

Hjerkin

Case History

Statens råstofflaboratorium

Trondheim

4431

Hjerkinn

Case History

Metal: Cu, Zn, Pb, Ni, Co.

Dispersion Type: Secondary; stream sediments and soils.

General Locality: Central-Norway.

Source: Internal reports by:
Björn Bölviken, Statens råstofflaboratorium,
Trondheim. (Geochemistry).
Hans-Peter Geis, Geofysisk Malmleting,
Trondheim. (Geology).
Per Singsaas, Geofysisk Malmleting,
Trondheim. (Geophysics).
Gunnar Sakshaug, Geofysisk Malmleting,
Trondheim. (Geophysics).

1. Location: Hjerkin area of the Dovre Mountains, Norway.
Area covers 200 km².
Lat: 62° 15' N. Long: 9° 30' E.
2. Physical Features:
 - a) Topography and drainage:
Rolling, well-drained country.
Altitude 900-1700 m.
 - b) Climate:
Yearly rainfall 398 mm, varying monthly from 16 mm to 72 mm.
Mean temperature range - 0.8° C.
Extremes: Jan. - 9.5° C. July + 10.3° C.
 - c) Vegetation:
Scarce vegetation, heather, moss, grass, and dwarf-birch.
3. Geology:
 - a) Geological setting:
Greenstones of lower Ordovician age in the Caledonides (App. SR 121).
 - b) Mineralization:
Concordant elongated plates of massive ore plunging 45° towards E.
Ore minerals: Mainly pyrite, subordinately sphalerite and chalcopyrite.
4. Weathering and Overburden:
 - a) Weathering:
Very little visible weathering of country rock.
Upper 10 m of the orebodies are strongly oxidized. Large limonite deposit in the glacial till downhill from the ore.
 - b) Overburden:
Glacial till of thickness 0-7 m, arithmetic mean 3.5 m (Observations from 34 drill-holes).
Podzol profile in soil.
Very few outcrops in the area. No outcrops of the known orebodies.
5. Geochemical Dispersion Patterns:
 - I Soil (App. SR 124).
 - a) Background concentrations: 10 ppm Cu and 10 ppm Zn.

b) Magnitude and form of anomalies:

No persistent anomaly. Odd points downslope of ore bodies show Cu and Zn concentrations up to 2000 ppm.

- c) In the soil profile over the deposit Cu and Zn concentrations increase with depth. Very small variations in Cu and Zn contents in different size-fractions of soil. No contamination problems. The ore deposit has been drilled, but not worked.

II Stream sediments (App. SR 111-116, SR 122, SR 124).

	Back ground ppm	Anomaly		Remarks
		Magnitude ppm	Length km	
Cu (Holman)	0-5	20-900	min. 3	starts 200 m downstream of ore deposit.
Zn,Cu,Pb (Bloom)	0-1	15-20	3	starts 300 m downstream of ore deposit.
Cu (Total)	5	25-100	2	starts 500 m downstream of ore deposit.
Pb (Total)	5	25	1	starts just above ore deposit.
Ni (Total)	5	no anom.	-	
Co (Total)	5	"	-	

The varying composition or origin of sediment samples (organic/inorganic, coarse/fine, under/above water) seems to have no significant disturbing influence on the anomaly pattern.

At certain places in the main stream (near joints of anomalous tributaries) the metal content of the sediment from one side of the stream is significantly different from metal content of samples from the opposite side.

No contamination (See 5 I c).

6. Field Technique:

a) Sampling:

Soil samples were collected from shovel dug 50 cm deep holes (C-horizon). Distance between holes 25 m, along lines 100 m apart.

Stream sediment samples were collected along all streams, interval between sampling sites being 100-300 m. Two samples (first year three) taken, one from each side of the stream at each site.

b) Analytical:

The samples were dried in air current of about 80° C and sieved through 80 mesh sieve of stainless steel.

Analytical methods:

Soil: Crowe test (USGS Open file report Sept. 1953) using HNO₃ digestion.

Sediments: Holman test, lab. method (Bull. Inst. Min. Met. 1956, 7-16).

Bloom test (Econ. Geol. 1956. 533-41).
Total Cu, Pb, Ni, Co by spectrographic method as follows: Sieved, dried sample was put into carbon electrode with 1½ x 4 mm cavity. No internal standard.
Excitation: AC arc of 9 amperes for 20 seconds.

Spectrograph: Bausch & Lomb 1.5 Stigmatic grating Spectrograph No. 11.

Film: Kodak Sp A1, 35 mm.

Visual comparison using spectra of standard samples.

7. Field Organization:

a) Other methods:

Up to 1958 geological, and the following geophysical investigations have been carried out:

1. Ground electromagnetic measurements using long straight-line insulated cable earthed in both ends.
2. Self potential and magnetic measurements covering part of the area.

