

D. DIR.	A.O.	C.G.	E.O.	D.S.P.
				Register
	- 8 AUG 1984			E & IL
	DEPT. OF MINES			
	REF. No. 8112/84			

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED
MINERAL RESOURCES DIVISION

MICROFILMED

PART OF EXPLORATION LICENCE 31/83 'MACQUARIE'

SWIFT CREEK AREA

PROGRESS REPORT ON EXPLORATION ACTIVITY

1ST OCTOBER, 1983 TO 30TH MARCH, 1984

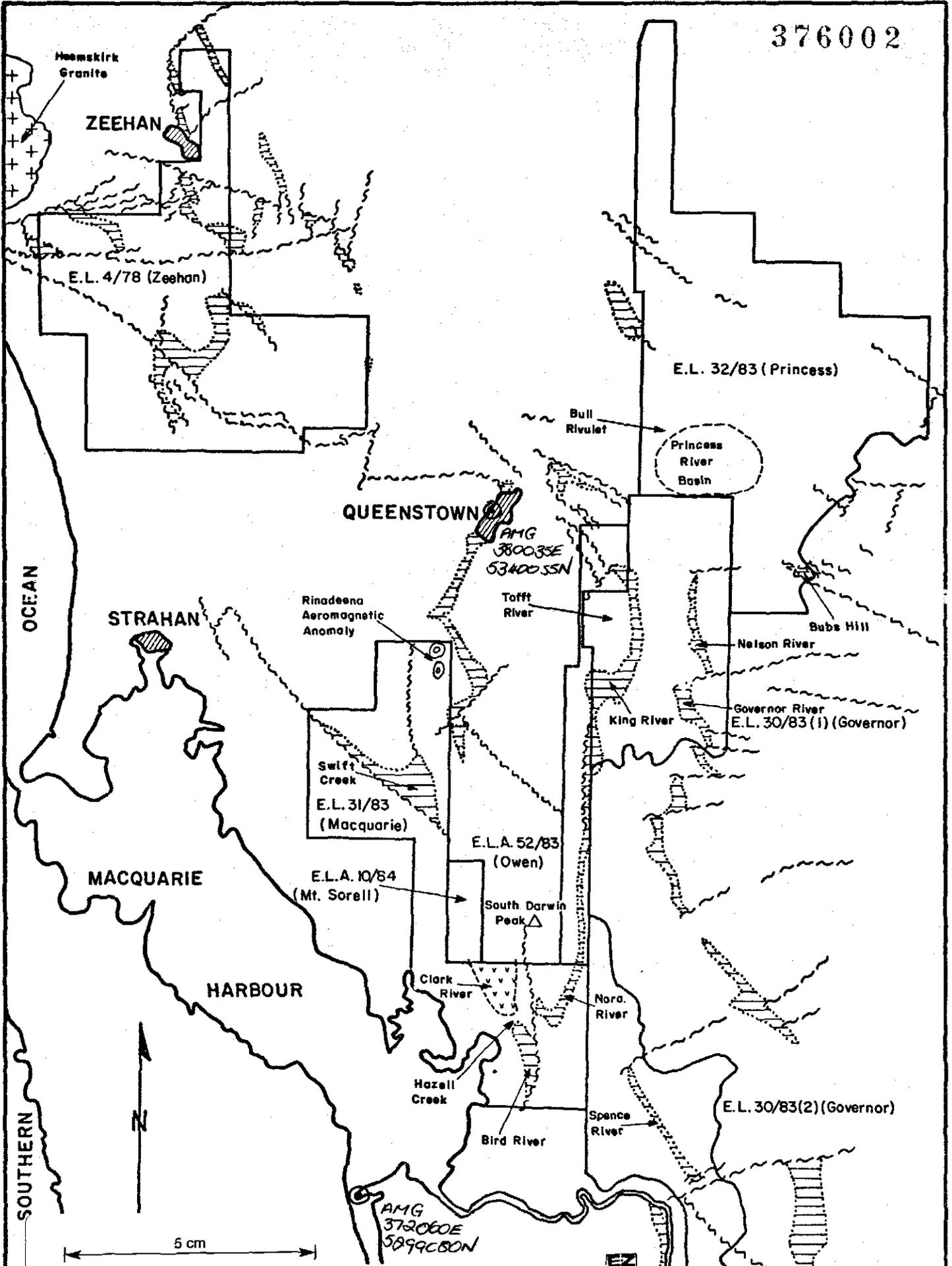
OPEN FILE

E.Z. REPORT No. T184

I.J. MATHISON,
JULY, 1984

001

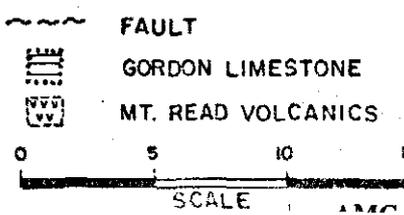
376002



OCEAN

SOUTHERN

5 cm



PROJECT: GORDON LIMESTONE J.V.			
LOCATIONS			
Compiled S.T.	Date:	PLAN NO	
Drawn: R. J. R.	Scale:	Fig.	

AMG REFERENCE POINTS ADDED

TABLE OF CONTENTS

<u>TABLE OF CONTENTS</u>	i.
<u>LIST OF FIGURES AND APPENDIX</u>	i.
<u>1. INTRODUCTION</u>	1.
<u>1.1. Location & Access</u>	1.
<u>1.2. Topography & Vegetation</u>	1.
<u>1.3. Previous Exploration</u>	1.
<u>2. E.Z. EXPLORATION - OCTOBER, 1983 - MARCH, 1984</u>	1.
<u>2.1. Work Completed</u>	1.
<u>2.2. Results Received</u>	2.
<u>2.2.1. STREAM SEDIMENT GEOCHEMISTRY</u>	2.
<u>2.2.2. ROCK GEOCHEMISTRY</u>	3.
<u>2.2.3. PANNED CONCENTRATES</u>	3.
<u>2.2.4. GEOLOGY</u>	4.
<u>3. DISCUSSION AND CONCLUSIONS</u>	5.

LIST OF FIGURES & APPENDIX

FIGURE SC1	Swift Creek Geochemistry - Zn	AO-530-2001 ✓
SC2	- Pb	AO-530-2002 ✓
SC3	- Ba	AO-530-2003 ✓
SC4	Swift Creek Sample Locations	AO-530-2000 ✓
SC5	Swift Creek Interpreted Geology	AO-530-2005 ✓
APPENDIX	Stream Sediment Data Sheets	
	Rock Sample Data Sheets	
	Petrological Descriptions	
	Panned Concentrates - Mineralogy	

003

1. INTRODUCTION

1.1. Location and Access

On the Strahan 1:50,000 and the Queenstown 1:250,000 geological sheets a triangle of Gordon Limestone is mapped around Swift Creek. This triangle lies 4km south of Dubbil Barril on the King River and 20km S.S.W. of Queenstown Airport. Access to the area is by helicopter.

1.2. Topography and Vegetation

The area is rugged and thickly forested. Steep arcuate strike ridges lie between a steep sided flat topped hill on the west and precipitous conglomerate hills to the east. A Tertiary peneplain has been deeply incised and partially stripped by rejuvenated drainage. Vegetation ranges from dense rainforest over the steep ridges and valleys to thick manuka and bauera scrub on the remnants of the peneplain.

1.3. Previous Exploration

No reports of systematic exploration, of old workings, or of significant mineralisation have been sighted. Published geology of the area is based on photo-interpretation supported by detailed mapping along the King River.

2. E.Z. EXPLORATION - OCTOBER, 1983 TO MARCH, 1984

2.1. Work Completed

In January and February, 1984, E.Z. field crews completed a reconnaissance rock chip sampling and stream sediment sampling programme. Geological data were collected at rock sample locations. A total of 55 stream sediment samples, 42 rock samples and 18 panned concentrates were collected.

Field work in this area proved slow and tedious. A helicopter pad and 3.5km of walking track were cut along a ridge in the northern part of the area. Old logging tracks provided helicopter and foot access to the southern part of the area.

