

BRITISH COLUMBIA
PROSPECTORS ASSISTANCE PROGRAM
MINISTRY OF ENERGY AND MINES
GEOLOGICAL SURVEY BRANCH

PROGRAM YEAR: 1998/99

REPORT #: PAP 98-21

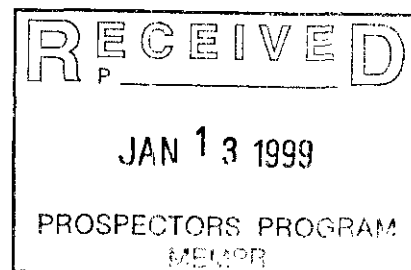
NAME: BRYAN MULOIN

GEOCHEM & GEOPHYSICS, JAWBONE CREEK
BRYAN MULOIN

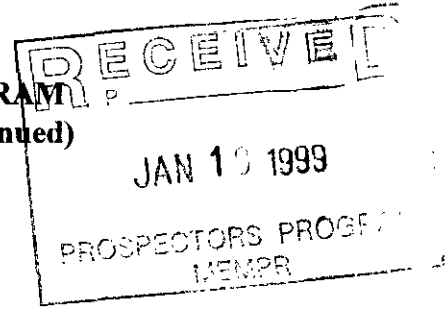
COMPILATION OF
GEOCHEMICAL SURVEYS
ON
JAWBONE CREEK

CARIBOO MINING DISTRICT
BRITISH COLUMBIA
NTS 93H/4 b,c,f,g,
LATITUDE 53° 2'
LONGITUDE 121° 45'

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**BRITISH COLUMBIA
PROSPECTORS ASSISTANCE PROGRAM
PROSPECTING REPORT FORM (continued)**



B. TECHNICAL REPORT

- One technical report to be completed for each project area.
- Refer to Program Requirements/Regulations 15 to 17, page 6.
- If work was performed on claims a copy of the applicable assessment report may be submitted in lieu of the supporting data (see section 16) required with this TECHNICAL REPORT.

Name Bryan Muloin Reference Number 97/98-P4E

LOCATION/COMMODITIES

Project Area (as listed in Part A) Jawbone Ck MINFILE No. if applicable _____
 Location of Project Area NTS 93 H/A E Lat 53°2' Long 121°45'
 Description of Location and Access By hwy 26 From Quesnel to the 72C logging road east of Timon Ck thence to 12 to 13 km - also at Al Taylor's camp on hwy 26 east of Jawbone & west of Davis Cks.
 Main Commodities Searched For gold

Known Mineral Occurrences in Project Area Foster Bench, Lightning Creek, Al Taylor's placer - on geophysical structure - white & chert placer workings

WORK PERFORMED

1. Conventional Prospecting (area) 26 hect.
2. Geological Mapping (hectares/scale) limited exposure
3. Geochemical (type and no. of samples) alder leaves 60
4. Geophysical (type and line km) magnetometer
5. Physical Work (type and amount) trenching 6 m³
6. Drilling (no. holes, size, depth in m, total m) _____
7. Other (specify) _____

SIGNIFICANT RESULTS

Commodities _____ Claim Name _____
 Location (show on map) Lat _____ Long _____ Elevation _____
 Best assay/sample type 41205 170E alder geochem 38 ppb Au


Description of mineralization, host rocks, anomalies symmetrical intrusive and alteration structure into phyllite, identifiable by surface exposure, geochem pattern magnetic and VLF EM surveys, interesting features associated or central to areas of previous place exploration


Supporting data must be submitted with this TECHNICAL REPORT

Information on this form is confidential for one year from the date of receipt subject to the provisions of the Freedom of Information Act.

KNEW MINERAL CLAIMS
Geological Study - Alder leaves

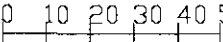
Map of the area showing the location of the claims.

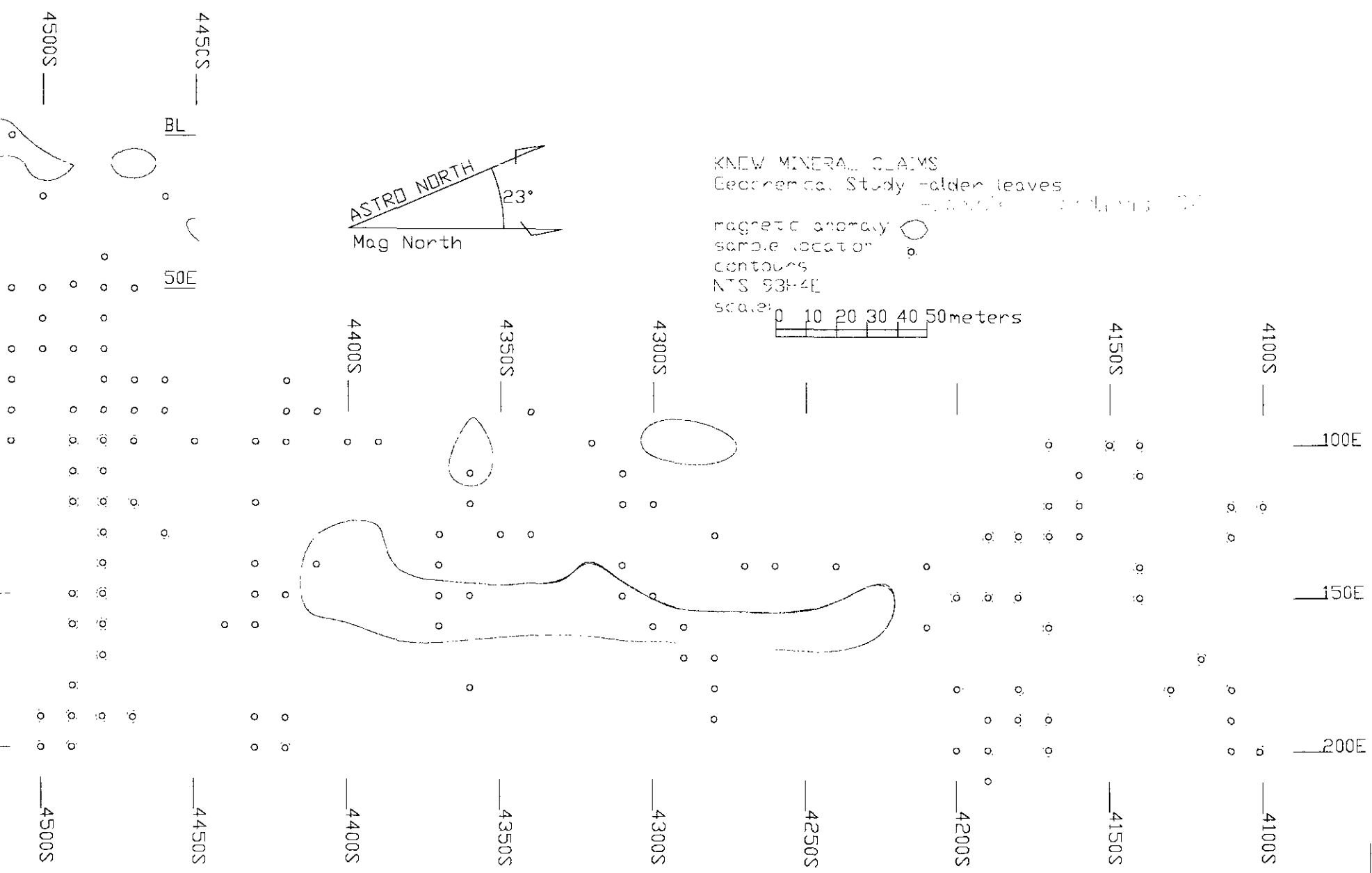
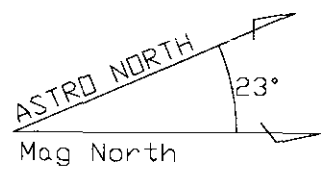
magnetic anomaly 

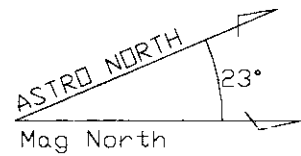
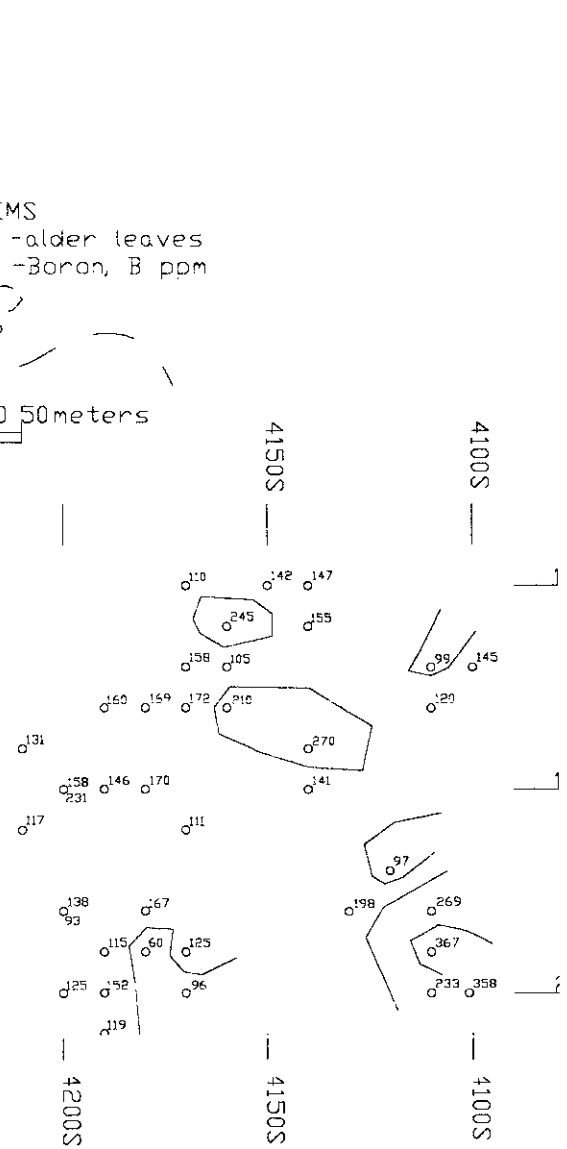
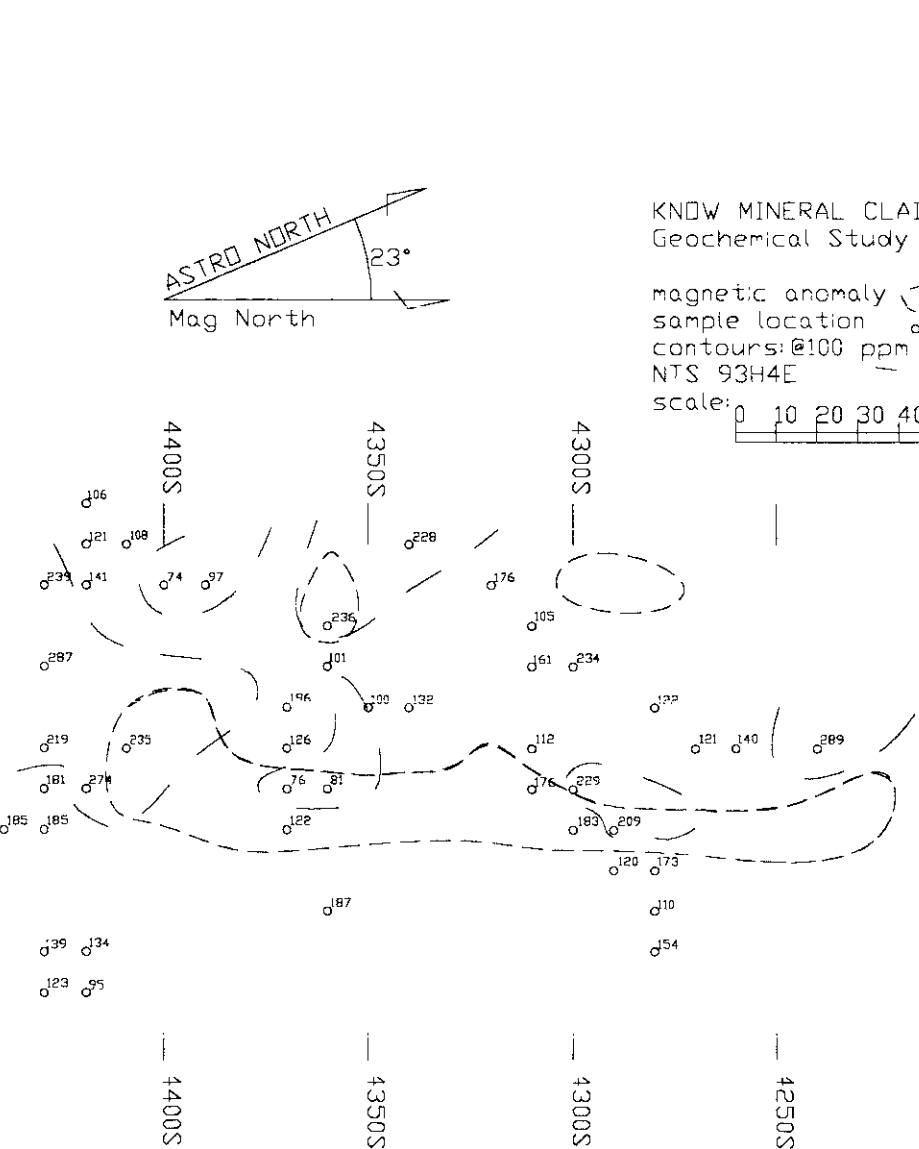
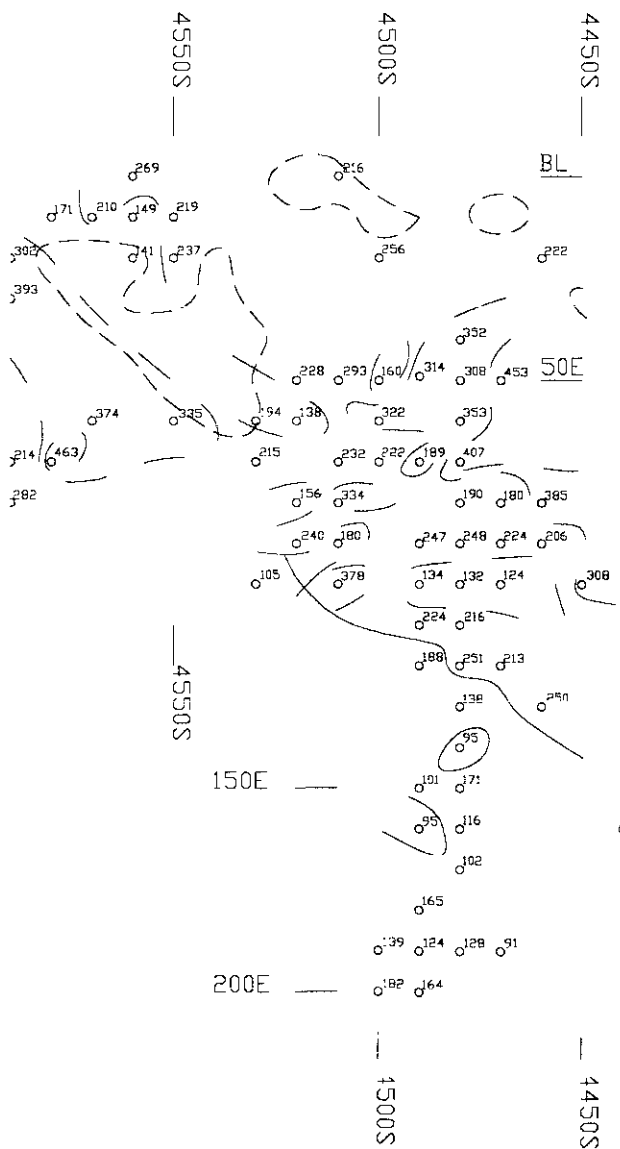
sample location 

contours

NTS 93F-4E

scale:  0 10 20 30 40 50 meters





KNOW MINERAL CLAIMS
 Geochemical Study -alder leaves
 -Boron, B ppm
 magnetic anomaly
 sample location
 contours: @100 ppm
 NTS 93H4E
 scale: 0 10 20 30 40 50 meters

GEOCHEM & GEOPHYSICS, JAWBONE CREEK
BRYAN MULOIN

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MOLYBDENUM

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SILVER

COBALT

IRON

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CADMIUM

BISMUTH

PHOSPHORUS

CHROMIUM

BARIUM

ALUMINUM

POTASSIUM

COPPER

ZINC

NICKEL

MANGANESE

ARSENIC

STRONTIUM

ANTIMONY

CALCIUM

LANTHANUM

MAGNESIUM

BORON

SODIUM

GOLD

GEOCHEM & GEOPHYSICS, JAWBONE CREEK BRYAN MULOIN

INTRODUCTION

This is a compilation study of the 237 geochemical analyses of alder leaves done from '94 to '98 on the KNOW group of mineral claims east of Jawbone Creek.

