

DESCRIPTIVE NOTES

GEOLOGICAL
The underlying consolidated rocks are quartzites, gneiss and schists, and sericitic, chloritic, and graphitic schists. These form a large faulted anticline with its axis along the South McQuesten River Valley. The area has been severely glaciated on the lower levels and is in the permafrost region.
Lead-zinc silver lodes occur in brecciated fault zones where these structures intersect thick-bedded quartzites and gneiss lenses. The lodes are of two general types: an early type containing quartz, pyrite and/or arsenopyrite with small amounts of galena and sphalerite, and a late type mineralized with siderite, galena, sphalerite, and freibergite (grey copper). Each type may occur separately, but most deposits exhibit the early lode type fractured and mineralized with minerals characteristic of the late lode type. The upper parts of nearly all lodes have been highly oxidized. The principal minerals in the oxidized zone are limonite, manganese oxides, cerussite, anglesite, malachite, and azurite.

GEOCHEMICAL
The field and laboratory methods used were those described by Boyle, Illey, and Green. Geochemical investigation of the Heavy Metal Content of the Stream and Spring Waters in the Keno Hill-Galena Hill Area, Yukon Territory, Geol. Surv. Canada, Bull. 10, 1955.
The results are expressed as total heavy metal (zinc, lead, copper) in parts per million. The principal heavy metal in the water is zinc. The temperature of the stream water varies from 2 to 10°C, and the pH varies from 5 to 8. Geochemical field work indicates that most of the lodes produce anomalies in the heavy metal content of the streams in their vicinity. Lodes not producing this effect are apparently not being oxidized owing to sealing by permafrost. Most of the anomalies in the streams are centered on the favourable belt of quartzites that underlies parts of Galena Hill and Mount Haldane and McQuesten River Valley south of Hanson Lake and then swings south-easterly at Keno Hill toward Mayo Lake. Small drag-folds with arms that measure only a few inches across are numerous and a few are from 10 to 15 feet across. The axial planes of the drag-folds lie parallel with the strike and dip of the enclosing quartzites and schists and roughly parallel with the axial plane of the main anticline, and indicate the latter to be overturned to the north and northeast.

