APPENDIX P. 1950s TO 2012 LOWER SUSITNA RIVER SEGMENT TURNOVER

Susitna-Watana Hydroelectric Project
(FERC No. 14241)

Geomorphology Study (6.5)

Mapping of Geomorphic Features and Turnover within the Middle and Lower Susitna River Segments from 1950s, 1980s, and Current Aerials Technical Memorandum

Prepared for

Alaska Energy Authority

SUSITNA-WATANA HYDRO
Clean, reliable energy for the next 100 years.

Prepared by

Tetra Tech Inc.

September 2014

LOWER SUSITNA RIVER SEGMENT TURNOVER ANALYSIS 1950s - 2012

ALASKA ENERGY AUTHORITY

151°W 150°30'W 150°W 149°30'W 149°W 148°30'W 148°W 147°30'W

62°20'N 62°10'N 62°N 61°50'N 61°40'N 61°30'N 61°20'N

Sheet 18
Sheet 16
Sheet 17
Sheet 15
Sheet 14
Sheet 13
Sheet 12
Sheet 10
Sheet 11
Sheet 8
Sheet 6
Sheet 9
Sheet 7
Sheet 5
Sheet 4
Sheet 3
Sheet 1
Sheet 2

Deshka River
Yentna River
Susitna River
Kashwitna River
Willow Creek
River

Legend

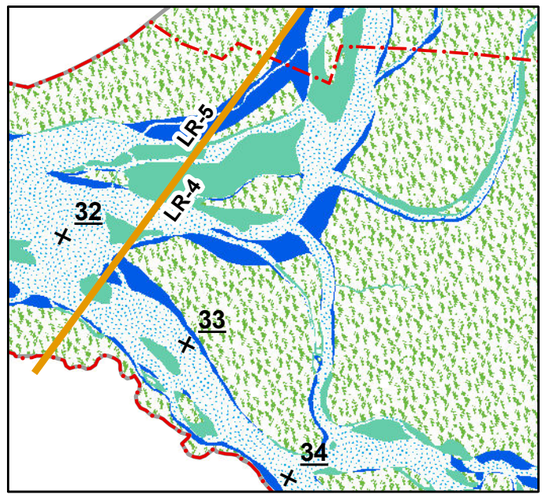
- Sheet Extents
- Roads
- Railroads
- Rivers and Streams
- Waterbodies

Data Sources: See Map References

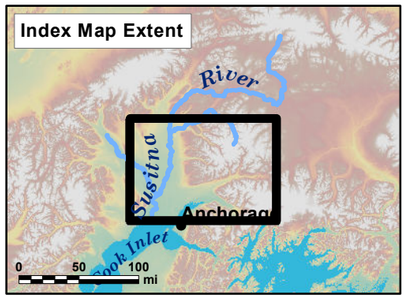
Legend For Individual Mapbook Pages

- Project River Miles
- Geomorphic Reach Breaks
- Analysis Extent Boundary
- Combined Extent of Aerial Photo Coverage for 1950s, 1983 & 2012
- Floodplain to Channel
- Channel to Floodplain
- Channel in both years
- Floodplain in both years

Example Mapbook Page Data



Index Map Extent



0 10 20 mi

Projection: NAD83 State Plane Alaska 4 FIPS 5004 (ft)
Date Created: 9/8/2014
Map Author: Tetra Tech
File: 1950sTo2012_LR_Turnover_v1_20140304_cover.mxd

N/A

LR-6

4

5

6

7

8

9

10

11

12

0 3,000 6,000 Feet

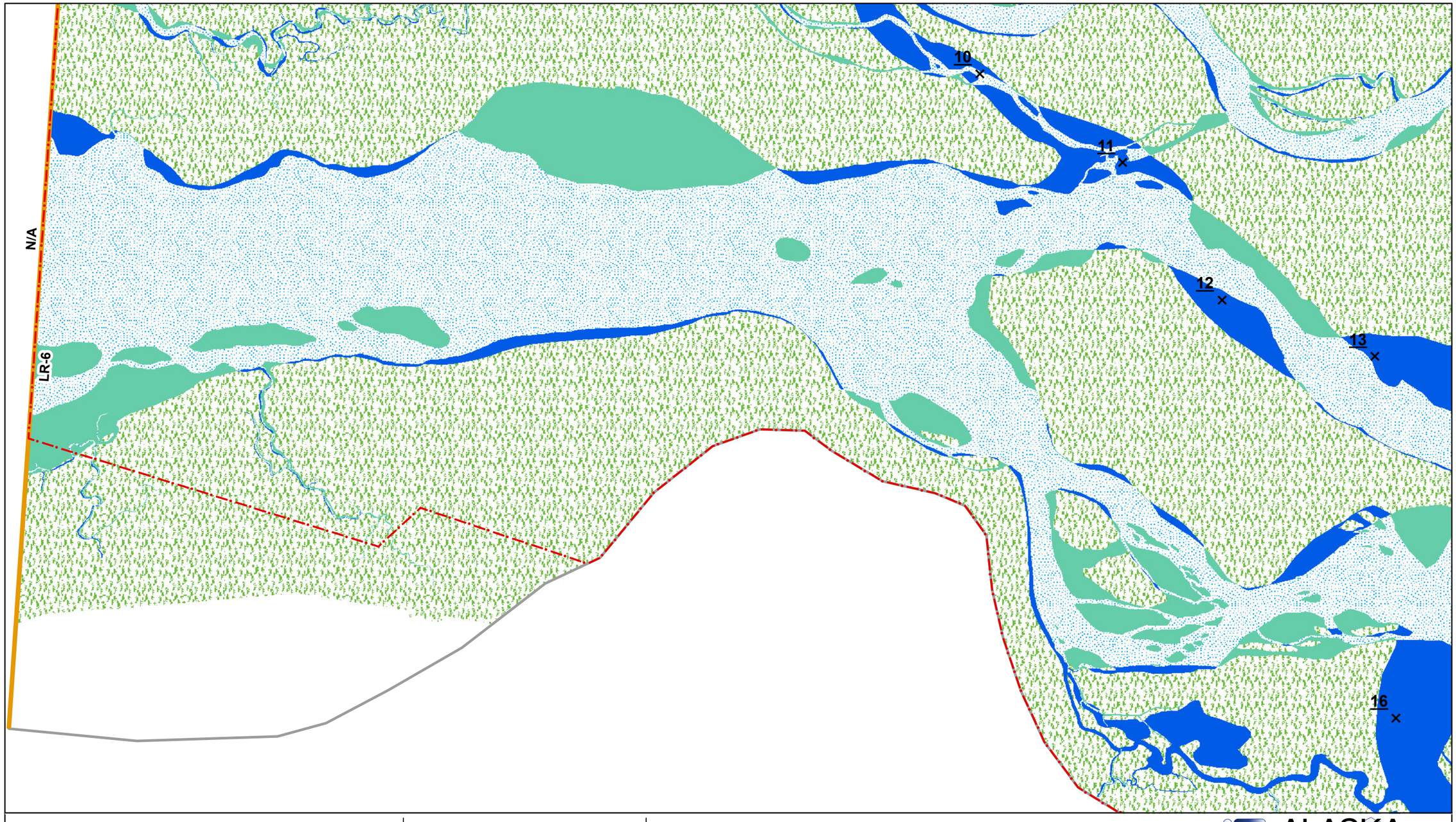
1 inch = 3,000 feet

See index page for legend and additional data information.

Sheet 1 of 18

LOWER SUSITNA RIVER SEGMENT
1950s to 2012 TURNOVER

ALASKA ENERGY AUTHORITY



0 3,000 6,000 Feet

1 inch = 3,000 feet

See index page for legend and additional data information.

Sheet 2 of 18

LOWER SUSITNA RIVER SEGMENT
1950s to 2012 TURNOVER

ALASKA ENERGY AUTHORITY

ALEXANDER CREEK

13

14

15

16

21

22

23

24

25

26

LR-5

LR-6

0 3,000 6,000 Feet

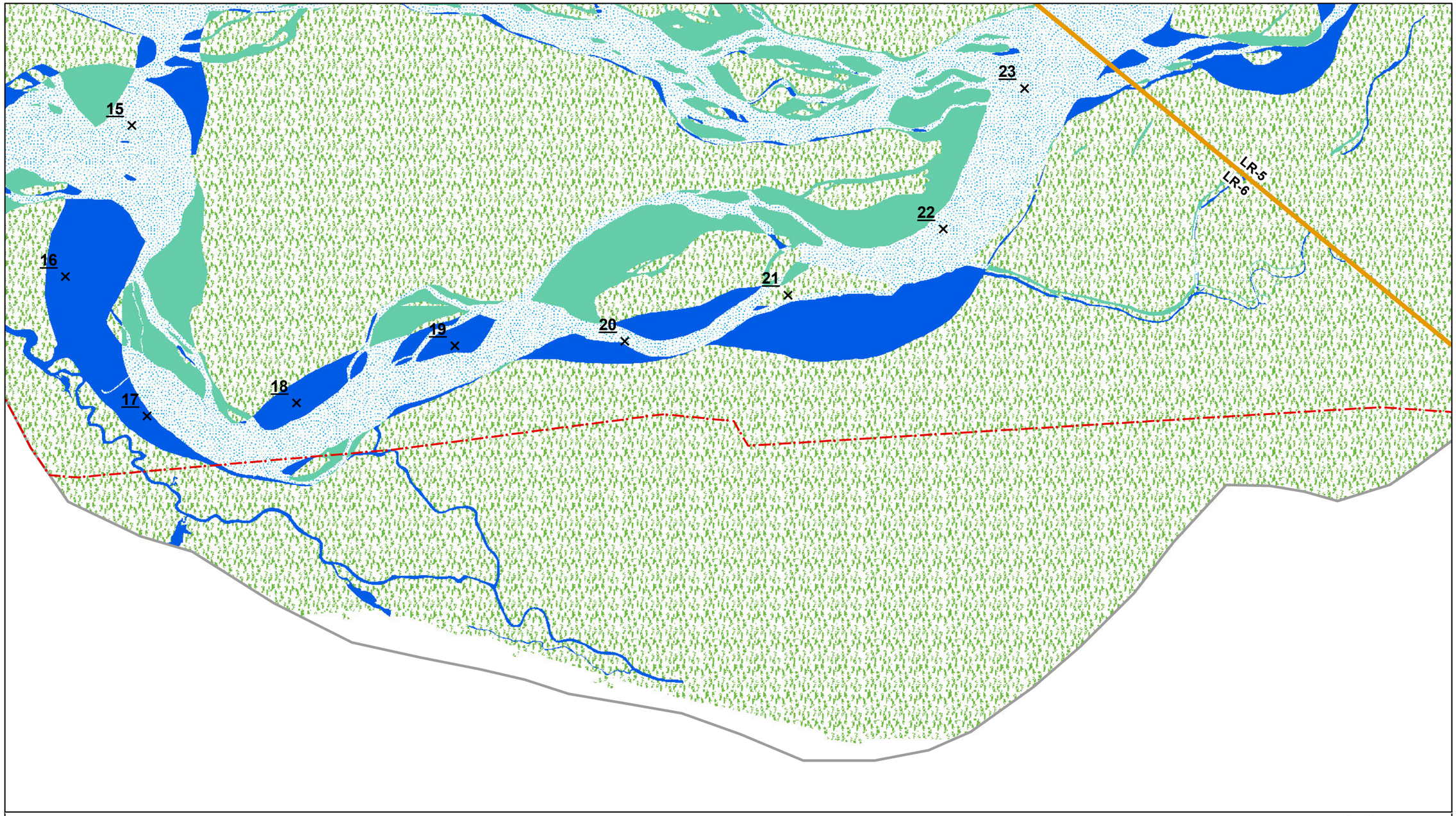
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See index page for legend and additional data information.

