FINAL SUBMISSION

GRANT NO. OP 92-828

STULL LAKE PROJECT:

GOLD IN TEMISKAMING TYPE VOLCANICS

ALONG STULL LAKE - WUNNUMIN LAKE SHEAR ZONE

AREA:	Stull Lake, NW Ontario
MINING DIVISION:	Red Lake
CLAIM MAP SHEET:	Stull Lake, G 1893
NTS MAP SHEET:	53 K 7
CENTERING ON	
LATITUDE:	54^0 25′ N
LONGITUDE:	92^0 35′ W

ECKART BUHLMANN
WINNIPEG, JANUARY 26, 1993

TABLE OF CONTENTS

SUMMARY

Between September 29 and October 5, 1992, a reconnaissance lithogeochemical survey, geological mapping and prospecting was carried out in the Stull Lake area under OPAP Grant No. OP 92-828.

The program delineated the extent of the K-rich, shoshonitic Temiskaming type sediments and volcanics which occupy the central part of the Stull Lake belt over a width of 8 km. The survey located evidence for the northern shear zone, within Temiskaming volcaniclastic rocks, close to the contact with Hayes River Group mafic volcanics to the north. The extension of this shear zone into Manitoba hosts the Twin Lakes and Seeber River gold deposits.

Prospecting of the area along the projected shear zone located a field of angular boulders composed of chloritic schists with strong quartz-carbonate veining, from where 135 and 185 ppb Au had been reported previously. Volcaniclastics in an outcrop in Safety Bay, on the northwest shore of Stull Lake, show clasts with attenuation to 1:20, providing direct evidence for the presence of the northern shear zone, which, on the Manitoba side controls the Twin Lakes and Seeber River gold deposits.

It is concluded that the area along the "northern shear zone" offers the best potential for large gold deposits in the Stull Lake area. The Ellard gold showing is situated close to but not within the shear zone. Extensive overburden limits the effectiveness of conventional prospecting.

The area along the "northern shear zone" is largely on open ground and should be staked.

It is recommended to concentrate future gold exploration in this area along the "northern shear zone". Additional prospecting is warranted especially in areas underlain by felsic subvolcanic intrusions, e.g. the quartz feldspar porphyries near the NE shore of Stull Lake along the "northern shear zone".

Prospecting is also warranted in the area of a small copper-anthophyllite/gedrite occurrence in central Stull Lake (#27272A).

LIST OF INDIVIDUALS WHO APPLIED FOR ASSISTANCE FOR THIS PROJECT

The only individual who has applied for assistance for this project is the writer of this report, Eckart Buhlmann.

LOCATION AND ACCESS

The project area is located 383 km north of Red Lake, Ontario. It centres on Stull Lake, NTS sheet 53K7, and is part of the Red Lake Mining Division. The area centres on latitude 54_0 25' N and longitude 92_0 35' W.

Access to the project area is by float-equipped aircraft to Stull Lake from Red Lake, Ontario, which is located 383 km south, or from God's Lake Narrows, 125 km west.

CHANGES TO PROPOSED PROJECT

The program was largely carried out as proposed but in a shorter time period. Because of generally good shore line exposures, the regional lithogeochemical and geological programs were carried out in a shorter time period. A smaller number of samples (66) was taken because they appeared to meet the needs of the program.

Less time was spent on conventional prospecting due to the paucity of outcrops away from shore lines.

Higher than planned mobilization and demobilization costs put severe pressure on the budget.

One helper's day was spent on staking one claim block of three units.

GEOLOGY

The project area occupies the central part of the Stull Lake area. Early Archean mafic volcanics of the Hayes River Group form the northern and southern margins of the belt. The central part is occupied by an 8 km wide zone of Late Archean shoshonitic and trachyandesitic Temiskaming type volcanics and sediments.

Near the northern contact between Hayes River Group tholeiitic basalts and Temiskaming type volcanics the major "northern shear zone" is present. It represents a strand of the regional Wunnumin deformation zone, aligned in an ESE direction. The shear zone

continues into Manitoba where it localizes the rhyodacitic volcanics which host the Twin Lakes and Seeber River gold deposits.

The Temiskaming type volcanics, volcaniclastics and sediments comprise rhyolite, dacite, trachyandesite, basalt, iron-rich sediments, siltstones, conglomerates and tuffs. The alkali-rich nature of these rocks is not apparent when inspecting hand specimens. The Temiskaming type rocks can be readily identified on the basis of major and trace element analyses.

The geological formations, rock types and structures observed, are plotted on MAP #3 (geology).

WORK DONE

Two phases of work were carried out. The first phase consisted of a geological and lithogeochemical program across the width of the Stull Lake volcanic belt. A total of fiftyfive rock samples were taken and submitted for major and trace element analyses. Geological observations were made at each sampling site.

The second phase consisted of detailed prospecting and was concentrated along the "northern shear zone" on the NW side of Stull Lake. Eleven samples were collected from a boulder field.

The results are shown in MAP #1 (SAMPLE LOCATION MAP), MAP #2 (GEOLOGY) and MAP #3 (LITHOGEOCHEMICAL INTERPRETATION).

RESULTS AND RECOMMENDATIONS

RESULTS:

(i) Distribution of Temiskaming Type Rocks

The lithogeochemical sampling program served to produce the necessary assay data for discriminating between tholeiitic Hayes River Group volcanics and calcalkaline and alkaline Temiskaming type sediments and volcanics.

The significance of the Temiskaming volcanics in the area is that they localize the linear features along which the Late Archean gold mineralizing events occur. In addition they provide the host rocks for gold mineralization, e.g. felsic volcanics.

(ii) Definition of "Northern Shear Zone" on Stull Lake

Mapping indicates strong alteration and shearing in an outcrop on the east shore of Safety Bay in the NW part of Stull Lake (#33231) . Strong carbonatization and sericitization is evident. Fragments are strongly attenuated with stretch ratios of 7:1. One km to the south, similar volcaniclastics appear undeformed and unaltered (#33231).

On the NE shore of Stull Lake, strongly sheared, chloritized, sericitized and carbonated schist indicates the re-appearance of the shear zone (#32281). Along the west shore of Rapson Bay, strong shearing is indicated at locations #32303 and #32304.

(iii) Felsic subvolcanics near "Northern Shear Zone"

At locations #33281, #31281, and #30282 along the NE shore of Stull Lake quartz-feldspar porphyry and granodioritic phases were noted. These felsic, brittle rocks on or close to the shear zone offer a favorable host for Twin Lakes or Seeber River type gold deposits.

(iv) Gold and Arsenic Anomalies

On the NW tip of a small island at location #27272A, dark grey, iron-rich tuff contains small amounts of chalopyrite (to 1810 ppm Cu) and few radially aligned clusters of gedrite or anthophyllite. Minor malachite, carbonate and quartz was observed on fractures. Ca. 200 m along trend to the WNW, on a small reef, finely disseminated magnetite was noted in similar material with rare anthophyllite/gedrite. The material at location #27272A contains anomalous gold (to 28 ppb), silver (to 1.3 ppm), and bismuth (to 18 ppm).

Along the W shore of Rapson Bay at location #29311 anomalous Au values (to 10 ppb), As values (to 456 ppm), and Sb (to 9 ppm) are present. At location #31301, Au values to 20 ppb and As values to 41 ppm were noted.

The area with boulders of altered material with abundant quartz-carbonate veining at location #33241A-K yielded Au values to 18 ppb.

RECOMMENDATIONS:

(i) The projected "northern shear zone" should be prospected in detail, including the area of claim #1144169 between Safety Bay and Stull Lake. Detailed prospecting is also warranted along the eastern segment of the shear zone between Stull Lake and Rapson Bay, where felsic subvolcanic intrusives provide brittle host rocks and where sampling indicates the presence of weakly anomalous gold and arsenic concentrations.

(ii) The area around the chalocpyrite-anthophyllite/gedrite occurrence at location #27272A should be prospected in detail.

SAMPLE DESCRIPTIONS

(all samples are from outcrop, except #33241A-K which are from a field of large angular boulders)

NOTE: The sample numbers describe UTM coordinates for the SW corner of the 1x1 km square in which the sample was taken on NTS map sheet 53K7.
Example: # 33231 denotes UTM latitude 6033000N, longitude 523000E; the last digit indicates that it is the first sample taken in the grid square.

sample no.	rock type
# 33231	Felsic lapilli tuff to bomb tuff; carbonated and sericitic; no visible mineralization.
# 32231	Felsic fragmental rock; buff to light grey, aphanitic.
# 33271	Medium grey-brown, fine grained tuff or sandstone; fissile to platy.
# 33241	Whitish and grey greenish carbonate quartz sericite schist with coarse whitish yellow quartz carbonate veins; tr cp, py.
# 34241	Light grey, medium-coarse grained tonalite; black chlorite on fractures; 1-2% disseminated py throughout; in places brecciated or sheared; pervasive sericite in small amounts; rare carbonate.
# 33261	Medium green, fine grained ash tuff, weakly chloritic, slightly carbonated; rare lapilli to 3 cm diameter.
# 32271	Light greyish greenish feldspar porphyry in 1 m dike; matrix is fine grained, light green, sericitized and carbonated; feldspar crystals are 10x3 mm in size.
# 32272	Grey green, fine grained slaty ash tuff; tr py throughout; this material hosts a 4 cm wide quartz vein.