Work on this prospect prior to '91 comprised of a dip angle VLF survey on a line spacing of 500 meters, and some geochemical sampling, both on the TARA claim group. From this work one strong conductor on the east branch of Jawbone Creek was singled out for study in '91.

The KNOW group covers that VLF structure for over a mile along the east branch of Jawbone Creek. Study to date includes magnetometer and VLF-EM traverses every 50 meters extending 100 to 400 meters either side. As part of that study a precision magnetic survey was initiated to define components in the alteration shatter envelope. These features are thought to be the feeders for the gold worked by a previous generation of miners. Ground flumes, shafts, and washes local to these structures attest to their interest.

An orientation geochemical survey done in '91 indicated the magnetically defined structures are related to subdued gold responses.

LOCATION AND ACCESS

Topographic description of site:

NTS 93H/4b,c,f,g

The KNOW Group, now 7 of 2 post claims: VINO, ENO, ZENO, SINO, CRONO, RENO and RHINO is successor to Jawbone and Tara Groups of mineral claims. It is situated in the area known as the Barkerville Gold Belt or the Cariboo Gold Mining District. For a general location see figure 1 on preceding page and in more detail, Know Claim Group Location Map, Figure 2 after this page. Access to the property from Highway 26 is by logging road 72C at Timon Creek and a short road just west of Jawbone Creek. It is situated west of the former community of Stanley enroute between Quesnel and Wells. Another, older, road enters the area from the north over Nelson Mountain from Slough Creek.

HISTORY

The Stanley and VanWinkle area on Lightning Creek to the south is a notable mining area. Butcher Bench produced the largest recorded nugget of the Cariboo 36.4 oz with 6100 oz coming from an area of only a few square yards. The district has several continuing active operations.

The Slough Creek area north of the property has attracted extensive work, and is reputed to have produced more gold than Williams Creek. Most recent photos showing the large nugget gold of the Cariboo are from the south side of this creek.

The promise of the KNOW prospect is inspirational if one beleaves the find reported by Stuart S. Holland 1948, p.34 that:"F.J. Tregillus, of Barkerville, says that the father of W.M. Hong, of Barkerville, told him a Chinese miner had found a 41 ounce nugget on the left fork of Jawbone Creek. The nugget was never shown locally because the finder shortly left for China."

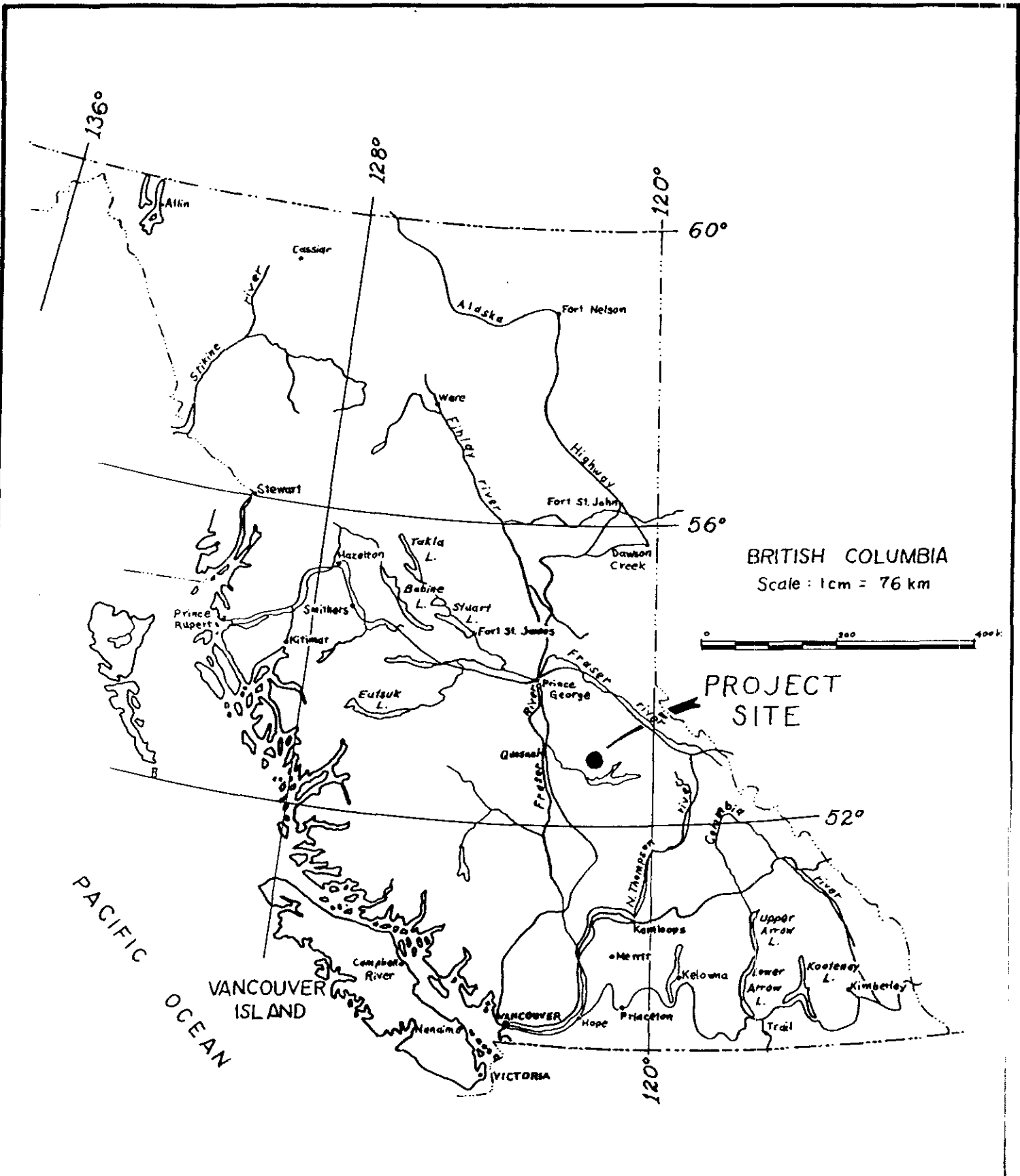


FIG 1
LOCATION MAP

DM 12/87

GEOCHEM & GEOPHYSICS, JAWBONE CREEK BRYAN MULOIN

HISTORY continued:

The father of W.M.Hong was Wong Gar Wong born in 1852 in Kwangtung, China. Wong Gar Wong aged 10 in 1862, traveled with two older brothers to Silver City Nevada. In 1880 he made his way to Stanley, B.C. It is assumed that the American west had become difficult for the chinese so they migrated north to escape the perscution. As a miner Wong Gar Wong earned less than \$10 a month. By 1885 he managed to buy the Kwong Lung Kee grocery store, to return to China to marry, and to ship groceries from Hong Kong. Fred Tregillus arrived in Stanley in 1885 his first employment was to unload Wong Gar Wong's supplies. Mr. F.J. Tregilles estimated the freight cost for the bull team from Yale to Stanley at \$4000 as he checked the weight of this freight. Won Gar Wong had other opportunities to meet with the owner of the largest nugget of the Cariboo. He took his family; wife and five children back to China in 1910 for a visit lasting till 1912. He probably knew the fortunate miner of the 41 ounce nugget. His own good fortune suggests he to was in some such venture.

The remains of a cabin are present near the area of both white and chinese mining on Jawbone Creek. Its size suggests white construction, possibly the home of H.M. Bryant who reports the production of gold from the creek in 1867. Artifacts in the moss of its floor include five worn but still useable shovels, opium containers, bottles with mercury in them, and a bronze pot repaired at least 3 times. This suggests the residence of the fortunate miner and four partners.

LOCAL GEOLOGY

Previously the area was included in the Richfield formation, a basal quartzite. Struick introduced the concept of terraines and renamed the formations. His description of the Jawbone Creek area is that it is underlain by phyllites. Structural elements he defines are: a fault parallel to Davis Creek, and the Lightning Creek Anticlinorium halfway up Mount Nelson.

Forestry road 72C, continued into the area in 1993, exposes phyllite bedrock. Brecciated phyllite outcrops, 5550S, 70E to 80E, its occurrence on a steep slope accounts for its exposure. To the west and just off the grid at about 4950S another out crop, in Jawbone Creek, is a silicified resistant phyllite. These with the group of siliceous outcrops just south of the grid are representative of the country rock.

There are also remnants of north striking mafic dykes presumably related to the Mount Murry intrusives. On the road cut they can be seen extending into the enclosing soils. They weather as angular gravel. At 10.6 km the intrusive perimeters a small pond. It may be a volcanic pipe. The road builders obtained gravel from it for use on this road. Examination still locates other thinner dykes. This on consideration seems evidence these soils are not tills. The Fraser glaciation if it did exist didn't scour or deposit till in this area. It probably did not completely cover the interior Basin as suggested by Tipper, 1971. This explains the lack of moraines noted by him. His 1971 report invites discussion. Subsequent writers ignore this purpose of Bulletin 196 treating this writing as proven fact.

KNOW CLAIM GROUP
LOCATION MAP

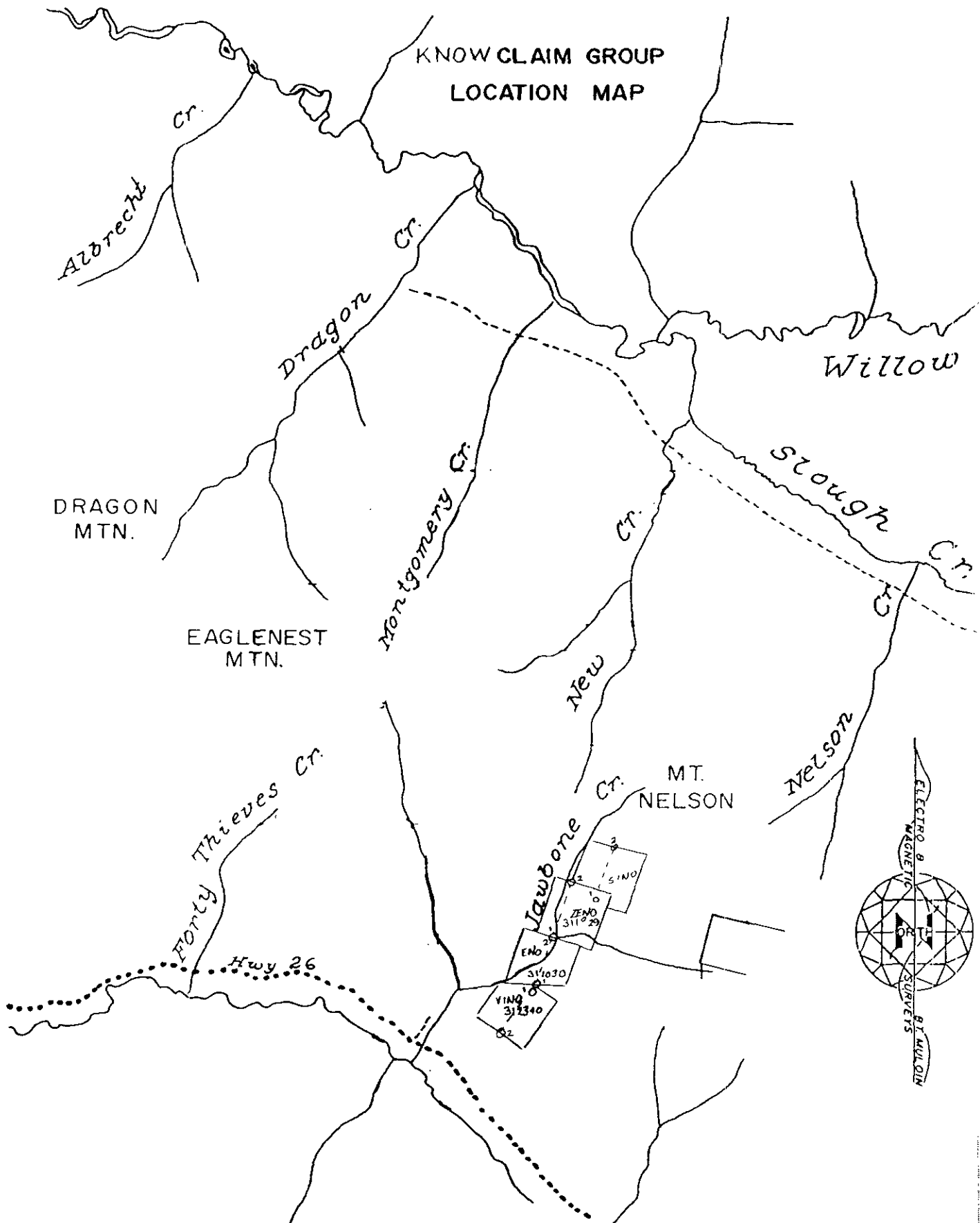


FIGURE 2

(BTM) 8/91

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LOCAL GEOLOGY continued:

South of Lightning Creek, the Dominion Claims were visited by Holland, 1948, p.56. A precis of that information follows:

The north east of Lot 11404 is underlain by grey flaggy quartzites and squeezed pea size quartz pebble conglomerate. They are overlain by about 100 feet of limestone outcropping in the canyon of Anderson Creek. Overlying the limestone is a 1500 feet or more belt of chloritic rocks grading upward from bright green chloritic schist to brown weathering chlorite schist to quartzite. They strike north 30 degrees west and dip 20 to 40 degrees west. The claims are south west of the major anticlinal axis but the limestone and chloritic schists are not repeated on the north east side.

It is suspected that Holland has described the components of alteration.

Along the baseline, paralleling the VLF-EM, and magnetic structures, the outcrop is similar to the Dominion Claims pebble conglomerate. Quartz intrusive alteration, is necessary for outcrops to expose through the mature weathered soils. The pisolites (pebbles) have a hyaline, opalene sheen to them. On the Dominion Claims they are seen to grade from oolites, 3mm, at the ends of the outcrop area, inward, to the larger size, 8 to 10mm with associated carbonate. On the grid, 5550S, 20E, an outcrop is quartz with phenocrysts of feldspar. This is also seen just east of the Dominion Claims adit possibly relating to the pre-Mississippian Proserpine type intrusive described by Holland 1948, p.18.

Some exposures have manganese stains, often a mineralization indicator. In the geochemical study it is noted alder may have a natural affinity to this element as the values are exceedingly high. At 4460S, 50E, 57,541ppm Mn, equivalent to 5.75% manganese in the plant tissues. Manganese seems to be an important element of the alteration pattern of the structure. Other EM conductors in the area have been drilled and labeled as graphitic shear zones. This may have been wad. Drilling inclined holes at this type of EM zone often misses the metallic component, other alteration features being seen instead.

In the area of this study, two large "B" type quartz veins have now been located. Between 4300S and 4330S, 80E to 90E, a quartz vein of over a meters width is located. Its vertical dip and exposed side give it the appearance of being over 2 to 3 meters across. This too is a measure of silica alteration intensity. Two parts of the EM conductor straddle this quartz vein. To the west near 40W the EM target is poorly conductive. To the east, at 200E, is an other conductor. This seems to indicate a sequence of events in this intrusive. First silica flooding, followed by intrusion of a more diverse chemical nature. The silica having sealed up the primary vents the subsequent activity has to shatter into a more brittle cap or divert around it. The second large quartz vein of over 1 meter width and showing vuggy crystalline quartz also shows a north strike. It overlooks Lightning Creek and lies north of the conductor that the grid follows. The quartz vein followed by the Dominion claims adit south of Lightning Creek was less than a foot wide with no gold values of assay at its portal its only merit compared to these veins was ease of access.

