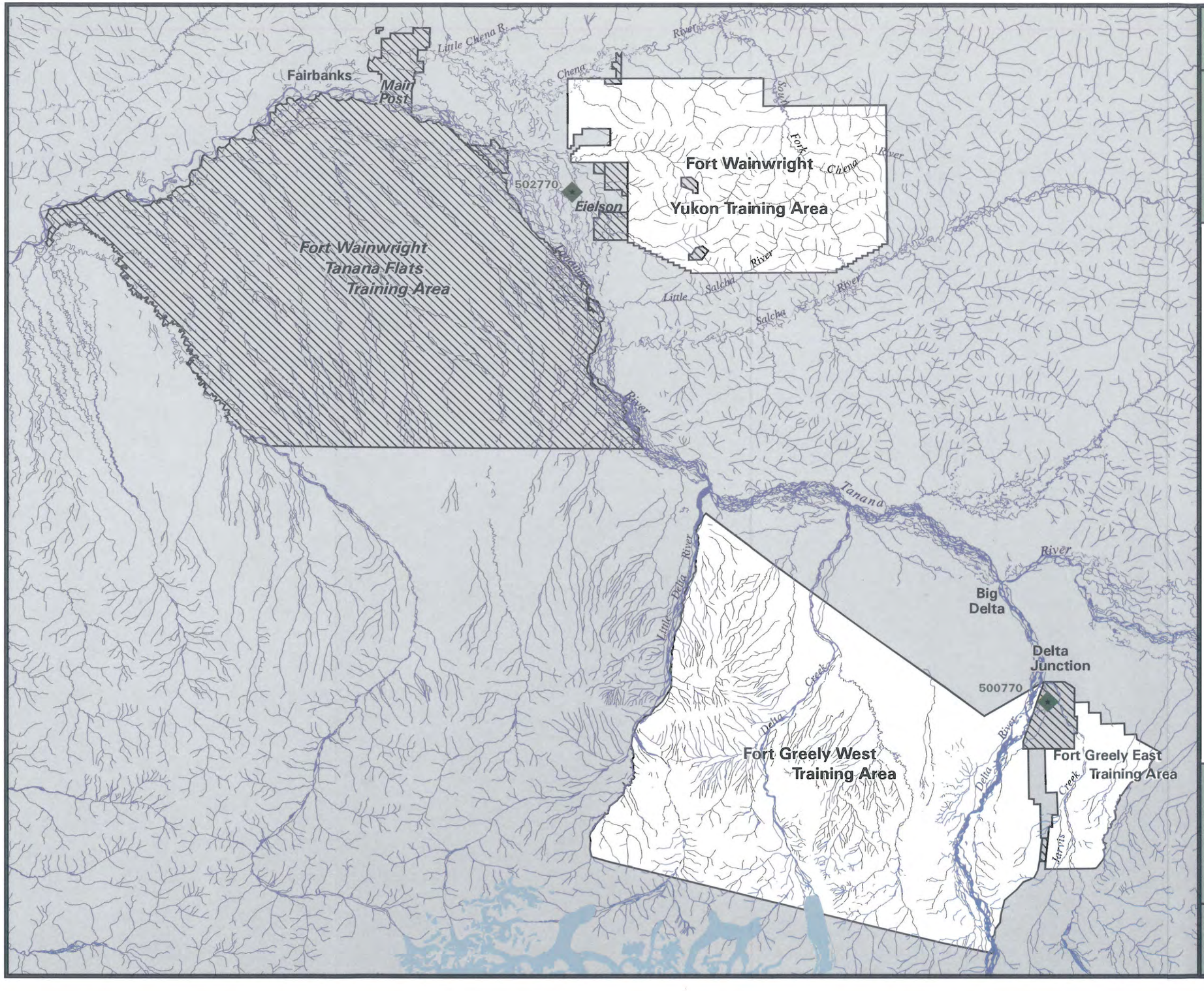
Figure 3.2.a

Climate Sampling Locations

Withdrawal Lands



Legend

- Climate Station
- PL99-606 Withdrawal Boundary
- Other Military Withdrawal Boundaries
- Stream
- Glacier

SCALE 1 : 550,000

2 0 2 4 6 8 10 12 14 16 18 20 22 24 26 Kilometers

2 0 2 4 6 8 10 12 14 16 Miles

N

Sources:

Earth Info, 1993

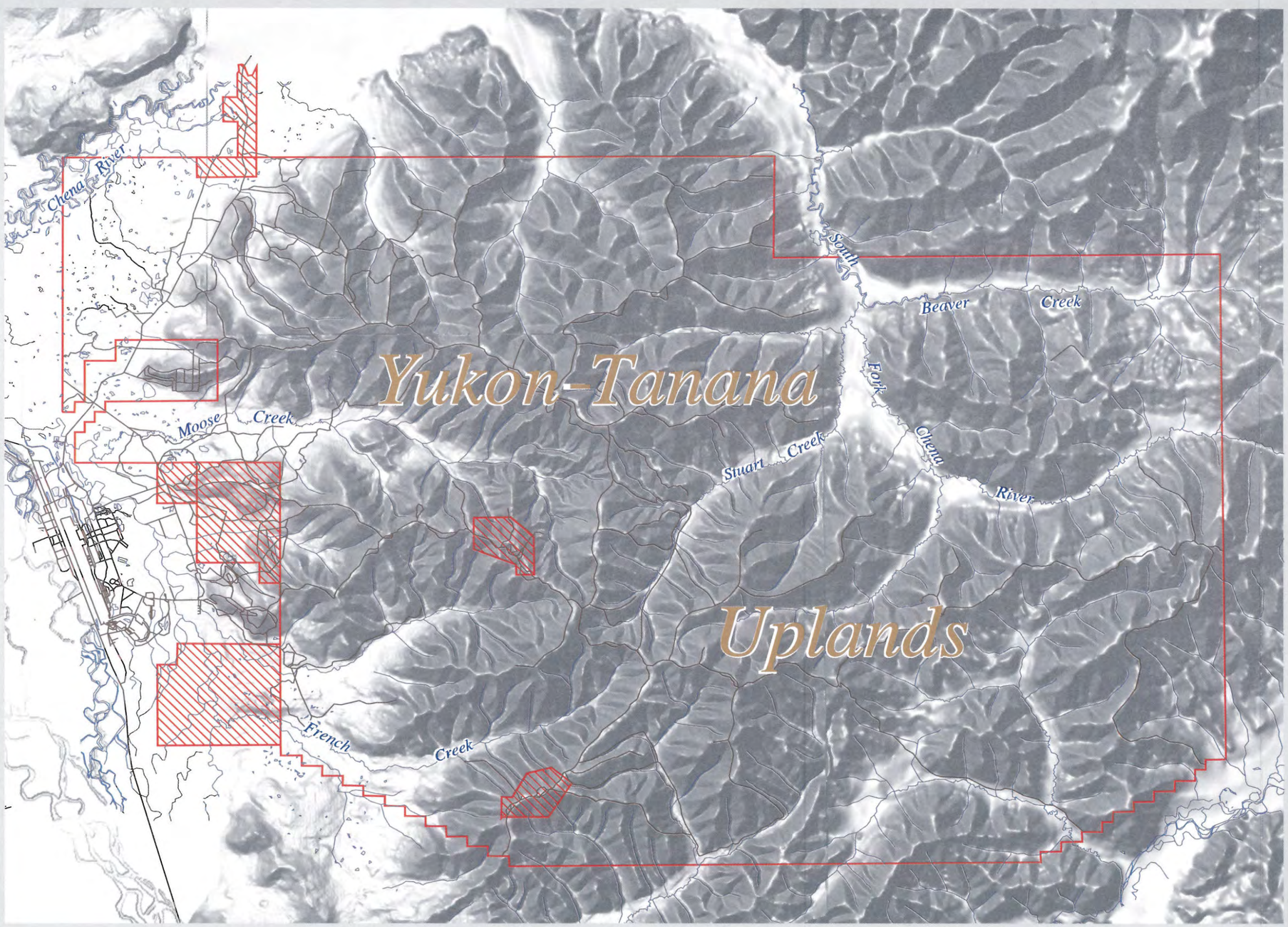


Figure 3.3.a

Terrain

Fort Wainwright Yukon Training Area

Legend

- Stream
- Roads and Trails
- PL99-606 Withdrawal Boundary
- Other Military Withdrawal Boundaries