# 32273	4 cm greyish quartz carbonate vein with 1% disseminated pyrite.
# 31231	Buff-greyish, very fine grained dike with numerous small whitish feldspar phenocrysts and visible magnetite.
# 30231	Coarse-medium grained feldspar porphyry clasts in whitish weathering conglomerate.
# 30232	Light grey-green, white weathering medium-fine grained siliceous volcanic material is present as subrounded elongated clasts in the conglomerate.
# 30233	Medium grey, whitish weathering, fine grained clasts of dacitic lava; some broken quartz crystals are present in this material. Clasts are attenuated 1.5:1 on average.
# 29211	Grey, sheared conglomerate; sericite along fractures.
# 28261	Grey brown slightly micaceous, fine grained wacke; tr pyrite in small patches; sericite, feldspar and carbonate on fractures and in patches of 1-2 mm.
# 27261	Grey, micaceous to sandy fine grained tuffaceous wacke or tuff with strongly attenuated fragments or clasts to 1:14.
# 25271	Grey, fine-grained tuff or wacke, tr pyrite, small quartz pods; tr cp.
# 25272	Greenish grey, medium to fine grained amphibolite or gabbro with salt and pepper texture on weathered surface; epidote-quartz stringers with tr pyrite and chalcopyrite; several rust spots.
# 24251	Dark grey-greenish fine-medium grained well foliated amphibole-plagioclase bearing mafic volcanic unit; quartz stringers and minor rust on fractures.
# 22281	Light grey-buff, medium-coarse grained, hybrid granitoid to migmatitic rock with white plagioclase crystals to 4 mm diameter; some hornblende, rare biotite; little quartz.
# 24311	Well laminated grey-greenish hard, siliceous sediment.

# 24301	Grey brownish rusty, hard, fine grained, foliated, sightly micaceous siliceous sedimentary rock with minor quartz stringers, blows, pods; 1% disseminated pyrite.
# 24302	Light grey, well laminated or banded fine grained silicified siltstone; quartz stringers.
# 25273	Grey greenish, fine grained amphibole and plagioclase rich mafic tuff; quartz, tr po.
# 28271	Medium grey, brownish fine grained, siliceous, strongly foliated tuff with rare 0.5-1 mm diameter blue quartz eyes; some sericite and chlorite, finely laminated; tr py throughout.
# 27271	White weathering, grey, fine grained siliceous, quartz rich well laminated tuffaceus sediment; 1% py throughout; strongly foliated.
# 27272	Grey, fine grained, foliated siliceous sericite rich hard siltstone with tr py throughout; few carbonte stringers; trace chalcopyrite and malachite stains; chalcopyrite is with quartz lenses and with minor carbonate along fractures; minor epidote; tr sp?
# 27272A	Grey, fine grained siliceous sericitic tuff with quartz and carbonate; disseminated chalcopyrite to 0.5%; tr py; anthophyllite or gedrite (blackish) patches to 5x10 mm diameter.
# 28271	Grey, fine-grained, siliceous, foliated feldspar porphyry; to 30% sheared out whitish feldspar phenocrysts.
# 29261	Conglomerate with cobble size clasts of quartz-feldspar porphyry.
# 29281	Light grey, buff-greenish aphanitic, silicified quartz-phyric rhyolite porphyry, clear quartz-crystals to 5mm diameter; green chloritic patches; dense, hard siliceous matrix.
# 30281	Light grey, buff quartz phyric rhyolite porphyry, much like #29281; fine grained to aphanitic.
# 30282	Light grey rhyolite porphyry with clear, small quartz crystals and occasional larger mafic clasts to 60x15cm.

# 31281	Sheared rhyolite porphyry.
# 32281	Greenish, softish, streaky chlorite quartz carbonate schist with 0.5% py disseminated; ochre weathering colors signal high Fe-content of carbonate.
# 33281	Light grey-buff, medium-coarse grained felsic granitic phase, similar to tonalitic phase on W-side (#34351).
# 34281	Dark grey, fine grained, hard, jointed interflow sediment.
# 31211	Buff feldspar porphyry with tr carbonate and pyrite.
# 33311	Greyish weathering, light-medium greenish fine grained siltstone; well laminated/banded.
# 33312	Fine grained, dark green massive volcanic flow with some microgabbro texture on weathered surface.
# 32302	Light yellowish greenish buff quartz sericite schist, well laminated and foliated, black chloritic and oblique py rich seams; banding is grey, light grey, and whitish (cherty).
# 32301	Light grey quartz sericite schist and quartz chlorite seams and occasional black quartz vein or lense.
# 32303	Greenish, fine grained, strongly foliated chlorite carbonate quartz schist and tr py.
# 32304	Green, fissile, fine grained chlorite schist, slightly sandy with yellow-brown carbonate veinlets tr py; a weak lineation plunges 5 deg. E.
# 31302	Grey, slightly chloritized fine grained weakly foliated feldspar phyric tuff. Fsp crystals occur in patches; otherwise lithic.
# 31302A	Light grey, buff, quite felsic ash tuff.
# 31303	Grey, fine grained hard siliceous tuff with some quartz veins parallel to foliation; with 1-10% disseminated py.
# 31303A	Mainly quartz vein with pyrite and malachite stains.

# 31303B	Greyish brown fine grained mica rich and porphyritic looking volcanic; ghosts of fine grained biotite after amphibole; at surface the material has a very irregular ropy to knotty texture.
# 31303C	Light grey to buff quartz sericite rock; a horizontal stretching fabric; highly siliceous and sericitic rock.
# 30311	Dark brown-grey biotite rich fine grained lava, occasional carbonate (ankerite) patch.
# 29311	Light grey, buff, very siliceous, very fine grained, almost cherty sediment, massive.
# 29321	Grey brown fine grained micaceous siltstone, highly foliated, contorted.
# 28321	Medium grey-green, fine grained, hard, sheared out volcaniclastic with feldspar, quartz and chlorite; tr py; fragments are near 3 x 20 cm.
# 33241A	Whitish and yellowish carbonate quartz veins and breccias in chloritic schist from angular boulder field along shore in shallow water.
# 33241B	Whitish and yellowish carbonate quartz veins and breccias in chloritic schist from angular boulder field along shore in shallow water.
# 33241C	Whitish and yellowish carbonate quartz veins and breccias in chloritic schist from angular boulder field along shore in shallow water.
# 33241D	Whitish and yellowish carbonate quartz veins and breccias in chloritic schist from angular boulder field along shore in shallow water.
# 33241E	Whitish and yellowish carbonate quartz veins and breccias in chloritic schist from angular boulder field along shore in shallow water.
# 33241F	Whitish and yellowish carbonate quartz veins and breccias in chloritic schist from angular boulder field along shore in shallow water.

# 33241G	Whitish and yellowish carbonate quartz veins and breccias in chloritic schist from angular boulder field along shore in shallow water.
# 33241H	Whitish and yellowish carbonate quartz veins and breccias in chloritic schist from angular boulder field along shore in shallow water.
# 33241I	Whitish and yellowish carbonate quartz veins and breccias in chloritic schist from angular boulder field along shore in shallow water.
# 33241J	Whitish and yellowish carbonate quartz veins and breccias in chloritic schist from angular boulder field along shore in shallow water.
# 33241K	Whitish and yellowish carbonate quartz veins and breccias in chloritic schist from angular boulder field along shore in shallow water.
# 27273	Grey fine grained siliceous tuffaceous unit with minor disseminated magnetite; tr chalcopyrite; rare anthophyllite/gedrite cluster.

XRAL

X-RAY ASSAY LABORATORIES

A DIVISION OF SGS SUPERVISION SERVICES INC.
1885 LESLIE STREET • DON MILLS, ONTARIO M3B 3J4 • CANADA
TEL: (416)445-5755 TELEX: 06-986947 FAX: (416)445-4152

CERTIFICATE OF ANALYSIS

REPORT 20906

TO: GRANGES INC.
ATTN: STEPHEN MASSON
P.O. BOX 849
FLIN FLON, MANITOBA
R8A 1N6

CUSTOMER No. 1984

DATE SUBMITTED
8-Oct-92

REF. FILE 13498-D1

Total Pages 12

66 ROCKS Proj. SHOSHON #1

	METHOD	DETECTION LIMIT
AU PPB	FADCP	1.
LI PPM	ICP	1.
BE PPM	ICP	.5
NA %	ICP	.01
URMAJ %	WR	.01
MG %	ICP	.01
AL %	ICP	.01
P %	ICP	.01
K %	ICP	.01
CA %	ICP	.01
SC PPM	ICP	.5
TI %	ICP	.01
V PPM	ICP	2.
CR PPM	ICP	1.
MN %	ICP	.01
FE %	ICP	.01
CO PPM	ICP	1.
NI PPM	ICP	1.
CU PPM	ICP	.5
ZN PPM	ICP	.5

	METHOD	DETECTION LIMIT
AS PPM	ICP	3.
RB PPM	XRF	2.
SR PPM	XRF	2.
SR PPM	ICP	.5
Y PPM	XRF	2.
Y PPM	ICP	.1
ZR PPM	XRF	3.
ZR PPM	ICP	.5
NB PPM	XRF	2.
MO PPM	ICP	1.
AG PPM	ICP	.1
CD PPM	ICP	1.
SN PPM	ICP	10.
SB PPM	ICP	5.
BA PPM	XRF	20.
BA PPM	ICP	1.
W PPM	ICP	10.
PB PPM	ICP	2.
BI PPM	ICP	3.