Maps: Appendix GM 209 Pl 5.

Drilling was done during 1957, 1958, 1959.

b) Geochemistry:

The investigation was carried out during the summer season 1958 and 1959.

Aim of investigation:

1958. To try out soil and stream sediment methods in the area.

1959. Prospecting by using Holman test on sediments from streams around geophysical electromagnetic indications along the strike direction of the deposit.

Operational statistics 1959.

Covered area 120 km².

Working time:

Sampling	422 hours
Transportation	393 " "
Packing	64 " "
Analysis (Holmans test)	47 " "
Map drawing	30 " "
Drying, sieving	not known

Cost exclusive administration about kr. 53,-
pr. km².

8. Results of investigation:

- I Soil analyses for Cu and Zn gave nonconclusive results.
- II a) Stream sediment analyses with Holman test, Bloom test, total Cu and Pb disclosed interesting anomalies around known deposit.
- b) No significant additional anomaly was found in this area.
- c) Areas of high background seem to be closely related to known uneconomic pyrite and pyrothite mineralization.

Trondheim, Norway, 25th February 1960.

Statens råstofflaboratorium

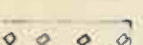
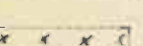
Björn Bølviken
Björn Bølviken

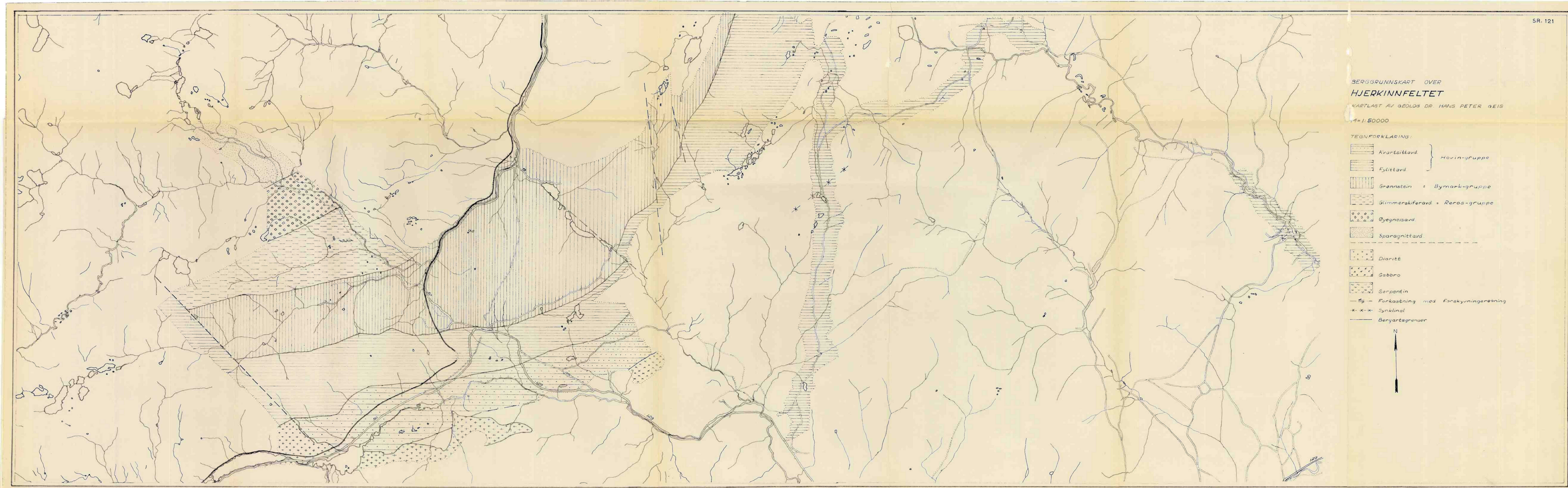