Rock samples, stream sediment samples and two panned concentrates were analysed for Cu, Pb, Zn, Ag, Fe, Mn and Ba by A.A.S. techniques.

Most panned concentrates were submitted for heavy mineral separation and microscopic identification. Four rock samples were described in this section.

2.2. Results Received

2.2.1. STREAM SEDIMENT GEOCHEMISTRY (See Appendix and Fig's SC1, 2 & 3)

Base metal and barium values reported from the Swift Creek samples are generally low. All results are listed in the Appendix and summarised below.

Note: n = 55

Element	Range	Mean	?Anomalous
Cu	< 5 - 30	10	
Pb	< 5 - 40	15	
Zn	5 - 245	80	>200 (2 samples)
Ag	<0.5 - 1.5	< 0.5	1.5
Fe	0.03- 4.05%	1.43%	
Mn	< 5 - 4300	330	
Ba	10 - 175		

The two possibly anomalous zinc values were collected from the north eastern corner of the area. Rock samples from this area also reported mildly elevated zinc contents (170 & 245 ppm). The weakly anomalous silver value came from a creek draining the siliceous conglomerates to the east. The low Fe values for samples from these creeks suggest that the sediment contribution from nearby sources is flooded by quartz detritus from the conglomerate and sandstone.

005

2.2.2. ROCK GEOCHEMISTRY (See Appendix and Fig's SC1, 2, & 3)

Base metal contents of rock samples from Swift Creek are comparable to those of stream sediment samples. Results are listed in the Appendix and summarised below. Two samples of limonitic and manganiferous stream deposits are excluded.

n = 39

Element	Range	Mean	?Anomalous
Cu	5 - 60	20	
Pb	<5 - 55	10	
Zn	5 - 245	75	>200 (1 sample)
Ag	<0.5	<0.5	
Fe	0.29 - 5.75%	2.5%	
Mn	15 - 920	290	
Ba	19 - 1760	400	>1,000 (1 sample)

None of the rock samples reported distinctly anomalous values. Zinc contents from the N.E. corner are mildly elevated. The high barium value was obtained from a pyritic black siltstone.

Limonitic and manganiferous stream deposits contain elevated metal values as detailed below.

Sample No.	Cu	Pb	Zn	Ag	Fe	Mn	Ba
60054	5	310	480	<0.5	5.70%	13.5%	1.07%
60192	30	100	105	<0.5	25.5%	70	153

The significance of these values has not yet been determined.

2.2.3. PANNED CONCENTRATES (See Appendix and Fig: SC4)

A comparison of the heavy mineral descriptions and their locations suggests four major sources of heavy minerals.

1. Owen Conglomerate - this formation is shedding abundant rutile, zircon and tourmaline with subordinate ilmenite and cassiterite.
2. Tertiary Sediments - residual Tertiary sands on the old peneplain contain some rutile, zircon, tourmaline and abundant oxidised ilmenite and ?titaniferous magnetite.

- 006
3. Poorly exposed basic igneous rocks - these supply fresh clinopyroxene, amphibole, magnetite.
 4. Recent surficial deposits - limonitised wood, ferricrete and nodular limonite are derived from these.

Scattered traces of pyritic sulphides noted from the central portion of the area correlate with pyrite described from rock samples in this area.

The occurrence of rounded monazite grains in the tributary near 5,323,000mN may be significant.

2.2.4. GEOLOGY (See Fig. SC5)

On the Strahan 1:50,000 Geological Sheet the triangular outcrop of Gordon limestone is mapped as the trough of a N.N.W. plunging syncline. Cambrian sediments and volcanics in the west are up thrust over the Ordovician sediments while in the east the more ductile Ordovician to Devonian limestone siltstone and shale have been deformed against the competent block of Mt. Read Volcanics with flanking siliceous conglomerate and quartzite.

Government mapping of the Swift Creek area is based on airphoto interpretation supported by detailed mapping along the King River. On the Strahan 1:50,000 sheet, the Gordon Group rocks in the Swift Creek area are interpreted as predominantly limestone. Further N.E. and N.W. along the limbs of the syncline, the same group has been subdivided into a predominantly siltstone and shale unit and a thinner limestone unit. E.Z. mapping indicates that this subdivision continues into the Swift Creek area. The older limestone unit is overlain by siltstone and shale with occasional sandstone and thin silty limestone beds.

Sulphide mineralisation was noted in two areas. Along the fault along the south west boundary of the limestone, carbonate rocks were intensely veined and contained sporadic disseminated pyrite. Pyrite in bedded black pyritic siltstone was also observed along the eastern boundary. No base metal mineralisation was detected.

Microscopic descriptions of carbonate rocks from Swift Creek suggest distal types of laminated massive limestones predominate with minor near shore or shallow water types. No indications of syn sedimentary tectonism were noted. All breccia characteristics seen in the carbonates were ascribed to dolomitisation.

007

3. DISCUSSION AND CONCLUSIONS

As mapped on Government geological maps, the Swift Creek area, with a thick limestone sequence against a prominent N.W. trending fault appears a likely prospect for Irish-style carbonate hosted lead-zinc deposits. However, the results of this season's field work revealed very few indications of mineralisation. No definitely anomalous stream sediment geochemistry or rock chip geochemistry was detected. No base metal mineralisation was seen. No clastic limestone breccias were located. And field mapping reduced the mapped thickness of the limestone sequence.

The only possible signs of mineralisation noted are indirect indications of uncertain significance. The significance of these indications can more easily be determined in other areas.

No field work is recommended for the Swift Creek area during the 1984-85 field season.

E.Z. Co. of A'Asia Ltd.,
ROSEBERY, Tasmania

GEOCHEMICAL SAMPLE DATA SHEET

PROJECT: GOODBY LIMESTONE
LOCALITY: SWIFT CREEK
GRID NAME:
NOMINAL GRID AZIMUTH:

MATERIAL: Stream Sediments
SAMPLE METHOD: SIEVE TO 75µ
SAMPLED BY: P. B. G. & M. S. P. W.
DATE: Jan. Feb. 1984

SIZE FRACTION ANALYSED: -80 mesh
ANALYSED BY: ANALABS
METHOD: A.A.S. Sp. W. by X.R.F.

SAMPLE NUMBER	SAMPLE LOCATION DATA			STREAM DATA			COMPOSITION DATA				Geology	METAL CONTENT (ppm unless specified)								
	GRID LINE NO.	Local A.M.B. CO-ORDINATES		Str. Order Direction of Flow	Width	Active Stream Level	Clay	Sand	Rock Fragm.	Organic		CONTAM.	Cu	Pb	Zn	Ag	Au	Fe	Mn	Ga
	GRID EASTING	NORTHING	EASTING																	
59253					0.5			30	40	25	5		15	20	90	0.5		1.75%	415	55
59254					0.5			40	35	10	5		30	40	165	0.5		2.50%	855	175
59255					0.5			20	30	45	5		15	20	115	0.5		2.40%	680	100
59256					0.5			25	30	40	5		25	20	105	X		1.75%	435	85
59257								15	35	45	5		10	10	45	X		1.15%	365	55
59258								20	30	45	5		15	20	100	X		1.75%	390	80
59259								10	35	50	5		15	15	60	X		2.10%	420	110
59708													X	X	10	X		350	5	25
59710					1.5								X	X	5	0.5		1750	15	20
59711					2.0								20	5	45	0.5		4350	235	30
59713					2.0								X	5	15	X		2950	195	30
59715					1.0								X	5	10	0.5		1950	325	15
59716					2.0								5	15	15	1.5		5800	680	35
59912					0.5			10	60	30			20	20	165	0.5		4.05%	165	125
59914					1.0			20	60	40			20	25	175	X		2.35%	440	110
59916					0.5			10	10	80			20	25	245	X		3.60%	680	110
59917					0.5			15	10	75			25	25	225	0.5		2.60%	1000	105
59918					0.5			10	20	70			20	25	150	0.5		2.35%	210	80
60005					1.5			5	15	79	1		15	15	80	0.5		2.30%	335	135
60006					5.0								15	15	100	X		1.65%	320	95
60048					1.0						5		5	X	25	X		300	15	20
60051					2.0								5	X	10	X		300	5	15
60053					0.3								15	60	20	X		8400	4300	95
60055					2.0								5	5	40	X		600	20	15
60057													10	X	40	0.5		2350	65	25
60059					0.5								X	X	15	X		250	X	15
60060					0.5								X	5	15	X		1750	100	25
60061					2.0								X	X	20	0.5		650	20	10
60101					1.5								15	20	120	X		2.80%	400	125
60102					1.5								20	20	135	0.5		2.45%	425	130
60103													15	20	115	X		2.10%	320	115

008

376009

Electrolytic Zinc Co. of Asia Ltd.
 Sebery, Tas.