*** UNLESS INSTRUCTED OTHERWISE WE WILL DISCARD PULPS IN 90 DAYS ***
AND REJECTS IN 30 DAYS FROM THE DATE OF THIS REPORT

DATE 18-DEC-92

CERTIFIED BY .....

Jean H.L. Opdebeeck, General Manager

SAMPLE	AU PPB	LI PPM	BE PPM	MA %	MG %	AL %	P %	K %
22281	1	7	<.5	.08	.39	.74	.04	.08
24251	2	89	.8	.08	1.57	2.05	.05	.05
24301	8	38	.6	.06	1.04	1.62	.07	.11
24302	2	9	<.5	.08	.76	1.10	.07	.13
24311	1	15	.5	.08	1.45	1.65	.06	.19
25271	6	7	<.5	.08	.85	1.00	.03	.02
25272	6	4	<.5	.11	.56	.89	.06	.04
25273	3	9	.6	.09	1.16	1.56	.03	.04
27261	2	20	.7	.08	1.82	2.35	.09	.57
27271	9	12	.6	.06	1.57	2.09	.09	.16
27272	2	21	.9	.07	2.44	2.68	.29	.81
27272A	28	16	.8	.05	2.08	2.15	.25	.37
27273	1	22	.9	.06	2.58	2.77	.23	.76
28261	<1	22	.7	.07	1.56	2.74	.11	1.93
28271	<1	26	.7	.08	.96	2.15	.13	1.36
28271A	6	25	.7	.08	1.89	2.42	.10	.94
28321	3	20	1.0	.25	.97	3.47	.08	.03
29211	2	20	.7	.07	1.76	2.44	.18	1.52
29281	<1	41	<.5	.08	.80	1.01	.07	.12
29311	10	3	<.5	.10	.66	.91	.07	.33
29321	2	12	.9	.04	.44	1.74	.24	1.18
30231	<1	10	1.0	.08	1.05	1.77	.22	.48
30232	2	6	.7	.04	.68	1.26	.17	.41
30233	3	9	1.0	.06	.90	1.71	.18	.38
30281	1	26	<.5	.07	.18	.51	.03	.09
30282	<1	25	<.5	.08	.51	.88	.02	.10
30311	<1	16	1.4	.09	1.91	2.70	.38	1.72
31211	<1	2	.7	.06	.24	.25	.07	.22
31231	2	4	.6	.06	.19	.45	.07	.40
31281	<1	9	<.5	.09	.28	.83	.06	.10
31301	8	15	1.2	.07	1.39	1.72	.25	.62
31302	20	13	1.1	.06	1.23	1.62	.28	.94
31302A	5	7	.6	.06	.80	1.04	.24	.25
31303A	16	7	1.3	.03	.68	1.54	.07	.19
31303	7	9	1.6	.04	.83	1.86	.06	.20
31303B	1	22	1.4	.06	2.24	2.87	.34	2.34
31303C	7	7	.5	.05	.65	.97	.03	.58
32231	1	5	<.5	.07	.24	.36	.03	.10
32271	4	20	.9	.08	1.73	1.99	.26	.10
32272	10	25	.9	.05	2.04	2.33	.13	.15
32273	170	13	.6	.04	1.17	1.30	.10	.16
32281	11	28	1.1	.02	2.30	2.68	.33	.16
32301	<1	11	.6	.04	1.09	1.32	.05	.16
32302	1	2	<.5	.07	.10	.33	.03	.15
32303	3	20	.9	.05	.45	1.64	.06	.08
32304	<1	51	1.1	.04	3.08	3.49	.29	.13
33231	<1	10	<.5	.07	.38	.75	.02	.09
33241	3	12	.7	.04	2.66	.75	.09	.12
33261	4	23	.6	.04	1.38	1.87	.15	.19
33271	3	18	.6	.06	2.14	2.33	.18	.05

SAMPLE	AU PPB	LI PPM	BE PPM	NA %	MG %	AL %	P %	K %
33281	<1	2	<.5	.07	.10	.29	.02	.14
33311	2	14	<.5	.05	1.18	1.50	.02	.02
33312	3	11	<.5	.08	.97	1.20	.03	.06
33241A	2	30	1.0	.06	2.29	1.74	.29	.08
33241B	4	4	.8	.05	1.12	.43	.19	.14
33241C	2	24	.9	.06	2.03	1.53	.21	.14
33241D	2	31	1.1	.04	3.54	1.53	.26	.10
33241E	18	9	.8	.05	1.66	.65	.18	.13
33241F	<1	19	1.0	.04	2.64	1.16	.28	.16
33241G	3	22	1.0	.05	2.51	1.27	.13	.14
33241H	1	16	1.0	.04	2.28	1.03	.29	.17
33241I	1	17	1.0	.04	3.40	1.02	.29	.15
33241J	3	8	.9	.06	1.87	.64	.22	.14
33241K	6	9	.8	.07	1.53	.68	.19	.12
34241	1	7	<.5	.07	.17	.38	.02	.22
34281	2	17	<.5	.15	1.22	1.87	.03	.07
C XRA CONTROL	--	--	--	--	--	--	--	--
C DCP CONTROL	--	8	<.5	.03	.28	.68	.03	.04
C DCP CONTROL	--	8	<.5	.03	.29	.70	.03	.05
D 22281	--	7	<.5	.07	.40	.76	.04	.07
D 27273	--	22	.9	.05	2.54	2.72	.21	.74
D 28271	--	--	--	--	--	--	--	--
D 30281	--	26	<.5	.06	.17	.49	.03	.08
D 31231	--	--	--	--	--	--	--	--
D 31303C	--	7	.5	.04	.61	.90	.03	.55
D 32301	--	--	--	--	--	--	--	--
D 33231	--	10	<.5	.07	.38	.75	.02	.09
D 33241F	--	20	1.1	.04	2.71	1.19	.28	.17

C - QUALITY CONTROL STANDARD
D - QUALITY CONTROL DUPLICATE

SAMPLE	CA %	SC PPM	TI %	V PPM	CR PPM	MN %	FE %	CO PPM
22281	.23	.7	.06	18	94	.02	1.55	4
24251	.81	5.5	.10	116	125	.06	3.42	18
24301	.17	2.3	<.01	42	105	.04	2.85	20
24302	1.96	3.7	.11	89	124	.05	2.33	34
24311	.55	3.0	.10	48	135	.04	2.44	15
25271	1.19	4.0	.05	47	89	.03	1.87	16
25272	1.23	4.1	.06	45	76	.03	1.88	13
25273	1.57	4.7	.06	72	70	.08	3.35	21
27261	1.16	6.1	.11	81	224	.07	3.76	24
27271	.34	3.8	.07	59	136	.05	3.70	20
27272	3.76	15.6	.10	165	55	.08	4.83	28
27272A	3.98	14.0	.06	121	65	.07	3.87	23
27273	3.50	12.2	.10	114	118	.09	4.42	30
28261	1.45	9.1	.20	123	31	.05	4.45	22
28271	.96	8.0	.15	58	78	.04	4.19	15
28271A	.35	6.2	.13	94	309	.06	3.85	24
28321	1.39	7.1	.03	83	100	.07	4.58	25
29211	2.32	6.7	.17	107	148	.07	4.01	25
29281	1.32	1.4	<.01	18	87	.02	1.49	8
29311	2.08	1.9	.03	21	71	.03	1.58	20
29321	.58	1.1	.10	29	37	.02	3.36	23
30231	2.69	1.1	.04	37	50	.09	3.97	14
30232	1.19	.7	.02	17	67	.05	2.60	15
30233	2.36	1.0	.02	24	59	.08	3.35	18
30281	.81	<.5	<.01	4	74	.01	.84	4
30282	2.14	.8	<.01	14	62	.04	1.93	6
30311	2.00	3.4	.17	83	56	.04	4.59	14
31211	1.59	1.1	<.01	5	46	.07	1.51	5
31231	.56	1.1	.02	7	47	.04	1.38	4
31281	1.73	1.1	<.01	19	86	.03	1.63	13
31301	2.95	.9	.04	30	50	.08	2.99	25
31302	3.31	.9	.08	36	40	.05	2.89	35
31302A	3.54	<.5	<.01	11	15	.05	1.51	11
31303A	1.67	.7	.02	20	65	.08	6.14	14
31303	1.25	1.0	.02	24	58	.08	6.54	14
31303B	2.95	3.4	.24	80	81	.08	4.72	7
31303C	1.40	.6	.06	10	64	.05	1.87	7
32231	1.69	.7	<.01	6	70	.06	1.71	5
32271	3.92	1.9	<.01	43	54	.06	3.33	20
32272	3.97	1.2	<.01	24	63	.07	3.56	21
32273	4.60	.7	<.01	16	84	.07	2.03	12
32281	5.18	1.3	<.01	31	34	.06	4.00	30
32301	2.85	.9	<.01	17	79	.06	2.71	14
32302	1.11	<.5	<.01	<2	52	.01	.49	2
32303	5.35	4.1	<.01	49	76	.14	4.60	24
32304	3.40	2.2	.01	47	69	.05	4.51	30
33231	2.67	<.5	<.01	4	42	.03	1.10	5
33241	5.78	1.7	<.01	21	44	.07	3.32	20
33261	2.12	.9	<.01	18	37	.04	2.56	22
33271	2.79	1.2	.06	33	75	.05	2.87	23

