		
Latitude: 68.013 SCS			Longitude:		
Logbook No.: 2	Logbook Page No.: 2-3	Total Fish Caught: N/A	Fish Mortalities: N/A	Total Photos: 49	
US @ CL Pic No.: N/A	DS @ CL Pic No.: N/A	RB to LB @ CL Pic No.: N/A	LB to RB @ CL Pic No.: N/A		
Other Pic No(s): MISC PT. P-F86ALISI.1-001-US		MISC PT. P-F86ALISI.1-003-AERIAL			
MISC PT. P-F86ALISI.1-002-DS		MISC PT. P-F86ALISI.1-004-AERIAL			

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): sunny		Precipitation (Describe): none			
Water Temperature (°C): N/A	Air Temperature (°C): N/A	pH: N/A	Dissolved Oxygen (mg/l): N/A		
Specific Conductance (µS/cm): N/A	Turbidity (NTU): N/A	ORP (mV): N/A	Dissolved Oxygen (%): N/A		
Ambient Conductance (µS/cm): N/A	Odor: N/A	Sheen (Y/N): N/A	Color: 1	Last date of Calibration:	
Defined Channel (Y/N): Y	Notes: DRY but channel present			Wetted Width (m):	
Flow (Y/N): N/A	Notes: N/A			Thalweg Depth @ CL (m):	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
Grass/Sedge (%)		Grass/Sedge (%)		Organics (%)	
Shrubs (%)		Shrubs (%)		Silt (%)	
Trees (%)		Trees (%)		Sand (%)	
Diameter DBH (in.)		Diameter DBH (in.)		Gravel (%)	
				Cobble (%)	
				Boulders (%)	
Stream Type:		Aquatic Habitats			
Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input checked="" type="checkbox"/>		Sand Bar			
		Mud Bar			
		Gravel Bar			
		Riffles			
		Pools			
		Undercut Banks			
		Large Woody Debris			
		Overhanging vegetation			
		Contiguous Wetlands			
		Emergent Plants			
		Submerged Plants			

STREAM PROFILE: Cross Sectional at Crossing (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

N/A

STREAM PROFILE: Plan View (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)

NORTH: ↑

MISC PT (no Feature ID): F86ALISI.1B (took 5 photos)

dry channel

500 ft.

P \* P wet discontinuous stream patches

ORIGINAL TARGET: MISC PT F86ALISI.1 (took 4 photos)

(F86AY007)

Dietrich River



Feature ID: F86A4007

Page 2 of 2



SPREAD:AY



Concept Information - Confidential

Unamed Tributary to Dienrich River

Dienrich River

Unamed Tributary to Dienrich River

DALTON HIGHWAY

ARCTIC OCEAN

Chukchi Sea

Beaufort Sea

ALASKA

Nome

Bethel

Anchorage

Fairbanks

Kodiak

Juneau

Chukchi Sea

Beaufort Sea

ALASKA

Nome

Bethel

Anchorage

Fairbanks

Kodiak

Juneau

Chukchi Sea

Beaufort Sea

ALASKA

Nome

Bethel

Anchorage

Fairbanks

Kodiak

Juneau

Chukchi Sea

Beaufort Sea

ALASKA

Nome

Bethel

Anchorage

Fairbanks

Kodiak

Juneau

Chukchi Sea

Beaufort Sea

ALASKA

Nome

Bethel

Anchorage

Fairbanks

Kodiak

Juneau

Chukchi Sea

Beaufort Sea

ALASKA

Nome

Bethel

Anchorage

Fairbanks

Kodiak

Juneau

Chukchi Sea

Beaufort Sea

ALASKA

Nome

Bethel

Anchorage

Fairbanks

Kodiak

Juneau

Chukchi Sea

Beaufort Sea

ALASKA

Nome

Bethel

Anchorage

Fairbanks

Kodiak

Juneau

Chukchi Sea

Beaufort Sea

ALASKA

Nome

Bethel

Anchorage

Fairbanks

Kodiak

Juneau

Chukchi Sea

Beaufort Sea

ALASKA

Nome

Bethel

Anchorage

Fairbanks

Kodiak

Juneau

Chukchi Sea

Beaufort Sea

ALASKA

Nome

Bethel

Anchorage

Fairbanks

Kodiak

Juneau

Chukchi Sea

Beaufort Sea

ALASKA

Nome

Bethel

Anchorage

Fairbanks

Kodiak

Juneau

Chukchi Sea

Beaufort Sea

ALASKA

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Bethel

Anchorage

Fairbanks

Kodiak

Juneau

Chukchi Sea

Beaufort Sea

ALASKA

Nome

Bethel

Anchorage

Fairbanks

Kodiak





P\_F86AY007\_001\_US

7/14/2015 AL151.1

DRY CHANNEL LOOKING US AT PLX



P\_F86AY007\_002\_DS

7/14/2015 AL151.1

DRY CHANNEL LOOKING DS AT PLX





**P\_F86AY007\_003\_AERIAL**  
**AERIAL PHOTO OF AL151.1**

**7/14/2015 AL151.1**



**P\_F86AY007\_004\_AERIAL**  
**AERIAL PHOTO OF AL151.1**

**7/14/2015 AL151.1**





P\_F86AY007\_005\_ALT\_US  
LOOKING US AT PLX AT AL151.1B

7/14/2015 AL151.1B



P\_F86AY007\_006\_ALT\_DS  
LOOKING DS AT PLX AT AL151.1B

7/14/2015 AL151.1B





**P\_F86AY007\_007\_ALT\_AERIAL**  
**AERIAL PHOTO OF AL151.1B**

**7/14/2015 AL151.1B**



**P\_F86AY007\_008\_ALT\_AERIAL**  
**AERIAL PHOTO OF AL151.1B**

**7/14/2015 AL151.1B**



**P\_F86AY007\_009\_ALT\_AERIAL  
AERIAL PHOTO OF AL151.1B**

**7/14/2015 AL151.1B**



Target Name: UNNAMED TRIBUTARY TO  
DIETRICH RIVER  
Feature ID: F86AY007



AL151.1  
F



#### LEGEND

##### 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

##### Species Observed

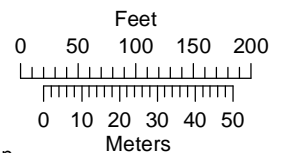
- AB Alaska Blackfish
- AG Arctic Grayling

- BU
- CH
- CO
- DV
- NS
- O
- RT

- Burbot
- Chinook Salmon
- Coho Salmon
- Dolly Varden
- Ninespine Stickleback
- Other Species Not Listed
- Rainbow Trout

- SA(U)
- SC(U)
- SS
- ST(U)
- TS
- OBS

- Salmonid (Unspecified)
- Sculpin (Unspecified)
- Slimy Sculpin
- Stickleback (Unspecified)
- Threespine Stickleback
- Fish Observation, No Species Information



#### ALASKA LNG

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DRAWING ICS		ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS			
DESIGN TCS	PROJECT AK 4	DATUM NAD83	CONTRACTOR NAME AECOM		MAP NUMBER Page 59 of 86
SCALE 1:2,000	DATE 15 Oct 2015	PROJECT NUMBER 26221392	ORIG PAGE SIZE 8.5 X 11	REV. A	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 7/15/2015	Investigators: SCS NSS ADF	Team No.: F86	Feature ID: F86AY001		
Stream Name: Unnamed Tributary to Dietrich River			Stream ID: AL149.1		
Pipeline Milepost: 180.8	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): heli		
Latitude: 68°01'21.1885" N			Longitude: -149°43'22.7102" W		
Logbook No.: 2	Logbook Page No.: 2-4	Total Fish Caught: 3	Fish Mortalities: 0	Total Photos: 10	
US @ CL Pic No.: P-F86AY001-001-US	DS @ CL Pic No.: P-F86AY001-002-DS	RB to LB @ CL Pic No.: P-F86AY001-003-LB	LB to RB @ CL Pic No.: P-F86AY001-004-RB		
Other Pic No(s): P-F86AY001-005-008, AERIAL (4 aerials)					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): Sunny			Precipitation (Describe): none		
Water Temperature (°C): 7.65	Air Temperature (°C): 19	pH: 6.59	Dissolved Oxygen (mg/l): 11.49		
Specific Conductance (µS/cm): 337	Turbidity (NTU): 0.94	ORP (mV): 358.3	Dissolved Oxygen (%): 97.3		
Ambient Conductance (µS/cm): 226	Odor: None	Sheen (Y/N): N	Color: Clear	Last date of Calibration: 7/11/2015	
Defined Channel (Y/N): Y	Notes: high gradient runs down from mountains			Wetted Width (m): 5.2m	
Flow (Y/N): Y	Notes: swift + riffle/pool			Thalweg Depth @ CL (m): 0.46	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
10 Grass/Sedge (%)		3 Grass/Sedge (%)		0 Organics (%)	
80 Shrubs (%)		60 Shrubs (%)		0 Silt (%)	
5 Trees (%)		10 Trees (%)		10 Sand (%)	
8 Diameter DBH (in.)		3 Diameter DBH (in.)		80 Gravel (%)	
				20 Cobble (%)	
				3 Boulders (%)	
Stream Type:				Aquatic Habitats	
<input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral				<input type="checkbox"/> Sand Bar <input type="checkbox"/> Large Woody Debris <input type="checkbox"/> Mud Bar <input type="checkbox"/> Overhanging vegetation <input checked="" type="checkbox"/> Gravel Bar <input type="checkbox"/> Contiguous Wetlands <input checked="" type="checkbox"/> Riffles <input type="checkbox"/> Emergent Plants <input checked="" type="checkbox"/> Pools <input type="checkbox"/> Submerged Plants <input type="checkbox"/> Undercut Banks	

**STREAM PROFILE: Cross Sectional at Crossing** (Include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

**STREAM PROFILE: Plan View** (Include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)



Feature ID: F86 AY001

Field Crew Chief: CS-1 Field Scientist/Technician: Adrian Smith Technical Lead: \_\_\_\_\_

**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86A4001 FT # AL149.1 Date: 7/15/15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500

☒ N/A If outside expected ranges, was sample re-taken?

- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?



Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86A4001

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

X Neal Smith

Fisheries Biologist (print)

X [Signature]

Signature

X Sam Simpson

Field Crew Chief (print)

X [Signature]

Signature



P\_F86AY001\_001\_US  
LOOKING US AT PLX

7/14/2015 AL149.1



P\_F86AY001\_002\_DS  
LOOKING DS AT PLX

7/14/2015 AL149.1





P\_F86AY001\_003\_LB

7/14/2015 AL149.1

LOOKING AT LB AT PLX



P\_F86AY001\_004\_RB

7/14/2015 AL149.1

LOOKING AT RB AT PLX





**P\_F86AY001\_005\_AERIAL  
AERIAL PHOTO**

**7/14/2015 AL149.1**



**P\_F86AY001\_006\_AERIAL  
AERIAL PHOTO**

**7/14/2015 AL149.1**





**P\_F86AY001\_007\_AERIAL  
AERIAL PHOTO**

**7/14/2015 AL149.1**



**P\_F86AY001\_008\_AERIAL  
AERIAL PHOTO**

**7/14/2015 AL149.1**



P\_F86AY001\_009\_SCULPIN  
PHOTO OF SLIMY SCULPIN

7/14/2015 AL149.1



P\_F86AY001\_010\_AG  
PHOTO OF ARCTIC GRAYLING

7/14/2015 AL149.1



Target Name: UNNAMED TRIBUTARY TO  
DIETRICH RIVER  
Feature ID: F86AY001



#### LEGEND

##### 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

##### Species Observed

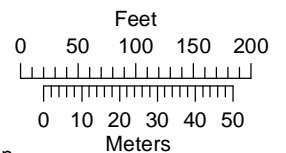
- AB Alaska Blackfish
- AG Arctic Grayling

- BU
- CH
- CO
- DV
- NS
- O
- RT

- Burbot
- Chinook Salmon
- Coho Salmon
- Dolly Varden
- Ninespine Stickleback
- Other Species Not Listed
- Rainbow Trout

- SA(U)
- SC(U)
- SS
- ST(U)
- TS
- OBS

- Salmonid (Unspecified)
- Sculpin (Unspecified)
- Slimy Sculpin
- Stickleback (Unspecified)
- Threespine Stickleback
- Fish Observation, No Species Information



#### ALASKA LNG

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DESIGN  
ICS

CHECK

DESIGN  
TCS

APPRO

#### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 60 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 7/17/2015	Investigators: SCS NOS ADF	Team No.: F86	Feature ID: F86AY002		
Stream Name: unnamed Trib. to North Fork Chandalar River	Stream ID: AL145.3				
Pipeline Milepost: 174.7	Stream found as expected (Y/N): Y	Hwy MP (N/A if heli accessed): 239.4			
Latitude: 68° 04' 46.2897" N	Longitude: 149° 34' 27.4062" W				
Logbook No.: 2	Logbook Page No.: 6-8	Total Fish Caught: X <sup>SCS</sup> 5	Fish Mortalities: 0	Total Photos: 8	
US @ CL Pic No.: P-F86AY002-001-US	DS @ CL Pic No.: P-F86AY002-002-DS	RB to LB @ CL Pic No.: P-F86AY002-003-LB	LB to RB @ CL Pic No.: P-F86AY002-004-RB		
Other Pic No(s): P-F86AY002-005-OVERVIEW P-F86AY002-006-OVERVIEW		P-F86AY002-007-DS CULVERT			

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): Partly cloudy		Precipitation (Describe): none			
Water Temperature (°C): 5.53	Air Temperature (°C): 19	pH: 6.35	Dissolved Oxygen (mg/l): 11.0		
Specific Conductance (µS/cm): 746	Turbidity (NTU): 81.4	ORP (mV): 173.7	Dissolved Oxygen (%): 87.3		
Ambient Conductance (µS/cm): 468	Odor: none	Sheen (Y/N): N	Color: tan	Last date of Calibration: 7/15/2015	
Defined Channel (Y/N): N	Notes: is defined US; ponded @ target			Wetted Width (m): 33.0	
Flow (Y/N): Y	Notes: slow @ target; more apparent US			Thalweg Depth @ CL (m): 0.41	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
20 Grass/Sedge (%)		20 Grass/Sedge (%)		30 Organics (%)	
90 Shrubs (%)		80 Shrubs (%)		90 Silt (%)	
0 Trees (%)		0 Trees (%)		1 Sand (%)	
NA Diameter DBH (in.)		NA Diameter DBH (in.)		0 Gravel (%)	
				0 Cobble (%)	
				0 Boulders (%)	
Stream Type:		Aquatic Habitats			
X Perennial		Sand Bar			
Intermittent		X Mud Bar			
Ephemeral		Gravel Bar			
		Riffles			
		X Pools			
		Undercut Banks			
		Large Woody Debris			
		Overhanging vegetation			
		X Contiguous Wetlands			
		X Emergent Plants			
		X Submerged Plants			

**STREAM PROFILE: Cross Sectional at Crossing** (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

**STREAM PROFILE: Plan View** (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)



# STREAM FISH INVESTIGATION DATA FORM

Feature ID: F86AY002

METHODS ATTRIBUTES				
Minnow Traps (Y/N): <u>Y</u>	Hook and Line (Y/N): <u>Y</u>	Beach Seine (Y/N): <u>N</u>	Fyke Net (Y/N): <u>N</u>	Hoop Net (Y/N): <u>N</u>
No. of Minnow Traps Set: <u>3</u>	Date & Time in: (mm/dd/yyyy) <u>7/17/2015 1005</u>	Date & Time in: (mm/dd/yyyy) <u>1</u>	Date & Time in: (mm/dd/yyyy) <u>1</u>	Date & Time in: (mm/dd/yyyy) <u>1</u>
Date & Time in: (mm/dd/yyyy) <u>7/16/2015 1145</u>	No. of lines in water: <u>2</u>	No. of passes: <u>1</u>	Date & Time out: (mm/dd/yyyy) <u>1</u>	Date & Time out: (mm/dd/yyyy) <u>1</u>
Date & Time out: (mm/dd/yyyy) <u>7/17/2015 1000</u>	Time lines in water: <u>60 min.</u>	Reach Length (m): <u>1</u>		

ELECTROFISHING ATTRIBUTES				
EF (Y/N): <u>N</u>	EF Start Time: <u>1005</u>	EF End Time: <u>1100</u>	EF Time (seconds): <u>1</u>	EF Reach Length (m): <u>1</u>
Duty Cycle: <u>1</u>	Frequency (Hz): <u>1</u>	Waveform: <u>1</u>	Sampling Efficiency (% of sample reach): <u>1</u>	
Current (A): <u>1</u>	Volts (V): <u>1</u>	Power (W): <u>1</u>	(amp x volts)	

FISH OBSERVATIONS						
ID (Seq. Num)	Gear Type	Species	Total Length (mm)	Life Stage (Juvenile or Adult)	Disposition (Dead or Alive)	Picture No.
001	vis. obs	arctic grayling	n/a	juv/adult	alive	n/a
002	"	"	"	"	"	"
003	"	"	"	"	"	"
004	vis. obs / Hook	"	n/a	"	alive	"
005	Hook + Line	arctic grayling	148	juv/adult	alive	* P-F86AY002-008-GRAYLING
				juvenile		

NOTES (any additional information)
<p>- visually observed several juv/adult arctic grayling upon arrival @ target + checkin point</p> <p>- No fish caught in mt</p> <p>- stream is more defined upstream, but ponded w/ unstable banks + bottom at target near culvert @ Dalton Highway.</p> <p>- Culvert is perched ~ 3" on DS side of Road</p> <p>- one grayling bit while hook + line fishing - did not catch</p> <p>Had Success afterward w/ hook + line</p> <p>- 005 was released w/ a little blood coming from the eye</p>

MISCELLANEOUS POINTS (if applicable)	
Point ID: <u>NA</u>	Description: <u>NA</u>
Point ID: <u>NA</u>	Description: <u>NA</u>

Field Crew Chief: <u>Sgt</u>	Field Scientist/Technician: <u>Michael King</u>	Technical Lead: <u></u>
------------------------------	---	-------------------------

**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86AY002

FT # AL145.3

Date: 7/17/15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?

