Mapbook 4

Master Legend - Geologic Formations

- Pump Station
- Valve

Steele City Segment Routes

- Alternative A
- Alternative A1A
- Alternative B
- Access Road
- Railroad
- Abandoned Railroad

Geologic Map Symbols

- Strike and dip of inclined beds
- Contact
- Contact, approximately located
- Contact, concealed
- Fault
- Fault, approximately located
- Fault, concealed
- Fault, inferred
- Bar and ball on downthrown block
- Fold axis
- Fold, approximately located axis
- Fold, concealed axis
- Fold, inferred axis
- Anticline
- Monocline
- Plunge Direction
- Syncline
- Ancient river channel axis
- Geological linement determined from air photos
- Extent of glaciation (hachures on glaciated side)
- Silcrete bed
- Terrace scarp
- Unconformity

Geologic Map Units

- Qal, Alluvium of modern channels and flood plains
- Qac, Alluvium-colluvium
- Qat, Alluvium of alluvial terrace deposit
- Qc, Colluvium
- Qls, Landslide deposit
- Qao, Alluvium, older, undivided
- Qg, Glacial deposits, undivided
- Qgac, Gravelly sheetwash alluvium and colluvium
- Qsg, Sand and gravel
- Qgr, Gravel
- Qgi, Glacial ice-contact deposits; kames, kame terraces, eskers
- Qgt, Glacial till
- Qgl, Glacial lake deposit
- Qglb, Glacial lake bar deposit
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- Tf, Flaxville Formation
- Tfu, Fort Union Formation
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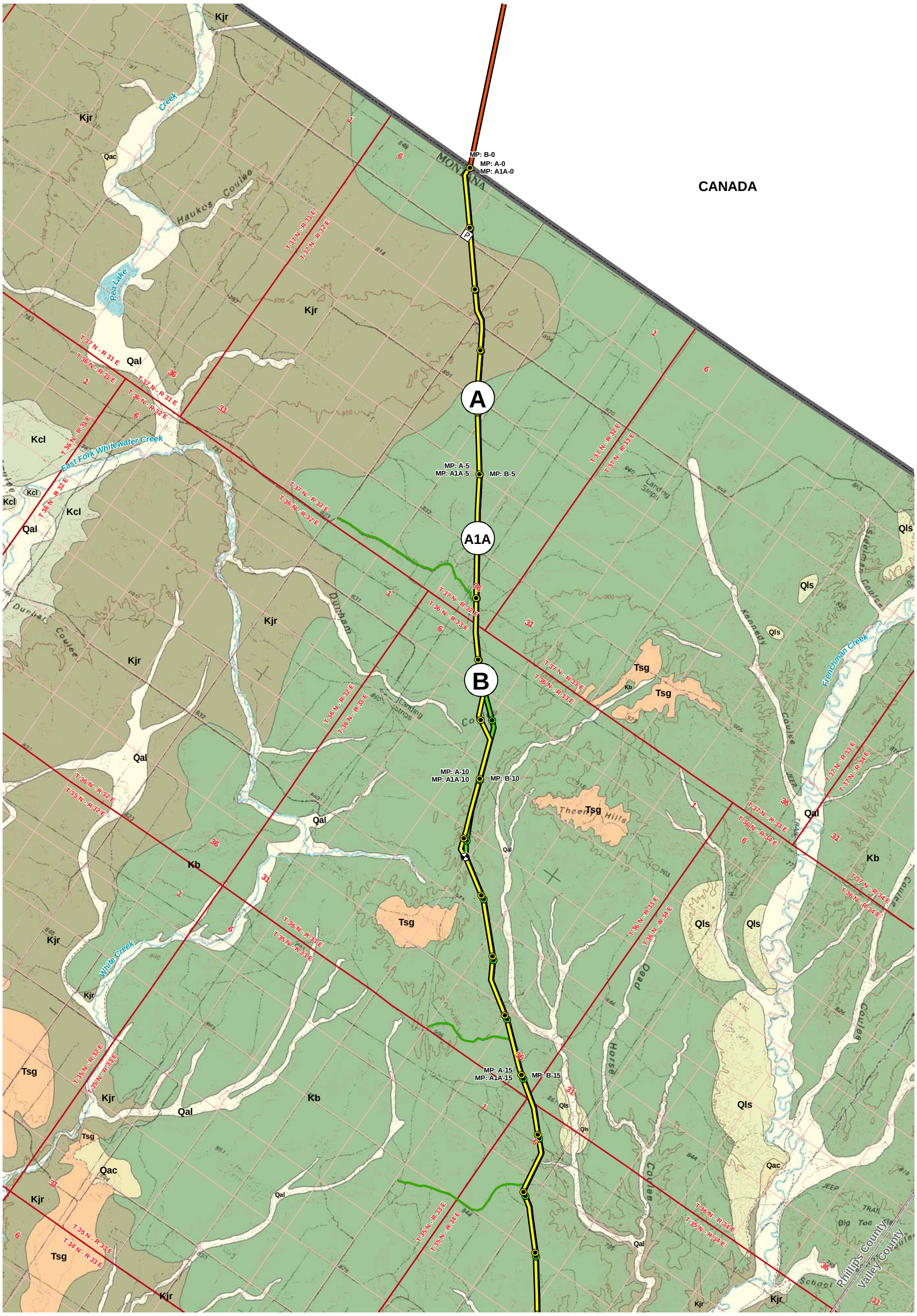

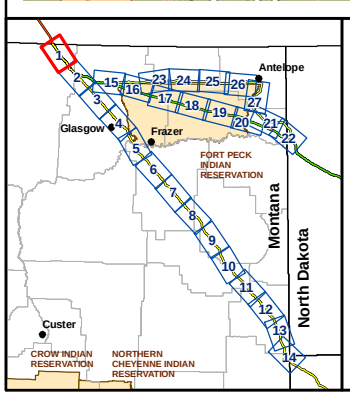

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Montana Study Area
KEYSTONE XL PROJECT

Mapbook 4
Geologic Formations

Map 01 of 27

0 0.5 1 2 Miles
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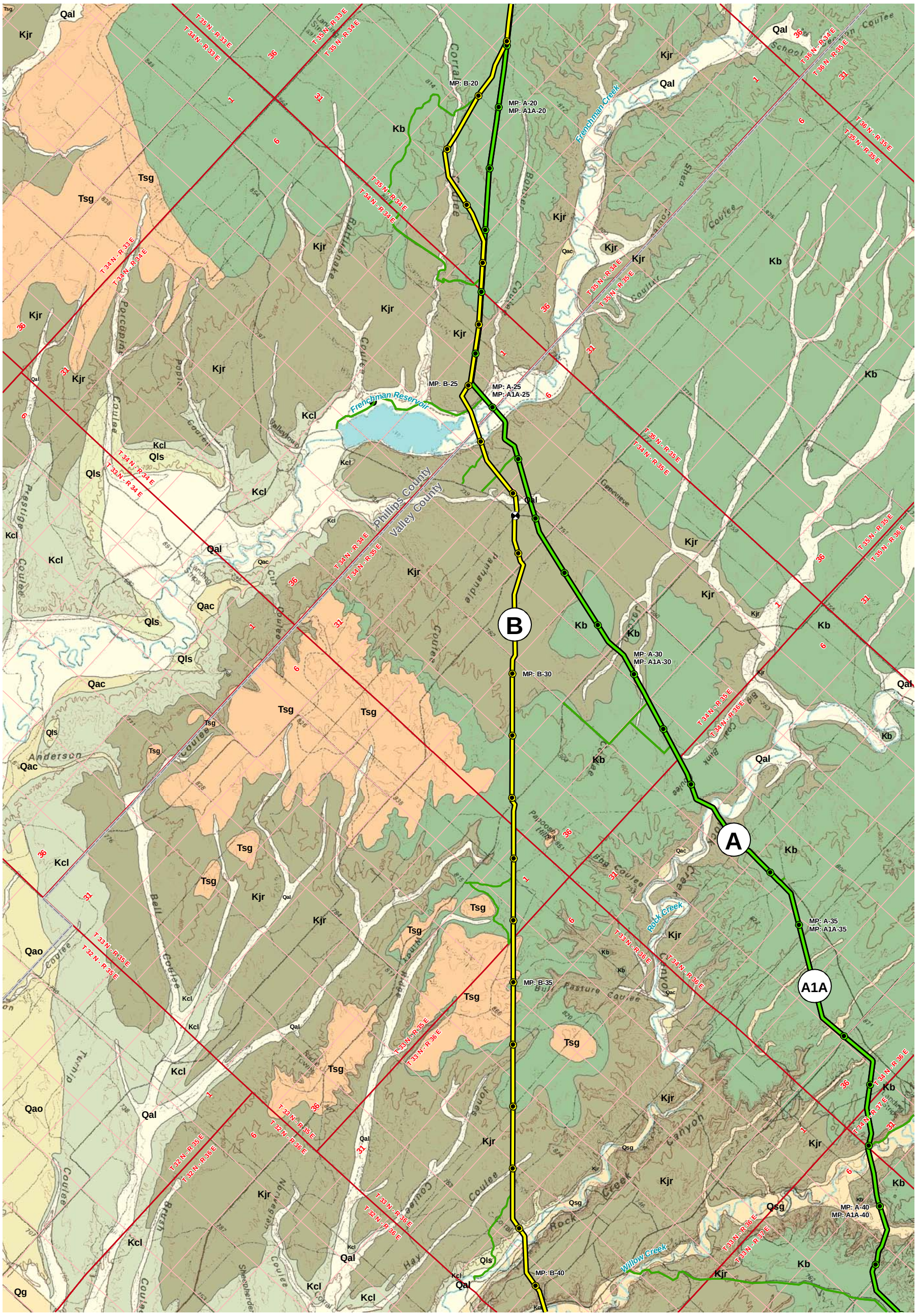

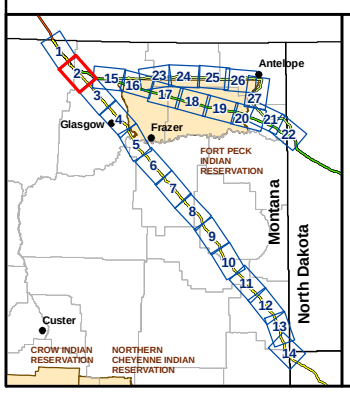

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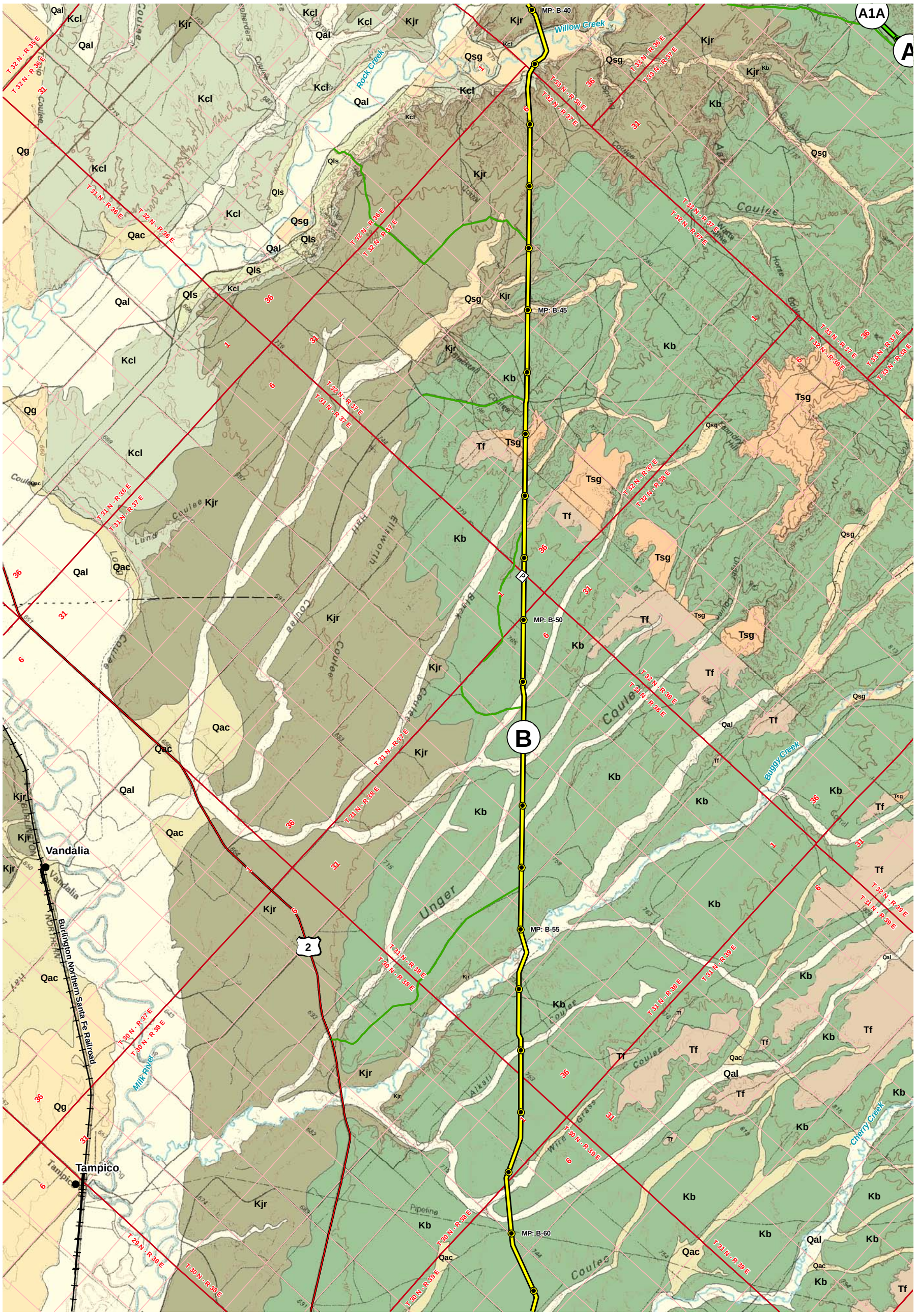