SAMPLE	CA %	SC PPM	TI %	V PPM	CR PPM	MN %	FE %	CO PPM
33281	.63	<.5	<.01	2	83	<.01	.48	2
33311	2.25	2.4	.06	61	81	.07	2.41	25
33312	.60	3.4	.05	45	59	.03	1.86	13
33241A	4.33	2.3	<.01	42	32	.10	4.58	25
33241B	3.51	<.5	<.01	8	20	.08	2.31	12
33241C	3.82	1.6	<.01	25	62	.07	3.86	23
33241D	6.13	4.1	<.01	37	114	.15	4.38	28
33241E	4.24	.9	<.01	13	42	.08	3.03	10
33241F	5.59	1.8	<.01	20	21	.11	4.24	22
33241G	4.64	2.7	<.01	33	87	.10	4.07	19
33241H	5.45	1.6	<.01	19	22	.10	4.24	26
33241I	7.45	2.6	<.01	22	52	.13	4.13	26
33241J	4.78	.8	<.01	16	28	.09	3.39	16
33241K	4.01	1.0	<.01	17	48	.09	3.04	10
34241	.81	<.5	.01	3	83	.02	.66	2
34281	.63	2.8	.05	41	79	.02	2.27	16
C XRA CONTROL	--	--	--	--	--	--	--	--
C DCP CONTROL	.34	1.2	.06	25	75	.01	1.14	5
C DCP CONTROL	.35	1.2	.06	25	75	.01	1.15	4
D 22281	.25	.8	.07	19	94	.02	1.56	4
D 27273	3.25	11.8	.11	113	115	.09	4.45	29
D 28271	--	--	--	--	--	--	--	--
D 30281	.78	<.5	<.01	5	71	.01	.83	4
D 31231	--	--	--	--	--	--	--	--
D 31303C	1.29	.5	.05	10	59	.05	1.73	6
D 32301	--	--	--	--	--	--	--	--
D 33231	2.58	<.5	<.01	4	42	.03	1.09	5
D 33241F	5.71	1.9	<.01	21	21	.11	4.33	23

C - QUALITY CONTROL STANDARD
D - QUALITY CONTROL DUPLICATE

SAMPLE	NI PPM	CU PPM	ZN PPM	AS PPM	RB PPM	SR PPM	SR PPM	Y PPM	Y PPM
22281	3	10.8	49.6	<3	66	379	9.1	<2	5.1
24251	34	36.7	52.6	<3	13	78	6.7	16	4.4
24301	42	57.2	64.9	59	72	570	11.2	5	4.6
24302	71	66.2	53.4	<3	27	184	10.1	9	4.5
24311	31	19.8	65.2	<3	51	525	39.5	<2	4.6
25271	21	71.9	29.9	10	11	164	7.8	<2	3.5
25272	15	121	26.2	<3	12	218	11.8	3	5.6
25273	27	68.2	43.2	<3	19	211	13.0	<2	4.0
27261	86	51.9	60.6	<3	54	446	35.3	<2	7.2
27271	64	28.8	64.9	<3	45	549	19.1	<2	6.0
27272	53	113	64.9	<3	40	1150	146	11	15.6
27272A	34	1810	51.0	12	17	1270	145	8	12.0
27273	63	17.1	80.7	<3	35	1030	125	4	11.6
28261	22	44.2	83.8	<3	88	357	19.7	7	8.8
28271	13	36.6	69.0	<3	70	336	28.6	14	13.4
28271A	113	46.1	65.3	<3	59	455	19.1	<2	6.9
28321	55	54.6	89.2	<3	8	508	101	3	10.5
29211	69	63.1	78.5	<3	61	884	101	5	8.1
29281	23	19.8	45.1	<3	54	622	44.0	<2	3.8
29311	45	86.5	24.8	456	42	616	93.8	<2	4.2
29321	37	166	87.2	19	163	696	47.2	4	9.9
30231	23	54.8	59.6	<3	99	782	230	<2	11.6
30232	30	28.1	61.6	<3	117	548	153	4	9.2
30233	32	71.5	88.8	<3	94	542	210	5	12.3
30281	4	7.2	31.3	<3	47	444	25.9	<2	1.3
30282	3	17.4	59.9	<3	44	368	42.1	<2	2.2
30311	32	3.9	238	17	149	1200	152	8	11.0
31211	3	8.2	52.7	<3	156	581	281	14	14.3
31231	3	7.2	56.2	<3	150	384	107	16	15.7
31281	32	42.4	41.8	<3	49	435	31.4	<2	3.9
31301	41	40.4	246	22	106	664	187	4	7.2
31302	33	52.5	47.1	24	132	1060	324	<2	8.7
31302A	16	97.3	60.1	4	91	1300	377	<2	9.3
31303A	17	462	114	29	34	105	52.5	<2	5.9
31303	15	164	114	17	41	176	53.0	<2	4.9
31303B	36	6.5	206	5	170	683	149	9	11.7
31303C	13	54.4	74.6	6	69	351	64.5	<2	3.5
32231	5	21.2	69.6	7	55	454	72.0	11	4.9
32271	28	51.1	77.0	<3	37	1180	403	7	8.5
32272	56	14.3	79.1	<3	66	788	424	<2	4.3
32273	25	16.7	44.8	7	44	707	534	<2	3.5
32281	43	76.6	74.3	<3	102	702	556	13	9.6
32301	39	42.7	44.4	<3	63	514	328	<2	2.5
32302	3	9.6	19.9	<3	43	513	76.8	<2	1.0
32303	47	49.3	56.8	41	50	250	150	<2	3.7
32304	57	12.0	77.5	<3	82	561	268	9	7.5
33231	4	15.5	38.0	<3	40	476	102	<2	1.2
33241	38	45.2	58.9	13	62	1100	659	<2	4.6
33261	41	70.3	46.8	<3	116	423	62.6	<2	3.1
33271	50	54.9	65.3	<3	18	1660	152	<2	3.2

SAMPLE	NI PPM	CU PPM	ZN PPM	AS PPM	RB PPM	SR PPM	SR PPM	Y PPM	Y PPM
33281	4	14.5	13.1	<3	40	645	25.9	<2	1.3
33311	22	85.5	41.9	<3	9	145	8.8	<2	2.1
33312	11	77.8	24.4	<3	16	141	7.9	<2	1.6
33241A	30	54.5	66.2	<3	--	--	375	--	8.1
33241B	19	45.9	40.9	8	--	--	381	--	6.3
33241C	42	65.6	71.8	5	--	--	293	--	6.1
33241D	72	43.7	54.3	<3	--	--	504	--	8.4
33241E	26	38.2	52.3	19	--	--	522	--	5.6
33241F	27	37.4	85.8	<3	--	--	676	--	10.6
33241G	33	7.7	127	<3	--	--	567	--	9.7
33241H	29	38.6	78.1	<3	--	--	602	--	10.3
33241I	55	65.8	46.3	<3	--	--	558	--	8.7
33241J	23	76.8	50.3	10	--	--	465	--	7.4
33241K	25	47.3	53.8	14	--	--	471	--	6.3
34241	4	6.5	13.3	<3	60	669	30.0	<2	1.6
34281	13	84.7	32.4	<3	9	128	17.8	<2	1.2
C XRA CONTROL	--	--	--	--	216	277	--	126	--
C DCP CONTROL	11	12.2	17.2	<3	--	--	7.2	--	2.6
C DCP CONTROL	10	11.7	16.5	<3	--	--	7.8	--	2.7
D 22281	3	11.2	49.9	<3	67	382	9.7	<2	5.3
D 27273	62	17.1	78.7	<3	--	--	118	--	11.0
D 28271	--	--	--	--	68	337	--	18	--
D 30281	5	7.9	31.6	<3	--	--	24.5	--	1.2
D 31231	--	--	--	--	149	387	--	13	--
D 31303C	13	51.3	69.2	7	--	--	59.4	--	3.2
D 32301	--	--	--	--	67	508	--	<2	--
D 33231	4	15.7	37.8	<3	--	--	99.7	--	1.2
D 33241F	28	37.9	86.0	<3	--	--	693	--	10.9