☒ pH: 4.0 – 10.0

☒ NTU: 0 – 3000

☒ DO (mg/L): 1.0 – 15.0

☒ Temp.: 1.0 – 19.0

☒ Specific Conductance: 20 - 1500

N/A ☒ If outside expected ranges, was sample re-taken?

☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- N/A ☐ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☐ Are units correct?



Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86AY003

**6. Fish Observations**

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

**7. General**

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ **N** Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

X Neal Smith

Fisheries Biologist (print)

X

Signature

Neal Smith

X Sam Simpson

Field Crew Chief (print)

X

Signature

Sam Simpson



P\_F86AY002\_001\_US  
LOOKING US AT OFF-ROW TARGET

7/16/2015 AL145.3



P\_F86AY002\_002\_DS  
LOOKING DS AT OFF-ROW TARGET

7/16/2015 AL145.3





P\_F86AY002\_003\_LB

7/16/2015 AL145.3

LOOKING AT LB AT OFF-ROW TARGET



P\_F86AY002\_004\_RB

7/16/2015 AL145.3

LOOKING AT RB AT OFF-ROW TARGET





**P\_F86AY002\_005\_OVERVIEW**  
**OVERVIEW OF SITE**

**7/16/2015 AL145.3**



**P\_F86AY002\_006\_OVERVIEW**  
**OVERVIEW OF SITE**

**7/16/2015 AL145.3**





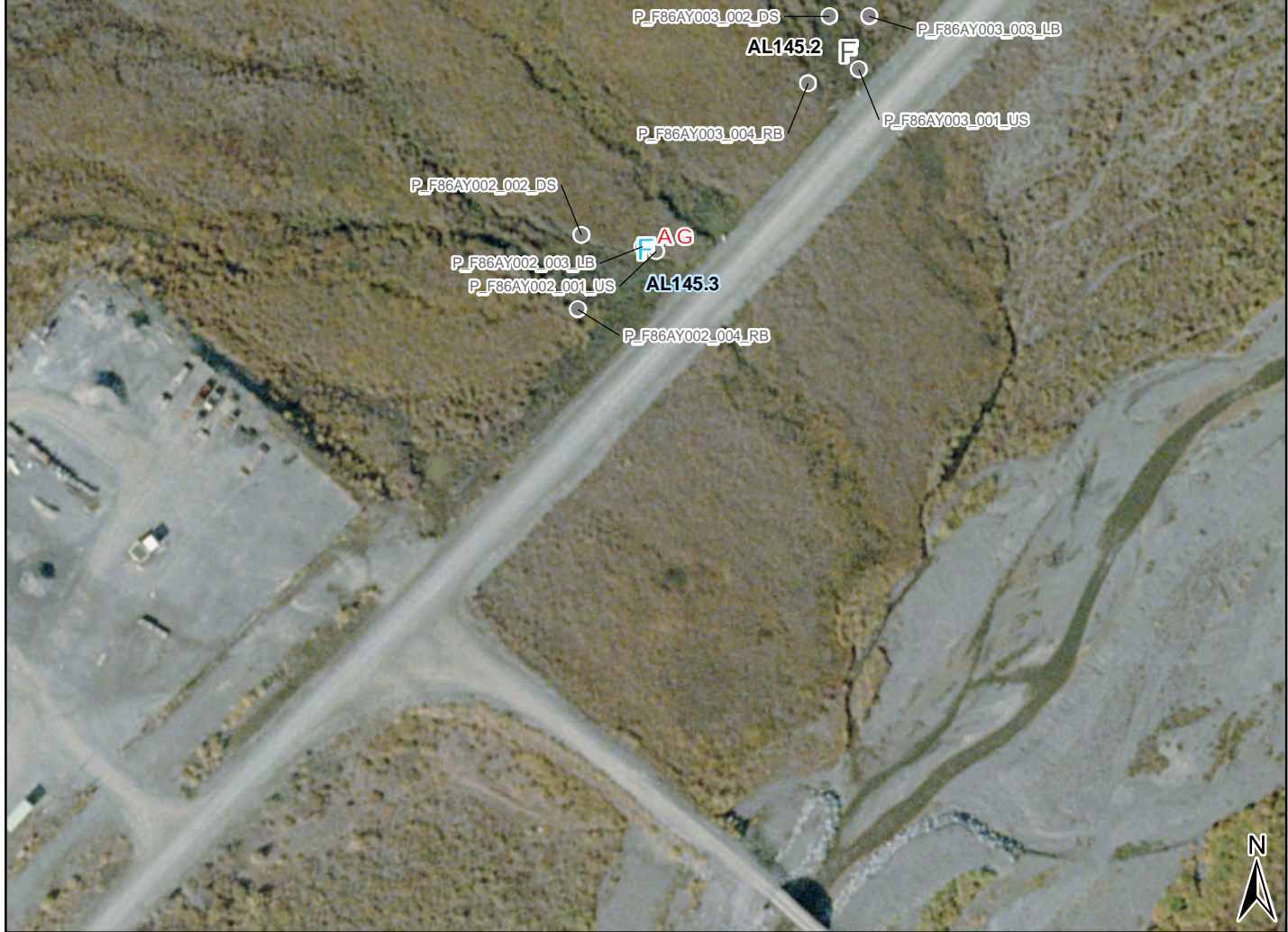
**P\_F86AY002\_007\_DS CULVERT 7/16/2015 AL145.3**  
**PHOTO OF PERCHED CULVERT DS OF FT & MINNOW TRAP 3**



**P\_F86AY002\_008\_GRAYLING 7/16/2015 AL145.3**  
**PHOTO OF ARCTIC GRAYLING**



Target Name: UNNAMED TRIBUTARY TO NORTH  
FORK CHANDALAR RIVER  
Feature ID: F86AY002



#### LEGEND

##### 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

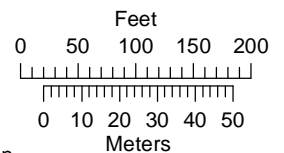
##### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

- BU
- CH
- CO
- DV
- NS
- O
- RT

- Burbot
- Chinook Salmon
- Coho Salmon
- Dolly Varden
- Ninespine Stickleback
- Other Species Not Listed
- Rainbow Trout

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
- TS Threespine Stickleback
- OBS Fish Observation, No Species Information



## ALASKA LNG

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DESIGN  
ICS

CHECK

DESIGN  
TCS

APPROVE

### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 61 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION				
Date: 7/17/2015	Investigators: SCS ADF NJS	Team No.: f86	Feature ID: F86AY003	
Stream Name: unnamed Trib. to North Fork Chandalar River			Stream ID: AL45.2	
Pipeline Milepost: 174.7	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): 239.5	
Latitude: 68° 04' 47.9694" N		Longitude: 149° 34' 22.0719" W		
Logbook No.: 2	Logbook Page No.: 7-9	Total Fish Caught: 0	Fish Mortalities: NA	Total Photos: 7
US @ CL Pic No.: P-F86AY003-001-US	DS @ CL Pic No.: P-F86AY003-002-DS	RB to LB @ CL Pic No.: P-F86AY003-003-LB	LB to RB @ CL Pic No.: P-F86AY003-004-RB	
Other Pic No(s): P-F86AY003-005-OVERVIEW P-F86AY003-006-OVERVIEW P-F86AY003-007-OVERVIEW DS CULVERT				

PHYSICAL/CHEMICAL ATTRIBUTES				
Weather (Describe): sunny		Precipitation (Describe): none		
Water Temperature (°C): 8.15	Air Temperature (°C): 20	pH: 6.92	Dissolved Oxygen (mg/l): 9.96	
Specific Conductance (µS/cm): 292	Turbidity (NTU): 1.43	ORP (mV): 81.6	Dissolved Oxygen (%): 84.6	
Ambient Conductance (µS/cm): 197	Odor: none	Sheen (Y/N): Y	Color: clear	Last date of Calibration: 7/15/2015
Defined Channel (Y/N): N	Notes: more defined US; ponded @ target			Wetted Width (m): 26.1
Flow (Y/N): Y	Notes: slow @ target, more evident US			Thalweg Depth @ CL (m): .32
<b>Riparian Veg at 0-5 m at LB:</b> 80 Grass/Sedge (%) 50 Shrubs (%) 0 Trees (%) NA Diameter DBH (in.)		<b>Riparian Veg at 0-5 m at RB:</b> 10 Grass/Sedge (%) 90 Shrubs (%) 0 Trees (%) NA Diameter DBH (in.)		<b>Stream Substrate:</b> 60 Organics (%) 90 Silt (%) 1 Sand (%) 0 Gravel (%) 0 Cobble (%) 0 Boulders (%)
<b>Aquatic Habitats</b> <input type="checkbox"/> Sand Bar <input checked="" type="checkbox"/> Mud Bar <input type="checkbox"/> Gravel Bar <input type="checkbox"/> Riffles <input checked="" type="checkbox"/> Pools <input type="checkbox"/> Undercut Banks		<input type="checkbox"/> Large Woody Debris <input type="checkbox"/> Overhanging vegetation <input checked="" type="checkbox"/> Contiguous Wetlands <input checked="" type="checkbox"/> Emergent Plants <input checked="" type="checkbox"/> Submerged Plants		
<b>Stream Type:</b> <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral				

**STREAM PROFILE: Cross Sectional at Crossing** (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

**STREAM PROFILE: Plan View** (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)

Feature ID: F86AY003



**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86A4003 FT # AL145.2 Date: 7/17/15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?

☒ pH: 4.0 – 10.0

☒ NTU: 0 – 3000

☒ DO (mg/L): 1.0 – 15.0

☒ Temp.: 1.0 – 19.0

☒ Specific Conductance: 20 - 1500

☒ If outside expected ranges, was sample re-taken?

☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?

Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86AY003

**6. Fish Observations**

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

**7. General**

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ **NO** Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

X Neal Smith

Fisheries Biologist (print)

X Neal Smith

Signature

X Sam Simpson

Field Crew Chief (print)

X [Signature]

Signature





**P\_F86AY003\_001\_US**  
**LOOKING US AT OFF-ROW TARGET**

**7/16/2015 AL145.2**



**P\_F86AY003\_002\_DS**  
**LOOKING DS AT OFF-ROW TARGET**

**7/16/2015 AL145.2**





P\_F86AY003\_003\_LB

7/16/2015 AL145.2

LOOKING AT LB AT OFF-ROW TARGET



P\_F86AY003\_004\_RB

7/16/2015 AL145.2

LOOKING AT RB AT OFF-ROW TARGET





**P\_F86AY003\_005\_OVERVIEW**  
**OVERVIEW OF SITE**

**7/16/2015 AL145.2**



**P\_F86AY003\_006\_OVERVIEW**  
**OVERVIEW OF SITE**

**7/16/2015 AL145.2**

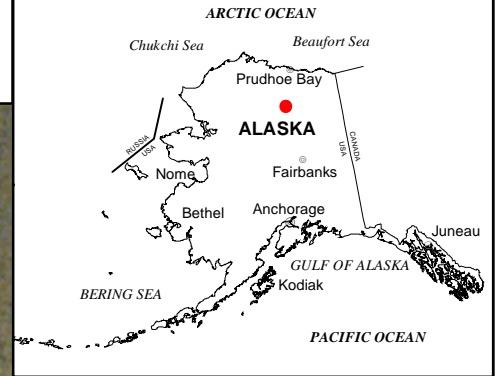


**P\_F86AY003\_007\_DS CULVERT  
VIEW FROM DS CULVERT**

**7/16/2015 AL145.2**



Target Name: UNNAMED TRIBUTARY TO NORTH  
FORK CHANDALAR RIVER  
Feature ID: F86AY003



#### LEGEND

##### 2015 Fish Survey Location

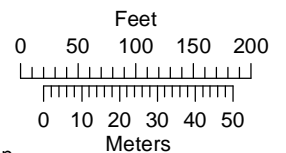
- F Fish Observed
- F No Fish Observed
- Photo Point

##### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

- BU Burbot
- CH Chinook Salmon
- CO Coho Salmon
- DV Dolly Varden
- NS Ninespine Stickleback
- O Other Species Not Listed
- RT Rainbow Trout

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
- TS Threespine Stickleback
- OBS Fish Observation, No Species Information



## ALASKA LNG

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DRAWN  
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TCS

APPROVED  
TCS

### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 62 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	

# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION				
Date:	7/17/2015	Investigators:	SCS NCS ADF	Team No.: F86
Stream Name:	Unnamed Trib. to North Fork Chandalan River			Feature ID: F86AY004
Pipeline Milepost:	174.6	Stream found as expected (Y/N):	Y	Hwy MP (N/A if heli accessed): 239.6
Latitude:		68°04'52.9768"N		
Longitude:		149°34'08.2703"W		
Logbook No.:	2	Logbook Page No.:	7-q	Total Fish Caught: 0
Fish Mortalities:		NA		Total Photos: 7
US @ CL	DS @ CL	RB to LB @ CL	LB to RB @ CL	
Pic No.: P-F86AY004-001-US	Pic No.: P-F86AY004-002-DS	Pic No.: P-F86AY004-003-LB	Pic No.: P-F86AY004-004-RB	
Other	P-F86AY004-005-OVERVIEW			
Pic No(s):	P-F86AY004-006-OVERVIEW			
	P-F86AY004-007-DS CULVERT			

PHYSICAL/CHEMICAL ATTRIBUTES									
Weather (Describe): <u>Sunny</u>				Precipitation (Describe): <u>none</u>					
Water Temperature (°C): <u>6.75</u>			Air Temperature (°C): <u>21</u>			pH: <u>6.98</u>		Dissolved Oxygen (mg/l): <u>7.90</u>	
Specific Conductance(μS/cm): <u>355</u>			Turbidity (NTU): <u>0.33</u>			ORP (mV): <u>278.1</u>		Dissolved Oxygen (%): <u>65.4</u>	
Ambient Conductance(μS/cm): <u>231</u>			Odor: <u>none</u>		Sheen (Y/N): <u>N</u>		Color: <u>clear</u>		Last date of Calibration: <u>7/15/2015</u>
Defined Channel (Y/N): <u>N</u>		Notes: <u>braided system; mostly dry</u>						Wetted Width (m): <u>0.97</u>	
Flow (Y/N): <u>Y</u>		Notes: <u>very low + little water</u>						Thalweg Depth @ CL (m): <u>.04</u>	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:		Aquatic Habitats			
<u>1</u> Grass/Sedge (%)		<u>1</u> Grass/Sedge (%)		<u>40</u> Organics (%)		<u>    </u> Sand Bar		<u>    </u> Large Woody Debris	
<u>60</u> Shrubs (%)		<u>80</u> Shrubs (%)		<u>1</u> Silt (%)		<u>    </u> Mud Bar		<u>X</u> Overhanging vegetation	
<u>0</u> Trees (%)		<u>0</u> Trees (%)		<u>5</u> Sand (%)		<u>X</u> Gravel Bar		<u>X</u> Contiguous Wetlands	
<u>NA</u> Diameter DBH (in.)		<u>NA</u> Diameter DBH (in.)		<u>80</u> Gravel (%)		<u>X</u> Riffles		<u>X</u> Emergent Plants	
				<u>5</u> Cobble (%)		<u>    </u> Pools		<u>    </u> Submerged Plants	
				<u>0</u> Boulders (%)		<u>    </u> Undercut Banks			
Stream Type:									
<u>X</u> Perennial <u>X</u> Intermittent <u>    </u> Ephemeral									

**STREAM PROFILE: Cross Sectional at Crossing** (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

Hand-drawn cross-sectional diagram of a stream at a crossing. The stream is 0.97 m wide and 1.04 m deep. The substrate is labeled 'gravel'. There are 'organics' on the left bank. The banks are lined with 'dense willows'. The diagram shows the water surface, the stream bed, and the surrounding vegetation.