BERGGRUNNSKART OVER
HJERKINN FELTET

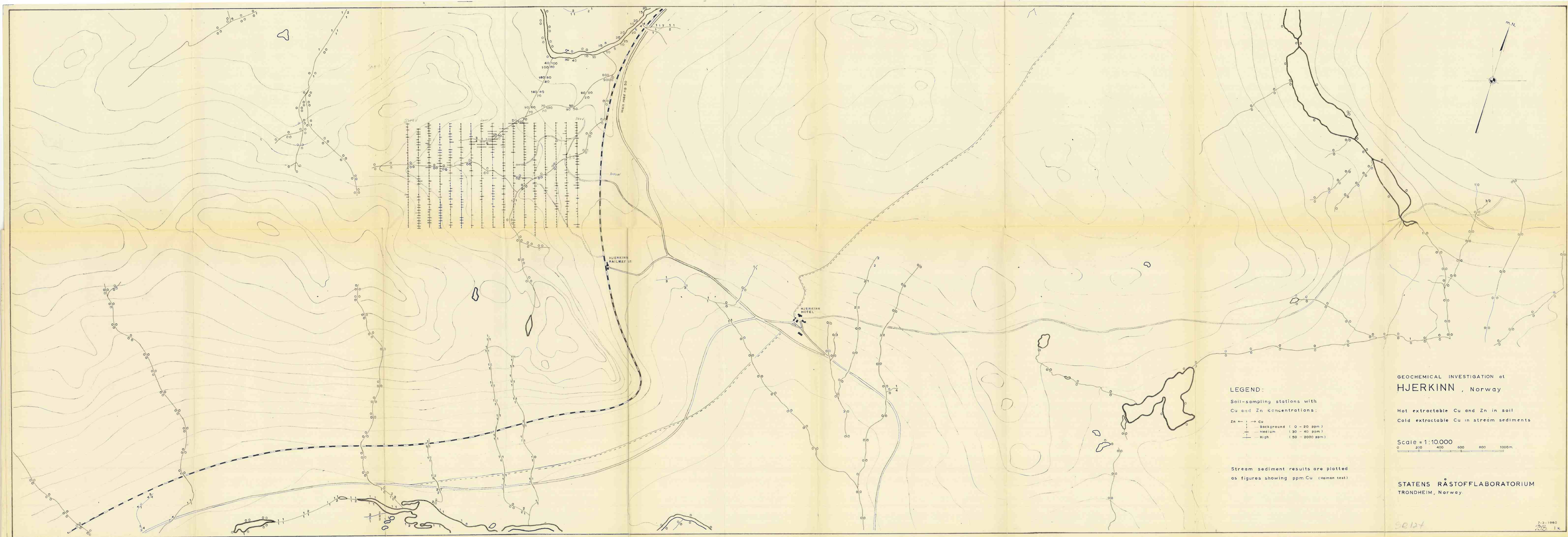
KARTLAGT AV GEÖLOG DR. HANS PETER GEIS

M = 1:50000

TEGNFÖRKLÄRING:

- | | | |
|---|-------------------------------------|----------------|
|  | Kvartsittavd. | } Hovin-gruppe |
|  | Fyllitavd. | |
|  | Grønnstein = Bymark-gruppe | |
|  | Glimmerskiferavd. = Roros-gruppe | |
|  | Øyegneisavd. | |
|  | Sparagnittavd. | |
| <hr/> | | |
|  | Dioritt | |
|  | Gabbro | |
|  | Serpentin | |
|  | Forkastning med forskyvningsretning | |
|  | Synklinal | |
|  | Bergartsgrenser | |







GEOKJEMISKE UNDERSØKELSER I
OMRÅDENE RUNDT OG VEST FOR

TVERRFJELLET, HJERFJERN

KART OVER SPORELEMENTER I BEKKESEDIMENTER
M=1:50000

PL. I

KOBBER, lett-løslig (Holmans prøve)

KARTGRUNNLAG: Fokkstua-Kongsvoll 1:50000
(Norges geografiske Opmåling 1934)

TEGNFORKLARING:

	Jernbane
	Vei
	Bekk, ikke prøvetatt
	Lav bakgrunn 0 ppm (vekt/volum)
	Høy bakgrunn 0-5
	Terskel 5-9
	Svak anomali 10-17
	Sterk anomali 20+

STATENS RÅSTOFFLABORATORIUM TRONDHEIM

PRØVETATT	ANAL.	TEGN.	TRAC.	KFR.	DATO
B.J.B., E.L.	R.	K.B., E.A.	E.A.	B.B.	16-2-59

1:50000
1934



GEOKJEMISKE UNDERSØKELSER I
OMRÅDENE RUNDT OG VEST FOR

TVERRFJELLET, HJERKINN

KART OVER SPORELEMENTER I BEKKESEDIMENTER
M=1:50000

PL.2

TUNGMETALLER, lett-løslige (Blooms prøve)