C - QUALITY CONTROL STANDARD
D - QUALITY CONTROL DUPLICATE

SAMPLE	ZR PPM	ZR PPM	NB PPM	MO PPM	AG PPM	CD PPM	SN PPM
22281	187	9.0	11	<1	.1	<1	<10
24251	97	4.0	6	<1	.4	2	<10
24301	251	38.4	14	<1	<.1	<1	<10
24302	119	2.1	10	<1	.2	<1	<10
24311	129	3.9	9	<1	.1	1	<10
25271	76	4.6	7	<1	<.1	<1	<10
25272	100	3.9	9	<1	<.1	<1	<10
25273	89	4.8	6	<1	.2	2	<10
27261	142	22.7	9	2	.3	1	<10
27271	141	18.5	11	<1	.1	2	<10
27272	164	20.2	16	<1	.2	2	<10
27272A	143	16.4	15	<1	1.3	2	<10
27273	158	22.4	11	<1	.1	2	<10
28261	148	11.2	11	<1	.2	2	<10
28271	253	58.9	11	<1	.4	2	<10
28271A	153	23.6	8	<1	<.1	2	<10
28321	126	12.9	8	<1	.3	2	<10
29211	177	18.1	12	<1	.3	2	<10
29281	125	25.3	10	<1	.2	<1	<10
29311	138	17.4	10	<1	.2	<1	<10
29321	290	92.7	13	<1	.7	1	<10
30231	272	11.0	16	1	<.1	2	<10
30232	207	54.1	14	1	<.1	1	<10
30233	232	56.3	12	1	.4	2	<10
30281	90	10.3	9	<1	<.1	<1	<10
30282	86	10.4	6	<1	<.1	<1	<10
30311	276	69.8	16	<1	.3	2	<10
31211	403	117	21	<1	.2	<1	<10
31231	438	165	22	<1	.4	<1	<10
31281	136	23.7	9	<1	.2	<1	<10
31301	248	65.1	17	2	.8	2	<10
31302	217	75.5	14	<1	.5	1	<10
31302A	307	42.2	22	<1	<.1	<1	<10
31303A	75	13.4	8	<1	.9	3	<10
31303	99	16.0	8	<1	.6	3	<10
31303B	284	69.6	15	<1	.5	2	<10
31303C	108	24.1	10	1	.3	1	<10
32231	180	21.8	13	<1	.4	1	<10
32271	224	49.4	12	<1	.3	2	<10
32272	119	28.2	8	<1	.4	2	<10
32273	78	23.2	6	1	.5	<1	<10
32281	252	33.0	16	<1	.4	2	<10
32301	103	6.6	7	<1	<.1	1	<10
32302	151	18.1	6	<1	<.1	<1	<10
32303	101	9.2	9	<1	.2	2	<10
32304	163	39.9	9	<1	.3	2	<10
33231	77	7.6	6	<1	.1	<1	<10
33241	117	24.7	7	<1	.6	2	<10
33261	124	16.1	9	<1	.3	<1	<10
33271	125	9.3	8	<1	.3	1	<10

SAMPLE	ZR PPM	ZR PPM	NB PPM	MO PPM	AG PPM	CD PPM	SN PPM
33281	81	7.1	8	<1	<.1	<1	<10
33311	64	1.1	7	<1	.3	1	<10
33312	67	1.1	7	<1	<.1	<1	<10
33241A	--	31.1	--	<1	<.1	2	<10
33241B	--	54.5	--	<1	.3	1	<10
33241C	--	22.5	--	<1	.3	2	14
33241D	--	30.3	--	<1	.2	2	<10
33241E	--	40.4	--	<1	.4	2	<10
33241F	--	12.8	--	<1	.3	2	<10
33241G	--	36.5	--	<1	.6	2	<10
33241H	--	26.5	--	<1	.4	2	<10
33241I	--	32.4	--	<1	.5	2	<10
33241J	--	40.7	--	<1	.2	2	<10
33241K	--	43.5	--	<1	.5	1	<10
34241	88	4.3	8	<1	<.1	<1	<10
34281	64	1.0	6	<1	<.1	1	<10
C XRA CONTROL	279	--	22	--	--	--	--
C DCP CONTROL	--	4.7	--	3	.6	<1	<10
C DCP CONTROL	--	3.0	--	2	.2	<1	<10
D 22281	190	9.5	11	<1	.2	<1	<10
D 27273	--	22.9	--	<1	.2	2	<10
D 28271	256	--	9	--	--	--	--
D 30281	--	10.2	--	<1	.2	<1	<10
D 31231	442	--	20	--	--	--	--
D 31303C	--	22.0	--	1	.5	1	<10
D 32301	104	--	7	--	--	--	--
D 33231	--	8.3	--	<1	.4	<1	<10
D 33241F	--	29.1	--	<1	.4	2	<10

C - QUALITY CONTROL STANDARD
D - QUALITY CONTROL DUPLICATE

SAMPLE	SB PPM	BA PPM	BA PPM	W PPM	PB PPM	BI PPM
22281	<5	531	18	<10	10	<3
24251	<5	208	20	<10	2	3
24301	<5	1120	44	<10	4	<3
24302	<5	394	47	<10	3	<3
24311	<5	894	60	<10	5	4
25271	<5	160	6	<10	<2	<3
25272	<5	184	6	<10	<2	<3
25273	<5	253	11	<10	3	<3
27261	<5	721	209	<10	4	<3
27271	<5	798	62	<10	6	<3
27272	<5	888	599	<10	2	5
27272A	<5	654	333	<10	3	18
27273	<5	897	467	<10	4	4
28261	<5	875	648	<10	<2	4
28271	<5	620	364	<10	2	<3
28271A	<5	766	359	<10	6	<3
28321	<5	217	28	<10	3	4
29211	<5	893	701	<10	3	<3
29281	<5	741	52	<10	<2	<3
29311	9	415	45	<10	8	<3
29321	<5	1680	189	<10	7	3
30231	<5	882	99	<10	20	<3
30232	<5	1570	148	<10	12	<3
30233	<5	963	91	<10	30	<3
30281	<5	516	30	<10	4	<3
30282	<5	498	35	<10	<2	4
30311	<5	1170	436	<10	9	7
31211	<5	1400	70	<10	19	<3
31231	6	1270	77	<10	20	<3
31281	<5	540	40	<10	3	<3
31301	<5	1140	126	<10	14	3
31302	<5	1670	207	<10	6	6
31302A	<5	1290	85	<10	29	<3
31303A	<5	435	38	<10	14	<3
31303	<5	561	46	<10	11	5
31303B	<5	1050	311	<10	12	7
31303C	<5	689	86	<10	6	<3
32231	<5	577	32	<10	4	4
32271	<5	599	53	<10	5	3
32272	<5	925	62	<10	8	<3
32273	<5	559	59	31	34	<3
32281	<5	1030	63	<10	6	4
32301	<5	637	51	<10	5	<3
32302	<5	1190	108	<10	8	3
32303	<5	451	24	<10	5	<3
32304	<5	1380	71	<10	18	<3
33231	<5	428	26	<10	4	<3
33241	<5	639	37	<10	11	5
33261	<5	923	54	<10	<2	<3
33271	<5	326	20	<10	<2	3

SAMPLE	SB PPM	BA PPM	BA PPM	U PPM	PB PPM	BI PPM
33281	<5	1020	89	<10	5	<3
33311	<5	148	5	<10	<2	<3
33312	<5	151	12	<10	<2	<3
33241A	<5	--	45	<10	5	3
33241B	<5	--	157	<10	8	<3
33241C	<5	--	62	<10	36	<3
33241D	<5	--	100	<10	9	4
33241E	<5	--	61	<10	10	5
33241F	<5	--	107	<10	5	4
33241G	<5	--	86	<10	5	5
33241H	<5	--	115	<10	5	4
33241I	<5	--	101	<10	9	4
33241J	<5	--	82	<10	5	<3
33241K	<5	--	74	<10	9	5
34241	<5	973	68	<10	6	<3
34281	<5	140	22	<10	<2	<3
C XRA CONTROL	--	417	--	--	--	--
C DCP CONTROL	<5	--	27	<10	6	6
C DCP CONTROL	<5	--	28	<10	6	5
D 22281	<5	529	18	<10	8	4
D 27273	<5	--	445	<10	4	5
D 28271	--	615	--	--	--	--
D 30281	<5	--	29	<10	<2	4
D 31231	--	1250	--	--	--	--
D 31303C	<5	--	79	<10	7	<3
D 32301	--	647	--	--	--	--
D 33231	<5	--	26	<10	5	<3
D 33241F	<5	--	110	<10	6	<3