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Geologic Formations

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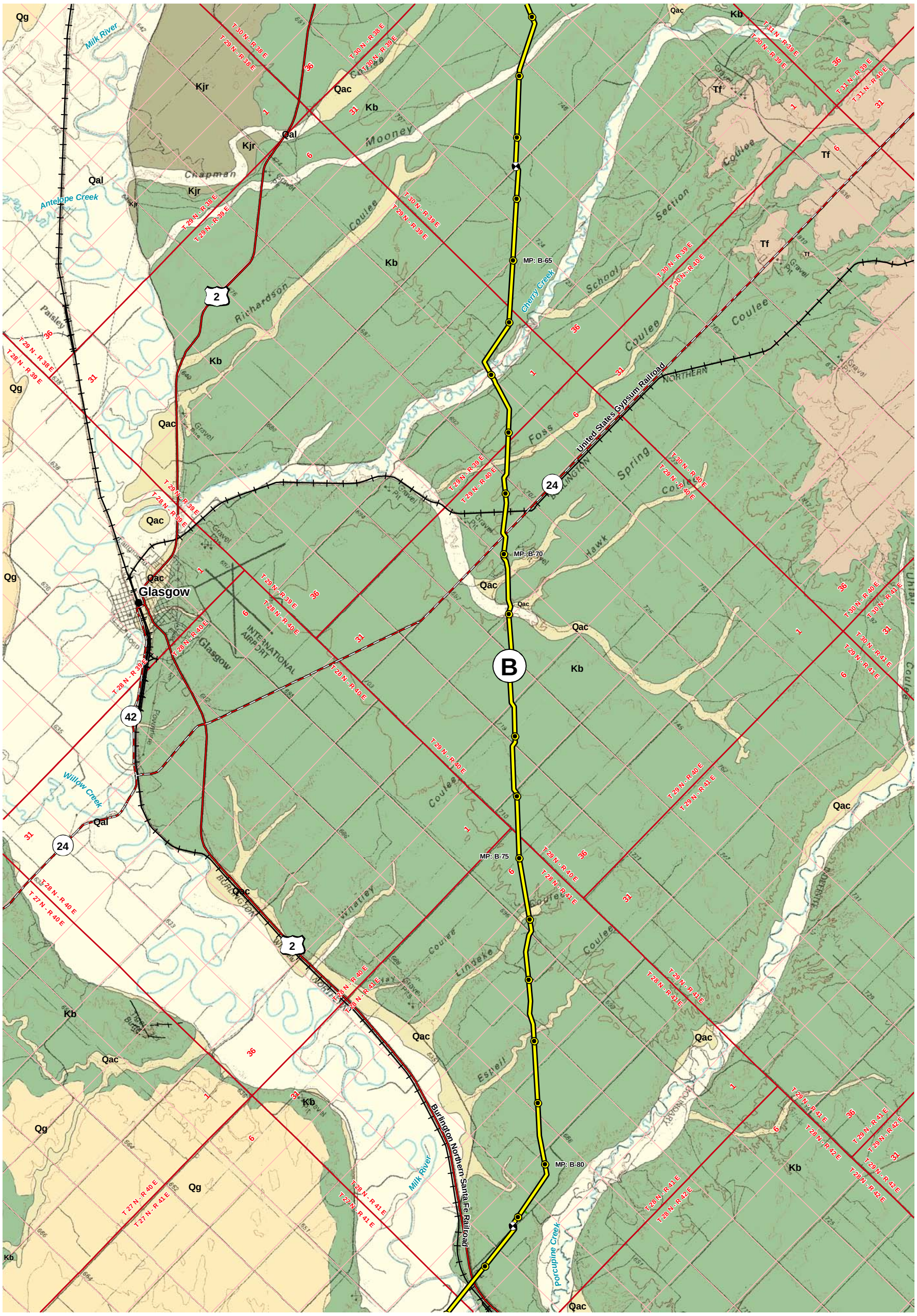

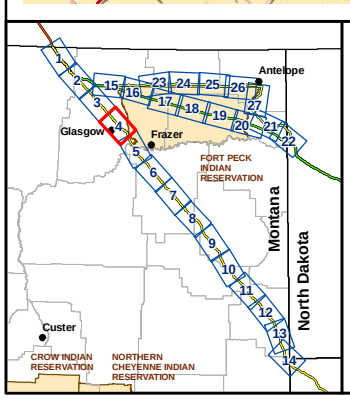

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Montana Study Area
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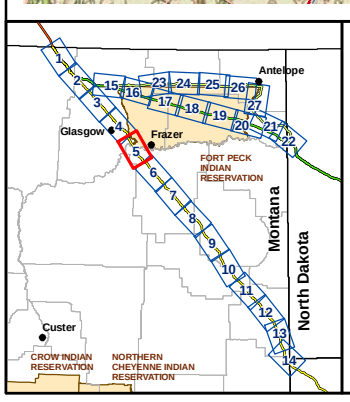

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Geologic Formations

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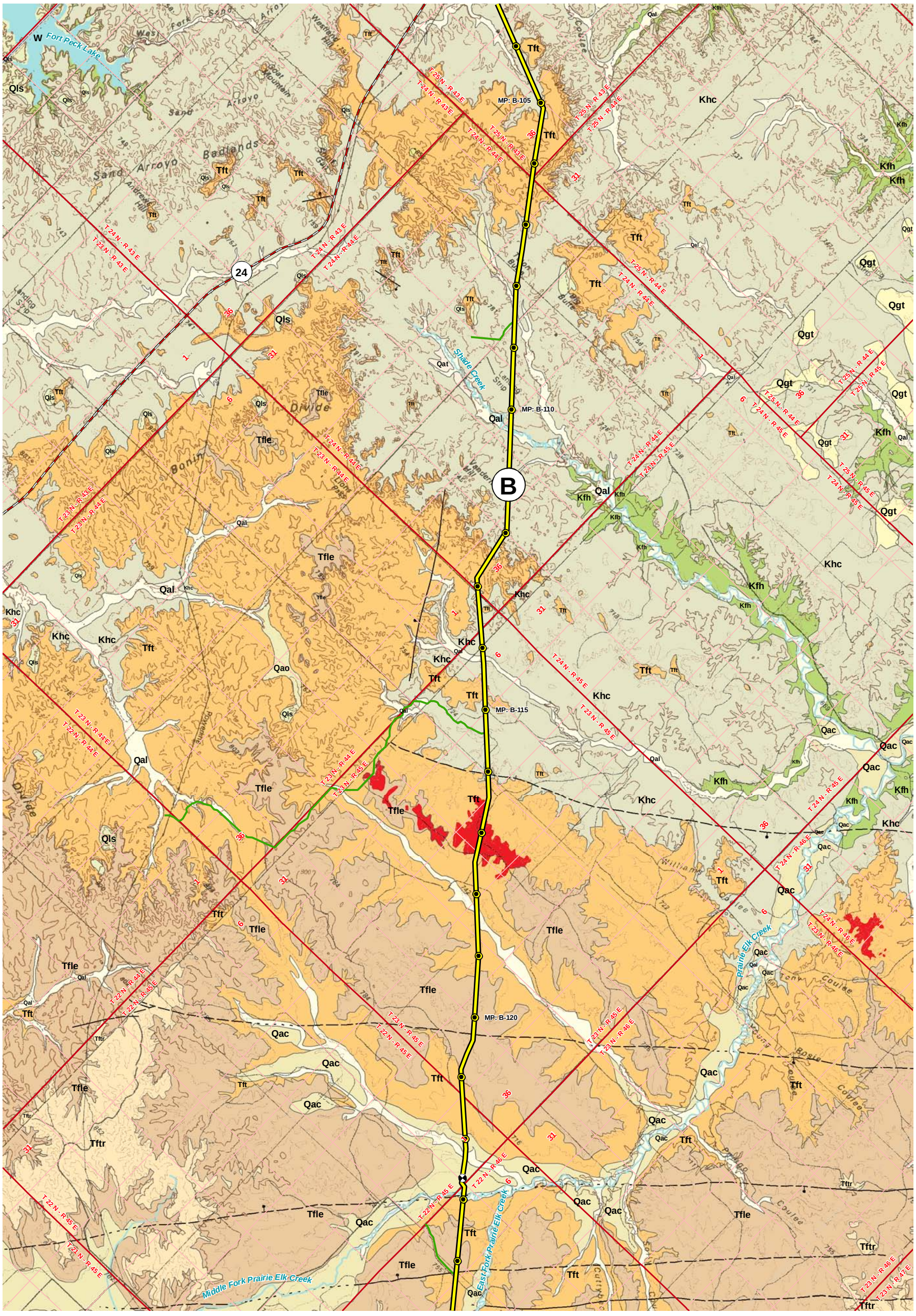

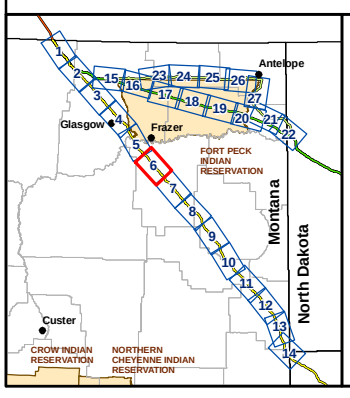

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Montana Study Area
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Geologic Formations