Of some interest is that the only placer mining along Jawbone Creek is on the east bank of the east branch where the outpourings of the mineralizing structure have enriched the weathered overburden.

GEOCHEM & GEOPHYSICS, JAWBONE CREEK BRYAN MULOIN

LOCAL GEOLOGY continued:

The 72C road from 12.5 km to 13.5 km exposes considerable outcrop allowing for some structural information to be observed. The schists are seen to have various shallow dipping orientation with several small tight folds. This does not seem to identify the lightning creek anticlinorium proposed by the more cursory explorers of this geology. This students experience has been in the Shield. There the processes seen around volcanic belts lead him to question the model of broad regional folding and faulting relied upon by these experts. Of interest are the two borrow pits excavated at 11.5 km and 11.8 km. They show quartz veining and general silicification at depth, 10 to 20 meters, that is not continuous to surface. When one realizes this is a mature weathered terrain, not deeply excavated by natures agencies through eons of time, there is significance to this observation. The processes of mountain building can be explained by other than great synclinal folding and valley scouring.

The orientation of jointing is dominantly 004 mag or 027 degrees and dips 82 degrees west. This is the "B" vein direction.

Excavation on the trench at 4400S, 130E seems to cross section a fumarolic vent expected to be the source of the weak magnetic structures followed in the magnetic study. A simple alteration pattern is associated with this vent. The trench is over 10 meters deep in what is essentially altered bedrock. The boulders seem to continue to depth. At present boulders exist only on the north side of the excavation with brown altered phyllite on the other three sides. Both gold and pyrite seem to increase with depth as tested by panning.

GEOPHYSICS

The present grid was initiated at 1675W on line "J" of a previous VLF reconnaissance grid. The base line is due magnetic north or 23 degrees east of true north. Numbering on the baseline is from 5000S at this point and follows along the VLF field strength maximum of the conductor.

The VLF conductive structure is continuous on or near the baseline for its entire length. It appears that the conductivity of the structure significantly drops off by about 4500S. North of this point the conductive nature of the structure appears to have transposed to both the east and west. Line extensions pick it up at about 200E. Exploration to the west is progressing. This bifurcation of the structure may indicate two cycles of intrusion, a primary one silica rich opening and initiating mineralization, and a secondary cycle in which a metallic rich injection occurs in selected channel ways.

Several alteration components of these intrusives are identifiable by geophysical means. The alteration can be divided into mineralogical, petrological, and shatter envelope components. The shatter envelope is the passages, plumbing, for alteration to develop in. With detailed study it is seen to have a fairly consistent pattern.

GEOCHEM & GEOPHYSICS, JAWBONE CREEK
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GEOPHYSICS cont.

A hint of the shatter envelope pattern is seen in the magnetometer survey, being irregular magnetic highs and lows flanking the EM conductor to the west and a fairly continuous but moderate high flanking on the east and uphill side of the conductor. The difference in the two flanking structures was dictated by the topography at the time of intrusion. This shows the terrain is mature and not heavily eroded since that time. The down hill side may be more interesting to the prospector. Here we are deeper into the shatter envelope where the focii of shear and tension stress form explosive venting passage ways. To identify this a closer grid spacing, 10 meters by 10 meters, was used. Detailed magnetometer surveys were paced in between lines.

To test the main structure, the VLF-EM conductor, several of these shatter cone, secondary zones, have been identified by magnetic surveys. The magnetometer gives structural detail on cloudless days. Clouds can cause reading drift of at least 20 gammas or more. This is not acceptable when the total range of the readings is 60 gammas.

The tension veins radiate laterally and parallel the intrusive, VLF-EM conductor. They show up as weak magnetic highs. There is also a pattern of oblique or shear fractures. Where these stress indicators focus is an area of intense shattering, the vent where the intrusive has released pressure. Depending on many complex factors these vents may be mineralized. On other prospects they have been seen to form dumbbell patterns or pairs straddling the intrusive. Because of the steepness of this hillside the uphill side was not tested assuming structural and geometric reasons for greater difficulty in identification.

Between 4230S and 4410S two parallel tension patterns are seen as the focii of venting. Chinese workings where the structure crosses the creek attest to this. These structures were not defined at their northern end. Complementary structures are suggested by more Chinese workings to the east.

The detailed magnetometer survey identifies the alteration pattern extending at least 400 meters east from its center. A regular pattern of oblique shears reticulate the survey. They focus on the most intense magnetic structure encountered in the Jawbone Creek area. Associated with this intense magnetic structure are: chloritic alteration, amygdular silicification along the road, and copper mineralization in the broken rock exposed by road building seen on line 4200S.

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GEOCHEMICAL TESTING

In '91 Warren Hunt requested that two of the shatter structures be tested by sampling of alder leaves. Two traverses were made then across magnetically defined structures. The assays are not spectacular for their values. They do seem to indicate gold concentration where they are near to the shatter structures interpreted from the magnetometer study. See figure 3 on the following page.

Subsequently 177 locations were tested. The samples were of one to two pounds in size. At some locations this defoliated all the alders. It took about an hour a pound to collect the samples. Assays are by the method ICP, induction coupled plasma emission spectrometry, for thirty elements with GF/AA for the gold. The studies all differ.

Limitations in alder leaf sampling were encountered with these studies. Alders do not grow every where in the area of interest. Presumably the presence of water controls their location. The '94 series were picked in July and the orientation survey was sampled in September '91. The '95 and '96 series were picked in August. There seems to be errors in adjustment of instrumentation too. In '94's study this is apparent in the elements potassium, chromium, and antimony. Changes are evident in either detection limits and analysis technique from year to year or regional variation for the elements: bismuth, cadmium, molybdenum, phosphorus, silver, and thorium. Calcium, is not so ambiguous in its variation. In this element regional variation seems to explain its higher concentrations through 4700S to 4500S where it is also associated with the magnetic structures.

Differing areas of the intrusive structure are being studied. The '94 area was fairly level and in an area east of intense silicification. The area tested in '95 is very steep and just west of the primary VLF structure because the silicification event was not as intense. The area tested in '96 joins up the two previous surveys and should indicate the transition between them. The '98 study straddles the '94 area with the intention that further work will proceed east ward towards interesting copper alteration.

A complex pattern of mineralization is evident. Similarity of metal distribution patterns for the elements indicates a primary mineralizing source is being examined. If this were a glacially distributed mineralization it would be expected that there would be a more random distribution of elements.

In an effort to prove this hypothesis the distribution patterns are presented:

Two north trending veins on the flanks of magnetic features, one through 5070S,20W to 4980S,10W identified by:

Arsenic, 93ppm @ 5070S,20W to 133ppm @ 5010S,30W

Barium, 302ppm @ 5040S,10W to 330ppm @ 4990S,20W

Cadmium, 0.7ppm @ 5060S,20W to 0.05ppm @ 4980S,30W

Gold, 7ppb @ 5060S,20W to 18ppb @ 5010S,20W

Lead, 10ppm @ 5060S,20W to 10ppm @ 5030S,20W to 6ppm @ 4970S,20W

Molybdenum, 5ppm @ 5060S,20W

Sodium, 0.03% @ 5060S,20W to 0.05% @ 4960S,40W

possibly aluminum, boron, chromium, copper, iron, lanthanum, magnesium, manganese, potassium, sodium, vanadium, and zinc, also indicate this vein like structure.

GEOCHEM & GEOPHYSICS, JAWBONE CREEK
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GEOCHEMICAL TESTING cont.

The second vein 5070S,50W to 4990S,70W identified by:

Arsenic, 182ppm @ 5070S,50W to 139ppm @ 5050S,50W to 260ppm @ 4990S,70W

Cadmium, 0.7ppm @ 5070S,50W to 0.7ppm @ 4990S,80W

Copper, 161ppm @ 5090S,40W to 168ppm @ 5060S,60W to 162ppm @ 5000S,80W

Lead, 10ppm @ 5060S,60W to 7ppm @ 4990S,80W

Nickel, 228ppm @ 5060S,60W to 183ppm @ 5000S,70W

Silver, detectable 5060S,60W to 4980S,100W

Sodium, 0.03% @ 5070S,50W to 0.02% @ 5030S,60W

possibly aluminum, antimony, boron, chromium, cobalt, lanthanum, manganese, sodium, thorium and vanadium also indicate this vein like structure.

At 5010S,40W a magnetically defined vein has associated high assays:

Arsenic, 133ppm @ 5010S,30W

Bismuth, 8ppm @ 5000S,40W

Copper, 124ppm @ 5010S,30W to 104ppm @ 4990S,40W

Manganese, 11578ppm or 1.15% @ 5000S,40W

Molybdenum, 2ppm @ 5000S,50W

Silver, 0.4ppm @ 4990S,40W

Thorium, 45ppm @ 5000S,40W

Uranium, 6ppm @ 5010S,40W to 7ppm @ 5000S,40W

possibly chromium, gold, lead, vanadium, and zinc.

At 4820S,80W a vent structure with associated shafts and wash at 4800S,60W dug by placer miners has high assays:

Arsenic, 174ppm @ 4830S,70W

Bismuth, 9 and 10ppm in the wash on line 4800S and 6ppm @ 4830S,70W

Cobalt, 17ppm @ 4830S,70W

Copper, 204ppm @ 4830S,70W

Lanthanum, 5 and 6ppm in the wash on line 4800S

Manganese, 18662ppm or 1.87% @ 4800S,70W

Uranium, 6 and 7ppm in the wash on line 4800S

Vanadium, detectably present

Thorium, 58 and 46ppm in the wash on line 4800S

possibly iron, strontium,

Nickel, 449ppm @ 4560S,BL and 429ppm @ 4510S,BL. along the baseline and with similar values to the south suggest a mafic dyke along an axial plane cleavage above the intrusive structure.

Cobalt, 82ppm @ 4670S,20W and 33ppm @ 4560S,BL

Possibly arsenic, chromium, and iron.

GEOCHEM & GEOPHYSICS, JAWBONE CREEK
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GEOCHEMICAL TESTING cont.

Two parallel NE trending veins associated with the mag structures one from 4600S,BL through 4520S,80E identified by:

Antimony, just detectable, identifies this vein.

Arsenic, 353ppm @ 4560S,BL to 371ppm @ 4550S,20E to 388ppm @ 4480S, 90E

Calcium, to 25ppm plus along 4560S,10E to 4490S,90E

Cobalt, 19ppm @ 4580S,10E to 18ppm @ 4470S,80E to 6ppm @ 4430S, 190E

Copper, 192ppm @ 4580S,10E to 163ppm @ 4490S,70E to 157ppm @ 4470S,80E to 116ppm @ 440S,150E

Lead, 28ppm @ 4580S,10E to 12ppm @ 4460S,90E

Molybdenum, 2ppm @ 4580S,20E

Zinc, 1213ppm @ 4580S,10E to 1203ppm @ 4520S,60E

Possibly iron, nickel, magnesium, and manganese.

The second parallel NE trending vein associated with the mag structures from 4510S,BL through 4400S,90E identified by:

Arsenic, 126ppm @ 4510S,BL to 221ppm @ 4460S,20E to 117ppm @ 4420S,100E

Bismuth, just detectable, identifies this vein.

Chromium, 12ppm @ 4510S,BL to 19ppm @ 4420S,80E

Cobalt, 10ppm @ 4510S,BL to 40ppm @ 4470S,50E to 13ppm @ 4400S,100E

Copper, 220ppm @ 4510S,BL to 125ppm @ 4400S,100E

Gold, 40ppm @ 4510S,BL

Lead, 11ppm @ 4510S,BL to 10 ppm @ 4420S,100E

Molybdenum, 2ppm @ 4460S,20E to 6ppm @ 4420S,80E to 5ppm @ 4410S,90E

Zinc, 1070ppm @ 4510S,BL to 1107ppm @ 4470S,50E to 806ppm @ 4400S,100E

Possibly iron, nickel, manganese.

A NW/SE texture through the area from 4200S to 4600S is pronounced by barium, 639ppm @ 4480S,50E to 625ppm @ 4520S,80E. It is evident in arsenic, barium, cadmium, gold, lead, strontium, and uranium, and possibly present in phosphorus. In this area we approach the south end of the silica flooding.

The following is an analysis by element presented in the same order as the assay sheets:

Molybdenums distribution is subdued, it has low but essential biological usage in nitrogen metabolism. There seems to be a change in analysis detection characteristics over the three years of this survey. The strongest values are associated with magnetic features at 5050S and 4400S. The known relationship of copper and molybdenum is evident in this study but there is an offsetting or adjacent character to be seen in it.

Copper patterns correspond to the magnetics in all three parts of this study. Both high values 204ppm at 4830S, 70W, and 220ppm at 4510S, BL are on magnetic highs and have placer miner activity near them suggesting its correlation with gold.

GEOCHEM & GEOPHYSICS, JAWBONE CREEK
BRYAN MULOIN

GEOCHEMICAL TESTING cont.

Leads highest analysis 28ppm is not significantly high in comparison to other biochemical studies where means run 50 to 80ppm. This may be a characteristic of alder in not taking up much lead generally a toxic substance.

Zinc is an essential metabolic nutrient, its presence in alder leaves is responsive to many factors including drainage, available sunlight, and plant health.

Silver was more variable and expressed identifiable trends in '94s study. It seems the assay detection limits have changed. The high 5ppm value at 4210S,160E on the continuation of a magnetic structure is significant. Silver normally runs less than 1ppm in plant material.

Nickel has a reasonably high response as a biological assay.

Cobalt is an essential element biologically as it is present in vitamin B12, cyanocobalamine. The 82ppm at 4670S,20W is exceptionally high as with other values such as 49, or 33ppm.

Manganese follows the concentration patterns of the other elements in their evident relationship to the magnetic features. Alder may have a natural affinity to this element as the values are exceedingly high. At 4460S, 50E, 57,541ppm is equivalent to 5.75% manganese in the plant tissues. Manganese seems to be an important element of the alteration pattern of the structure.

Iron has a similar pattern like the other elements in their evident relationship to the magnetic features.

Arsenic values are high for organic matter, alder may have a high tolerance for this essential but toxic substance.

Uranium shows distinct zoned concentrations in all three years and areas. Its assay is also quite high for plant material a possible feature of alder. Proximity to the silica dome and axis was suggested as a control to its occurrence.

Thorium does not respond above the detection limit in this years and 1994's samples though in 1995 it did. This probably is due to changes in the analysis technique. It did show correlation with uranium, manganese, strontium, and bismuth, at 5000S, 40W and 4800S, 50W to 70W, a placer miners flumed wash.

Strontium is only nominally significant. It is biologically active supposibly replacing calcium. Its concentration from 4800S to the high value 1959ppm, at 4680S,20W adjacent to a magnetic structure compares well with the results of Dunn etal. They had 2300ppm from pine bark adjacent to the MBX. It also seems to indicate the NW/SE pattern, particularly at 4300S much like gold, arsenic, lead, and uranium.

Cadmium concentrates near the magnetic features the highest value 3.4ppm at 4620S,10E is on one. The assays are low as compared to the results of Dunn etal., possibly alder does not mobilize this element.

Antimony is assayably present and shows zoned concentrations related to the magnetic structures in this years sample set. The detection limit of the ICP method is too high to monitor the range of this element catching only anomalously high values, 3 and 4ppm.

GEOCHEM & GEOPHYSICS, JAWBONE CREEK
BRYAN MULOIN

GEOCHEMICAL TESTING cont.

Bismuth assays low in the 1996 sample set. This may be another expression of the offsetting pattern associated but mutually exclusive to the other mineralization. Where assays are generally higher for most elements in this area bismuth assays low.

Vanadium should be assayable, 20 ppm is expectable in most plant tissues. The two explanations as to why it is not identified in this survey are assay precision or that alder does not take this element up.

Calcium, present in high percentage values is also in zoned concentrations. In this element regional variation seems to explain its higher concentrations through 4700S to 4500S where it is also associated with the magnetic structures. High value 29.4% at 4680S,10W and 25% plus along 4560S,10E to 4490S,90E. Other elements: bismuth, boron, cadmium, molybdenum, phosphorus, silver, and thorium are ambiguous as to whether it is regional or changes in detection limits and analysis technique from year to year.

Phosphorus is present in high percentage values. It shows zoned concentrations with '94's study area showing assays to 6.6%. It is difficult to be sure if this is a regional or analysis technique variation. Like gold, arsenic, lead, and uranium it seems to indicate a NW/SE pattern. This characteristic is seen from 5100S to 4200S.

