

MINNOVA INC.
WESTERN CANADA

87-448 - 16163
4/88

27 JUNE 1987

MINNOVA INC.

ASSESSMENT REPORT
GEOLOGY & LITHOGEOCHEMISTRY
ON THE PLUM CLAIM

VICTORIA MINING DIVISION

NTS 92B/13E, 13W

48°53' N

123°46' W
45'30"

Owner/Operator: Falconbridge Copper

16,163

GEOLOGICAL BRANCH
ASSESSMENT REPORT

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(N.B. figures 2 through 8 in back pocket)

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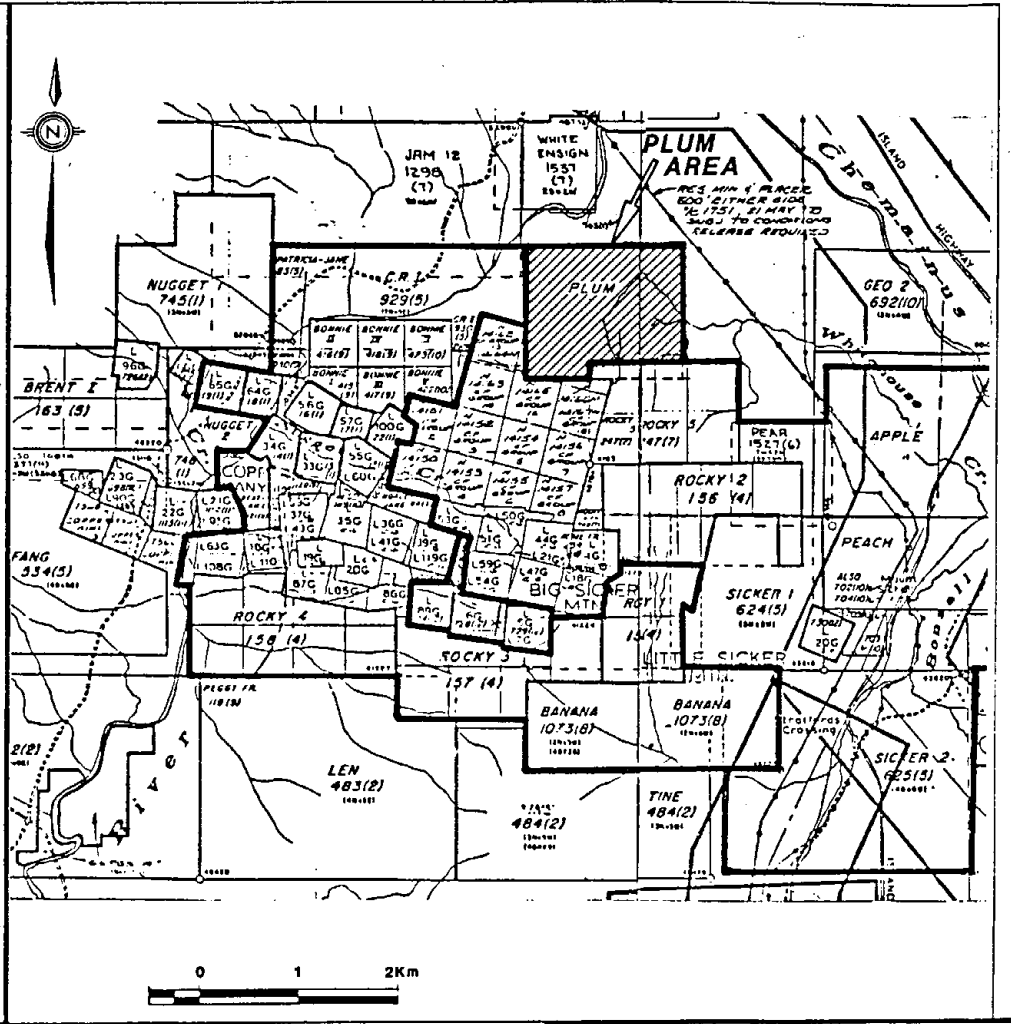
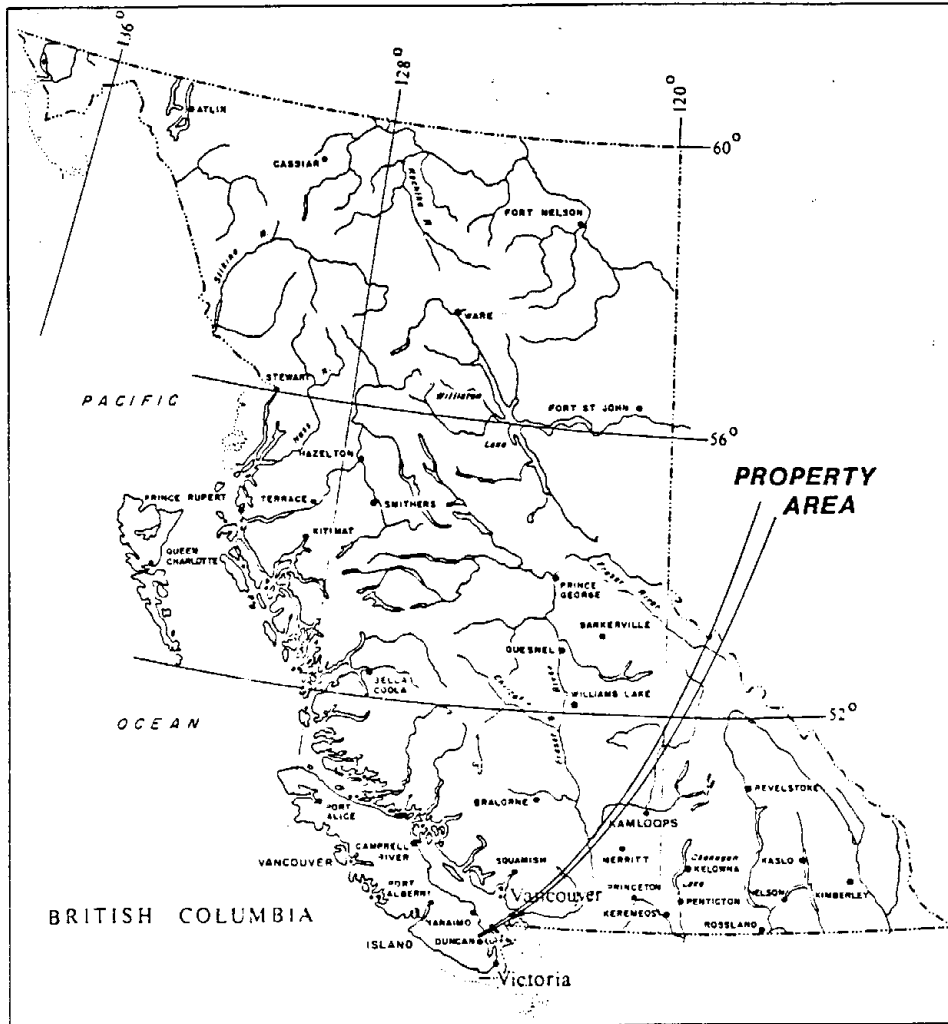
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I. SUMMARY CONCLUSIONS

The Plum property, located 12km north of Duncan, (NTS 92B/5; 49°59'N, 124°34'W), is owned by Minnova Inc. and flanks claims under option to Minnova Inc. on the north side of Mt. Sicker.