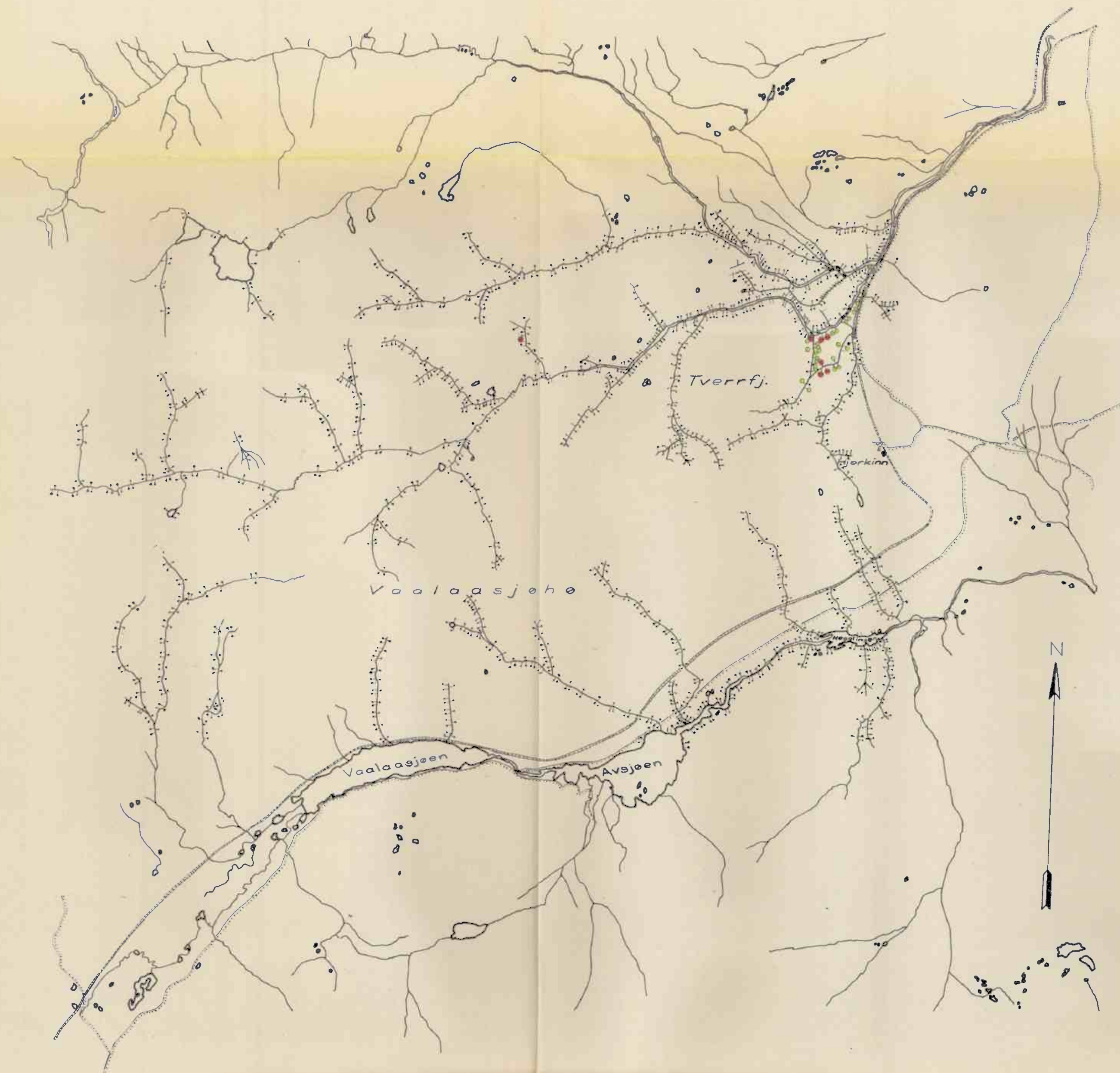
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(Norges geografiske Opmåling 1934)

TEGNFORKLARING:

	Jernbane
	Vei
	Bekk, ikke prøvetatt
	Lav bakgrunn 0 ppm (vekt/volum)
	Høy bakgrunn 2095
	Terskel 7
	Svak anomali 10-17
	Sterk anomali 20

