

GEOLOGICAL AND GEOCHEMICAL REPORT
ON THE COB CLAIM.

LOG NO: 1102	FILE
ACTION:	
KAMLOOPS MINING DIVISION	
FILE #:	

KAMLOOPS MINING DIVISION

NTS - 92I/9W

LAT. 50 34'N LONG. 120 18'W

OWNER: J.E. CHRISTOFFERSEN
OPERATOR: J.E. CHRISTOFFERSEN
REPORT BY: J.E. CHRISTOFFERSEN

OCTOBER 30, 1989.

SUB-RECORDER
RECEIVED
OCT 27 1989
M.R. # \$.....
VANCOUVER, B.C.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

19,261

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1
1.1 Location and Access	1
1.2 Claims	1
1.3 Claim History	1
1.4 1989 Program	1
2.0 INTERPRETATION OF RESULTS	2
2.1 Geology	2
2.1.1 Regional Geology	2
2.1.2 Claim Geology	3
2.2 Geochemistry	4
3.0 CONCLUSIONS	4
4.0 STATEMENT OF COSTS	6
5.0 STATEMENT OF QUALIFICATIONS	7

LIST OF FIGURES

Figure 1 Property Location Map	after page 1
Figure 2 Claim Map	" " 1
Figure 3 Regional Geological Map	" " 2
Figure 4 Cob Claim Geological Map	" " 3
Figure 5 Cob Claim Ge ^{chemical} ological Map	" " 4

LIST OF APPENDICES

APPENDIX I Soil and Rock Analytical Data (Min-En Laboratories)

1.0 INTRODUCTION

1.1 Location and Access

The Cob claim is located at Lat. 50 34'N and Long. 120 18'W about 15 kilometers south of Kamloops in the south-central interior of British Columbia (Fig. 1). The property occupies open rolling ranchland with a mean elevation of 915 meters (3,000 feet) and relief of 90 meters (300 feet).

Access is gained directly from either Kamloops or Merritt via Highway 5A, which transects the claims. Several public gravel roads and private ranch trails allow entry to much of the property to two-wheel-drive vehicles for most of the year.

1.2 Claims

The property comprises one modified-grid claim totalling nine units as shown in Figure 2. Details are as follows.

<u>Claim</u>	<u>Record Date</u>	<u>Record No.</u>
COB 1	Oct. 10, 1988	8085

The claim is owned by J.E. Christoffersen of 14070 Greencrest Dr., White Rock, B.C., V4A 2Y4.