* Vertical Exaggeration = 5x

SCALE 1 : 165,000

1 0 1 2 3 4 5 6 7 Kilometers

1 0 1 2 3 4 Miles

N

Sources:

Wahrhaftig, 1965
USGS, 1998

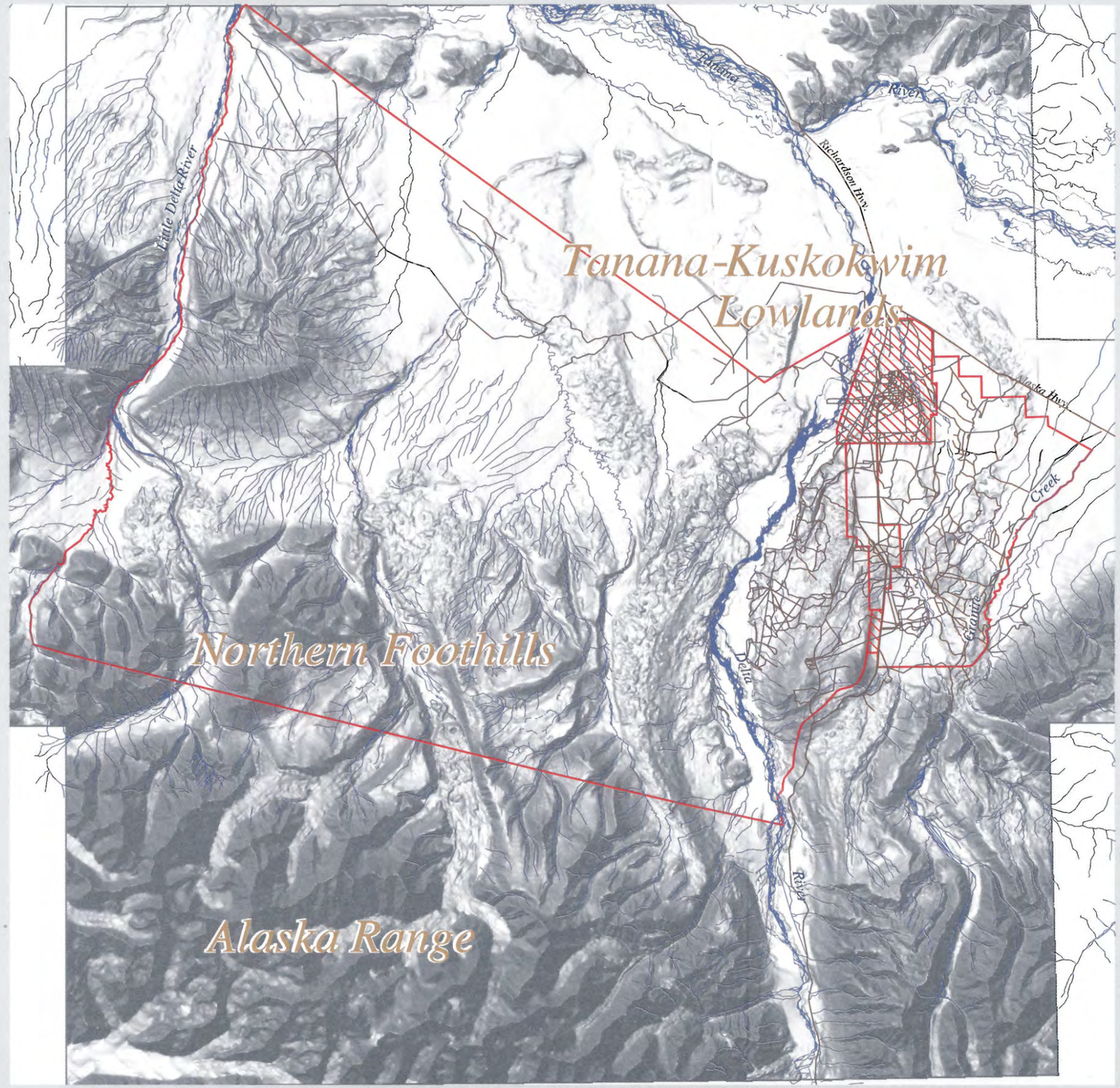


Figure 3.3.b

Terrain

Fort Greely

Legend

- Stream
- Roads and Trails
- PL99-606 Withdrawal Boundary
- Other Military Withdrawal Boundaries

* Vertical Exaggeration = 5x

SCALE 1 : 360,000

2 0 2 4 6 8 10 12 14 16 Kilometers

2 0 2 4 6 8 10 Miles

N

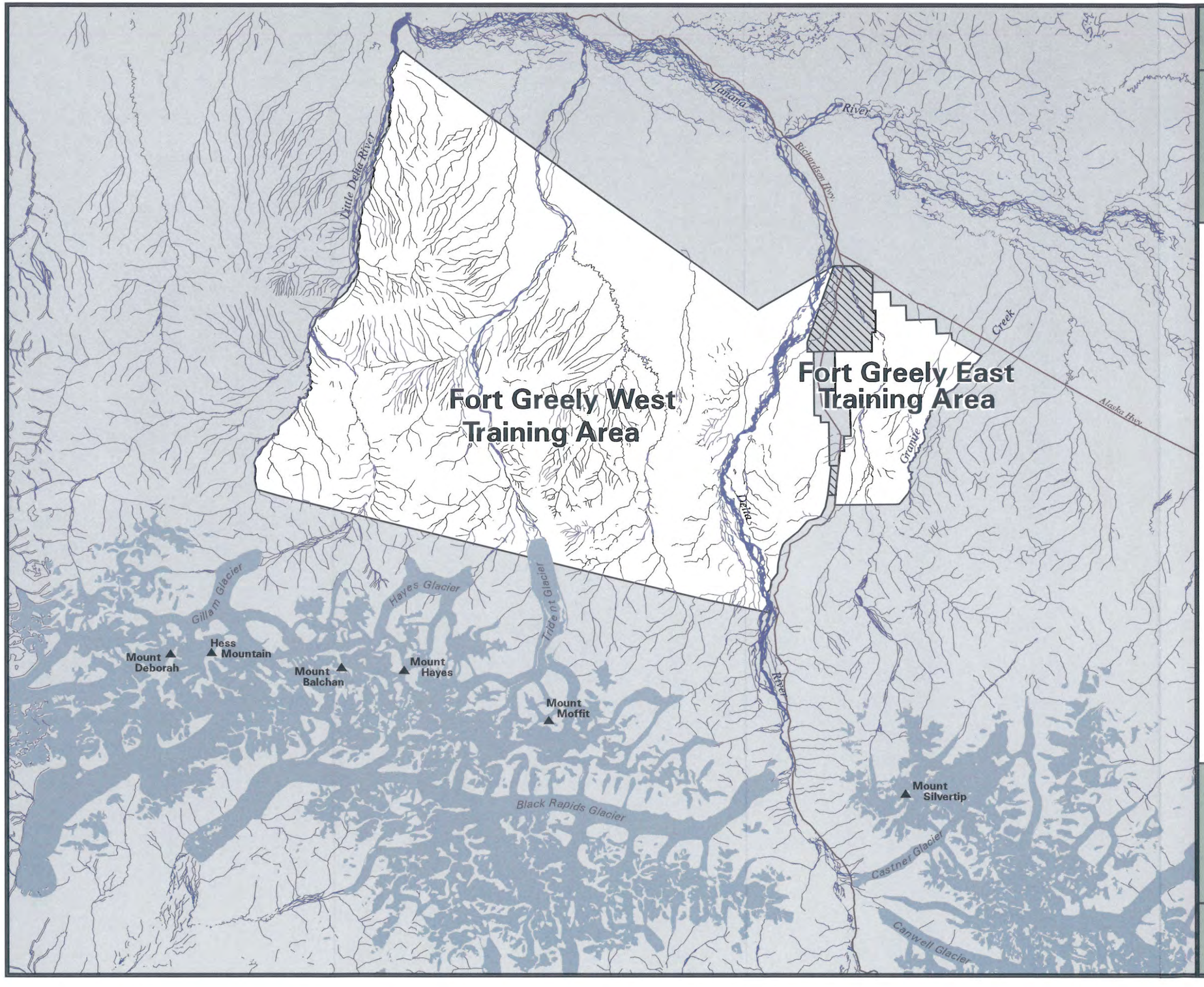
Sources:

Wahrhaftig, 1965
USGS, 1998

Figure 3.3.c

Glaciers

Fort Greely



Legend

- Glacier
- Mountain
- PL99-606 Withdrawal Boundary
- Other Military Withdrawal Boundaries
- Stream

SCALE 1 : 430,000

2 0 2 4 6 8 10 12 14 16 18 20 Kilometers

2 0 2 4 6 8 10 12 Miles

N

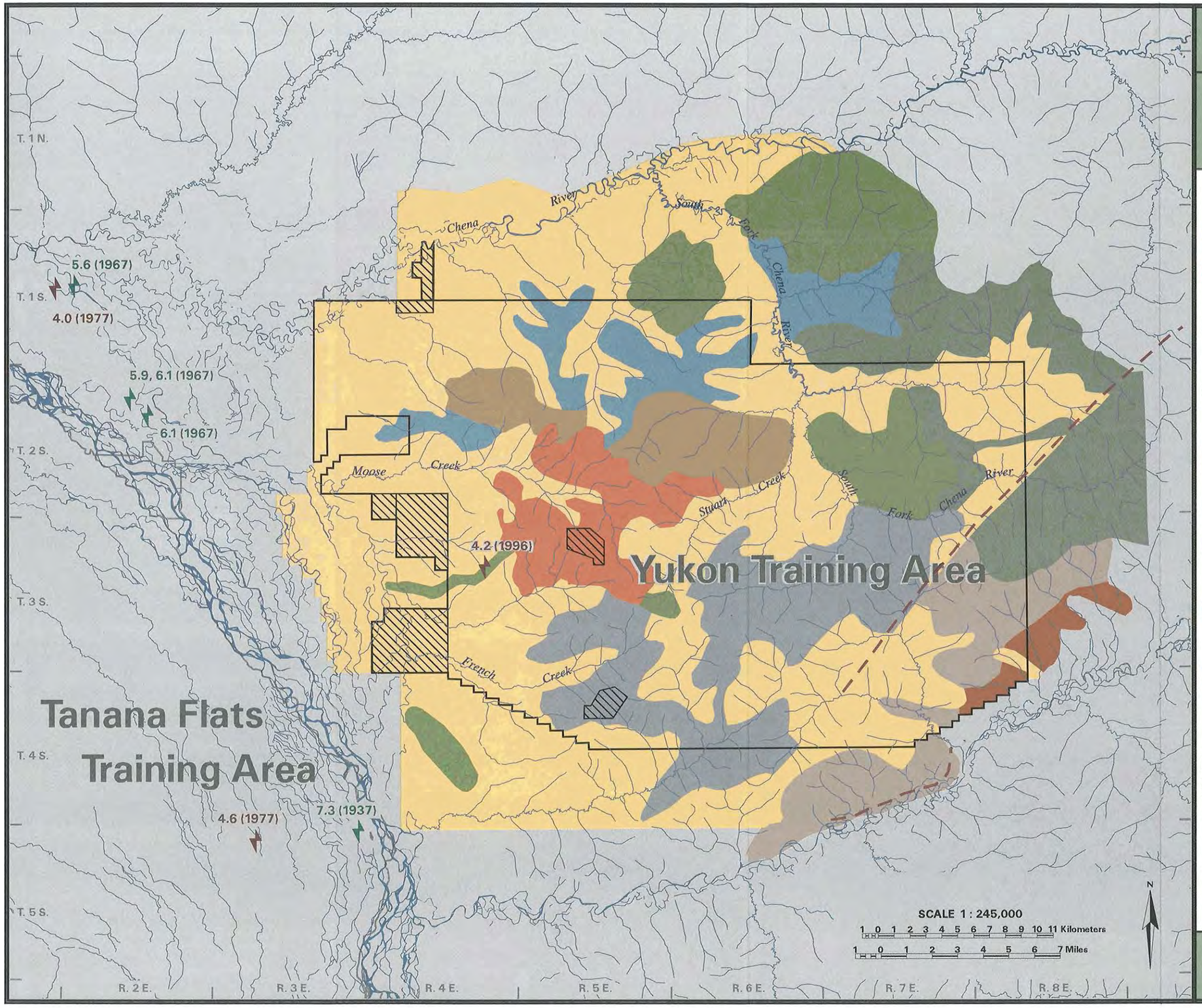
Sources:

USGS, 1998

Figure 3.4.a

Geology

Fort Wainwright



Legend

- *Qs. Quaternary surficial deposits including alluvium, colluvium, fluvial, and loess*
- *TKg. Early Tertiary to late-Cretaceous granitic plutonic rocks of the Eielson Pluton*
- *Pzsg. Mississippian/Devonian calcareous sediments, limestone, quartzite, arkose, greenstone, and rhyolite. Regionally metamorphosed to greenschist facies*
- *Pzq. Mississippian and older quartzite, graphitic sediments, limestone, and rhyolite. Regionally metamorphosed to greenschist facies*
- *Pzm. Early Paleozoic calcareous sediments and marble. Regionally metamorphosed to greenschist facies*
- *Pzc. Cataclastically deformed Paleozoic rocks*
- *Pzs. Early to mid-Paleozoic schist, quartz-mica schist with marble and quartzite. Regionally metamorphosed to amphibolite facies*
- *Pzg. Early to mid-Paleozoic fine to medium-grained gneissic rocks. Ductilely deformed and regionally metamorphosed to amphibolite facies*
- *PzpCsq. Early Paleozoic quartz-muscovite-biotite schist, quartzite, and amphibolite. Ductilely deformed and regionally metamorphosed to amphibolite facies*
- *Fault*
- *PL99-606 Withdrawal Boundary*
- *Other Military Withdrawal Boundaries*
- *Stream*

Earthquakes of Magnitude ≥4.0

- *Pre-1970 Earthquake (magnitude, year)*
- *Post-1970 Earthquake (magnitude, year)*

Sources:

Weber et al, 1978
Wilson et al, 1998

Figure 3.4.b

Geology-Fort Greely

Legend

- *Qs. Quaternary surficial deposits including alluvium, colluvium, glacial, fluvial/ lacustrine, rock glaciers, snow and ice*
- *Tn. Late Tertiary Nenana gravel; thick bedded to massive, poorly sorted conglomerates with some sandstone and siltstone interbeds*
- *Ts. Early to middle Tertiary sandstone, graywacke, and poorly consolidated siltstones and mudstones. This unit overlies sedimentary rocks of the Jarvis Creek coal fields just to the east of the Fort Greely area. Unit occurs in fault bounded prisms along the northern edge of the Alaska range*
- *TKg. Early Tertiary to mid-Cretaceous granitic plutonic rocks*
- *Kgd. Cretaceous granitic and granodioritic plutonic rocks, local intense hydrothermal alteration*
- *MDt. Early Mississippian to Middle Devonian schistose volcanic rocks and pelitic schists, marble and greenstone. Polydeformed, greenschist metamorphic grade. This unit is formally known as the Totalanika schist.*
- *Dmv. Devonian fine-grained schistose volcanic rocks and pelitic schists. Polydeformed, greenschist metamorphic grade, locally intense iron staining with disseminated and massive sulfide minerals*
- *DPzmp. Devonian and older fine-grained, metasedimentary rocks including pelitic schists and quartzites. Polydeformed and generally greenschist facies metamorphic grade*
- *Pzg. Early to mid-Paleozoic fine to medium grained gneissic granitic rocks, hornblende-biotite diorite and granodiroite. Ductilely deformed and regionally metamorphosed to amphibolite facies*
- *Pzs. Early to mid-Paleozoic schist, quartz mica schist with marble and quartzite*
- *Indefinite Northern Extent of Quaternary Surficial Deposits*
- *PL99-606 Withdrawal Boundary*
- *Other Military Withdrawal Boundaries*
- *Stream*

Earthquakes of Magnitude ≥4.0

- *Earthquake (magnitude, year)*

R. 4 E. R. 5 E. R. 6 E. R. 7 E. R. 8 E. R. 9 E. R. 10 E. R. 11 E. R. 12 E.

T. 8 S.

T. 9 S.

T. 14 S.

Tanana River

Little Delta River

Delta River

One Hundred Mile Creek

Buchanan Creek

East Fork Little Delta River

McGinnis Glacier Fault

Donnelly Dome-Granite Mt. Fault

Jarvis Creek

Granite Creek

4.3 (1975)

4.1 (1994)

4.5 (1992)

SCALE 1 : 300,000

1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 Kilometers

1 0 1 2 3 4 5 6 7 8 9 Miles

N

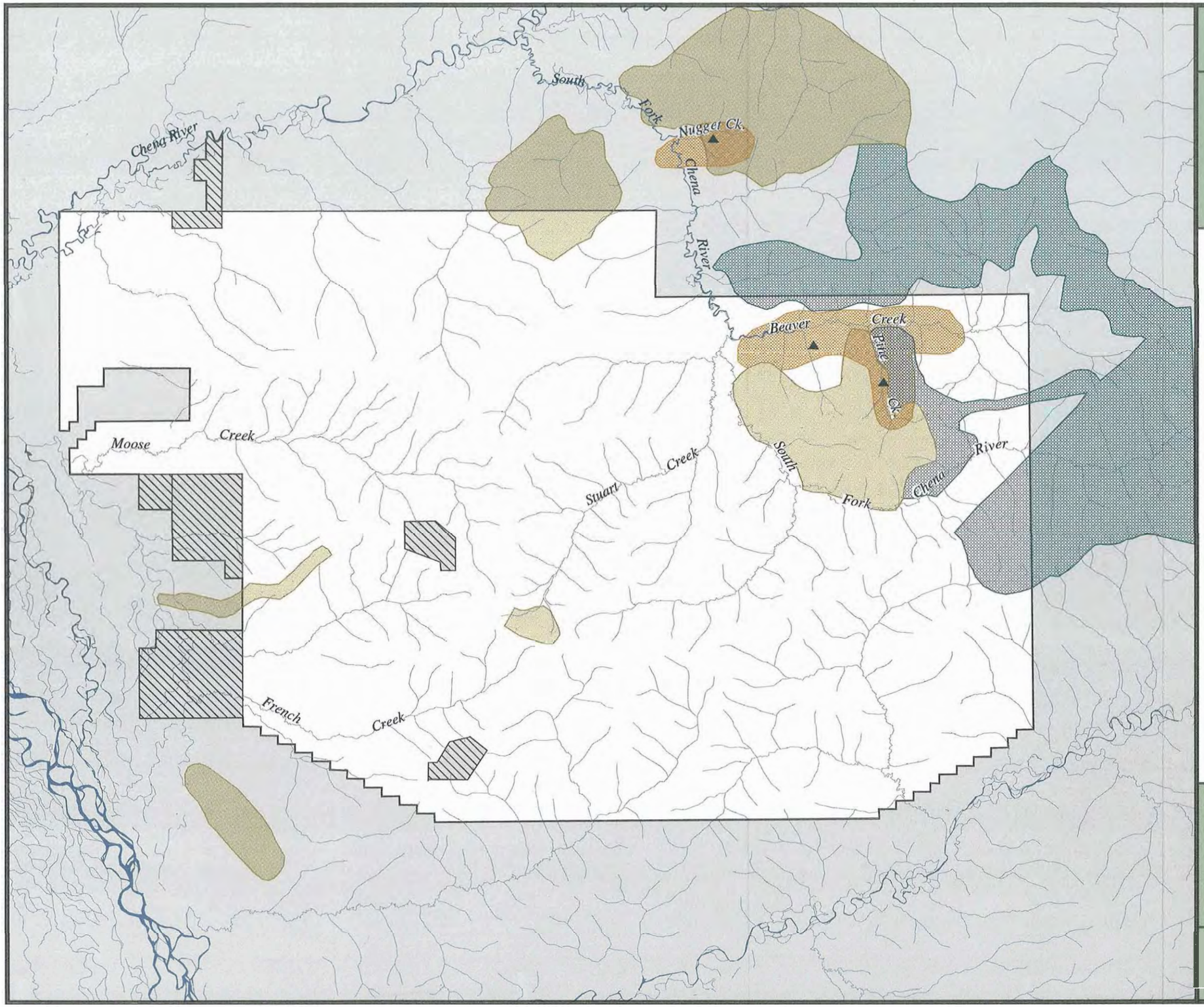
Sources:

Weber et al, 1978
Nokleberg et al, 1990
Foster et al, 1987
Wilson et al, 1998

Figure 3.5.a

Locatable Minerals

Fort Wainwright Yukon Training Area



Legend

- Areas with Favorable Geology for Placer Gold
- Areas with Favorable Geology for Volcanic-hosted Cu-Pb-Zn
- Areas with Favorable Geology for Sediment-hosted Pb-Zn
- ▲ Historic Placer Mine Locations (approximate)
- PL99-606 Withdrawal Boundary
- Other Military Withdrawal Boundaries
- Stream