STATENS RÅSTOFFLABORATORIUM
TRONDHEIM

PRØVETATT	ANAL.	TEGN.	TRAC.	KFR.	DATO
B.J.B., C.L.	Rr	K.B., E.A.	E.A.	B.B.	16-2-59



GEOKJEMISKE UNDERSØKELSER I
OMRÅDENE RUNDT OG VEST FOR

TVERRFJELLET, HJERFJERN

KART OVER SPORELEMENTER I BEKKESEDIMENTER
M=1:50000

PL. 4

KOBBER, spektrografisk bestemt

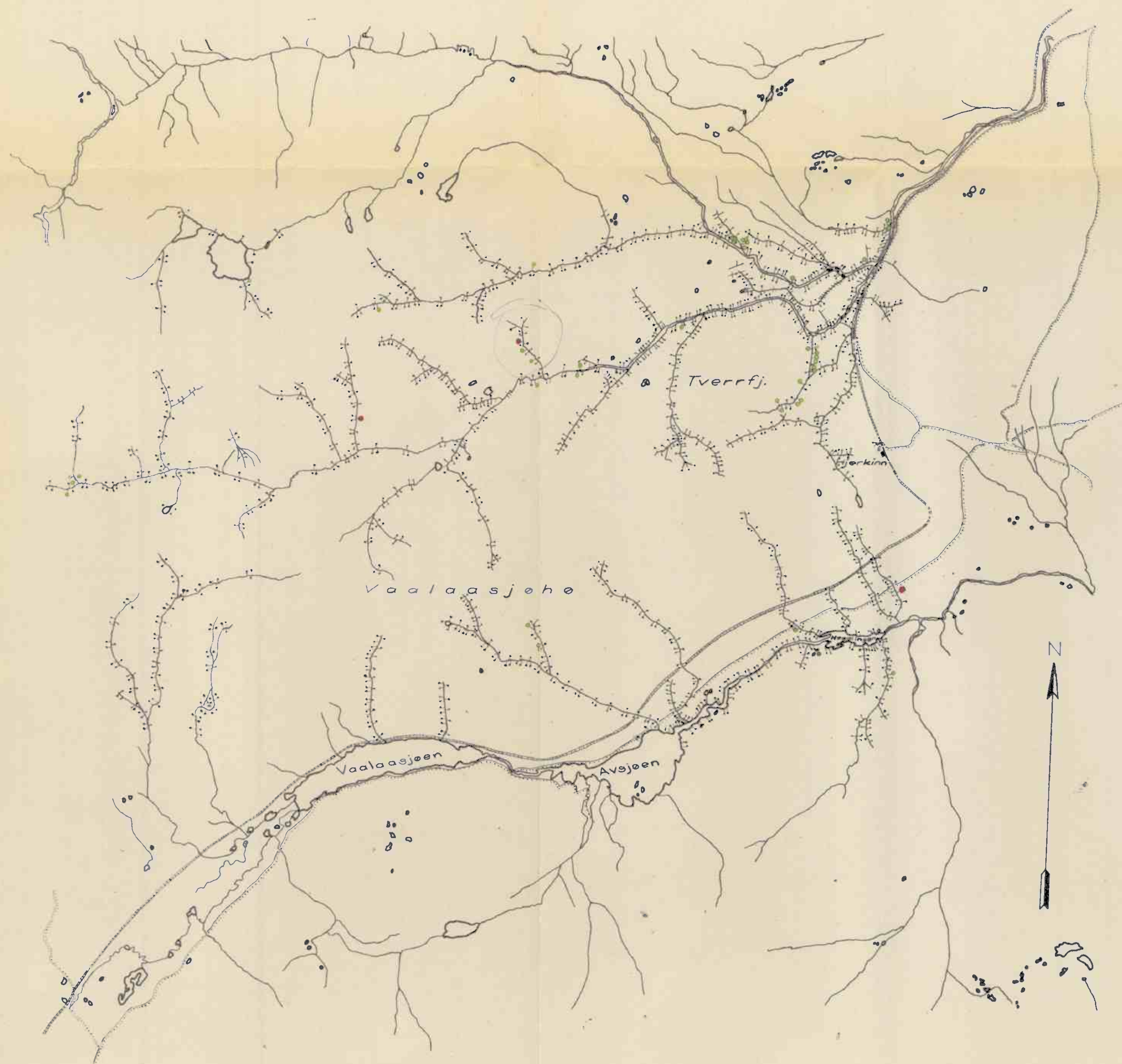
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(Norges geografiske Opmåling 1934)

TEGNFORKLARING:

- jernbane
- vei
- Bekk, ikke prøvetatt
- +++++ Lav bakgrunn 5 ppm (vekt/volum)
- +++++ Høy bakgrunn 25 ppm
- +++++ Svak anomali 100 ppm