The Yukon group rocks are divided into four map-units, (1, 2, 3, and 4) on a basis of their lithology. These divisions were originally recognized and used by C. H. Stockwell (1924) and H. S. Boston (1947). The rocks of map-unit 1 are the oldest. They consist of thin-bedded, brown weathering, micaceous quartzite, black graphitic schist, quartz-mica schist, and greenish quartz-mica-chlorite schist.
Map-unit 2, generally referred to as the quartzite formation, is composed dominantly of thick-bedded grey and white quartzite beds. The quartzite is intercalated with bands of graphitic schist and with quartz-mica schist and quartz-mica-chlorite schist. Much of the quartzite is micaceous and a westerly direction, probably as a result of several of the lowest quartzite beds changing gradually to schist.
Map-unit 3 consists largely of grey and yellow quartz-mica schists, greenish chloritic schists, and dark graphitic schists with limestone lenses in the lower part of the formation. Five of these shown on Sourdough Hill from bottom to top are 6, 10, 30, 8, and 30 feet thick, respectively.
Map-unit 4 is composed dominantly of brownish weathering quartz-mica schist and light-colored schistose quartzite with some beds of massive white quartzite. Some of the quartzite is coarse, formed of grit to pea sized quartz grains. The contact of 4 and 3 is marked by a change from quartzite to graphitic schist. Lenses of crystalline limestone up to 25 feet thick are present locally and one bed occurs very persistently at a horizon a few hundred feet above its base.
Diorite and gneiss intrude only map-units 1 and 2. Thick bodies of these intrusions display coarsely crystalline textures, whereas thin bodies are finely crystalline and are generally sheared and altered in part at least to greenschist.
Dikes and sills of rhyolite, quartz porphyry, and granite porphyry that cut the diorite and older rocks are probably related to the granites that outcrop north of the east end of Mayo Lake, northwest of Hanson Lake, and at Dublin Gulch. A dike of biotite lamprophyre at the Yukon mine may also be related. These all fresh, massive looking rocks and their unaltered appearance suggests a Mesozoic or younger age.
Most of the ore deposits occur along northeasterly striking fault fissures that dip steeply southeast. The most productive and persistent veins are in the quartzite formation and many of them lie near the contacts of the quartzite with overlying or underlying bands of graphitic schist. Some important orebodies have been found where greenschist is faulted against schist, and a few vein deposits occur where both hanging- and foot-wall are schist. Many of the veins are offset by cross-faults and in some cases ore has been deposited along the cross-faults as well as along the northeasterly fault system. Most of the ore shoots are from 1 foot to 6 feet wide, but in the Hector mine one ore shoot, now being developed, is 35 feet wide on the 650 level (650 feet below surface).
Galena, sphalerite, and freibergite are the principal ore minerals. The galena normally carries from 60 to 200 ounces of silver a ton but in places, where freibergite is present, the ore carries greater quantities of silver, reaching as much as 2,000 ounces. The gangue is coarsely crystalline quartz, with minor quantities of calcite and arsenopyrite, pyrite, and chalcocite and in a few deposits there are small amounts of siliceous silver ore (pyrrhotite and proustite). Post ore fault movements in the Belkeno mine produced brecciated sulphide deposits that have since been renewed by circulating ground waters that redeposited lead and zinc as carbonates. The cerussite and smithsonite coat and form a cement about the primary sulphides.
Prospectors searching for the silver-lead deposits have had success in the past by watching for float of black, weathered manganeseiferous siderite with which there may be more or less associated with quartz. Areas underlain by quartzite and greenschist or diorite have been the most favourable for prospecting. Slight showings are also developed in the neighbourhood of small bodies of conglomerate that have been cemented by limonite. One of these occurs in the map-area at elevation 3,000 feet along the most easterly stream, northeast of Mayo Lake.

LEGEND

Concentration of heavy metal, 0.010 or greater ppm 2.04
Concentration of heavy metal, less than 0.010 ppm 0.010
Approximate location of known ore veins 10
Mining properties 10

INDEX TO MINING PROPERTIES

- | | |
|------------------|---------------------|
| 1 Tin Can | 8 No Cash |
| 2 Bluebird | 9 Bermingham |
| 3 Yukeno | 10 Coral and Wigwam |
| 4 Mackeno | 11 Dixie |
| 5 Dragon | 12 Elsa |
| 6 Hector-Calumet | 13 Silver King |
| 7 Cream | 14 Lookout |