SCALE 1 : 180,000

1 0 1 2 3 4 5 6 7 8 Kilometers

1 0 1 2 3 4 5 Miles

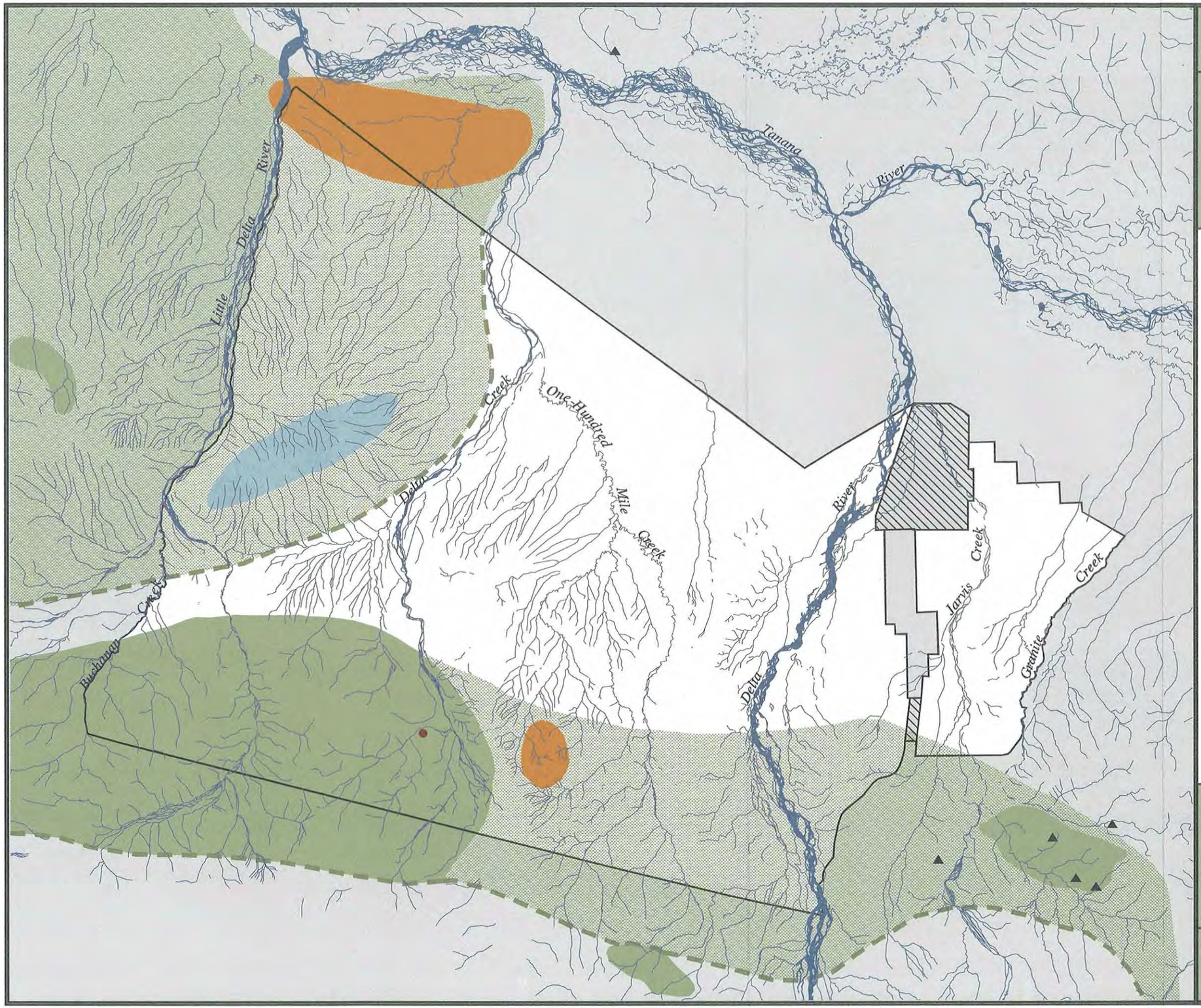
N

Sources: Dusel-Bacon et al, 1998a, b, c; 1997
Menzie and Foster, 1979
O'Leary et al, 1978
US Department Interior and
US Department Defense, 1994b

Figure 3.5.b

Locatable Minerals

Fort Greely



Legend

- Areas with Favorable Geology for Placer Gold
- Areas with Favorable Geology for Placer Tin
- Areas with Favorable Geology for Lode Gold and/or Sediment-hosted Cu, Pb, Zn, Ag and/or Porphyry Cu-Mo
- As Above, but Bedrock Buried Beneath Surficial Deposits
- Indefinite Southern Extent of Buried Bedrock
- Ptarmigan Creek Molybdenum Prospect
- Historic Placer Mine Locations (approximate)
- PL99-606 Withdrawal Boundary
- Other Military Withdrawal Boundaries
- Stream

SCALE 1 : 300,000

1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 Kilometers

1 0 1 2 3 4 5 6 7 8 9 Miles

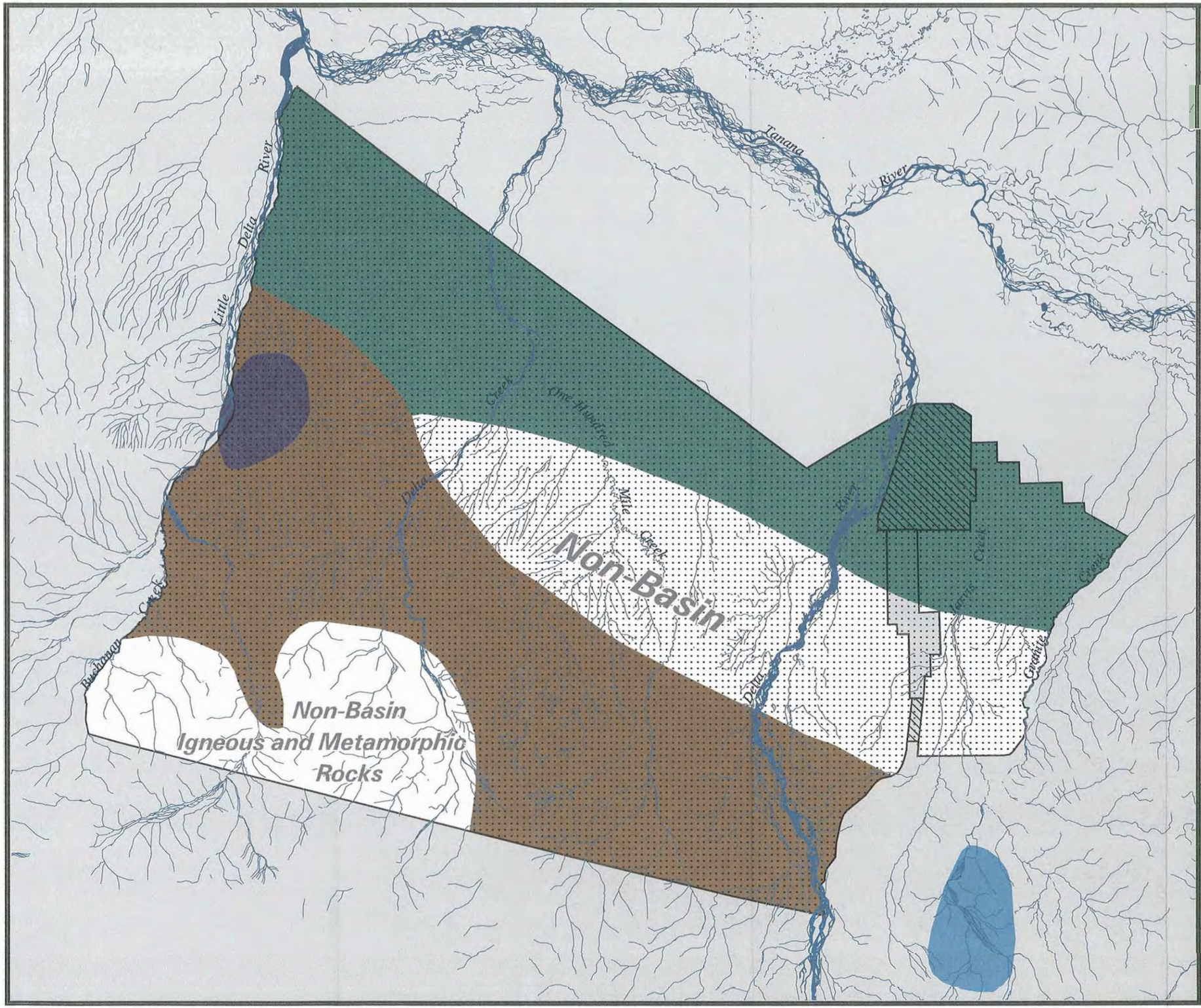
N

Sources: Weber et al, 1978
Nokleberg et al, 1990
Foster et al, 1987
Cobb, 1972

Figure 3.5.c

Leasable and Saleable Minerals

Fort Greely



Legend

- Glacial Outwash and Moraine with Favorable Geology for Sand and Gravel
- Middle Tanana Basin - Low Potential for Gas
- Nenana Coal Basin - Low to Moderate Potential for Coal, Coalbed Methane, and Gas
- Outcrop of Tertiary Coal-bearing Unit
- Jarvis Creek Coal Deposit
- PL99-606 Withdrawal Boundary
- Other Military Withdrawal Boundaries
- Stream