The Plum property is underlain by Paleozoic Sicker Group mafic tuffs and tuff-breccias of the Myra formation, and by Cretaceous sediments of the Nanaimo Group.

Geological mapping and lithogeochemical sampling on the claim did not detect any significant alteration or metal enrichment typically associated with Volcanogenic Massive Sulphide Deposits.



MINNOVA Inc.

MT. SICKER PROPERTY

**PLUM CLAIM
LOCATION MAP
92B/13**

DRAWN BY: MG/dm DATE: JULY 1987

FIGURE:
1

II. INTRODUCTION

Exploration on the Plum claim involved a single exploration phase of geological mapping and lithogeochemical sampling. This work is part of a large programme on Mt. Sicker in search of Volcanogenic Massive Sulphides similar to the old Lenora-Tyee Mine (305,787 tons grading 3.3% Cu, 7.5% Zn, 0.13 oz/ton Au, 2.75 oz/ton Ag), the adjacent Lara Deposit (1.5% Cu, 14.9% Zn, 3.1% Pb, 0.24 oz/ton Au, 6.7 oz/ton Ag) and Westmins' HW Mine (2.2% Cu, 5.3% Zn, 0.3% Pb, 0.07 oz/ton Au, 1.1 oz/ton Ag).

II.1 Location and Access

The Plum property is within the Victoria Mining Division, B.C., NTS 92B/13. The property is located approximately 12km north of Duncan, B.C. on the north slope of Big Mt. Sicker, centred on coordinates 48°53'N, 123°46'W.

Access to the property is by Mt. Sicker road from Highway 1 then south along Cranko Road.

The Plum property mainly covers farmland at the base of Big Mt. Sicker. The southern third, however, is located on forested, moderate to gentle slopes of the north flank of Big Mt. Sicker.

II.2 Tenure

The Plum claim consists of a single six unit four-post block. Pertinent claim data are listed below.

| Claim Name | Record No. | No. of units | Date of Record | Assessment Due |
|------------|------------|--------------|----------------|----------------|
| PLUM | 1665 | 6 | 25 April 1985 | 25 April 1987 |

The Plum claim is 100% owned by Minnova Inc.

III. REGIONAL GEOLOGY

The Plum property lies within the Cowichan-Horne Lake uplift; one of three structural windows exposing Paleozoic Sicker Group rocks (Muller, 1980). The Sicker Group includes the total succession of Paleozoic volcanics and sediments on Vancouver Island (Muller, 1980). The Sicker Group is subdivided by Muller into the following formations and units:

Buttle Lake Formation (old name): limestone, calcarenite, crinoidal, commonly recrystallized; interbedded with subordinate or equal thicknesses of calcareous siltstone and chert; some diabase sills.

Sediment-Sill Unit (not a formational name): thinly bedded to massive argillite, siltstone and chert with interlayered sills of diabase.

Myra Formation (new name): Basic to rhyodacitic banded tuff, breccia and (?) lava; thinly bedded to massive argillite, siltstone, chert.

Nitinat Formation (new name): metabasaltic lavas, pillowed or agglomeratic, commonly with large conspicuous uraltized pyroxene phenocrysts and amygdules of quartz and dark green minerals; minor massive to banded tuff.

The Sediment-Sill unit is transitional between the Myra and Buttle Lake formations and may or may not be useful as a separate formation when better field correlations can be made.

Intruding the Myra Formation are Triassic(?) age gabbro/diorite dykes petrochemically similar to the Triassic Karmutsen Volcanic flows and pillowed flows. In addition, Quartz-Feldspar Porphyry dykes are seen to crosscut Myra and Nitinat rocks, and may represent feeder dykes to the overlying Myra Formation.

Cretaceous Nanaimo Group sediments occur as small troughs unconformably overlying Myra rocks, also as reverse fault slices where the Myra rocks appear to overlie the younger Nanaimo Group.

IV. PROPERTY GEOLOGY

The Plum Claim is underlain by steeply(?) dipping east-west striking mafic to intermediate volcanoclastic rocks and flows of the Myra Formation, part of the Paleozoic Sicker Group. Cretaceous Nanaimo Group sediments unconformably(?) lie on top of Myra rocks to the north (Fig.2). Outcrops were found in creeks and as scarps. A brief description of each map unit follows.

Unit 1 - Mafic Volcanics

Unit 1 consists of mafic lapilli tuffs, pyroxene phyric flows(?)/crystal tuffs and minor tuff-breccia. Weathered surfaces are typically dull medium brown whereas fresh surfaces are medium to dark green. Lapilli tuffs have 5-25% flattened 2 X 6mm mafic fragments (some pyroxene?) in a fine chloritic matrix. Similarly the pyroxene phyric flows or crystal tuffs have <5-15% flattened pyroxene crystals that have distinct square outlines on end section. Minor tuff-breccia seen in small outcrops appears to be monolithic.

Unit 1 is very weakly to weakly foliated with foliation dips moderately to steeply north (Fig. 2). No layering within unit 1 was observed. Lithogeochemical sampling results suggest an andesite-basalt composition of Unit 1.

The weak chlorite alteration is probably a result of regional lower greenschist facies metamorphism. No sulphides were noted in Unit 1.

Unit 2- Intermediate Volcanics

Unit 2 consists of a single outcrop of fine tuff. Unit 2 weathers medium green-brown, and is medium green on fresh surface. The fine chloritic ash is moderately foliated but does not have any layering.

The one sample collected for lithogeochemistry suggests an andesite to dacite composition, based on SiO₂ and TiO₂ values.

Weak chlorite alteration is probably due to regional metamorphism. No sulphides were observed.

Unit 3- Nanaimo Group Sediments

No outcrops of Unit 3 were observed on the Plum, but an approximate contact with the Myra rocks is projected onto figure 2 from mapping data on adjacent claim blocks.

V. LITHOGEOCHEMISTRY

Lithogeochemical samples were collected from outcrops at 25m spacing. Lithogeochemistry was used to detect anomalous metal values, alteration zones and to help determine compositions of the volcanics.