Field work by R.W. Boyle, E.L. Pekar and P.R. Patterson, July, August, 1955

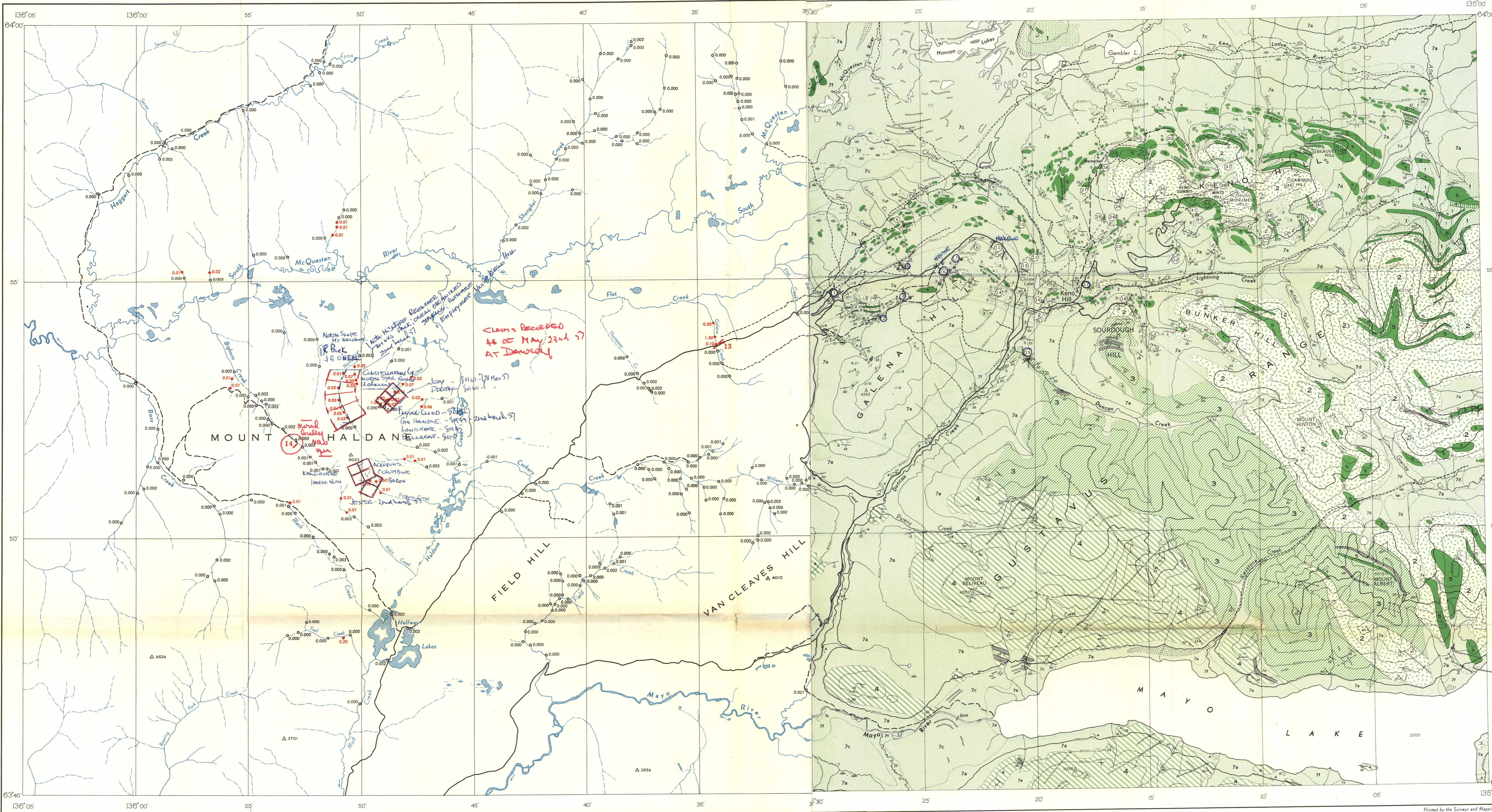
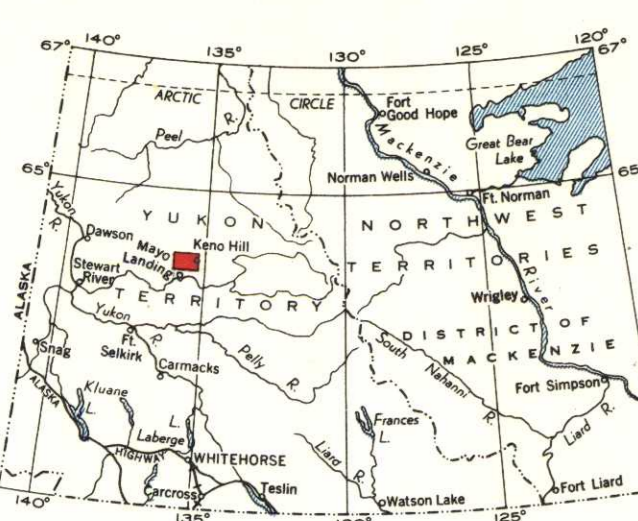
To accompany Bulletin 36