STATENS RÅSTOFFLABORATORIUM
TRONDHEIM

PRØVETATT	ANAL.	TEGN.	TRAC.	KFR.	DATO
BJB 62	Rr	EA	EA	BB	16-2-59



GEOKJEMISKE UNDERSØKELSER I
OMRÅDENE RUNDT OG VEST FOR

TVERRFJELLET, HJERKINN

KART OVER SPORELEMENTER I BEKKESEDIMENTER
M=1:50000

PL.3

BLY, spektrografisk bestemt

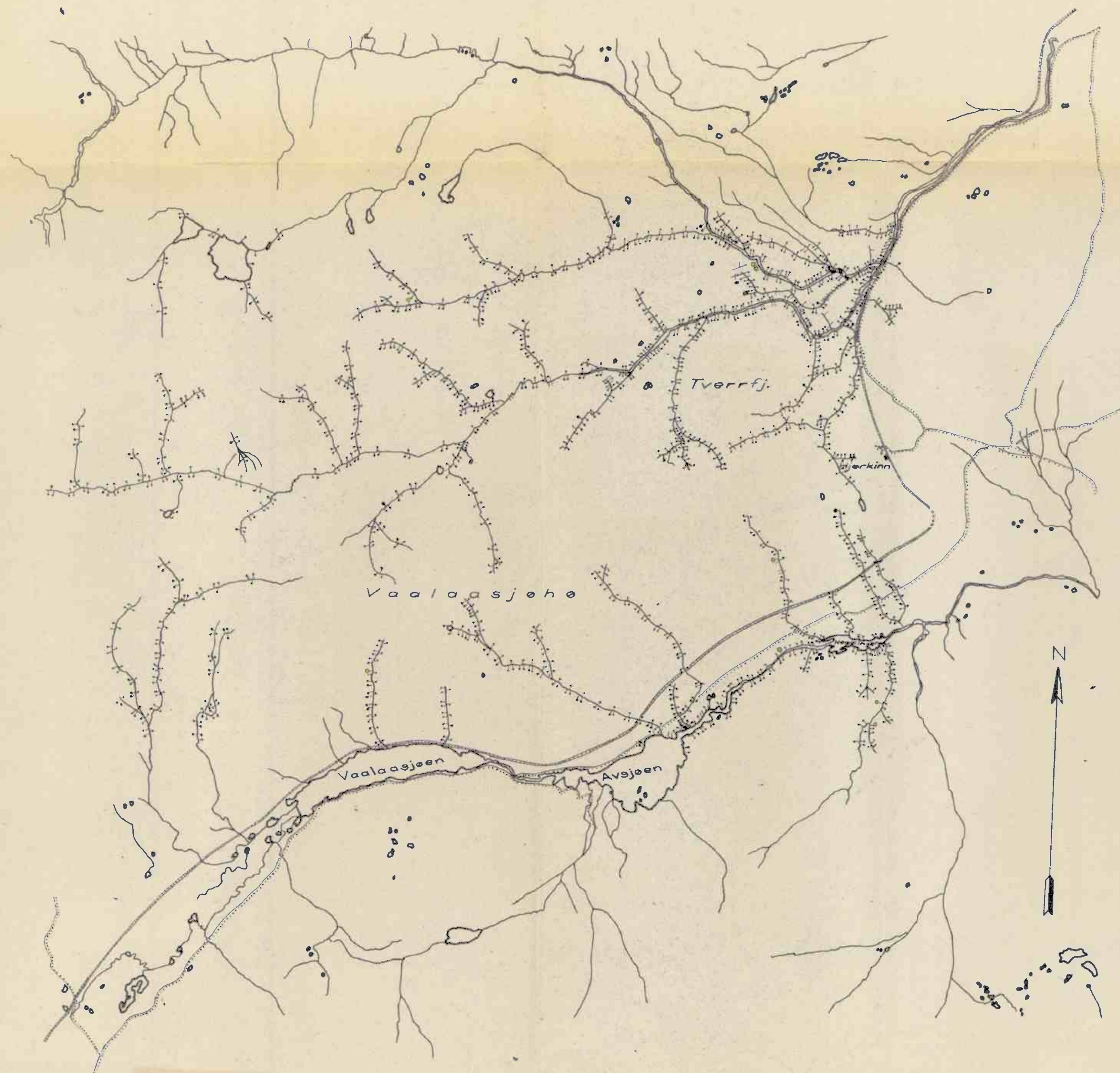
KARTGRUNNLAG: Fokkstua-Kongsvoll 1:50000
(Norges geografiske Opmåling 1934)

TEGNFORKLARING:

- Jernbane
- Vei
- Bekk, ikke prøvetatt
- Lav bakgrunn 5 ppm (vekt/volum)
- Høy bakgrunn 25 ppm
- Svak anomali 100 ppm