A total of 9 samples were submitted for a 13-element ICP analysis (SiO_2 , Al_2O_3 , CaO , Fe_2O_3 , K_2O , MgO , MnO_2 , Na_2O , TiO_2 , Zr, Ba, Sr), in addition Cu, Zn, Pb, Ag, Au, B, As, Sb were analyzed by atomic absorption. All samples were placed in plastic bags and shipped to MIN-EN Laboratories Ltd., 705 West 15th St., North Vancouver. Samples were then crushed to -10 mesh, (in two stages), and pulverized to -150 mesh. Each sample was divided and digested by aqua regia and Nitric Perchloric Acid for ICP and atomic absorption analyses respectively. A listing of all analyses is contained in Appendix II, and plotted on figures 4 to 8.

VI. RECOMMENDATIONS

Although exploration on the Plum claim did not detect anomalous metal concentrations or significant alteration zones within the Myra Formation volcanics, outcrop exposure is very poor (<1%). A soil geochem survey is therefore recommended for the area underlain by the Myra Formation (Fig. 2) in order to complete geochemical coverage of this area and define potential anomalous zones.

The soil survey should be carried out on the existing grid (100m line spacing) and collected at 50m intervals. Soil samples should be analyzed for Cu, Zn, Au, Ag.

VII. STATEMENT OF COSTS

| | | | |
|----------------------|------------------------|---|-----------|
| PERSONNEL | | | |
| Geologist- M.J. Gray | 3 man days @ \$300/day | = | 900.00 |
| TRANSPORTATION | | | |
| Truck (1) | 3 days @ \$100/day | = | 300.00 |
| DOMICILE | | | |
| Accomodation & Food | 3 days @ \$50/day | = | 150.00 |
| ANALYSIS | | | |
| Litho geochemistry | 9 rocks @ \$21 each | = | 189.00 |
| REPORT PREPARATION | | | |
| Report Writing | 1 man day @ \$300/day | = | 300.00 |
| Drafting | 1 man day @ \$150/day | = | 150.00 |
| Typing | 1 man day @ \$100/day | = | 100.00 |
| | TOTAL COST | = | \$2089.00 |

VIII. REFERENCES

- Muller, J.E.
1980: The Paleozoic Sicker Group of Vancouver Island, B.C.; GSC Paper 79-30.
- Ronning, P.A.
1980: Geology and Soil Geochemistry, Mt. Sicker Property, Victoria Mining Division, B.C.; Assessment Report.
- Walker, R. et al
1984: Guidebook for 2nd Annual Fall Field Trip "Buttle Lake Mine and Lithoprobe Geology".
- Watson, I.M.
1987: A Summary Review of the Lara Project Mt. Sicker Area Vancouver Island, B.C.

APPENDIX I

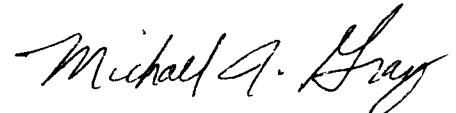
Statement of Qualifications

Statement of Qualifications

I, Michael J. Gray, of 6722 Lakes Road, Duncan, British Columbia hereby certify that:

- 1) I graduated from the University of British Columbia with a Bachelor of Science Degree in Geology (1985).
- 2) I am a geologist employed on a temporary basis by Minnova Inc. of 400-311 Water Street, Vancouver, B.C.
- 3) I have been practicing my profession for the past two years and have been involved in mineral exploration programmes throughout B.C. and the Yukon Territory for the past seven years.
- 4) I have no financial interest in the claims involved in this report, or in Minnova Inc.

Dated at Duncan, B.C. this 11th day of July, 1987.



Michael J. Gray
Geologist

APPENDIX II

Lithogeochemistry Results

COMPANY: MINNOVA INC.

MIN-EN LABS ICP REPORT

(ACT:L126) PAGE 1 OF 1

PROJECT NO: 305

705 WEST 15TH ST., NORTH VANCOUVER, B.C. V7M 1T2

FILE NO: 7-609

ATTENTION: G.WELLS/M.GRAY

(604)980-5814 OR (604)988-4524

* TYPE ROCK GEOCHEM * DATE: JUNE 24, 1987

| (VALUES IN %) | AL2O3 | BA | CAO | FE2O3 | K2O | MGO | MNO2 | NA2O | SI02 | SR | TIO2 | ZR | TOT(%) |
|----------------|-------|------|-------|-------|------|------|------|------|-------|-----|------|------|--------|
| FLUM1 | 15.51 | .045 | 7.50 | 10.41 | 1.22 | 7.41 | .30 | 2.90 | 48.14 | .05 | .66 | .005 | 94.15 |
| FLUM2 | 15.47 | .027 | 10.03 | 10.16 | .72 | 7.02 | .29 | 3.37 | 49.95 | .05 | .65 | .005 | 97.75 |
| FLUM3 | 18.94 | .056 | 6.18 | 9.62 | 1.43 | 4.64 | .27 | 4.96 | 50.61 | .08 | .72 | .005 | 97.51 |
| FLUM4 | 14.90 | .088 | 2.92 | 7.73 | .36 | 3.80 | .20 | 3.96 | 63.11 | .04 | .82 | .005 | 97.94 |
| FLUM-4 | 17.86 | .071 | 6.69 | 10.74 | 1.18 | 5.39 | .27 | 3.79 | 50.90 | .06 | .82 | .005 | 97.77 |
| FLUM-5 | 18.33 | .015 | 3.56 | 11.75 | .16 | 7.55 | .34 | 4.69 | 50.28 | .03 | .81 | .005 | 97.54 |
| FLUM-6 | 20.59 | .046 | 2.54 | 11.01 | 1.12 | 4.77 | .29 | 5.24 | 51.15 | .05 | .88 | .005 | 97.69 |
| FLUM-7 | 18.23 | .016 | 8.02 | 11.94 | .45 | 6.71 | .34 | 4.04 | 46.77 | .05 | .83 | .005 | 97.41 |
| FLUM-8 | 19.07 | .027 | 4.75 | 11.40 | .32 | 6.36 | .23 | 5.15 | 49.33 | .07 | .93 | .005 | 97.62 |

COMPANY: MINNOVA INC.

