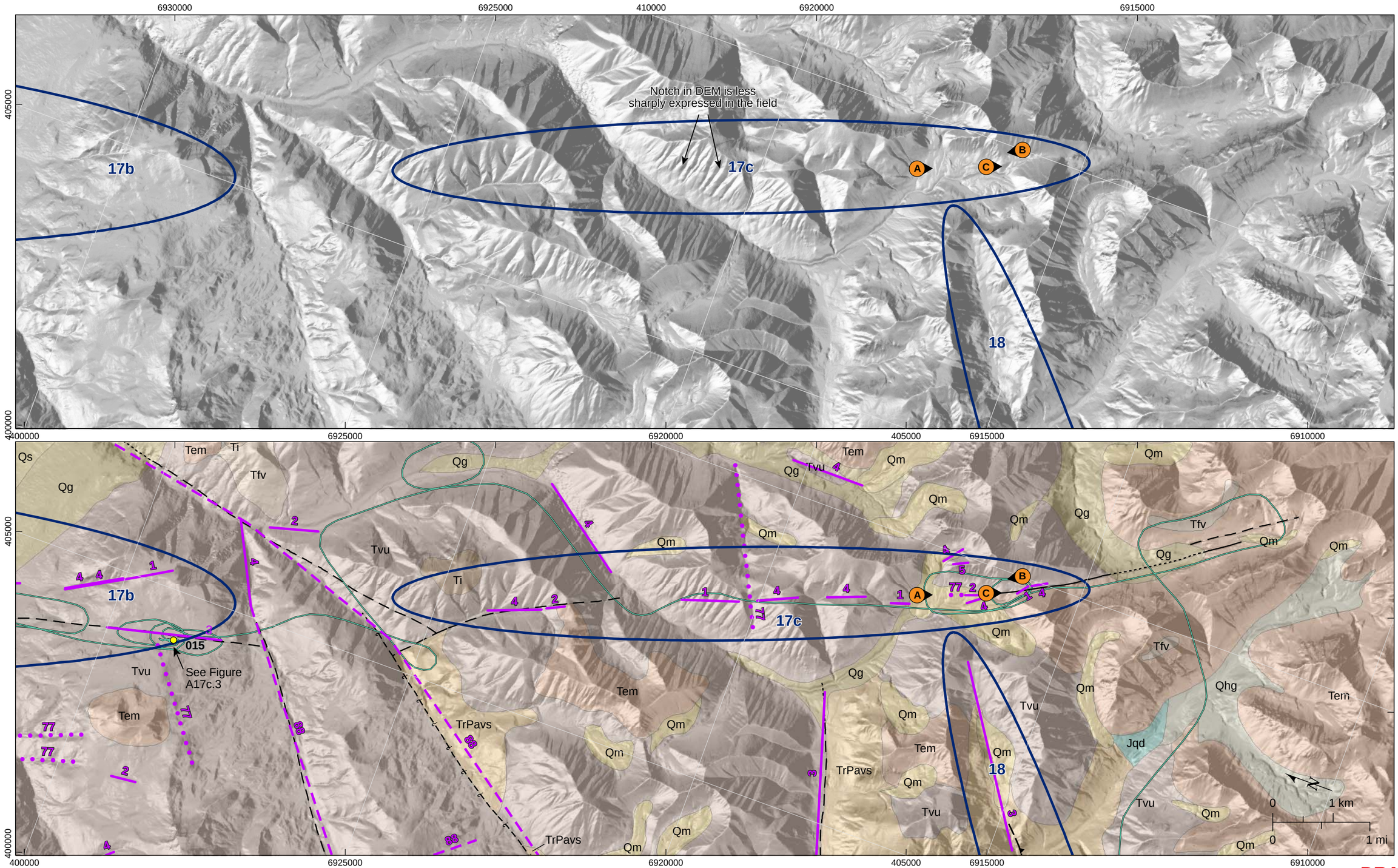

Notes: 1. See Figures A0.2, A0.3, A0.4, and A0.5 for explanation.
2. Data frame has been rotated 70° west of north.
3. Geology by Wilson et al., 2009.

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TUGRO Date 10/18/13	STATE OF ALASKA ALASKA ENERGY AUTHORITY ALASKA ENERGY AUTHORITY	SUSITNA-WATANA HYDROELECTRIC PROJECT LINEAMENT GROUP 17c MAP DATA	FIGURE A17c.1

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A)

View looking southeasterly at lineament expressed at erosional drainage cutting through the likely Holocene rock glacier deposit.

B)

View looking northwesterly (opposite that in Photograph A) at lineament expressed as erosional drainage cutting through the likely Holocene rock glacier deposit.

C)

View looking southeasterly at lineament expressed as likely Holocene rock glacier deposit contacting the valley floor.