**STREAM PROFILE: Plan View** (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)

Hand-drawn plan view diagram of a stream. The stream flows from left to right, indicated by an arrow labeled 'Flow'. The centerline is marked. Distances from the centerline are noted: 20m to the left bank, 30m to the right bank, and 5m to the crossing. The crossing is labeled 'Dalton Hwy' and 'culvert'. There are 'dry channels' on the left bank. A 'ob-row Target' is marked on the left bank. Photo locations are marked with 'P' and sample locations with 'MT'. A north arrow is in the top left corner.



Feature ID: F86AY004

[illegible]

MISCELLANEOUS POINTS (if applicable)	
Point ID: NA	Description: NA
Point ID: NA	Description: NA

Field Crew Chief: [Signature] Field Scientist/Technician: [Signature] Technical Lead: [Signature]

**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86AY004

FT # AL145.1

Date: 7/17/15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☐ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500

☒ If outside expected ranges, was sample re-taken?

☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☐ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☐ Are units correct?



Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86 AY004

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

By signing below, I verify that all field data for this site has been verified for accuracy and completeness.

X Neal Smith

Fisheries Biologist (print)

X Neal Smith

Signature

X Sam Simpson

Field Crew Chief (print)

X

Signature



**P\_F86AY004\_001\_US**  
**LOOKING US AT OFF-ROW TARGET**

**7/16/2015 AL145.1**



**P\_F86AY004\_002\_DS**  
**LOOKING DS AT OFF-ROW TARGET**

**7/16/2015 AL145.1**





**P\_F86AY004\_003\_LB**

**7/16/2015 AL145.1**

**LOOKING AT LB AT OFF-ROW TARGET**



**P\_F86AY004\_004\_RB**

**7/16/2015 AL145.1**

**LOOKING AT RB AT OFF-ROW TARGET**





**P\_F86AY004\_005\_OVERVIEW**  
**OVERVIEW OF SITE**

**7/16/2015 AL145.1**



**P\_F86AY004\_006\_OVERVIEW**  
**OVERVIEW OF SITE**

**7/16/2015 AL145.1**





**P\_F86AY004\_007\_DS CULVERT  
VIEW FROM DS CULVERT**

**7/16/2015 AL145.1**



Target Name: UNNAMED TRIBUTARY TO NORTH  
FORK CHANDALAR RIVER  
Feature ID: F86AY004



#### LEGEND

##### 2015 Fish Survey Location

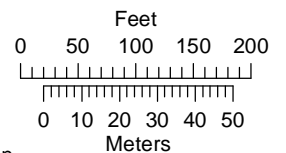
- F Fish Observed
- F No Fish Observed
- Photo Point

##### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

- BU Burbot
- CH Chinook Salmon
- CO Coho Salmon
- DV Dolly Varden
- NS Ninespine Stickleback
- O Other Species Not Listed
- RT Rainbow Trout

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
- TS Threespine Stickleback
- OBS Fish Observation, No Species Information



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DESIGN  
ICS

CHECK

DESIGN  
TCS

APPROVE

### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 63 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	

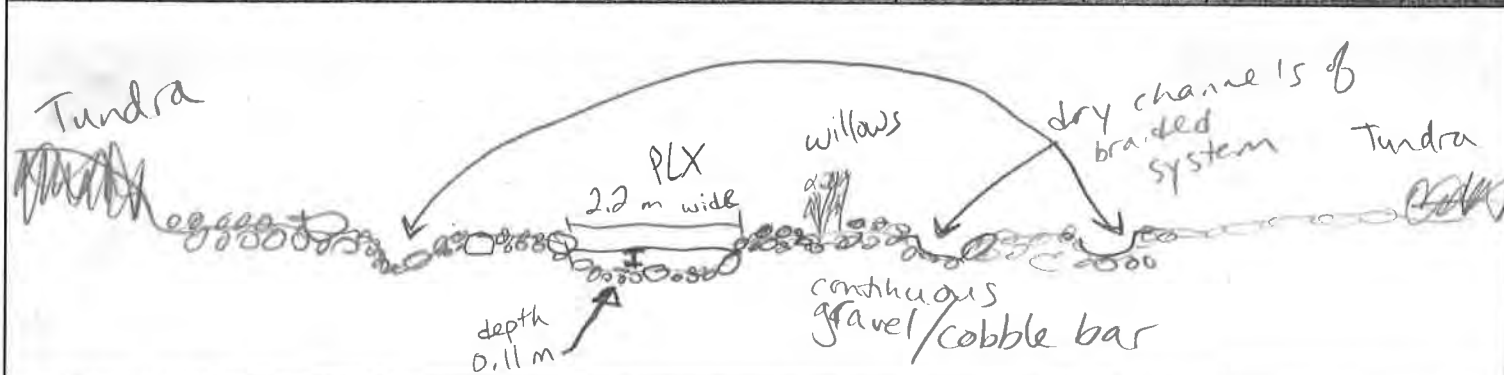


# STREAM FISH INVESTIGATION DATA FORM

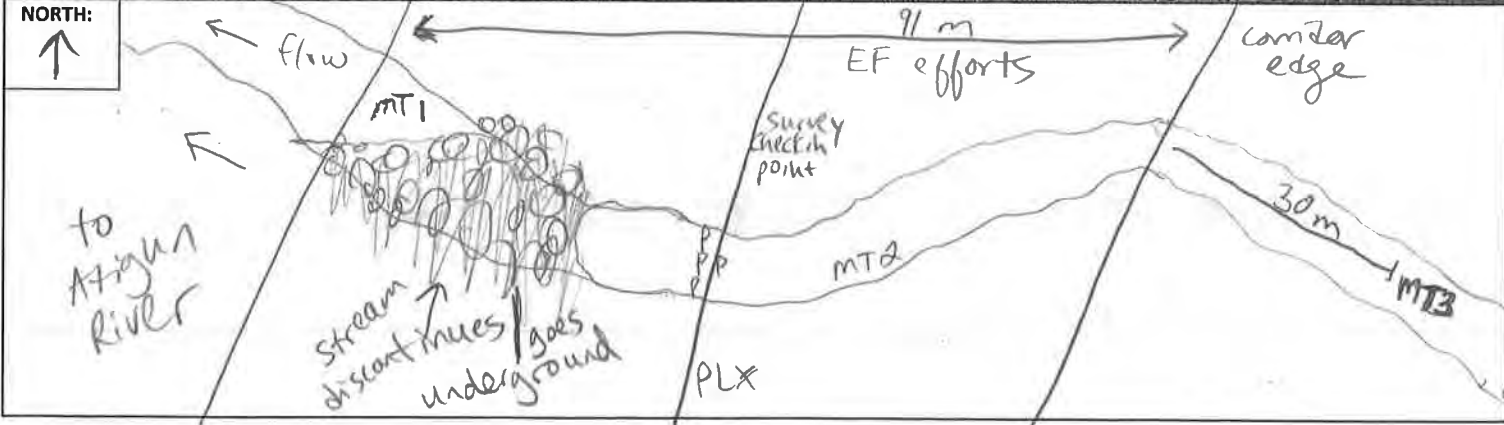
SITE DESCRIPTION					
Date: 7/16	Investigators: SCS NJS ADF	Team No.: F86	Feature ID: F86 PA 001		
Stream Name: Unnamed Tributary to Atigun River			Stream ID: AL135.1		
Pipeline Milepost: 165.5	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): heli		
Latitude: 68°10'51.5858"N			Longitude: 149°24'49.1174"W (Paltan milepost 250.6)		
Logbook No.: 2	Logbook Page No.: 5-6	Total Fish Caught: 0	Fish Mortalities: 0	Total Photos: 8	
US @ CL Pic No.: P-F86PA001-001-US	DS @ CL Pic No.: P-F86PA001-002-DS	RB to LB @ CL Pic No.: P-F86PA001-003-LB	LB to RB @ CL Pic No.: P-F86PA001-004-RB		
Other Pic No(s.): P-F86PA001-005-AERIAL P-F86PA001-007-AERIAL P-F86PA001-006-AERIAL P-F86PA001-008-DRY (dried out channel on trap pull day-7/16)					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): sunny			Precipitation (Describe): none		
Water Temperature (°C): 5.83	Air Temperature (°C): 22	pH: 6.09	Dissolved Oxygen (mg/l): 11.53		
Specific Conductance (µS/cm): 200	Turbidity (NTU): 1.02	ORP (mV): 303.1	Dissolved Oxygen (%): 92.0		
Ambient Conductance (µS/cm): 127	Odor: none	Sheen (Y/N): N	Color: clear	Last date of Calibration: 7/14/2015	
Defined Channel (Y/N): N	Notes: braided system within wide gravel bar			Wetted Width (m): 2.2	
Flow (Y/N): Y	Notes: high gradient			Thalweg Depth @ CL (m): 0.11	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
<input checked="" type="checkbox"/> Grass/Sedge (%) <input checked="" type="checkbox"/> Shrubs (%) <input checked="" type="checkbox"/> Trees (%) <input checked="" type="checkbox"/> Diameter DBH (in.)		<input checked="" type="checkbox"/> Grass/Sedge (%) <input checked="" type="checkbox"/> Shrubs (%) <input checked="" type="checkbox"/> Trees (%) <input checked="" type="checkbox"/> Diameter DBH (in.)		<input checked="" type="checkbox"/> Organics (%) <input checked="" type="checkbox"/> Silt (%) <input checked="" type="checkbox"/> Sand (%) <input checked="" type="checkbox"/> Gravel (%) <input checked="" type="checkbox"/> Cobble (%) <input checked="" type="checkbox"/> Boulders (%)	
Aquatic Habitats		<input checked="" type="checkbox"/> Sand Bar <input checked="" type="checkbox"/> Mud Bar <input checked="" type="checkbox"/> Gravel Bar <input checked="" type="checkbox"/> Riffles <input checked="" type="checkbox"/> Pools <input checked="" type="checkbox"/> Undercut Banks			
Stream Type:		<input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral			

STREAM PROFILE: Cross Sectional at Crossing (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)



STREAM PROFILE: Plan View (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)



Feature ID: F86PA 001

[illegible]

- No fish captured or observed w/ EF or MT
- wide gravel bar w/ braided channels - mostly dry
  - goes underground in places but still has steady ripple flow
- when returning on 7/16 to pull traps; (see photo # P-F86PA001-008.D)
- Channel was dry where MT<sub>2</sub> and MT<sub>1</sub> were - no water at all. Yet there was still water and flow US where MT<sub>3</sub> was. Went underground between MT<sub>3</sub> and MT<sub>2</sub>.

Field Crew Chief: SS Field Scientist/Technician: Andrew Technical Lead: \_\_\_\_\_



**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86PA001 FT # ALBS.1 Date: 7/16/15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?

- ☒ pH: 4.0 – 10.0
- ☒ NTU: 0 – 3000
- ☒ DO (mg/L): 1.0 – 15.0
- ☒ Temp.: 1.0 – 19.0
- ☒ Specific Conductance: 20 – 1500

- ☒ If outside expected ranges, was sample re-taken?
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?

Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86PA001

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

By signing below, I verify that all field data for this site has been verified for accuracy and completeness.

X Neal Smith

Fisheries Biologist (print)

X

Signature

X Sam Simpson

Field Crew Chief (print)

X

Signature





P\_F86PA001\_001\_US  
LOOKING US AT PLX

7/15/2015 AL135.1



P\_F86PA001\_002\_DS  
LOOKING DS AT PLX

7/15/2015 AL135.1





P\_F86PA001\_003\_LB

7/15/2015 AL135.1

LOOKING AT LB AT PLX



P\_F86PA001\_004\_RB

7/15/2015 AL135.1

LOOKING AT RB AT PLX





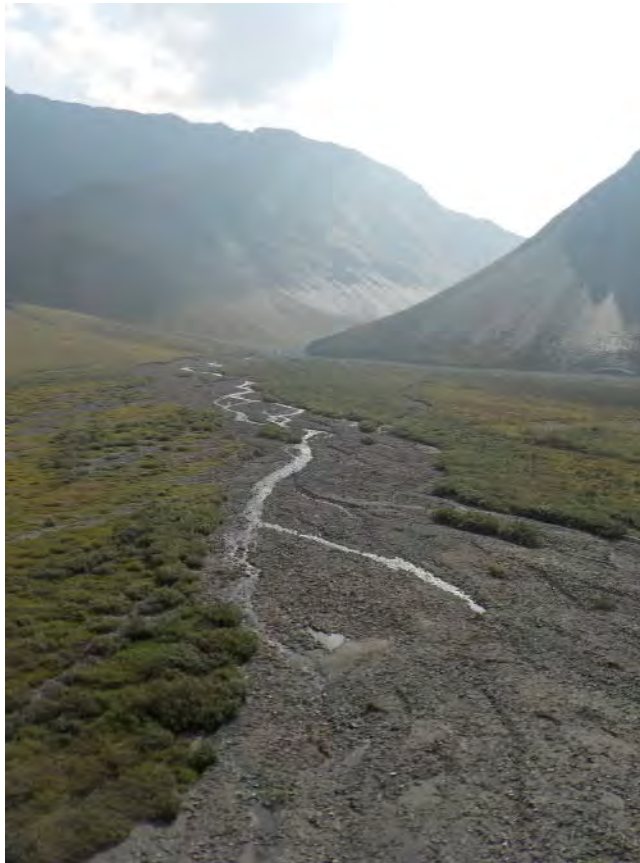
**P\_F86PA001\_005\_AERIAL  
AERIAL PHOTO**

**7/15/2015 AL135.1**



**P\_F86PA001\_006\_AERIAL  
AERIAL PHOTO**

**7/15/2015 AL135.1**



**P\_F86PA001\_007\_AERIAL  
AERIAL PHOTO**

**7/15/2015 AL135.1**

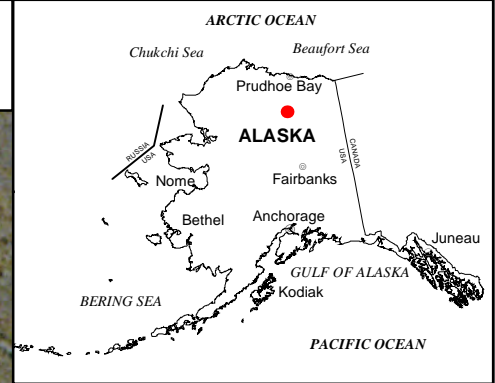


**P\_F86PA001\_008\_DRY  
PHOTO OF DRY CHANNEL ON TRAP PULL DAY (7/16/15)**

**7/16/2015 AL135.1**



Target Name: UNNAMED TRIBUTARY TO ATIGUN  
RIVER  
Feature ID: F86PA001



## LEGEND

### 2015 Fish Survey Location

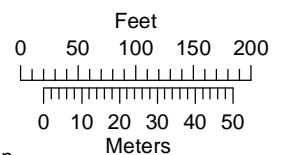
- F Fish Observed
- F No Fish Observed
- Photo Point

### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

- BU Burbot
- CH Chinook Salmon
- CO Coho Salmon
- DV Dolly Varden
- NS Ninespine Stickleback
- O Other Species Not Listed
- RT Rainbow Trout

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
- TS Threespine Stickleback
- OBS Fish Observation, No Species Information



## ALASKA LNG

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DESIGN  
ICS

CHECK

DESIGN  
TCS

APPROVE

### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 64 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	

# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 8/31/2015	Investigators: SCS NIS ADF	Team No.: F86	Feature ID: F86PA014		
Stream Name: Tributary to Tee Lake Outlet			Stream ID: AL114.9		
Pipeline Milepost: 147.0	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): 269.4		
Latitude: 68°25'54.7284" N		Longitude: 149°21'09.5843" W			
Logbook No.: 3	Logbook Page No.: 37-39	Total Fish Caught: 0	Fish Mortalities: NA	Total Photos: 4	
US @ CL Pic No.: P-F86PA014-001-US	DS @ CL Pic No.: P-F86PA014-002-DS	RB to LB @ CL Pic No.: P-F86PA014-003-LB	LB to RB @ CL Pic No.: P-F86PA014-004-RB		
Other Pic No(s): N/A					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): Cloudy / overcast		Precipitation (Describe): light snow			
Water Temperature (°C): 0.40	Air Temperature (°C): 3	pH: 8.45	Dissolved Oxygen (mg/l): 17.01		
Specific Conductance (µS/cm): 377	Turbidity (NTU): 0.71	ORP (mV): 204.6	Dissolved Oxygen (%): 118.3		
Ambient Conductance (µS/cm): 200	Odor: none	Sheen (Y/N): N	Color: clear	Last date of Calibration: 8/29/2015	
Defined Channel (Y/N): Y	Notes: contained w/in stable tundra banks			Wetted Width (m): 0.75 m	
Flow (Y/N): Y	Notes: steady flow w/ ripples			Thalweg Depth @ CL (m): 0.28 m	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
30 Grass/Sedge (%)		10 Grass/Sedge (%)		0 Organics (%)	
70 Shrubs (%)		90 Shrubs (%)		0 Silt (%)	
0 Trees (%)		0 Trees (%)		0 Sand (%)	
NA Diameter DBH (in.)		NA Diameter DBH (in.)		60 Gravel (%)	
				40 Cobble (%)	
				1 Boulders (%)	
Stream Type:		Aquatic Habitats			
<input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral		<input type="checkbox"/> Sand Bar <input type="checkbox"/> Large Woody Debris <input type="checkbox"/> Mud Bar <input checked="" type="checkbox"/> Overhanging vegetation <input type="checkbox"/> Gravel Bar <input type="checkbox"/> Contiguous Wetlands <input checked="" type="checkbox"/> Riffles <input type="checkbox"/> Emergent Plants <input checked="" type="checkbox"/> Pools <input type="checkbox"/> Submerged Plants <input type="checkbox"/> Undercut Banks			

**STREAM PROFILE: Cross Sectional at Crossing** (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

**STREAM PROFILE: Plan View** (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)



Feature ID: F86PA014

Page 2 of 2

**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86PA014

FT # AL114.9

Date: 8/31/2015

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500
- ☒ If outside expected ranges, was sample re-taken? Yes
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?



Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86PA014

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- N/A* ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- NO* ☐ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

**X** Neal Smith

Fisheries Biologist (print)

**X** 

Signature

**X** Sam Simpson

Field Crew Chief (print)

**X** 

Signature



**P\_F86PA014\_001\_US**

**8/31/2015 AL114.9**

**LOOKING US AT OFF-ROW TARGET**

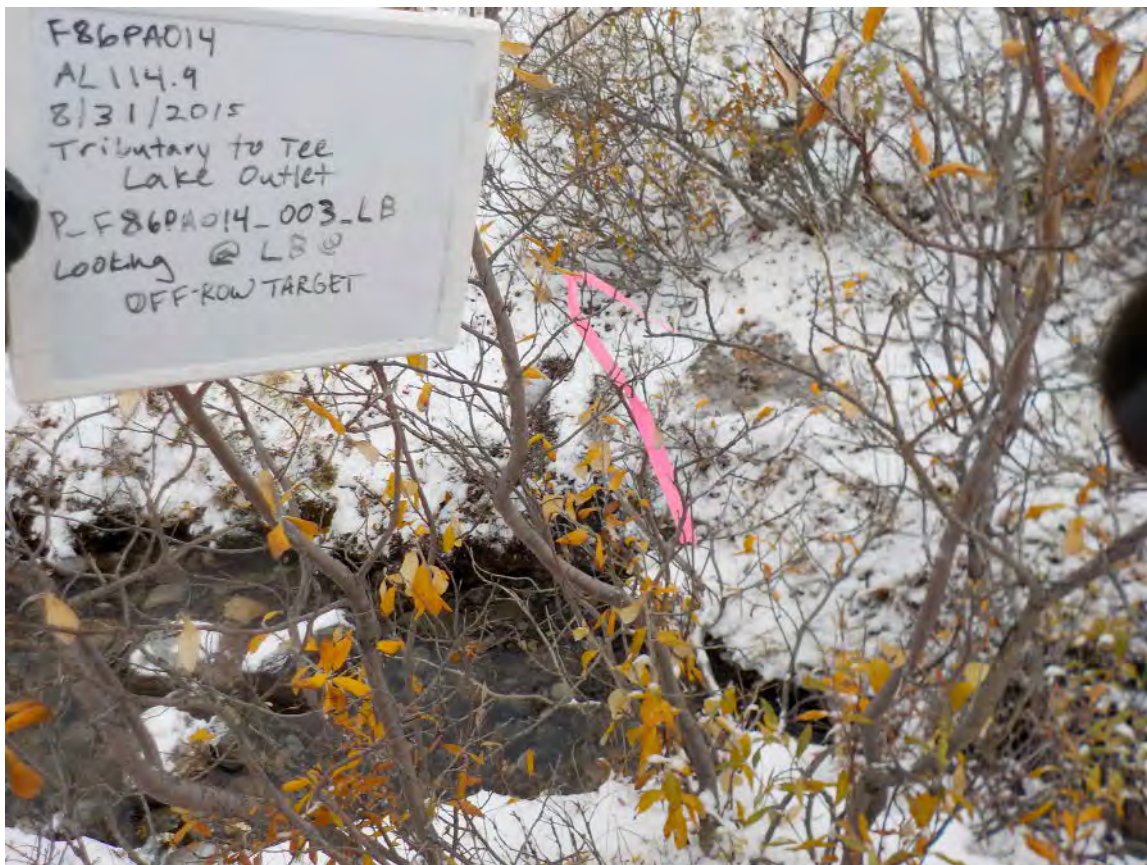


**P\_F86PA014\_002\_DS**

**8/31/2015 AL114.9**

**LOOKING DS AT OFF-ROW TARGET**

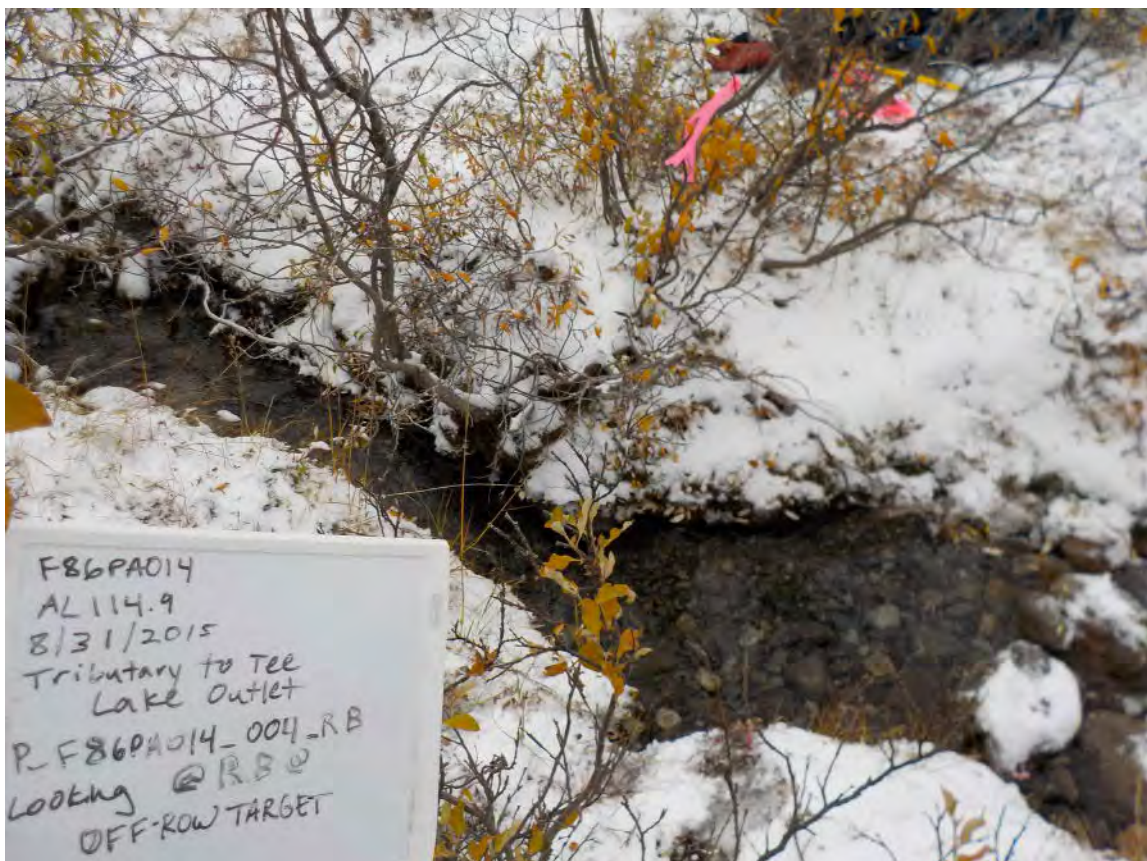




P\_F86PA014\_003\_LB

8/31/2015 AL114.9

LOOKING AT LB AT OFF-ROW TARGET



P\_F86PA014\_004\_RB

8/31/2015 AL114.9

LOOKING AT RB AT OFF-ROW TARGET



Target Name: TRIBUTARY TO TEE LAKE OUTLET  
Feature ID: F86PA014



P\_F86PA014\_004\_RB  
P\_F86PA014\_002\_DS  
P\_F86PA014\_003\_LB  
P\_F86PA014\_001\_US  
AL114.9



## LEGEND

### 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

### Species Observed

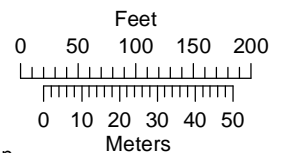
- AB Alaska Blackfish
- AG Arctic Grayling

- BU
- CH
- CO
- DV
- NS
- O
- RT

- Burbot
- Chinook Salmon
- Coho Salmon
- Dolly Varden
- Ninespine Stickleback
- Other Species Not Listed
- Rainbow Trout

- SA(U)
- SC(U)
- SS
- ST(U)
- TS
- OBS

- Salmonid (Unspecified)
- Sculpin (Unspecified)
- Slimy Sculpin
- Stickleback (Unspecified)
- Threespine Stickleback
- Fish Observation, No Species Information



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DRAWN  
ICS

CHECKED  
TCS

DESIGN  
TCS

APPROVED  
TCS

### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

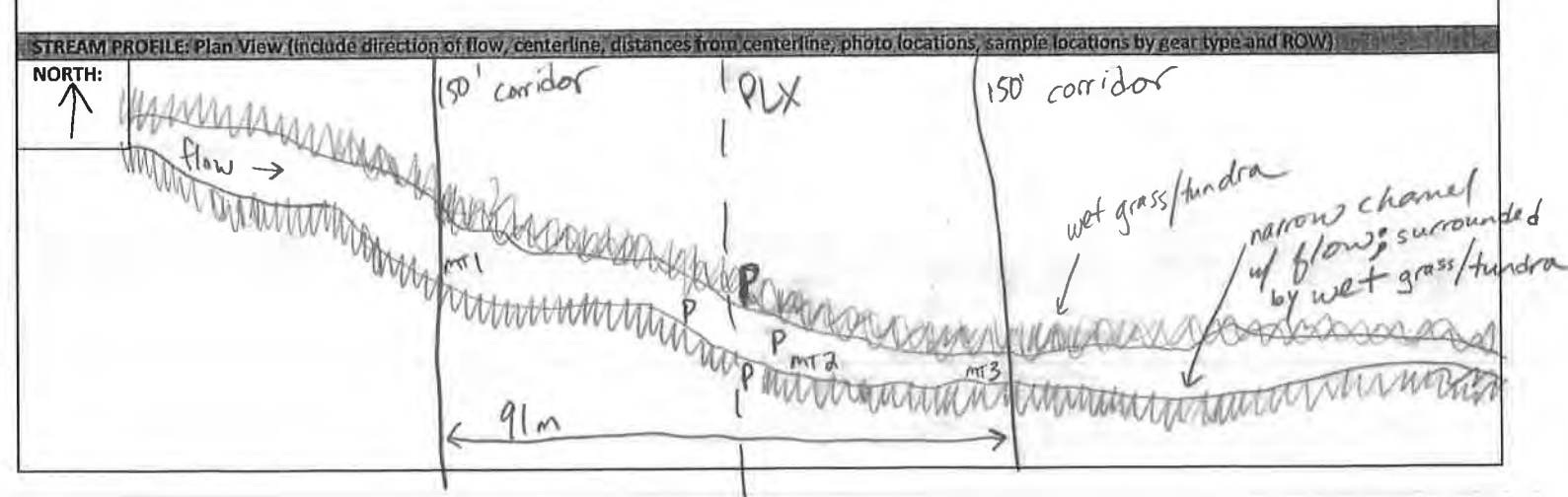
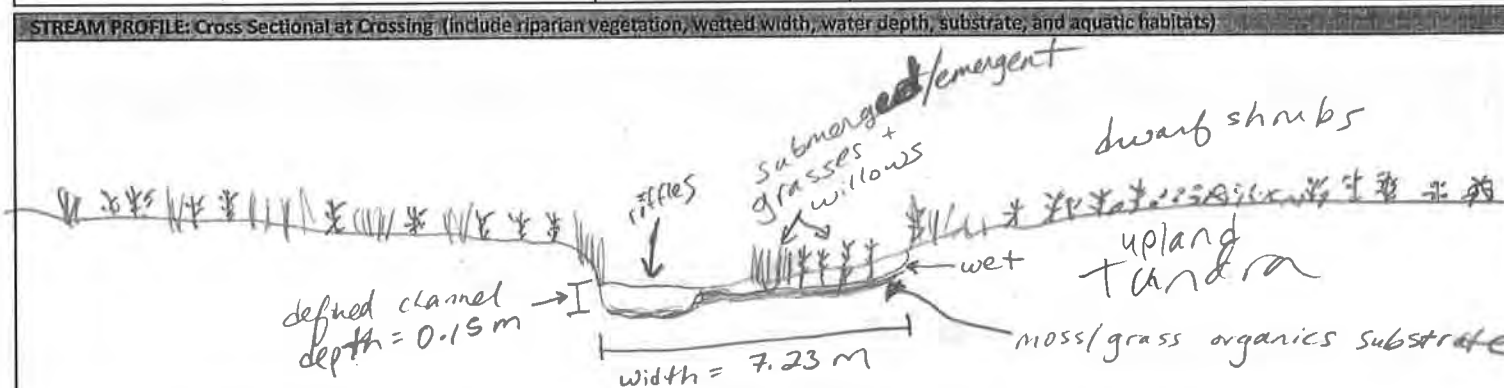
PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 65 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 8/29/2015	Investigators: SCS NJS ADF	Team No.: F86	Feature ID: F86PA011		
Stream Name: unnamed Tributary to Polygon Creek			Stream ID: ALO61.3		
Pipeline Milepost: 103.9	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): heli		
Latitude: 68°54'52.8237" N		Longitude: 148°53'41.3680" W			
Logbook No.: 3	Logbook Page No.: 32-35	Total Fish Caught: 0	Fish Mortalities: N/A	Total Photos: 6	
US @ CL Pic No.: P-F86PA011-001-US	DS @ CL Pic No.: P-F86PA011-002-DS	RB to LB @ CL Pic No.: P-F86PA011-003-LB	LB to RB @ CL Pic No.: P-F86PA011-004-RB		
Other Pic No(s): P-F86PA011-005-AERIAL P-F86PA011-006-AERIAL					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): cloudy		Precipitation (Describe): flurries			
Water Temperature (°C): 3.12	Air Temperature (°C): 6	pH: 2.11	Dissolved Oxygen (mg/l): 12.21		
Specific Conductance (µS/cm): 11	Turbidity (NTU): 1.26	ORP (mV): 359.9	Dissolved Oxygen (%): 91.0		
Ambient Conductance (µS/cm): 7	Odor: none	Sheen (Y/N): N	Color: clear	Last date of Calibration: 8/29/15	
Defined Channel (Y/N): Y	Notes: very narrow channel w/ wet surroundings			Wetted Width (m): 7.23 m	
Flow (Y/N): Y	Notes: riffles in the narrow defined channel			Thalweg Depth @ CL (m): 0.15 m	
Riparian Veg at 0-5 m at LB: 50 Grass/Sedge (%) 50 Shrubs (%) 0 Trees (%) N/A Diameter DBH (in.)		Riparian Veg at 0-5 m at RB: 20 Grass/Sedge (%) 70 Shrubs (%) 0 Trees (%) N/A Diameter DBH (in.)		<b>Stream Substrate:</b> 100 Organics (%) 0 Silt (%) 0 Sand (%) 0 Gravel (%) 0 Cobble (%) 0 Boulders (%)	
<b>Aquatic Habitats</b> <input type="checkbox"/> Sand Bar <input type="checkbox"/> Mud Bar <input type="checkbox"/> Gravel Bar <input checked="" type="checkbox"/> Riffles <input type="checkbox"/> Pools <input type="checkbox"/> Undercut Banks		<input type="checkbox"/> Large Woody Debris <input type="checkbox"/> Overhanging vegetation <input checked="" type="checkbox"/> Contiguous Wetlands <input checked="" type="checkbox"/> Emergent Plants <input checked="" type="checkbox"/> Submerged Plants			
<b>Stream Type:</b> <input checked="" type="checkbox"/> Perennial <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral					



Feature ID: F86PA011

METHODS ATTRIBUTES				
Minnow Traps (Y/N): <i>Y</i>	Hook and Line (Y/N): <i>N</i>	Beach Seine (Y/N): <i>N</i>	Fyke Net (Y/N): <i>N</i>	Hoop Net (Y/N): <i>N</i>
No. of Minnow Traps Set: <i>3</i>	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)
Date & Time In: <i>8/28/2015</i> (mm/dd/yyyy) <i>1545</i>	No. of lines in water:	No. of passes:	Date & Time out: (mm/dd/yyyy)	Date & Time out: (mm/dd/yyyy)
Date & Time out: <i>8/28/2015</i> (mm/dd/yyyy) <i>1145</i>	Time lines in water:	Reach Length (m):		

ELECTROFISHING ATTRIBUTES				
EF (Y/N):	EF Start Time:	EF End Time:	EF Time (seconds):	EF Reach Length (m):
Duty Cycle:	Frequency (Hz):	Waveform:	Sampling Efficiency (% of sample reach):	
Current (A):	Volts (V):	Power (W):	(amp x volts)	

[illegible]

- No fish caught in MT
- feature is a narrow defined channel w/ flow + ripples.
  - <sup>Banks composed of</sup> ~~surrounded by~~ wet surface water and <sup>tundra</sup> ~~men upland~~
- <sup>flow</sup> Is likely present each year but <sup>influenced</sup> ~~determined~~ by upstream runoff + precip
- \* water is clear but has red/brown hue when substrate is stepped in.