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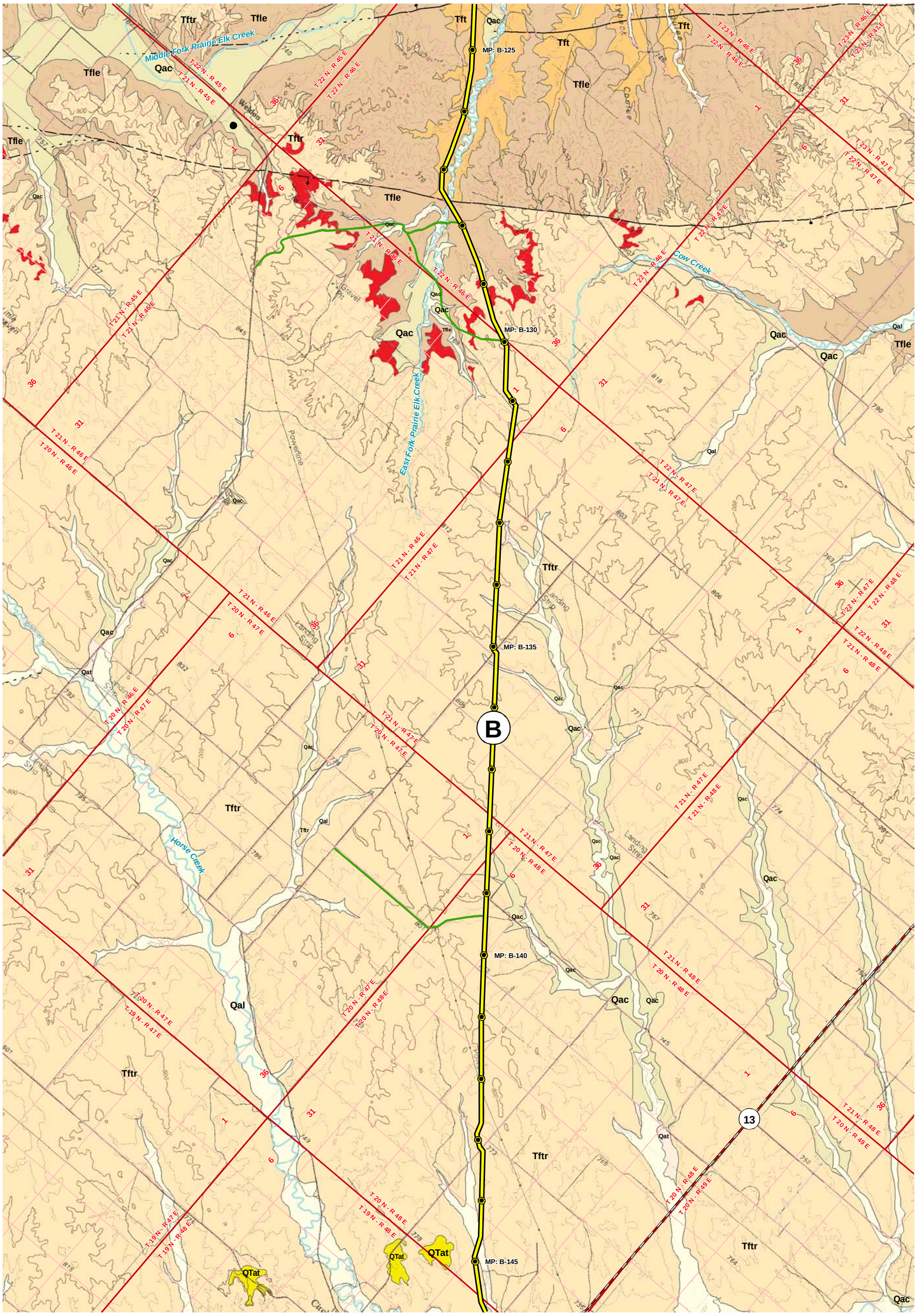

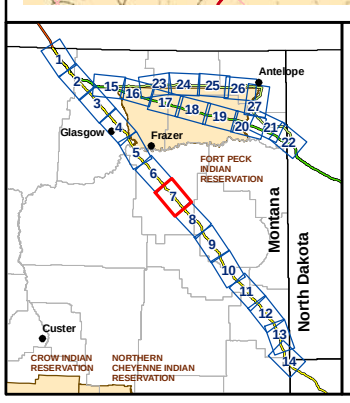

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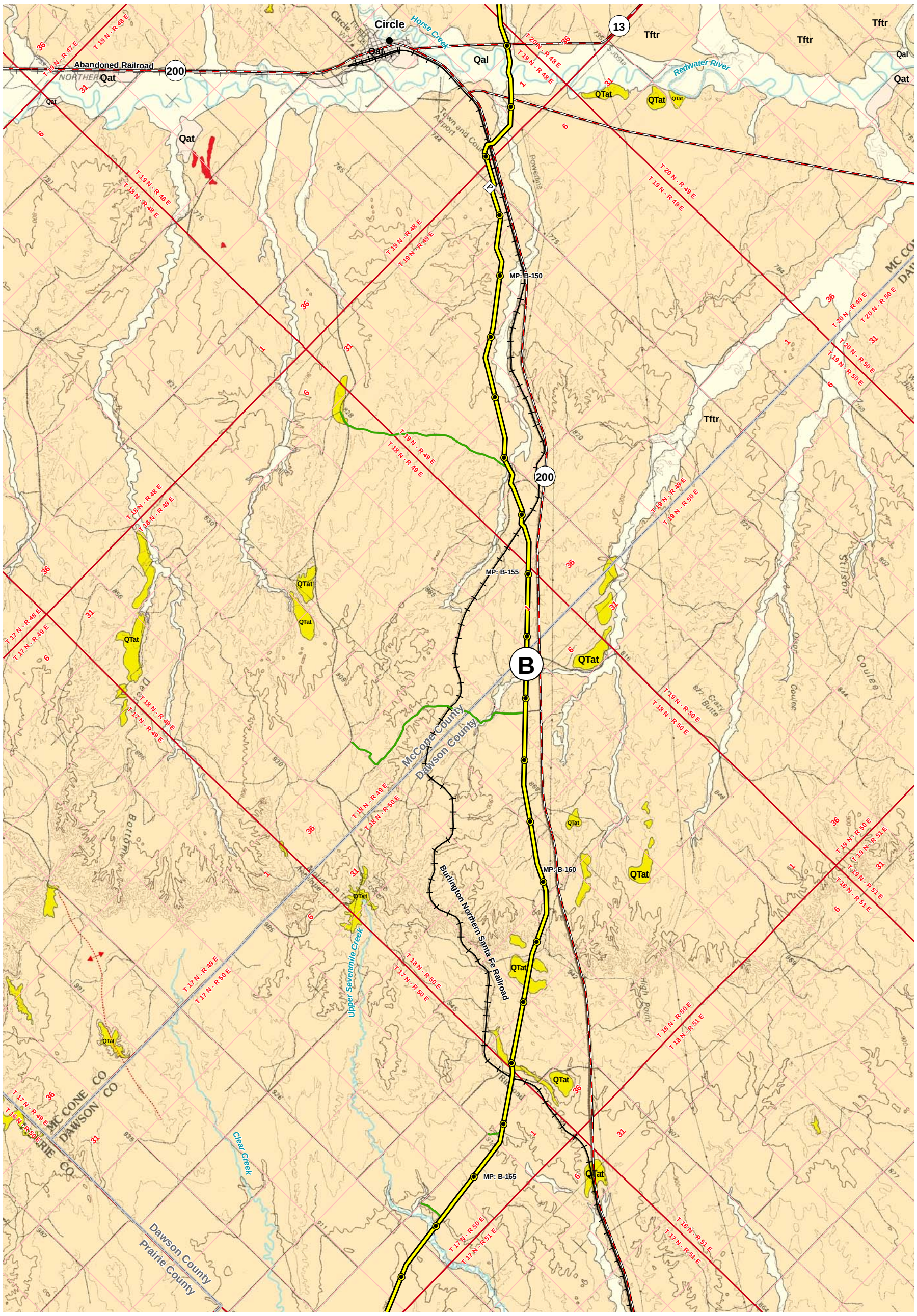

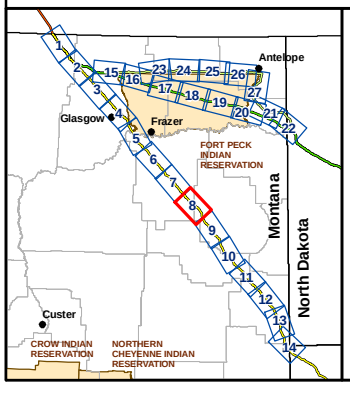

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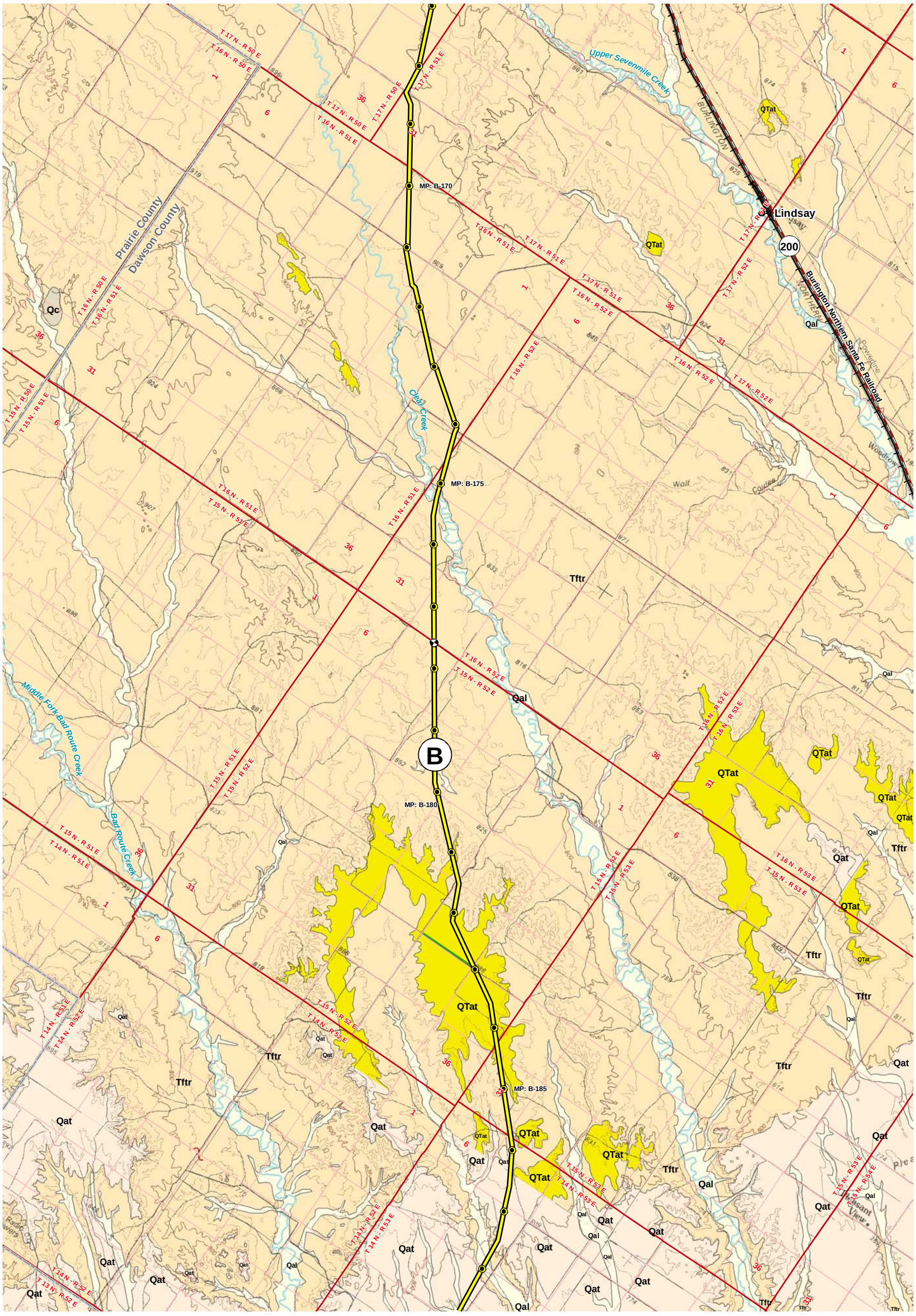