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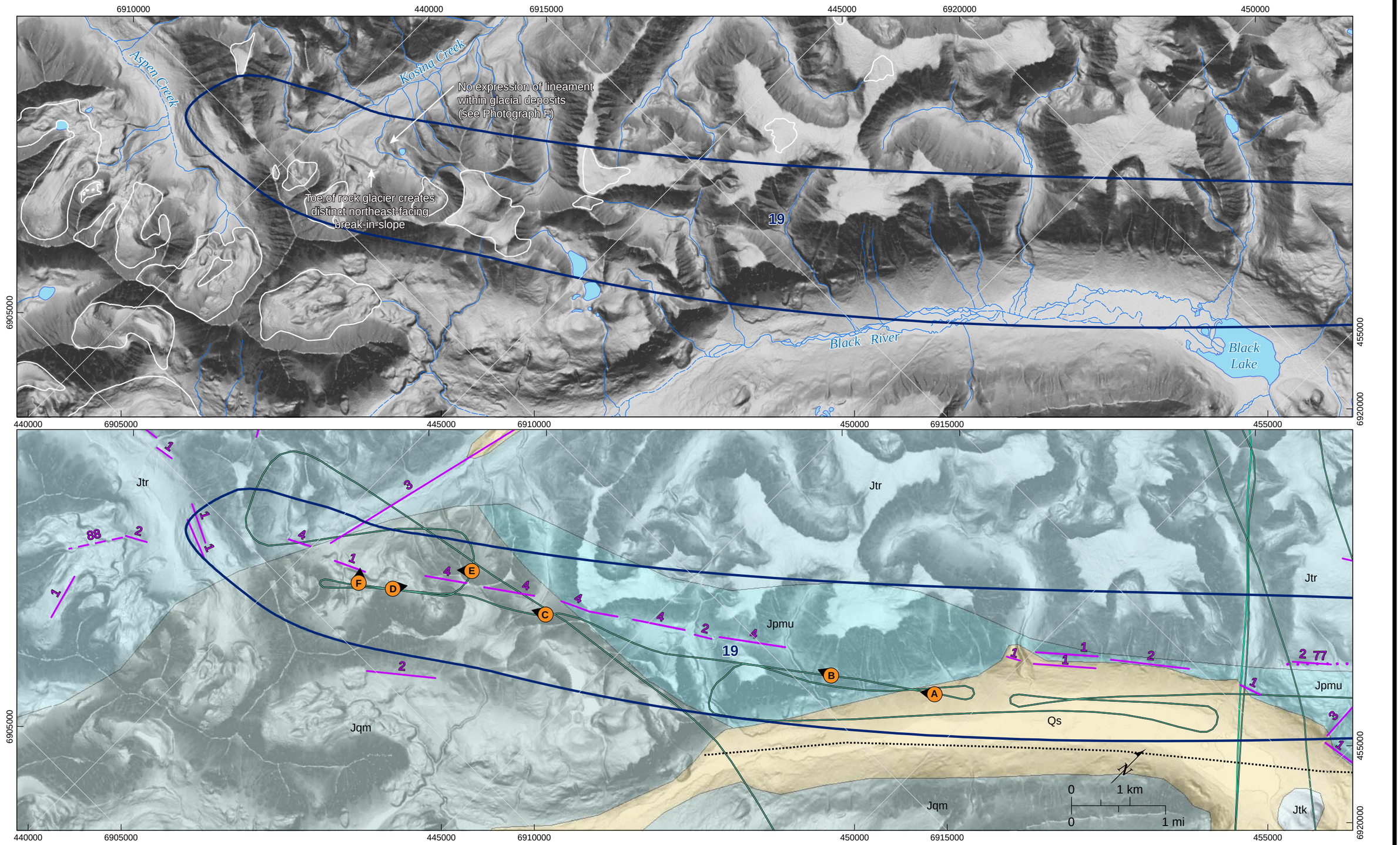
FUGRO Date 10/18/13	STATE OF ALASKA ALASKA ENERGY AUTHORITY ALASKA ENERGY AUTHORITY	SUSITNA-WATANA HYDROELECTRIC PROJECT LINEAMENT GROUP 17c PHOTOGRAPHS	FIGURE A17c.2



Notes: 1. See Figures A0.2, A0.3, A0.4, and A0.5 for explanation.
2. Data frame has been rotated 45° east of north.
3. Geologic map from Wilson et al., 2009.

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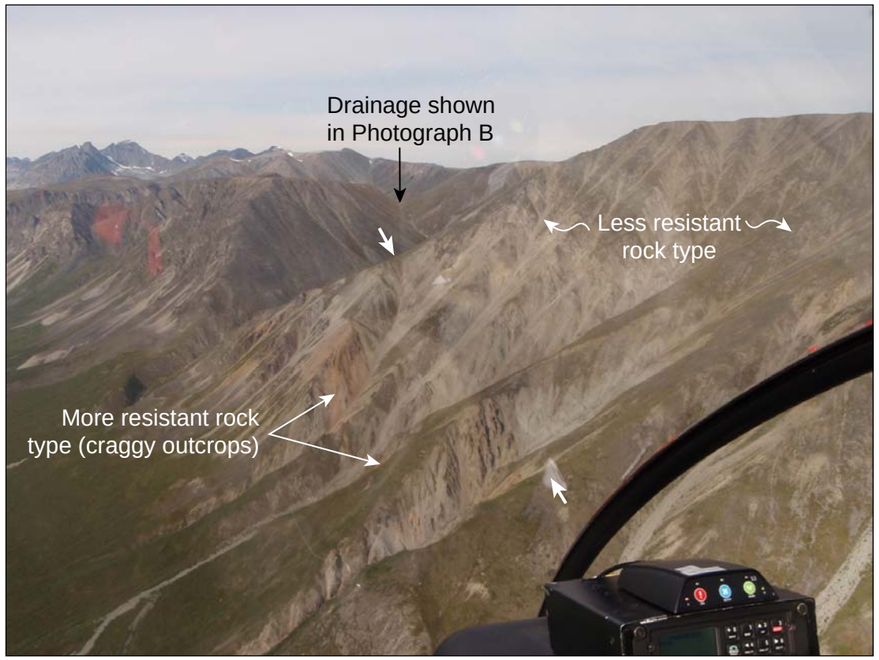
FUGRO Date 10/18/13	STATE OF ALASKA ALASKA ENERGY AUTHORITY ALASKA ENERGY AUTHORITY	SUSITNA-WATANA HYDROELECTRIC PROJECT LINEAMENT GROUP 19 MAP DATA	FIGURE A19-1.1

79_218900_Alaska_Railbelt/2189_Lineament Report October 2013, modified 10.18.13

A)



Photograph taken from location A looking southwest along apparent rock type contrast (contact?) and towards mapped lineaments in steep-walled, v-shaped, linear drainage. Arrows point along apparent contact between less-resistant rock on the north and more resistant and craggy outcrops on the south.

B)

Photograph taken from location B looking west along mapped lineaments and apparent rock contact in steep-walled, v-shaped, linear drainages.

C)

Photograph taken from location C looking west at head of steep-walled, v-shaped, linear drainage where mapped lineaments correspond to apparent rock contact.