MIN-EN LABS ICP REPORT

(ACT:BE027) PAGE 1 OF 1

PROJECT NO: 305

705 WEST 15TH ST., NORTH VANCOUVER, B.C. V7M 1T2

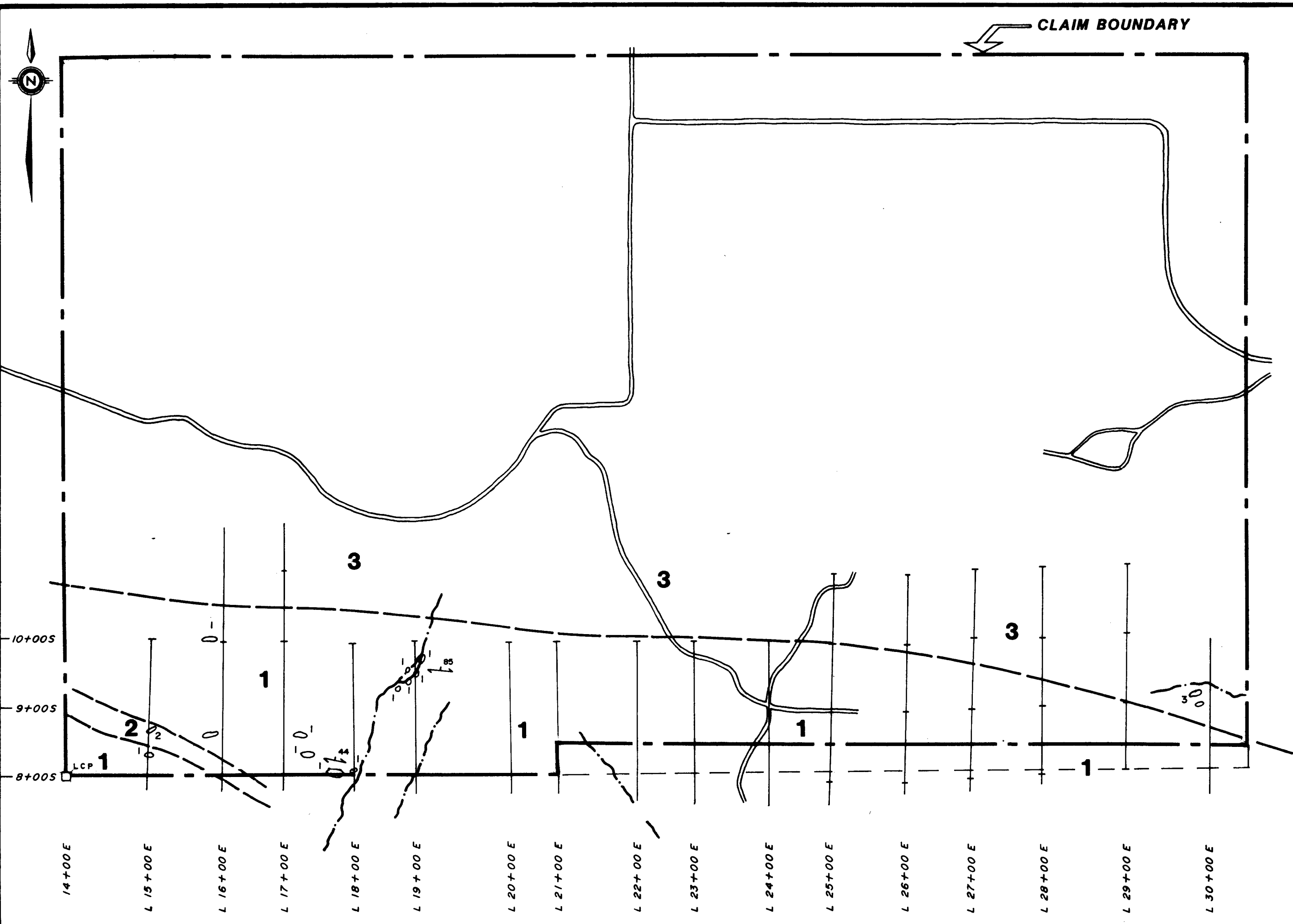
FILE NO: 7-609

ATTENTION: G.WELLS/M.GRAY

(604)980-5814 OR (604)988-4524

* TYPE ROCK GEOCHEM * DATE: JUNE 24, 1987

| (VALUES IN PPM) | AG | AS | B | CU | PB | SB | ZN | AU-PPB |
|------------------|-----|----|----|-----|----|----|-----|--------|
| FLUM 1 | 1.2 | 3 | 17 | 125 | 6 | 3 | 48 | 5 |
| FLUM 2 | .8 | 1 | 12 | 136 | 7 | 2 | 34 | 5 |
| FLUM 3 | 1.2 | 2 | 16 | 67 | 14 | 2 | 53 | 10 |
| FLUM 9 | 1.7 | 11 | 22 | 53 | 5 | 1 | 47 | 5 |
| FLUM-4 | 1.5 | 1 | 14 | 99 | 14 | 1 | 71 | 5 |
| FLUM-5 | 1.3 | 1 | 16 | 152 | 20 | 3 | 76 | 10 |
| FLUM-6 | .9 | 2 | 15 | 19 | 24 | 6 | 109 | 5 |
| FLUM-7 | 1.4 | 1 | 10 | 87 | 16 | 1 | 63 | 10 |
| FLUM-8 | 1.1 | 1 | 13 | 69 | 12 | 1 | 73 | 10 |



LEGEND

UPPER CRETACEOUS

3 NANAIMO GROUP; Siltstone

PALEOZOIC

SICKER GROUP-MYRA FORMATION

2 INTERMEDIATE VOLCANICS; Fine tuff, minor feldspar phyrlic crystal tuff

1 MAFIC VOLCANICS; Lapilli tuff, coarse tuff, locally pyroxene(?) phyrlic

SYMBOLS

- Outcrop
- Geological contact (defined, assumed)
- Foliation
- Grid lines
- Creek
- Road

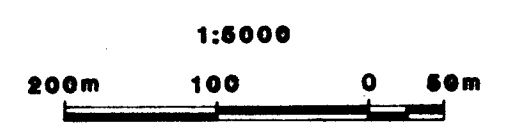
**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