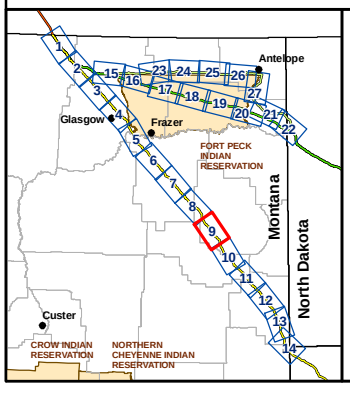

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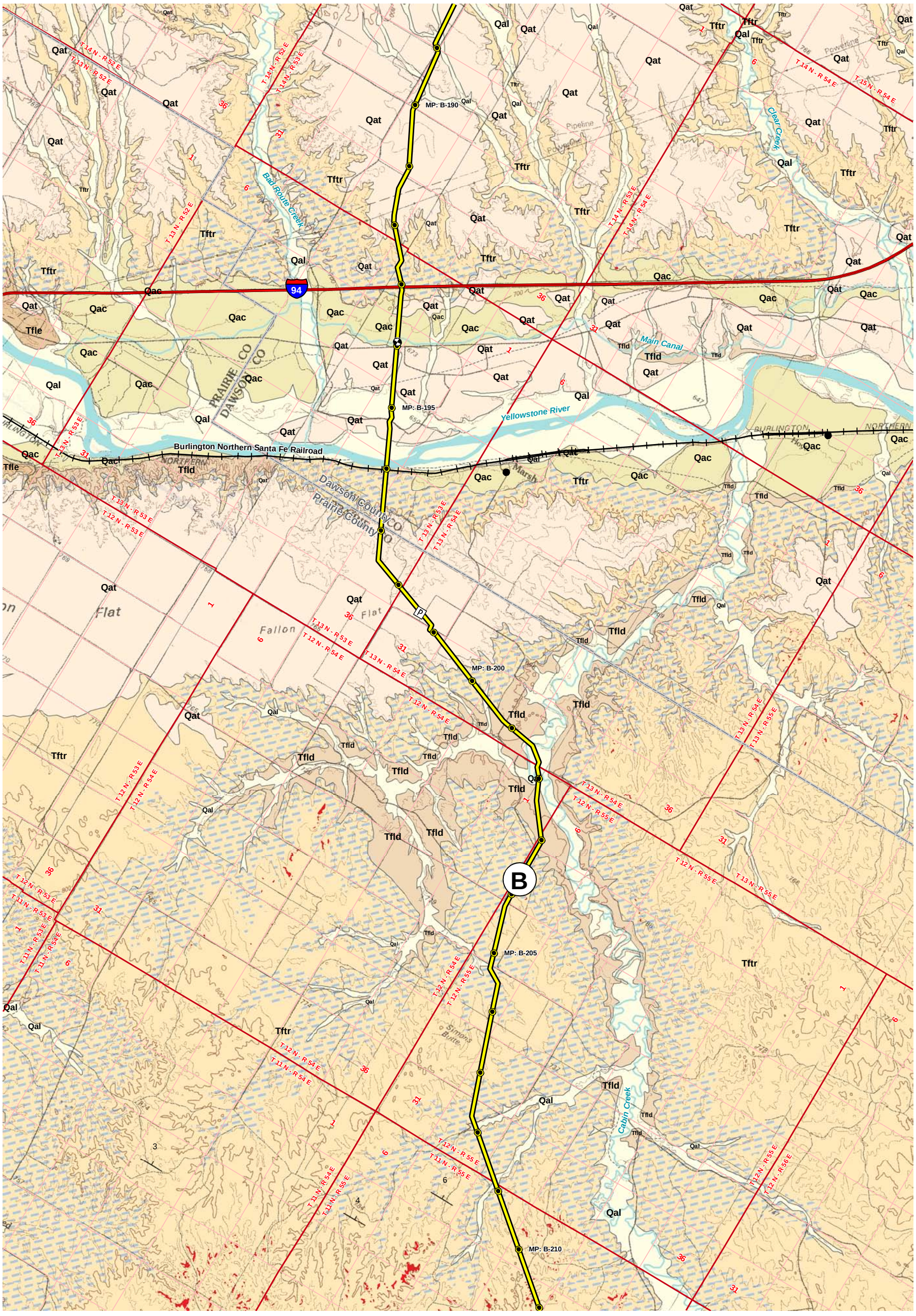

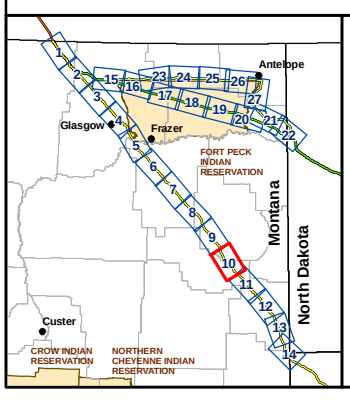

Geologic Map Units

- Qal, Alluvium of modern channels and flood plains
- Qac, Alluvium-colluvium
- Qat, Alluvium of alluvial terrace deposit
- Qc, Colluvium
- Qls, Landslide deposit
- Qao, Alluvium, older, undivided
- Qg, Glacial deposits, undivided
- Qgac, Gravelly sheetwash alluvium and colluvium
- Qsg, Sand and gravel
- Qgr, Gravel
- Qgi, Glacial ice-contact deposits; kames, kame terraces, eskers

Legend

- Qgt, Glacial till
- Qgl, Glacial lake deposit
- Qglb, Glacial lake bar deposit
- QTat, Alluvium of alluvial terrace deposit
- QTgr, Terrace gravel ??
- Tf, Flaxville Formation

Fort Union Formation
- Tfu, Fort Union Formation
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- Kp, Pierre Shale
- af, Artificial fill - large dams, freeway interchanges
- W, Water
- Clinker
- Regions of paleosol

Montana Study Area
KEYSTONE XL PROJECT

ConocoPhillips — TransCanada

Mapbook 4
Geologic Formations

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0 0.5 1 2 Miles
0 0.5 1 2 Kilometers
1:100,000

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MP: B-215

MP: B-220

MP: B-225

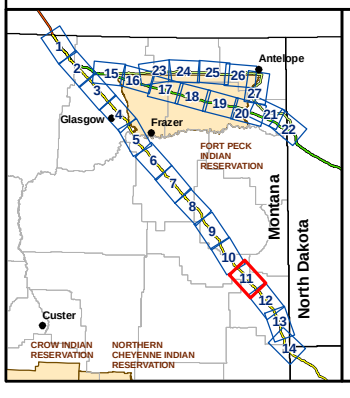
MP: B-230

Prairie County
Custer County
Fallon County
Wibaux County

Cabin Creek
Pennel Creek
Sandstone Creek
Burlington Northern Santa Fe Railroad

PRAIRIE CO
CUSTER CO
FALLON CO
WIBAUX CO

Tftr
Qal
Qat
Tfld
Khc
Kftt
Kp
Kfc



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Montana Study Area
KEYSTONE XL PROJECT

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Geologic Formations

Map 11 of 27

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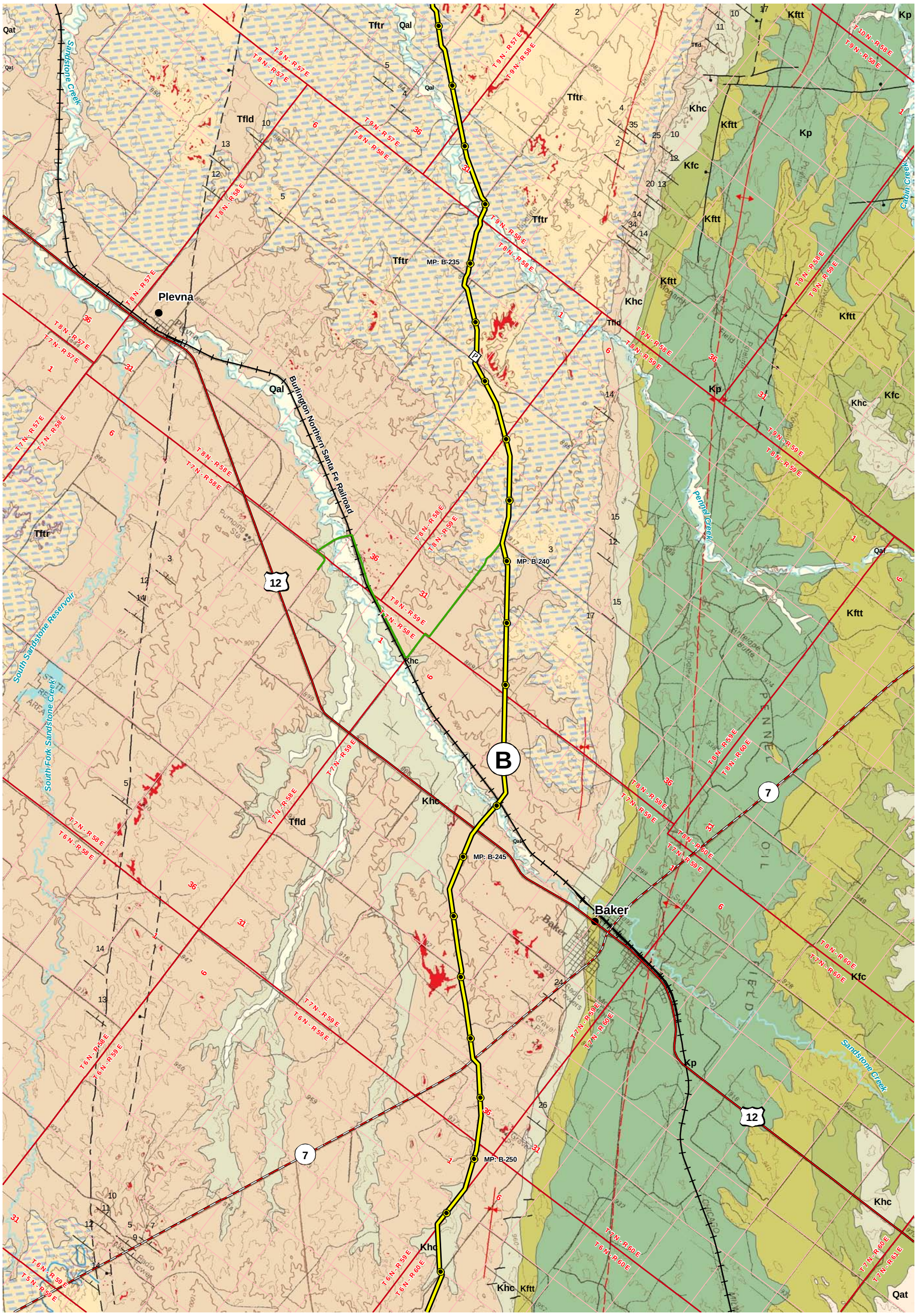

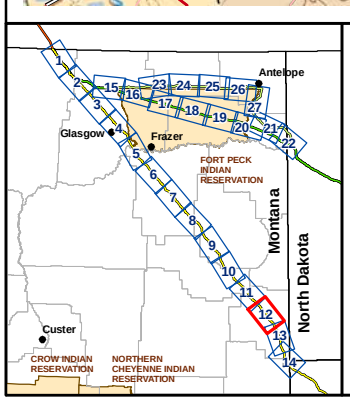

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MP: B-250
MP: B-255
MP: B-260
MP: B-265
MP: B-270
B
Burlington Northern Santa Fe Railroad
Little Beaver Creek
North Dakota
Montana

Legend

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Geologic Formations

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0 0.5 1 2 Miles
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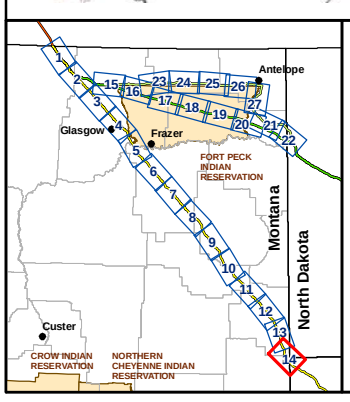
MP: B-265
MP: B-270
MP: B-275
MP: B-280
MP: B-285
B
Carter County
Fallon County
Boxelder Creek
North Dakota
MONTANA
NORTH DAKOTA
BOWMAN CO
HARDING CO
FALLON CO
CARTER CO
Monument Butte
Dooks Butte
Gaging Station
PIPELINE
Seal
Draw
Tfld
Tfe
Qls
Qal
Khc
Kp



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Legend

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Fort Union Formation
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ConocoPhillips
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Geologic Formations