Sheet 3 of 18

LOWER SUSITNA RIVER SEGMENT
1950s to 2012 TURNOVER

ALASKA ENERGY AUTHORITY



0 3,000 6,000 Feet

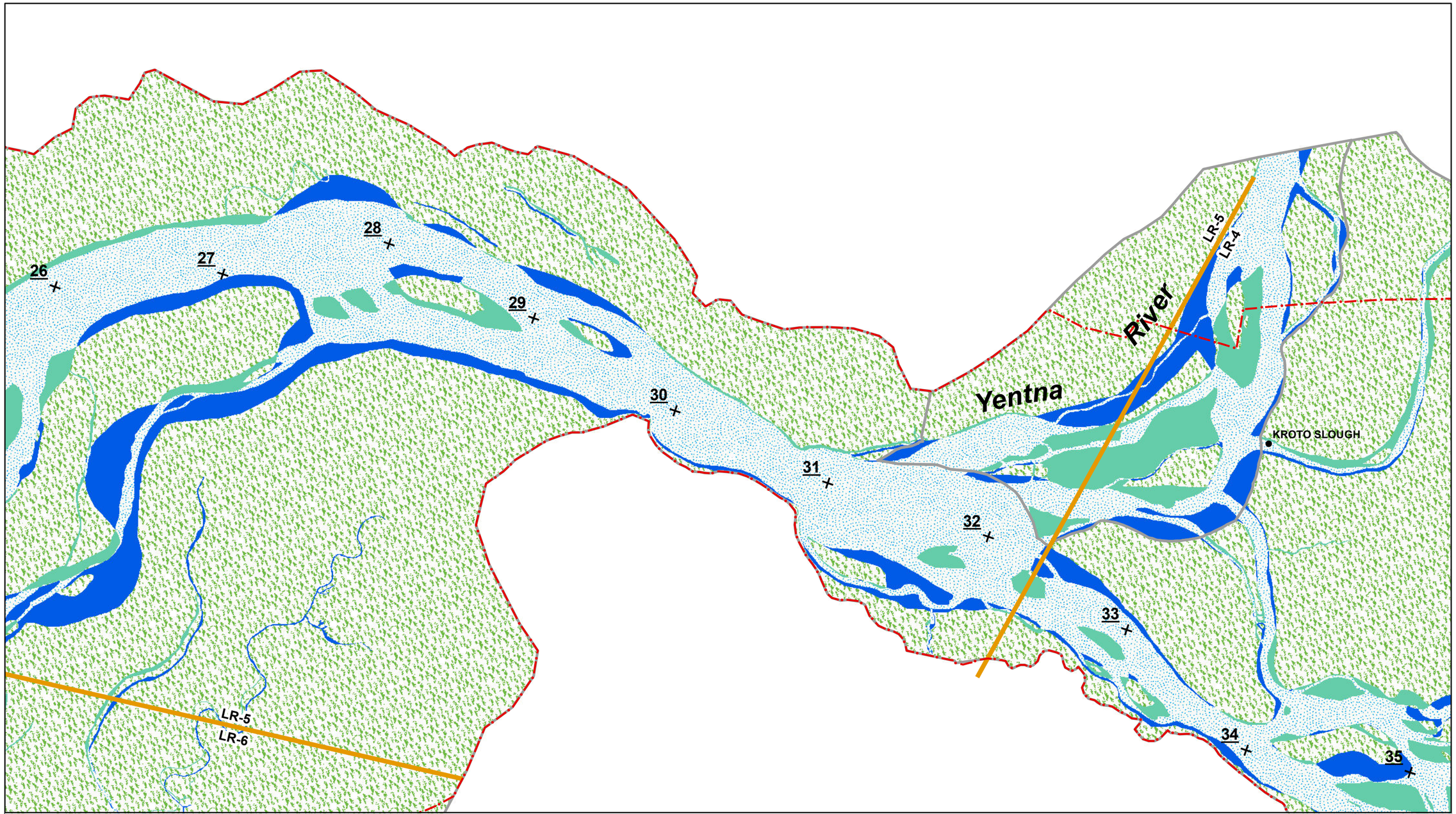
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See index page for legend and additional data information.

Sheet 4 of 18

LOWER SUSITNA RIVER SEGMENT
1950s to 2012 TURNOVER

ALASKA ENERGY AUTHORITY



0 3,000 6,000 Feet

1 inch = 3,000 feet

See index page for legend and additional data information.

Sheet 5 of 18

LOWER SUSITNA RIVER SEGMENT
1950s to 2012 TURNOVER

ALASKA ENERGY AUTHORITY

KROTO SLOUGH

DESHKA RIVER

39

40

41

45

LR-3

LR-1

0 3,000 6,000 Feet

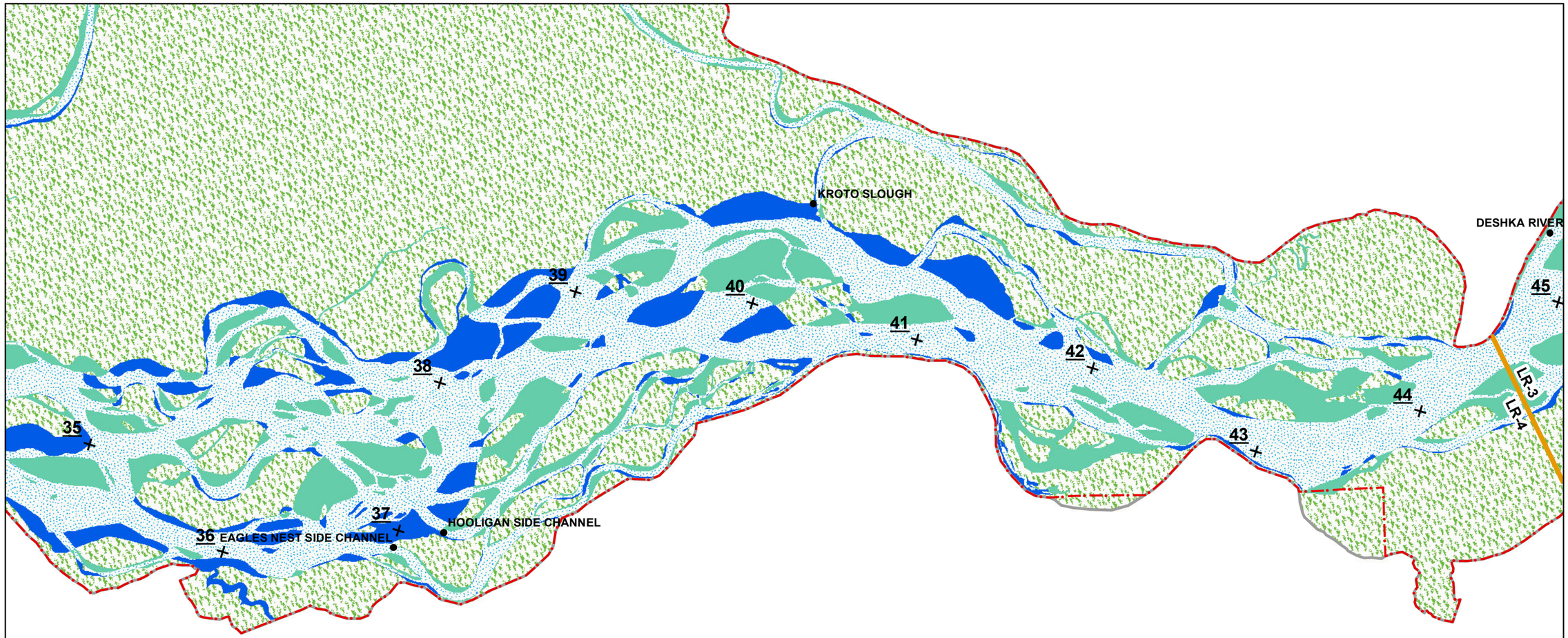
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See index page for legend and additional data information.

Sheet 6 of 18

LOWER SUSITNA RIVER SEGMENT
1950s to 2012 TURNOVER

ALASKA ENERGY AUTHORITY



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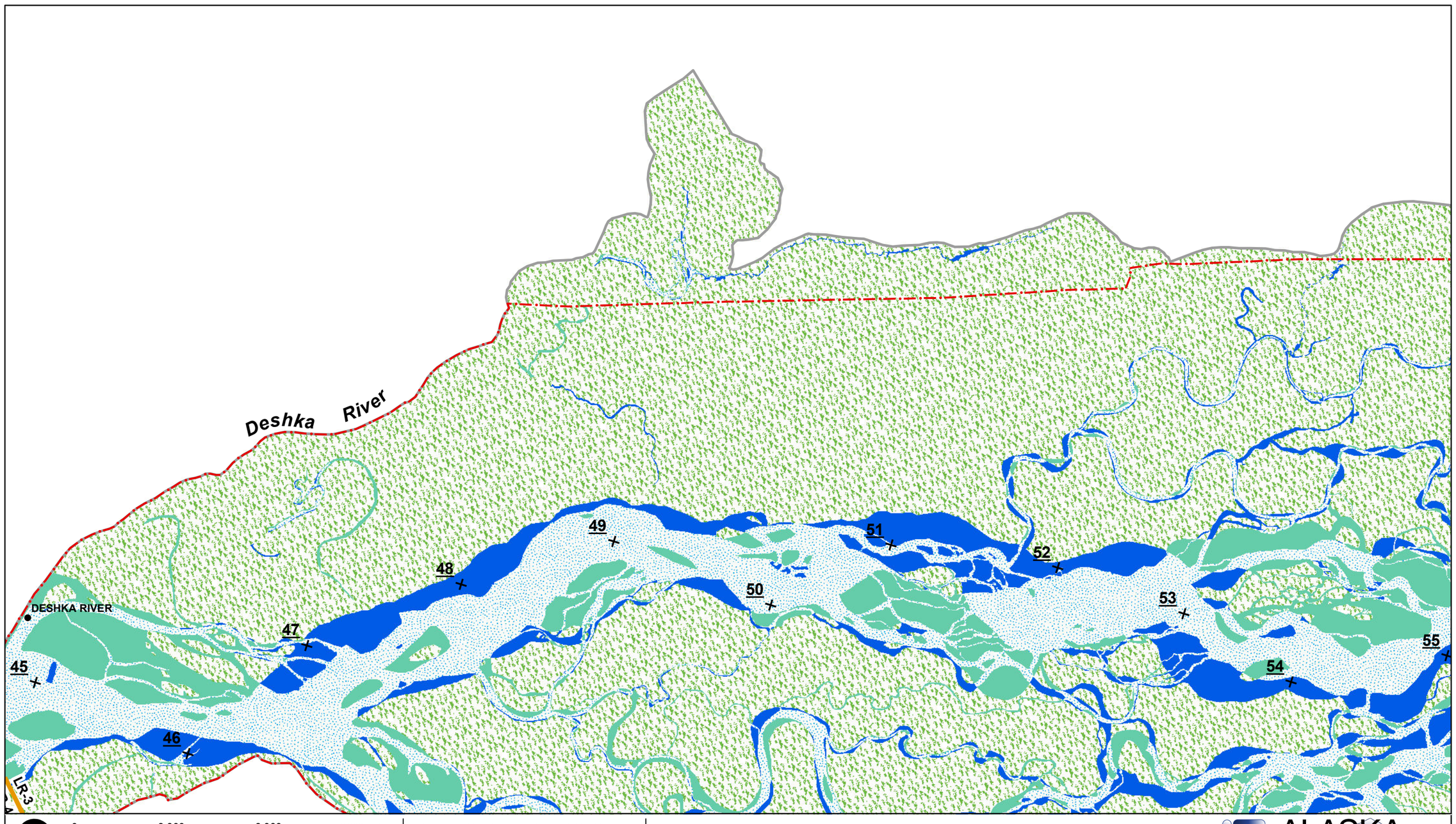
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See index page for legend and additional data information.