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CLAIM BOUNDARIES LOCATED WITH RESPECT TO GRID

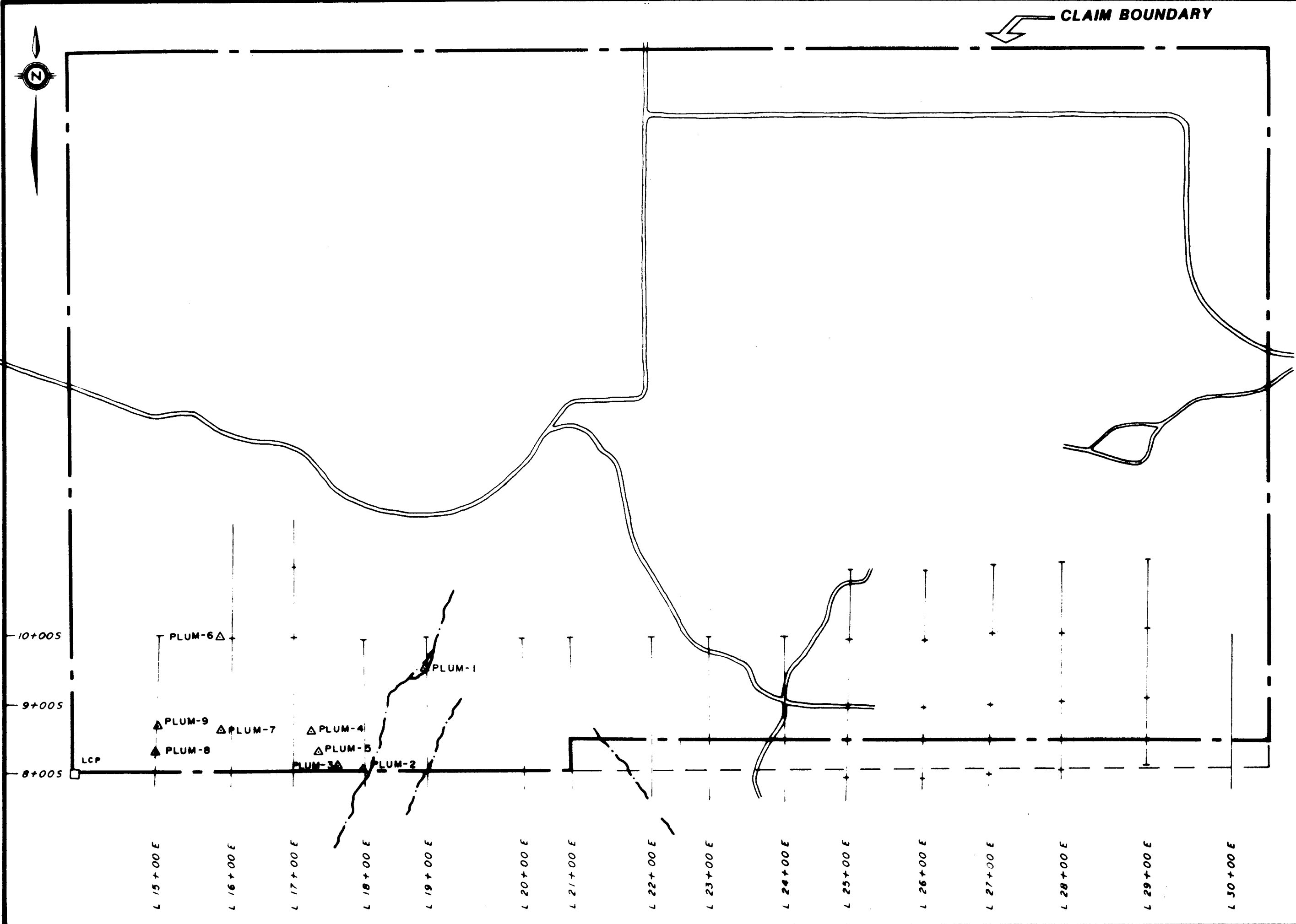
**MT. SICKER PROJECT
PLUM CLAIM
92B/13**

- GEOLOGY -



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FIGURE 2



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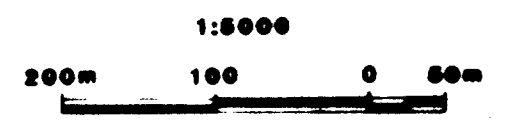
PLUM-9 Δ Sample location

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ASSESSMENT REPORT

16,163

CLAIM BOUNDARIES LOCATED WITH RESPECT TO GRID

**MT. SICKER PROJECT
PLUM CLAIM
92B/13
LITHOGEOCHEMISTRY
SAMPLE LOCATIONS**



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FIGURE 3

CLAIM BOUNDARY

LEGEND

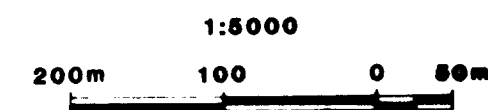
Sample location Δ 48.14, 0.66, 15.51, 7.50
SiO₂, TiO₂, Al₂O₃, CaO %

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ASSESSMENT REPORT

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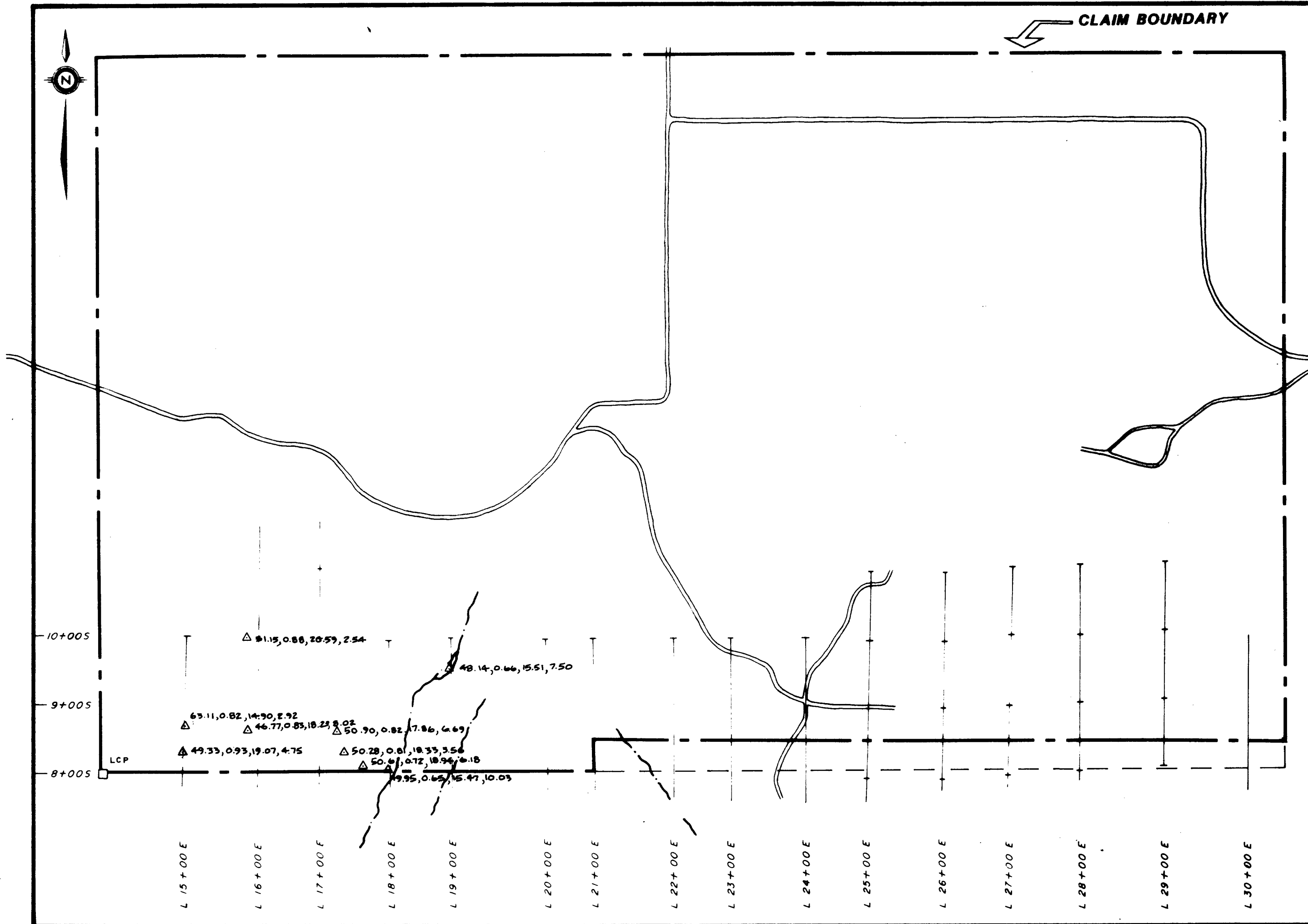
CLAIM BOUNDARIES LOCATED WITH RESPECT TO GRID