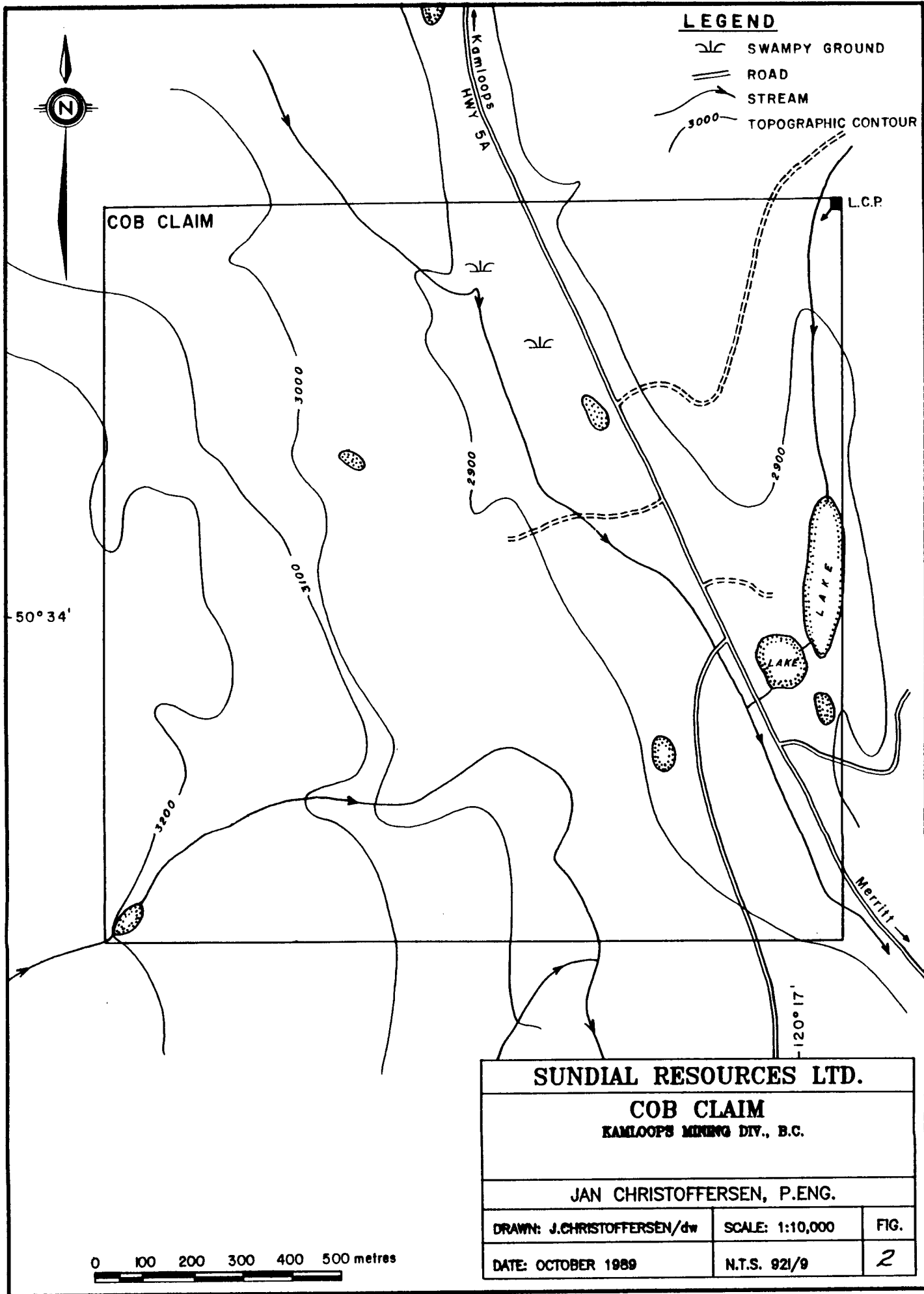
1.3 Claim History

In 1977, Cominco held the AND claim group, which extended over the western part of the COB claim. Cominco carried out mapping, ground magnetic and I.P. surveys over the AND claims, outlining an I.P. anomaly around the Phil copper showing about 500 meters south of the COB claim (B.C. Assessment Report #6224).





In 1983, Cominco drilled six percussion holes totalling 549 meters on the Phil showing (B.C. Assessment Report #11,336). The best assay was three meters grading 0.18% Cu.

1.4 1989 Program

A short program of geological mapping and soil sampling was conducted by the writer on the claim between Oct. 2-4, 1989.



LEGEND

-  SWAMPY GROUND
-  ROAD
-  STREAM
-  TOPOGRAPHIC CONTOUR

COB CLAIM

L.C.P.

50° 34'

120° 17'

SUNDIAL RESOURCES LTD.

COB CLAIM
KAMLOOPS MINING DIV., B.C.

JAN CHRISTOFFERSEN, P.ENG.

DRAWN: J.CHRISTOFFERSEN/dw	SCALE: 1:10,000	FIG.
DATE: OCTOBER 1989	N.T.S. 921/9	2



Geological mapping was undertaken at a scale of 1:10,000 as shown in Figure 4. Outcrops are scarce, being restricted to the western part of the claim with two exposures in road cuts along Highway 5A. Elsewhere, the property is covered with gravel deposits.

A total of 44 soil samples was collected at 100-meter intervals along hip-chain and compass lines as shown in Figure 5. Samples were collected at depths of 15-20 cm. and stored in wet-strength kraft paper bags for transport to a geochemical laboratory. Every attempt was made to sample B-horizon material although the soil profile is poorly developed on the claim. Some samples along roadsides were taken from bank cuts and, hence, obtained significantly deeper in the overburden profile. Six rock samples were also collected in the course of geological mapping and placed in plastic bags for subsequent geochemical analysis.

The soil and rock samples were transported to Min-En Laboratories Ltd., Vancouver for gold (wet chemical-A.A.) and 31-element ICP analysis. Analytical data are presented in Appendix I.