Sheet 7 of 18

LOWER SUSITNA RIVER SEGMENT
1950s to 2012 TURNOVER

ALASKA ENERGY AUTHORITY



0 3,000 6,000 Feet

1 inch = 3,000 feet

See index page for legend and additional data information.

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LOWER SUSITNA RIVER SEGMENT
1950s to 2012 TURNOVER

ALASKA ENERGY AUTHORITY

DESHKA RIVER

45

46

47

48

49

50

51

52

53

54

LR-3

LR-4

WILLOW CREEK

Willow Creek

0 3,000 6,000 Feet

1 inch = 3,000 feet

See index page for legend and additional data information.

Sheet 9 of 18

LOWER SUSITNA RIVER SEGMENT
1950s to 2012 TURNOVER

ALASKA ENERGY AUTHORITY

54
55
56
57
58
59
60
61
62
63
64

0 3,000 6,000 Feet

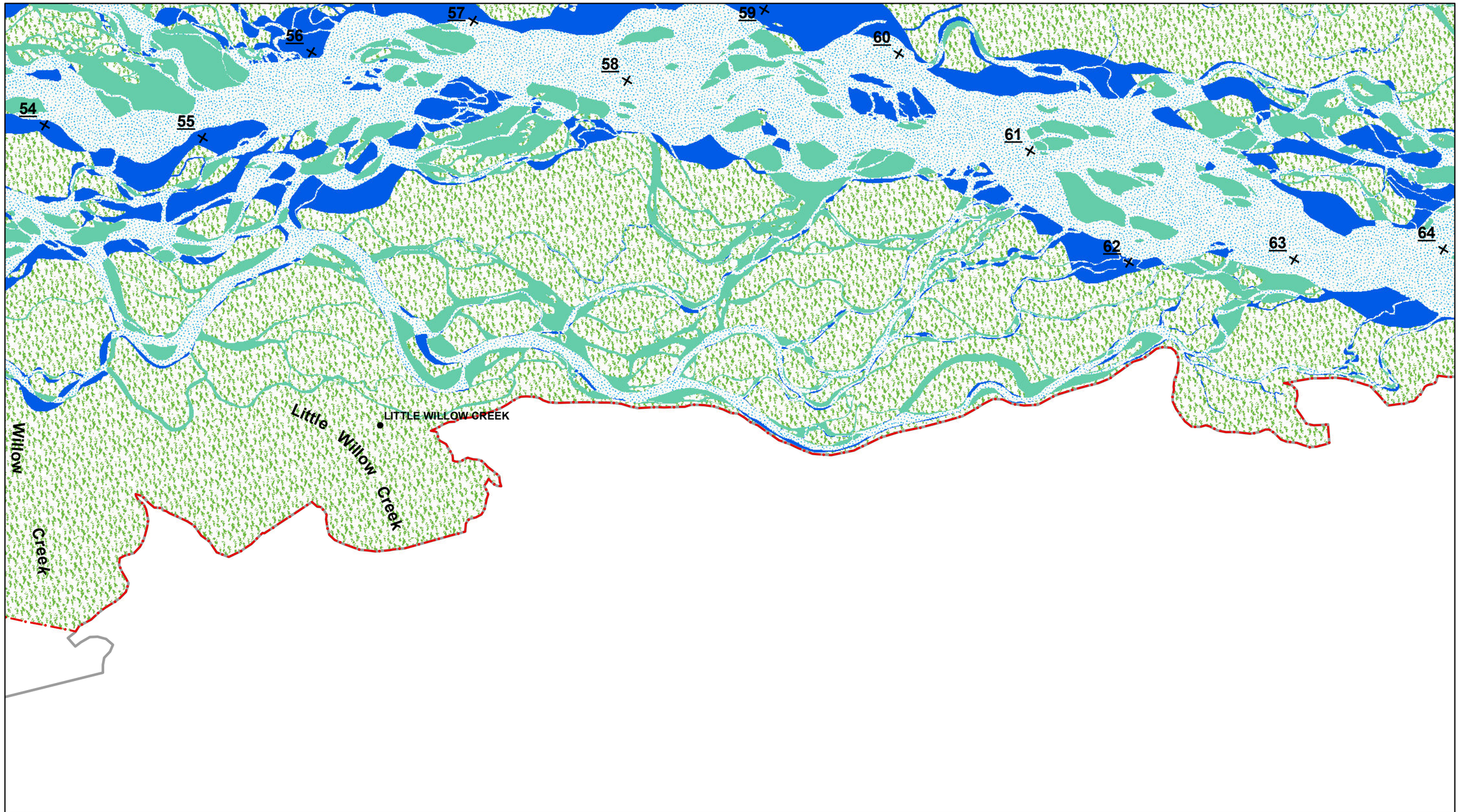
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See index page for legend and additional data information.

Sheet 10 of 18

LOWER SUSITNA RIVER SEGMENT
1950s to 2012 TURNOVER

ALASKA ENERGY AUTHORITY



0 3,000 6,000 Feet

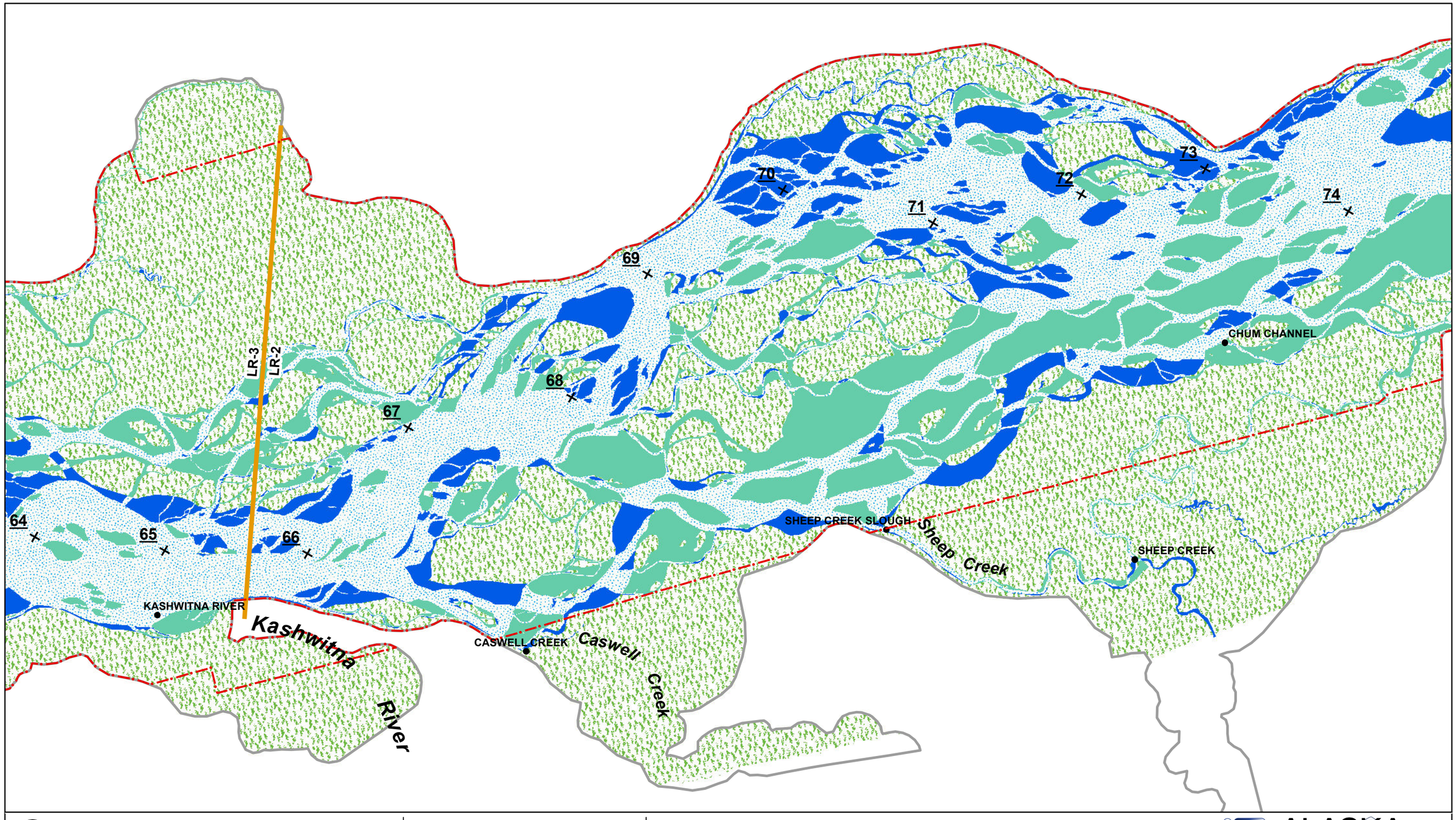
1 inch = 3,000 feet

See index page for legend and additional data information.

Sheet 11 of 18

LOWER SUSITNA RIVER SEGMENT
1950s to 2012 TURNOVER

ALASKA ENERGY AUTHORITY



0 3,000 6,000 Feet

1 inch = 3,000 feet

See index page for legend and additional data information.

Sheet 12 of 18

LOWER SUSITNA RIVER SEGMENT
1950s to 2012 TURNOVER

ALASKA ENERGY AUTHORITY

74
75
76
77
78
79
80
81
82
83
WHITEFISH SLOUGH
GOOSE CREEK
GOOSE CREEK SLOUGH
Goose Creek
Montana Creek