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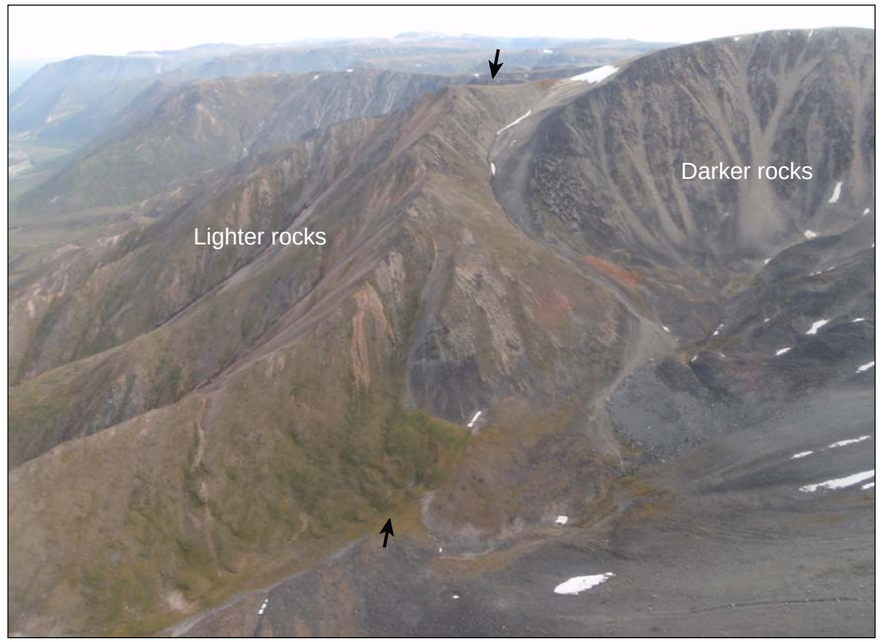
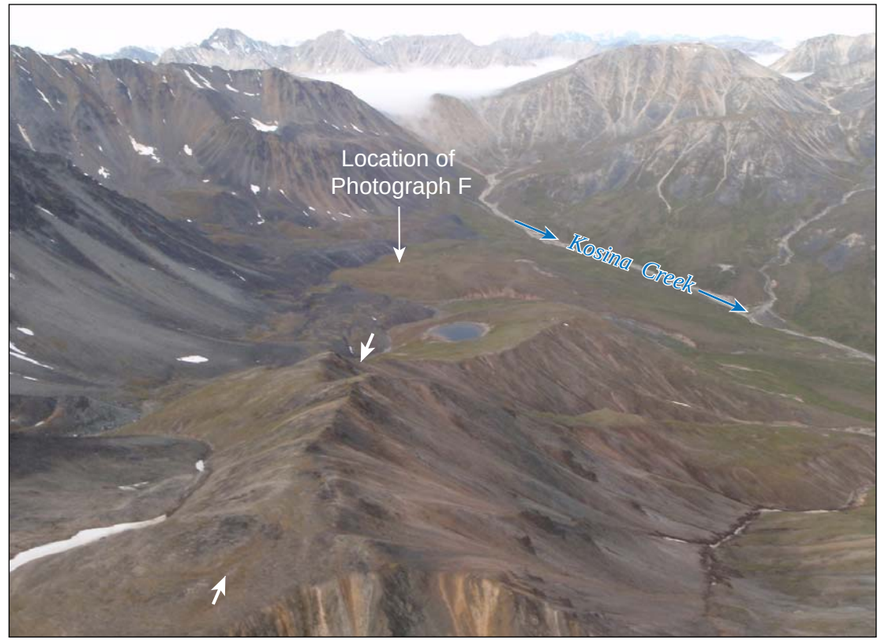
FUGRO Date 10/18/13	STATE OF ALASKA ALASKA ENERGY AUTHORITY ALASKA ENERGY AUTHORITY	SUSITNA-WATANA HYDROELECTRIC PROJECT LINEAMENT GROUP 19 PHOTOGRAPHS	FIGURE A19-1.2

D)



Photograph looking northeast from location D along the western continuation of the apparent rock type contrast shown in Photographs A, B, and C. Arrows point along apparent contact.

E)



Photograph from location E looking southwest down the ridgeline shown in Photograph D. View is 180 degrees from that in Photograph D. Note presence of rock glacier and glacial deposits in valley bottom. Arrows point along apparent contact.

F)

Photograph looking northwest from location F showing apparently undeformed rock glacier and/or glacial deposits along strike of the mapped lineaments and apparent rock contact shown in Photographs A through D.