MT. SICKER PROJECT
PLUM CLAIM
92B/13
LITHOGEOCHEMISTRY
SiO₂, TiO₂, Al₂O₃, CaO %



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FIGURE 4



10+005
9+005
8+005

L 15+00 E L 16+00 E L 17+00 E L 18+00 E L 19+00 E L 20+00 E L 21+00 E L 22+00 E L 23+00 E L 24+00 E L 25+00 E L 26+00 E L 27+00 E L 28+00 E L 29+00 E L 30+00 E

Δ 51.15, 0.88, 20.59, 2.54

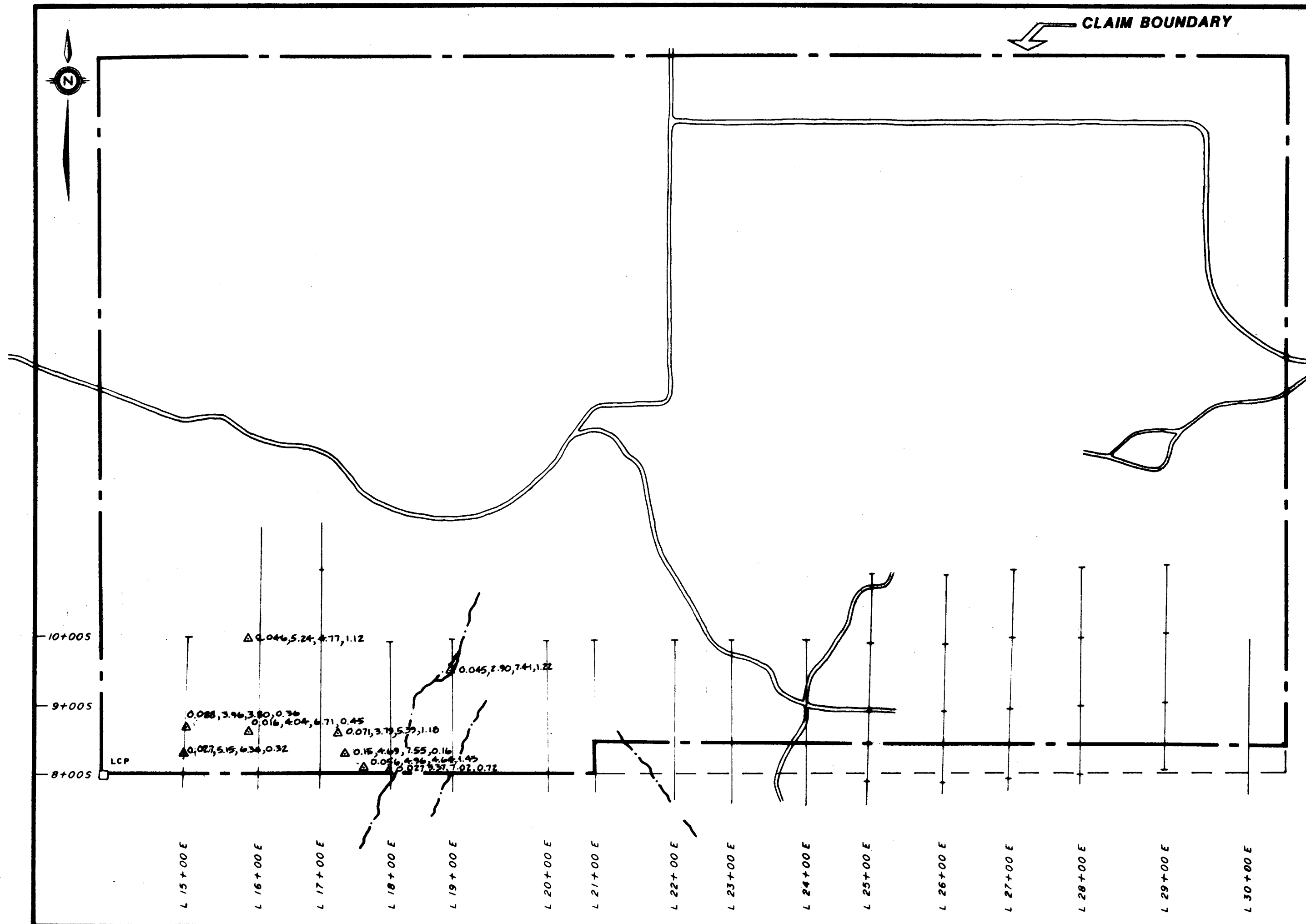
Δ 48.14, 0.66, 15.51, 7.50

Δ 63.11, 0.82, 14.90, 2.92
 Δ 46.77, 0.83, 18.23, 8.02
 Δ 50.90, 0.82, 17.86, 6.69

Δ 49.33, 0.93, 19.07, 4.75
 Δ 50.28, 0.81, 18.33, 3.56
 Δ 50.41, 0.72, 18.96, 6.18

Δ 49.95, 0.65, 15.47, 10.03

LCP



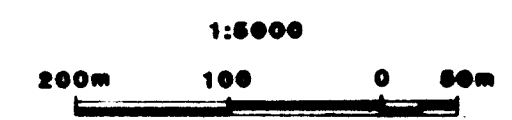
Sample location Δ 0.045, 2.90, 7.41, 1.22
Ba, Na₂O, MgO, K₂O %