MISCELLANEOUS POINTS (If applicable)	
Point ID: N/A	Description: N/A
Point ID: N/A	Description: N/A

Field Crew Chief: [Signature] Field Scientist/Technician: [Signature] Technical Lead: \_\_\_\_\_



**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86PA011 FT # AL061.3 Date: 8/29/15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500
- ☒ If outside expected ranges, was sample re-taken?
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?

Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86 PA011

6. Fish Observations

- N/A* ☒ Are all fish captured/observed recorded in the Fish Observation table?
- N/A* ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- NO* ☐ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

**X** Neal Smith

Fisheries Biologist (print)

**X**

Signature

*Neal Smith*

**X** Sam Simpson

Field Crew Chief (print)

**X**

Signature

*Sam Simpson*





**P\_F86PA011\_001\_US**  
**LOOKING US AT PLX**

**8/29/2015 AL061.3**



**P\_F86PA011\_002\_DS**  
**LOOKING DS AT PLX**

**8/29/2015 AL061.3**





**P\_F86PA011\_003\_LB**  
**LOOKING AT LB AT PLX**

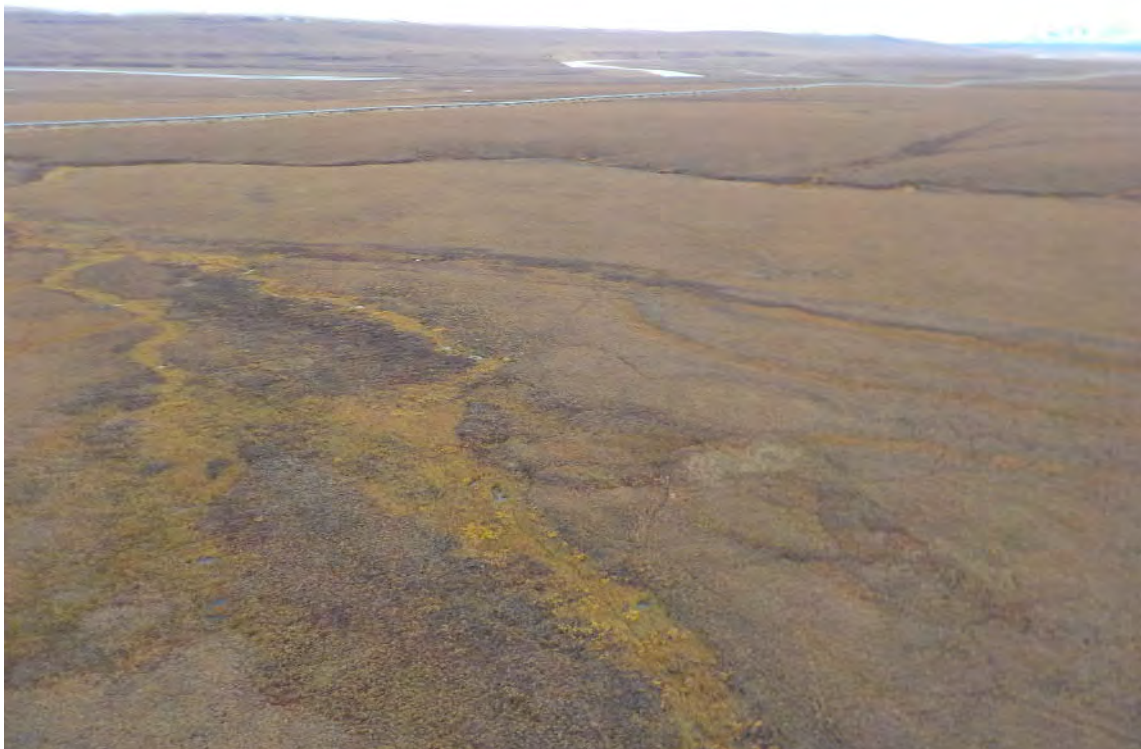
**8/29/2015 AL061.3**



**P\_F86PA011\_004\_RB**  
**LOOKING AT RB AT PLX**

**8/29/2015 AL061.3**





**P\_F86PA011\_005\_AERIAL  
AERIAL PHOTO**

**8/29/2015 AL061.3**



**P\_F86PA011\_006\_AERIAL  
AERIAL PHOTO**

**8/29/2015 AL061.3**



Target Name: UNNAMED TRIBUTARY TO  
POLYGON CREEK  
Feature ID: F86PA011



P\_F86PA011\_002\_DS  
P\_F86PA011\_003\_LB  
AL061.3  
P\_F86PA011\_004\_RB  
P\_F86PA011\_001\_US



#### LEGEND

##### 2015 Fish Survey Location

F Fish Observed  
F No Fish Observed  
● Photo Point

##### Species Observed

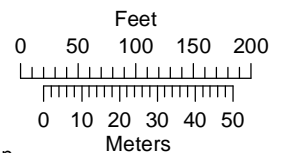
AB Alaska Blackfish  
AG Arctic Grayling

BU  
CH  
CO  
DV  
NS  
O  
RT

Burbot  
Chinook Salmon  
Coho Salmon  
Dolly Varden  
Ninespine Stickleback  
Other Species Not Listed  
Rainbow Trout

SA(U)  
SC(U)  
SS  
ST(U)  
TS  
OBS

Salmonid (Unspecified)  
Sculpin (Unspecified)  
Slimy Sculpin  
Stickleback (Unspecified)  
Threespine Stickleback  
Fish Observation, No Species Information



#### ALASKA LNG

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DESIGN  
ICS

CHECK

DESIGN  
TCS

APPROVE

#### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 66 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 8/29/2015	Investigators: SCS NJS ADF	Team No.: F86	Feature ID: F86PAD12		
Stream Name: Unnamed Tributary to Sagavanirktok River			Stream ID: ALOSO		
Pipeline Milepost: 85.5	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): 35.3		
Latitude: 69° 09' 36.1607" N		Longitude: 148° 50' 31.3173" W			
Logbook No.: 3	Logbook Page No.: 35-37	Total Fish Caught: 0	Fish Mortalities: N/A	Total Photos: 6	
US @ CL Pic No.: P-F86PAD12-001-US	DS @ CL Pic No.: P-F86PAD12-002-DS	RB to LB @ CL Pic No.: P-F86PAD12-003-LB	LB to RB @ CL Pic No.: P-F86PAD12-004-RB		
Other Pic No(s): P-F86PAD12-005-AERIAL P-F86PAD12-006-AERIAL					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): cloudy		Precipitation (Describe): light rain			
Water Temperature (°C): 4.55	Air Temperature (°C): 7	pH: 5.58	Dissolved Oxygen (mg/l): 13.00		
Specific Conductance (µS/cm): 22	Turbidity (NTU): 2.24	ORP (mV): 348.0	Dissolved Oxygen (%): 100.7		
Ambient Conductance (µS/cm): 13	Odor: none	Sheen (Y/N): N	Color: clear	Last date of Calibration: 8/29/15	
Defined Channel (Y/N): Y	Notes: contained within tundra valley			Wetted Width (m): 2.85	
Flow (Y/N): Y	Notes: fairly rapid w/ pools			Thalweg Depth @ CL (m): .81m	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
20 Grass/Sedge (%)	20 Grass/Sedge (%)	20 Organics (%)	Aquatic Habitats		
80 Shrubs (%)	80 Shrubs (%)	0 Silt (%)	Sand Bar		
0 Trees (%)	0 Trees (%)	0 Sand (%)	Mud Bar		
N/A Diameter DBH (in.)	N/A Diameter DBH (in.)	20 Gravel (%)	Gravel Bar		
		50 Cobble (%)	X Riffles		
		105 Boulders (%)	X Pools		
			Undercut Banks		
Stream Type:					
X Perennial		Intermittent			
		Ephemeral			

STREAM PROFILE: Cross Sectional at Crossing (Include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

STREAM PROFILE: Plan View (Include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)

Feature ID: F86PAD12



**Stream Fish Investigations Field Form**  
**QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F868A012

FT # AL050

Date: 8/31/15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500

☒ N/A If outside expected ranges, was sample re-taken?

☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ N/A Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?

Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86PA012

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- N/A ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- NO ☐ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

By signing below, I verify that all field data for this site has been verified for accuracy and completeness.

X Neal Smith

Fisheries Biologist (print)

X

Signature

X Sam Simpson

Field Crew Chief (print)

X

Signature





**P\_F86PA012\_001\_US**  
**LOOKING US AT PLX**

**8/30/2015 AL050**



**P\_F86PA012\_002\_DS**  
**LOOKING DS AT PLX**

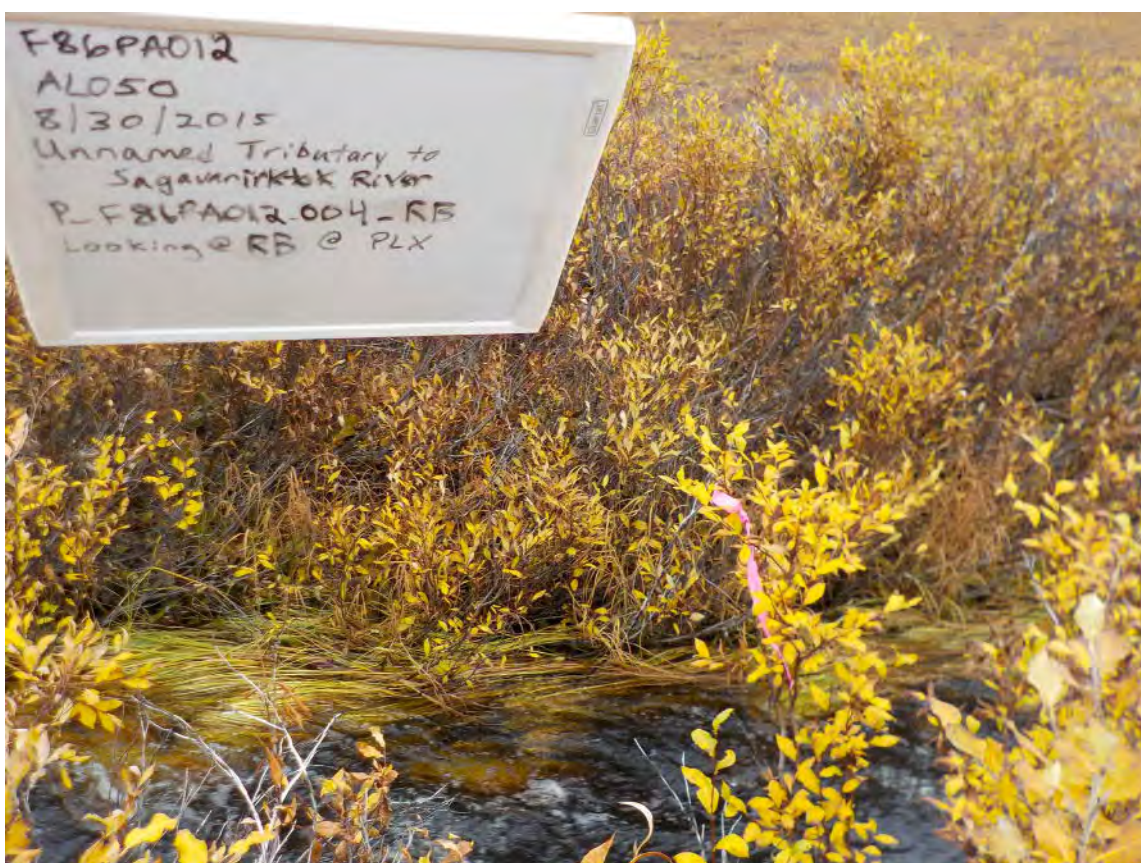
**8/30/2015 AL050**





**P\_F86PA012\_003\_LB**  
**LOOKING AT LB AT PLX**

**8/30/2015 AL050**



**P\_F86PA012\_004\_RB**  
**LOOKING AT RB AT PLX**

**8/30/2015 AL050**





**P\_F86PA012\_005\_AERIAL**  
**AERIAL PHOTO**

**8/30/2015 AL050**



**P\_F86PA012\_006\_AERIAL**  
**AERIAL PHOTO**

**8/30/2015 AL050**



Target Name: UNNAMED TRIBUTARY TO  
SAGAVANIRKTOK RIVER  
Feature ID: F86PA012



#### LEGEND

##### 2015 Fish Survey Location

- F** Fish Observed
- F** No Fish Observed
- Photo Point

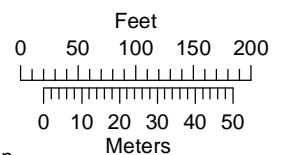
##### Species Observed

- AB** Alaska Blackfish
- AG** Arctic Grayling

- BU**
- CH**
- CO**
- DV**
- NS**
- O**
- RT**

- Burbot
- Chinook Salmon
- Coho Salmon
- Dolly Varden
- Ninespine Stickleback
- Other Species Not Listed
- Rainbow Trout

- SA(U)** Salmonid (Unspecified)
- SC(U)** Sculpin (Unspecified)
- SS** Slimy Sculpin
- ST(U)** Stickleback (Unspecified)
- TS** Threespine Stickleback
- OBS** Fish Observation, No Species Information



#### ALASKA LNG

NOTES:  
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DESIGN  
ICS

CHECK

DESIGN  
TCS

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#### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

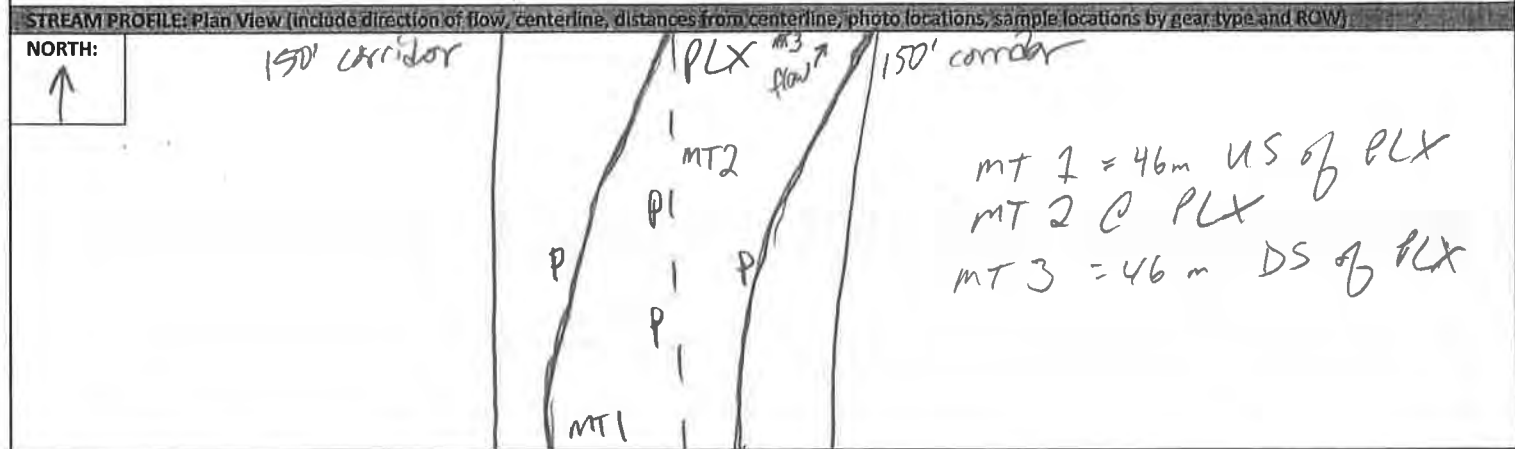
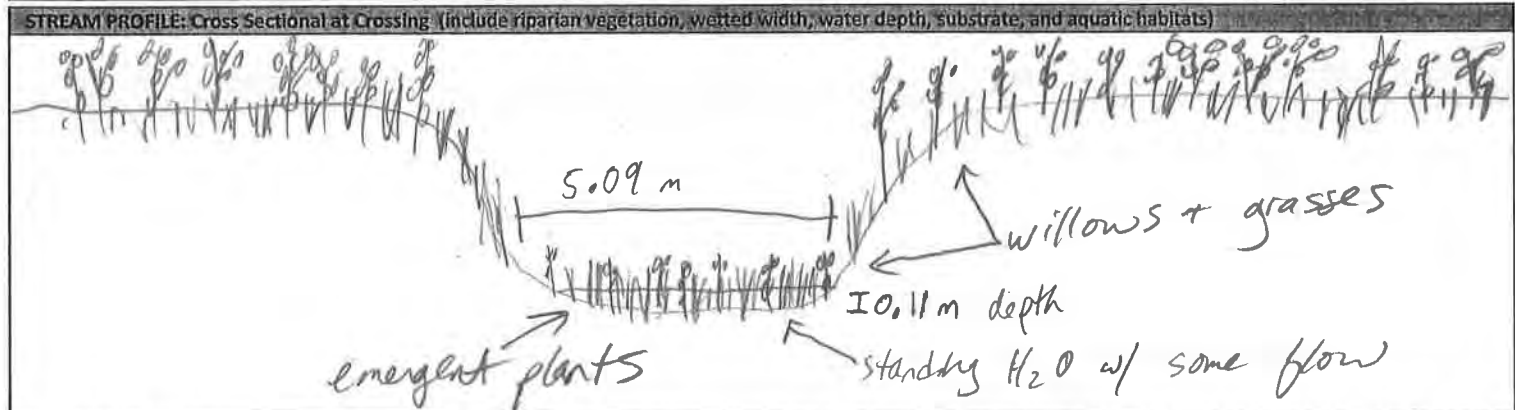
PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 67 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