ROCK SAMPLE LEDGER

PROJECT: 4011

COLLECTED ON MAR 2, 1957 S.T.

DATE: JAN 1957

Sample Number	A.M.G. Coordinates (Local)		Sample Type	Geological Description	Rock-type (Macroscopic)	Thin or Polished Section			Metal Content (p.p.m. unless specified)							
	N	E				T or P	By	Reference	Rock-type (Microscopic)	Cu	Pb	Zn	Ag	Fe	Mn	Ba
294				Grey LIMESTONE with calcite crystals	LST	T	DCouper	CMS	del LST	10	5	20	X	3450	90	24
295				Dark grey argillaceous LIMESTONE coarse calcite veining	LST											
296				Black SILTSTONE with quartz lenses + 10-20% P ₂ O ₅	SILT					40	5	20	X	195%	10	170
296				Oxidized orange yellow silty SANDSTONE	SST					25	15	170	X	3.20%	555	620
2997				Pale grey cleaved SILTSTONE	SILT					40	20	245	X	5.75%	550	753
2998				Cleaved, part oxidized pale grey SILTSTONE	SILT					35	15	105	X	4.40%	370	672
2999				Oxidized cream/grey irregularly cleaved SILTSTONE	SILT					35	25	125	X	5.30%	215	722
3008				Dark grey cleaved SILTSTONE	SILT					35	15	90	X	4.15%	320	874
60050				Grey medium to coarse grained micaceous QUARTZITE	QZT					5	X	5	X	2950	15	202
60052				Grey medium grained stylolitic LIMESTONE	LST	T	DCouper	CMS	del LST	5	55	105	X	3250	195	24
60054				Black cavernous WAD ? manganese	WAD					5	310	430	X	5.70%	13.5%	1.07%
60062				Grey equigranular medium grained	DLST					5	5	15	X	5600	560	23
60191				Green - grey cleaved QUARTZITE with more green SILTSTONE	QZT					10	5	30	X	1.65%	110	172
60192				LEMONITE and CHAY	LIM					30	100	105	X	25.5%	70	153
60193				Finely bedded grey - black argillaceous LIMESTONE	LST					10	5	20	X	1.15%	240	90

376011
 010

Electrolytic Zinc Co. of Asia Ltd.
Rosebery, Tas.

ROCK SAMPLE LEDGER

PROJECT: GORDON LIMESTONE LOCALITY
COLLECTED BY: G. [redacted], S. [redacted] DATE: Feb, 1961

Sample Number	A.M.G. Co-ordinates (250)		Sample Type	Geological Description	Rock-type (Macroscopic)	Thin or Polished Section			Metal Content (p.p.m. unless specified)							
	N	E				T or P	By	Reference	Rock-type (Microscopic)	Cu	Pb	Zn	Ag	Fe	Mn	Ba
60194				Black fine grained crystalline LIMESTONE, minor carbonaceous staining, etc.	LST	T	D. Cowan	CMS	del LST polished	10	10	20	X	9000	300	36
60195				Grey - dark grey laminated SILTSTONE	SLT			24/3/17		35	15	75	X	2.95%	180	807
60196				Orange - grey SILTSTONE	SLT					30	25	125	X	3.80%	210	640
60197				Green - grey micaceous SILTSTONE with grey-brown QUARTZITE	SLT					10	X	30	X	1.75%	70	207
60198				Pale grey friable SHALE	SH					30	5	150	X	4.45%	260	665
60199				Grey cleaved SILTSTONE	SLT					20	10	120	X	4.20%	375	608
60200				Tan - brown micaceous SILTSTONE or SHALE	SLT					35	15	145	X	4.70%	245	736
59279				Dark grey interbedded, thin bedded SHALE and LIMESTONE	LST					10	10	60	X	1.65%	345	215
59280				Grey cleaved SILTSTONE	SLT					30	15	120	X	3.75%	130	674
59281				Well cleaved dark grey SILTSTONE	SLT					20	5	110	X	3.15%	105	480
59282				Oxidized pale brown cleaved SILTSTONE	SLT					25	X	130	X	4.20%	285	521
59283				Oxidized green grey SILTSTONE	SLT					35	20	150	X	4.15%	495	600
59284				Grey well cleaved SILTSTONE	SLT					40	10	150	X	4.90%	145	648
60258				Strongly quartz veined, iron stained QUARTZITE	QZT					20	5	55	X	2.45%	225	163
60259				Dark grey argillaceous LIMESTONE with prominent calcite net veining	LST					10	5	25	X	6150	155	27

Smith Print No. 41102

011
376012

Electrolytic Zinc Co. of Austral Ltd.
Rosebery, Tas.

ROCK SAMPLE LEINER

PROJECT: GORDON
COLLECTED BY: T.

LOCALITY: J

DATE: Feb 1984

Sample Number	Approx. Co-ordinates (local)		Sample Type	Geological Description	Rock-type (Macroscopic)	Thin or Polished Section			Metal Content (p.p.m. unless specified)								
	N	E				T or P	By	Reference	Rock-type (Microscopic)	Cu	Pb	Zn	Ag	Fe	Mn	Ba	
60260				Iron stained QUARTZITE	QZT						15	X	55	X	2.15%	270	171
60261				Greenish grey SHALE	SH						15	5	95	X	2.70%	920	701
60262				Grey iron stained QUARTZITE	QZT						10	X	60	X	1.75%	850	198
60263				Grey iron stained QUARTZITE	QZT						15	5	60	X	2.60%	65	226
60264				Grey argillaceous QUARTZITE	QZT						60	10	160	X	3.35%	85	675
60265				Dark grey argillaceous LIMESTONE	LST						10	10	20	X	6350	360	19
60283				Grey coarsely recrystallized dol. LIMESTONE, numerous small irreg dol. frags	DLST	T.D. Green	CMS	DLST			5	5	15	X	5200	460	23
60284				Grey recrystallized LIMESTONE with minor pyrite	LST						5	5	30	X	5150	395	22
60285				Black ARGILLITE, non calcareous	SLT						10	15	60	X	1.65%	680	292
60286				Dark grey fine grained argillaceous LIMESTONE (OR calcareous ARGILLITE)	LST						10	20	20	X	8500	210	46
60287				Grey fine grained pulverified LIMESTONE	LST						10	5	20	X	3350	215	40
60288				Dark grey fine grained argillaceous LIMESTONE	LST						5	5	20	X	7000	180	46

Small Form No. 401822

012
376013

013

Central Mineralogical Services



The Supervising Geologist
 Mineral Resources Division
 Electrolytic Zinc Co. of
 Australasia Ltd.
 West Coast Mines
 P.O. Box 21
ROSEBERY / TAS. 7470

ORDER	PHONE	NAME	INDUSTRY
		17 APR 1984	
AGENTS			
DEPT	END	OROL	

33 Beulah Road
 Norwood, S.A. 5067
 Telephone 42 5659

11th April, 1984

REPORT CMS 84/3/17

YOUR REFERENCE: Order No. 900513
 DATE RECEIVED: 8th March, 1984
 SAMPLE NOS.: 11 Samples
 SUBMITTED BY: I.J. Mathison
 WORK REQUESTED: Petrology

H.W. Fander for
H.W. Fander, M. Sc.