STATENS RÅSTOFFLABORATORIUM
TRONDHEIM

PRØVETATT	ANAL.	TEGN.	TRAC.	KFR.	DATO
BJB. 64	Rc	CA	EA	BB	16-2-59



GEOKJEMISKE UNDERSØKELSER I
OMRÅDENE RUNDT OG VEST FOR

TVERRFJELLET, HJERKINN

KART OVER SPORELEMENTER I BEKKESEDIMENTER
M=1:50000

PL. 6

NIKKEL, spektrografisk bestemt

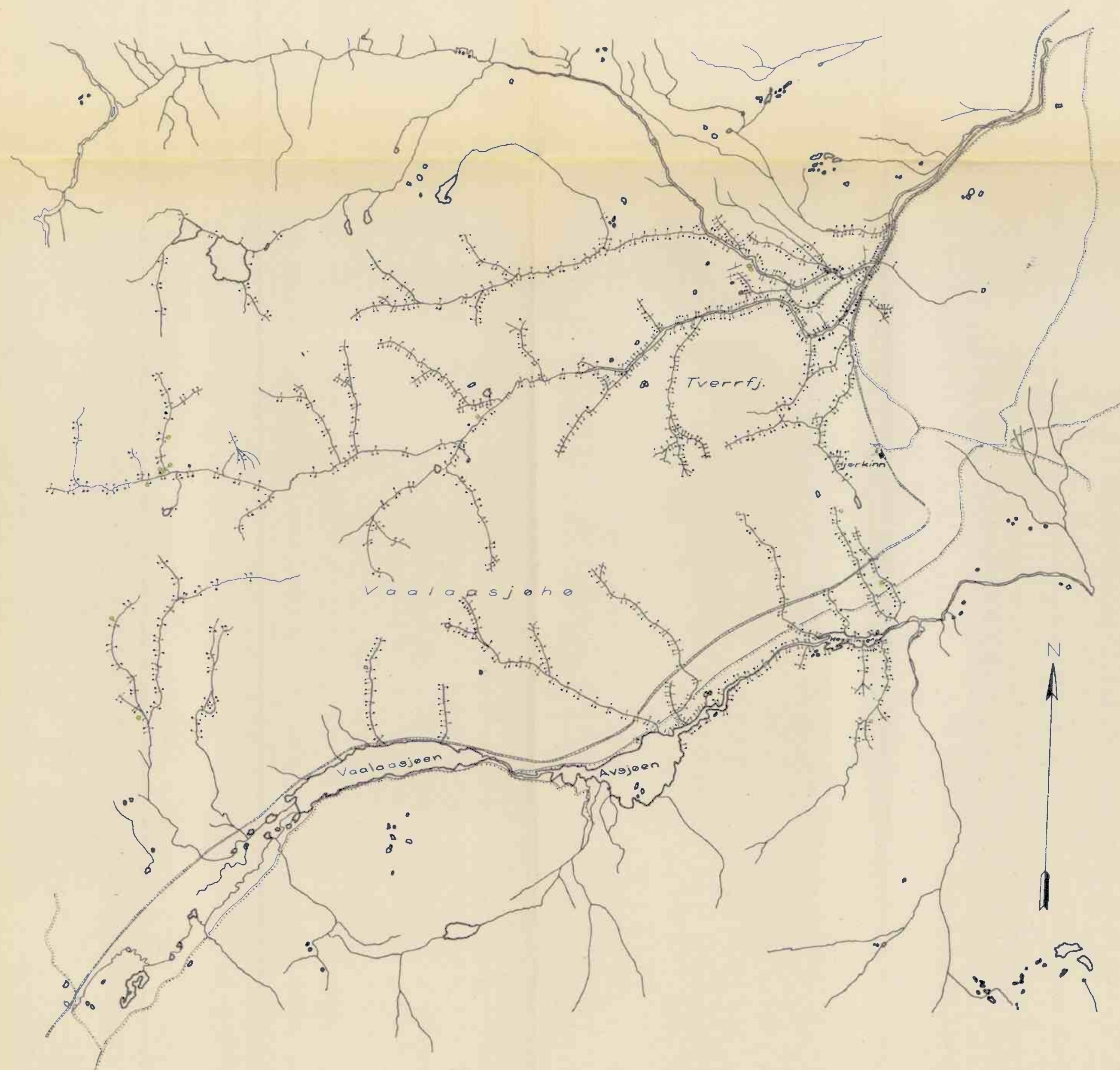
KARTGRUNNLAG: Fokkstua - Kongsvoll 1:50000
(Norges geografiske Opmåling 1934)

TEGNFORKLARING:

- Jernbane
- Vei
- Bekk, ikke prøvetatt
- Lav bakgrunn 5 ppm (vekt/volum)
- Høy bakgrunn 25 ppm
- Svak anomali 100 ppm