0 3,000 6,000 Feet

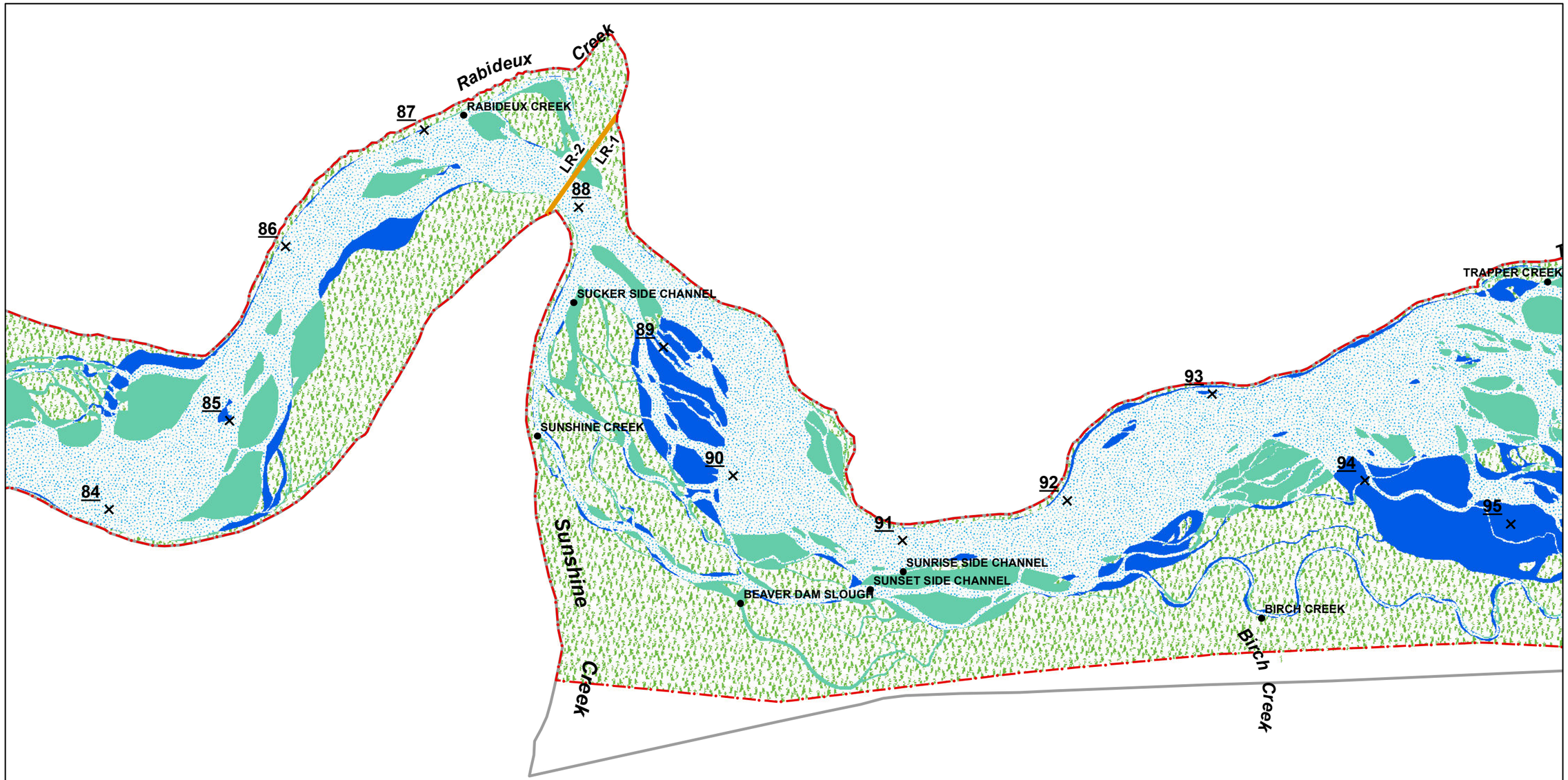
1 inch = 3,000 feet

See index page for legend and additional data information.

Sheet 13 of 18

LOWER SUSITNA RIVER SEGMENT
1950s to 2012 TURNOVER

ALASKA ENERGY AUTHORITY



0 3,000 6,000 Feet

1 inch = 3,000 feet

See index page for legend and additional data information.

Sheet 14 of 18

LOWER SUSITNA RIVER SEGMENT
1950s to 2012 TURNOVER

ALASKA ENERGY AUTHORITY

Trapper Creek

TRAPPER CREEK

Chulitna River

Whiskers Slough

96

97

98

99

100

101

102

103

104

105

LR-1

MR-8

0 3,000 6,000 Feet

1 inch = 3,000 feet

See index page for legend and additional data information.

Sheet 15 of 18

LOWER SUSITNA RIVER SEGMENT
1950s to 2012 TURNOVER

ALASKA ENERGY AUTHORITY

95
96
97
98
99
100
101
102
103
104
LR-1
MR-8
Whiskers Slough
Talkeetna River

0 3,000 6,000 Feet

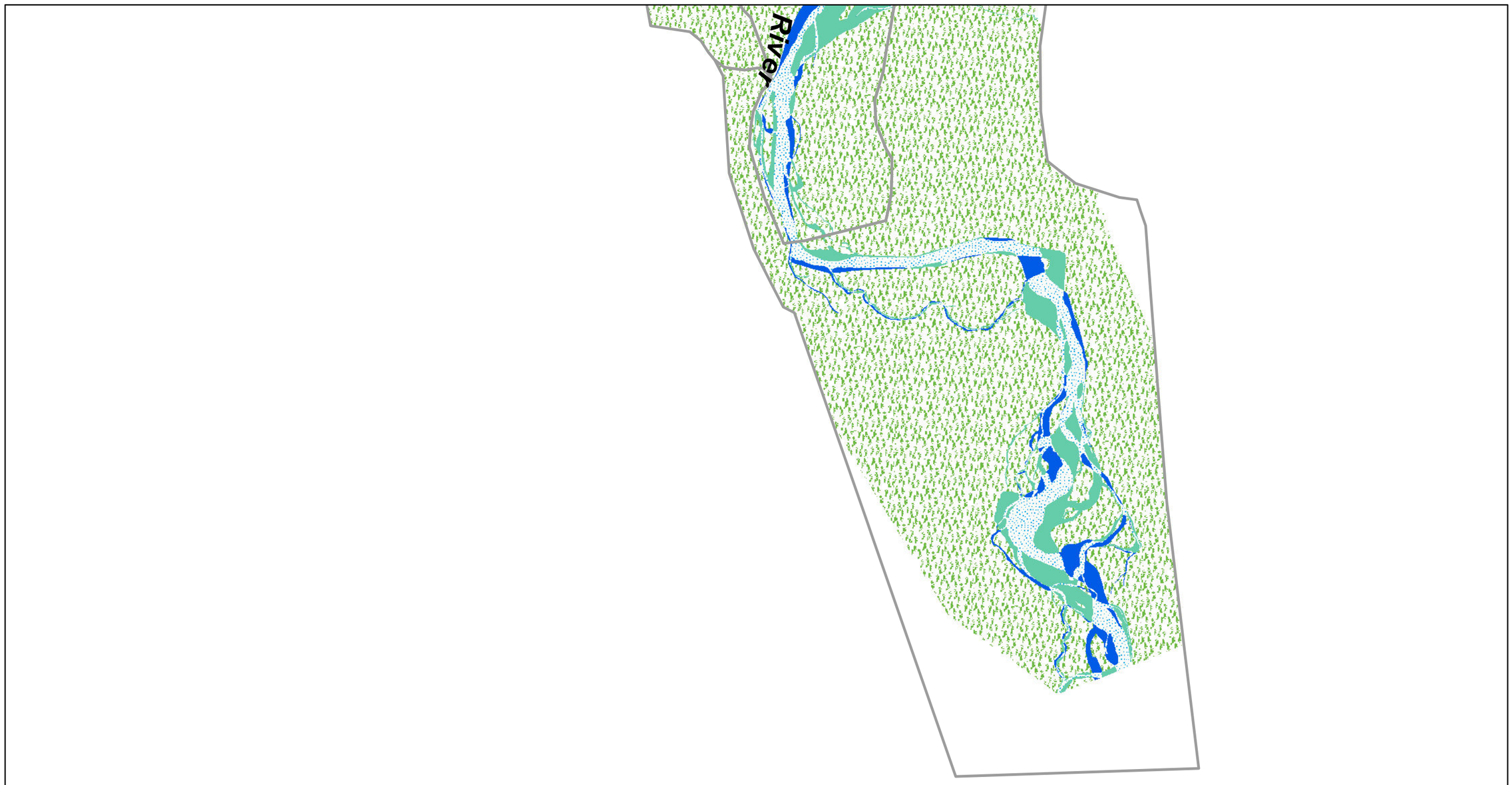
See index page for legend and additional data information.

1 inch = 3,000 feet

Sheet 16 of 18

LOWER SUSITNA RIVER SEGMENT
1950s to 2012 TURNOVER

ALASKA ENERGY AUTHORITY



0 3,000 6,000 Feet

1 inch = 3,000 feet

See index page for legend and additional data information.

Sheet 17 of 18

LOWER SUSITNA RIVER SEGMENT
1950s to 2012 TURNOVER

ALASKA ENERGY AUTHORITY

Whiskers Slough

0 3,000 6,000 Feet

1 inch = 3,000 feet

See index page for legend and additional data information.

Sheet 18 of 18

LOWER SUSITNA RIVER SEGMENT
1950s to 2012 TURNOVER

ALASKA ENERGY AUTHORITY

APPENDIX Q. 2012 GEOMORPHIC FEATURES IN THE THREE RIVER CONFLUENCE

Susitna-Watana Hydroelectric Project (FERC No. 14241)

Geomorphology Study (6.5)

Mapping of Geomorphic Features and Turnover within the Middle and Lower Susitna River Segments from 1950s, 1980s, and Current Aerials Technical Memorandum

Prepared for

Alaska Energy Authority

SUSITNA-WATANA HYDRO

Clean, reliable energy for the next 100 years.

Prepared by

Tetra Tech Inc.

September 2014

150°W

149°30'W

62°30'N

62°20'N

62°10'N

Sheet 13

Sheet 12

Sheet 7

Sheet 10

Sheet 9

Sheet 6

Sheet 8

Sheet 11

Sheet 5

Sheet 4

Sheet 3

Sheet 2

Sheet 1

Talkeetna River

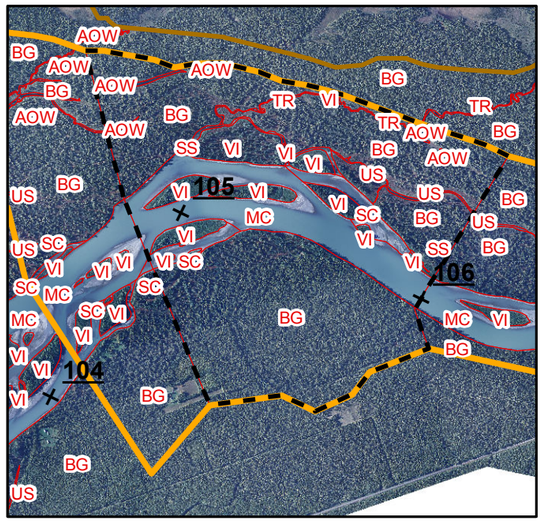
Chulitna River

Susitna River

Legend For Individual Mapbook Pages

- Project River Miles
- LR-1, MR-8, TK-1, CH-1 Erosion in Water Year 2012
- Geomorphic Reach Breaks
- Geomorphic Assessment Area Extents
- Focus Area Extents
- Analysis Extent Boundary
- 2012 Geomorphic Features