Lanthanum is assayably present and shows zoned concentrations related to magnetic and other identified structures. The detection limit of the ICP method is too high to monitor the range of this element catching only anomalously high values, 3 and 4ppm. The values: 8ppm at 4360S,180E; 7ppm at 5060S, 60W; and 5 and 6ppm along 4800S are interestingly high.

Chromium assays are low relative to general abundances. The high values follow specific magnetic features though.

Magnesium, present in high percentage values is plotted for completeness. It shows zoned concentrations around identified features.

Barium appears to decrease towards the south over the three sample sets. It shows zoned concentrations, particularly at 4500S, 60E.

Boron is zonally concentrated. It is ambiguous as to whether regional variation or changes in detection limits and analysis technique from year to year are indicated. Boron is an essential biological element.

Aluminum assays are low relative to general abundances. It appears to be zonally concentrated. The 0.64% @ 4670S,20W is interesting as this location is anomalous for other elements.

Sodium, present in high percentage values is plotted for completeness. It too shows zoned concentrations.

Potassium, present in high percentage values is plotted for completeness. It too shows zoned concentrations.

Gold, the primary interest, highest concentration to date, 40ppb at 4510S, BL, central to a magnetic structure. This compares favourably with the survey results of C.E. Dunn et al. over the Mt. Milligan MBX zone.

GEOCHEM & GEOPHYSICS, JAWBONE CREEK
BRYAN MULOIN

CONCLUSIONS AND RECOMMENDATIONS

The distribution patterns developed in the geochemical study identify small vein structures, and that this is a residual soil that is being tested. The bedrock topography of this hill side is more rugged than the soil surface. It is between 20 to 30 feet to these veins judging from the magnetometer survey. The range in bedrock topography can be seen in the quartz veining which stands high and exposes above the soil surface. Metallic veins can be expected to weather deeply. Fumarolic sources of metal are likely to be very deep fissures.

BRYAN T. MULOIN, GEOLOGIST

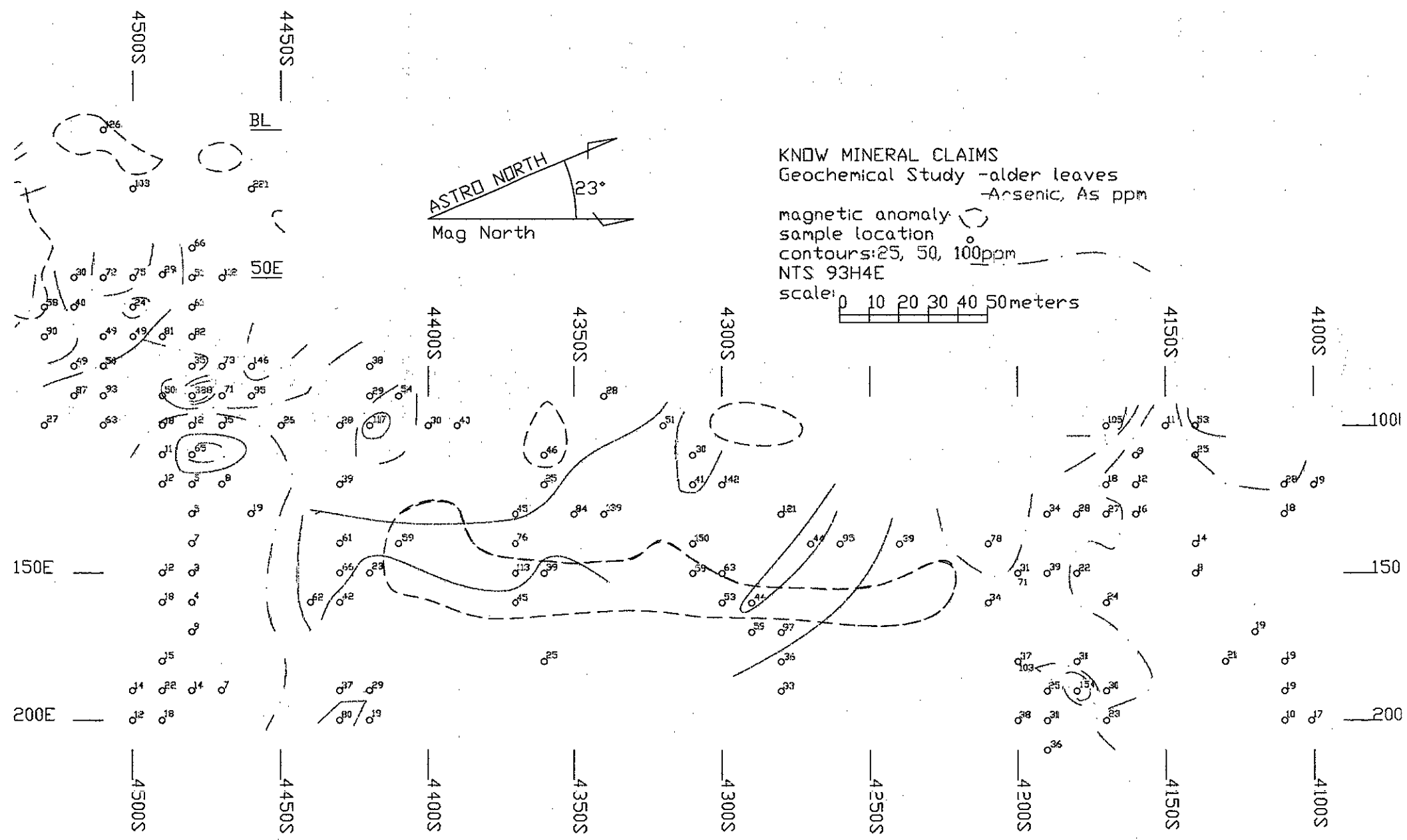
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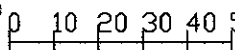
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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%	ppm	ppm	%	ppm	%	%	%	%	%	ppm	ppb	gm	gm
4420S 200E	1	80	7	514	.6	62	8	3850	.06	19	<8	<2	<2	969	.5	<3	<3	1	19.39	1.755	<1	1	5.26	1096	<.01	95	.08	.01	8.77	<2	5	5.7	230
4460S 130E	1	71	5	419	.3	30	5	8249	.08	19	<8	<2	<2	729	.7	<3	<3	<1	19.00	2.042	<1	1	5.58	963	<.01	250	.04	.01	9.35	<2	1	5.6	230
4470S 100E	<1	78	8	576	.3	24	4	4320	.12	15	8	<2	<2	660	.6	<3	<3	1	18.43	2.453	<1	2	4.88	1052	<.01	124	.03	.01	10.18	<2	2	4.9	230
4470S 120E	<1	82	3	695	<.3	54	4	8607	.11	8	<8	<2	<2	632	.8	<3	<3	<1	16.42	2.456	<1	2	4.09	1401	<.01	213	.03	.01	11.28	<2	3	5.6	230
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4480S 100E	<1	74	6	563	<.3	42	3	2727	.09	12	15	<2	<2	753	.9	<3	<3	1	19.90	2.535	<1	1	5.88	1242	<.01	132	.03	.01	8.98	<2	6	4.9	230
4480S 110E	<1	79	5	812	<.3	28	2	7636	.10	65	<8	<2	<2	667	.6	<3	<3	<1	19.09	2.545	<1	2	4.16	843	<.01	216	.04	.01	9.99	<2	2	5.3	230
4480S 120E	1	80	5	786	<.3	24	3	7421	.10	5	<8	<2	<2	614	.4	<3	<3	<1	19.76	2.558	<1	2	4.17	794	<.01	251	.05	.01	9.22	<2	1	5.2	230
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RE 4490S 160E	<1	69	4	510	<.3	60	3	2843	.08	17	<8	<2	<2	757	.5	<3	<3	<1	20.40	2.233	<1	2	5.11	624	<.01	93	.03	.01	8.05	<2	2	-	-
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STANDARD C3/AU-S	24	62	35	153	5.2	35	11	729	3.19	55	18	2	21	29	22.0	16	21	78	.54	.085	18	163	.58	148	.09	20	1.90	.04	.17	15	45	-	-
STANDARD G-2	1	3	3	37	<.3	7	3	480	1.84	<2	<8	<2	5	89	<.2	<3	<3	38	.62	.086	8	71	.54	236	.12	<3	1.15	.15	.53	2	<1	-	-

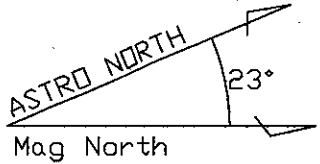
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KNDW MINERAL CLAIMS
 Geochemical Study -alder leaves
 -Arsenic, As ppm

magnetic anomaly 
 sample location 
 contours: 25, 50, 100 ppm

NTS 93H4E
 scale:  0 10 20 30 40 50 meters



BL

50E

150E

200E

100

150

200

4500S

4450S

4500S

4450S

4400S

4400S

4350S

4350S

4300S

4300S

4250S

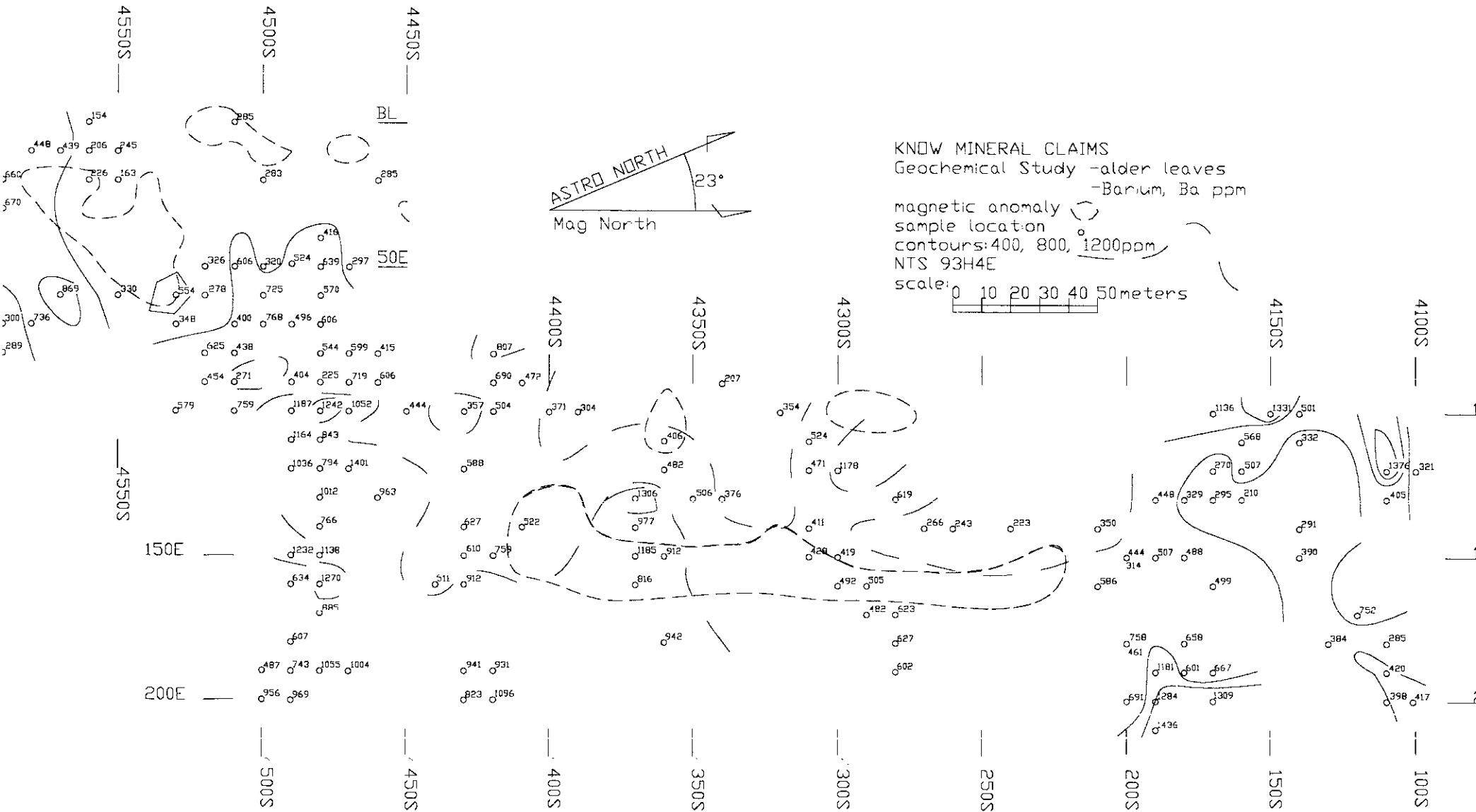
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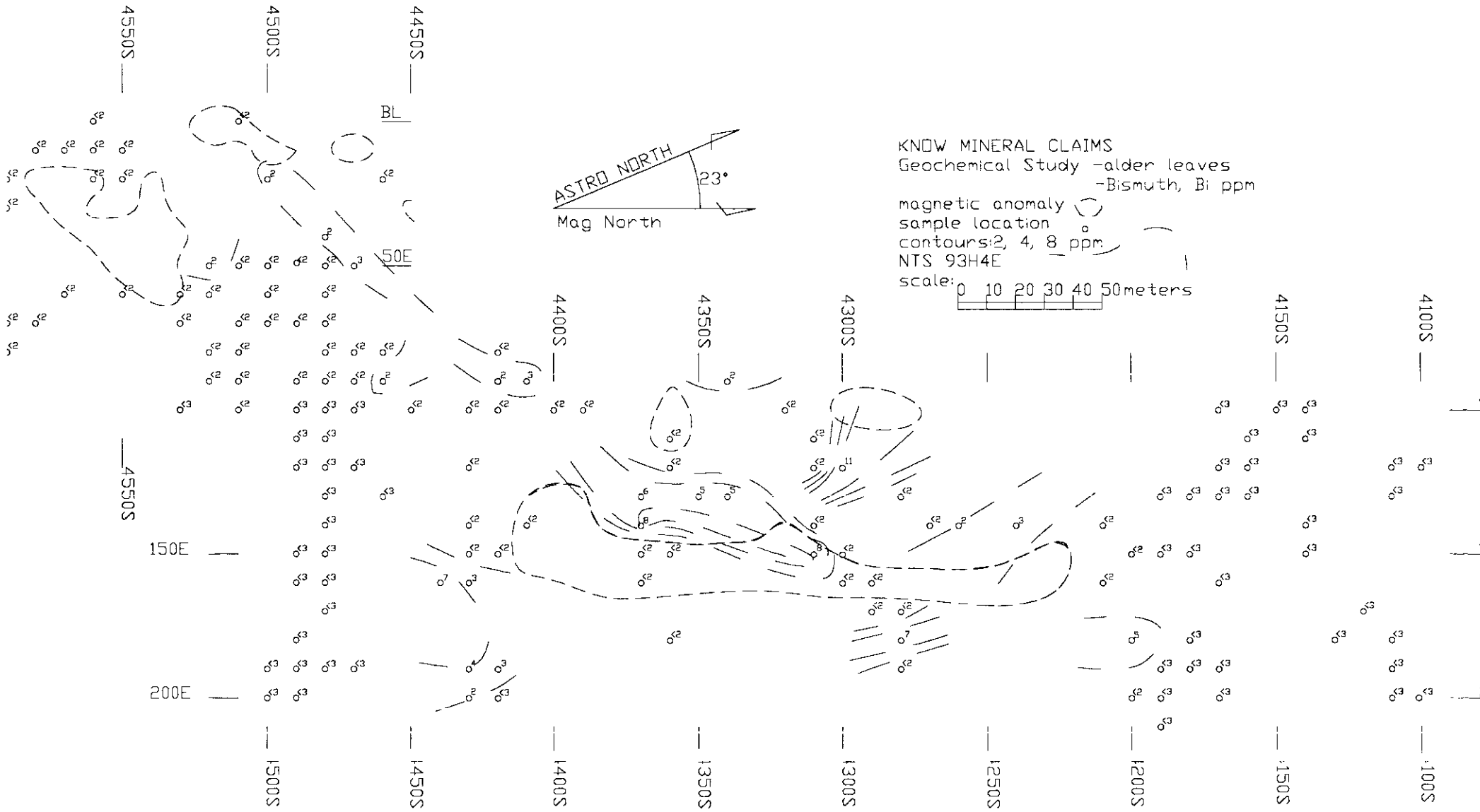
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4100S