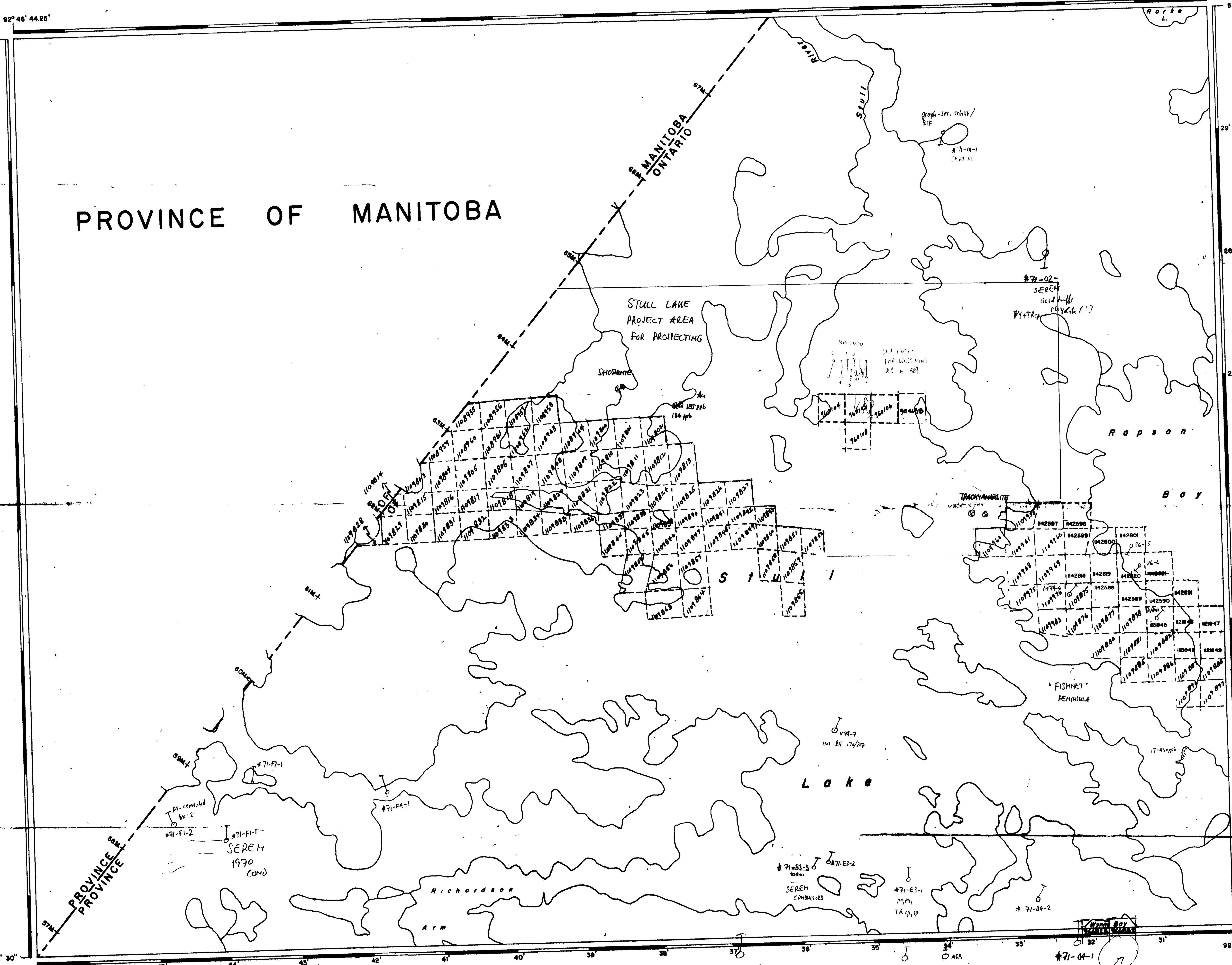
C - QUALITY CONTROL STANDARD
D - QUALITY CONTROL DUPLICATE

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
22281	68.3	15.8	2.80	.81	5.28	1.66	2.81	.04	.361	.12	.01	1.00	99.0
24251	48.2	14.1	8.83	7.15	1.90	.41	15.2	.38	1.49	.14	.06	2.25	100.1
24301	54.3	24.3	2.89	2.40	3.40	2.86	5.37	.07	.990	.18	.03	3.75	100.5
24302	55.6	15.6	8.69	2.64	3.30	.89	7.66	.18	1.49	.20	.02	2.10	98.4
24311	61.5	16.6	4.75	2.76	4.01	2.03	5.07	.08	.617	.15	.02	1.75	99.3
25271	54.0	14.0	8.94	6.02	3.01	.27	11.0	.18	.713	.09	.02	1.85	100.1
25272	51.9	13.7	9.89	5.05	2.48	.39	14.2	.20	1.11	.17	.01	1.05	100.2
25273	54.4	13.6	7.87	5.01	2.45	.56	12.7	.33	.640	.10	.01	2.45	100.1
27261	59.7	15.8	5.28	3.64	2.44	1.91	7.53	.15	.671	.24	.04	2.85	100.3
27271	63.0	15.5	2.87	3.10	3.22	1.59	7.05	.12	.671	.23	.02	2.60	100.0
27272	47.0	15.8	8.38	5.13	3.17	1.17	10.7	.17	.991	.77	<.01	6.05	99.3
27272A	46.1	15.3	9.21	5.59	2.35	.62	10.8	.15	1.08	.71	.01	7.10	99.0
27273	49.0	15.8	7.68	5.55	2.94	1.44	10.0	.18	.860	.57	.01	5.95	100.0
28261	54.0	17.7	5.79	3.29	2.99	2.83	8.70	.11	1.06	.29	<.01	2.15	98.9
28271	61.6	15.1	3.69	1.84	4.01	2.16	7.26	.09	.892	.31	<.01	1.60	98.6
28271A	61.1	15.9	4.08	3.64	2.96	1.92	7.44	.13	.690	.26	.06	1.90	100.1
28321	57.0	18.5	7.05	2.07	2.44	.20	9.45	.18	.783	.23	<.01	1.90	99.8
29211	55.4	16.5	7.45	3.34	3.08	2.06	8.18	.15	.921	.46	.02	2.95	100.5
29281	63.7	16.9	3.64	1.88	3.21	2.06	3.64	.05	.568	.19	.12	3.85	99.8
29311	62.7	16.1	3.58	1.41	6.27	1.90	2.91	.06	.484	.17	<.01	3.20	98.8
29321	54.1	24.4	1.63	1.10	.79	7.19	6.79	.07	.905	.58	<.01	2.95	100.5
30231	54.4	18.1	4.27	2.13	4.09	2.96	7.86	.17	.664	.52	.15	4.85	100.2
30232	64.9	15.8	2.09	1.66	1.68	3.85	5.73	.09	.563	.44	.02	3.30	100.1
30233	58.5	16.2	4.52	1.96	2.44	3.27	6.95	.15	.648	.46	<.01	4.70	99.8
30281	68.8	16.3	2.14	.57	4.06	1.87	2.25	.03	.280	.09	.01	2.50	98.9
30282	64.3	16.2	4.21	1.15	3.47	1.90	3.72	.07	.257	.08	<.01	4.85	100.2
30311	51.9	18.5	3.92	3.89	4.45	3.59	8.70	.08	.857	.97	<.01	3.05	99.9
31211	61.8	16.2	2.69	.89	4.39	4.98	4.30	.12	.694	.22	.01	3.70	100.0
31231	65.0	17.0	1.09	.78	4.51	5.06	4.04	.09	.734	.20	<.01	1.95	100.5
31281	64.7	16.9	4.01	.71	4.89	1.53	3.42	.07	.529	.18	.04	3.15	100.1
31301	54.0	17.9	4.86	3.03	3.42	3.68	6.23	.13	.735	.61	.04	4.90	99.5
31302	50.5	19.7	5.58	2.87	3.45	4.61	6.41	.09	.710	.74	<.01	5.45	100.1
31302A	52.5	20.1	6.00	2.15	4.93	3.56	4.14	.09	.688	.64	<.01	5.85	100.6
31303A	70.6	7.76	3.00	1.44	.58	1.34	11.4	.13	.240	.18	<.01	3.55	100.2
31303	66.1	10.9	2.30	1.68	1.71	1.87	11.5	.14	.347	.17	<.01	3.60	100.3
31303B	51.2	17.0	4.98	4.31	3.24	4.58	8.55	.13	.896	.85	<.01	4.10	99.8
31303C	72.2	12.2	2.46	1.44	3.00	2.35	3.42	.09	.250	.10	<.01	2.70	100.2
32231	67.4	16.0	2.82	.57	4.03	2.21	2.80	.09	.286	.10	.01	4.20	100.5
32271	51.9	17.0	6.40	3.42	5.59	1.29	5.98	.10	.664	.66	<.01	6.50	99.5
32272	51.7	17.1	6.33	4.24	2.99	2.51	7.00	.11	.567	.34	.01	7.30	100.2
32273	65.0	9.59	7.77	2.62	1.32	1.75	4.24	.11	.319	.27	.03	7.10	100.1
32281	47.2	17.0	7.97	4.84	.67	3.72	8.07	.10	.866	.87	<.01	9.05	100.4
32301	60.0	14.8	4.75	3.08	2.08	2.29	5.81	.11	.576	.15	.02	5.30	99.0
32302	70.3	15.2	2.26	.64	5.61	1.93	1.53	.03	.297	.08	.01	2.15	100.0
32303	56.3	12.7	8.86	1.02	2.60	1.53	7.86	.22	1.02	.16	.01	7.70	100.0
32304	44.7	19.2	5.46	6.40	1.43	2.87	8.66	.07	.901	.75	<.01	8.25	98.7
33231	64.4	16.1	4.57	.93	4.20	1.73	2.26	.05	.246	.07	<.01	4.90	99.5
33241	42.7	14.6	9.99	5.19	3.26	2.44	5.93	.11	.561	.25	.01	14.6	99.6
33261	53.0	20.0	4.11	3.08	2.95	3.77	5.28	.07	.659	.38	<.01	5.40	98.7
33271	49.9	17.3	10.1	4.46	3.03	.56	7.30	.11	.695	.48	<.01	5.25	99.2