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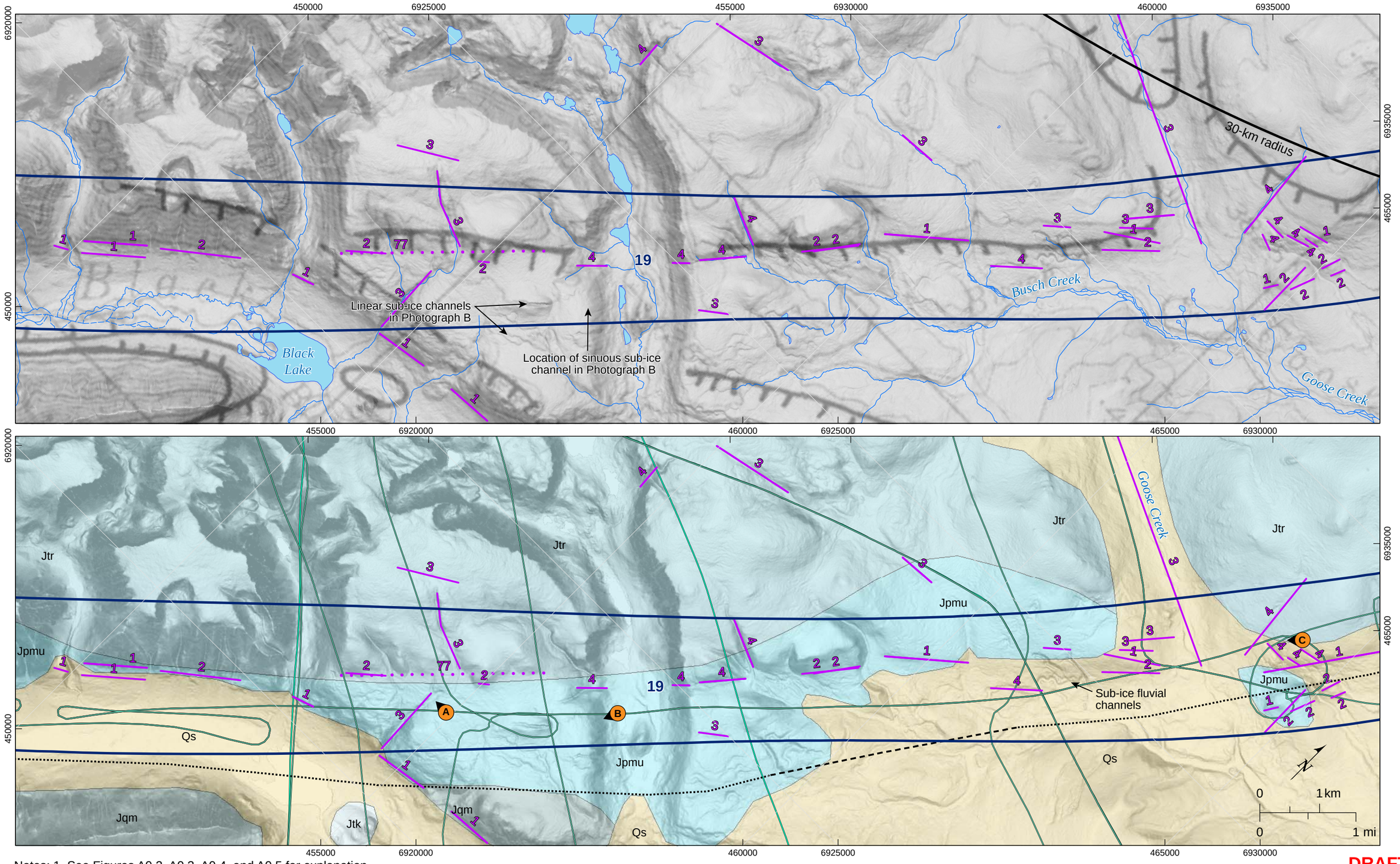
FUGRO Date 10/18/13	STATE OF ALASKA ALASKA ENERGY AUTHORITY ALASKA ENERGY AUTHORITY	SUSITNA-WATANA HYDROELECTRIC PROJECT LINEAMENT GROUP 19 PHOTOGRAPHS	FIGURE A19-1.3



Notes: 1. See Figures A0.2, A0.3, A0.4, and A0.5 for explanation.
2. Data frame has been rotated 45° east of north.
3. Geologic map in top panel by Williams and Galloway, 1986 and bottom panel by Wilson et al., 2009

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FUGRO Date 10/18/13	STATE OF ALASKA ALASKA ENERGY AUTHORITY ALASKA ENERGY AUTHORITY	SUSITNA-WATANA HYDROELECTRIC PROJECT LINEAMENT GROUP 19 MAP DATA	FIGURE A19-2.1

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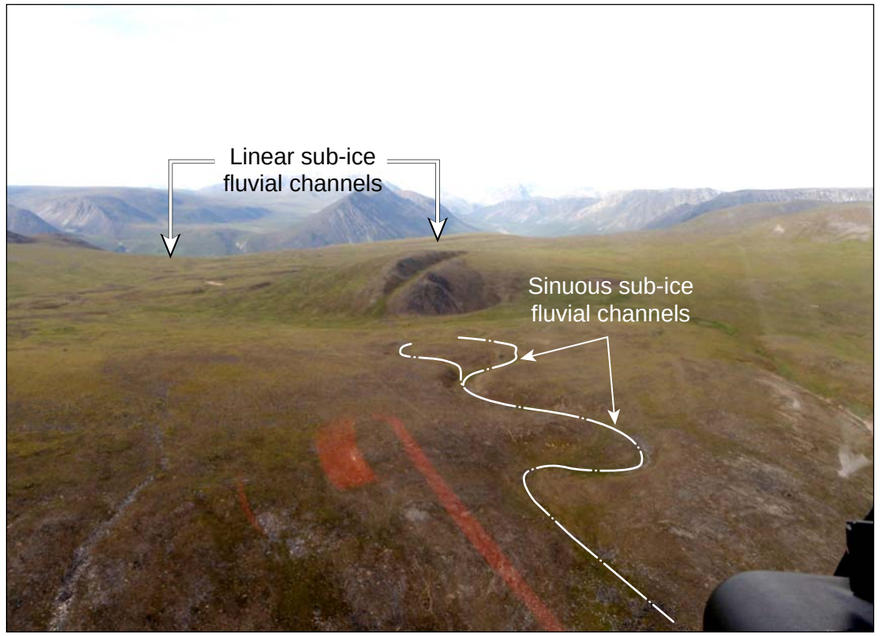
A)