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CLAIM BOUNDARIES LOCATED WITH RESPECT TO GRID

**MT. SICKER PROJECT
PLUM CLAIM
92B/13
LITHOGEOCHEMISTRY
Ba, Na₂O, MgO, K₂O %**



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FIGURE 5

CLAIM BOUNDARY

LEGEND

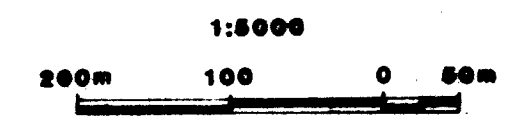
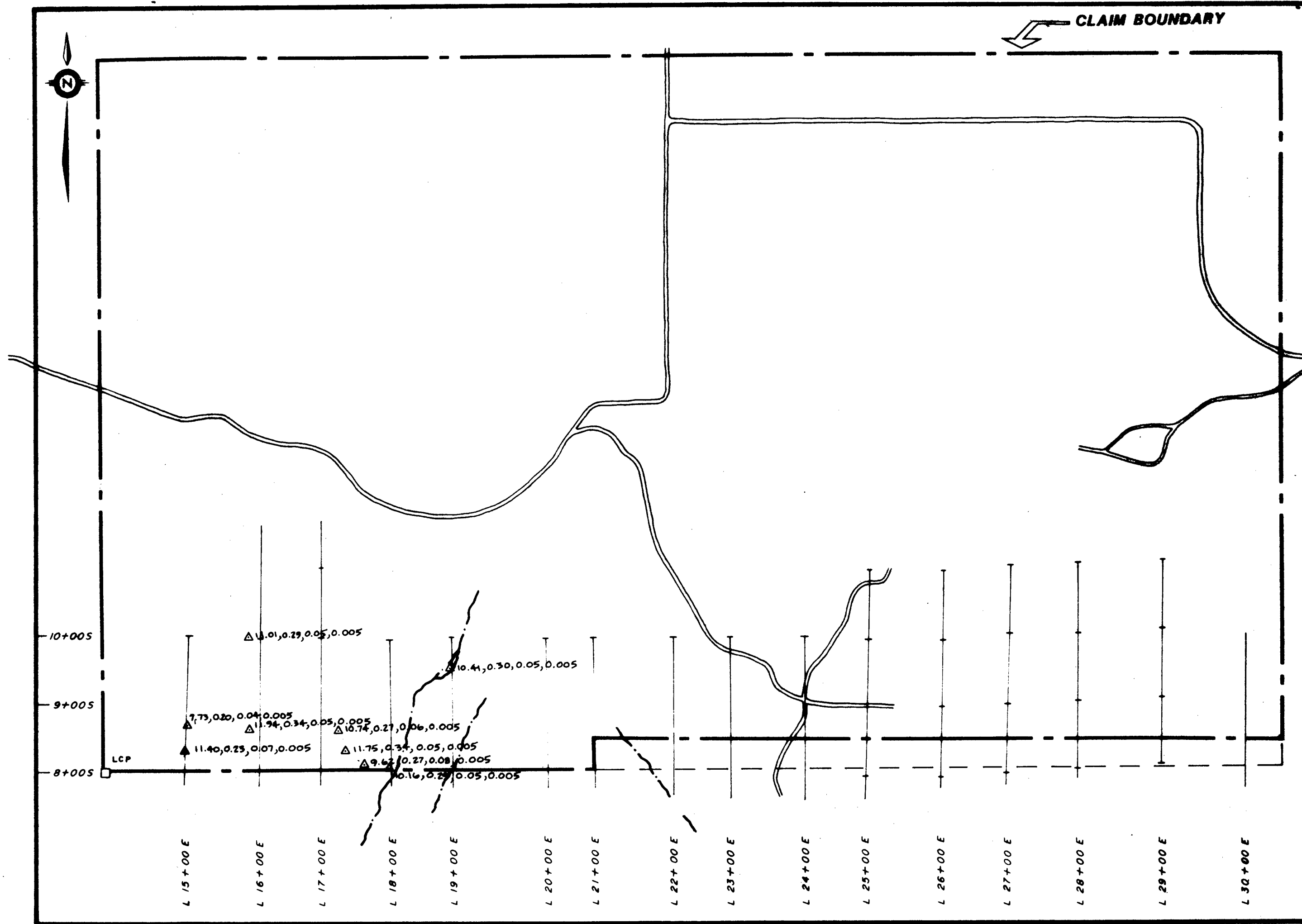
Sample location Δ 10.41, 0.30, 0.05, 0.005
Fe₂O₃, MnO₂, Sr, Zr %

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CLAIM BOUNDARIES LOCATED WITH RESPECT TO GRID

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PLUM CLAIM
92B/13
LITHOGEOCHEMISTRY
Fe₂O₃, MnO₂, Sr, Zr %



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FIGURE 6



CLAIM BOUNDARY

LEGEND

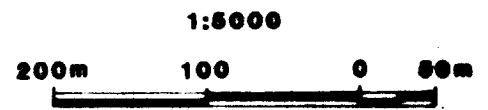
Sample location Δ 125, 6, 48, 17
Cu, Pb, Zn, B ppm