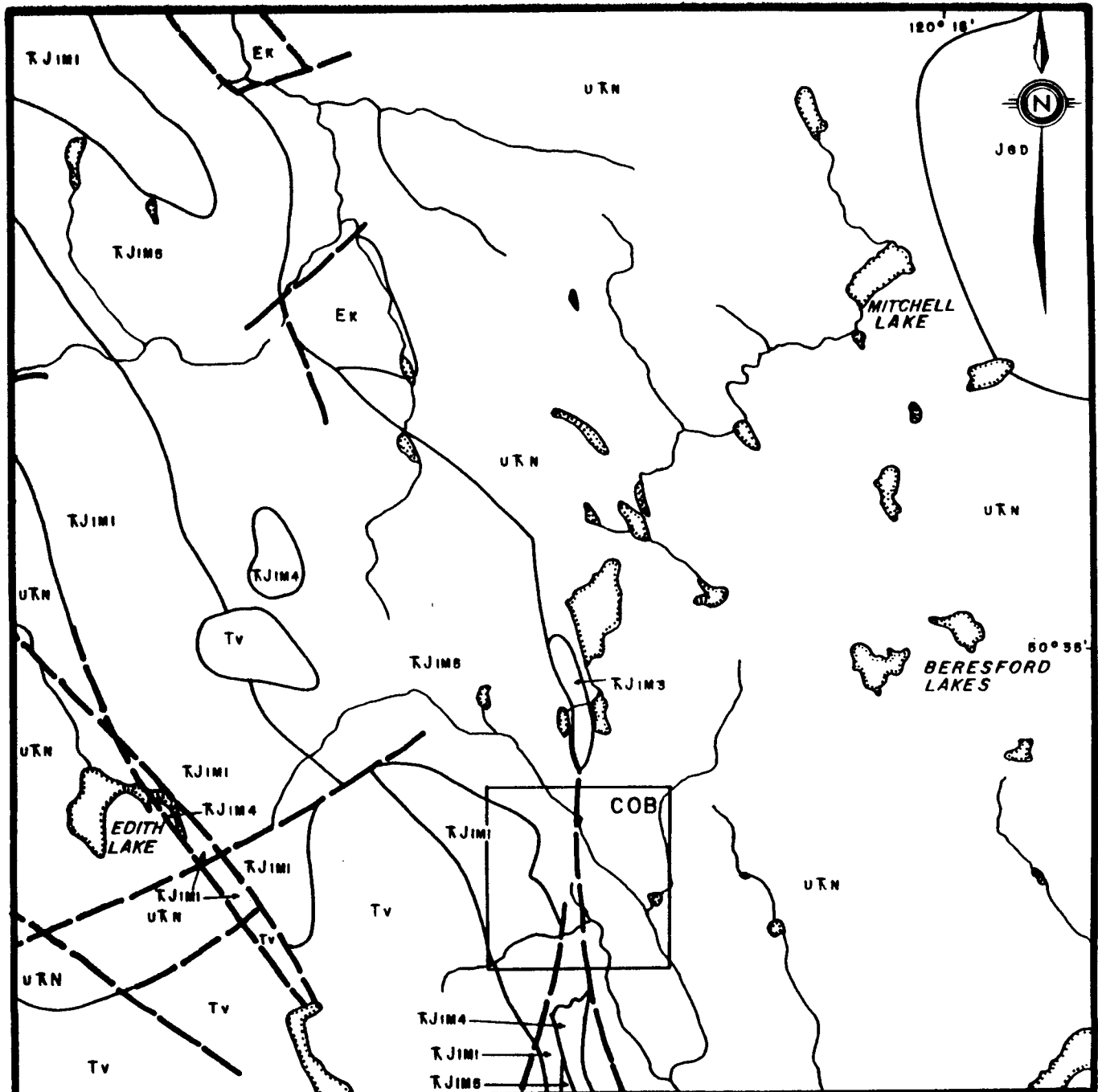
2.0 INTERPRETATION OF RESULTS

2.1 Geology

2.1.1 Regional Geology

The COB 1 claim lies at the south-east extremity of the Iron Mask batholith, a composite intrusive body of alkaline affinity (Fig. 3). The batholith intrudes, and is thought to be coeval with, Upper Triassic volcanic rocks of the Nicola Group, comprising basalts, tuffs and related epiclastics. Small bodies of picrite occur generally peripheral to the batholith. South west of the claim, extensive Tertiary basalts are exposed.

The Iron Mask pluton is noted for the Afton gold-copper porphyry orebody and several satellitic copper bodies of economic significance.



Tv TERTIARY MIOCENE (?) & OLDER
Olive basalt, local intermediate volcanics

Ek EOCENE
Kamloops Group: undifferentiated volcanic (basaltic to andesitic flows & agglomerates w minor dacite, latite & trachyte) & sedimentary (tuffaceous sandstone, siltstone & shale w minor conglomerate) rocks

Ukn UPPER TRIASSIC
Nicola Group: meta-basalt, andesite, tuff & uncommon argillite

Jed JURASSIC
Wild Horse Batholith, Nicola Batholith & Similar
Granitic Rocks: granodiorite, quartz monzonite

KJm1 UPPER TRIASSIC TO LOWER JURASSIC
Cherry Creek Unit: diorite, monzonite, syenite, porphyritic & finegrained varieties common.

KJm2 Sugarloaf Unit: porphyritic hornblende & augite micro-diorite, minor andesitic dykes

KJm3 Picrite Unit: basaltic dykes & lenses w abundant serpentinized olivine & clinopyroxene; probably non-batholithic

KJm4 Iron Mask Hybrid Unit: agamite commonly w about 80% by volume of diorite, gabbro & hornblende frags. in a fine-grained dioritic matrix

FAULT

0 1 2 kilometres
AFTER: Y.T.J. KWONG, 1982; BCDM BULLETIN 77

SUNDIAL RESOURCES LTD.		
COB CLAIM		
REGIONAL GEOLOGY		
J. CHRISTOFFERSEN, P. ENG.		
N.T.S. 921/9	SCALE: 1:50,000	FIG.
DATE: OCT., 1989	DRAWN: J.C./dw	3

2.1.2 Claim Geology

The western part of the claim is underlain by dioritic rocks of the Iron Mask batholith (Fig.4). These rocks vary from melanocratic to leucocratic and coarse to fine grained. Dark varieties are magnetite bearing. Intrusive breccias are common. The eastern-most outcrops of the batholith are normally strongly fractured and locally sheared, suggesting a nearby fault, possibly with a north-south strike. Otherwise the rocks are essentially fresh.