- Main road
Other roads
Trail
Stream (intermittent)
Marsh
Horizontal control point
Height in feet above mean sea-level 470

Approximate magnetic declination, 34° 30' East

Cartography by the Geological Cartography Unit, 1956

Air photographs covering this map-area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa, Ontario



DESCRIPTIVE NOTES

Elsa and Keno Hill mining camps are in Mayo mining district in central Yukon about 220 miles north of Whitehorse. The area is reached from Whitehorse by a gravelled highway with three river ferries.
Keno Hill map-area lies in the Stewart Plateau and is characterized by individual mountains and small ranges separated by broad deep valleys. The Gustavus Range occupies the central part with the deep valley of Mayo Lake and Mayo River on the south.
All parts of the area except the highest peaks were glaciated during the glacial epoch and even the peaks may have been covered in an early period of greater ice development. Well-developed kame terraces up to elevations of 3,000 feet along the south slopes of Mount Albert suggest that the ice level remained below 4,000 feet above sea-level in the main valleys throughout the last major advance of the Pleistocene epoch. In the main valleys the scouring action of the westerly moving ice destroyed gold placer deposits in its path but in protected and constricted valleys, particularly those trending about at right angles to the course of the main valleys, gold placer gravels were over-run and covered by glacial deposits.
Quartzite, micaceous, chloritic, and graphitic schists, and crystalline limestone, all belonging to the Yukon group, form the bulk of the rocks in the area. These are intruded by sills of diorite and gneiss and are dykes of quartz porphyry and rhyolite. The Yukon group forms a continuous belt at the west end of Mayo Lake. The schists and quartzite form the southerly limb of an anticline whose axial plane trends easterly along the McQuesten River Valley south of Hanson Lake and then swings south-easterly at Keno Hill toward Mayo Lake. Small drag-folds with arms that measure only a few inches across are numerous and a few are from 10 to 15 feet across. The axial planes of the drag-folds lie parallel with the strike and dip of the enclosing quartzites and schists and roughly parallel with the axial plane of the main anticline, and indicate the latter to be overturned to the north and northeast.
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INDEX TO MINES AND PROSPECTS

- SILVER-LEAD-ZINC-CADMIUM DEPOSITS
- Elsa (United Keno Hill Mines Limited)
 - Coral and Wigwam (United Keno Hill Mines Limited)
 - Arctic and Mactell (United Keno Hill Mines Limited)
 - No Cash (United Keno Hill Mines Limited)
 - Cream
 - Hector (United Keno Hill Mines Limited)
 - Calumet (United Keno Hill Mines Limited)
 - Dragon
 - Yee-Rocket (Yukeno Mines Limited)
 - Bluebird
 - No Keno (MacKeno Mines Limited)
 - Tin Can
 - Kio
 - Sage
 - Overtime (United Keno Hill Mines Limited)
 - Flame and Moth (United Keno Hill Mines Limited)
 - Creek (United Keno Hill Mines Limited)
 - Whipsaw-Tundra (Belkeno Mines Limited)
 - Ram (Mayo Mines Limited)
 - Hornet (United Keno Hill Mines Limited)
 - Thunderbird-Greta (Mount Keno Mines Limited and Arco Exploration Inc.)
 - Vanguard
 - Dorothy (Arkono Mines Limited)
 - Crosscut No. 1
 - Kio
 - Black Cat
 - Blue Rock (Brews Red Lake Mines Limited)
 - Sadie-Friendship (United Keno Hill Mines Limited)
 - Ladue (United Keno Hill Mines Limited)
 - Lake
 - Highlander-Burny
 - Lucky Queen
 - Spot
 - Shamrock (United Keno Hill Mines Limited)
 - Gambler
 - Silver Basin
 - Ladue Fraction
 - Nabob (Comstock Keno Mines Limited)
 - Roulette (No. 9) (United Keno Hill Mines Limited)
 - Keno (No. 6) (United Keno Hill Mines Limited)
 - Porcupine (United Keno Hill Mines Limited)
 - Minto (Comstock Keno Mines Limited)
 - Goldhill No. 2
 - Gold Queen
 - Caribou
 - Faith
 - Divide
 - Heien Fraction
 - Devon