REPORT CMS 84/3/17

Eleven rock samples from the Swift Creek and Bird River limestones and the Clark River volcanics were received for petrological examination. Representative thin-sections were prepared and examined microscopically. Attached brief tabulated descriptions summarise the microscopic data and results of carbonate and K-feldspar stainings tests, where applicable, and include interpretative comments.

Summary

The six samples of limestone (Swift Creek, Bird River) reflect dolomitisation-related breccia characteristics, but relict features are typically indicative of "massive" (laminated but non-clastic) limestones or reef-distal facies. Minor exceptions relate to the Swift Creek rocks which are locally weakly fossiliferous and include one "oolithic" or algal-pelletal limestone.

Limestones, in general, include accessory fine to ultrafine pyrite of syngenetic character and may be closely compared with typical massive facies of Gordon Limestone. The Swift Creek rocks are simply variably dolomitised. In contrast, the two Bird River rocks exhibit post-dolomite quartz veining and partial silicification with accessory traces of sphalerite, galena, and sulphosalt (?tetrahedrite). This late "epigenetic" alteration/mineralisation may be compared with the siliceous (as against sideritic) variants at Zeehan.

The Clark River volcanics include intermediate-acid (dacitic-rhyolitic) porphyries, tuffs and tuffaceous pelitic sediments. Sediments reflect composite feldspathic and subsequent argillic alteration assemblages enhanced by weak regional metamorphism. Porphyries and psammitic pyroclastics are semi-selectively sericitised. Accessory Fe-sulphide is present in the sediments and carbonate is a more or less ubiquitous accessory alteration phase.

D. Cowan, B. Sc.

Sample No.	Classification - Composition	Fabric	Accessories	Comments
59794 (T.S. 49145)	"Dolomitic" Limestone. Microcrystalline calcite with pervasively disseminated aggregates, discontinuous films of ankeritic carbonate. Minor carbonaceous matter. Sporadic discordant veinlets of calcite.	Microlaminated, concordantly sheared with boudinaged ankerite nodules, films; stressed calcite veinlets.	Traces ill-defined clay ("sericite", stained with carbonaceous matter); pervasive ultrafine pyrite.	Partly ankeritised, calcite-veined, subsequently concordantly sheared, microlaminated impure limestone. Non fossiliferous. Ankerite in boudinage nodules, veinlets.
60194	Dolomitic Limestone. Microcrystalline calcite with subordinate to minor fine sparry dolomite, pervasive carbonaceous matter. Minor carbonaceous stylolites, irregular calcite veinlets; disseminated fine-sand-sized quartz.	Confused by relatively marked high-angle discordant shearing. Relict bedded fine-scale "oolithic" (?algal pelletal).	Traces ultrafine pyrite. Rare ill-defined recrystallized microfossils.	Partly dolomitised/calcite-veined, subsequently stylolitised and relatively sheared oolitic impure limestone. Vague relict algal pelletal characteristics.
60052	Dolomitic Limestone. Microcrystalline calcite with pervasively disseminated clots, discontinuous films of ankeritic dolomite, minor dolomitised fossil fragments. Relatively conspicuous ultrafine pyrite.	Closely analogous to 59794.	Traces carbonaceous matter.	Close affinities with 59794. In contrast, the secondary carbonate is dolomitic (as against ankeritic) and is locally selectively pseudomorphous after fossil fragments.
60283	Dolomitised Breccia. Ankeritic dolomite rock comprising clasts of fine sparry to microcrystalline dolomite; matrix of medium-grained sparry dolomite. Sporadic carbonaceous stylolites. Minor late films of calcite.	Breccia-like, with sub- to millimetric clasts, corrosive matrix. Relict sub- to millimetric bedding.	Traces carbonaceous matter (clasts), fine to ultrafine pyrite (in clasts, stylolites) laminations.	Primarily a laminated impure, non-fossiliferous limestone on relict textural grounds. "In situ" style of brecciation appears to result directly from dolomitisation.

016

376017

JOHN F. GILFILLAN & ASSOCIATES PTY. LIMITED

**MINERAL EXPLORATION AND GEOLOGICAL CONSULTANTS
PETROLOGY IN ASSOCIATION WITH Dr. B.J. BARRON**

Commodity Studies
Regional Assessments
Prospect Evaluation
Mineral Exploration
Exploration Management
Mining Geology
Petrology

Postal Address:
P.O. Box 422,
Lane Cove, N.S.W. 2066
Australia

Telephone:
(02) 436 1056

Our Ref: E3/81

Your Ref: E-Z Order No. 900494

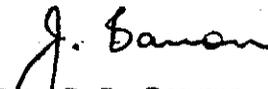
Project: Queenstown

MINERALOGICAL EXAMINATION OF
FORTY EIGHT SAMPLES OF HEAVY
MINERAL CONCENTRATES

Report No: E3/81/255

13th April, 1984.

For: Electrolytic Zinc Company of Australasia Ltd.


Dr. B.J. Barron,
Petrologist.

017

Sample No.

59260 (Swift Creek)

376018

Description of Concentrate

A fine grained concentrate, very few grains of which remain.

Thin Section

Very few grains represent this concentrate which exhibits an average grain size of approximately 0.15 mm (very fine sand). Rare grains reach 0.5 mm across.

The oxides include several grains of ?ilmenite (and/or magnetite), as well as a few grains converted to translucent leucoxene, while others now comprise limonitic oxides. A single large angular grain and several smaller grains of yellow-brown to deep red-brown rutile are present.

The silicates include several subhedral prismatic tourmaline grains, several crystals of zircon, and a large angular cleavage fragment of andalusite which encloses abundant patchy carbonaceous dust.

Sample No.

59709 (Swift Creek)

Description of Concentrate

Traces of fine grained sand sized particles indicate a pale brown coloured concentrate largely devoid of black oxides.

Thin Section

This sample has an average grain size of approximately 0.13 mm (very fine sand) with rare grains reaching 0.6 mm (coarse sand size). The oxide fraction accounts for an almost equal major proportion of grains to that of the silicate fraction in the present thin section.

The oxides include very abundant small subrounded to rather irregular grains of rutile, as well as subordinate sparse, poorly cleaved grains of cassiterite. Also present are sparse but dense clusters of leucoxene altered titaniferous opaque oxides, and also several grains of strongly clouded and altered limonitic oxides, including rare goethite.

The silicate fraction includes abundant subhedral to quite well rounded grains of tourmaline, as well as abundant grains of quartz contamination. The latter include single grains and aggregates with distinct strain shadows. Well rounded small grains of zircon are common and rare accessory grains of pale yellow monazite are crowded with minute dusty inclusions. Rare lithic clasts comprise very fine grained types which are essentially aggregates of quartz and wispy sericite, or polygonised quartz and very fine grained low birefringent clay.

Sample No. 59712 (Swift Creek)

Description of Concentrate Only trace proportions of the very fine grained sand sized fraction of this dark grey sample remain in which rare euhedral magnetite octahedra can be recognised.

Thin Section The sample clearly comprises two separate size fractions, the coarsest of which includes material within the range 0.5 mm up to more than 2 mm across (coarse to very coarse sand size). The finer size fraction comprises grains mostly within the size range 0.06 mm up to 0.16 mm (very fine to fine sand size). Both sets of grains exhibit fairly well rounded shapes with scattered subhedral grains within the fine sand sized fraction.

Oxides account for approximately 60% of the sample and include most of the coarser grained material. The latter comprises mainly dense massive aggregates and nodules or concretions of red-brown limonitic oxides with minor cellular woody material, largely replaced by limonitic oxides. Also present are grains in which numerous small angular quartz chips are "suspended" in a dense very fine grained matrix of red-brown limonitic oxides. The finer grained fraction includes almost equally abundant grains of partly oxidised ?titaniferous magnetite and rutile, and the latter is in the order of 10% of the total sample. Subordinate small grains of pale brown cassiterite are accessory.

The silicate fraction includes very abundant well rounded grains of zircon, almost equally abundant variegated tourmaline, rare grains of pale yellow monazite, sphene and traces of quartz contamination.

019

Sample No.