Two exposures of altered ultramafic rock were noted in road cuts along Highway 5A in the south west of the claim. The relationship of these to the dioritic rocks is uncertain as exposure is very limited in the area.

Little in the way of economic minerals was observed except for an occurrence of malachite and pyrite in sheared and brecciated diorite near the north-west corner of the claim (rock sample 89CR-5) and a trace of malachite in an ultramafic rock (89CR-2).

Lithological units recognized on the claim are described below.

Unit 1- Augite Diorite is a fine- to medium-grained rock comprising 60% light grey plagioclase (2-3mm), 30% light green ragged augite crystals (1-3mm) and 10% disseminated magnetite. The rock is fresh.

Unit 2- Diorite Breccia consists of large angular fragments of diorite (unit 1), amphibolite and gabbro in a groundmass of leucocratic microdiorite.

Unit 3- Leucocratic Microdiorite comprises an even-grained mixture of 65% light grey crystalline plagioclase (1mm) and 35% pale green to pale brown augite and hornblende (1mm) with a trace of magnetite. The rock forms either the groundmass of breccia (unit 2) or dykes and larger masses.

LEGEND

- SWAMPY GROUND
- ROAD
- STREAM
- TOPOGRAPHIC CONTOUR



COB CLAIM

L.C.P.

KAMLOOPS SA HWY

50° 34'

120° 17'

LEGEND

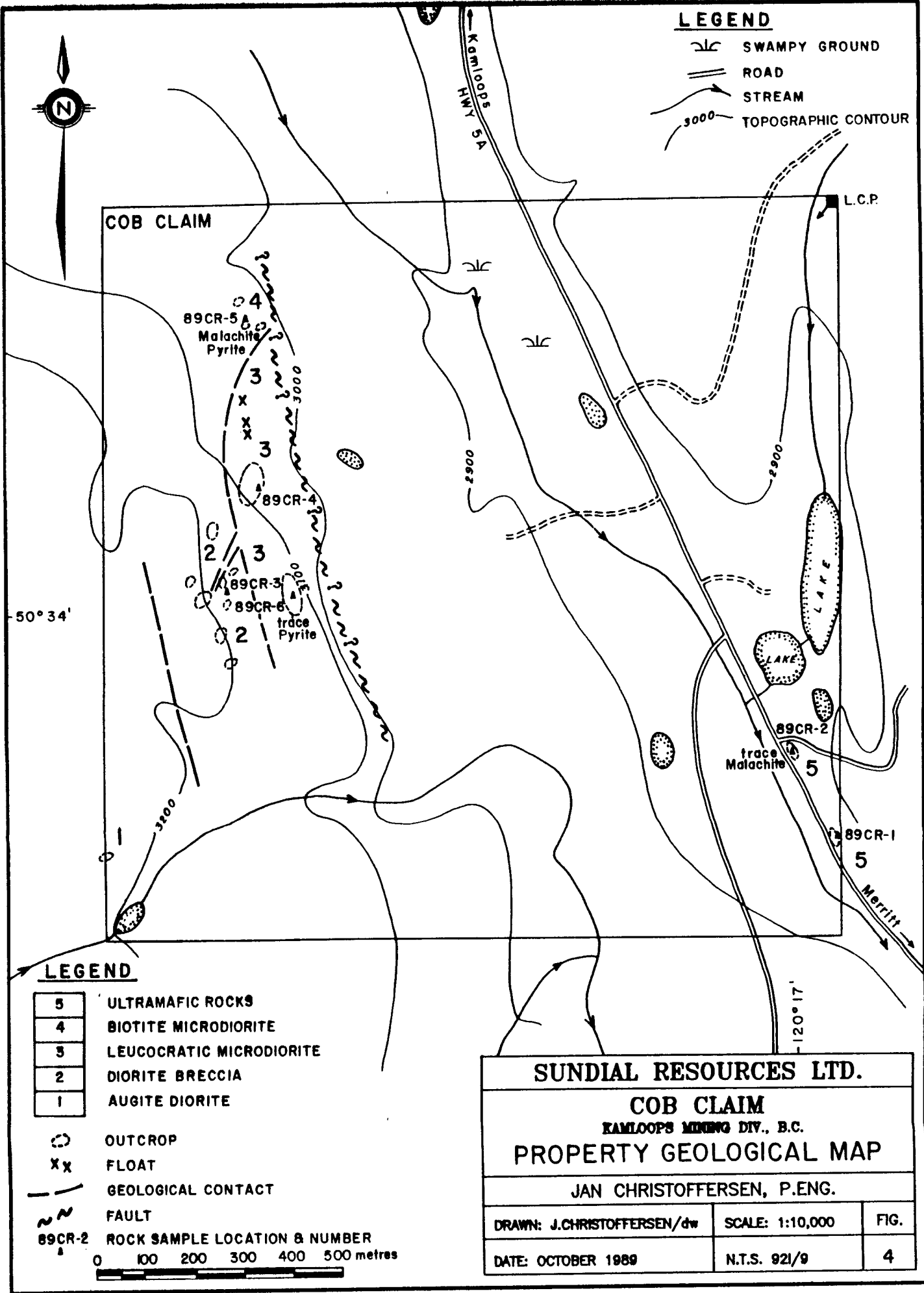
- 5 ULTRAMAFIC ROCKS
 - 4 BIOTITE MICRODIORITE
 - 3 LEUCOCRATIC MICRODIORITE
 - 2 DIORITE BRECCIA
 - 1 AUGITE DIORITE
 - OUTCROP
 - FLOAT
 - GEOLOGICAL CONTACT
 - FAULT
 - 89CR-2 ROCK SAMPLE LOCATION & NUMBER
- 0 100 200 300 400 500 metres