SCALE 1 : 300,000

1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 Kilometers

1 0 1 2 3 4 5 6 7 8 9 Miles

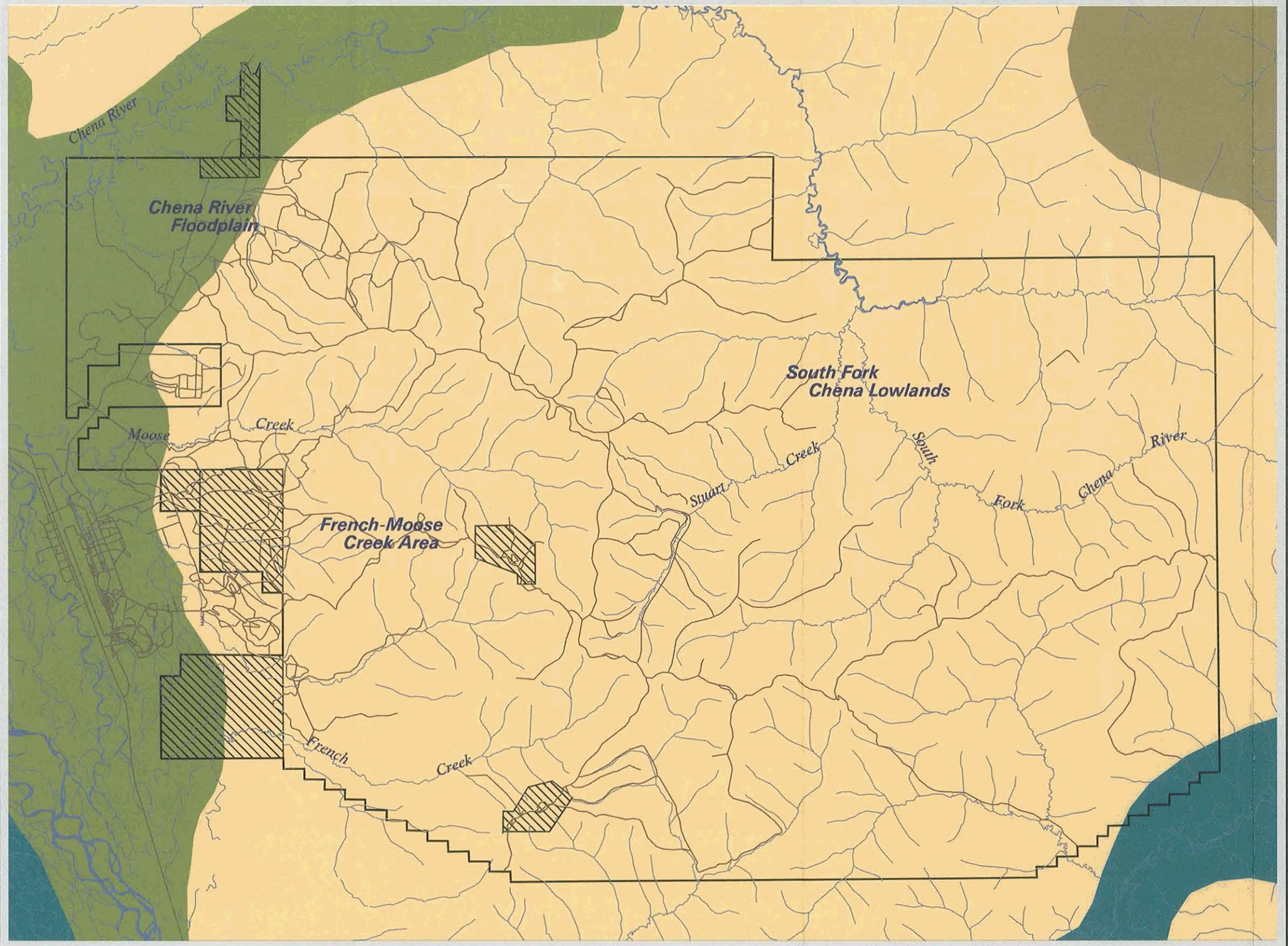
N

Sources:
US Department of Interior and
US Department of Defense, 1994b

Figure 3.6.a

Soils

Fort Wainwright Yukon Training Area



Legend*

- *Soil Map Unit 2*
  Histic Pergelic Cryaquepts
- *Soil Map Unit 3*
  Histic Pergelic Cryaquepts in association with Typic Cryofluvents
- *Soil Map Unit 4*
  Alfic Cryochrepts in association with Histic Pergelic Cryaquepts
- *Soil Map Unit 5*
  Typic Cryochrepts in association with Histic Pergelic Cryaquepts
- *PL99-606 Withdrawal Boundary*
- *Other Military Withdrawal Boundaries*
- *Stream*

*see Table 3.6.a for further soil descriptions

SCALE 1 : 165,000

1 0 1 2 3 4 5 6 7 Kilometers

1 0 1 2 3 4 Miles

N

Sources:

Reiger et al, 1979

Soil Map Unit	Soil Type	Location	Description
2	Histic Pergelic Cryaquepts	This soil association is found in broad valleys and basins in the Upper Salcha River Basin and to the southwest of Fort Wainwright Yukon Training Area.	Over 60% of this soil type is found on level to rolling land with poor drainage. The soil is dominantly silt loam, with textures ranging from sand loam to clay loam and is fairly gravelly in areas. The permafrost table is shallow.
			The remaining 40% of the soil is composed poorly drained peat, silty to gravelly loams with permafrost and gravel.
3	Histic Pergelic Cryaquepts in association with Typic Cryofluvents	This soil association is found in the nearly level flood plains of the Chena and Tanana Rivers northwest of Fort Wainwright Yukon Training Area.	Approximately 45% of the soil association is characterized by poorly drained loam soils with textures of either silt loam or sandy loam.
			On 35% of the area, alluvial soils composed of stratified silt loam and sand can be found along streams.
			The remainder of the soil consists of peat deposits with shallow loamy materials over very gravelly sand located in depressions within the flood plain.
4	Alfic Cryochrepts in association with Histic Pergelic Cryaquepts	This soil association is found in the rolling to steep uplands which composed a majority of Fort Wainwright Yukon Training Area.	On approximately 35% of the area, well drained deep silt loams occur on slopes other than north facing.
			On 20% of the area, poorly drained silt loams occur on foot slopes and in valley bottoms. An overlying peat layer and a shallow permafrost table exists.
			Moderately drained silt loams occupy foot slopes on 15% of the area and well drained shallow silt loam over bedrock occupies slopes on 10% of the area. The remainder of the area is occupied by poorly drained shallow silt loam underlain by permafrost in north facing areas.
5	Typic Cryochrepts in association with Histic Pergelic Cryaquepts	The soils are found in the hilly uplands to the northeast of Fort Wainwright Yukon Training Area.	Soil is very gravelly silt loam or very gravelly loam on 30% of the area. It occurs on low slopes that are other than north facing.
			On approximately 25% of the area, poorly drained silt loams with overlying peat can be found in valley bottoms and along north facing slopes.
			A mixture of soil types is present in the remaining area including gravelly and stony silt loams to silt soils.