59714 (Swift Creek)

376020

Description of Concentrate

Only traces of a very fine sand sized concentrate remain in the sample bag, which under the stereobinocular microscope appear to include rare ?magnetite octahedra, minute subhedral olive green prismatic tourmaline crystals, abundant very small rounded clear zircon grains, and some small mid-brown translucent grains which may be rutile.

Thin Section

Only twelve grains of a coarse grained fraction are represented in one thin section and these are generally in the order of 2 mm across (or smaller broken fragments) and are generally quite well rounded to rather irregular. They are lithic clasts of a single lithology which comprises sparse unsorted angular quartz chips, as well as rare large euhedral quartz crystals enclosed within a very dense voluminous matrix of fine grained red-brown, partly colloform or nodular limonitic oxides. Most of this material is probably near-surface ferricrete.

A second thin section of this sample includes sparse grains with an average grain size of only about 0.1 mm across (very fine sand). These include subhedral elongate to rounded crystals of red-brown rutile with sparse small grains of cassiterite, numerous small crystals of zircon, subordinate tourmaline, sphene and white-leucoxene altered titaniferous oxide grains. Scattered opaque oxide grains include subhedral grains of a non-magnetic spinel.

Sample No.

59717 (Swift Creek)

Description of Concentrate

A very fine sand sized sample comprises only several clusters of grains which, when examined using the stereobinocular microscope, appear to include rare small crystals of subhedral octohedr magnetite, subhedral hexagonal tourmaline crystal well rounded grains of colourless to pink zircon, as well as sparse dark brown translucent grains which may be ?rutile.

Thin Section

The present thin section includes only three relatively coarse, well rounded grains, the largest of which is approximately 2 mm across. All three grains contain very sparse small angular quartz chips and small aggregates, as well as small aggregates of subhedral quartz crystals, "suspended" in a dense fine grained matrix of red-brown limonitic oxides. The latter retain clear concentric zonal structures resulting from colloform precipitation from a circulating fluid phase. These lithic clasts of ferricrete are essentially similar to those of the previous sample 59714.

020

Sample No.

59913 (Swift Creek)

Description of Concentrate

Two distinct size ranges are represented in this sample, with several large brown lithic grains more than 3 mm across, as well as a very fine grained sand-sized fraction. The sample contains several very small magnetic grains.

Thin Section

The coarse fraction of this sample contains large elongate clasts up to 3 mm long which are generally subrounded to irregular shapes and which comprise mainly red-brown cellular plant material. Sparse recognisable lithic grains comprise a fine grained silty lithology in which minute quartz chips are scattered throughout a matrix crammed with wispy sericite, well oriented parallel to a weak foliation. Other fragments include fibrous aggregates of a green pleochroic layer silicate with anomalous birefringence.

The majority of the sample consists of silicate phases with very abundant angular cleavage fragments of relatively unaltered colourless clinopyroxene (mainly less than 0.5 mm across) predominating, and related sparse fresh cleavage fragments of a brown hornblende. Small well rounded zircon grains are common, as are fairly well rounded crystals of tourmaline.

A subordinate oxide fraction which accounts for only about 15% of the total grains present in the thin section, includes abundant white leucoxene-altered titaniferous oxides, sparse grains of ?titaniferous magnetite (or magnetite) with subhedral octahedral shapes. Small, well rounded grains of rutile are a minor accessory phase.

Sample No. 59915 (Swift Creek)

Description of Concentrate A small proportion of very fine grained sand sized grains remain in this concentrate and only rare small black grains are magnetic.

Thin Section This sample comprises two separate size fractions the coarsest of which includes material within the size range 0.5 mm to more than 3 mm across (medium sized sand to granule sized gravel). In the finer material single crystals are generally represented which are less than 0.3 mm across (medium sized sand).

The coarse fraction includes almost equally abundant quartz-bearing ferricrete and irregular plant remains retaining clear relict cellular structures. The finer grained fraction comprises the heavy mineral concentrate.

The oxide fraction in the finer grained fraction accounts for approximately 50% of this part of the sample represented in the present thin section. This includes very abundant white leucoxene-altered titaniferous oxides, subordinate opaque oxides which include subhedral magnetite, octahedra and well rounded grains of this mineral, certain of which are partly to completely converted to red-brown limonitic oxides. Also present are sparse small scattered rounded to subhedral elongate prismatic grains of rutile, as well as rare small grains of cassiterite and several subrounded grains of yellow-brown and red-brown spinel.

The silicate portion of the finer grained fraction contains common small prismatic crystals and well rounded grains of zircon, equally abundant well rounded to irregular shaped tourmaline grains, aggregates and cleavage fragments of fresh clinopyroxene, sparse cleavage fragments of equally fresh pale brown to greenish amphibole, an apple green fibrous phase and irregular shaped grains of quartz (contamination).

022

Sample No. 60007 (Swift Creek)

Description of Concentrate A pale brownish grey coloured fine grained sample containing sparse black to dark brown grains which are distinctly magnetic.

Thin Section A coarse grained fraction which comprises approximately 50% of the grains represented in thin section includes mainly well rounded red-brown fine grained ferric oxide-stained lithic fragments, silcrete with various proportions of silt-sized angular (strained) quartz chips, as well as well rounded clasts of very dense fine grained pale green chlorite and fine grained quartzite ± trails of oxidised cubic crystal sites.

The remainder of the sample (approximately 50%) consists of a medium sand sized fraction containing ubiquitous angular cleavage fragments of clinopyroxene, fewer of olivine, as well as sparse grains of intergrown orthopyroxene and clinopyroxene. Rare accessory grains include epidote, garnet, tourmaline and zircon.

Oxides within the finer grained fraction include subrounded to well rounded grains altered to translucent ferric oxides, scattered titaniferous grains partly converted to white leucoxene, sparse opaque oxides which include elongate grains of ilmenite and subhedral crystals of magnetite, as well as a dark red-brown spinel. Rare small grains of rutile and a single large, well rounded grain of ?cassiterite are accessory.

Sample No. 60049 (Swift Creek)

Description of Concentrate A red-brown fine sand sized sample with sparse grains of coarse sand. Sparse small grains are clearly magnetic.

Thin Section This is a very significant sample which contains in the order of 65% to 70% of rutile in the present thin section. This phase mainly occurs within the size range 0.15 mm to 0.5 mm and occurs both as angular to irregular shaped grains, as well as grains that appear to be quite well rounded. Also comprising part of the oxide fraction are scattered elongate grains of red-brown hematite, as well as rare grains of opaque oxides and leucoxene-sphene-altered titaniferous oxides. Rare grains of poorly cleaved cassiterite are accessory.

The subordinate silicate fraction, only about 30% of the grains present in the thin section, includes quite abundant well rounded zircon grains, almost equally abundant subrounded tourmaline grains, as well as granular aggregates and quite large single crystals of quartz.

Sample No. 60056 (Swift Creek)

Description of Concentrate A grey-brown, more or less even grained fine sand-sized concentrate containing only rare magnetic grains.

Thin Section This sample is fairly similar to the previous sample with an average grain size of about 0.2 mm (fine sand size) and it contains approximately 60% of rutile grains which have angular, elongate, prismatic, subhedral and quite well rounded grain shapes. Also present in the oxide fraction are sparse scattered opaque oxide grains, numerous grains of white leucoxene- and sphene-altered titaniferous opaque oxides and sparse grains of cassiterite.

60056 (Cont.)

The silicate fraction is dominated by subhedral to well rounded grains of variegated blue-green to yellow-brown tourmaline, with almost equally abundant small well rounded grains of zircon, and small accessory grains of quartz contamination.

Sample No. 60058 (Swift Creek)

Description of Concentrate A brownish-grey to white coloured sample comprising mainly fine sand-sized, well sorted grains, very few of which are magnetic.