SUNDIAL RESOURCES LTD.

COB CLAIM
 KAMLOOPS MINING DIV., B.C.
PROPERTY GEOLOGICAL MAP

JAN CHRISTOFFERSEN, P.ENG.

DRAWN: J.CHRISTOFFERSEN/dw	SCALE: 1:10,000	FIG.
DATE: OCTOBER 1989	N.T.S. 92/9	4



Unit 4- Biotite Microdiorite is a medium to dark grey rock made up of 60% light grey crystalline feldspar (1mm), 20% green and brown augite (1mm), 15% books of black biotite (up to 6mm) and 5% accessory magnetite.

Unit 5-Ultramafic rocks are highly fractured and sheared. They are soft, green, even-grained rocks composed of 30% dark serpentized olivine (1-3mm) and 15% green pyroxene (1-2mm) in a light green textureless groundmass. Traces of magnetite are present and, locally, rare specks of malachite, although no copper sulphide minerals were observed.

2.2 Geochemistry





Soil geochemical data (Appendix I) indicate only low order anomalies in the areas surveyed. Only one sample is significantly anomalous in gold (55 ppb), with the remainder ranging from 5-15 ppb. Copper exhibits a high background and only one sample could be considered probably anomalous (199 ppm). Copper and gold soil data have been plotted in Figure 5.