Table 3.6.a

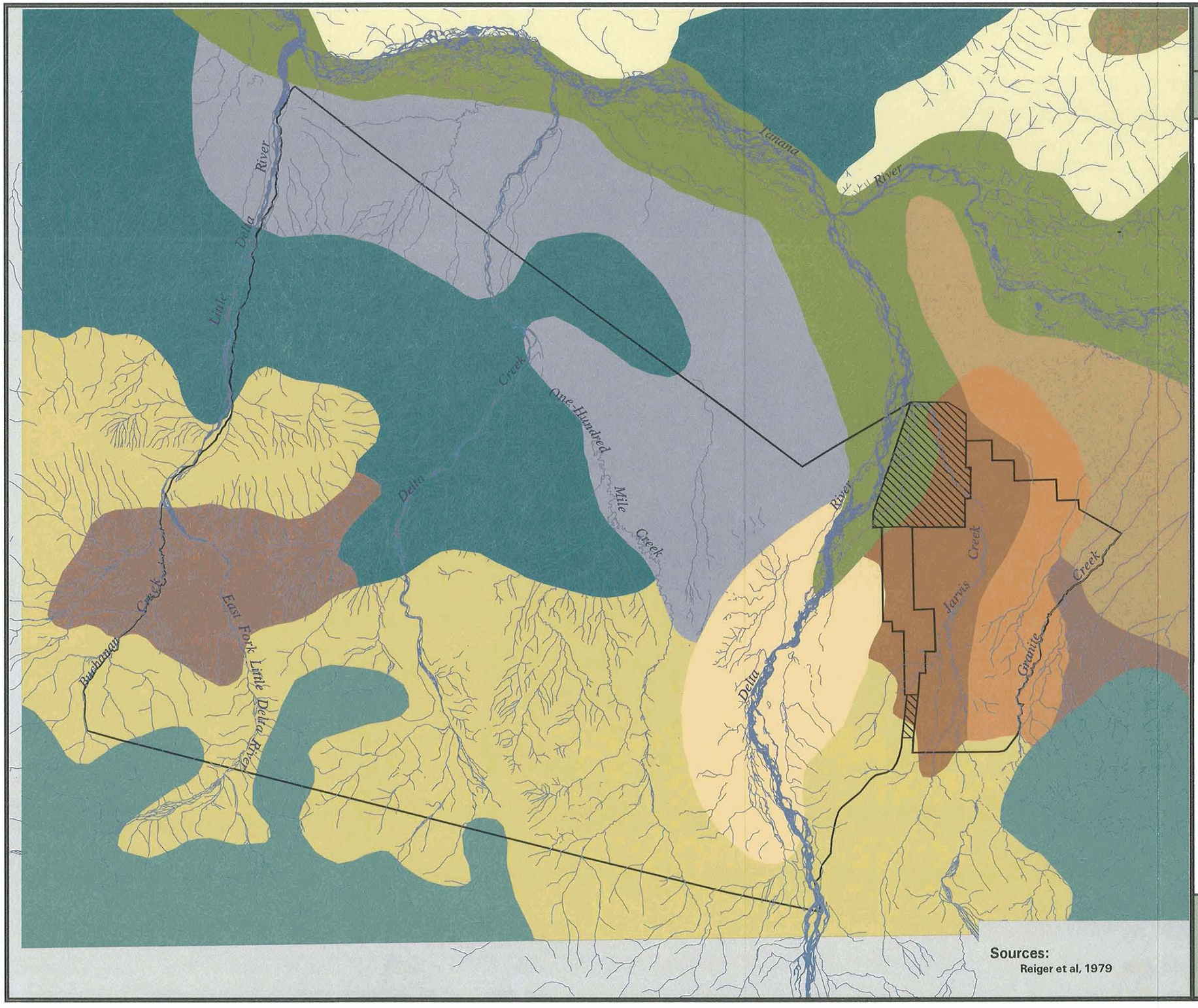
General Description of Soil Types

Fort Wainwright Yukon Training Area

Source:
Adapted from U.S. Dept. Of Army 1980, Rieger et al. 1979

Figure 3.6.b

Soils - Fort Greely



Legend*

- *Soil Map Unit 1*
  Typic Cryochrepts in association with Aeric Cryaquept
- *Soil Map Unit 2*
  Histic Pergelic Cryaquepts
- *Soil Map Unit 3*
  Histic Pergelic Cryaquepts in association with Typic Cryofluvents
- *Soil Map Unit 4*
  Alfic Cryochrepts in association with Histic Pergelic Cryaquepts
- *Soil Map Unit 5*
  Typic Cryochrepts in association with Histic Pergelic Cryaquepts
- *Soil Map Unit 6*
  Pergelic Cryaquepts in association with Pergelic Cryochrepts
- *Soil Map Unit 7*
  Histic Pergelic Cryaquepts
- *Soil Map Unit 8*
  Typic Cryochrepts in association with Histic Pergelic Cryaquepts
- *Soil Map Unit 9*
  Typic Cryochrepts
- *Soil Map Unit 10*
  Typic Cryochrepts
- *Soil Map Unit 11*
  Rockland
- *Soil Map Unit 12*
  Typic Cryochrepts in association with Histic Pergelic Cryaquepts
- *PL99-606 Withdrawal Boundary*
- *Other Military Withdrawal Boundaries*
- *Stream*