Example Mapbook Page Data



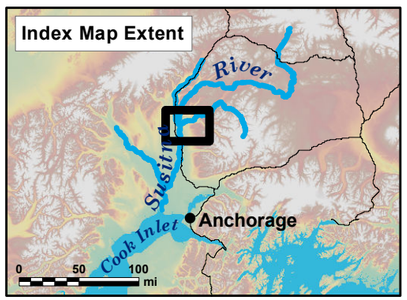
ALASKA ENERGY AUTHORITY

LR-1, MR-8, TK-1, CH-1 2012 GEOMORPHIC FEATURES

Legend

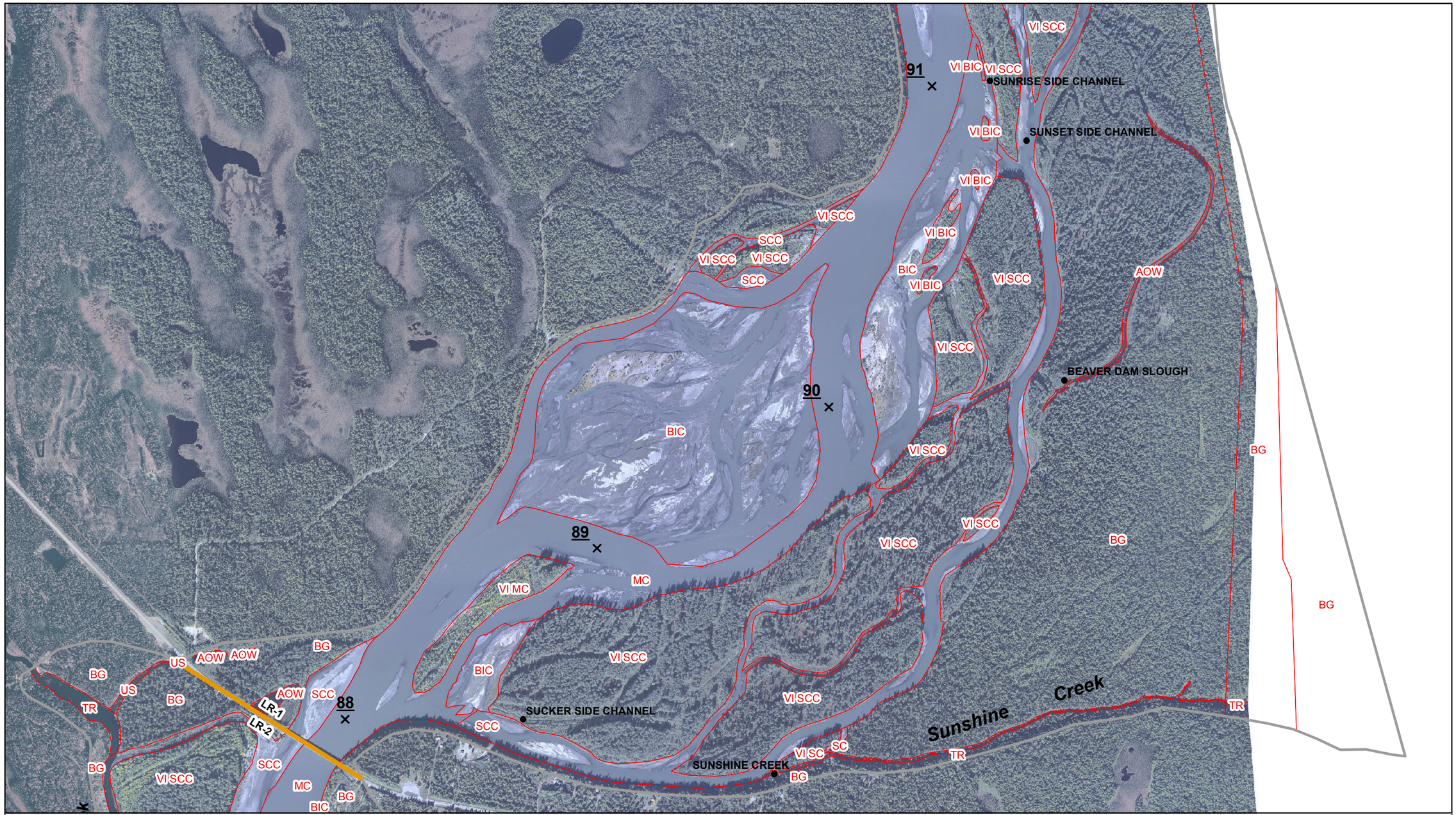
- Sheet Extent
- Roads
- Railroads
- Rivers and Streams
- Waterbodies

Data Sources: See Map References



0 2 4 mi

Projection: NAD83 State Plane Alaska 4 FIPS 5004 (ft)
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Map Author: Tetra Tech
File: 2012_3RC_GeomFeat_v2_20140225_Cover.mxd



0 1,500 3,000 Feet

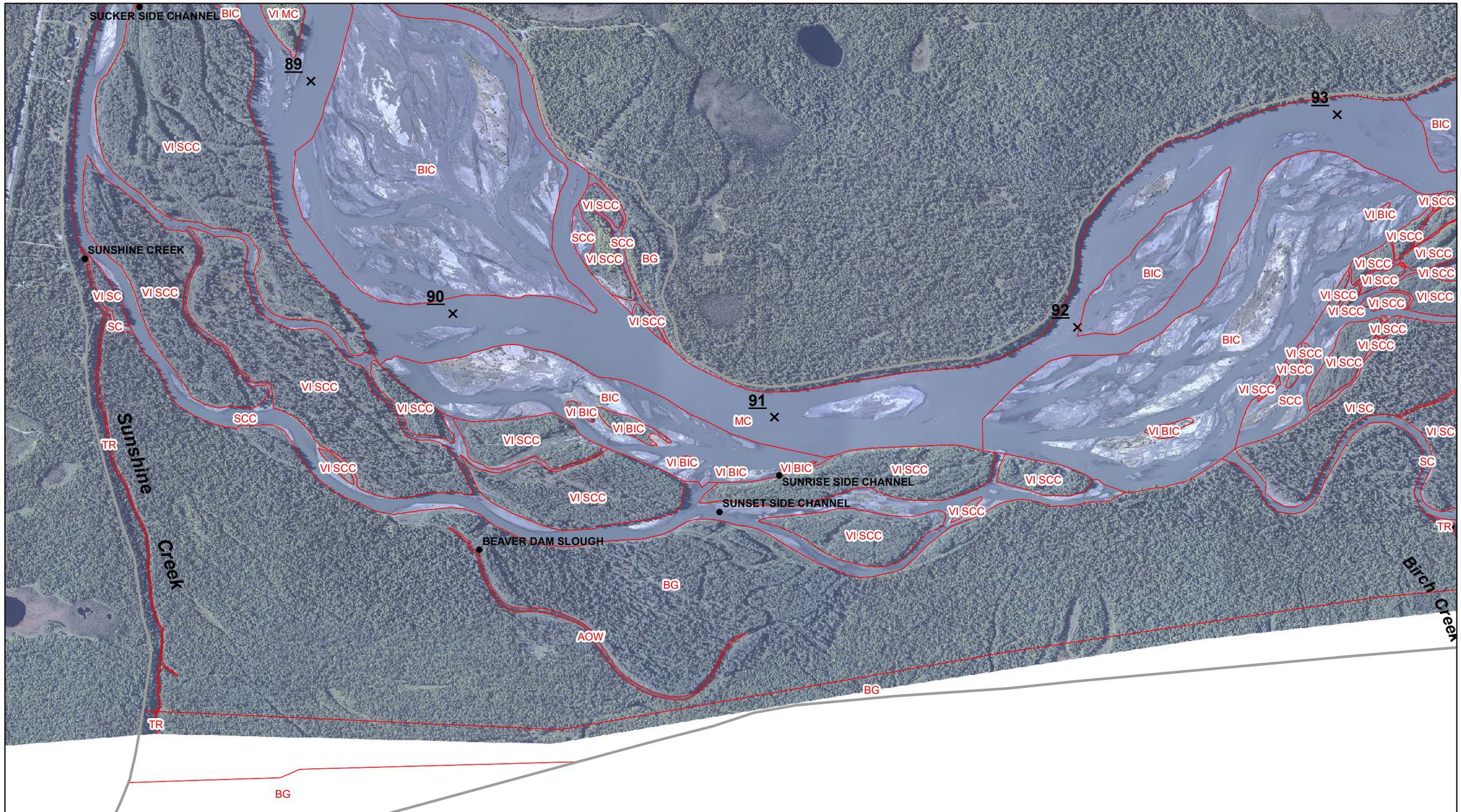
See index page for legend and additional data information.

Sheet 1 of 13

LR-1, MR-8, TK-1, CH-1
2012 GEOMORPHIC FEATURES

Location:	Imagery Date,	Discharge (Sunshine)	Location:	Imagery Date,	Discharge (Gold Creek)
PRM 77.7 - 102.4:	09/10/2012,	37,900 cfs	**PRM 102.4 - 143.6:**	09/10/2012,	12,900 cfs

ALASKA ENERGY AUTHORITY



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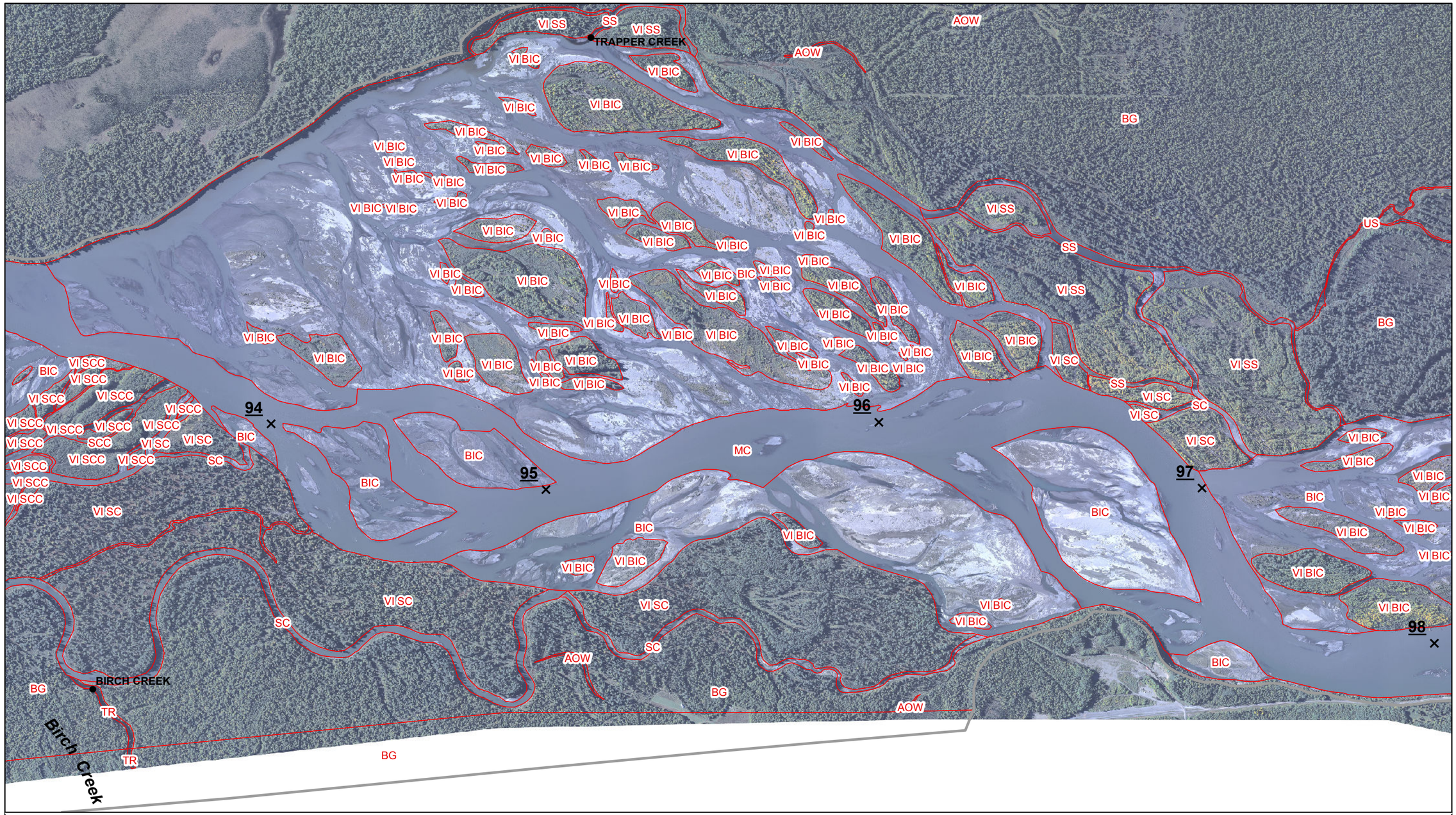
See index page for legend and additional data information.