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
33281	71.7	14.8	2.60	.58	5.38	1.84	1.54	.03	.205	.07	.01	1.50	100.3
33311	52.1	15.1	10.5	4.47	2.83	.36	8.31	.20	.633	.08	.01	4.05	98.6
33312	51.4	14.3	9.92	7.10	2.00	.62	12.2	.19	.681	.09	.01	1.65	100.2
34241	68.9	15.0	2.80	.70	5.12	2.54	1.75	.04	.220	.07	.01	1.85	99.0
34281	51.6	13.9	9.15	7.88	1.78	.30	11.3	.16	.655	.08	.03	1.85	98.7
C SY-2	60.6	12.2	7.94	2.77	4.63	4.60	6.44	.33	.144	.44	<.01	.00	100.1
C SY-2	60.8	12.2	8.55	2.78	4.59	4.65	6.53	.33	.142	.44	<.01	.00	101.0
D 22281	67.5	15.6	3.98	.87	5.37	1.69	2.86	.04	.378	.12	.02	1.00	99.4
D 31303B	51.1	16.8	5.84	4.39	3.45	4.56	8.69	.13	.892	.83	<.01	4.20	100.9
D 33241	42.8	14.6	9.51	5.13	3.15	2.39	5.87	.11	.542	.25	<.01	14.5	98.9

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES



REFERENCES

AREAS WITHDRAWN FROM DISPOSITION

M.R.O. – MINING RIGHTS ONLY
S.R.O. – SURFACE RIGHTS ONLY
M.+S. – MINING AND SURFACE RIGHTS

Description | Order No. | Date | Disposition | File

LEGEND

HIGHWAY AND ROUTE No
OTHER ROADS
TRAILS
SURVEYED LINES.
TOWNSHIPS, BASE LINES, ETC
LOTS, MINING CLAIMS, PARCELS, ETC
UNSURVEYED LINES
LOT LINES
PARCEL BOUNDARY
MINING CLAIMS ETC.
RAILWAY AND RIGHT OF WAY
UTILITY LINES
NON-PERENNIAL STREAM
FLOODING OR FLOODING RIGHTS
SUBDIVISION
ORIGINAL SHORELINE
MARSH OR MUSKEG
MINES

DISPOSITION OF CROWN LANDS

TYPE OF DOCUMENT — SYMBOL
PATENT, SURFACE & MINING RIGHTS
SURFACE RIGHTS ONLY
MINING RIGHTS ONLY
LEASE, SURFACE & MINING RIGHTS
SURFACE RIGHTS ONLY
MINING RIGHTS ONLY
LICENCE OF OCCUPATION
CROWN LAND SALE — C.S.
ORDER-IN-COUNCIL — OC
RESERVATION
CANCELLED
SAND & GRAVEL

1 CHAIN = 66 ft = 20.1 m

SCALE: 1 INCH = 40 CHAINS

ACRES 40 — HECTARES 16

AREA

STULL LAKE

M.N.R. ADMINISTRATIVE DISTRICT
RED LAKE
MINING DIVISION
RED LAKE
LAND TITLES / REGISTRY DIVISION
KENORA / PATRICIA

Ministry of Natural Resources — Land Management Branch
Ontario

Date FEB 1983 — Number G-1893

THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES, AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON

1 : 31 680

(544923 & 544924 Blow-up)

STULL LAKE
CLAIM MAP A

ECKART BUHL

200

54 30

93 00

92 30

TWIN LAKES

SEEBER RIVER GOLD ZONE

TWIN LAKES GOLD ZONE

SEEBER RIVER

JEFFERS LAKE

SAFETY BAY

MONUMENT BAY

RAPSON BAY

RICHARDSON ARM

STULL LAKE

MANITOBA

ONTARIO

34281
34241
33281
33231
33241 A-K
33267
33271
32281
33312
33311
32301
32302
32303
32304
32231
31211
31231
31281
31301
31302
31302A
31303
31303A
30231
30232
30233
30281
30282
30311
29281
29311
29211
29321
28261
28321
28271
27273
27261
27272A
27272
27271
28271A
25271
25273
25272
24301
24311
24302
24251
22281

SAMPLE LOCATION MAP

⊙ SAMPLE LOCATION

25272 SAMPLE NUMBER

0 1 2 3 4 5 KM

54 15

GRANT NO. OP 92-828

SCALE	1: 50,000
DATE	JAN. 15, 1993
DRAWN BY	E. B.

STULL LAKE PROJECT

STULL LAKE, NW ONTARIO
RED LAKE MINING DIVISION

APPROVED

MAP 1

NTS 53 K 7

53K08NW0005 OP92-828 STULL LAKE

54 30

93 00

92 30

54 15

TWIN LAKES

SEEBER RIVER GOLD ZONE

TWIN LAKES GOLD ZONE

SEEBER RIVER

MONUMENT BAY

JEFFERS LAKE

SALEEN BAY

RAPSON BAY

RICHARDSON ARM

STULL LAKE

MANITOBA

ONTARIO

GEOLOGICAL LEGEND

2 INTERMEDIATE VOLCANICS
- a undifferentiated
- b massive aphyric flows
- c massive quartz +/- feldspar phyric flow; 1-5%
- d massive quartz +/- feldspar phyric flow; 5-15% phenocrysts 1-3mm diameter
- e flow breccia
- f hyaloclastite
- g lithic tuff
- h crystal tuff (quartz +/- feldspar) tuff
- i lapilli tuff
- j tuff breccia, monolithic
- k tuff breccia, heterolithic
- l debris flow
- q amygdaloidal

1 MAFIC VOLCANICS
- a undifferentiated
- b massive flow
- c pillowed flow
- d pillow breccia
- e banded flow
- f debris flow
- g feeder dikes
- h tuff
- i lapilli tuff
- j tuff breccia, monolithic
- k tuff breccia, heterolithic
- m variolitic flow
- o epiclastics, volcanic conglomerate
- p volcanic siltstone
- q amygdaloidal

9 LATE MAFIC INTRUSIONS
- a undifferentiated
- b mafic dikes

8 LATE FELSIC INTRUSIONS
- a undifferentiated
- b granite
- c granodiorite

7 SYNVOLCANIC MAFIC INTRUSIONS
- a undifferentiated
- b quartz diorite
- c diorite
- d gabbro

6 SUBVOLCANIC FELSIC INTRUSIONS
- a undifferentiated
- b quartz porphyry
- c feldspar porphyry
- d quartz feldspar porphyry

4 CLASTIC SEDIMENTS
- a undifferentiated
- b argillite
- c siltstone, sandstone
- d greywacke
- e conglomerate

3 FELSIC VOLCANICS
- a undifferentiated
- b massive aphyric flows
- c massive quartz +/- feldspar phyric flow; 1-5%
- d massive quartz +/- feldspar phyric flow; 5-15% phenocrysts 1-3mm diameter
- e flow breccia
- f hyaloclastite
- g lithic tuff
- h crystal tuff (quartz +/- feldspar) tuff
- i lapilli tuff
- j tuff breccia, monolithic
- k tuff breccia, heterolithic
- l debris flow

Bx xx	large, angular boulders
SQC	sericite-quartz-carbonate schist
Q CHL CARB	quartz-chlorite-carbonate schist
CHL	chlorite schist
anth	anthophyllite or gedrite
mg	magnetite
py	pyrite
cp	chalcopyrite
	S2 foliation
	bedding
	strong shearing

⊙ SAMPLE LOCATION

0 1 2 3 4 5 KM

GEOLOGY

GRANT NO. OP 92-828

SCALE	1: 50,000
DATE	JAN. 15, 1993
DRAWN BY	E. B.