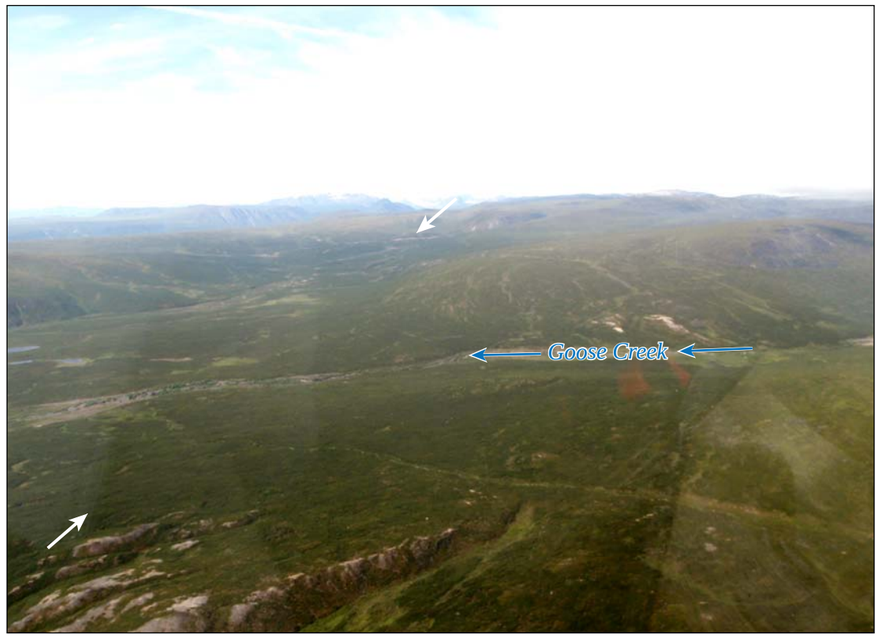
Photograph taken from location A looking west. Arrows point along trend of mapped lineaments along southwest-facing aligned break-in-slope. Note the rounded and subdued nature of break-in-slope. Relief across break-in-slope is ~125 m.

B)



Photograph looking southwest from location B. The sinuous sub-ice channels are not large enough features to be seen on INSAR data.

C)



Overview photograph looking southwest from location C along alignment of mapped lineaments. Arrows point along trend of lineament group 19. Note absence of expression of lineaments within the landscape across the Goose Creek portion of the lineament group.

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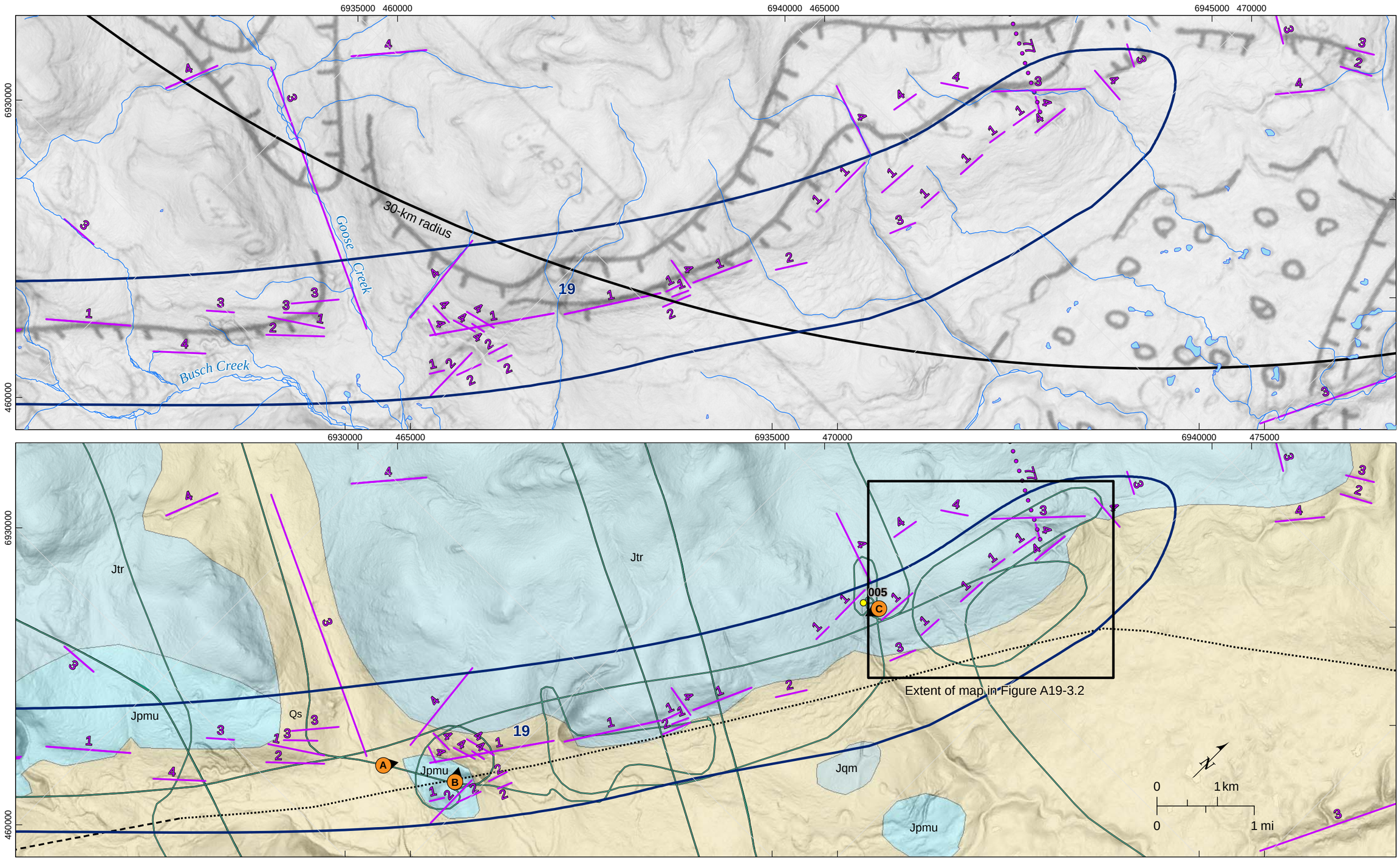
FUGRO Date 10/18/13	STATE OF ALASKA ALASKA ENERGY AUTHORITY ALASKA ENERGY AUTHORITY	SUSITNA-WATANA HYDROELECTRIC PROJECT LINEAMENT GROUP 19 PHOTOGRAPHS	FIGURE A19-2.2



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Notes: 1. See Figures A0.2, A0.3, A0.4, and A0.5 for explanation.
2. Data frame has been rotated 45° east of north.
3. Geologic map in top panel by Williams and Galloway, 1986 and bottom panel by Wilson et al., 2009