Sheet 2 of 13

LR-1, MR-8, TK-1, CH-1
2012 GEOMORPHIC FEATURES

Location:	Imagery Date,	Discharge (Sunshine)	Location:	Imagery Date,	Discharge (Gold Creek)
PRM 77.7 - 102.4:	09/10/2012,	37,900 cfs	**PRM 102.4 - 143.6:**	09/10/2012,	12,900 cfs

ALASKA ENERGY AUTHORITY



0 1,500 3,000 Feet

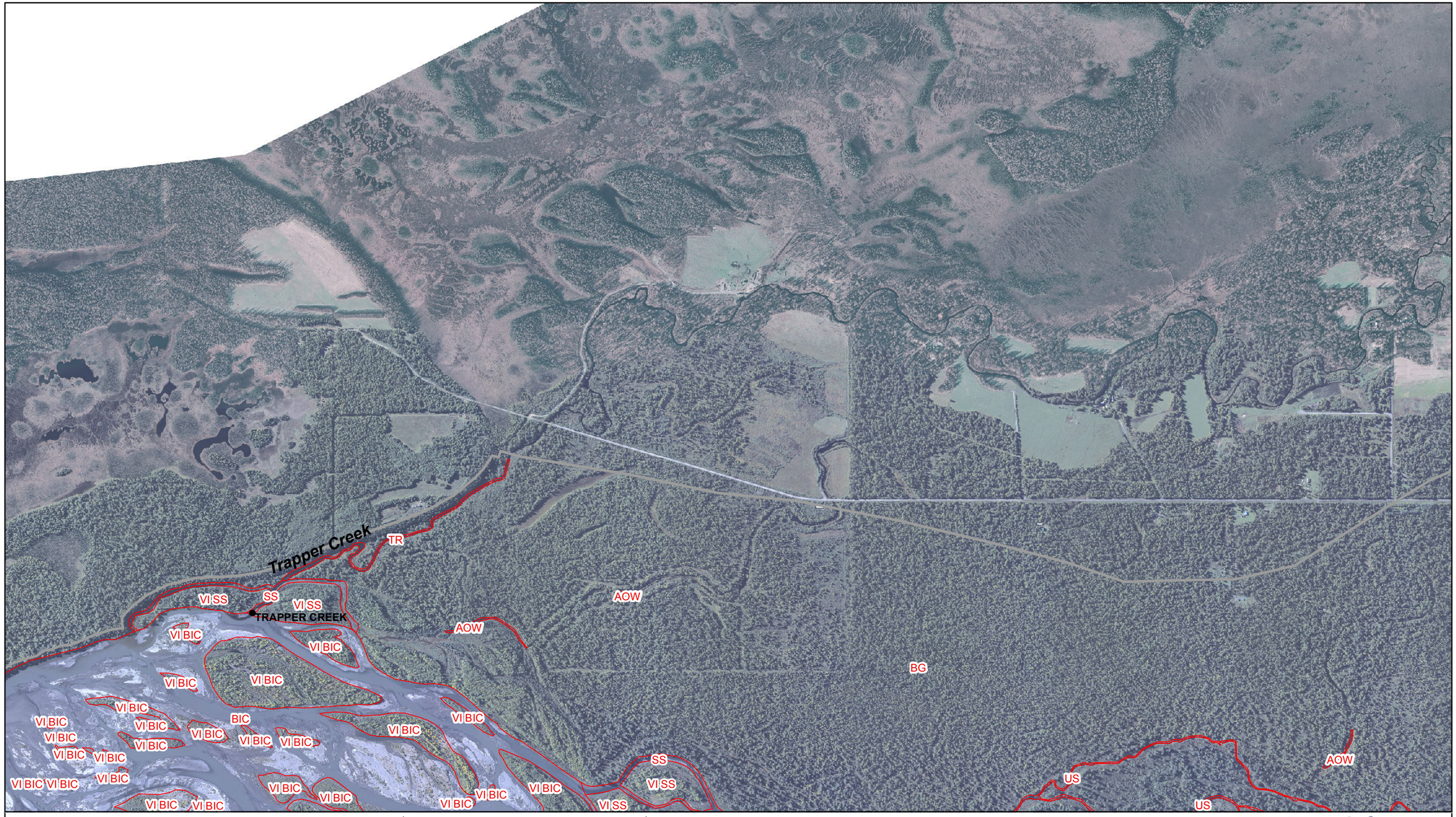
See index page for legend and additional data information.

Sheet 3 of 13

LR-1, MR-8, TK-1, CH-1
2012 GEOMORPHIC FEATURES

Location:	Imagery Date, Discharge (Sunshine)	Location:	Imagery Date, Discharge (Gold Creek)
PRM 77.7 - 102.4:	09/10/2012, 37,900 cfs	**PRM 102.4 - 143.6:**	09/10/2012, 12,900 cfs

ALASKA ENERGY AUTHORITY



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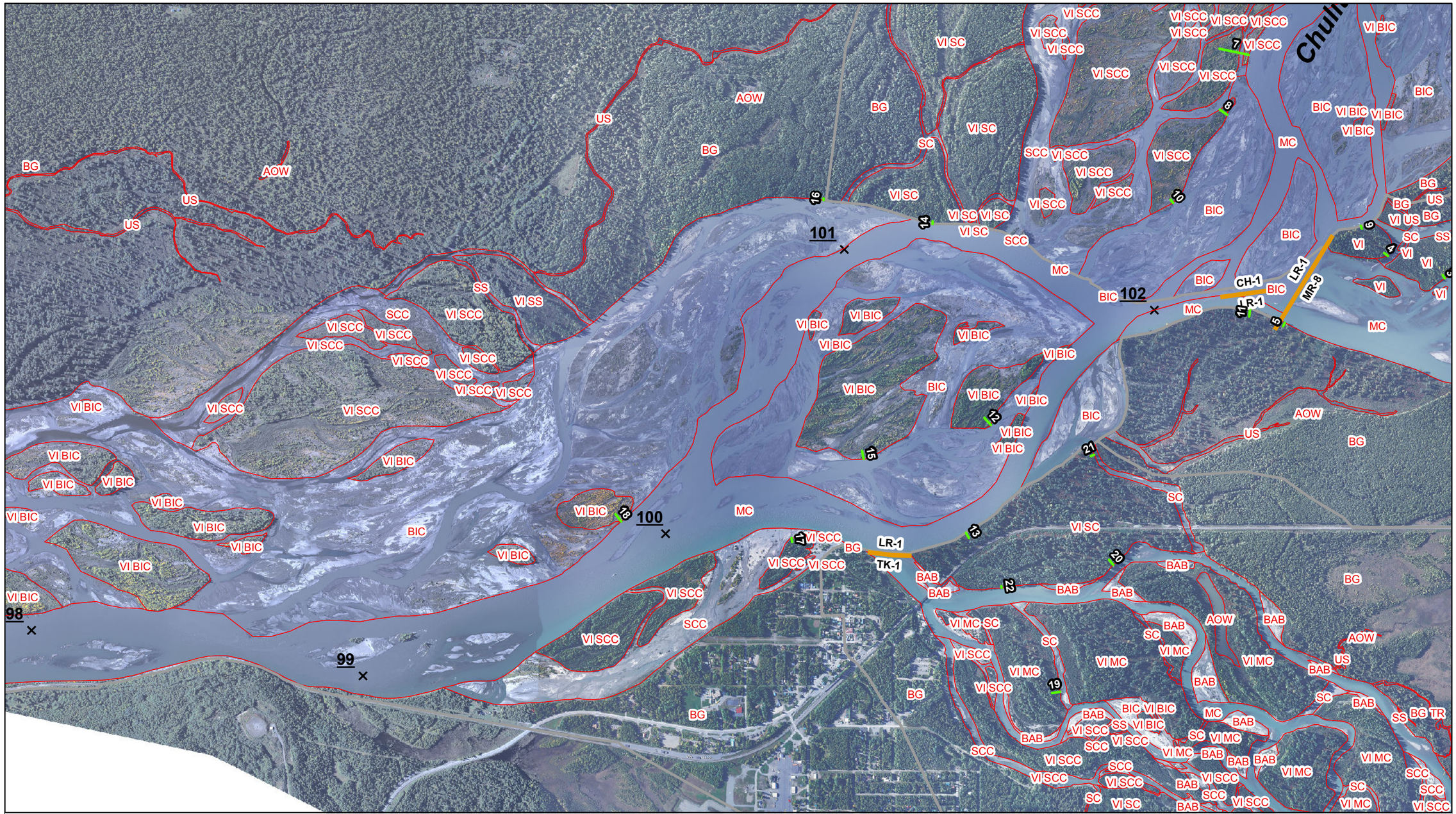
See index page for legend and additional data information.

Sheet 4 of 13

LR-1, MR-8, TK-1, CH-1
2012 GEOMORPHIC FEATURES

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PRM 77.7 - 102.4:	09/10/2012, 37,900 cfs	**PRM 102.4 - 143.6:**	09/10/2012, 12,900 cfs

ALASKA ENERGY AUTHORITY



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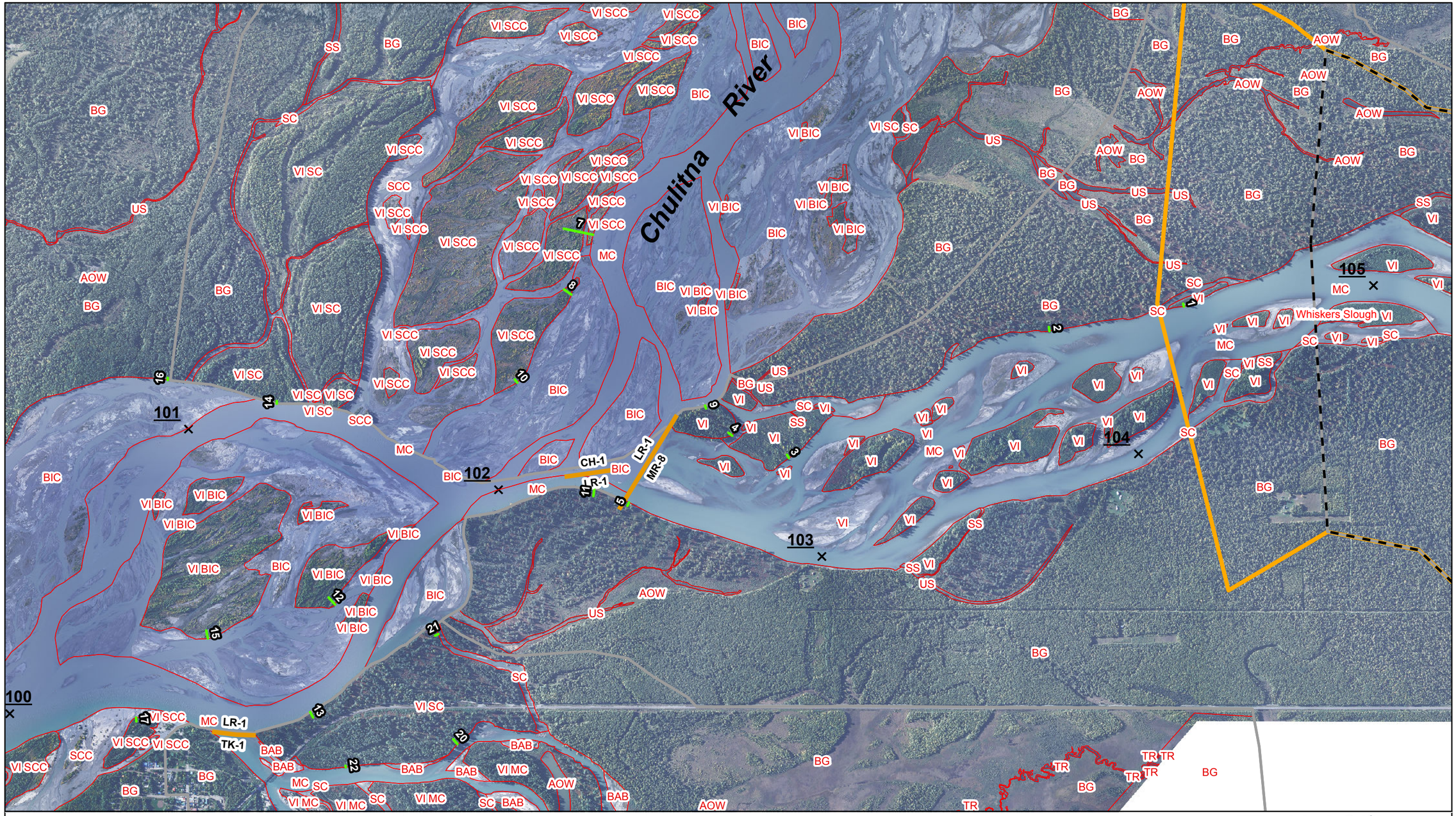
See index page for legend and additional data information.