<b>SITE DESCRIPTION</b>					
Date: 8/30/15	Investigators: SCS, NJS, ADF		Team No.: F86	Feature ID: F86PA013	
Stream Name: Unnamed Tributary to Sagavanirktok River			Stream ID: ALO35.32		
Pipeline Milepost: 69.8	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): 349.9		
Latitude: 69° 21' 58.4507" N			Longitude: 148° 45' 28.6528" W		
Logbook No.: 3	Logbook Page No.: 36-37	Total Fish Caught: 0	Fish Mortalities: N/A	Total Photos: 6	
US @ CL Pic No.: P-F86PA013-001-US	DS @ CL Pic No.: P-F86PA013-002-DS	RB to LB @ CL Pic No.: P-F86PA013-003-LB	LB to RB @ CL Pic No.: P-F86PA013-004-RB		
Other Pic No(s): P-F86PA013-005-AERIAL P-F86PA013-006-AERIAL					

<b>PHYSICAL/CHEMICAL ATTRIBUTES</b>					
Weather (Describe): cloudy			Precipitation (Describe): mist / fog		
Water Temperature (°C): 2.34	Air Temperature (°C): 4	pH: 6.71	Dissolved Oxygen (mg/l): 13.70		
Specific Conductance (µS/cm): 39	Turbidity (NTU): 2.76	ORP (mV): 372.7	Dissolved Oxygen (%): 99.6		
Ambient Conductance (µS/cm): 23	Odor: none	Sheen (Y/N): N	Color: none	Last date of Calibration: 8/29/15	
Defined Channel (Y/N): N	Notes: depression / ditch			Wetted Width (m): 5.09	
Flow (Y/N): Y	Notes: minimal but present			Thalweg Depth @ CL (m): 0.11	
<b>Riparian Veg at 0-5 m at LB:</b> 40 Grass/Sedge (%) 60 Shrubs (%) 0 Trees (%) N/A Diameter DBH (in.)		<b>Riparian Veg at 0-5 m at RB:</b> 40 Grass/Sedge (%) 60 Shrubs (%) 0 Trees (%) N/A Diameter DBH (in.)		<b>Stream Substrate:</b> 100 Organics (%) 0 Silt (%) 0 Sand (%) 0 Gravel (%) 0 Cobble (%) 0 Boulders (%)	
<b>Aquatic Habitats</b> Sand Bar Mud Bar Gravel Bar Riffles Pools Undercut Banks		Large Woody Debris Overhanging vegetation Contiguous Wetlands <input checked="" type="checkbox"/> Emergent Plants Submerged Plants			
<b>Stream Type:</b> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral <input type="checkbox"/>					



Feature ID: F86PA013



**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86PA013 FT # A1035.32 Date: 8/31/2015

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500
- ☒ If outside expected ranges, was sample re-taken?
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?

Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86P1A035.32

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

By signing below, I verify that all field data for this site has been verified for accuracy and completeness.

☒ Neal Smith

Fisheries Biologist (print)

☒

Signature

☒ Sam Simpson

Field Crew Chief (print)

☒

Signature





**P\_F86PA013\_001\_US**  
**LOOKING US AT PLX**

**8/30/2015 AL035.32**



**P\_F86PA013\_002\_DS**  
**LOOKING DS AT PLX**

**8/30/2015 AL035.32**





**P\_F86PA013\_003\_LB**  
**LOOKING AT LB AT PLX**

**8/30/2015 AL035.32**



**P\_F86PA013\_004\_RB**  
**LOOKING AT RB AT PLX**

**8/30/2015 AL035.32**





**P\_F86PA013\_005\_AERIAL**  
**AERIAL PHOTO**

**8/30/2015 AL035.32**



**P\_F86PA013\_006\_AERIAL**  
**AERIAL PHOTO**

**8/30/2015 AL035.32**



Target Name: UNNAMED TRIBUTARY TO  
SAGAVANIRKTOK RIVER  
Feature ID: F86PA013



## LEGEND

### 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

BU

Burbot

CH

Chinook Salmon

CO

Coho Salmon

DV

Dolly Varden

NS

Ninespine Stickleback

O

Other Species Not Listed

RT

Rainbow Trout

SA(U)

Salmonid (Unspecified)

SC(U)

Sculpin (Unspecified)

SS

Slimy Sculpin

ST(U)

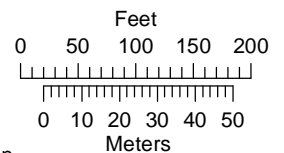
Stickleback (Unspecified)

TS

Threespine Stickleback

OBS

Fish Observation, No Species Information



## ALASKA LNG

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DESIGN  
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### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 68 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 8/26/2015	Investigators: SCS NJS ADF	Team No.: F86	Feature ID: F86PA008		
Stream Name: Unnamed Stream			Stream ID: <del>A19.4</del> A1019.4		
Pipeline Milepost: 43.8	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): 377.4		
Latitude: 69° 43' 02.7835" N		Longitude: 148° 43' 48.5797" W			
Logbook No.: 3	Logbook Page No.: 26-29	Total Fish Caught: 234	Fish Mortalities: 14	Total Photos: 6	
US @ CL Pic No.: P-F86PA008-001-US	DS @ CL Pic No.: P-F86PA008-002-DS	RB to LB @ CL Pic No.: P-F86PA008-003-LB	LB to RB @ CL Pic No.: P-F86PA008-004-RB		
Other Pic No(s): P-F86PA008-005-NS P-F86PA008-006-NS					

PHYSICAL / CHEMICAL ATTRIBUTES					
Weather (Describe): overcast, cloudy		Precipitation (Describe): light rain			
Water Temperature (°C): 10.43	Air Temperature (°C): 15	pH: 5.91	Dissolved Oxygen (mg/l): 9.90		
Specific Conductance (µS/cm): 458	Turbidity (NTU): 0.74	ORP (mV): 68.6	Dissolved Oxygen (%): 88.7		
Ambient Conductance (µS/cm): 330	Odor: none	Sheen (Y/N): N	Color: clear	Last date of Calibration: 8/16/2015	
Defined Channel (Y/N): N	Notes: grassy wetlands / standing water			Wetted Width (m): 30.2	
Flow (Y/N): Y	Notes: very light + almost unnoticeable			Thalweg Depth @ CL (m): .21 m	
Riparian Veg at 0-5 m at LB: 95 Grass/Sedge (%) 5 Shrubs (%) 0 Trees (%) N/A Diameter DBH (in.)	Riparian Veg at 0-5 m at RB: 95 Grass/Sedge (%) 5 Shrubs (%) 0 Trees (%) N/A Diameter DBH (in.)	Stream Substrate: 100 Organics (%) 0 Silt (%) 0 Sand (%) 0 Gravel (%) 0 Cobble (%) 0 Boulders (%)	Aquatic Habitats Sand Bar Mud Bar Gravel Bar Riffles Pools Undercut Banks Large Woody Debris Overhanging vegetation Contiguous Wetlands Emergent Plants Submerged Plants		
Stream Type: Perennial <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input type="checkbox"/>					

**STREAM PROFILE: Cross Sectional at Crossing** (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

**STREAM PROFILE: Plan View** (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)

# STREAM FISH INVESTIGATION DATA FORM

Feature ID: F86PA008

METHODS ATTRIBUTES				
Minnow Traps (Y/N): <u>Y</u>	Hook and Line (Y/N): <u>N</u>	Beach Seine (Y/N): <u>N</u>	Fyke Net (Y/N): <u>N</u>	Hoop Net (Y/N): <u>N</u>
No. of Minnow Traps Set: <u>3</u>	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)	Date & Time in: (mm/dd/yyyy)
Date & Time In: <u>8/26/2015</u> <u>1430</u>	No. of lines in water:	No. of passes:	Date & Time out: (mm/dd/yyyy)	Date & Time out: (mm/dd/yyyy)
Date & Time out: <u>8/27/2015</u> <u>1345</u>	Time lines in water:	Reach Length (m):		

ELECTROFISHING ATTRIBUTES				
EF (Y/N): <u>N</u>	EF Start Time:	EF End Time:	EF Time (seconds):	EF Reach Length (m):
Duty Cycle:	Frequency (Hz):	Waveform:	Sampling Efficiency (% of sample reach):	
Current (A):	Volts (V):	Power (W):	(amp x volts)	

FISH OBSERVATIONS						
ID (Seq. Num)	Gear Type	Species	Total Length (mm)	Life Stage (Juvenile or Adult)	Disposition (Dead or Alive)	Picture No.
001	MT 2	ninespine stickleback	51	juv/adult	alive	*P-F86PA008-005-NS
002	MT 3	"	53	"	Alive	N/A
003	"	"	50	"	"	N/A
004	"	"	53	"	"	"
005	"	"	51	"	"	"
006	"	"	52	"	"	"
007	"	"	54	"	"	"
008	"	"	49	Juvenile	"	"
009	"	"	55	Juv/Adult	"	"
010	"	"	56	"	"	"
011	"	"	55	"	"	"
012	"	"	51	"	"	"

NOTES (any additional information)
<ul style="list-style-type: none"> <li>- many ninespine stickleback caught in MT. Several dead or injured due to gills stuck in mesh.</li> <li>- feature is a large wetland channel - no real defined stream</li> <li>- Flow difficult to see</li> <li>- substrate is organics/grasses - in standing water</li> </ul>

MISCELLANEOUS POINTS (if applicable)	
Point ID: <u>N/A</u>	Description: <u>N/A</u>
Point ID: <u>N/A</u>	Description: <u>N/A</u>

Field Crew Chief: [Signature] Field Scientist/Technician: [Signature] Technical Lead: [Signature]



# STREAM FISH INVESTIGATION DATA FORM

Feature ID: F86PA008

FISH OBSERVATIONS (continued)						
ID (Seq. Num)	Gear Type	Species	Total Length (mm)	Life Stage (Juvenile or Adult)	Disposition (Dead or Alive)	Picture No.
013	MT3	Ninespine Stickleback	48	Juvenile	Alive	N/A
014	11	11	46	11	Alive	11
015	11	11	56	Juv/Adult	11	11
016	11	11	50	11	11	11
017	11	11	53	11	11	11
018	11	11	49	Juvenile	11	11
019	11	11	44	11	11	11
020	11	11	51	Juv/Adult	11	11
021	11	11	56	11	11	11
022	11	11	54	11	11	11
023	11	11	48	Juvenile	11	11
024	11	11	45	11	11	11
025	11	11	41	11	11	11
026	11	11	45	11	11	11
027	11	11	47	11	11	11
028	11	11	46	11	11	11
029	11	11	47	11	11	11
030	11	11	48	11	11	11
031	11	11	46	11	11	11
032	11	11	41	11	11	11
033	11	11	46	11	11	11
034	11	11	44	11	11	11
035	11	11	41	11	11	11
036	11	11	44	11	11	11
037	11	11	43	11	11	11
038	11	11	48	11	11	11
039	11	11	44	11	11	11
040	11	11	48	11	11	11
041	11	11	42	11	11	11
042	11	11	43	11	11	11
043	11	11	51	Juv/Adult	11	11
044	11	11	45	Juvenile	11	11
045	11	11	51	Juv/Adult	11	11
046	11	11	48	Juvenile	11	11
047	11	11	41	11	11	11
048	11	11	51	Juv/Adult	11	11
049	11	11	44	Juvenile	11	11
050	11	11	51	Juv/Adult	dead	*P-F86PA008-006-NS
051	11	11	57	11	Alive	N/A
052	11	11	42	Juvenile	Alive	11
053	11	11	46	Juvenile	11	11
054	11	11	46	Juvenile	11	11

Feature ID: F86PA008

Feature ID:

F86PA008

ID (Seq. Num)	Gear Type	Species	Total Length (mm)	Life Stage (Juvenile or Adult)	Disposition (Dead or Alive)	Picture No.
055	MT3	Ninespine Stickleback	43	Juvenile	alive	N/A
056	"	"	41	"	dead	"
057	"	"	50	Juv/Adult	alive	"
058	"	"	53	"	alive	"
059	"	"	42	Juvenile	alive	"
060	"	"	45	"	alive	"
061	"	"	50	Juv/Adult	dead	"
062	MT1	"	48	Juvenile	dead	"
063		"	50	Juv/Adult	dead	"
064		"	50	"	dead	"
065		"	50	"	alive	"
066		"	48	Juvenile	dead	"
067		"	42	"	dead	"
068		"	51	Juv/Adult	<del>active</del> dead SCS	"
069		"	50	"	dead	"
070		"	41	Juvenile	alive	"
071		"	51	Juv/Adult	alive	"
072		"	53	"	dead	"
073		"	43	Juvenile	alive	"
074		"	48	"	alive	"
075		"	42	"	alive	"
076		"	43	"	alive	"
077		"	45	"	dead	"
078		"	50	Juv/Adult	alive	"
079		"	45	Juvenile	dead	"
080		"	42	"	alive	"
081		"	48	"	alive	"
082		"	49	"	dead	"
083-120	MT1	"	40	Juvenile	Alive	
121-172	MT1	"	45	"	Alive	
173-224	MT1	"	50	Juv/Adult	Alive	
225-232	MT1	"	55	"	Alive	
233-234	MT1	"	60	"	Alive	"
SCS	MT1	"	65	adult	Alive	



**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86PA008 FT # AL019.4 Date: 8/27/2015

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500

- N/A ☐ If outside expected ranges, was sample re-taken?
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- N/A ☐ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☐ Are units correct?