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0 0.5 1 2 Miles
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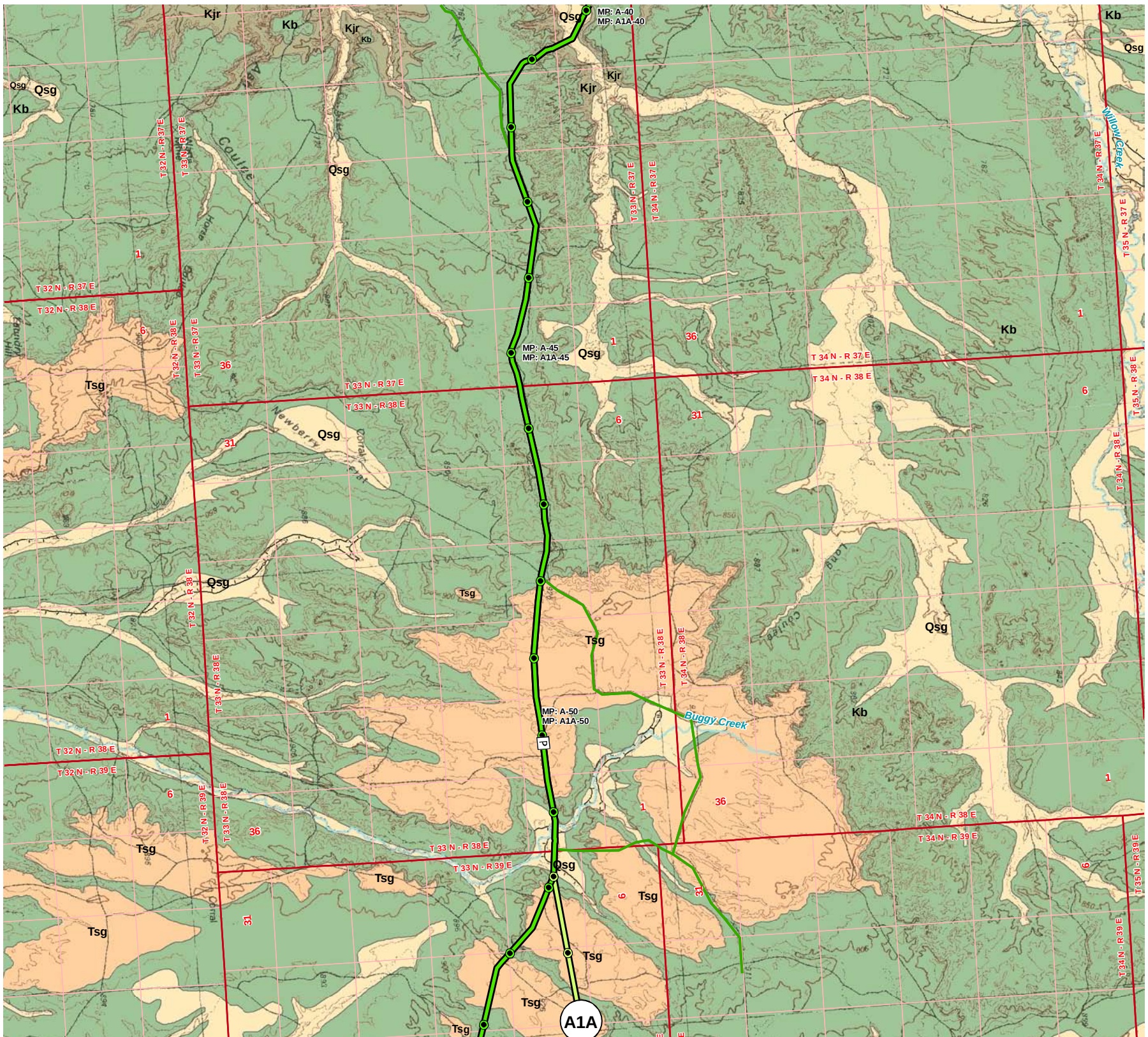

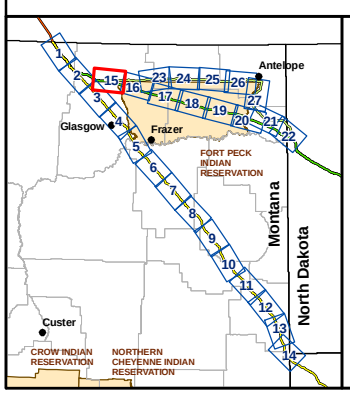

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Montana Study Area
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Geologic Formations

Map 15 of 27

0 0.5 1 2 Miles
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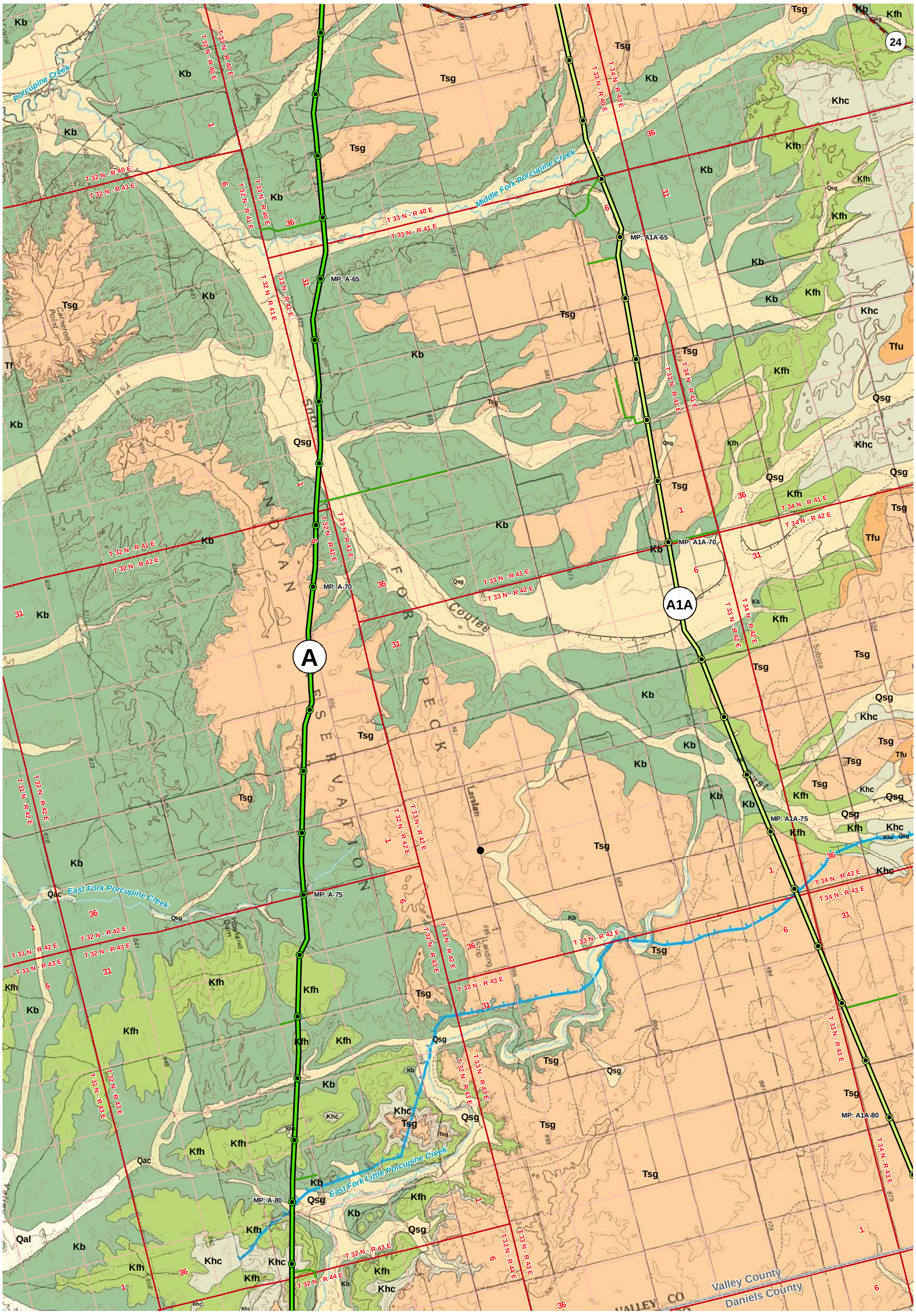

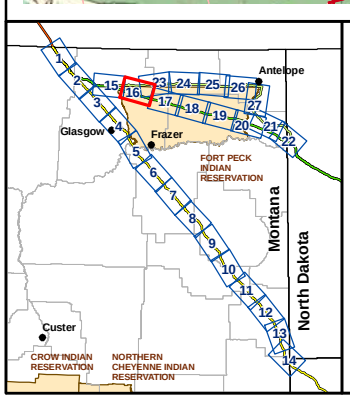

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Montana Study Area
KEYSTONE XL PROJECT

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Mapbook 4
Geologic Formations

Map 16 of 27

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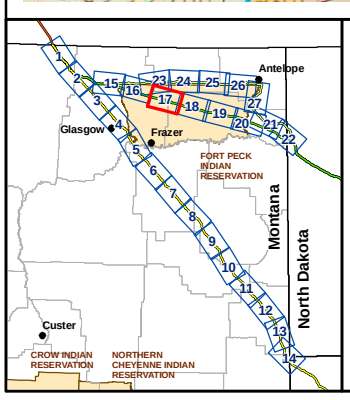

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Montana Study Area
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Geologic Formations

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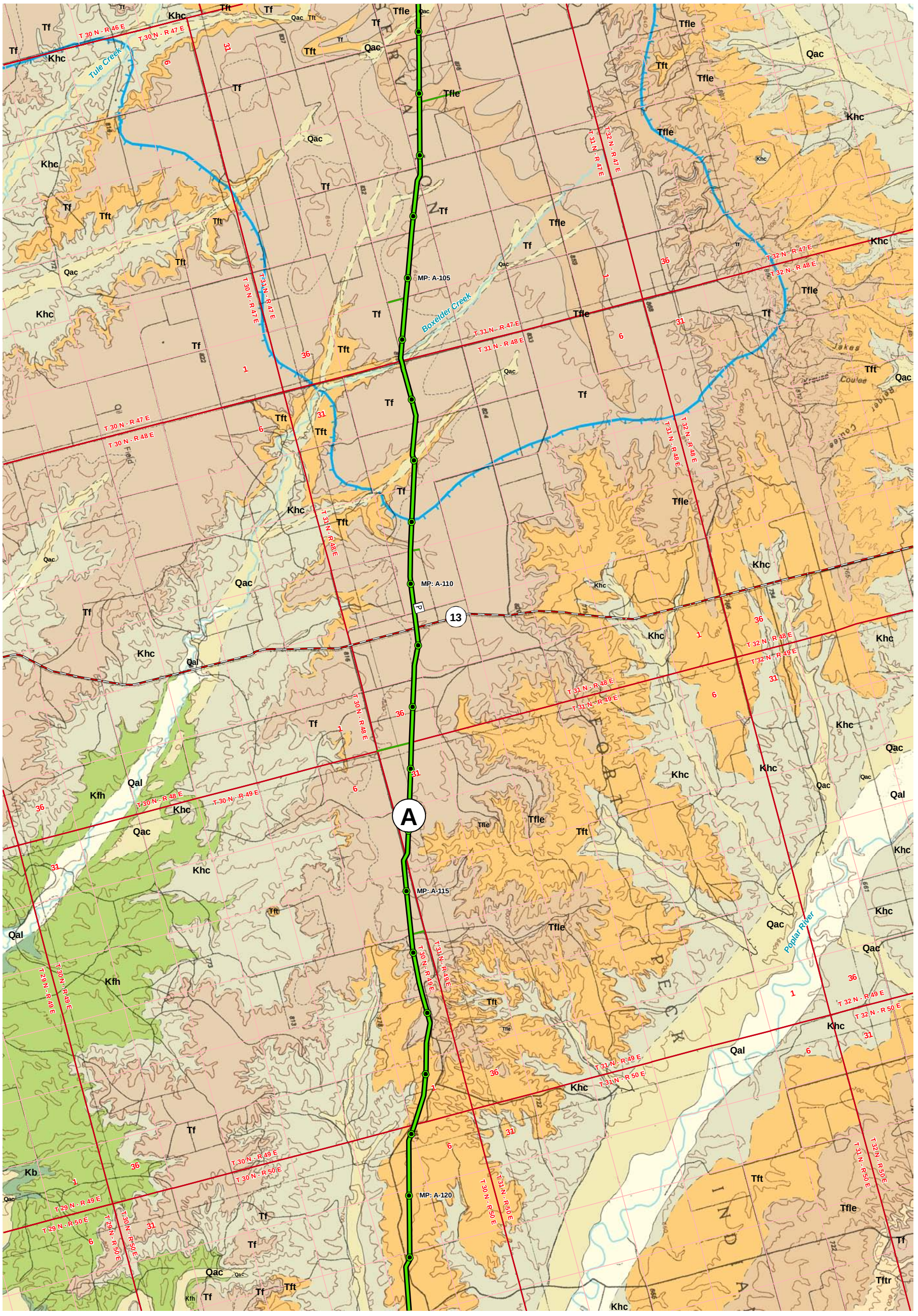