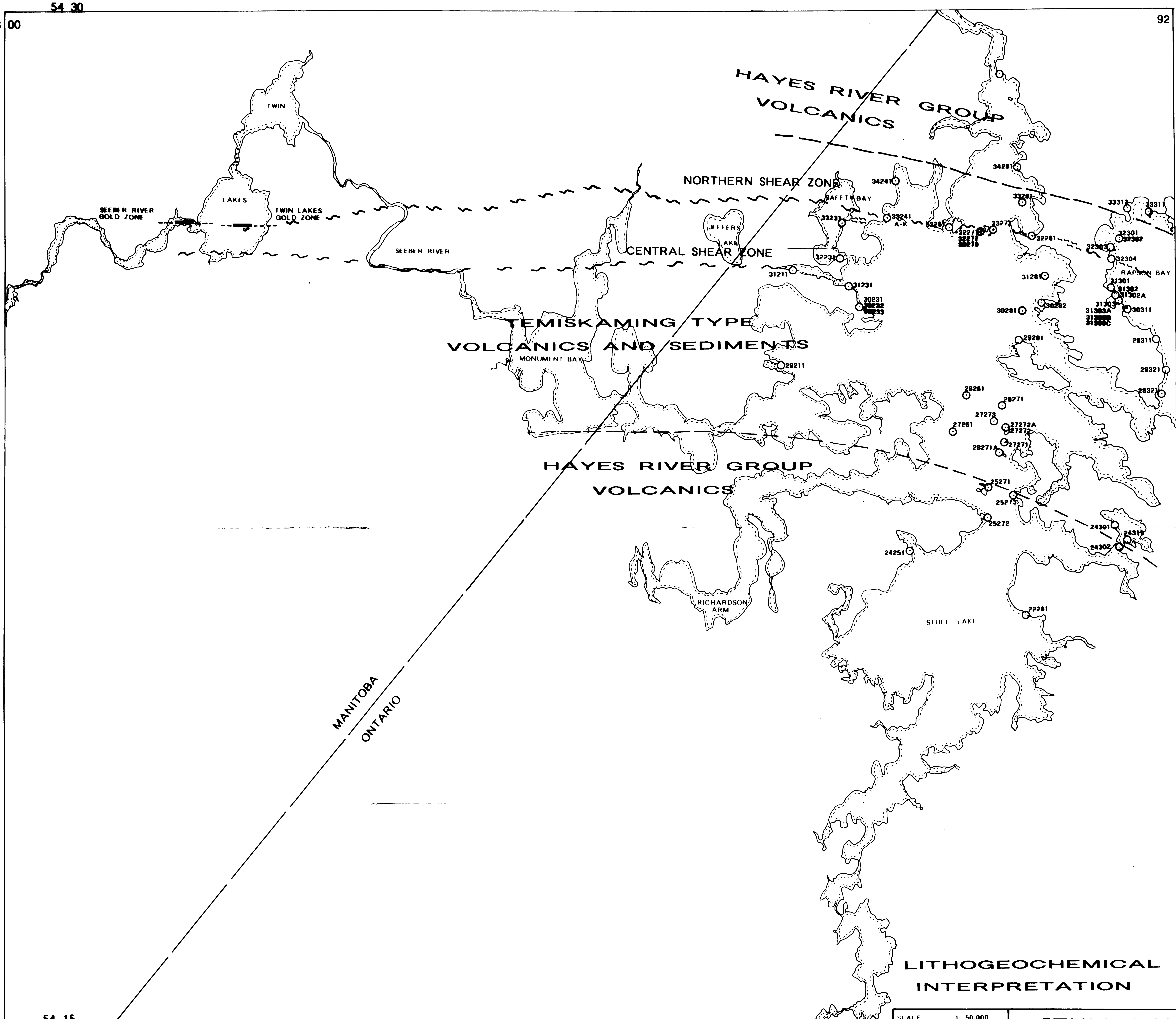
STULL LAKE PROJECT

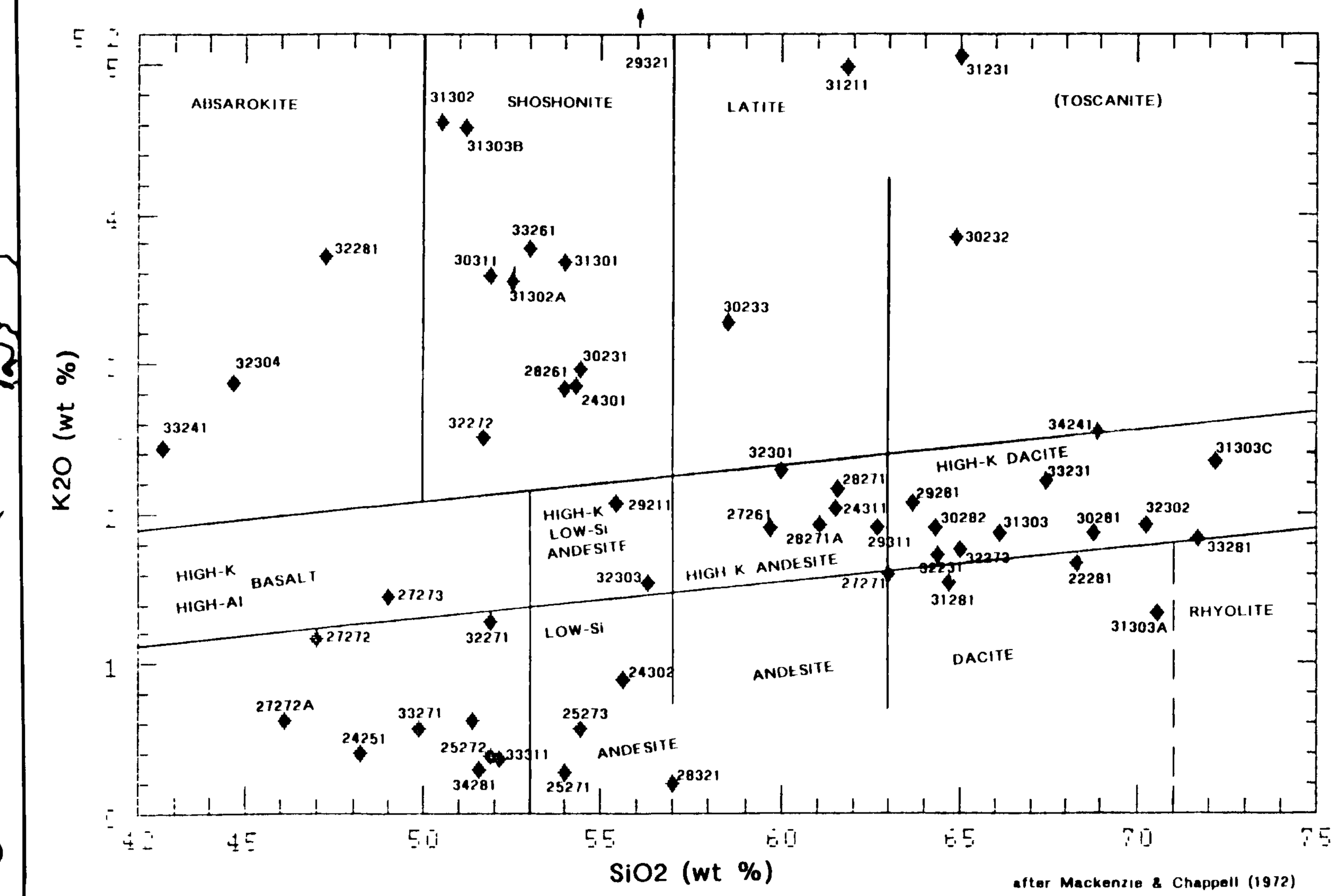
STULL LAKE, NW ONTARIO
RED LAKE MINING DIVISION

APPROVED

MAP 2

NTS 53 K 7





⊙ SAMPLE LOCATION

25272 SAMPLE NUMBER

0 1 2 3 4 5 KM

LITHOGEOCHEMICAL INTERPRETATION

SCALE 1: 50,000	STULL LAKE PROJECT	STULL LAKE, NW ONTARIO	APPROVED	
DATE JAN. 15, 1993		RED LAKE MINING DIVISION	MAP 3	
DRAWN BY E. B.			NTS 53 K 7	

GRANT NO. OP 92-828

54 30

93 00

92 30

TWIN

LAKES

TWIN LAKES GOLD ZONE

BEEBER RIVER GOLD ZONE

BEEBER RIVER

MONUMENT BAY

JEFFERS LAKE

SAFETY BAY

CLAIM NO. 1 144 169

RAPSON BAY

RICHARDSON ARM

STULL LAKE

MANITOBA

ONTARIO

54 15

G
AREA STAKED DURIN DESIGNATED PERIOD

CLAIM STAKED
DURING
DESIGNATED PERIOD

0 1 2 3 4 5 KM

GRANT NO. OP 92-828

SCALE	1: 50,000
DATE	JAN. 15, 1993
DRAWN BY	E. B.

STULL LAKE PROJECT

STULL LAKE, NW ONTARIO
RED LAKE MINING DIVISION

APPROVED

MAP 4

NTS 53 K 7

240

DJKARMAZIN OP92-828 STULL LAKE