Sheet 5 of 13

LR-1, MR-8, TK-1, CH-1
2012 GEOMORPHIC FEATURES

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PRM 77.7 - 102.4:	09/10/2012, 37,900 cfs	**PRM 102.4 - 143.6:**	09/10/2012, 12,900 cfs

ALASKA ENERGY AUTHORITY



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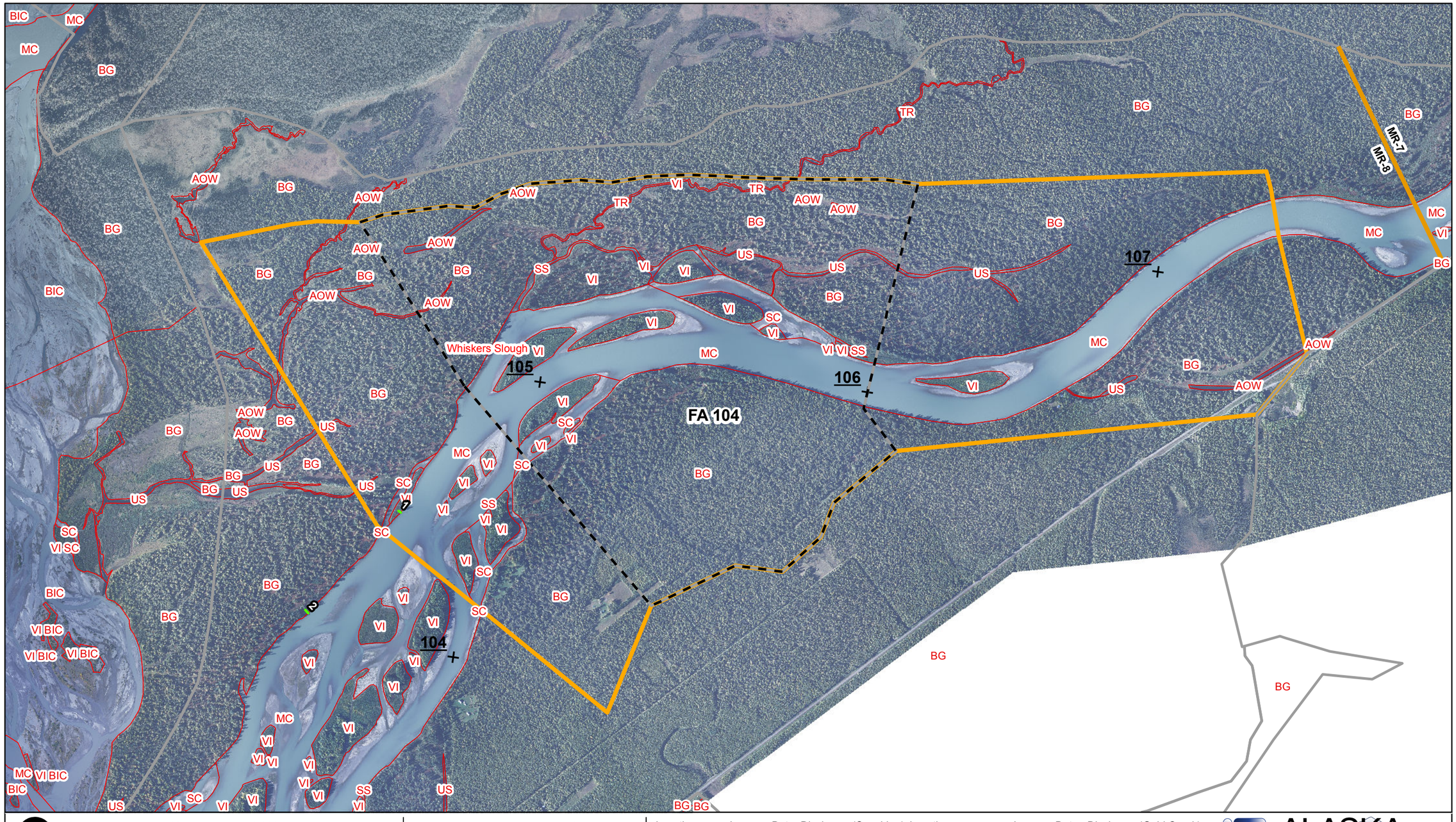
See index page for legend and additional data information.

Sheet 6 of 13

LR-1, MR-8, TK-1, CH-1
2012 GEOMORPHIC FEATURES

Location:	Imagery Date, Discharge (Sunshine)	Location:	Imagery Date, Discharge (Gold Creek)
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ALASKA ENERGY AUTHORITY



0 1,500 3,000 Feet

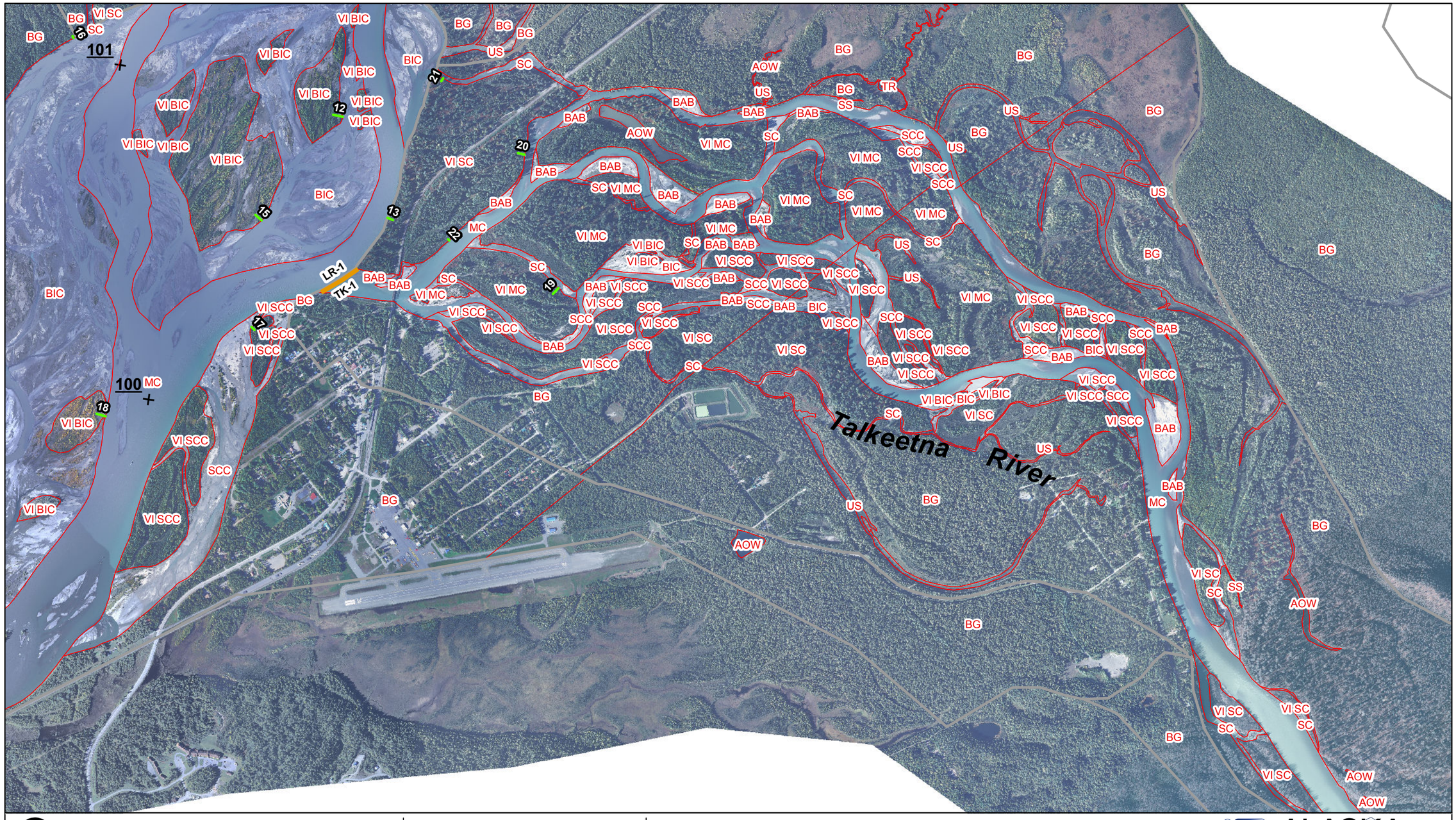
See index page for legend and additional data information.

Sheet 7 of 13

LR-1, MR-8, TK-1, CH-1
2012 GEOMORPHIC FEATURES

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ALASKA ENERGY AUTHORITY



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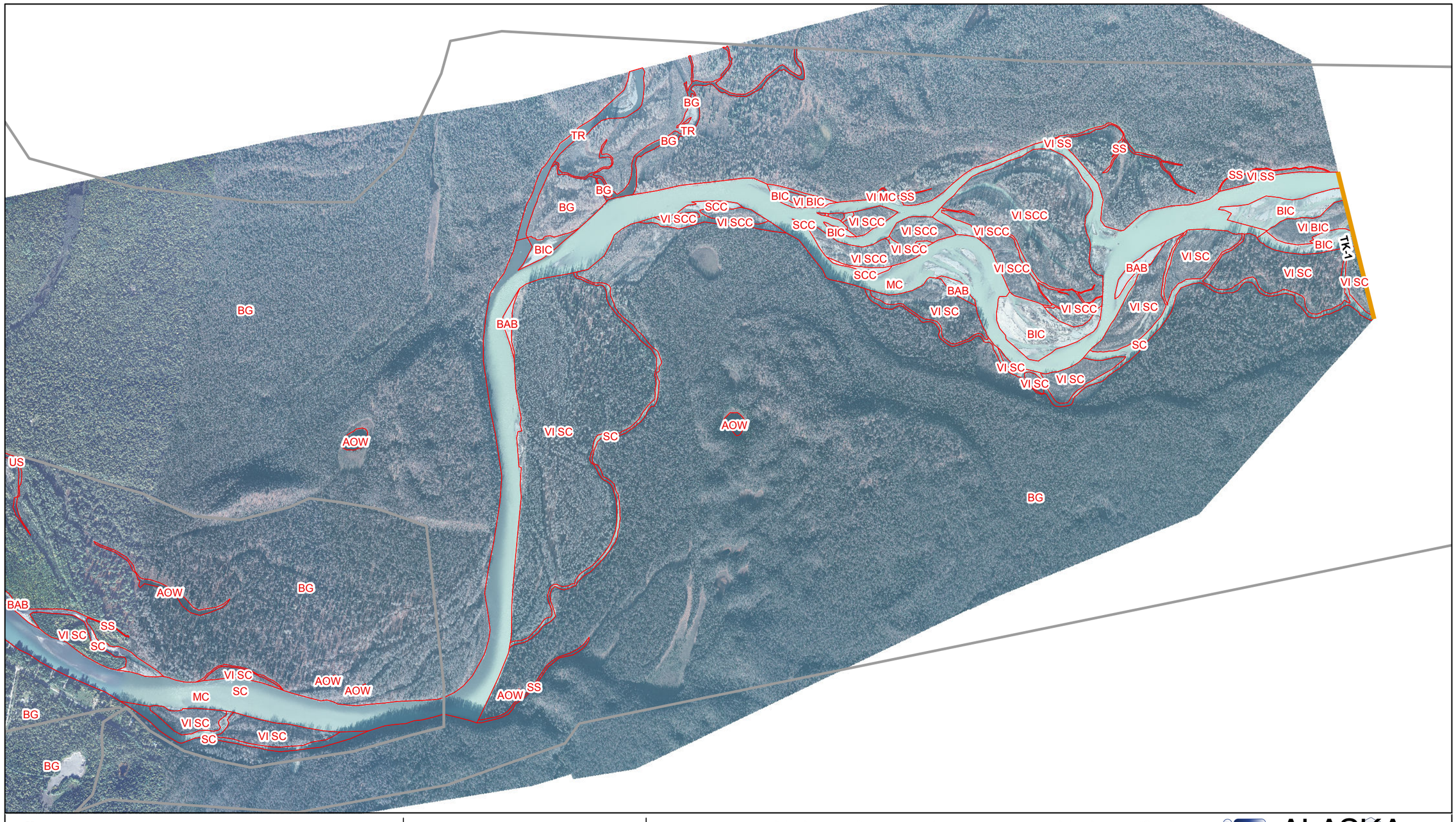
See index page for legend and additional data information.