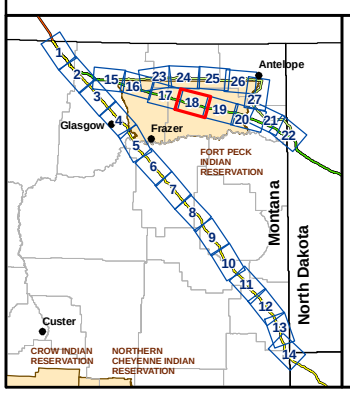

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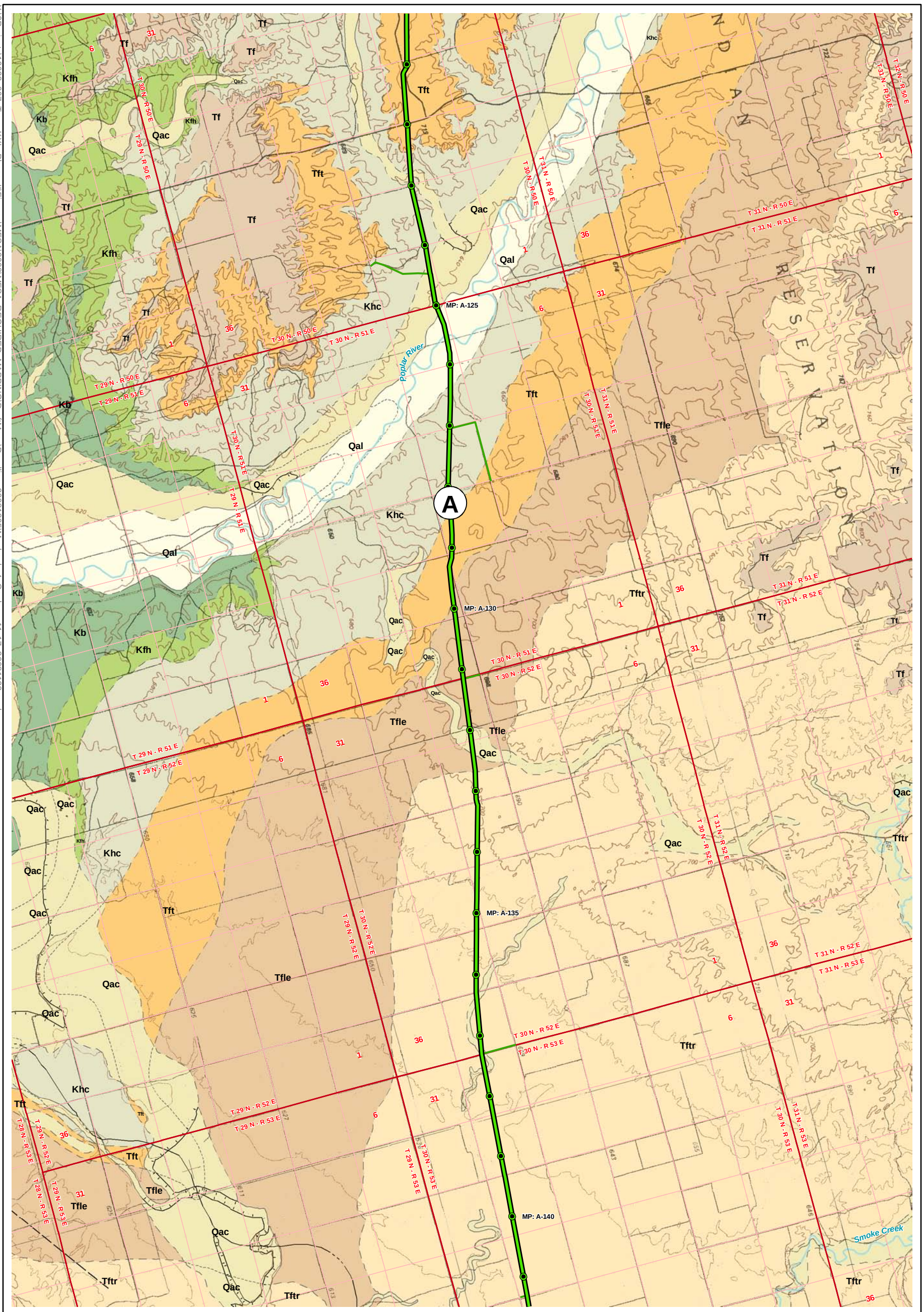

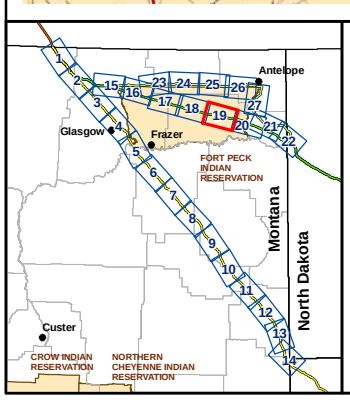

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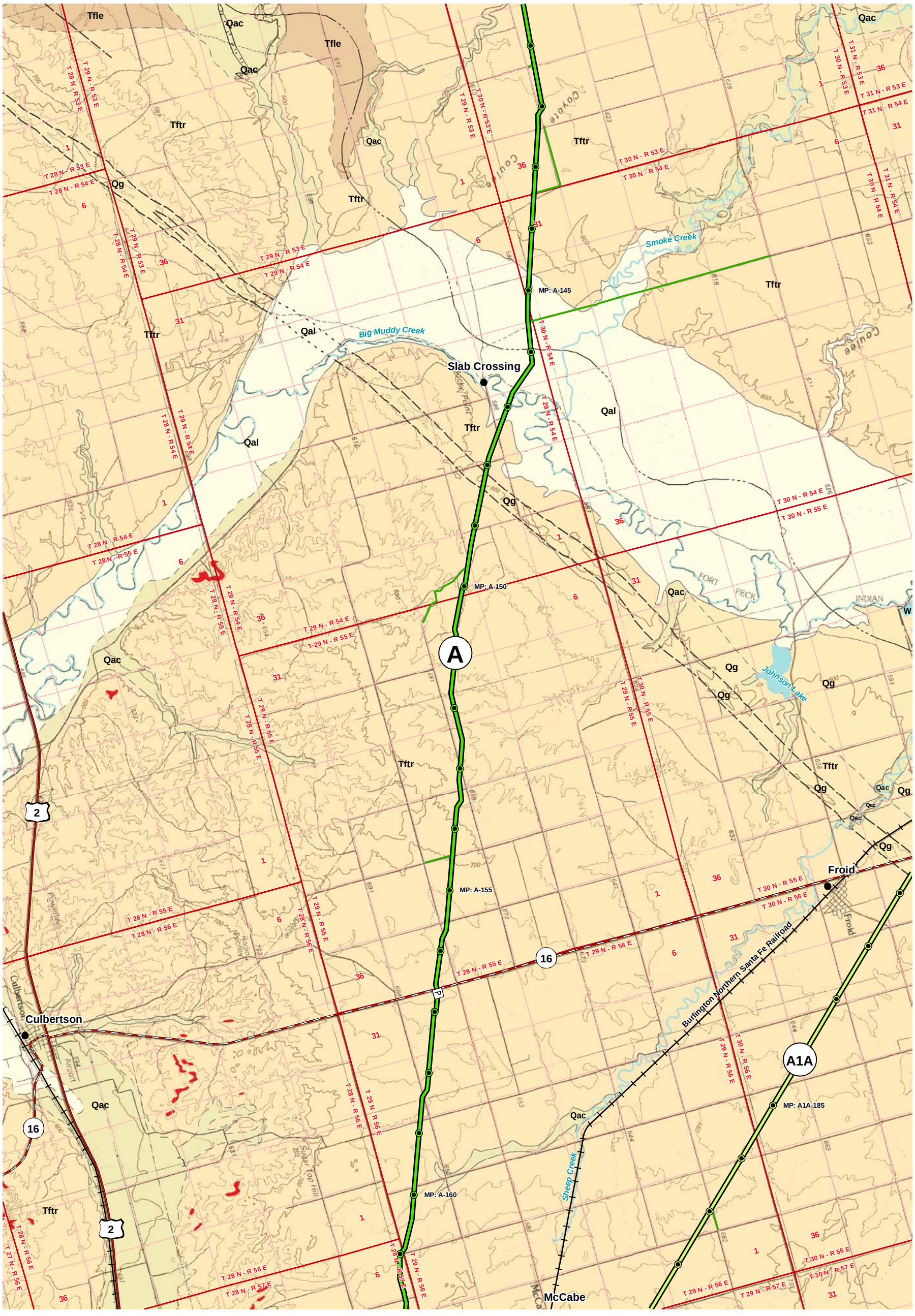

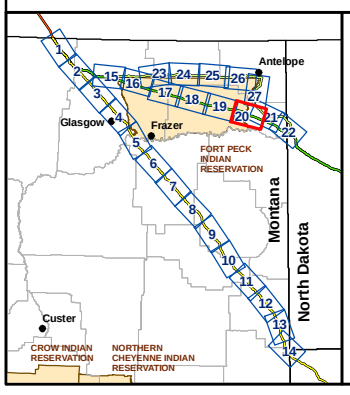

Geologic Map Units

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- Qac, Alluvium-colluvium
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- Qls, Landslide deposit
- Qao, Alluvium, older, undivided
- Qg, Glacial deposits, undivided
- Qgac, Gravelly sheetwash alluvium and colluvium
- Qsg, Sand and gravel
- Qgr, Gravel
- Qgi, Glacial ice-contact deposits; kames, kame terraces, eskers

Legend

- Qgt, Glacial till
- Qgl, Glacial lake deposit
- Qglb, Glacial lake bar deposit
- QTat, Alluvium of alluvial terrace deposit
- QTgr, Terrace gravel ??
- Tf, Flaxville Formation

Fort Union Formation:

- Tfu, Fort Union Formation
- Tfsb, Sentinel Butte Member
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- Tft, Tullock Member
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- Kp, Pierre Shale
- af, Artificial fill - large dams, freeway interchanges
- W, Water
- Clinker
- Regions of paleosol

Montana Study Area
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0 0.5 1 2 Miles

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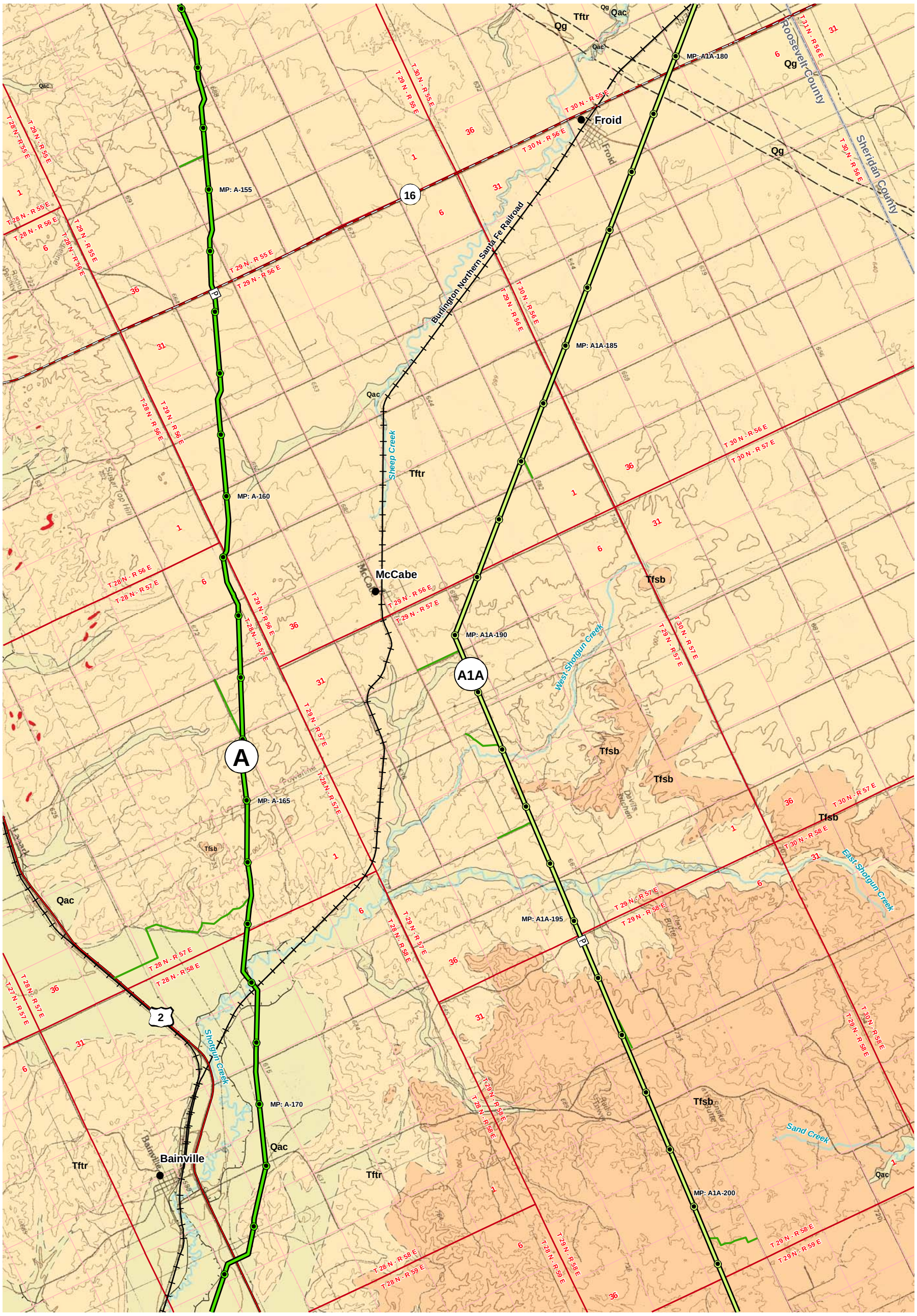