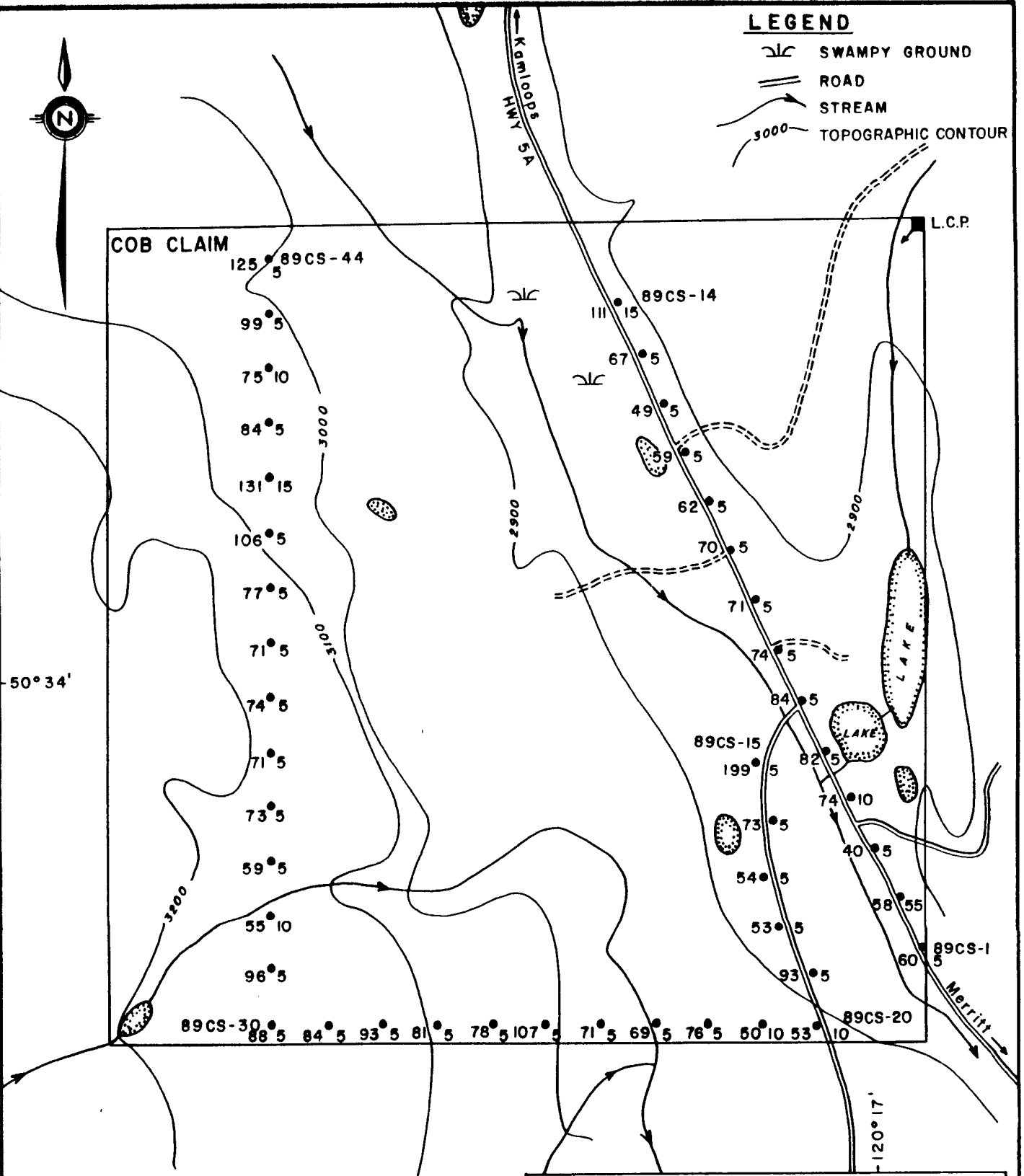
Rock geochemical results (Appendix I) indicate low-order anomalies in several elements. Ultramafic rocks (CR-1,2) are anomalous in Mo, Ni, Cd, Co, Cr and Zn (CR-1). The remaining rocks, representing Iron Mask intrusive types, are generally anomalous in Cu and Au. CR-5 has the highest copper (737 ppm) and gold (30 ppb) contents and was observed to contain pyrite and minor amounts of malachite.

3.0 CONCLUSIONS

The COB claim is partly underlain by dioritic rocks of the Iron Mask pluton and ultramafic intrusions of unknown extent. Exposures on the claim are poor due to extensive glacial overburden. Economic minerals are limited to minor occurrences of malachite in two outcrops.

LEGEND

-  SWAMPY GROUND
-  ROAD
-  STREAM
-  TOPOGRAPHIC CONTOUR



● SOIL SAMPLE LOCATION WITH
Cu ppm Au ppb

SOIL SAMPLE LOCATION WITH
COPPER VALUES IN PPM & GOLD
VALUES IN PPB



SUNDIAL RESOURCES LTD.

COB CLAIM

KAMLOOPS MINING DIV., B.C.

GEOCHEMICAL MAP - Cu, Au

JAN CHRISTOFFERSEN, P.ENG.

DRAWN: J.CHRISTOFFERSEN/dw

SCALE: 1:10,000

FIG.

DATE: OCTOBER 1989

N.T.S. 921/9

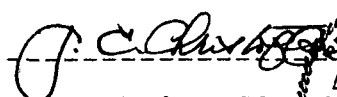
5

Geochemistry suggests a high background in copper in the claim area but no strongly anomalous levels that could be indicative of economic concentrations of copper or other metals.

5.0 STATEMENT OF QUALIFICATIONS

I, J.E. Christoffersen, of 14070 Greencrest Drive, White Rock, British Columbia, V4A 2Y4 hereby declare:

- 1) I am a graduate of the University of Toronto where I received a B. Sc. in Geological Engineering in 1968.
- 2) I am a full member in good standing of the Association of Professional Engineers of the Province of British Columbia.
- 3) I have practised as an exploration geologist on a full-time basis for 21 years.
- 4) The information and interpretations presented in this report are based upon personal experience gained in the course of carrying out the work program on the property.


J.E. Christoffersen, P. Eng.

October 30, 1989.