FUGRO Date 10/18/13	STATE OF ALASKA ALASKA ENERGY AUTHORITY ALASKA ENERGY AUTHORITY	SUSITNA-WATANA HYDROELECTRIC PROJECT LINEAMENT GROUP 19 MAP DATA	FIGURE A19-3.1

79_218900_Alaska_Railbelt/2189_Lineament Report October 2013, modified 10.18.13

A)

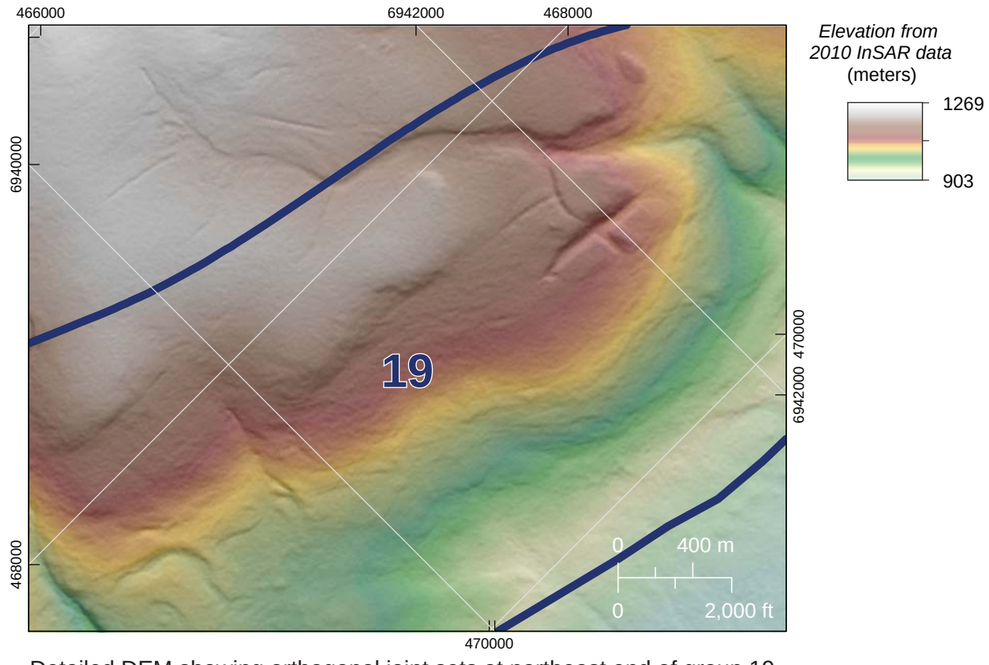
Photograph looking north-northeast from location A along the east-facing break-in-slope that defines the northeast portion of LG 19. Arrows point along alignment of mapped lineaments.

B)

Photograph looking northwest from location B at sub-ice fluvially-eroded channels. Arrows point along the trend of mapped lineaments that make up group 19.

C)

Photograph looking south-southwest from location C at widely spaced, near vertical, well-developed joints in trondhjemite (aka tonalite) bedrock. Joint spacing is 1 to 1.5 meters. Predominant orientations of joints are 042/80SE, 012/85SE, and 082/85SE but other orientations exist. Joint faces have clean surfaces with relief of minerals of 1 to 3 mm. No gouge or mineralization observed on joint surfaces, nor any sense of movement indicators (striae or mullions).



Detailed DEM showing orthogonal joint sets at northeast end of group 19.

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FUGRO Date 10/18/13	STATE OF ALASKA ALASKA ENERGY AUTHORITY ALASKA ENERGY AUTHORITY	SUSITNA-WATANA HYDROELECTRIC PROJECT LINEAMENT GROUP 19 PHOTOGRAPHS	FIGURE A19-3.2

Apparent rock type contrasts

Location of granitic glacial erratic

Glacial lake sediments

Tyone Creek

20

A B C D E F G H I

001 002 018 019 020 021

6895000 480000 6900000 485000 6905000 490000 6910000 495000

6890000 485000 6895000 490000 6900000 495000 6905000

0 1 km

0 1 mi

Notes: 1. See Figures A0.2, A0.3, A0.4, and A0.5 for explanation.
2. Data frame has been rotated 45° east of north.
3. Geologic map from Grantz, 1960.

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FUGRO Date 10/18/13	STATE OF ALASKA ALASKA ENERGY AUTHORITY ALASKA ENERGY AUTHORITY	SUSITNA-WATANA HYDROELECTRIC PROJECT LINEAMENT GROUP 20 MAP DATA	FIGURE A20.1

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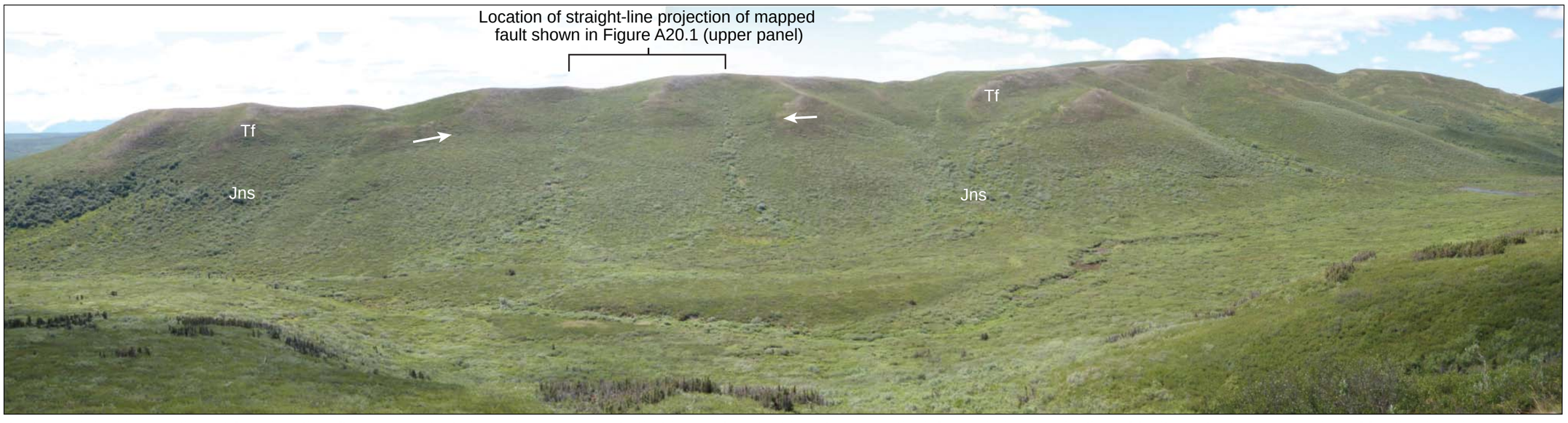
A)

Photograph looking northeast from location A.