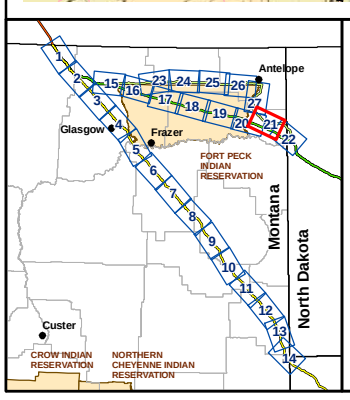

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0 0.5 1 2 Miles
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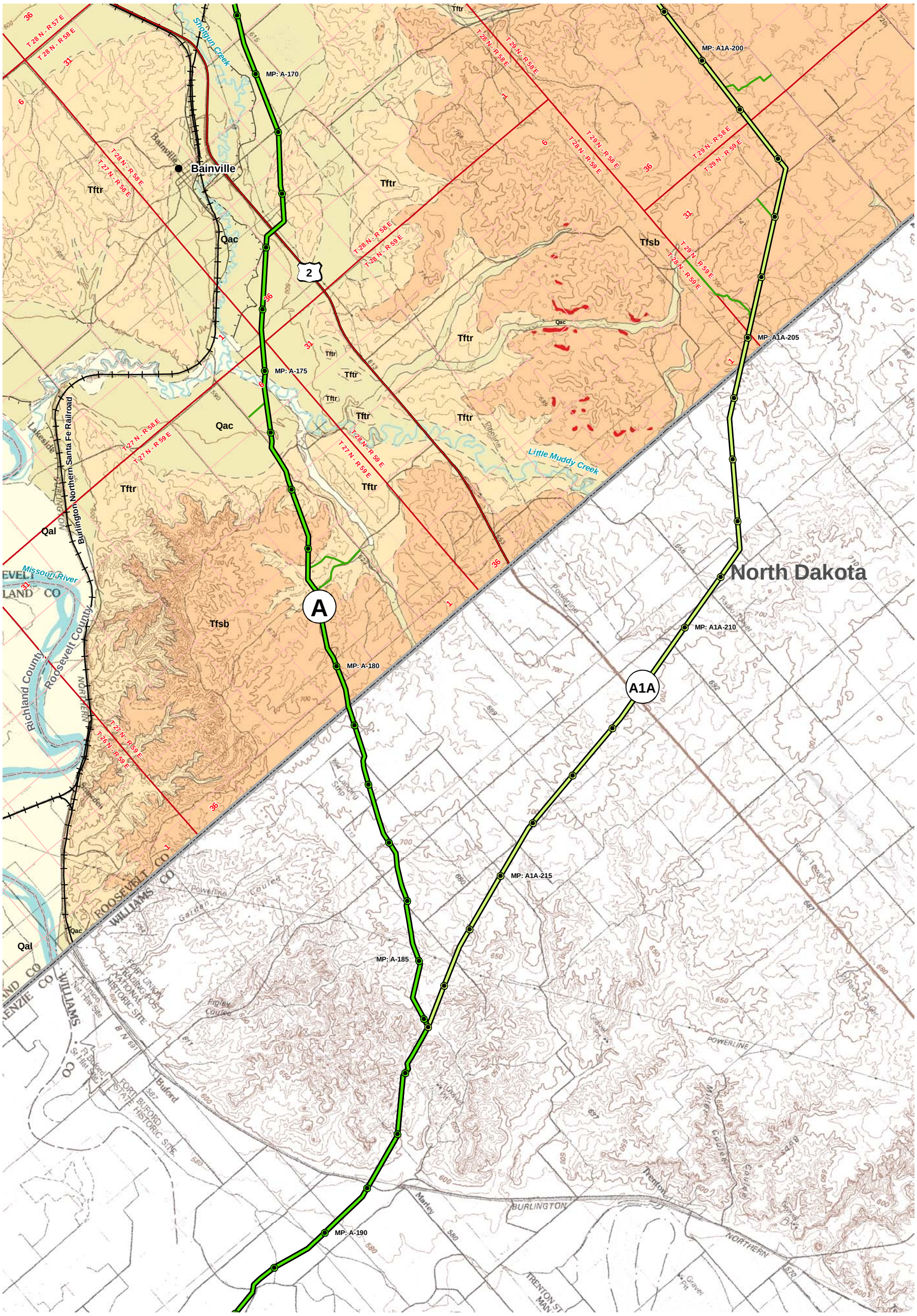

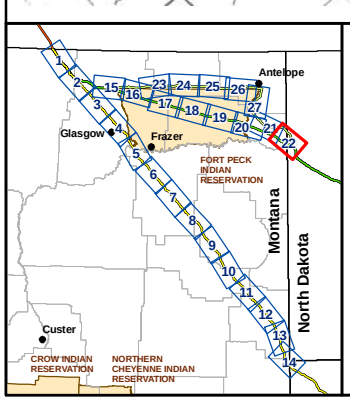

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0 0.5 1 2 Miles
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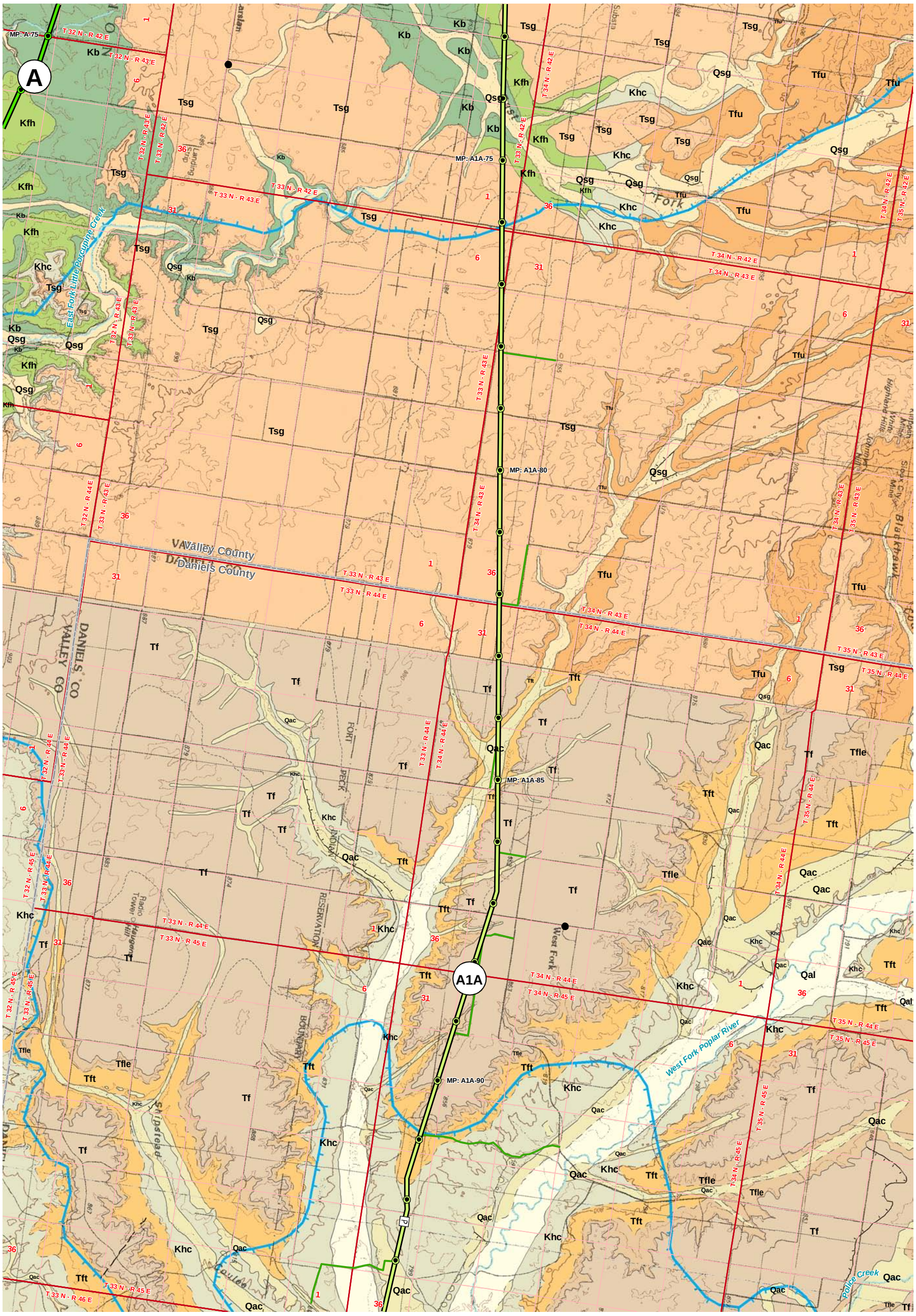