Thin Section This is a more or less equigranular concentrate for which the average grain size is about 0.15 mm or fine sand size. Oxides account for approximately 60% to 65% of the grains represented in the thin section, and most of these grains have subrounded to quite well rounded shapes. This fraction is dominated by very abundant titaniferous grains which are almost completely altered to strongly clouded white leucoxene ± microgranular sphene. Sparse black opaque oxides most likely include titaniferous magnetite and ilmenite with very few magnetic grains of magnetite (see above). Approximately 30% of the oxide fraction comprises subrounded to irregular shaped or elongate prismatic grains of well cleaved rutile, as well as scattered rounded grains of yellow-brown poorly cleaved cassiterite.

The subordinate silicate fraction, which comprises about 35% of the concentrate, includes dominant subrounded grains of zircon and almost equally abundant subhedral crystals of zoned and variegated blue-green to yellow-brown tourmaline, as well as numerous scattered grains of quartz contamination.

Sample No. 60113 (Swift Creek)

Description of Concentrate A red-brown coloured concentrate of which only a small fraction remains of a very fine grained sand sized concentrate. However, in thin section grains up to 3 mm across are represented. Very rare small grains are magnetic.

Thin Section The coarser fraction of this sample includes

025
60113 (Cont.)

grains which range in size up to more than 3 mm across and include the following types, dense fine grained zoned concretionary red-brown ferric oxides, ferricrete, including dense red-brown oxides enclosing various proportions of small angular quartz chips, and strongly stained yellow- to red-brown oxidised lithic fragments of weakly foliated quartz-bearing siltstone with angular quartz chips, set throughout a fine grained matrix rich in wispy "sericite" stained by ferric oxides. A slightly finer grained fraction with grains mainly in the order of 0.3 mm also includes similar oxidised material, while a very subordinate even finer grained fraction includes small rounded zircon grains, opaque oxides, tourmaline, rare grains of clinopyroxene and several small rounded grains of rutile.

Sample No.

60115 (Swift Creek)

Description of Concentrate

A brown coarse to medium grained oxidised concentrate, with a very subordinate fraction of fine sand sized grains which appear to include very well rounded zircon crystals. Scattered small subhedral cubic crystals of magnetite are a common accessory phase.

Thin Section

By far the majority of this sample is within the size range 0.3 mm to 0.8 mm with sparse clasts ranging up to 1.5 mm across. It contains very abundant angular to subrounded clasts of red-brown translucent to opaque limonitic oxides, mainly hematite. Also present are zoned concretionary masses of more highly birefringent red-brown oxides, possibly including goethite. Common scattered grains of opaque oxides include magnetite, and possibly a small proportion of ilmenite which is converted to dense white leucoxene. Rare subhedral grains, which are almost completely converted to red-brown limonitic oxides, retain central zones of unaltered pyritic sulphides.

A very fine grained fraction includes rare grain of rounded zircon, a single small grain of rutile and traces of andalusite. Rare lithic clasts comprise partly weathered, very fine grained foliated quartz siltstone.

Sample No.

60119 (Swift Creek)

Description of Concentrate

Very fine grained sand sized particles comprise very few scattered grains which include well rounded clear zircon, black oxides and small brown grains, as well as somewhat larger pale grey fine grained lithic clasts.

Thin Section

The coarser fraction predominates in the present section, and this includes subrounded to fairly angular grains of oxidised and altered lithic material including ferricrete enclosing numerous small angular quartz chips. Other clasts comprise very dense concretionary limonitic oxides, as well as oxide-stained dense masses of pale green chlorite. Still other lithic clasts include types in which oxidised subhedral opaque crystals and/or sphene and irregular quartz grains are set in a very fine grained weakly foliated sericite-rich carbonaceous matrix. Dense trails of partly oxidised sulphides are present in a vein-like mass, which is enclosed within very fine grained subparallel prismatic crystals of hydrothermal quartz.

Sparse small angular cleavage fragments of rutil subhedral crystals to well rounded grains of tourmaline, and angular chips of andalusite are minor accessory phases, as well as rare grains of leucoxene-altered titaniferous oxides.

Sample No.

60121 (Swift Creek)

Description of Concentrate

Only a very small proportion of fine sand sized particles remain, which include pale brown, black and clear colourless grains, as well as rare grains which are distinctly magnetic.

Thin Section

As in previous samples a coarse grained fraction is present which includes most grains within the size range 0.4 mm up to about 2 mm across. These are invariably rich in red-brown limonitic oxides and include types with concretionary, as well as spherulitic or fine grained radial textures. Also present are silty lithic clasts which enclose numerous angular quartz chips and rare sericite flakes in a dense red-brown limonitic matrix. Plant material is represented by subrounded clasts with well preserved cellular structures.

60121 (Cont.)

The fine sand sized fraction (containing grains which are mainly about 0.1 mm across), consists of almost equally abundant oxides and silicates. The oxides include common opaque grains of partly oxidised magnetite, white leucoxene-altered titaniferous oxides and subordinate scattered angular cleavage fragments, small rounded grains and elongate subhedral crystals of rutile. Rare oxidised sulphides are enclosed within rims of fine prismatic vein quartz.

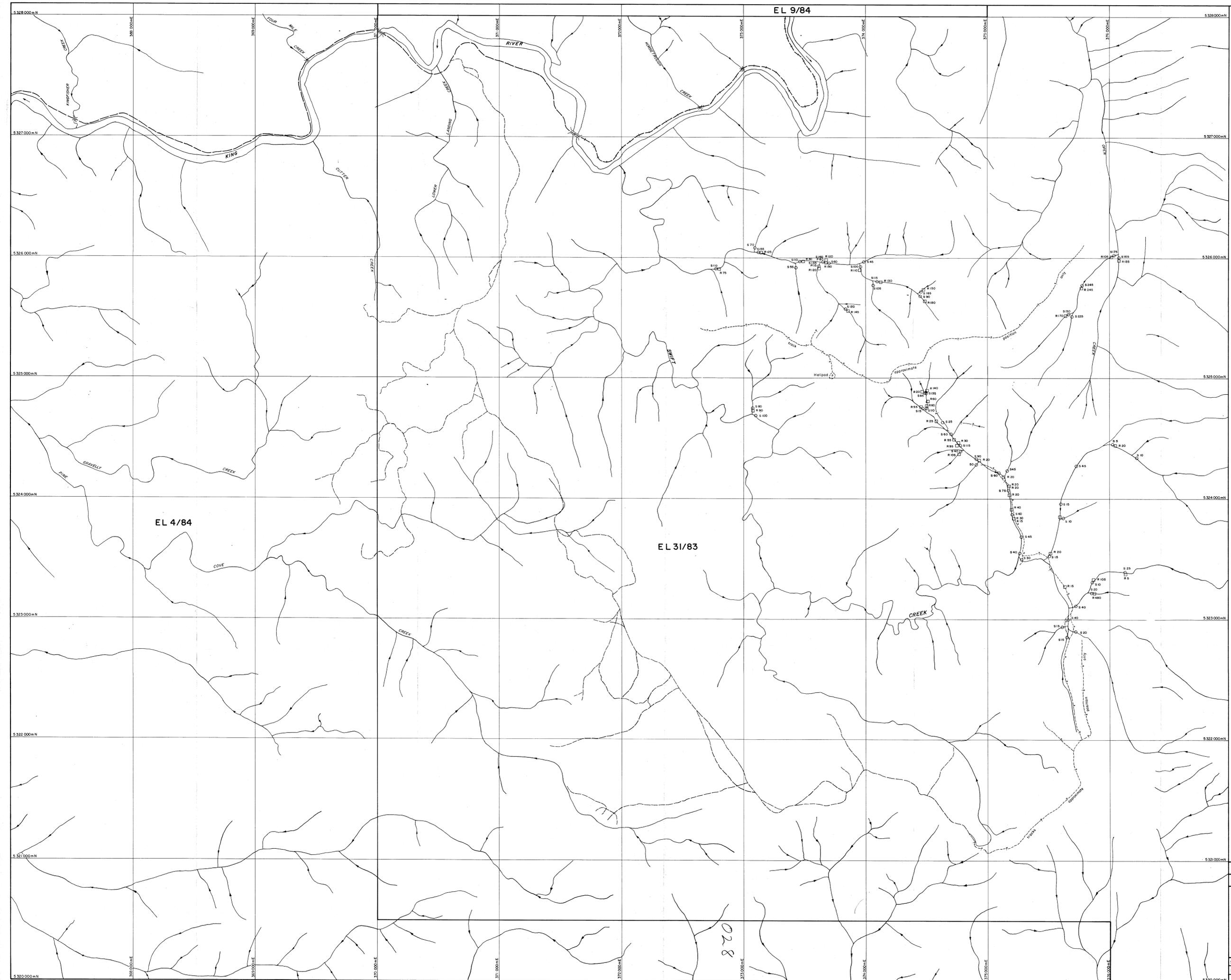
The silicate fraction includes abundant well rounded to elongate prismatic grains of zircon, with almost equally abundant well rounded grains of variegated blue to blue-green to pale yellow-brown tourmaline and numerous angular quartz chips as contamination.