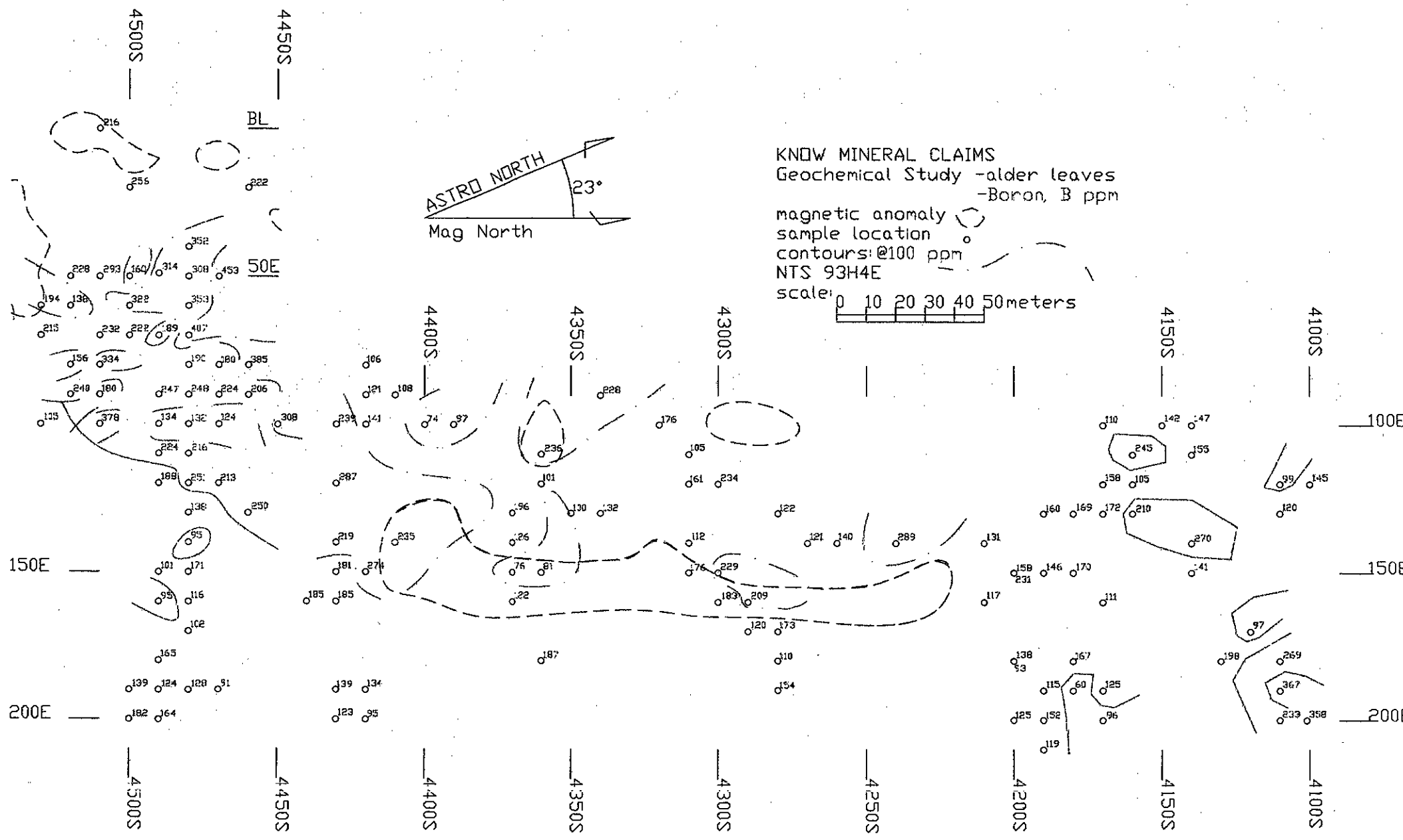
4100S



KNOW MINERAL CLAIMS
 Geochemical Study -alder leaves
 -Barium, Ba ppm
 magnetic anomaly
 sample location
 contours: 400, 800, 1200ppm
 NTS 93H4E
 scale: 0 10 20 30 40 50 meters



KNOW MINERAL CLAIMS
 Geochemical Study -alder leaves
 -Bismuth, Bi ppm
 magnetic anomaly (shaded area)
 sample location (circle)
 contours: 2, 4, 8 ppm
 NTS 93H4E
 scale: 0 10 20 30 40 50 meters

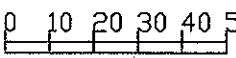
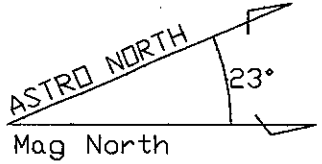


KNOW MINERAL CLAIMS

Geochemical Study -alder leaves
-Boron, B ppm

magnetic anomaly
sample location
contours: @100 ppm
NTS 93H4E

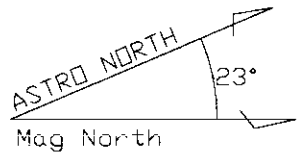
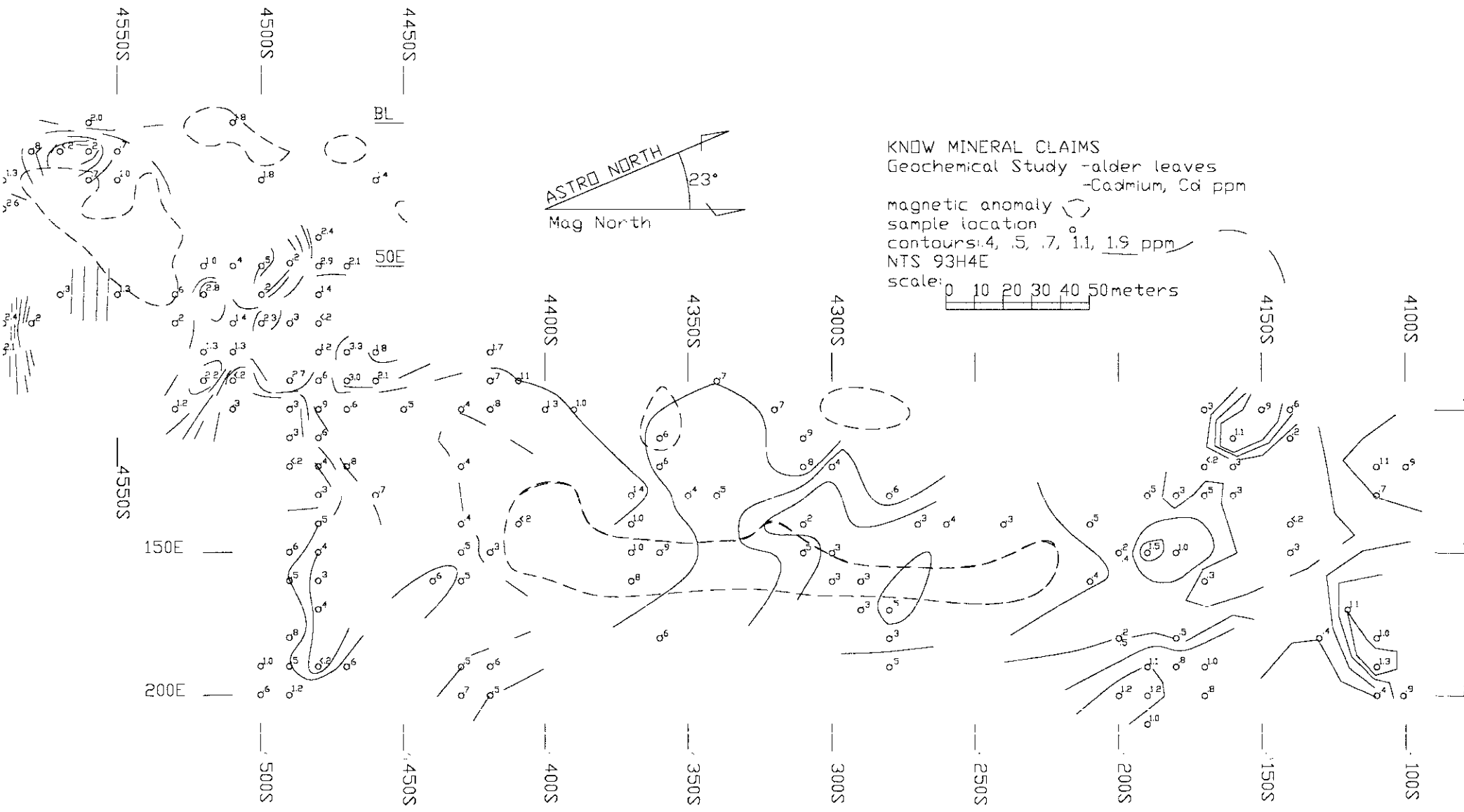
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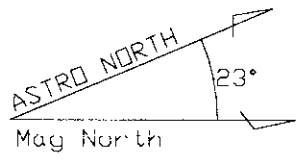
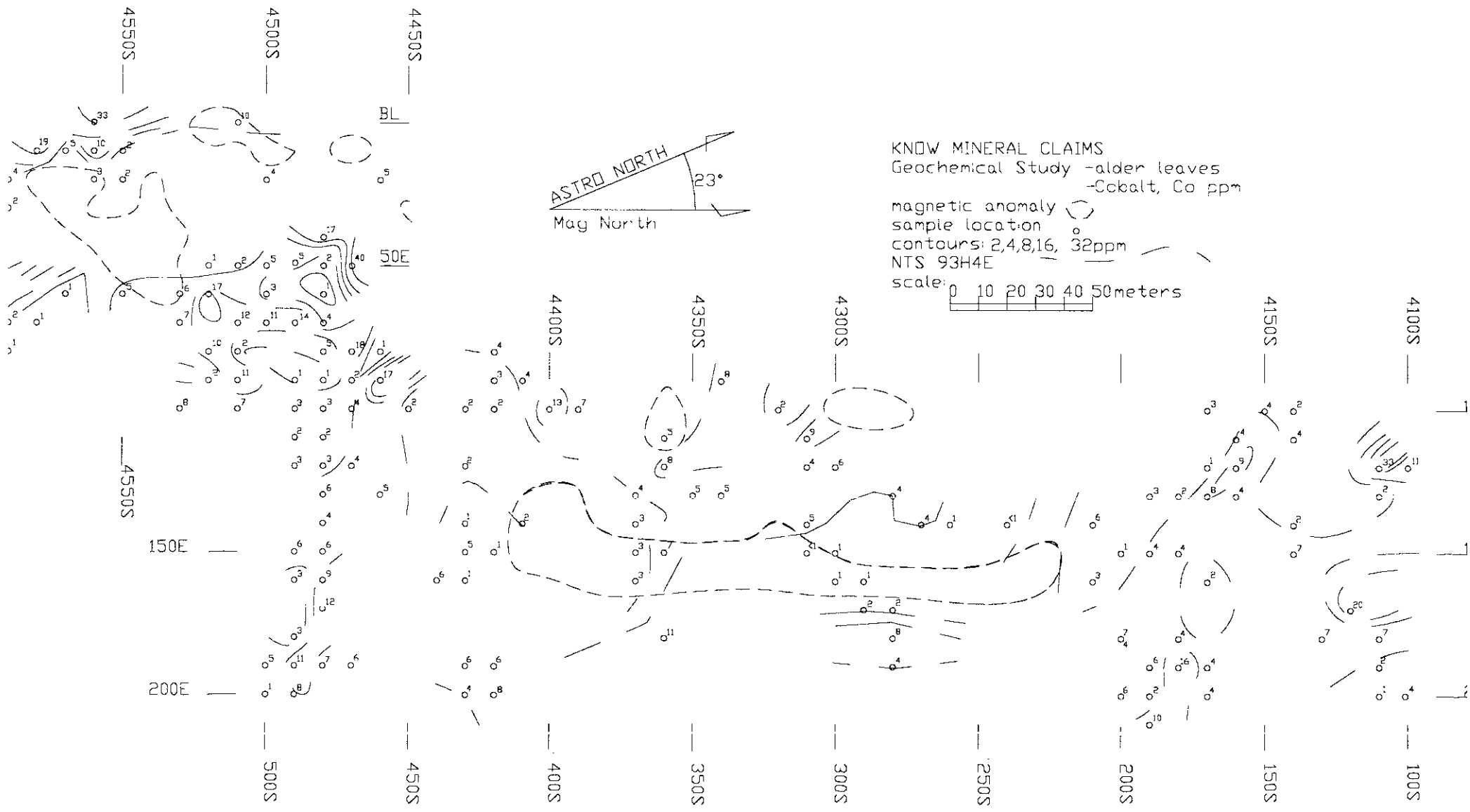
4500S
4450S
BL
50E
150E
200E
4500S
4450S

4400S
4350S
4300S
4400S
4350S
4300S
4250S
4200S
4150S
4100S

4150S
4100S
100E
150E
200E
4150S
4100S



KNOW MINERAL CLAIMS
 Geochemical Study -alder leaves
 -Cadmium, Cd ppm
 magnetic anomaly ()
 sample location (o)
 contours: .4, .5, .7, 1.1, 1.9 ppm
 NTS 93H4E
 scale: 0 10 20 30 40 50 meters



KNOW MINERAL CLAIMS
 Geochemical Study -alder leaves
 -Cobalt, Co ppm

magnetic anomaly (---)
 sample location (o)