B)

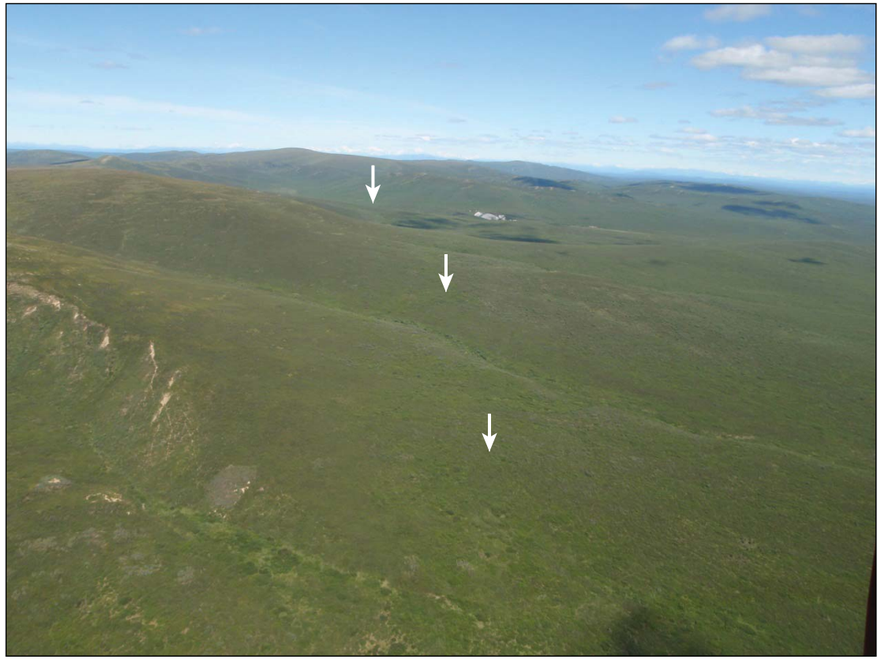
Photograph looking west-southwest from location B. Geologist standing in 3- to 6-m deep- and ~30-m-wide swale. Swale only exists in saddle; it does not continue down either side of saddle.

C)



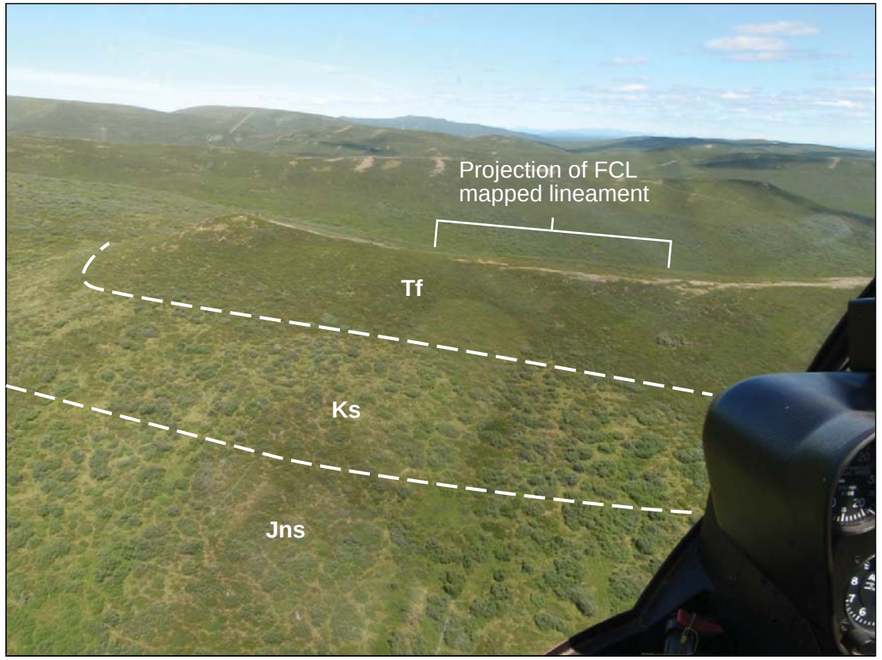
Photograph looking southwest from location C. Basal contact shown by arrows. Note that base of contact is not apparently deformed along projection of fault and that no expression of faulting in valley bottom is apparent.

G)