*see Table 3.6.b for further soil descriptions

SCALE 1 : 300,000

1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 Kilometers

1 0 1 2 3 4 5 6 7 8 9 Miles

N

Sources:
Reiger et al, 1979

Soil Map Unit	Soil Type	Location	Description
1	Typic Cryochrepts in association with Aeric Cryaquept	These soils are found on high terraces, outwash plains, and foot slopes south of the Tanana River extending into the northern portion of Fort Greely.	Moderately to well drained silt loams with underlying gravelly sand occur on nearly level to gently sloping terraces, outwash plains and low moraines on 60% of the area.
			The remainder of the area is covered an assortment of poorly drained sandy gravels and clays. Peat layers are present in low lying areas.
2	Histic Pergelic Cryaquepts	This association occupies the broad rolling hills and valleys in the northwest portion of Fort Greely.	Over 60% of this soil type is found on level to rolling land with poor drainage. The soil is dominantly silt loam, with textures ranging from sand loam to clay loam and is fairly gravelly is areas. The permafrost table is shallow.
			The remaining 40% of the soil is composed poorly drained peat, silty to gravelly loams with permafrost and gravel.
3	Histic Pergelic Cryaquepts in association with Typic Cryofluvents	This association is found along the level flood plains of the Delta and Tanana Rivers.	Approximately 45% of the soil association is characterized by poorly drained loam soils with textures of either silt loam or sandy loam.
			On 35% of the area, alluvial soils composed of stratified silt loam and sand can be found along streams.
			The remainder of the soil consists of peat deposits with shallow loamy materials over very gravelly sand located in depressions within the flood plain.
4	Alfic Cryochrepts in association with Histic Pergelic Cryaquepts	These soils are located in the uplands to the north of the withdrawal area.	On approximately 35% of the area, well drained deep silt loams occur on slopes other than north facing.
			On 20% of the area, poorly drained silt loams occur on foot slopes and in valley bottoms. An overlying peat layer and a shallow permafrost table exists.
			Moderately drained silt loams occupy foot slopes on 15% of the area and well drained shallow silt loam over bedrock occupies slopes on 10% of the area. The remainder of the area is occupied by poorly drained shallow silt loam underlain by permafrost in north facing areas.
5	Typic Cryochrepts in association with Histic Pergelic Cryaquepts	These soils are located in the uplands to the north of the withdrawal area.	Soil is very gravelly silt loam or very gravelly loam on 30% of the area. It occurs on low slopes that are other than north facing.
			On approximately 25% of the area, poorly drained silt loams with overlying peat can be found in valley bottoms and along north facing slopes.
			A mixture of soil types is present in the remaining area including gravelly and stony silt loams to silt soils.
6	Pergelic Cryaquepts in association with Pergelic Cryochrepts	This association occupies the foothills and moraines of the Alaska Range which lies within the southern portion of Fort Greely.	Poorly drained gravelly and stony loams occur on north facing slopes, lower parts of hillsides, and in drainageways in approximately 40% of the area.
			Well drained gravelly and stony loams occur on steep slopes and ridge tops in 35% of the area.
			The remaining area consists of poorly drained silt loams located on north slopes, lower slopes and valley bottoms.
7	Histic Pergelic Cryaquepts	The soils occupies low slopes subject to seepage and occurs in drainageways in the southwestern and southeastern portions of Fort Greely.	These soils are poorly drained shallow loams with permafrost over very gravelly and stony loam. An overlying peat layer is also present
8	Typic Cryochrepts in association with Histic Pergelic Cryaquepts	These soils occur on the hilly portions along the Delta River in the eastern portion of Fort Greely.	Well drained shallow silt loams occur on south facing slopes of hills and ridges on 45% of the area.
			Poorly drained shallow silt loams occur on north facing slopes and hills and in valleys bottoms in 30% of the area.
			A mixture of very gravelly loams and silt loams occur in the remainder of the area.
9	Typic Cryochrepts	These soils can be found on the terraces, outwash plains and low moraines along Jarvis Creek.	Shallow silt loams occur on plains, terraces, and low moraine hills of 70% of the area.
			The remaining 30% is composed of shallow loams or gravels and poorly drained silty to gravelly soils in drainageways.
10	Typic Cryochrepts	This soil occupies areas of hilly to steep moraines northeast of the Air Drop Zone.	On slopes other than north facing, shallow silt loams occupy 65% of the area.
			The remainder of the area consists of gravelly loams located on ridges and south slopes of hills.
11	Rockland	This soil type occurs on the mountainous areas and foothills of the Alaska Range in the southern portion of Fort Greely.	Rockland occupies 75% of the area. The remaining area is covered by very gravelly shallow soils.
12	Typic Cryochrepts in association with Histic Pergelic Cryaquepts	This soil association is found on the moraines and footslopes to the east of Jarvis Creek	Gravelly silt loams over very gravelly loams occupy moraines and steep south facing slopes below treeline on 65% of the area.
			In the remaining area, gravelly, stony silt loam or sand loam exist on steep north facing slopes, valleys bottoms, and seepage areas on foot slopes.

Table 3.6.b

General Description of Soil Types

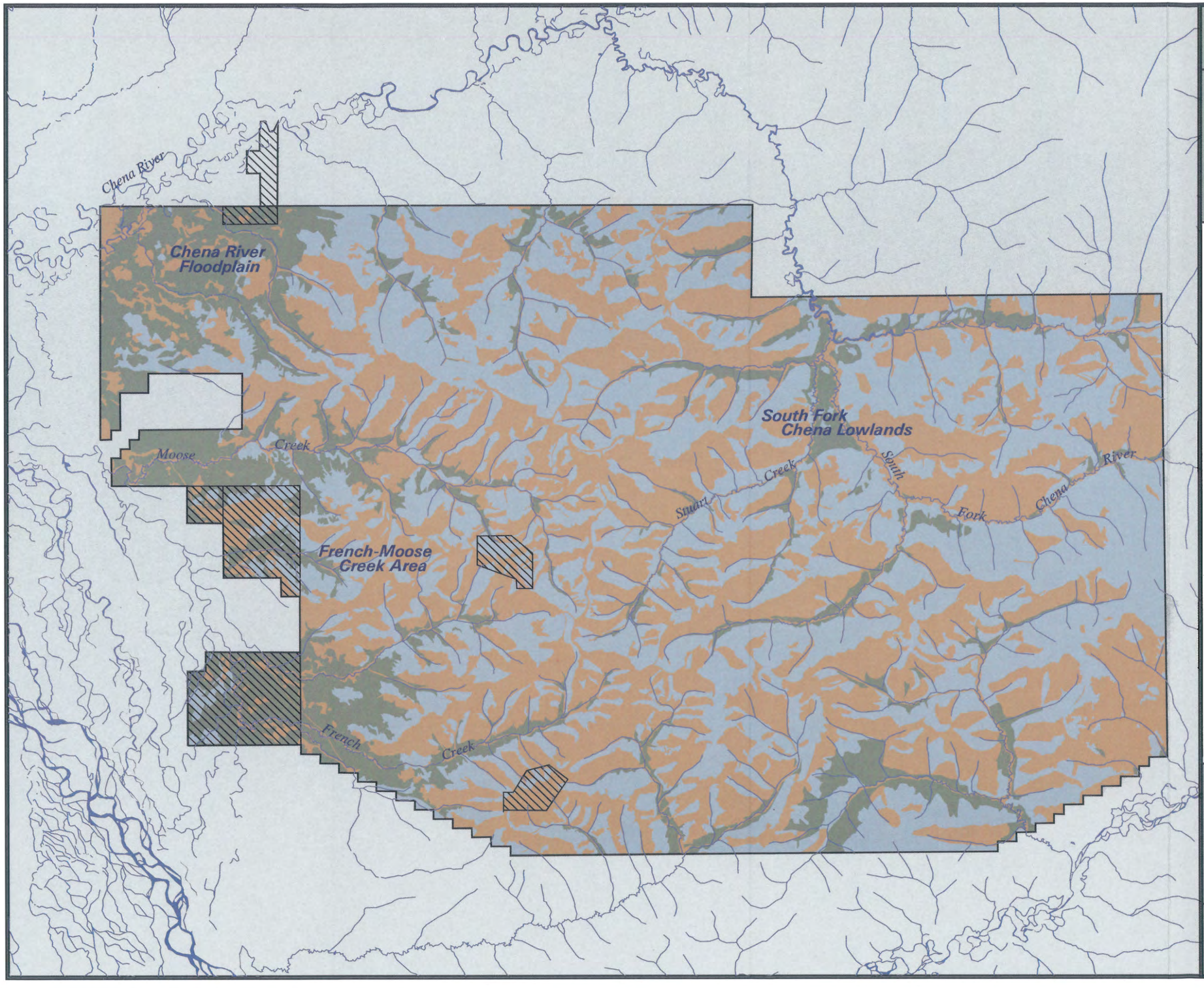
Fort Greely

Source:
Adapted from U.S. Dept. Of Army 1980, Rieger et al. 1979

Figure 3.7.a

Permafrost

Fort Wainwright Yukon Training Area



Legend

- Continuous
- Discontinuous
- Permafrost Free
- PL99-606 Withdrawal Boundary
- Other Military Withdrawal Boundaries
- Stream

SCALE 1 : 165,000

1 0 1 2 3 4 5 6 7 Kilometers

1 0 1 2 3 4 Miles

N

Sources:

U.S. Army, Alaska, 1998