contours: 2,4,8,16, 32ppm
 NTS 93H4E

scale: 0 10 20 30 40 50 meters

4450S
 4500S
 4550S

BL
 50E
 150E
 200E

4550S

4500S
 4450S

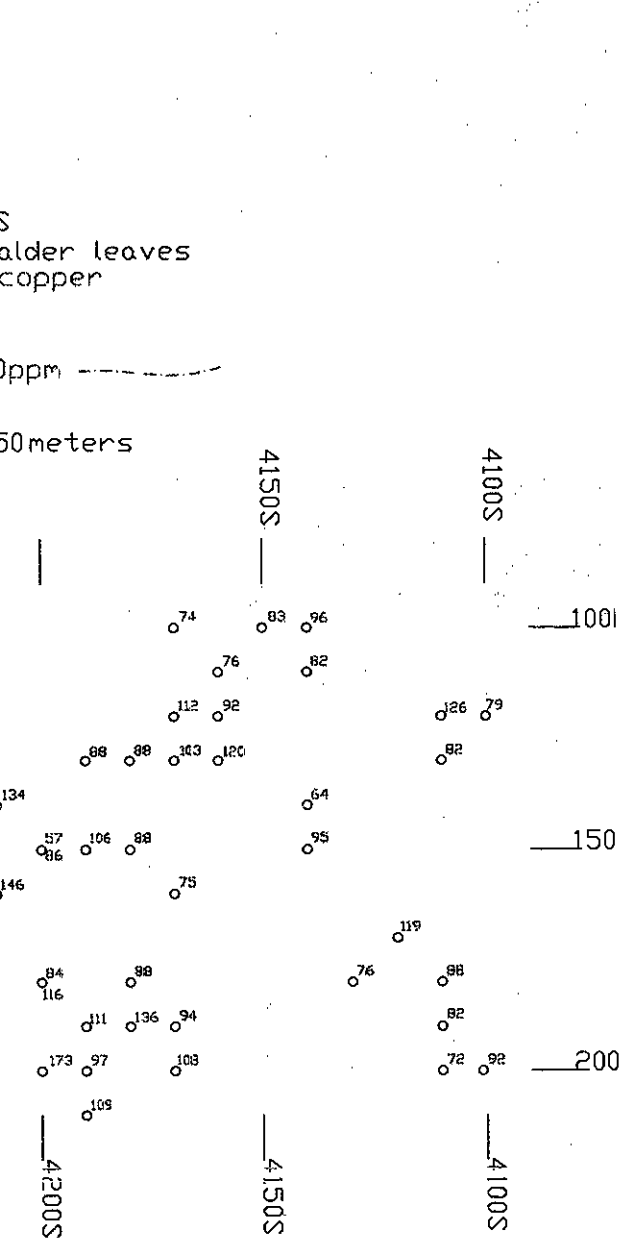
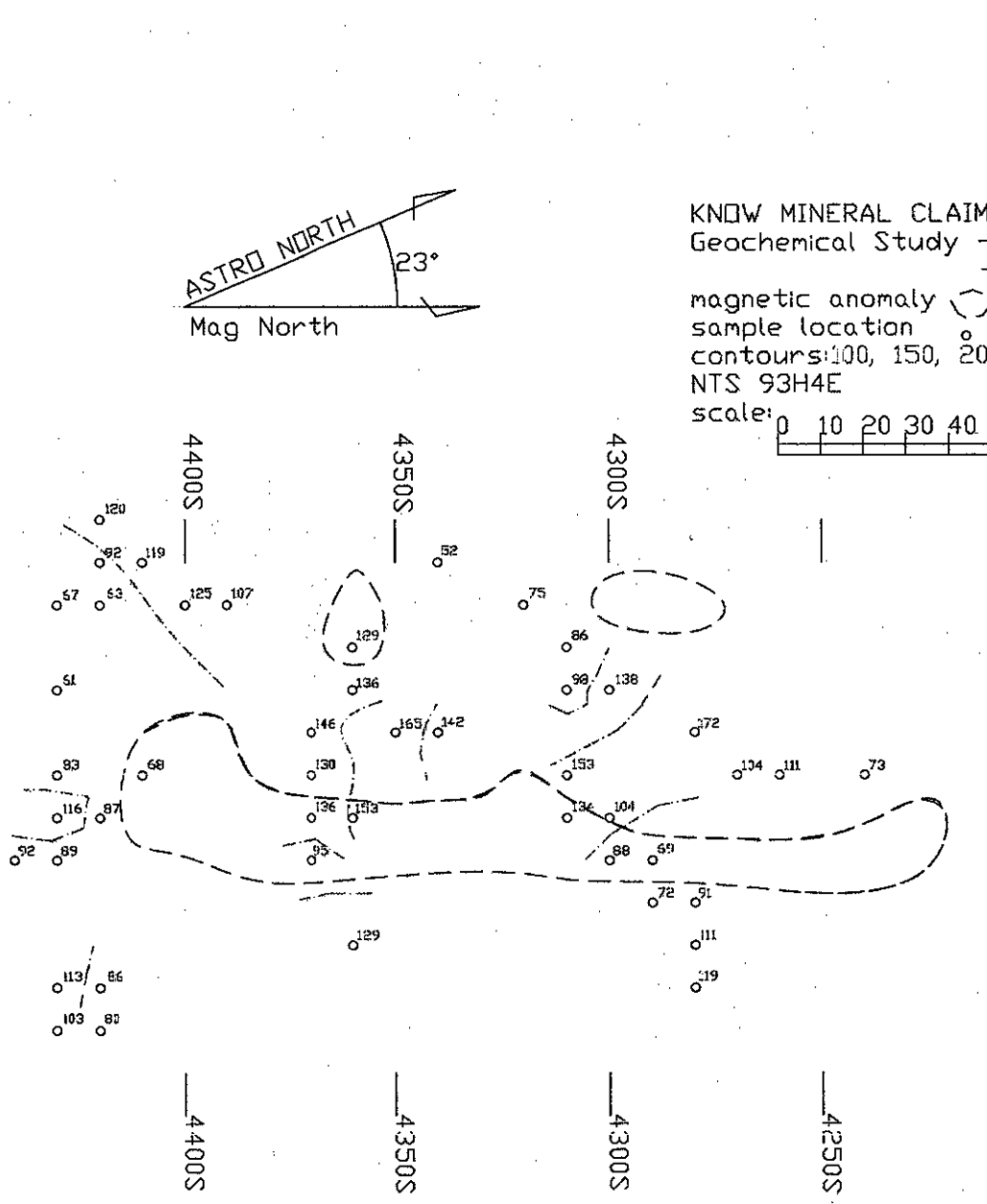
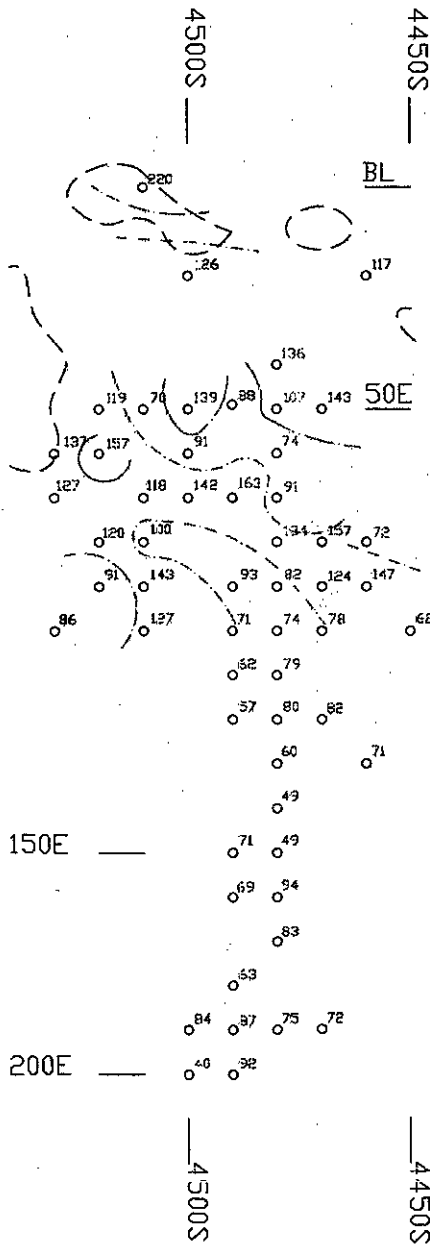
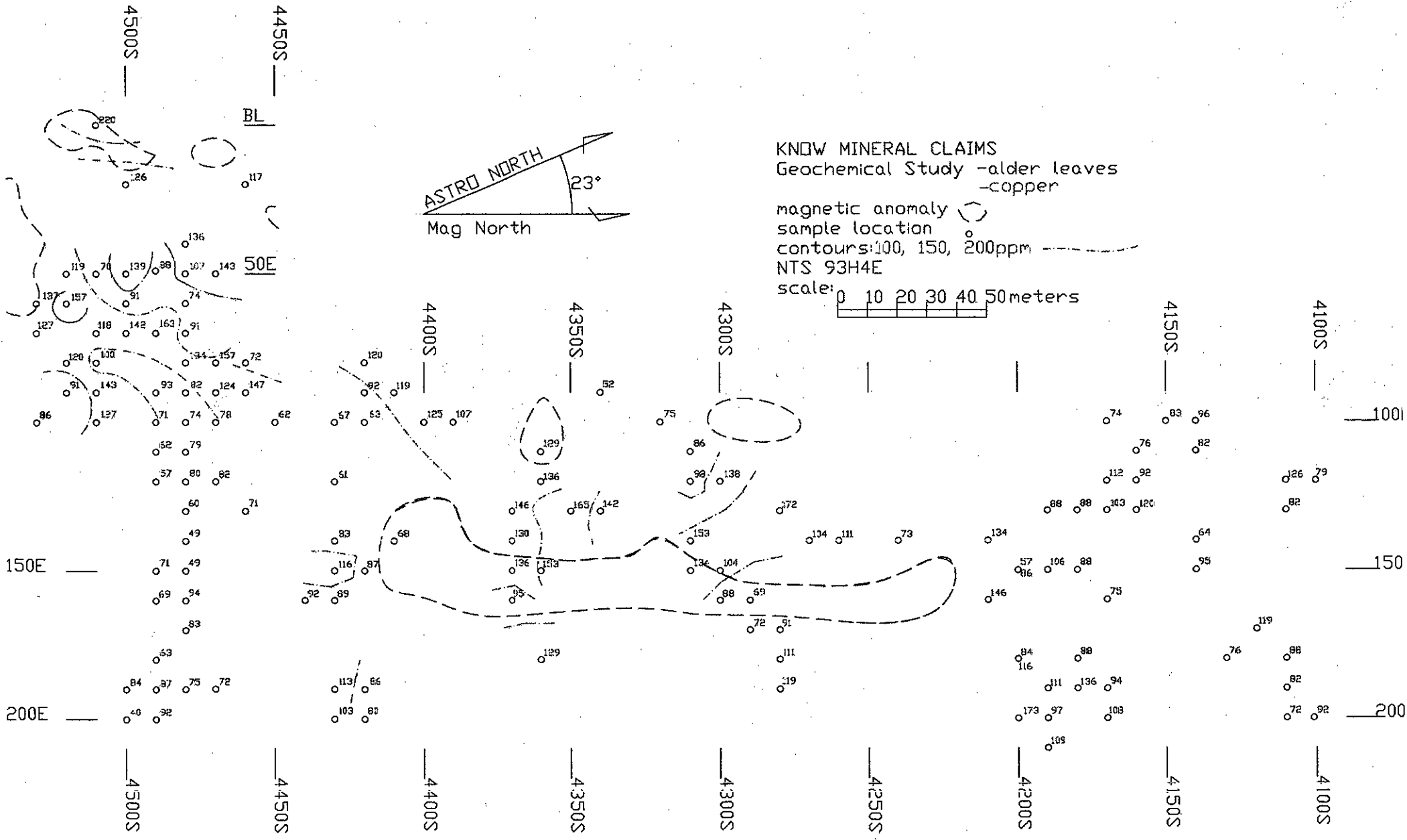
4400S
 4350S
 4300S

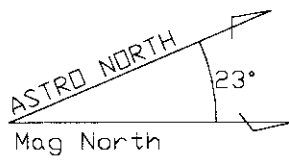
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 4350S
 4300S
 4250S

4150S
 4100S



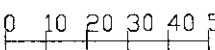
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 4100S

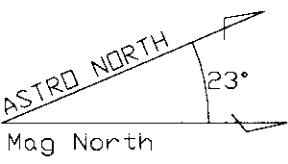
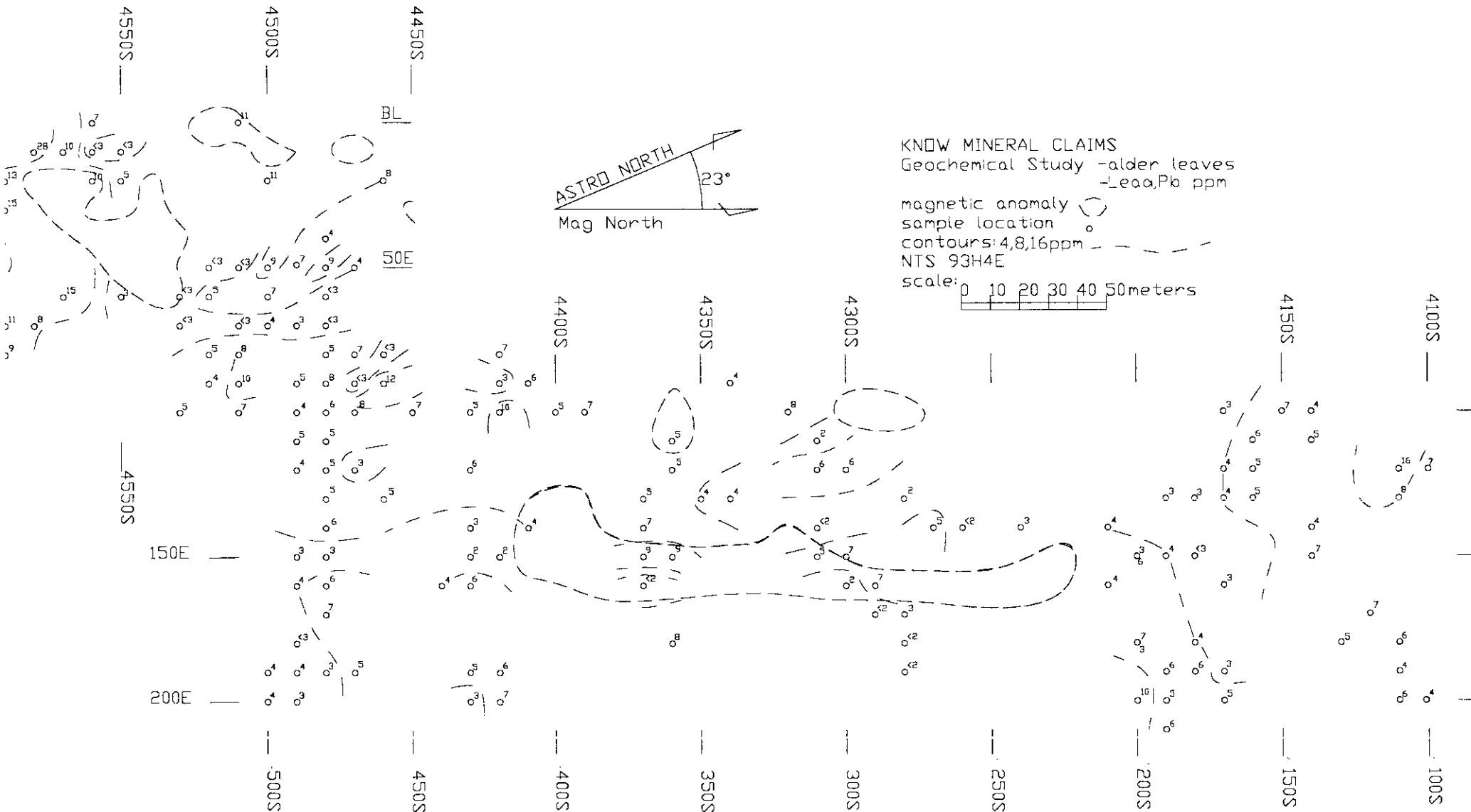
4500S
 4450S
 4400S
 4350S
 4300S
 4250S
 4200S
 4150S
 4100S





KNOWN MINERAL CLAIMS
 Geochemical Study -alder leaves
 -Gold, Au ppm

magnetic anomaly 
 sample location 
 contours: 2, 4, 8, 16, 32ppm
 NTS 93H4E
 scale: 



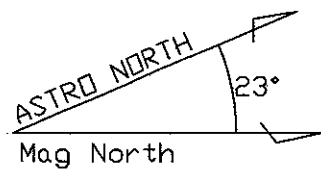
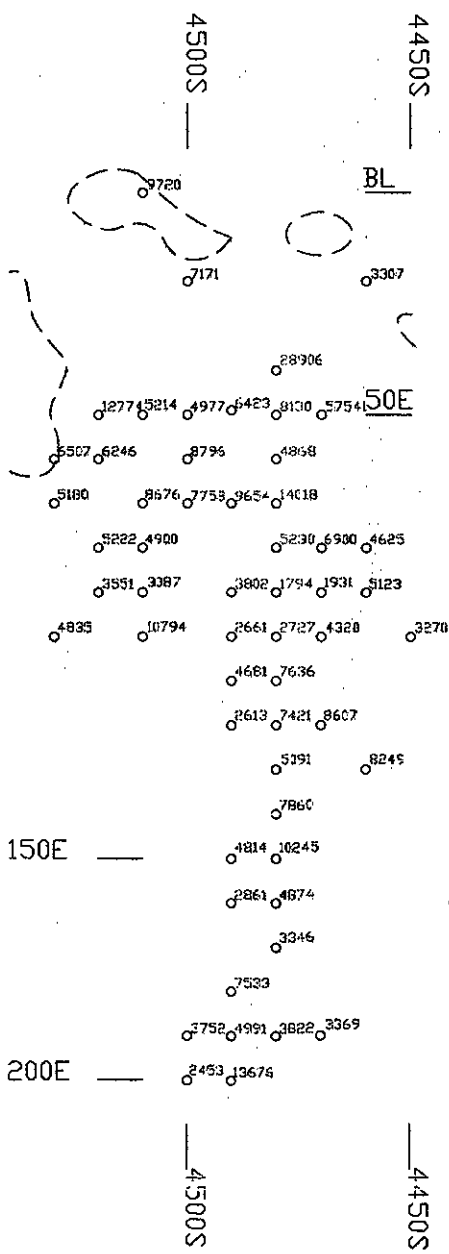
KNOWN MINERAL CLAIMS
Geochemical Study -alder leaves
-Lead,Pb ppm

magnetic anomaly (dashed line)
sample location (circle)
contours: 4,8,16ppm
NTS 93H4E
scale: 0 10 20 30 40 50 meters