APPENDIX I

SOIL AND ROCK ANALYTICAL DATA

COMP: SUNDIAL RESOURCES
 PROJ: COB KAMLOOPS
 ATTN: J.E.CHRISTOFFERSEN

MIN-EN LABS — ICP REPORT
 705 WEST 15TH ST., NORTH VANCOUVER, B.C. V7M 1T2
 (604)980-5814 OR (604)988-4524

FILE NO: 9V-1282-SJ1+2
 DATE: OCT-09-89
 * TYPE SOIL GEOCHEM * (ACT:F31)

SAMPLE NUMBER	AG PPM	AL PPM	AS PPM	B PPM	BA PPM	BE PPM	BI PPM	CA PPM	CD PPM	CO PPM	CU PPM	FE PPM	K PPM	LI PPM	MG PPM	MN PPM	MO PPM	NA PPM	NI PPM	P PPM	PB PPM	SB PPM	SR PPM	TH PPM	U PPM	V PPM	ZN PPM	GA PPM	SN PPM	W PPM	CR PPM	AU PPM
89 CS 01	.7	19680	1	1	136	1.0	8	7230	1.2	27	60	34870	2540	7	25990	555	7	790	179	910	47	2	36	1	1	83.0	62	1	1	3	271	5
89 CS 02	.8	14620	1	1	111	1.0	7	21610	2.8	23	58	31740	2750	9	20600	543	7	1060	99	960	45	1	44	1	1	87.8	56	1	1	2	148	55
89 CS 03	.5	10620	5	1	81	.7	6	16300	.8	15	40	22700	2170	15	10940	488	4	680	39	890	19	1	32	1	1	69.1	41	1	1	1	48	5
89 CS 04	1.2	23030	1	1	121	1.1	10	32540	4.3	37	74	31110	2980	15	56240	683	11	880	330	1000	69	8	111	1	1	74.0	73	1	1	4	274	10
89 CS 05	1.0	8080	1	10	149	.7	5	78980	3.7	11	82	14490	2750	11	27270	504	9	740	36	1980	41	5	138	1	1	36.6	59	1	1	1	38	5
89 CS 06	.4	12190	3	4	116	.7	4	24140	1.1	14	84	22220	4330	7	12120	466	4	960	48	1730	30	1	40	1	1	57.4	66	1	1	1	57	5
89 CS 07	.6	14730	1	1	134	.9	6	8900	.1	18	74	27480	2780	8	10500	625	5	410	56	1200	26	1	29	1	1	76.1	68	1	1	1	79	5
89 CS 08	.9	12500	12	1	106	.8	8	18130	1.2	22	71	31810	1460	6	16170	551	5	560	76	1030	33	1	34	1	1	97.8	50	1	1	2	138	5
89 CS 09	1.3	12900	6	1	112	1.0	7	20850	1.7	24	70	34100	1430	6	19920	552	7	590	98	1020	33	3	37	1	1	104.7	48	1	1	3	193	5
89 CS 10	.8	10610	6	1	90	.9	8	21510	2.5	18	62	30860	1290	5	13660	511	5	820	56	1070	41	1	37	1	1	97.2	49	1	1	2	95	5
89 CS 11	.6	15980	1	1	92	.8	7	7820	.2	19	59	28720	3280	8	9810	675	5	490	57	1040	20	1	48	1	1	75.9	60	1	1	1	94	5
89 CS 12	.7	16800	14	1	107	.9	6	6810	.1	19	49	27950	3160	8	9010	721	5	420	57	930	22	1	43	1	1	71.9	82	1	1	1	97	5
89 CS 13	.5	18050	1	1	186	.9	7	7000	.1	20	67	28340	2780	8	12130	719	3	430	88	1040	21	1	30	1	1	71.5	90	1	1	2	119	5
89 CS 14	1.0	15360	9	1	115	1.1	7	16580	.9	22	111	36700	2100	8	15600	599	5	820	77	1020	34	1	38	1	1	113.0	53	1	1	2	128	15
89 CS 15	.8	23710	1	1	192	1.1	8	9200	2.2	28	199	39180	3520	9	22630	791	6	330	147	1300	39	2	34	1	1	102.5	69	1	1	2	141	5
89 CS 16	1.4	19860	1	1	153	1.3	9	43400	3.4	32	73	32400	3960	9	40200	548	9	680	241	960	55	9	289	1	1	84.1	53	1	1	3	274	5
89 CS 17	.8	20650	1	1	123	.9	8	6650	.1	20	54	32060	3320	9	11890	652	4	420	67	920	19	1	29	1	1	91.1	64	1	1	2	107	5
89 CS 18	.8	19100	1	1	164	1.0	8	7650	1.9	20	53	26250	4520	8	13680	716	5	480	82	1190	24	2	38	1	1	66.0	74	1	1	2	105	5
89 CS 19	1.2	14800	11	1	128	1.0	9	19250	2.5	27	93	33760	2910	7	26050	589	9	1160	155	1090	43	5	40	1	1	94.6	52	1	1	3	223	5
89 CS 20	1.0	18600	15	1	260	.9	7	10090	1.5	20	53	25340	2620	8	14130	665	5	320	109	1140	27	2	37	1	1	61.3	61	2	1	2	152	10