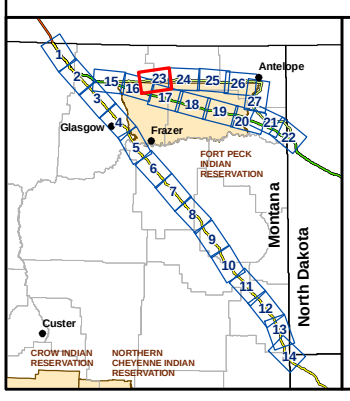

Legend

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Fort Union Formation

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0 0.5 1 2 Miles

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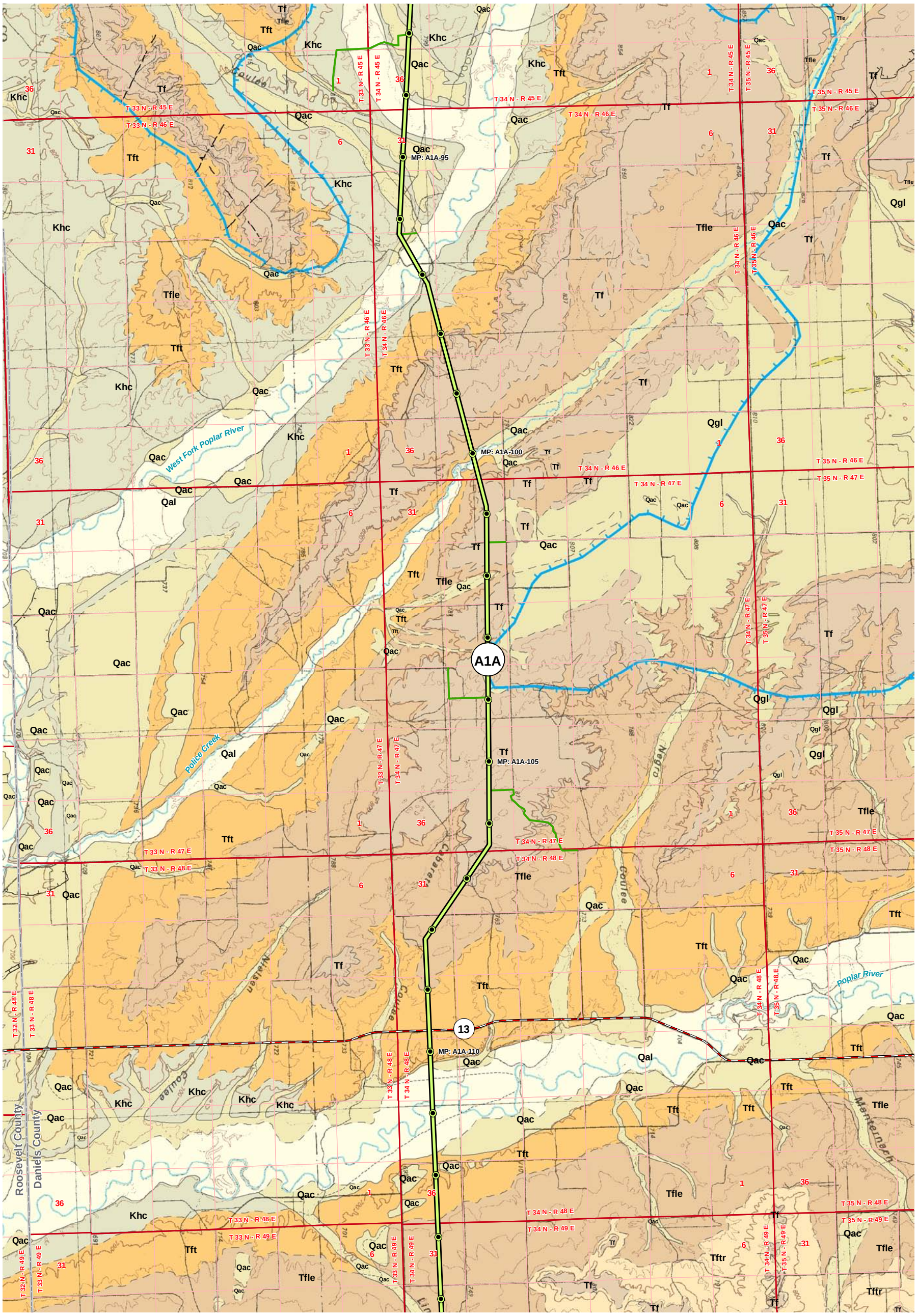

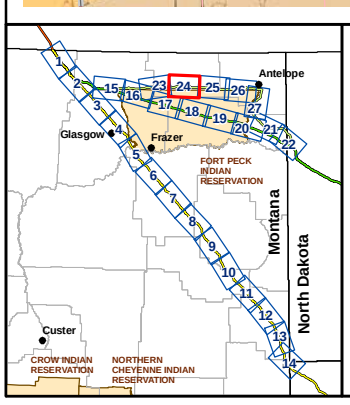

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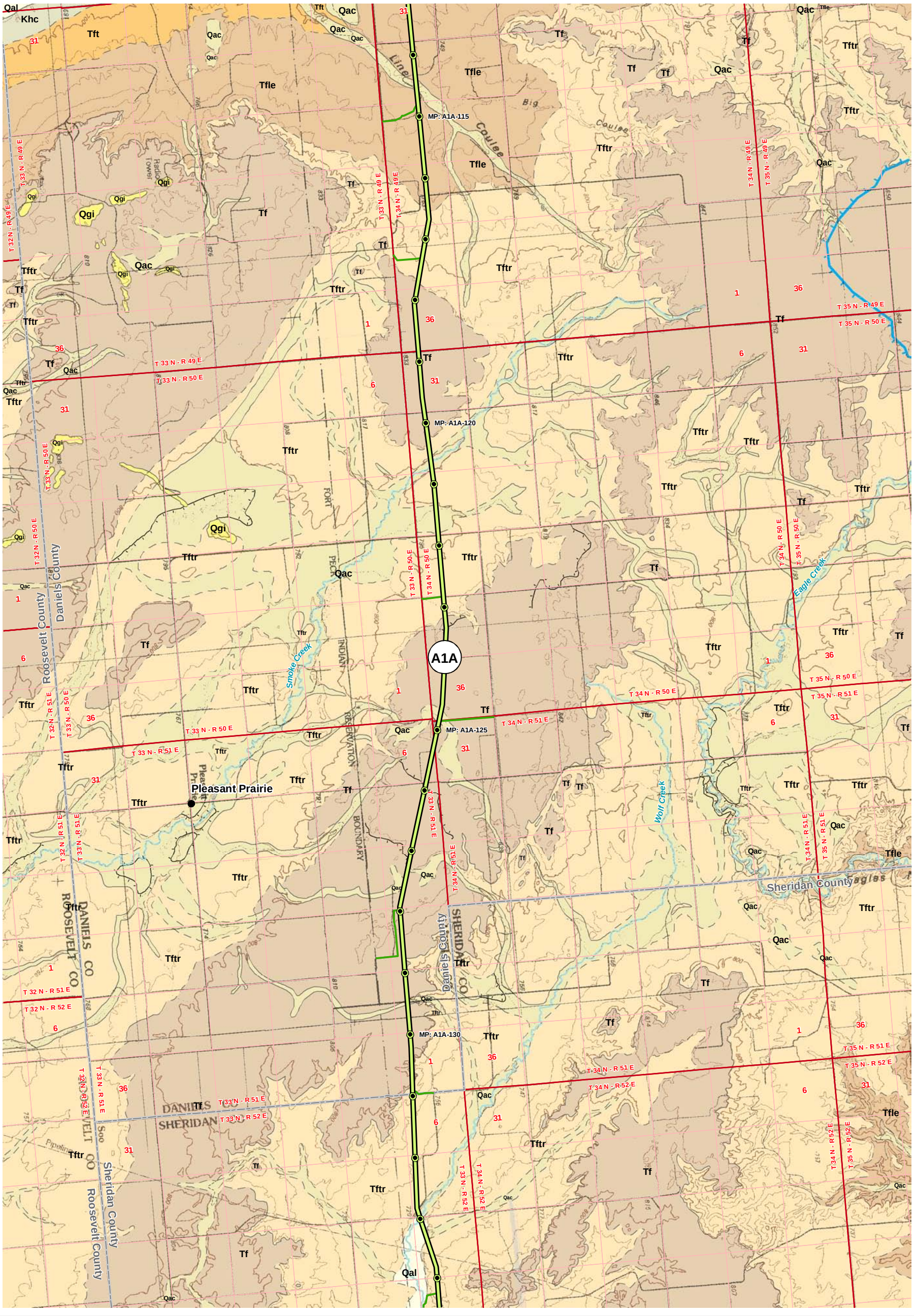

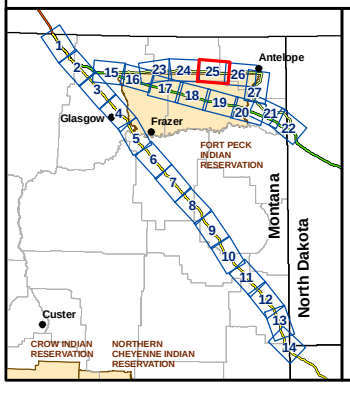

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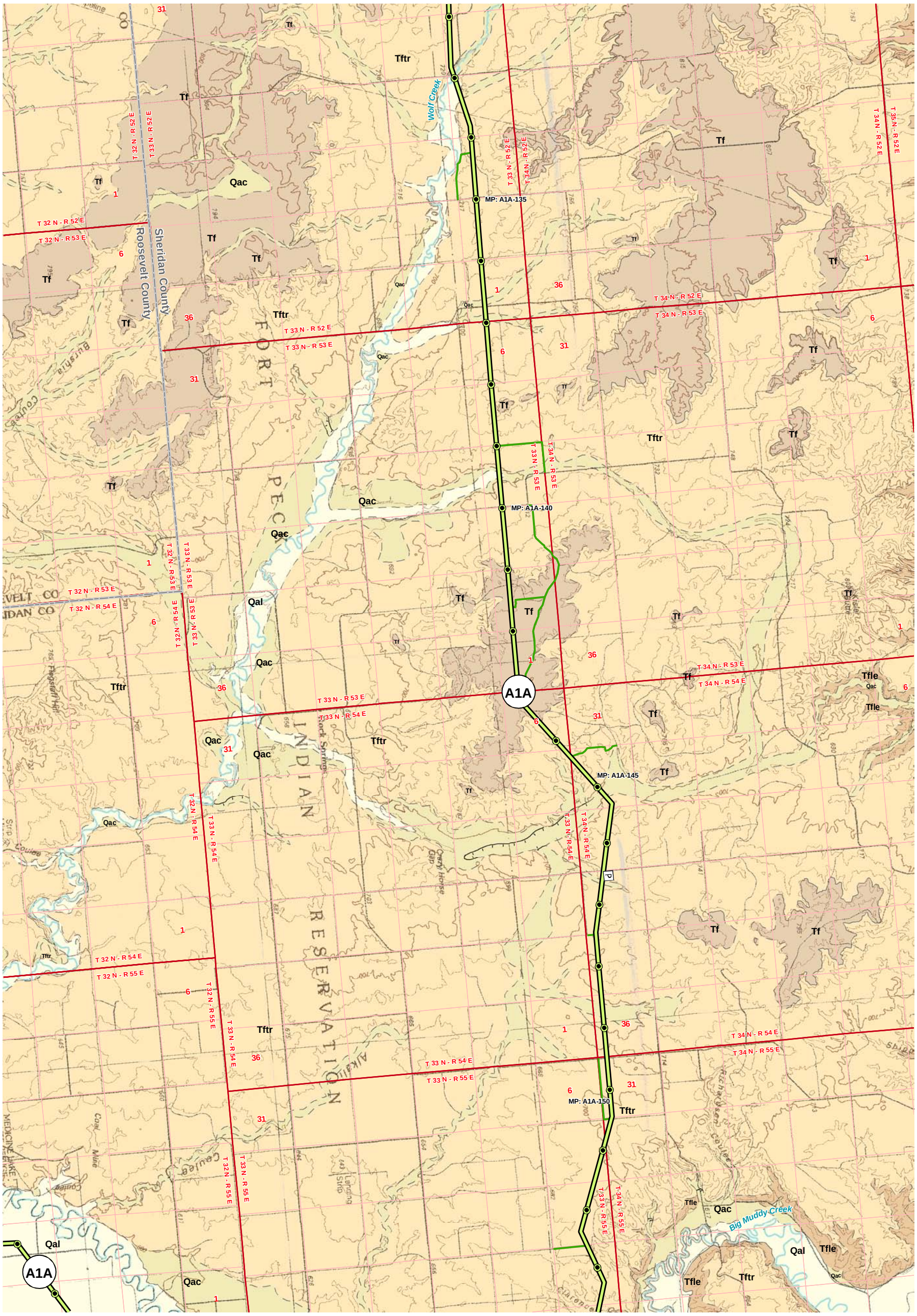

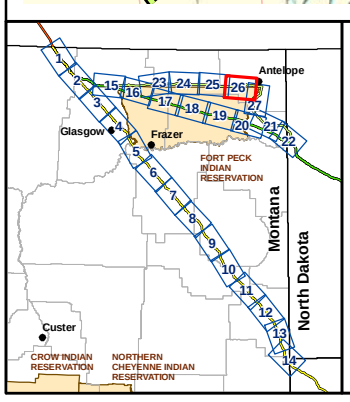

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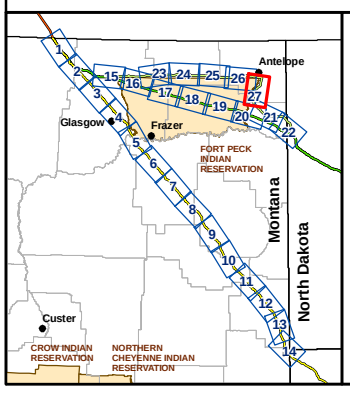

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