STATENS RÅSTOFFLABORATORIUM
TRONDHEIM

PROVETATT	ANAL.	TEGN.	TRAC.	KFR.	DATO
BJB. 62	Rc	E.A.	E.A.	B.B.	16-2-59



GEOKJEMISKE UNDERSØKELSER I
OMRÅDENE RUNDT OG VEST FOR

TVERRFJELLET, HJERKINN

KART OVER SPORELEMENTER I BEKKESEDIMENTER
M=1:50000

PL.5

KOBOLT, spektrografisk bestemt

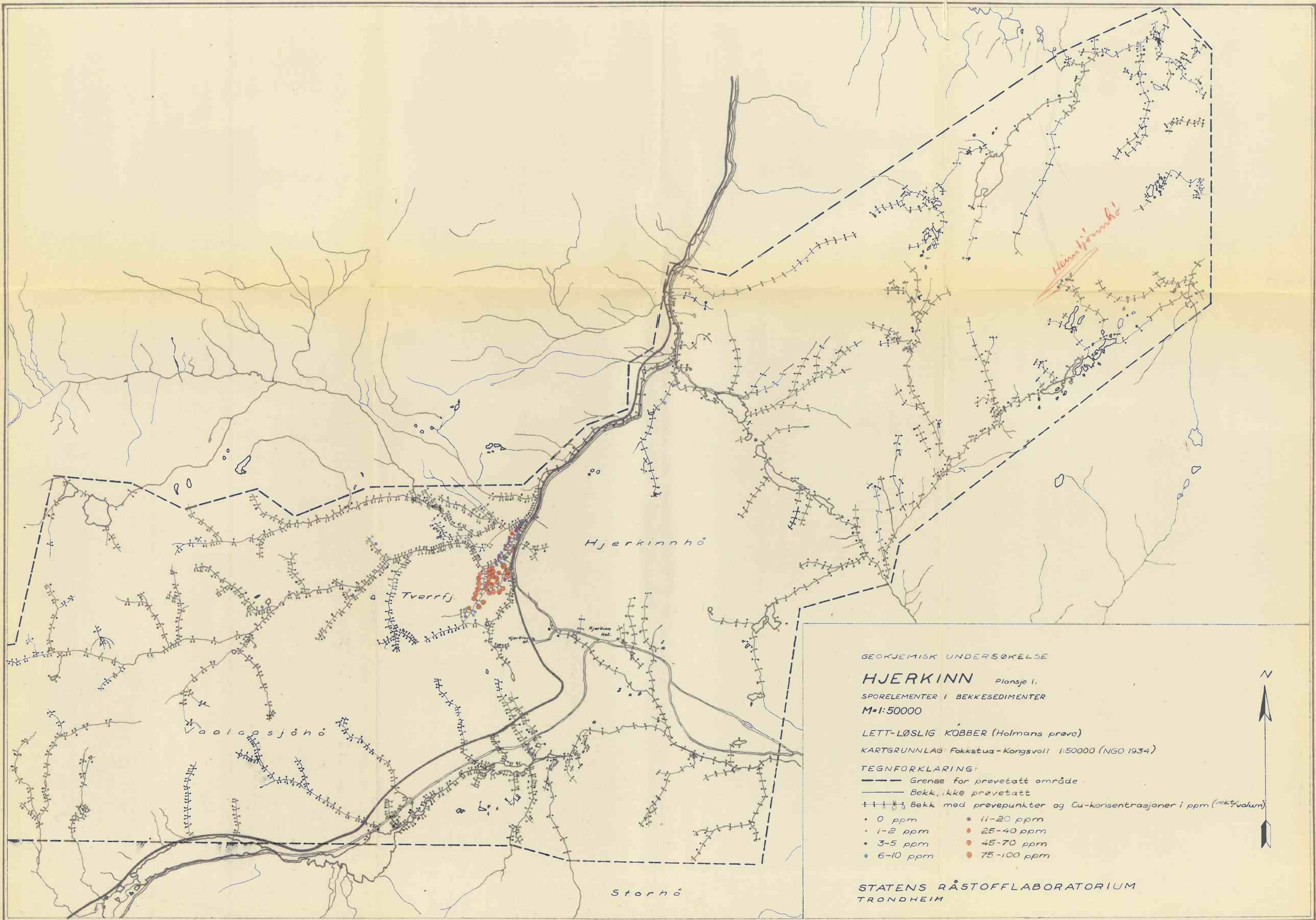
KARTGRUNNLAG: Fokkstua-Kongsvoll 1:50000
(Norges geografiske Opmåling 1934)

TEGNFORKLARING:

- Jernbane
- Vei
- Bekk, ikke prøvetatt
- ||||| Lav bakgrunn 5 ppm (vekt/volum)
- ||||| Høy bakgrunn 25 ppm
- Svak anomali 100 ppm

STATENS RÅSTOFFLABORATORIUM TRONDHEIM

PRØVETATT	ANAL.	TEGN.	TRAC.	KFR.	DATO
BJ.B 62	Rc	EA	EA	BB	16-2-59



GEOKJEMISK UNDERSØKELSE

HJERKINN Plansje I.

SPORELEMENTER I BEKKESEDIMENTER

M:1:50000

LETT-LØSLIG KØBBER (Holmans prøve)

KARTGRUNNLAG: Fokkstua-Kongsvoll 1:50000 (NGO 1934)

TEGNFORKLARING:

--- Grense for prøvetatt område

— Bekk, ikke prøvetatt

+++ Bekk med prøvepunkter og Cu-konsentrasjoner i ppm (vekt/volum)

- | | |
|------------|--------------|
| • 0 ppm | • 11-20 ppm |
| • 1-2 ppm | • 25-40 ppm |
| • 3-5 ppm | • 45-70 ppm |
| • 6-10 ppm | • 75-100 ppm |

STATENS RÅSTOFFLABORATORIUM
TRONDHEIM