89 CS 21	.7	15200	7	1	91	.8	7	6170	.7	20	50	28810	3480	7	12190	643	4	390	82	900	22	1	28	1	1	74.0	55	1	1	2	184	10
89 CS 22	.9	17750	1	1	154	1.2	9	9370	2.0	26	76	34810	3060	7	24030	655	10	400	168	1090	37	3	28	1	1	90.6	62	1	1	3	293	5
89 CS 23	1.1	18640	13	1	145	1.3	8	8340	1.6	26	69	32700	3070	7	21140	683	8	410	161	1080	37	2	33	1	1	82.4	61	1	1	3	245	5
89 CS 24	.7	19560	1	1	206	1.0	7	7460	.1	19	71	28890	3420	8	9710	804	4	370	55	1110	13	1	34	1	1	78.3	61	1	1	1	81	5
89 CS 25	.8	18780	6	1	226	1.0	7	10900	.9	20	107	29840	2750	7	11710	788	4	340	68	1260	25	1	35	1	1	82.7	55	1	1	2	103	5
89 CS 26	1.0	20310	6	1	168	1.2	8	8880	.1	19	78	31970	2460	10	8840	715	4	370	40	1020	16	1	31	1	1	100.5	55	2	1	1	89	5
89 CS 27	.7	15180	1	1	168	1.0	6	10060	1.0	17	81	27280	2980	7	8930	703	2	360	35	1200	8	1	33	1	1	75.7	56	1	1	1	46	5
89 CS 28	.6	18390	1	1	219	1.0	7	10320	.2	18	93	29240	2980	7	8820	767	3	260	47	1190	15	1	34	1	1	85.6	58	1	1	1	67	5
89 CS 29	.6	17420	4	1	217	1.0	6	10750	.1	15	84	26390	2570	7	6630	705	3	260	29	1040	9	1	36	1	1	75.8	55	1	1	1	47	5
89 CS 30	.8	20530	1	1	172	1.1	7	7500	.3	18	88	31300	2720	8	8080	618	4	350	35	1000	12	1	29	1	1	92.6	59	1	1	1	62	5
89 CS 31	1.0	22510	1	1	206	1.1	7	8280	.1	20	96	32650	2860	9	8300	814	2	340	33	1040	14	1	32	1	1	99.6	68	1	1	1	40	5
89 CS 32	.6	16120	1	2	108	1.0	6	9850	1.5	15	55	26090	3750	11	19770	535	5	1390	35	1090	28	1	36	1	1	77.0	55	1	1	1	44	10
89 CS 33	.8	13730	1	3	133	.9	6	21870	2.2	14	59	22690	3410	8	18110	614	6	1530	33	1020	29	1	64	1	1	64.7	51	1	1	1	40	5
89 CS 34	.5	17250	1	1	184	.9	6	8290	.8	17	73	28770	2690	9	8010	710	2	280	38	1100	14	1	28	1	1	78.0	62	1	1	1	48	5
89 CS 35	.9	16580	1	1	167	1.0	7	9100	.8	18	71	30790	2500	8	9050	640	3	320	43	1100	21	1	28	1	1	90.9	57	1	1	1	48	5
89 CS 36	.6	16520	1	1	209	.8	6	8880	1.0	16	74	27650	2500	8	7590	742	3	290	26	1040	15	1	33	1	1	80.7	58	1	1	1	36	5
89 CS 37	.9	17070	1	1	149	1.0	6	7620	.1	19	71	32540	2370	8	9300	658	3	660	37	1090	14	1	27	1	1	99.5	56	1	1	1	52	5
89 CS 38	.8	15970	1	1	182	.8	6	8750	1.1	16	77	27920	2670	7	8220	716	2	280	34	1180	12	1	27	1	1	81.0	58	1	1	1	42	5
89 CS 39	1.0	16590	1	1	157	1.0	7	13420	.1	20	106	32670	2040	8	12300	646	5	380	47	1200	23	1	32	1	1	102.4	52	1	1	1	52	5
89 CS 40	.8	16600	1	1	172	.9	6	12360	.1	18	131	33150	3100	8	11440	692	1	340	35	1400	21	1	37	1	1	104.2	51	1	1	1	38	15
89 CS 41	.6	18210	1	1	243	.9	5	12190	.5	16	84	26510	2960	8	6710	802	2	230	26	1620	10	1	32	1	1	73.7	66	1	1	1	29	5
89 CS 42	1.0	16260	1	1	165	1.0	7	8970	.6	19	75	32880	2850	8	11300	673	3	360	51	1430	19	1	29	1	1	98.7	60	1	1	1	63	10
89 CS 43	.8	19110	1	1	237	.8	5	10380	.5	17	99	29800	2600	8	7350	777	2	230	34	1370	15	1	32	1	1	88.2	64	1	1	1	38	5
89 CS 44	.9	20940	1	1	268	.9	7	10320	.8	20	125	30580	2730	12	9290	1007	3	300	49	1250	22	1	30	1	1	79.2	70	1	1	1	42	5