Sample No. 60211 (Swift Creek)

Description of Concentrate A very small amount of very fine to fine sand sized material remains which appears to contain abundant white and pale brown grains, as well as dark grey to black oxides. The sample is not magnetic.

Thin Section A subordinate coarse grained fraction of this sample includes subrounded to quite well rounded grains of red-brown oxidised altered plant remains, as well as dense fine grained red-brown ferric oxides (ferricrete), and degraded siltstone. The majority of the sample, however, comprises subrounded to quite well rounded grains, mainly within the size range 0.13 mm and 0.4 mm (fine to medium sized sand). The oxide fraction greatly predominates, and this includes almost equally abundant titaniferous opaque oxides which are largely converted to white leucoxene, and non-magnetic opaque oxides of ?titaniferous magnetite (including subhedral octahedral crystals), together with oxides partly converted to translucent red-brown limonitic oxides. Irregular shaped crystals of rutile tend to have a slightly coarser grain size than other oxides, with common grains and aggregates reaching 0.6 mm across and several grains of pale blue to dark blue anatase. The rutile and anatase accounts for approximately 5% of the finer grained fraction of the rock. Also present are accessory small grains of cassiterite.

The silicate fraction includes abundant well rounded zircon crystals, common well rounded to subrounded or subhedral prismatic crystals of tourmaline, sparse irregular shaped grains of ?andalusite, minor sphene, chlorite and quartz.



EL 4/84

EL 31/83

EL 9/84

- STREAM SEDIMENT SAMPLE.
S60
 - PANNE CONCENTRATE-STREAM SEDIMENT SAMPLE.
P115
 - ROCK CHIP SAMPLE.
R30
 - x = below 5 ppm
- Note: All results are ppm

376029

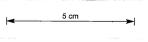


Fig. SC 1

ELECTROLYTIC ZINC CO. OF ASIA LTD.
PROJECT: SWIFT CREEK EL 31/83 ,TAS.

GEOCHEMISTRY 028

Zn

Scale: 1:10000	Survey: I.MAT.	Revised:
Reference: H.E.C.	Date: 23-3-84	Ref. No.
Drawn: R.J.R.	Checked: L.W.	A0-530-2001

028

2152

EL 9/84

EL 4/84

EL 31/83

029

- O STREAM SEDIMENT SAMPLE
S10
 - O PANNEO CONCENTRATE-STREAM SEDIMENT SAMPLE
P5
 - ROCK CHIP SAMPLE
R55
 - X = below 5 ppm
- Note: All results are ppm

376030
5cm

Fig. SC 2

ELECTROLYTIC ZINC CO. OF ASIA LTD.
PROJECT: SWIFT CREEK EL 31/83 TAS.

GEOCHEMISTRY 029

Pb

84-2182

Scale: 1:10000	Survey: I.MAT.	Revised:
Reference: H.E.C.	Date: 23-3-84	Ref. No.
Drawn: R.J.R.	Checked: L.W.	AO-530-2002

EL 9/84

EL 4/84

EL 31/83

- STREAM SEDIMENT SAMPLE.
S 30
 - PANNEED CONCENTRATE - STREAM SEDIMENT SAMPLE.
P 65
 - ROCK CHIP SAMPLE.
R 202
 - X = below 10 ppm
- Note: All results are ppm, unless shown otherwise.

376031

Fig. SC 3

ELECTROLYTIC ZINC CO. OF ASIA LTD.
PROJECT: SWIFT CREEK EL 31/83 ,TAS.

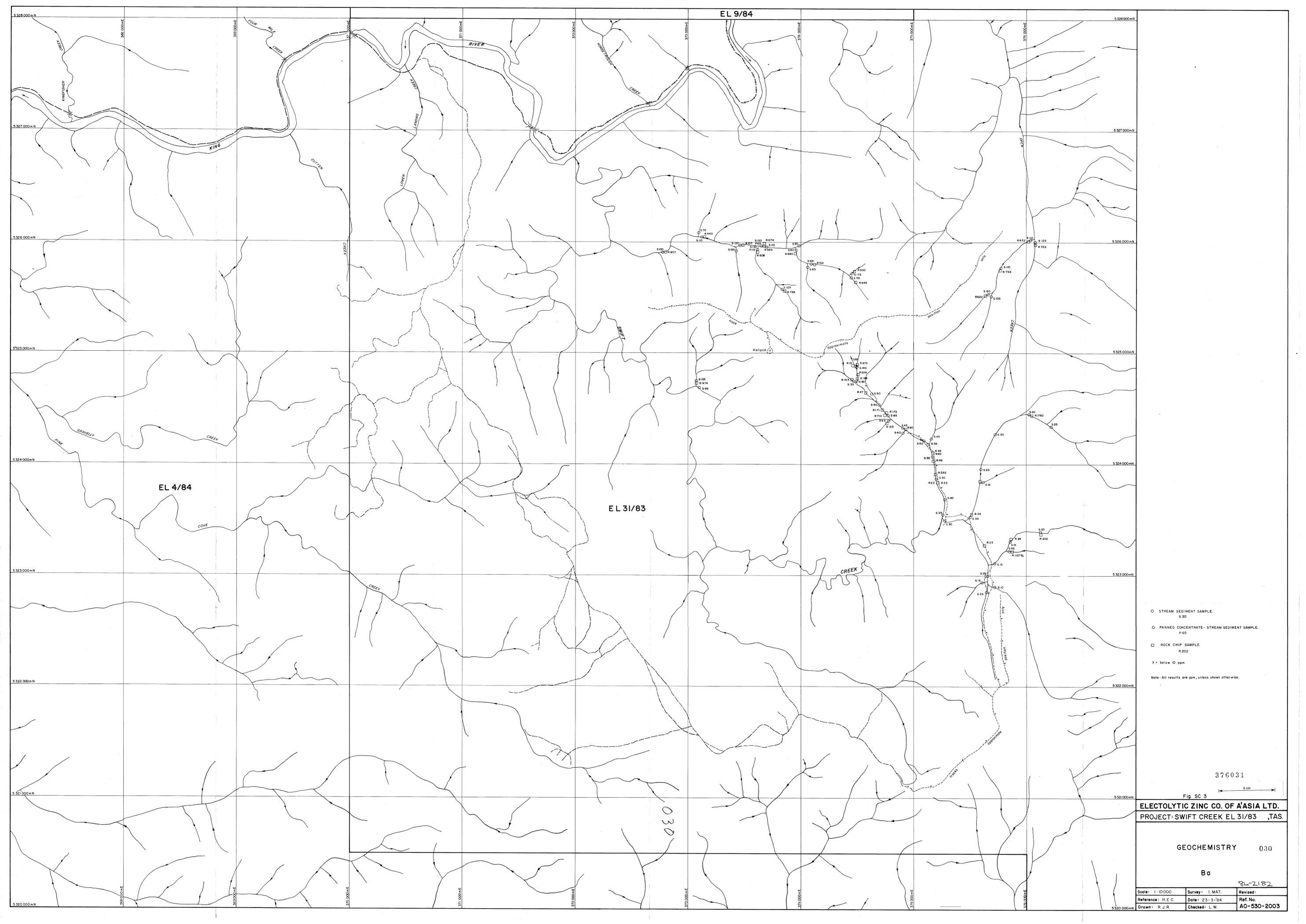
GEOCHEMISTRY 030

Ba

Scale: 1:10000	Survey: I. MAT.	Revised:
Reference: H.E.C.	Date: 23-3-'84	Ref. No.
Drawn: R.J.R.	Checked: L.W.	AO-530-2003