Geology by E.D. Kindle, 1952-53

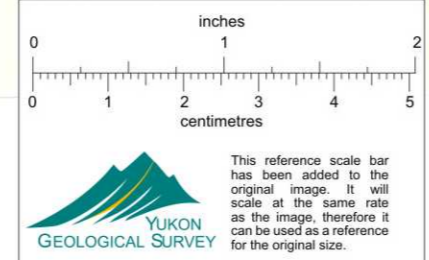
LEGEND

- QUATERNARY**
PLEISTOCENE AND RECENT
7a-7i Surficial deposits; 7a, mantle till and talus; 7b, glacial outwash; 7c, kame moraine deposits; 7d, alpine moraine deposits; 7e, stratified silts; 7f, fluvial sand and gravel
- CENOZOIC**
6 Quartz porphyry, granite porphyry, rhyolite
- MESOZOIC**
5 Diorite, gabbro, gneiss
- YUKON GROUP (1-4)**
2 Quartz-mica schist, quartzite, chloritic schist, limestone
3 Quartz-mica schist, graphitic schist, quartzite, limestone
4 Quartzite, graphitic schist, quartz-mica-chlorite schist
- PRECAMBRIAN**
1 Quartz-mica schist, graphitic schist, thin bedded quartzite
- Kame terrace
Esker
Budding (horizontal, inclined, vertical)
Fault (defined, assumed)
Glacial stria
Limestone
Shaft
Adit
Mine or prospect 6

MAP 1
Heavy Metal Content of Streams,
Galena Hill-Mt. Haldane Area,
Yukon Territory

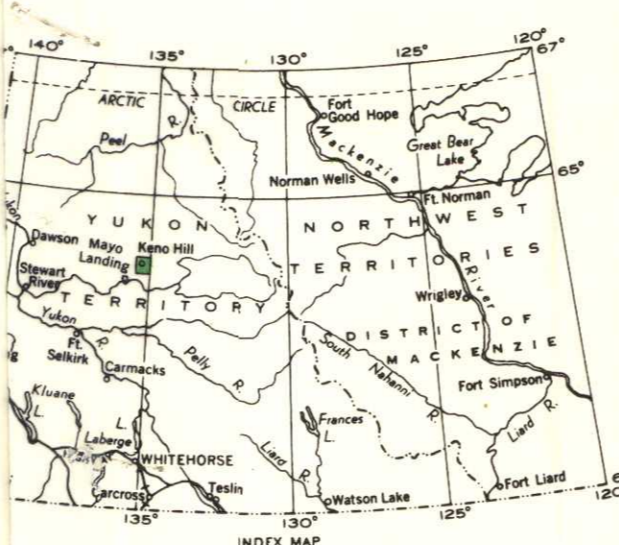
Scale: One Inch to One Mile = 1/63,360
Miles 1/2 0 1 2 3

Geographical names subject to revision



PRELIMINARY MAP 55-12
KENO HILL
YUKON TERRITORY

Scale: One Inch to One Mile = 1/63,360
Miles 1/2 0 1 2 3
Approximate magnetic declination, 34° 27' East



LEGEND

- Main roads
Other roads
Trail
Stream (position approximate)
Marsh
Triangulation station
Height in feet above mean sea-level 460

Cartography by the Geological Cartography Unit, 1955

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PRELIMINARY MAP 55-12
KENO HILL
YUKON TERRITORY

SHEET 105 M
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