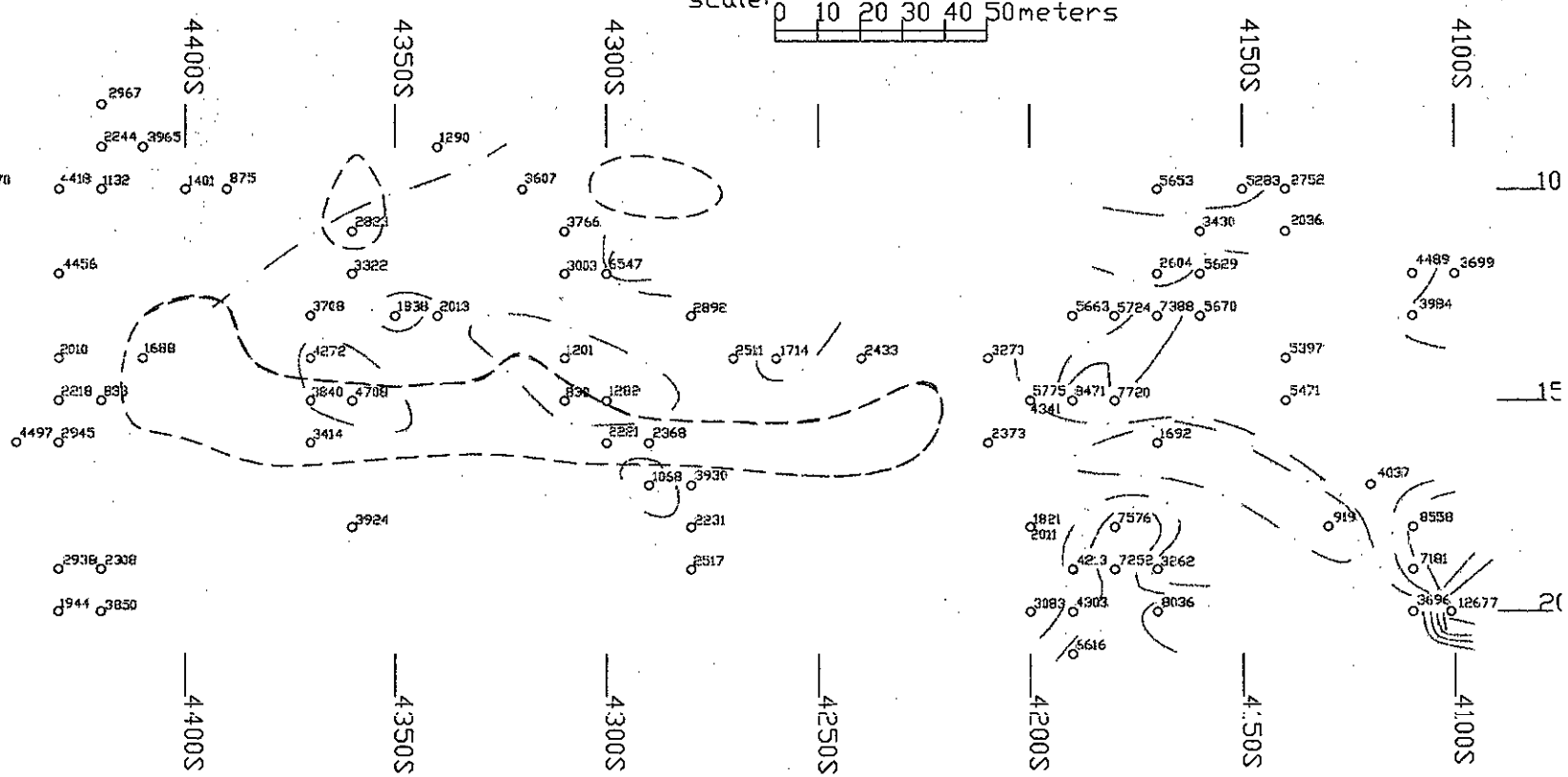
4550S
4500S
4450S
BL
50E
4550S
150E
200E
500S
450S

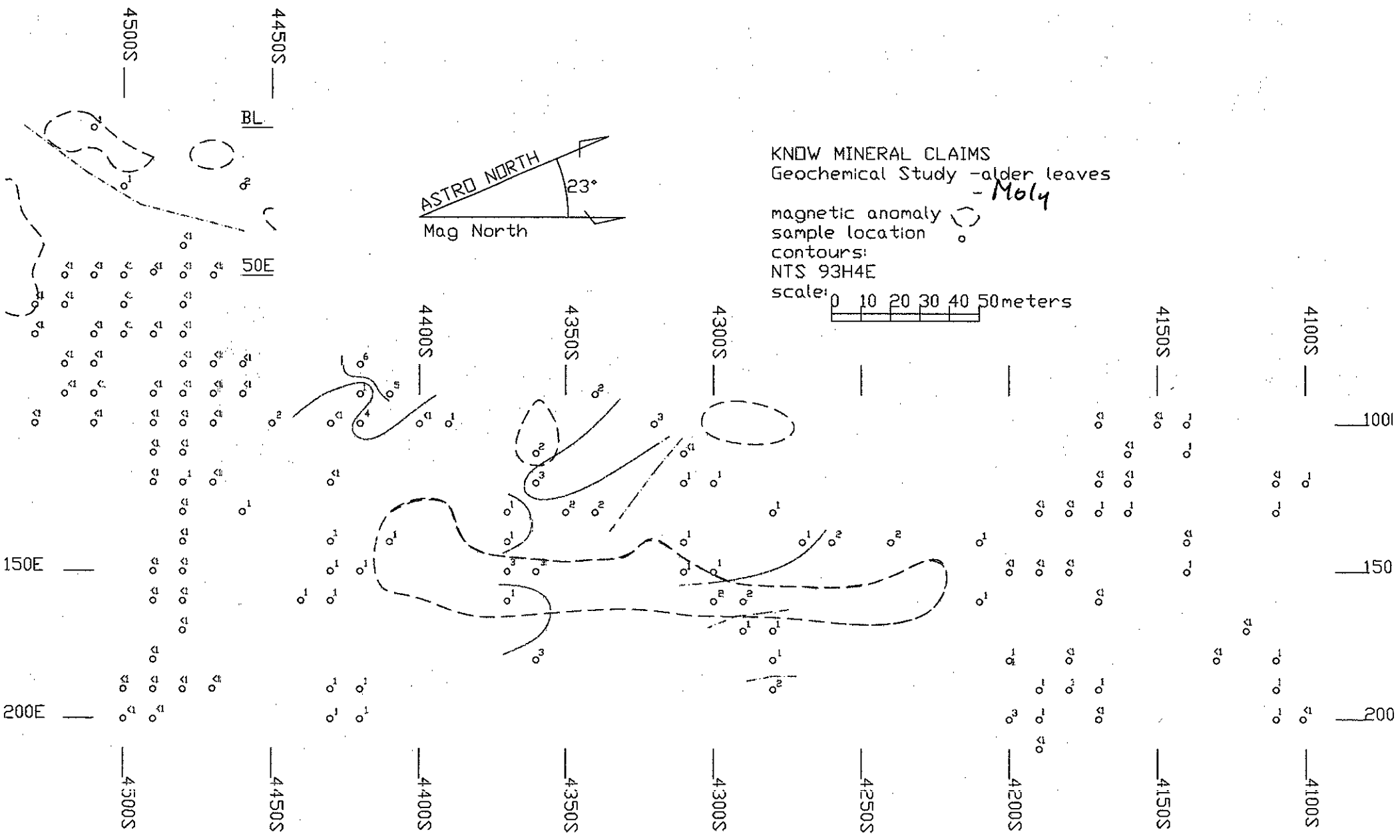
4400S
4350S
4300S
400S
350S
300S
250S

4150S
4100S
150S
100S



KNOW MINERAL CLAIMS
 Geochemical Study -alder leaves
 -Manganese, Mn ppm
 magnetic anomaly
 sample location
 contours: @2000 ppm
 NTS 93H4E
 scale: 0 10 20 30 40 50 meters

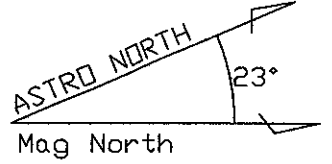




KNOW MINERAL CLAIMS
 Geochemical Study - alder leaves
 - Moly

magnetic anomaly
 sample location
 contours:
 NTS 93H4E

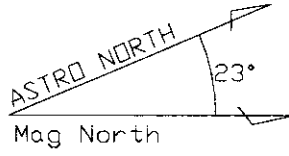
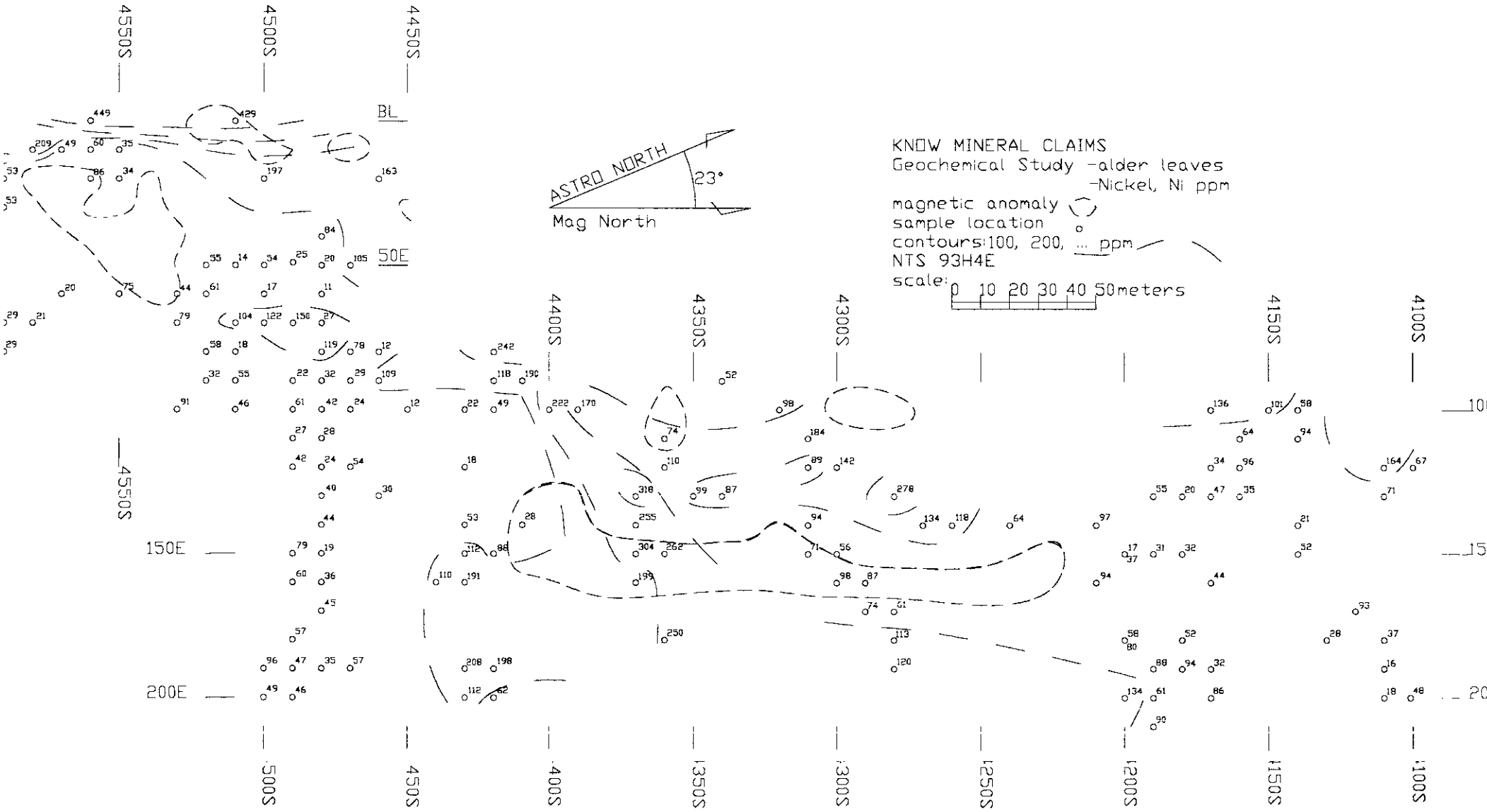
scale: 0 10 20 30 40 50 meters



4500S
 4450S
 BL
 50E
 150E
 200E
 4500S
 4450S

4400S
 4350S
 4300S
 4250S
 4200S
 4400S
 4350S
 4300S
 4250S
 4200S

4150S
 4100S
 100
 150
 200
 4150S
 4100S



KNOW MINERAL CLAIMS
 Geochemical Study -alder leaves
 -Nickel, Ni ppm
 magnetic anomaly
 sample location
 contours: 100, 200, ... ppm
 NTS 93H4E
 scale: 0 10 20 30 40 50 meters

4550S

4500S

4450S

BL

50E

4550S

150E

200E

500S

450S

400S

350S

300S

250S

200S

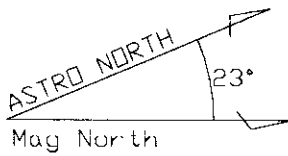
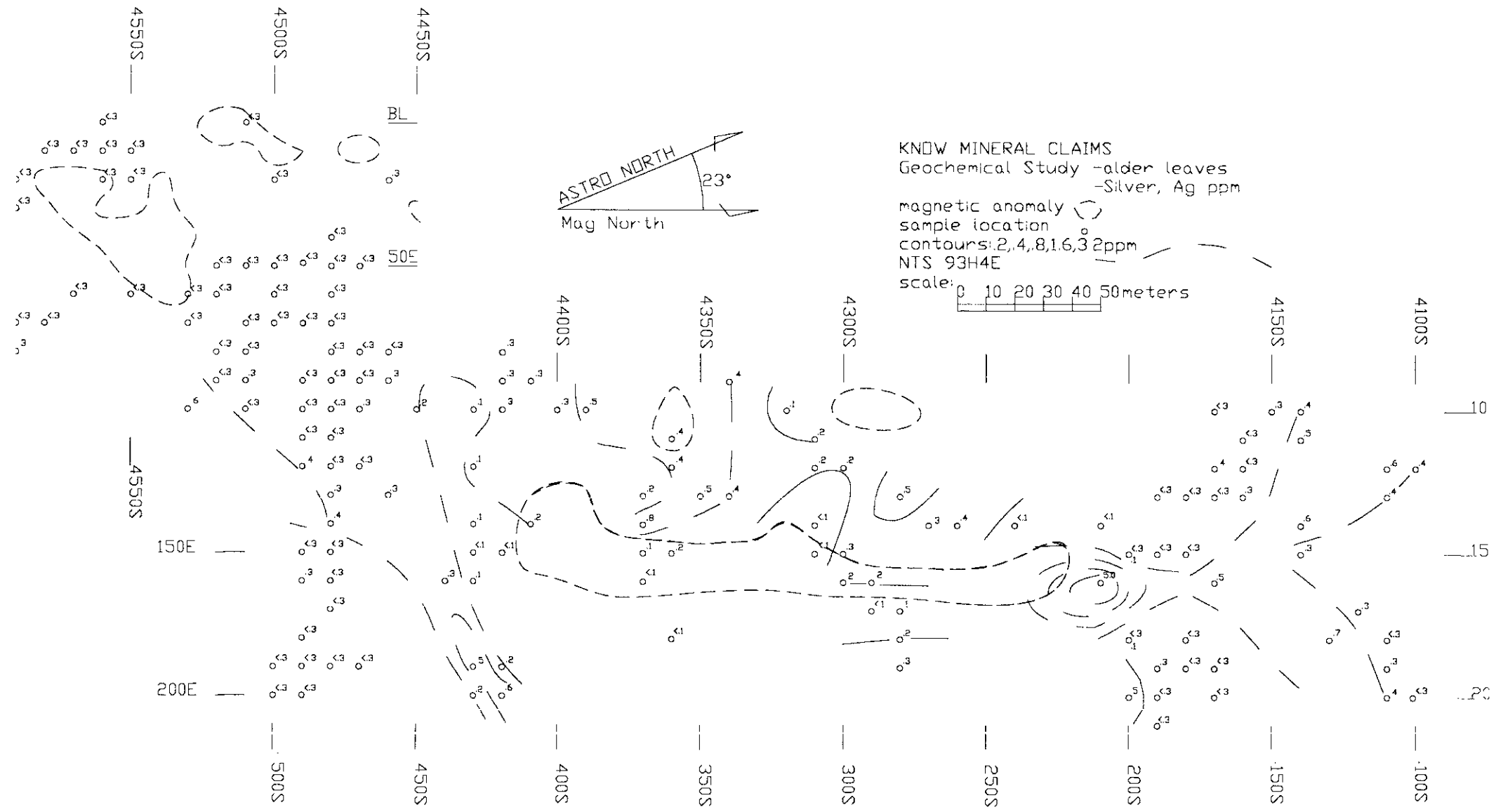
150S