**Stream Fish Investigations Field Form  
QA/QC Checklist**

Feature ID: F86PA008

**6. Fish Observations**

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

**7. General**

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ **NO** Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

X Neal Smith

Fisheries Biologist (print)

X Neal Smith

Signature

X Sam Simpson

Field Crew Chief (print)

X

Signature





**P\_F86PA008\_001\_US**  
**LOOKING US AT OFF-ROW TARGET**

**8/26/2015 AL019.4**



**P\_F86PA008\_002\_DS**  
**LOOKING DS AT OFF-ROW TARGET**

**8/26/2015 AL019.4**



**P\_F86PA008\_003\_LB**

**8/26/2015 AL019.4**

**LOOKING AT LB AT OFF-ROW TARGET**



**P\_F86PA008\_004\_RB**

**8/26/2015 AL019.4**

**LOOKING AT RB AT OFF-ROW TARGET**





P\_F86PA008\_005\_NS

8/26/2015 AL019.4

PHOTO OF NINESPINE STICKLEBACK



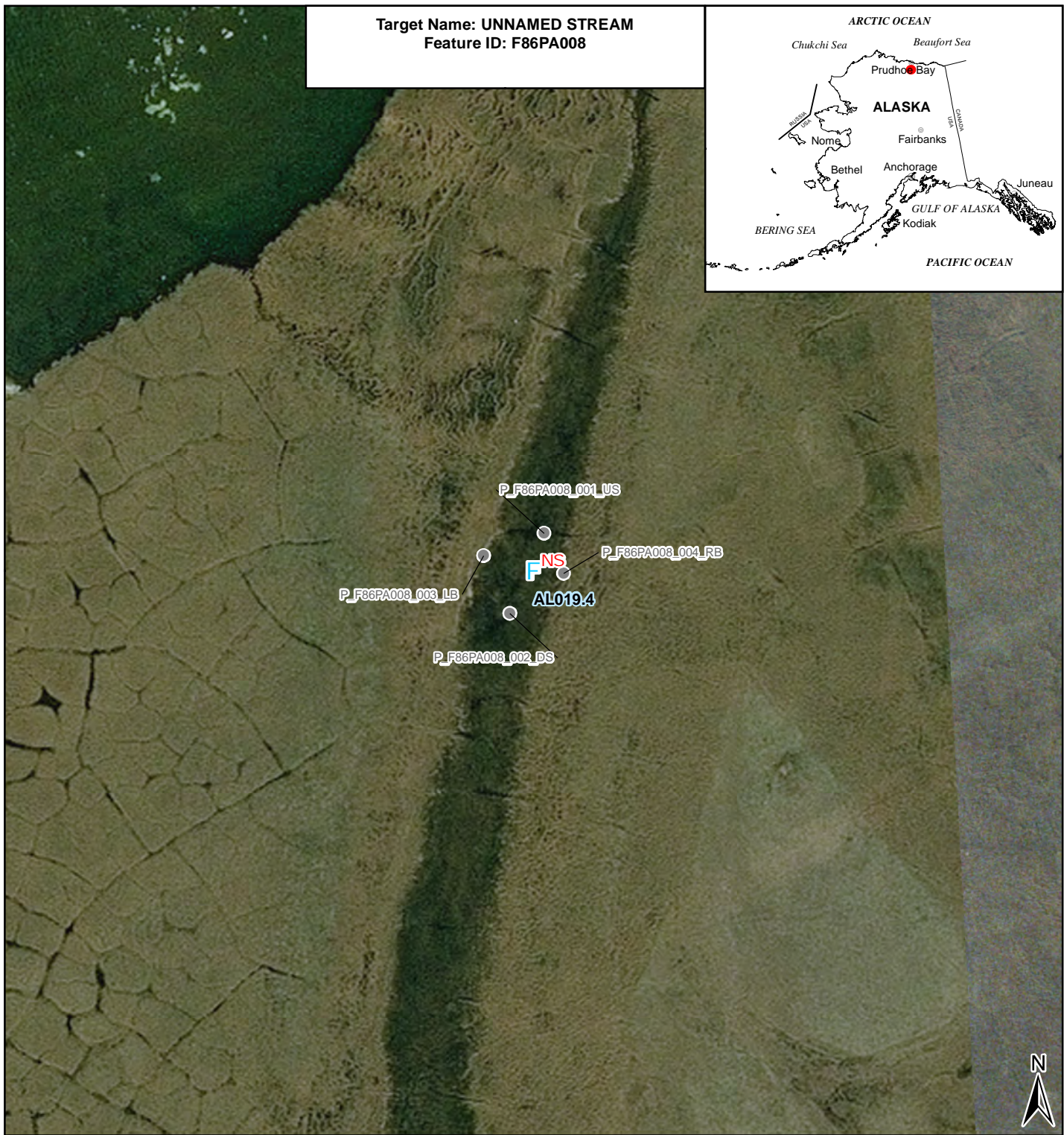
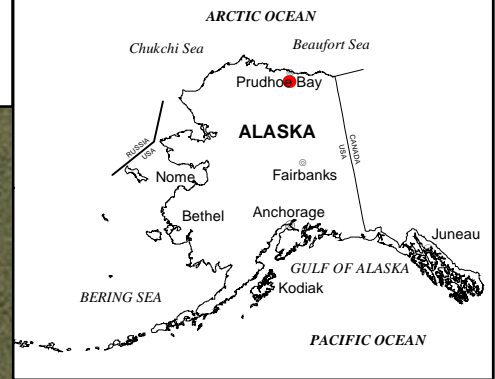
P\_F86PA008\_006\_NS

8/26/2015 AL019.4

PHOTO OF NINESPINE STICKLEBACK



Target Name: UNNAMED STREAM  
Feature ID: F86PA008



#### LEGEND

##### 2015 Fish Survey Location

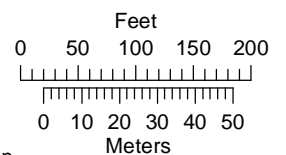
- F Fish Observed
- F No Fish Observed
- Photo Point

##### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

- BU Burbot
- CH Chinook Salmon
- CO Coho Salmon
- DV Dolly Varden
- NS Ninespine Stickleback
- O Other Species Not Listed
- RT Rainbow Trout

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
- TS Threespine Stickleback
- OBS Fish Observation, No Species Information



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DESIGN  
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CHECK

DESIGN  
TCS

APPROVE

### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 69 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 8/26/2015	Investigators: SCS NJS ADF	Team No.: F86	Feature ID: F86PA007		
Stream Name: Unnamed Stream			Stream ID: A019.12		
Pipeline Milepost: 40.6	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): 381		
Latitude: 69°46'01.9389" N			Longitude: 148°42'42.0791" W		
Logbook No.: 3	Logbook Page No.: 26 - 28	Total Fish Caught: 0	Fish Mortalities: N/A	Total Photos: 4	
US @ CL Pic No.: P-F86PA007-001-US	DS @ CL Pic No.: P-F86PA007-002-US	RB to LB @ CL Pic No.: P-F86PA007-003-LB	LB to RB @ CL Pic No.: P-F86PA007-004-RB		
Other Pic No(s): N/A					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): overcast			Precipitation (Describe): none		
Water Temperature (°C): 12.29	Air Temperature (°C): 14	pH: 5.17	Dissolved Oxygen (mg/l): 10.43		
Specific Conductance (µS/cm): 556	Turbidity (NTU): 0.76	ORP (mV): 195.8	Dissolved Oxygen (%): <del>98.5</del> 96.7		
Ambient Conductance (µS/cm): 421	Odor: none	Sheen (Y/N): N	Color: clear	Last date of Calibration: 8/16/2015	
Defined Channel (Y/N): N	Notes: feature is a wetland depression			Wetted Width (m): 25.2	
Flow (Y/N): Y	Notes: standing water w/ wetland (very little flow)			Thalweg Depth @ CL (m): 0.14m	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
90 Grass/Sedge (%)		85 Grass/Sedge (%)		100 Organics (%)	
10 Shrubs (%)		15 Shrubs (%)		0 Silt (%)	
0 Trees (%)		0 Trees (%)		0 Sand (%)	
N/A Diameter DBH (in.)		N/A Diameter DBH (in.)		0 Gravel (%)	
				0 Cobble (%)	
				0 Boulders (%)	
Stream Type:		Aquatic Habitats			
Perennial <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input type="checkbox"/>		<input type="checkbox"/> Sand Bar <input type="checkbox"/> Mud Bar <input type="checkbox"/> Gravel Bar <input type="checkbox"/> Riffles <input type="checkbox"/> Pools <input type="checkbox"/> Undercut Banks <input type="checkbox"/> Large Woody Debris <input type="checkbox"/> Overhanging vegetation <input checked="" type="checkbox"/> Contiguous Wetlands <input checked="" type="checkbox"/> Emergent Plants <input checked="" type="checkbox"/> Submerged Plants			

**STREAM PROFILE: Cross Sectional at Crossing** (include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

**STREAM PROFILE: Plan View** (include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)

Feature ID: F86PA007



**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86PA007

FT # AL019.12

Date: 8/27/15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

☒ Was ADF&G contacted before conducting any work in this area?

☒ Site Description complete? (Every cell must have entry or N/A)

☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

☒ Calibration performed prior to sampling?

☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)

☒ Water quality data within expected ranges?

☒ pH: 4.0 – 10.0

☒ NTU: 0 – 3000

☒ DO (mg/L): 1.0 – 15.0

☒ Temp.: 1.0 – 19.0

☒ Specific Conductance: 20 - 1500

N/A ☒ If outside expected ranges, was sample re-taken?

☒ Are units correct?

**3. Stream Profile**

☒ Stream profile view sketch included?

☒ Stream profile view captures water depth and wetted width?

☒ Stream profile view captures where efforts were made to capture fish?

☒ Plan view sketch included?

**4. Methods Attributes**

☒ Methods attributes complete? (Every cell must have entry or N/A)

☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

N/A ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)

☒ Are units correct?

Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86PA007

6. Fish Observations

- N/A ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- N ☒ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

By signing below, I verify that all field data for this site has been verified for accuracy and completeness.

X Neal Smith

Fisheries Biologist (print)

X

Signature

X Sam Simpson

Field Crew Chief (print)

X

Signature





F86PA007  
AL 19.12  
8/26/2015  
Unnamed Stream  
P\_F86PA007\_001\_US  
Looking US @ Off-Row  
Target

**P\_F86PA007\_001\_US**  
**LOOKING US AT OFF-ROW TARGET**

**8/26/2015 AL019.12**



F86PA007  
AL 19.12  
8/26/2015  
Unnamed Stream  
P\_F86PA007\_002\_DS  
Looking DS @ Off-Row  
Target

**P\_F86PA007\_002\_DS**  
**LOOKING DS AT OFF-ROW TARGET**

**8/26/2015 AL019.12**



**P\_F86PA007\_003\_LB**

**8/26/2015 AL019.12**

**LOOKING AT LB AT OFF-ROW TARGET**



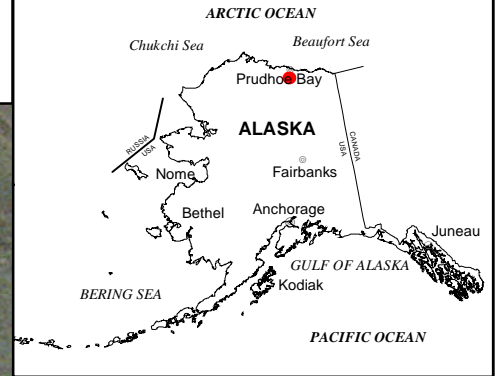
**P\_F86PA007\_004\_RB**

**8/26/2015 AL019.12**

**LOOKING AT RB AT OFF-ROW TARGET**



Target Name: UNNAMED STREAM  
Feature ID: F86PA007



P\_F86PA007\_003\_LB P\_F86PA007\_001\_US  
F AL019:12  
P\_F86PA007\_002\_DS P\_F86PA007\_004\_RB



## LEGEND

### 2015 Fish Survey Location

- F Fish Observed
- F No Fish Observed
- Photo Point

### Species Observed

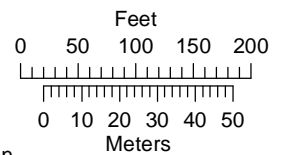
- AB Alaska Blackfish
- AG Arctic Grayling

- BU
- CH
- CO
- DV
- NS
- O
- RT

- Burbot
- Chinook Salmon
- Coho Salmon
- Dolly Varden
- Ninespine Stickleback
- Other Species Not Listed
- Rainbow Trout

- SA(U)
- SC(U)
- SS
- ST(U)
- TS
- OBS

- Salmonid (Unspecified)
- Sculpin (Unspecified)
- Slimy Sculpin
- Stickleback (Unspecified)
- Threespine Stickleback
- Fish Observation, No Species Information



## ALASKA LNG

NOTES:  
Concept Information - Confidential. Produced by Alaska LNG team. The information used to create this product is based on the collected data on the date of issue; it is considered reliable only at the scale at which the data was created and the scale at which the map was published. This drawing is solely prepared for use by the contractual Alaska LNG team partners and the Alaska LNG team assumes no liability to any other party for any representations contained in these drawings. This map must be printed/viewed at full scale (100%) in order for the scale to remain correct.

ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS					
DESIGN ICS	PROJECTION AK 4	DATUM NAD83	CONTRACTOR NAME AECOM	MAP NUMBER Page 70 of 86	REV. A
DESIGN TCS	SCALE 1:2,000	DATE 15 Oct 2015	PROJECT NUMBER 26221392	ORIG PAGE SIZE 8.5 X 11	
APPR					

# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 8/27/2015	Investigators: SCS NSS ADF	Team No.: F86	Feature ID: F86PA009		
Stream Name: Thelma Creek			Stream ID: ALOIS		
Pipeline Milepost: 37.1	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): 384		
Latitude: 69° 48' 46.2981" N		Longitude: 148° 45' 45.5384" W			
Logbook No.: 3	Logbook Page No.: 26 - 28	Total Fish Caught: 0	Fish Mortalities: N/A	Total Photos: 4	
US @ CL Pic No.: P-F86PA009-001-US	DS @ CL Pic No.: P-F86PA009-002-DS	RB to LB @ CL Pic No.: P-F86PA009-003-LB	LB to RB @ CL Pic No.: P-F86PA009-004-RB		
Other Pic No(s): N/A					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): overcast, windy			Precipitation (Describe): none		
Water Temperature (°C): 4.62	Air Temperature (°C): 4	pH: 6.04	Dissolved Oxygen (mg/l): 13.91		
Specific Conductance (µS/cm): 363	Turbidity (NTU): 0.69	ORP (mV): 891.9	Dissolved Oxygen (%): 107.9		
Ambient Conductance (µS/cm): 223	Odor: none	Sheen (Y/N): N	Color: clear	Last date of Calibration: 8/26/2015	
Defined Channel (Y/N): N	Notes: wetland pools/puddles; discontinuous			Wetted Width (m): 7.0 m	
Flow (Y/N): N	Notes: flat area w/ no banks			Thalweg Depth @ CL (m): .15 m	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
95 Grass/Sedge (%)		95 Grass/Sedge (%)		100 Organics (%)	
5 Shrubs (%)		5 Shrubs (%)		0 Silt (%)	
0 Trees (%)		0 Trees (%)		0 Sand (%)	
N/A Diameter DBH (in.)		N/A Diameter DBH (in.)		0 Gravel (%)	
				0 Cobble (%)	
				0 Boulders (%)	
Stream Type:		Aquatic Habitats			
Perennial Intermittent <input checked="" type="checkbox"/> Ephemeral		<input type="checkbox"/> Sand Bar <input type="checkbox"/> Large Woody Debris <input type="checkbox"/> Mud Bar <input type="checkbox"/> Overhanging vegetation <input type="checkbox"/> Gravel Bar <input checked="" type="checkbox"/> Contiguous Wetlands <input type="checkbox"/> Riffles <input checked="" type="checkbox"/> Emergent Plants <input type="checkbox"/> Pools <input checked="" type="checkbox"/> Submerged Plants <input type="checkbox"/> Undercut Banks			

**STREAM PROFILE: Cross Sectional at Crossing** (Include riparian vegetation, wetted width, water depth, substrate, and aquatic habitats)

**STREAM PROFILE: Plan View** (Include direction of flow, centerline, distances from centerline, photo locations, sample locations by gear type and ROW)



Feature ID: F86PAD09

[illegible]

- no fish caught in MT
- 'stream' feature is a series of disconnected pools/puddles in wetland complex. No flow + very shallow
- grass/organic substrate

MISCELLANEOUS POINTS (If applicable)	
Point ID: <i>N/A</i>	Description: <i>N/A</i>
Point ID: <i>N/A</i>	Description: <i>N/A</i>

Field Crew Chief: [Signature] Field Scientist/Technician: [Signature] Technical Lead: \_\_\_\_\_

**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86PA009 FT # AL015 Date: 8/27/15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500
- ☒ If outside expected ranges, was sample re-taken?
- ☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- ☒ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☒ Are units correct?



Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86P1009

**6. Fish Observations**

- MA ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

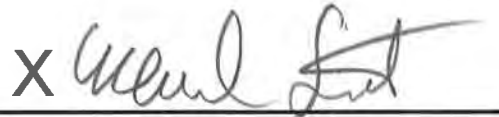
**7. General**

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- NO ☐ Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

*By signing below, I verify that all field data for this site has been verified for accuracy and completeness.*

X Neal Smith

Fisheries Biologist (print)

X 

Signature

X Sam Simpson

Field Crew Chief (print)

X 

Signature



**P\_F86PA009\_001\_US**  
**LOOKING US AT OFF-ROW TARGET**

**8/27/2015 AL015**



**P\_F86PA009\_002\_DS**  
**LOOKING DS AT OFF-ROW TARGET**

**8/27/2015 AL015**





**P\_F86PA009\_003\_LB**

**8/27/2015 AL015**

**LOOKING AT LB AT OFF-ROW TARGET**



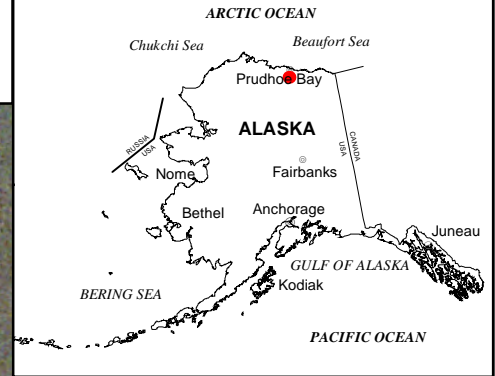
**P\_F86PA009\_004\_RB**

**8/27/2015 AL015**

**LOOKING AT RB AT OFF-ROW TARGET**



Target Name: THELMA CREEK  
Feature ID: F86PA009



P\_F86PA009\_001\_US  
AL015  
P\_F86PA009\_004\_RB  
P\_F86PA009\_003\_LB  
P\_F86PA009\_002\_DS



## LEGEND

### 2015 Fish Survey Location

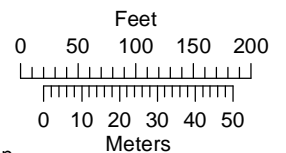
- F Fish Observed
- F No Fish Observed
- Photo Point

### Species Observed

- AB Alaska Blackfish
- AG Arctic Grayling

- BU Burbot
- CH Chinook Salmon
- CO Coho Salmon
- DV Dolly Varden
- NS Ninespine Stickleback
- O Other Species Not Listed
- RT Rainbow Trout

- SA(U) Salmonid (Unspecified)
- SC(U) Sculpin (Unspecified)
- SS Slimy Sculpin
- ST(U) Stickleback (Unspecified)
- TS Threespine Stickleback
- OBS Fish Observation, No Species Information



## ALASKA LNG

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DESIGN  
ICS

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DESIGN  
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### ALASKA LNG 2015 FISH FIELD SURVEY LOCATIONS

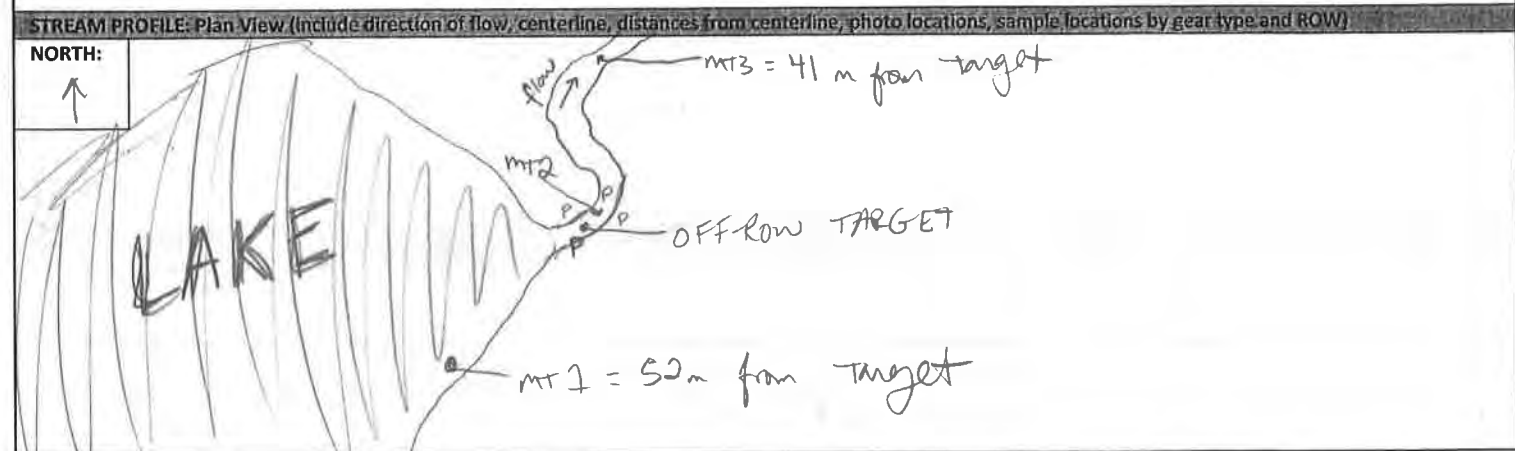
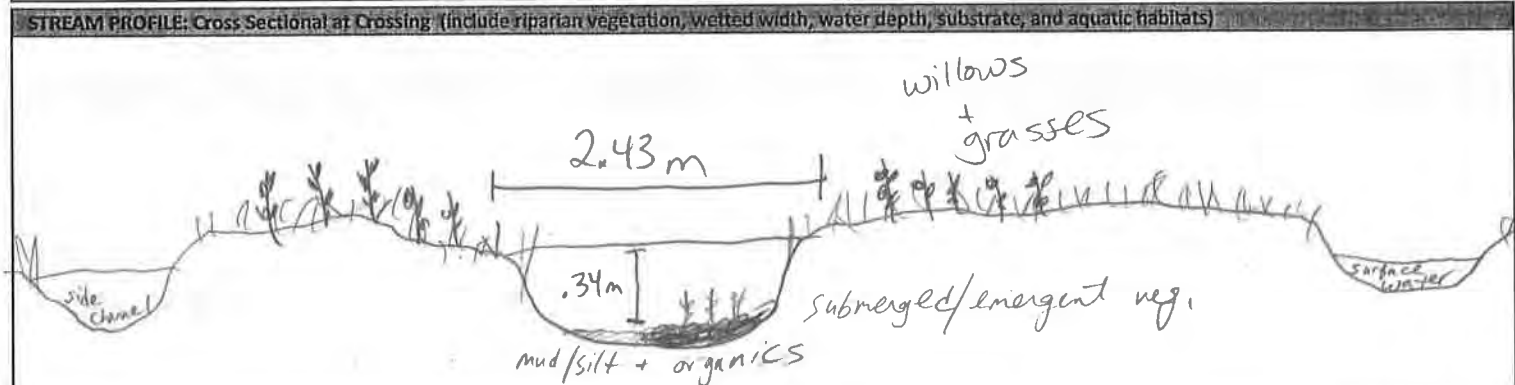
PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	AECOM	Page 71 of 86	A
SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE	
1:2,000	15 Oct 2015	26221392	8.5 X 11	



# STREAM FISH INVESTIGATION DATA FORM

SITE DESCRIPTION					
Date: 8/16/2015	Investigators: SCS NJS ADF	Team No.: F86	Feature ID: F86PA006		
Stream Name: Unnamed Stream			Stream ID: AL005-1		
Pipeline Milepost: 32.7	Stream found as expected (Y/N): Y		Hwy MP (N/A if heli accessed): heli		
Latitude: 69° 52' 21.7408" N		Longitude: 148° 49' 17.2084" W			
Logbook No.: 3	Logbook Page No.: 21-23	Total Fish Caught: 71	Fish Mortalities: 1	Total Photos: 7	
US @ CL Pic No.: P-F86PA006-001-US	DS @ CL Pic No.: P-F86PA006-002-DS	RB to LB @ CL Pic No.: P-F86PA006-003-LB	LB to RB @ CL Pic No.: P-F86PA006-004-RB		
Other Pic No(s): P-F86PA006-005-AERIAL P-F86PA006-006-AERIAL					

PHYSICAL/CHEMICAL ATTRIBUTES					
Weather (Describe): mostly cloudy			Precipitation (Describe): none		
Water Temperature (°C): 10.01	Air Temperature (°C): 8	pH: 7.72	Dissolved Oxygen (mg/l): 12.17		
Specific Conductance (µS/cm): 252	Turbidity (NTU): 1.64	ORP (mV): 189.2	Dissolved Oxygen (%): 108.0		
Ambient Conductance (µS/cm): 180	Odor: none	Sheen (Y/N): N	Color: clear	Last date of Calibration: 8/16/2015	
Defined Channel (Y/N): Y	Notes: defined outflow from large lake			Wetted Width (m): 2.43	
Flow (Y/N): Y	Notes: ripples/pools			Thalweg Depth @ CL (m): .34 m	
Riparian Veg at 0-5 m at LB:		Riparian Veg at 0-5 m at RB:		Stream Substrate:	
40 Grass/Sedge (%)		50 Grass/Sedge (%)		70 Organics (%)	
60 Shrubs (%)		50 Shrubs (%)		30 Silt (%)	
0 Trees (%)		0 Trees (%)		0 Sand (%)	
N/A Diameter DBH (in.)		N/A Diameter DBH (in.)		0 Gravel (%)	
				0 Cobble (%)	
				0 Boulders (%)	
Stream Type:				Aquatic Habitats	
<input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral				<input type="checkbox"/> Sand Bar <input type="checkbox"/> Mud Bar <input type="checkbox"/> Gravel Bar <input checked="" type="checkbox"/> Ripples <input checked="" type="checkbox"/> Pools <input type="checkbox"/> Undercut Banks	
				<input type="checkbox"/> Large Woody Debris <input type="checkbox"/> Overhanging vegetation <input checked="" type="checkbox"/> Contiguous Wetlands <input checked="" type="checkbox"/> Emergent Plants <input checked="" type="checkbox"/> Submerged Plants	



# STREAM FISH INVESTIGATION DATA FORM

Feature ID: F86PA006

METHODS ATTRIBUTES				
Minnow Traps (Y/N): <u>Y</u>	Hook and Line (Y/N): <u>M</u>	Beach Seine (Y/N): <u>N</u>	Fyke Net (Y/N): <u>Y</u>	Hoop Net (Y/N): <u>N</u>
No. of Minnow Traps Set: <u>3</u>	Date & Time in: (mm/dd/yyyy) <u>1</u>	Date & Time In: (mm/dd/yyyy) <u>1</u>	Date & Time in: (mm/dd/yyyy) <u>1</u>	Date & Time In: (mm/dd/yyyy) <u>1</u>
Date & Time in: <u>8/16/2015</u> (mm/dd/yyyy) <u>1545</u>	No. of lines in water: <u>1</u>	No. of passes: <u>1</u>	Date & Time out: (mm/dd/yyyy) <u>1</u>	Date & Time out: (mm/dd/yyyy) <u>1</u>
Date & Time out: <u>8/17/2015</u> (mm/dd/yyyy) <u>1430</u>	Time lines in water: <u>1</u>	Reach Length (m): <u>1</u>		

ELECTROFISHING ATTRIBUTES				
EF (Y/N): <u>N</u>	EF Start Time: <u>1</u>	EF End Time: <u>1</u>	EF Time (seconds): <u>1</u>	EF Reach Length (m): <u>1</u>
Duty Cycle: <u>1</u>	Frequency (Hz): <u>1</u>	Waveform: <u>1</u>	Sampling Efficiency (% of sample reach): <u>1</u>	
Current (A): <u>1</u>	Volts (V): <u>1</u>	Power (W): <u>1</u>	(amp x volts)	

FISH OBSERVATIONS						
ID (Seq. Num)	Gear Type	Species	Total Length (mm)	Life Stage (Juvenile or Adult)	Disposition (Dead or Alive)	Picture No.
001	MT 3	ninespine stickleback	46	juvenile	alive	n/a
002	"	"	46	"	alive	n/a
003	"	"	46	"	alive	n/a
004	"	"	38	"	dead	n/a
005	"	"	41	"	alive	n/a
006	"	"	42	"	alive	n/a
007	"	"	43	"	"	n/a
008	"	"	47	"	"	n/a
009	"	"	46	"	"	n/a
010	MT 2	"	50	juv/adult	alive	N/A
011	"	"	41	juvenile	alive	N/A
012	"	"	41	juvenile	alive	N/A

NOTES (any additional information)
<p>- 71 <del>AT</del> <u>ninespine stickleback</u> caught in MT</p> <p>- one mortality - head stuck in MT mesh.</p> <p>- Target located at lake outflow</p> <p>- well defined channel + flow - adjacent to wetlands</p>

MISCELLANEOUS POINTS (if applicable)	
Point ID: <u>N/A</u>	Description: <u>N/A</u>
Point ID: <u>N/A</u>	Description: <u>N/A</u>

Field Crew Chief: [Signature] Field Scientist/Technician: [Signature] Technical Lead:



# STREAM FISH INVESTIGATION DATA FORM

Feature ID: F86P A006

FISH OBSERVATIONS (continued)						
ID (Seq. Num)	Gear Type	Species	Total Length (mm)	Life Stage (Juvenile or Adult)	Disposition (Dead or Alive)	Picture No.
<del>013</del> 013	MT2	ninespine stickleback	43	juv	alive	N/A
014			47	"		
015			50	juv/adult		
016			43	juv		
017			52	juv/adult		
018			51	"		
019			43	juv.		
020			47	"		
021			55	juv/adult		
022			51	"		
023			43	juv.		
024			46	"		
025			48	"		
026			41	"		
027			52	juv/adult		
028			45	juv		
029			50	juv/adult		
030			38	juv		
031			47	"		
032			45	"		
033			44	"		
034			46	"		
035			42	"		
036			44	"		
037			46	"		
038			43	"		
039	MT1		45	juvenile	dead	N/A
040			48	"	alive	*F86PA006_007.N5
041			42	"	alive	N/A
042			52	juv/adult	alive	N/A
043			45	juvenile	alive	N/A
044			52	juv/adult	"	N/A
045			51	"	"	N/A
046			52	"	"	N/A
047			55	"	"	N/A
048			53	"	"	N/A
049			55	"	"	N/A
050			43	juvenile	"	N/A
051			53	juv/adult	"	N/A
052			52	"	"	N/A
053			50	"	"	N/A
054			48	juv.	"	N/A

Feature ID: F86PA006

Feature ID:

F86PAD06

FISH OBSERVATIONS (continued)						
ID (Seq. Num)	Gear Type	Species	Total Length (mm)	Life Stage (Juvenile or Adult)	Disposition (Dead or Alive)	Picture No.
055	MT 1	ninegus sickleback	46	juv	alive	n/a
056			47	"	"	n/a
057			56	juv/adult	"	n/a
058			52	"	"	n/a
059			52	"	"	n/a
060			43	juv	"	n/a
061			47	"	"	n/a
062			49	"	"	n/a
063			47	"	"	n/a
064			43	"	"	n/a
065			45	"	"	n/a
066			47	"	"	n/a
067			44	"	"	n/a
068			43	"	"	n/a
069			44	"	"	n/a
070			42	"	"	n/a
071			48	"	"	n/a



**Stream Fish Investigations Field Form  
QA/QC Checklist**

*This form is to be completed before leaving the field site.*

Feature ID: F86PA006 FT # AL005.1 Date: 8/17/15

*For all items not checked, please provide detailed explanation in the notes section of data form.*

**1. Site Description**

- ☒ Was ADF&G contacted before conducting any work in this area?
- ☒ Site Description complete? (Every cell must have entry or N/A)
- ☒ Were all photos taken and labeled correctly?

**2. Physical/Chemical Attributes**

- ☒ Calibration performed prior to sampling?
- ☒ Physical/Chemical attributes complete? (Every cell must have entry or N/A)
- ☒ Water quality data within expected ranges?
  - ☒ pH: 4.0 – 10.0
  - ☒ NTU: 0 – 3000
  - ☒ DO (mg/L): 1.0 – 15.0
  - ☒ Temp.: 1.0 – 19.0
  - ☒ Specific Conductance: 20 - 1500

N/A ☐ If outside expected ranges, was sample re-taken?

☒ Are units correct?

**3. Stream Profile**

- ☒ Stream profile view sketch included?
- ☒ Stream profile view captures water depth and wetted width?
- ☒ Stream profile view captures where efforts were made to capture fish?
- ☒ Plan view sketch included?

**4. Methods Attributes**

- ☒ Methods attributes complete? (Every cell must have entry or N/A)
- ☒ Were methods used adequate (explanation needed if no methods selected)?

**5. Electrofishing Attributes**

- N/A ☐ Electrofishing attributes complete? (Every cell must have entry or N/A)
- ☐ Are units correct?

Stream Fish Investigations Field Form  
QA/QC Checklist

Feature ID: F86 PA006

6. Fish Observations

- ☒ Are all fish captured/observed recorded in the Fish Observation table?
- ☒ Are units correct? (Total Length (mm))
- ☒ Were adequate photos taken of fish captured? (Take a photo if in doubt)

7. General

- ☒ Feature ID and Field Target # are consistent on data forms, logbook entries, photos, and maps?
- ☒ All additional data in logbook captured on data form and additional photos noted?
- ☒ Were all additional comments on stream habitat, etc. recorded on data form?
- ☒ **No** Was any gear missing/damaged for this survey or did you have any problems that should require resampling of this stream for an adequate survey effort?

By signing below, I verify that all field data for this site has been verified for accuracy and completeness.

X Neal Smith

Fisheries Biologist (print)

X Neal Smith

Signature

X Sam Simpson

Field Crew Chief (print)

X Sam Simpson

Signature