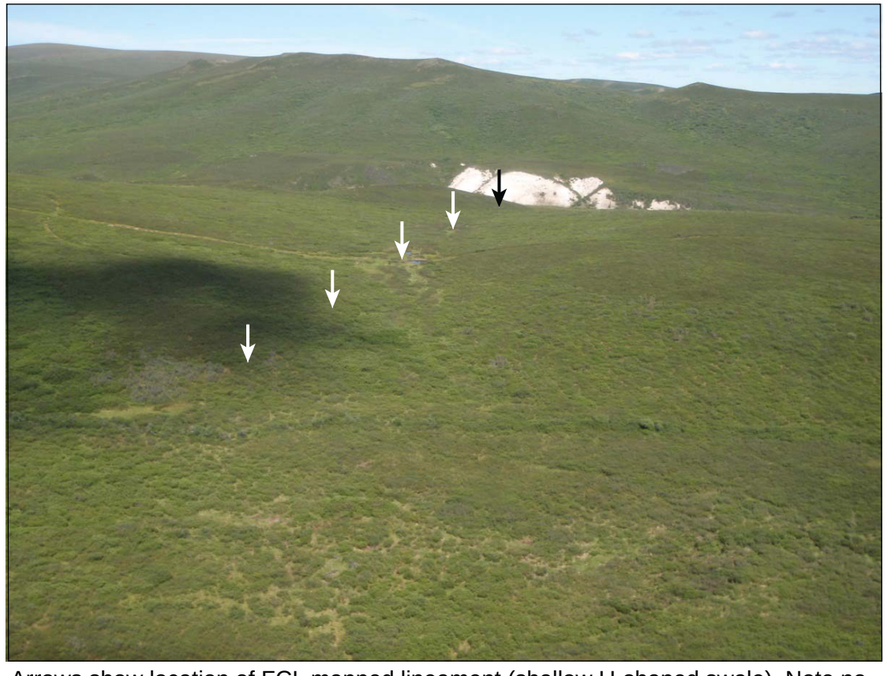
Photograph looking north from location G along mapped fault of Grantz (1960). Arrows point to approximate location of mapped fault. Note absence of apparent geomorphic expression fault.

D)



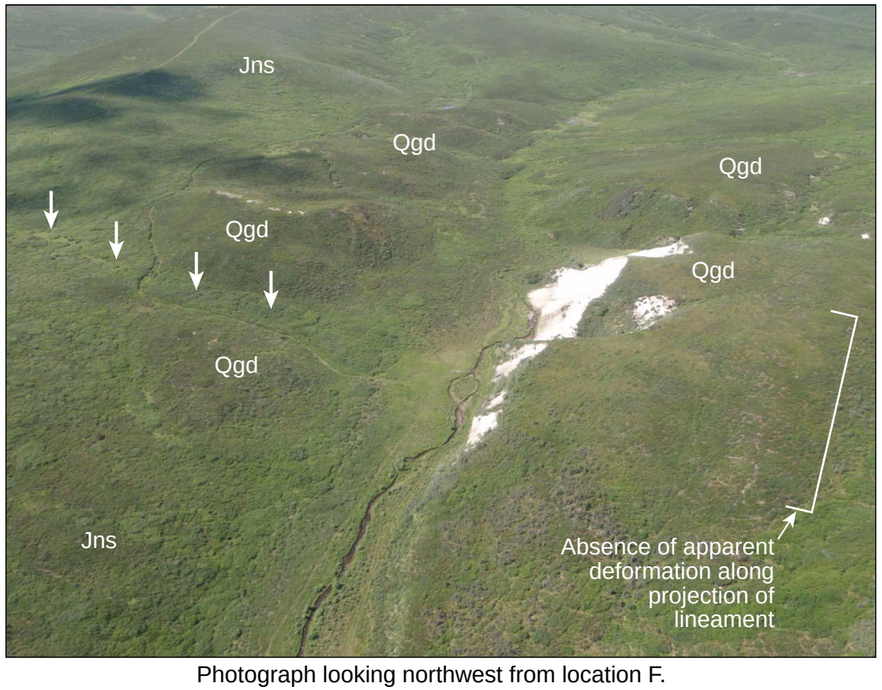
Photograph looking northeast from location D. Note absence of deformation in ridge line of Tf.

E)



Arrows show location of FCL mapped lineament (shallow U-shaped swale). Note no apparent deformation of white-bedded sediments (glacial lake sediments) along projection of lineament.

F)



Photograph looking northwest from location F.

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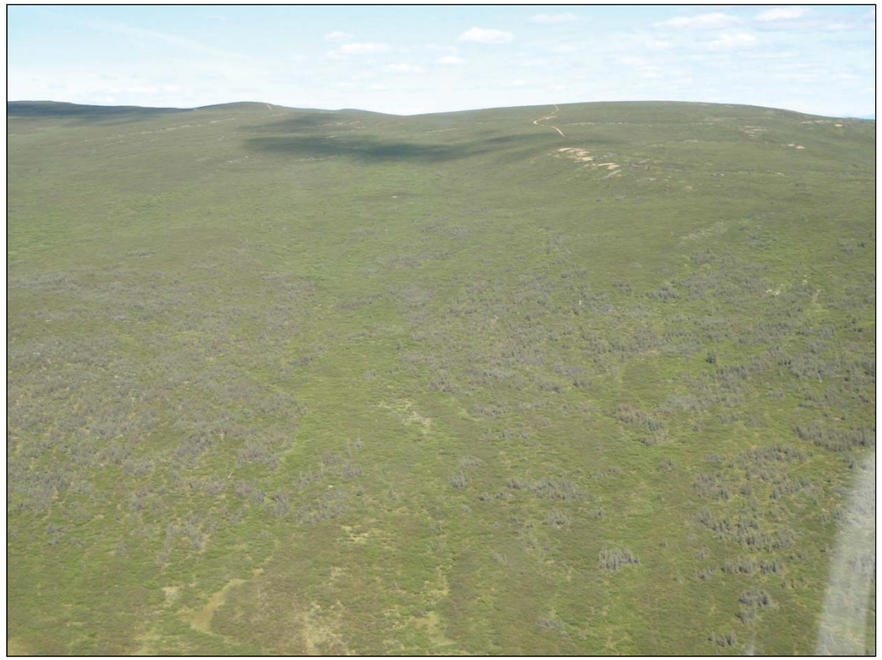
H)



Photograph looking north-northeast from location H along queried mapped fault of Grantz (1960) that lies outside of lineament group. Note absence of fault expression.

I)

Photograph looking north-northeast from location I along queried mapped fault of Grantz (1960) that lies outside of lineament group. Note absence of fault expression.

FUGRO Date 10/18/13	STATE OF ALASKA ALASKA ENERGY AUTHORITY ALASKA ENERGY AUTHORITY	SUSITNA-WATANA HYDROELECTRIC PROJECT LINEAMENT GROUP 20 PHOTOGRAPHS	FIGURE A20.4