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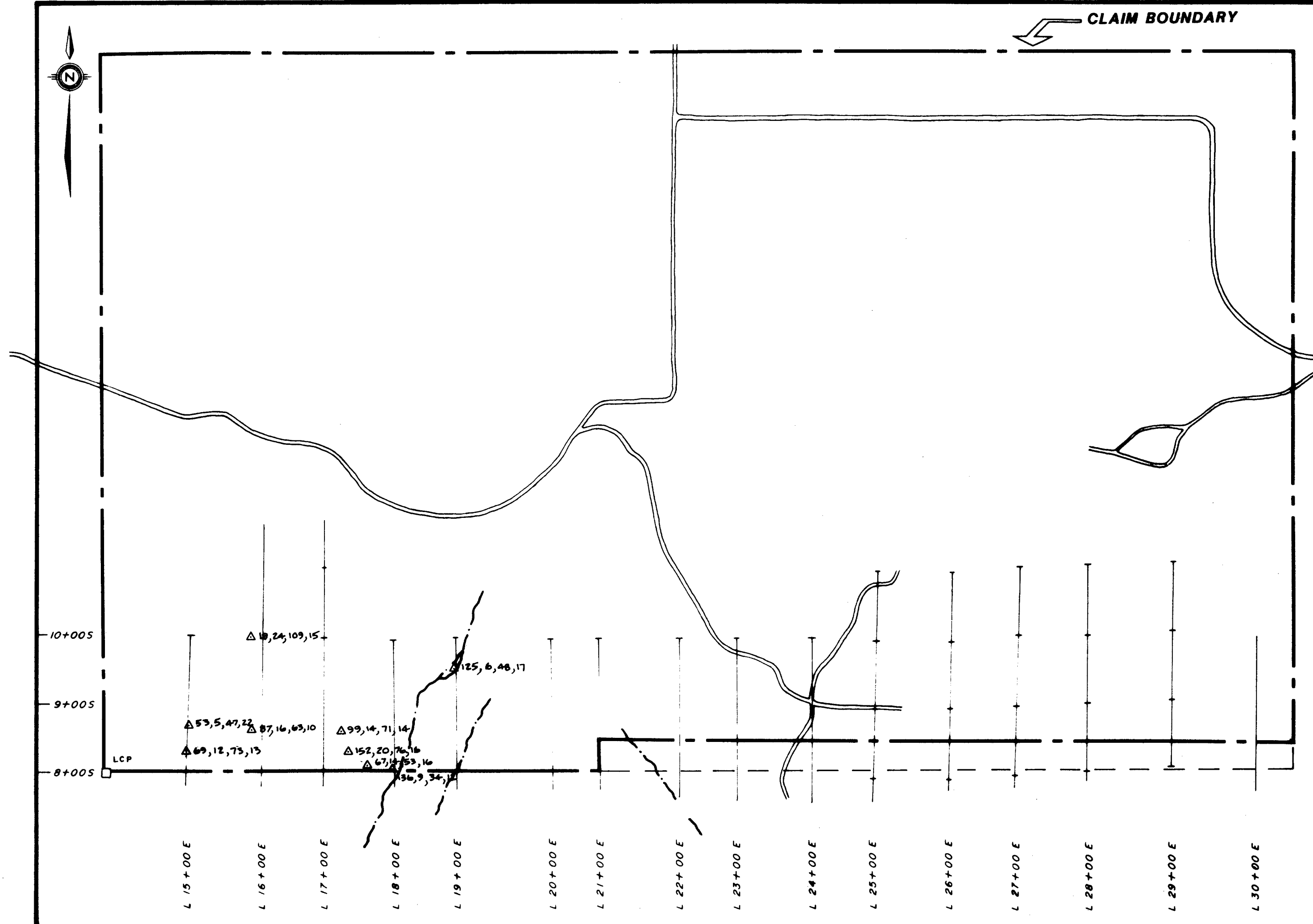
CLAIM BOUNDARIES LOCATED WITH RESPECT TO GRID

MT. SICKER PROJECT
PLUM CLAIM
92B/13
LITHOGEOCHEMISTRY
Cu, Pb, Zn, B ppm



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FIGURE 7



CLAIM BOUNDARY

LEGEND

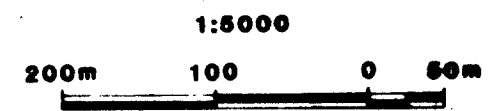
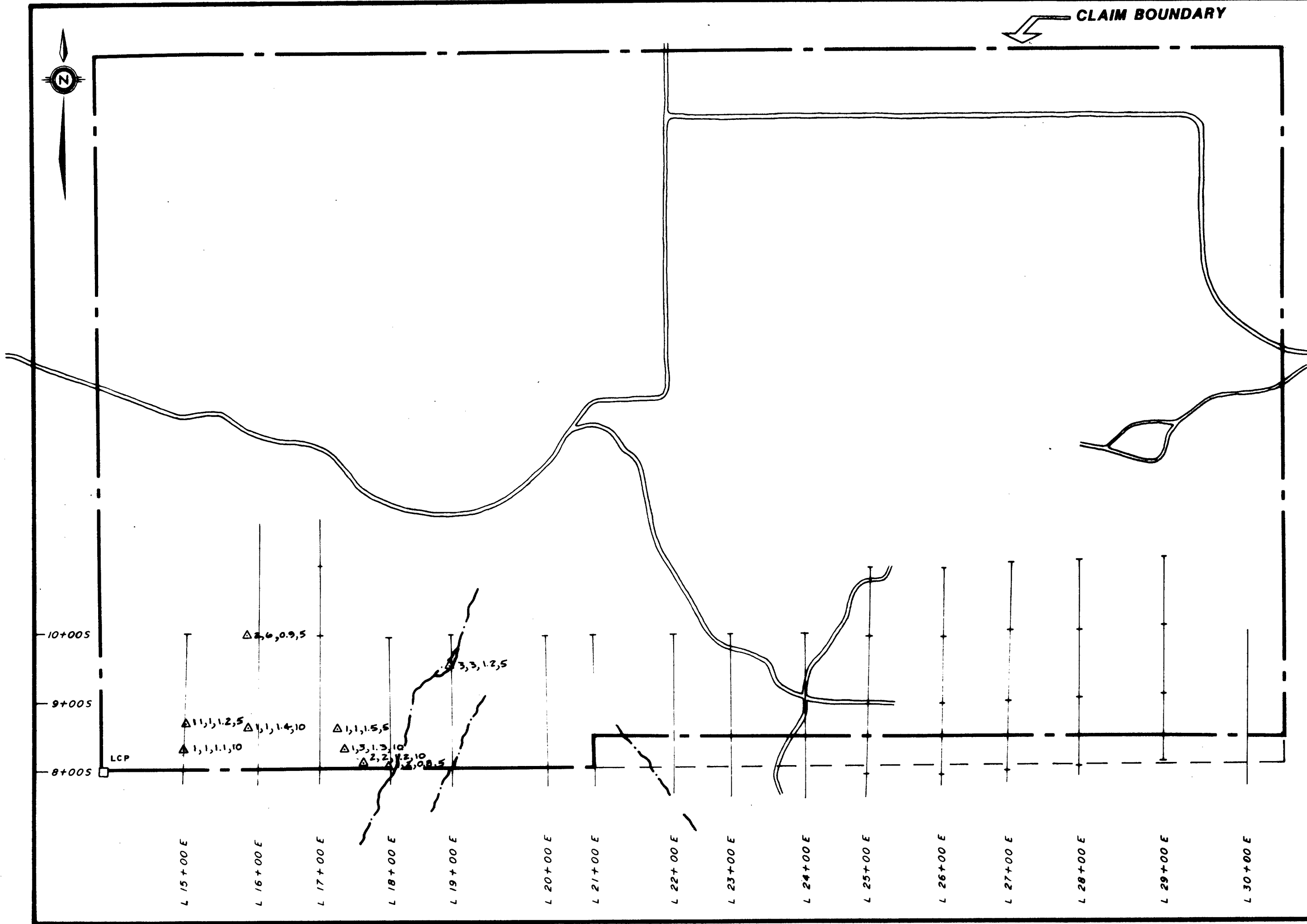
Sample location Δ 3,3,1,2,5
As,Sb,Ag ppm,Au ppb

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CLAIM BOUNDARIES LOCATED WITH RESPECT TO GRID

MT. SICKER PROJECT
PLUM CLAIM
92B/13
LITHOGEOCHEMISTRY
As,Sb,Ag ppm,Au ppb



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FIGURE 8