100S

100

150

200



KNOW MINERAL CLAIMS
 Geochemical Study -alder leaves
 -Silver, Ag ppm
 magnetic anomaly
 sample location
 contours: 2, 4, 8, 1.6, 3, 2 ppm
 NTS 93H4E
 scale: 0 10 20 30 40 50 meters

4550S

4500S

4450S

BL

50E

4550S

150E

200E

500S

450S

400S

350S

300S

250S

200S

150S

100S

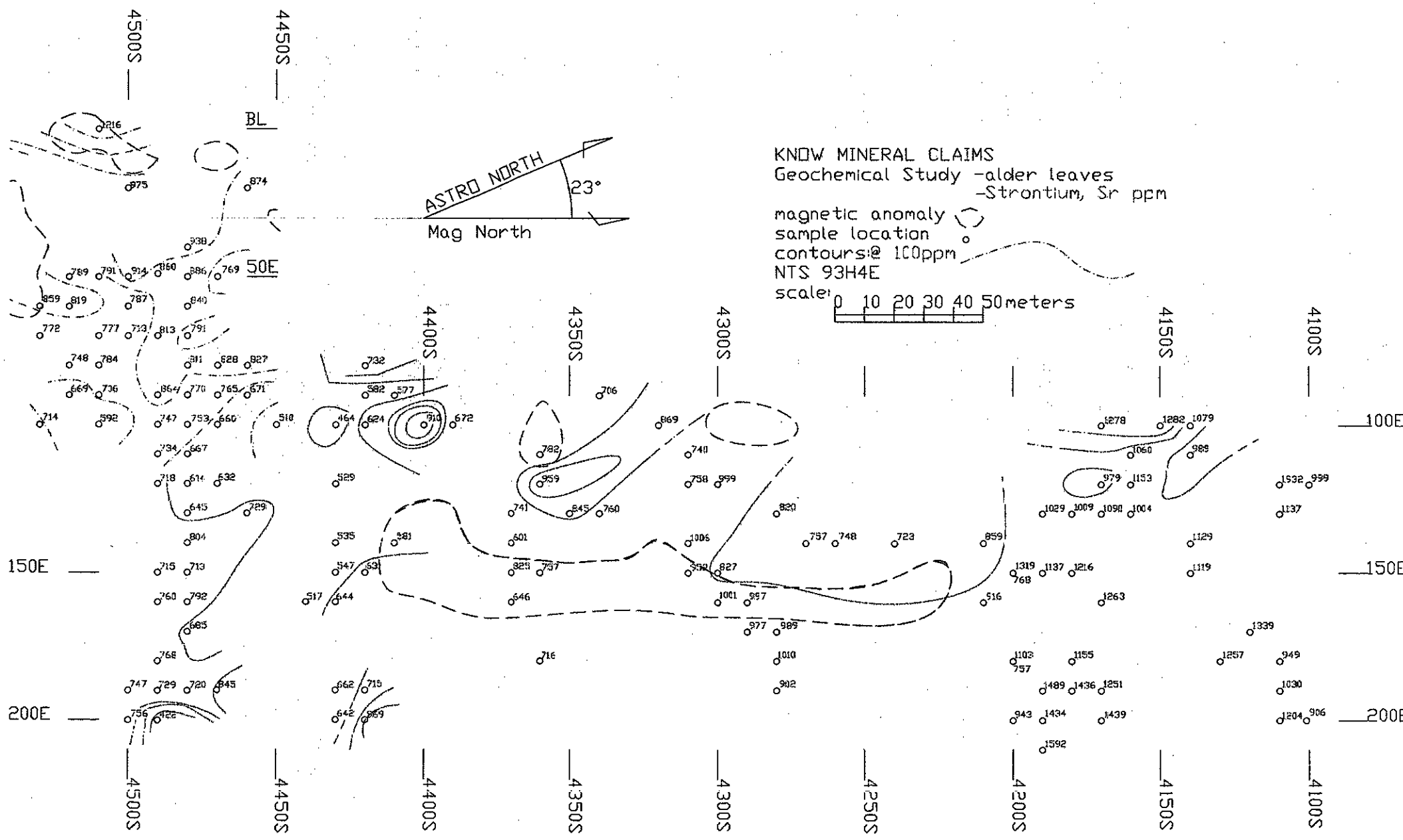
4100S

4150S

10

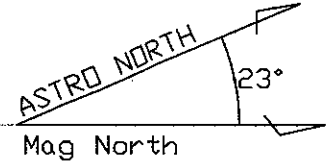
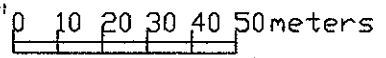
15

20



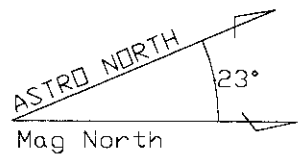
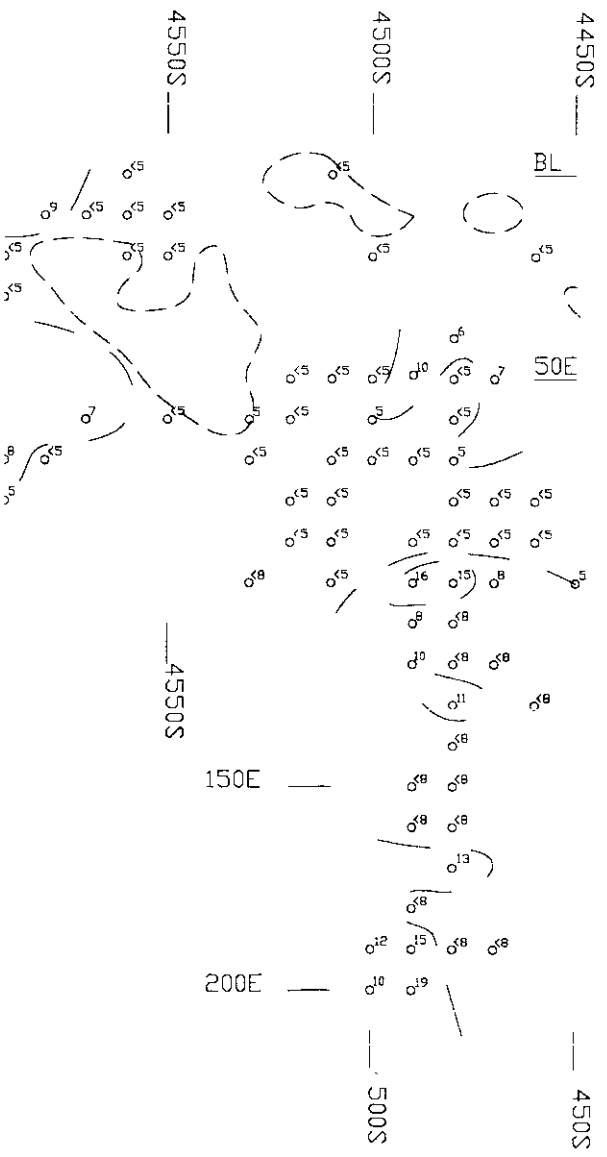
KNOW MINERAL CLAIMS
 Geochemical Study -alder leaves
 -Strontium, Sr ppm



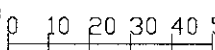
magnetic anomaly
 sample location
 contours @ 100ppm
 NTS 93H4E
 scale:

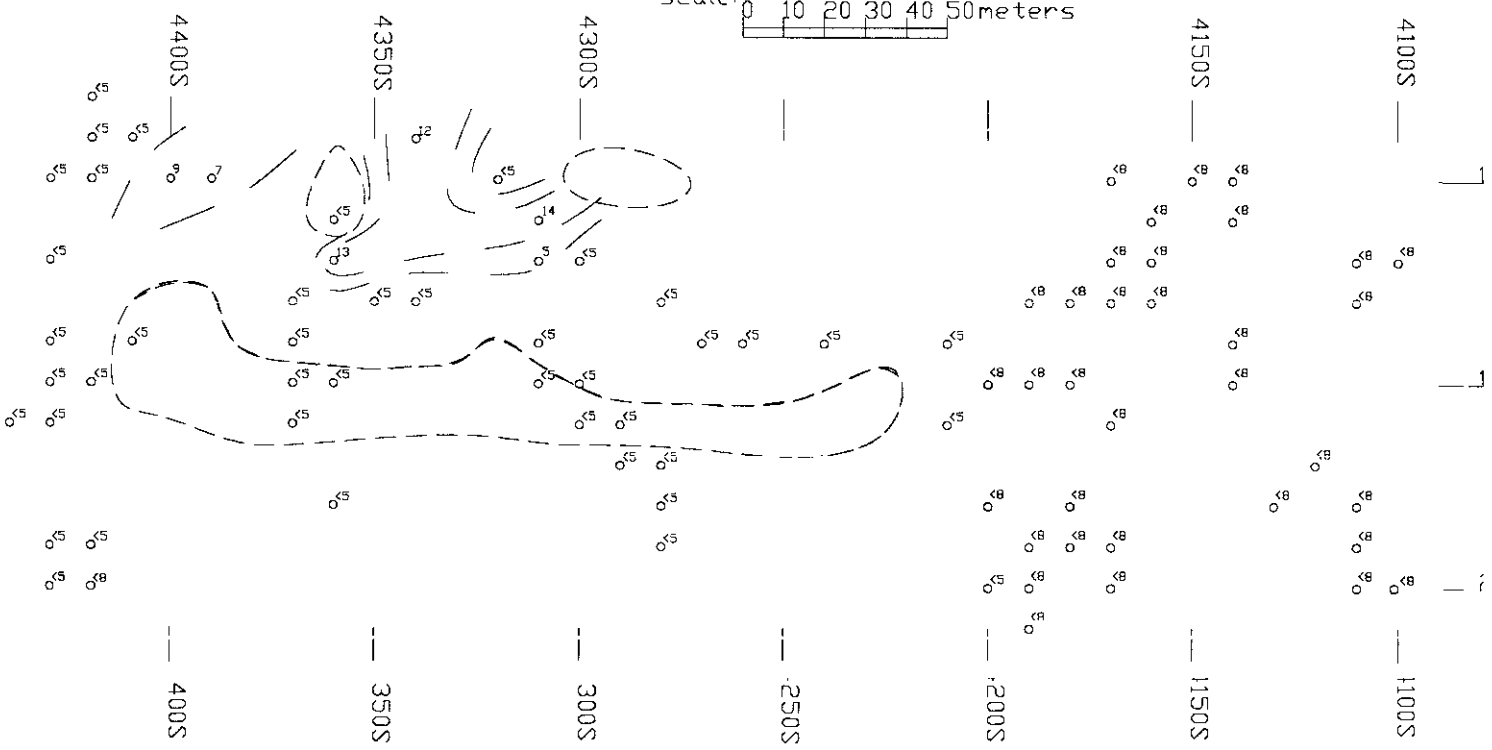


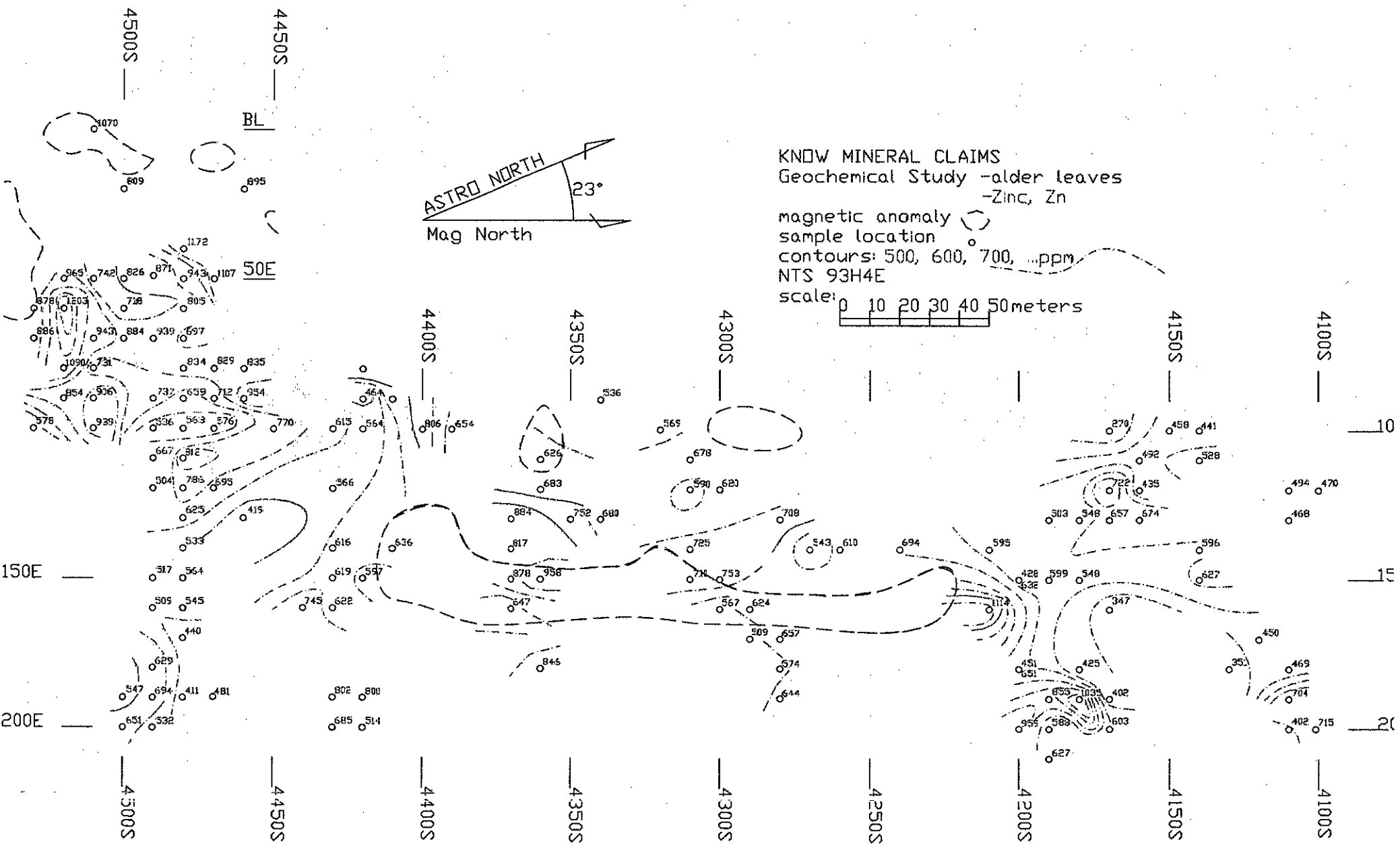
4500S
 4450S
 BL
 50E
 4400S
 4350S
 4300S
 4250S
 4200S
 4150S
 4100S
 150E
 200E

100E
 150E
 200E





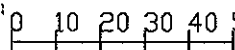
KNOW MINERAL CLAIMS
 Geochemical Study -alder leaves
 -Uranium, U ppm
 magnetic anomaly 
 sample location 
 contours: 5, 10 ppm
 NTS 93H4E
 scale:  0 10 20 30 40 50 meters

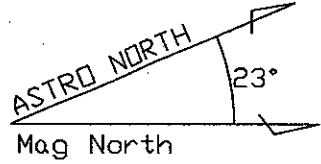




KNOW MINERAL CLAIMS
 Geochemical Study -alder leaves
 -Zinc, Zn

magnetic anomaly 
 sample location 
 contours: 500, 600, 700, ...ppm
 NTS 93H4E

scale:  0 10 20 30 40 50 meters



4500S
 4450S
 BL
 50E
 150E
 200E
 4500S
 4450S

4400S
 4350S
 4300S
 4250S
 4200S
 4150S
 4100S

10
 15
 20