Sheet 8 of 13

LR-1, MR-8, TK-1, CH-1
2012 GEOMORPHIC FEATURES

Location:	Imagery Date, Discharge (Sunshine)	Location:	Imagery Date, Discharge (Gold Creek)
PRM 77.7 - 102.4:	09/10/2012, 37,900 cfs	**PRM 102.4 - 143.6:**	09/10/2012, 12,900 cfs

ALASKA ENERGY AUTHORITY



0 1,500 3,000 Feet

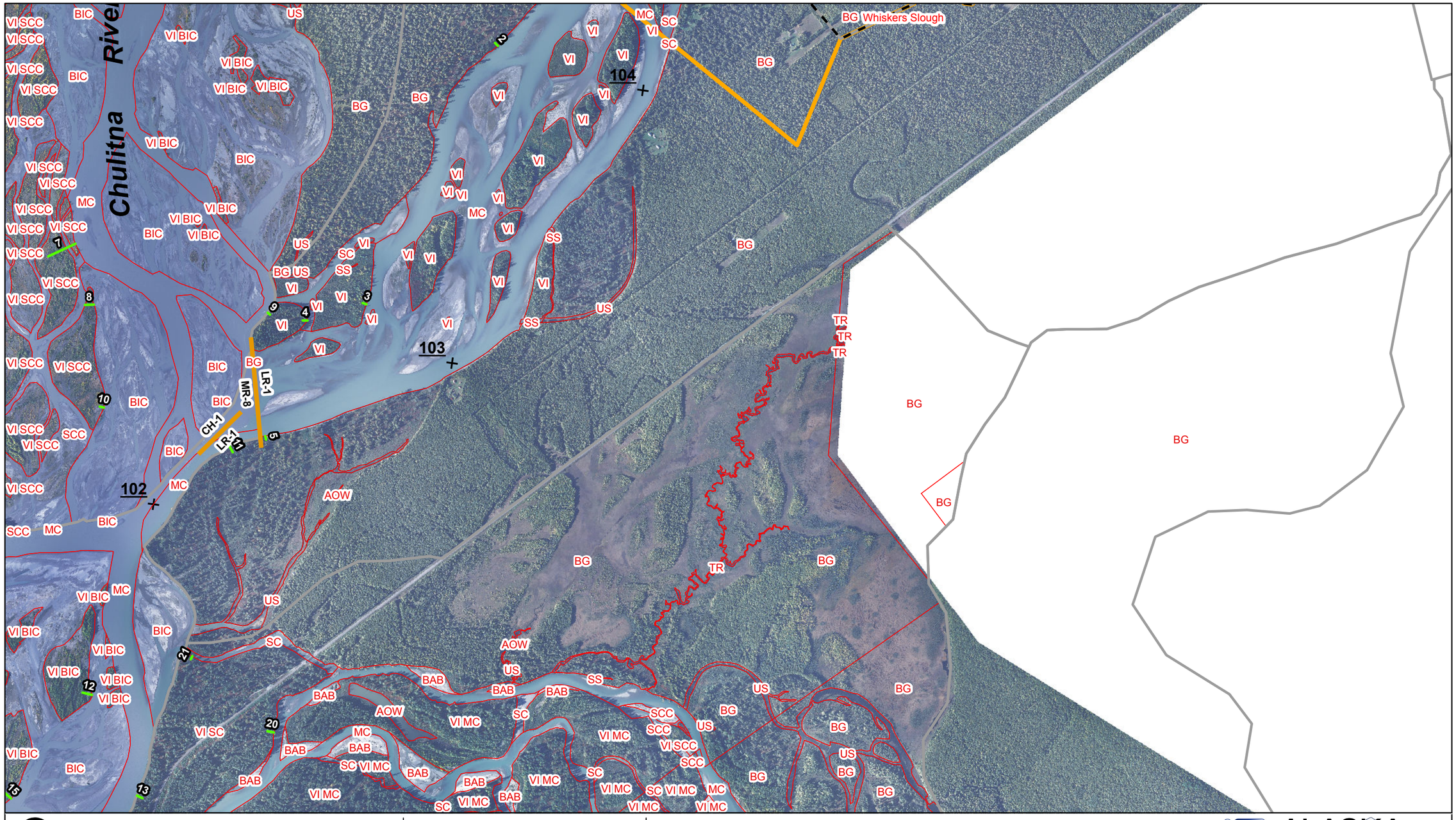
See index page for legend and additional data information.

Sheet 9 of 13

LR-1, MR-8, TK-1, CH-1
2012 GEOMORPHIC FEATURES

Location:	Imagery Date, Discharge (Sunshine)	Location:	Imagery Date, Discharge (Gold Creek)
PRM 77.7 - 102.4:	09/10/2012, 37,900 cfs	**PRM 102.4 - 143.6:**	09/10/2012, 12,900 cfs

ALASKA ENERGY AUTHORITY



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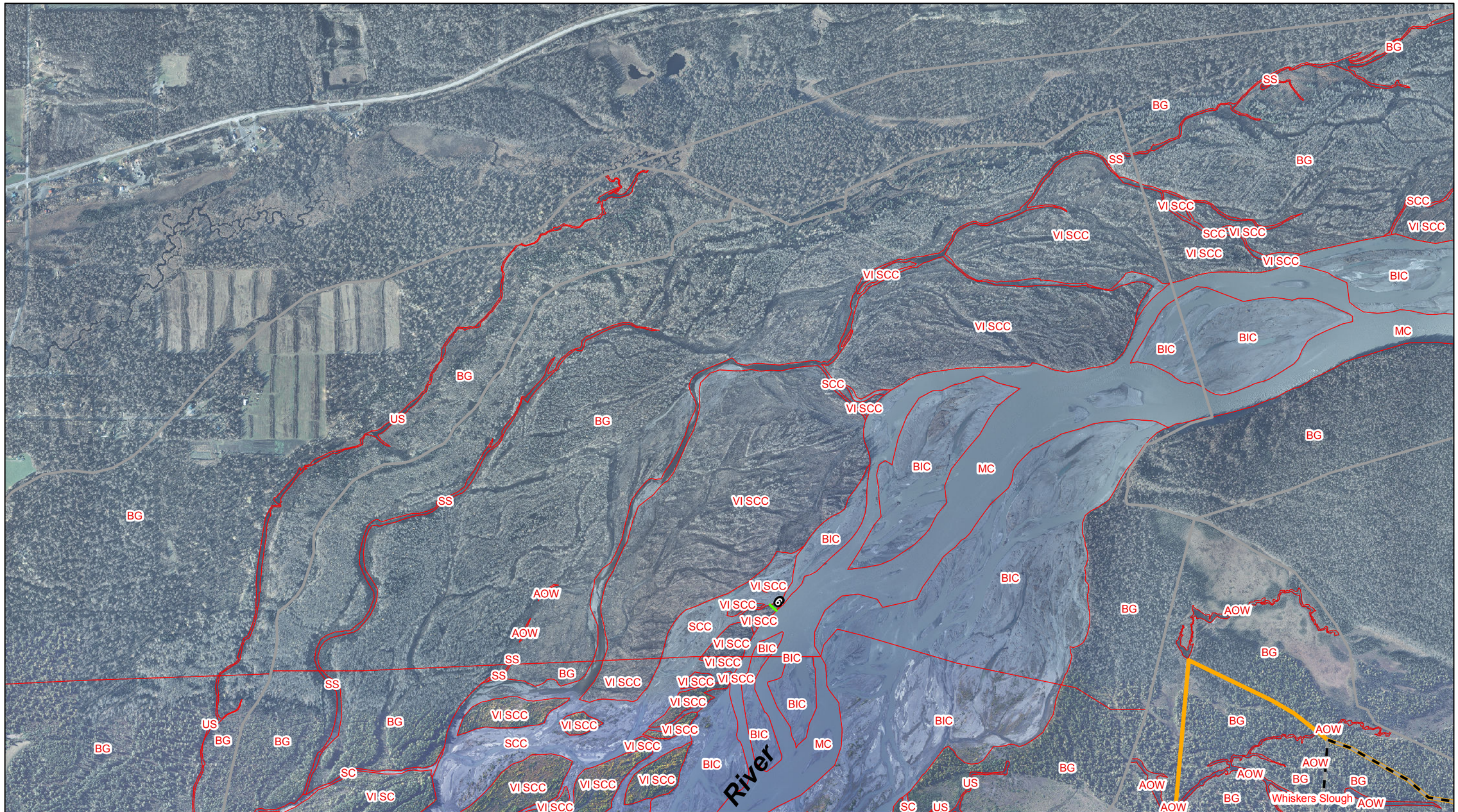
See index page for legend and additional data information.

Sheet 10 of 13

LR-1, MR-8, TK-1, CH-1
2012 GEOMORPHIC FEATURES

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PRM 77.7 - 102.4:	09/10/2012, 37,900 cfs	**PRM 102.4 - 143.6:**	09/10/2012, 12,900 cfs

ALASKA ENERGY AUTHORITY



0 1,500 3,000 Feet

See index page for legend and additional data information.

Sheet 11 of 13

LR-1, MR-8, TK-1, CH-1
2012 GEOMORPHIC FEATURES

Location:	Imagery Date, Discharge (Sunshine)	Location:	Imagery Date, Discharge (Gold Creek)
PRM 77.7 - 102.4:	09/10/2012, 37,900 cfs	**PRM 102.4 - 143.6:**	09/10/2012, 12,900 cfs

ALASKA ENERGY AUTHORITY



0 1,500 3,000 Feet

See index page for legend and additional data information.

Sheet 12 of 13

LR-1, MR-8, TK-1, CH-1
2012 GEOMORPHIC FEATURES

Location:	Imagery Date, Discharge (Sunshine)	Location:	Imagery Date, Discharge (Gold Creek)
PRM 77.7 - 102.4:	09/10/2012, 37,900 cfs	**PRM 102.4 - 143.6:**	09/10/2012, 12,900 cfs

ALASKA ENERGY AUTHORITY



0 1,500 3,000 Feet

See index page for legend and additional data information.

Sheet 13 of 13

LR-1, MR-8, TK-1, CH-1
2012 GEOMORPHIC FEATURES

Location:	Imagery Date, Discharge (Sunshine)	Location:	Imagery Date, Discharge (Gold Creek)
PRM 77.7 - 102.4:	09/10/2012, 37,900 cfs	**PRM 102.4 - 143.6:**	09/10/2012, 12,900 cfs

ALASKA ENERGY AUTHORITY