EL-2182

030



SPL 806

EL 31/83

031

- STREAM SEDIMENT SAMPLE
SAMPLE No. S45678
- ◐ PANNE D CONCENTRATE-STREAM SEDIMENT SAMPLE
SAMPLE No. P 78901
- ◑ ROCK CHIP SAMPLE
SAMPLE No. R 23456

376032



Fig. SC 4

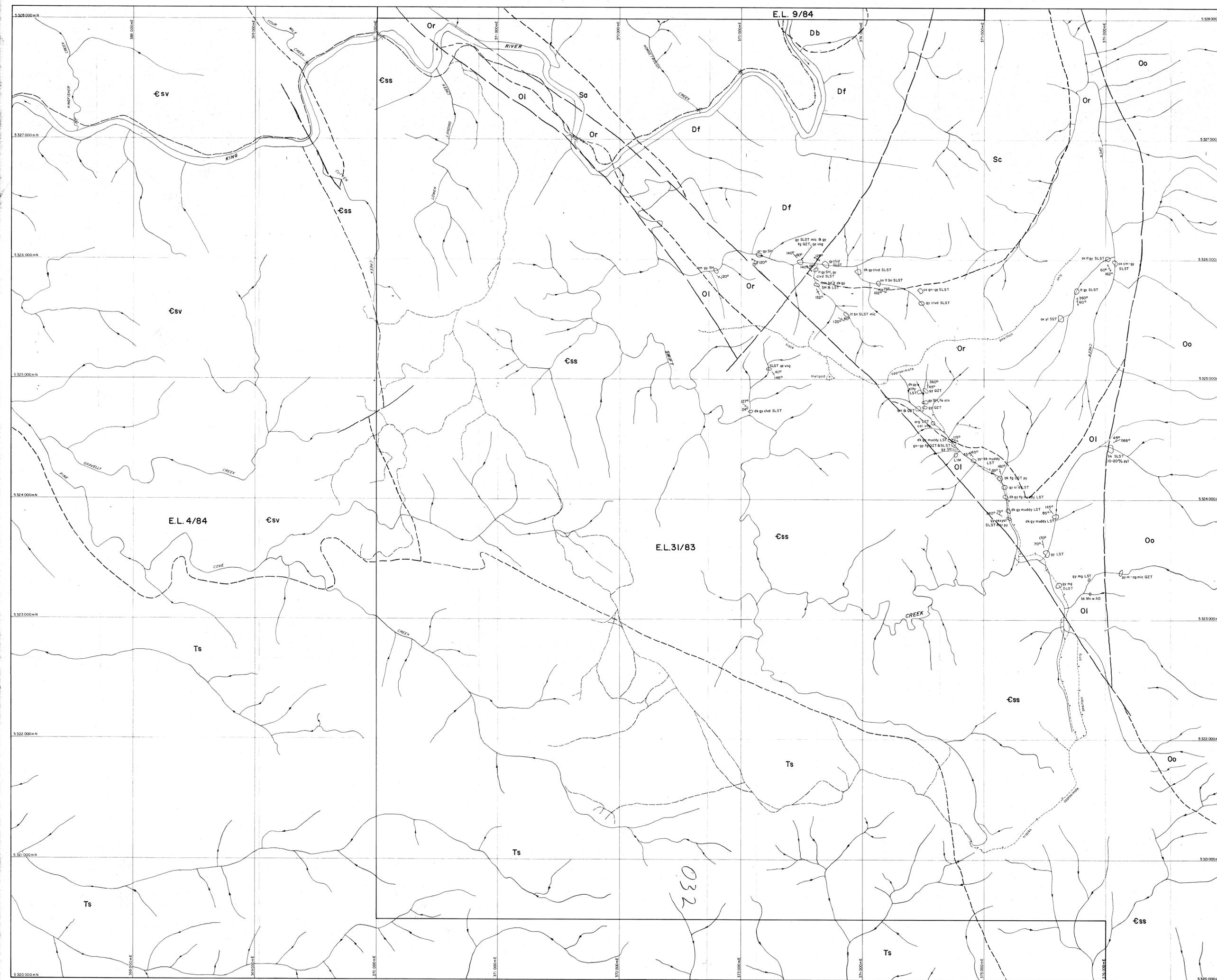
ELECTROLYTIC ZINC CO. OF ASIA LTD.
PROJECT: SWIFT CREEK EL 31/83 ,TAS.

SAMPLE LOCATION 031

NUMBERS and TYPES

Scale: 1:10000	Survey: I. MAT.	Revised:
Reference: H.E.C.	Date: 23-2-84	Ref. No.
Drawn: R.J.R.	Checked: L.W.	AO-530-2000

84-2182



LEGEND

COLOUR

pk - pink	wh - white
br - brown	bk - black
bl - blue	gr - green
gv - grey	yl - yellow
rd - red	or - orange
cr - cream	pl - pale
lt - light	dk - dark

TEXTURE

fg - fine grained	fs - fusiferous
mg - medium grained	sil - siliceous
cg - coarse grained	mic - micaceous
brd - bracediated	ferr - ferruginous
clvd - cleaved	int - intense
shd - sheared	wk - weak
colc - carbonaceous	v - very
carb - carbonaceous	pb - pebble
lgn - laminated	cb - cobble
kb - cross bedded	tr - trace
tr bd - thin bedded	mb - inter bedded
tb - thick bedded	tbl - tabular
vn - veins, veining	frct - fractured

ROCK TYPE

SST - sandstone	SLT - siltstone
LST - limestone	DLST - dolomite
Bx - breccia	CGL - conglomerate
SH - shale	BSH - black shale
QZT - quartzite	LIM - limestone
GRIT - grit	CLY - clay
PUG - pug	GRA - gravel

MINERALOGY or ALTERATION

qt - quartz	py - pyrite
gn - garnet	sp - sphalerite
lim - limonite	cp - chalcopyrite
cbd - carbonated	sil - silicified
c - calcite	

ORDER

Colour, Texture, Rock Type, Mineralogy or Alteration, Fossils

1-9

dk gy mg rock SST or gy calc SH py or pl gy LST sil

TOPOGRAPHICAL

cut grid lines	joint
roads	joint - vertical
tracks	overturned
tramways	bedding
power lines	bedding - vertical
rivers, creeks	quarries
swampy area	

INTERPRETED GEOLOGY
(Modified from 1:50,000 Strahon sheet)

TERTIARY	Ts	Interbedded sandstone, siltstone, clay and conglomerate with lignite horizons.
DEVONIAN	Db	Interbedded fine grained quartz sandstone and mudstone.
	Df	Dominantly fine grained quartz sandstone sequence.
SILURIAN	Sa	Grey mudstone and siltstone with some sandstone beds.
	Sc	Quartz sandstone with minor mudstone.
ORDOVICIAN	Or	Dominantly interbedded grey slate and siltstone with some impure limestone horizons.
	OI	Limestone and impure limestone.
	Oo	Siliceous conglomerate, quartz sandstone with minor siltstone.
CAMBRIAN	Csvg	Interbedded laminated siltstone, micaceous sandstone, greywacke and quartzite.
	Csv	Interbedded laminated siltstone, sandstone, quartzwacke, pyritic slate with volcanic horizons.

--- Geological boundary.
- - - Fault.

376003

Fig. SC 5

ELECTROLYTIC ZINC CO. OF ASIA LTD.
PROJECT: SWIFT CREEK EL 31/83, TAS.

GEOLOGY 032
(INTERP)

Scale: 1:10000	Survey: 1. MAT.	Revised:
Reference: H.E.C.	Date: 22-6-'84	Ref. No.
Drawn: R.J.R.	Checked:	AO-530-2005

032

84-2182