



Bergvesenet

Postboks 3021, 7002 Trondheim

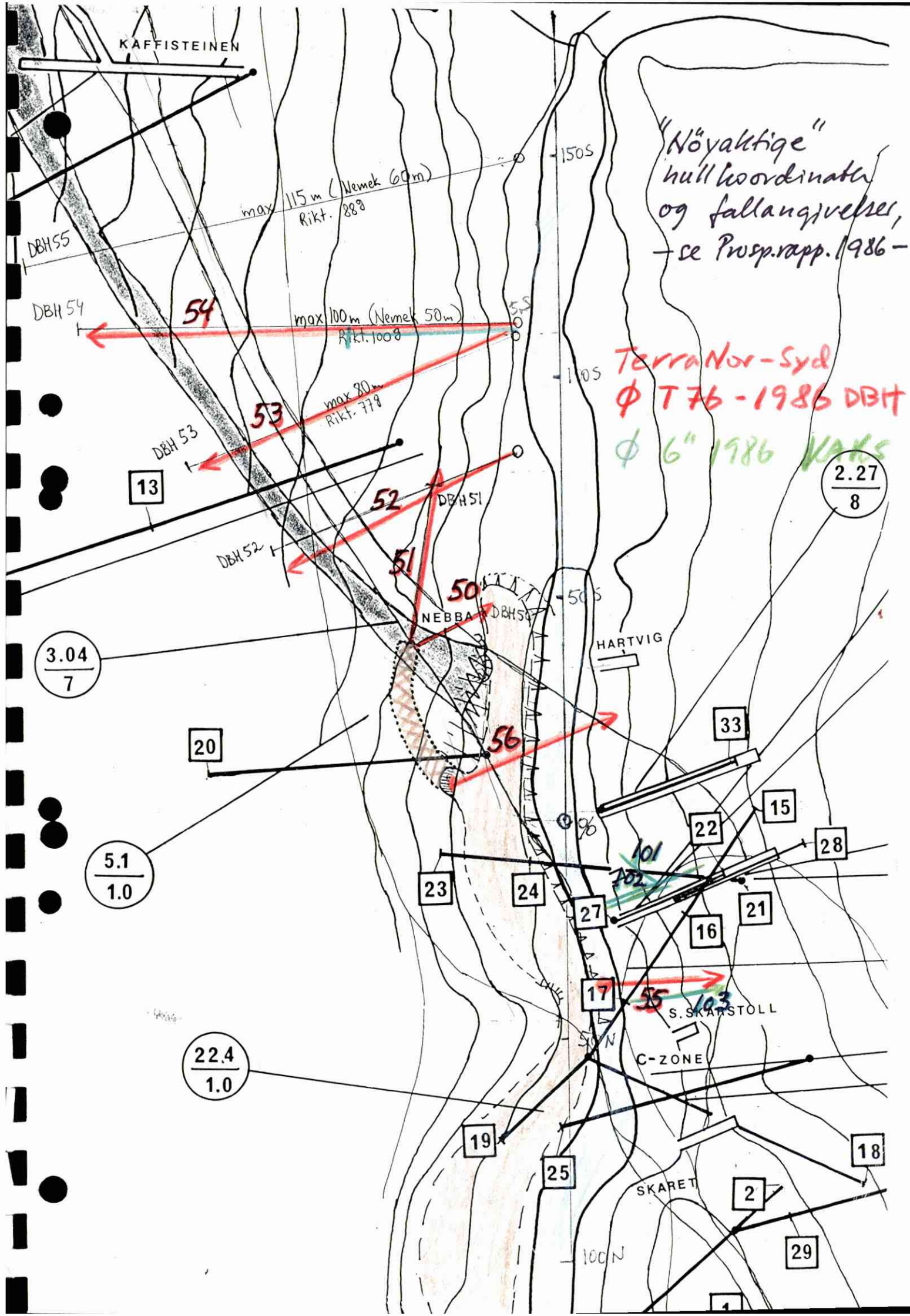
Rapportarkivet

Bergvesenet rapport nr BV 578	Intern Journal nr	Internt arkiv nr	Rapport lokalisering Trondheim	Gradering Fortrolig
Kommer fra ..arkiv Nordlandske	Ekstern rapport nr	Oversendt fra Terra Mining A/S	Fortrolig pga	Fortrolig fra dato:
Tittel Borlogger fra Bh 50-54, Kolsvik.Fargelagt og med analyser og mineralobservasjoner på EDB-borlogg. Lokalitetskart for Borhullene. Oppredningsnotater.				
Forfatter		Dato 1986	Bedrift Terra Mining A/S	
Kommune Bindal	Fylke Nordland	Bergdistrikt Nordlandske	1: 50 000 kartblad 18252	1: 250 000 kartblad
Fagområde Boring	Dokument type		Forekomster Kolsvik	
Råstofftype Malm/metall	Emneord Au As			
Sammendrag Det henvises til rapport for 1986.				

KAFFISTEINEN

"Nöyaktige"
hullkoordinater
og fallangivelser,
- se Prosp.rapp. 1986 -

TerraNor-Syd
Ø T 76 - 1986 DBH
Ø 6" 1986 KAKS



3.04
7

5.1
1.0

22.4
1.0

2.27
8

1986	BINDAL	*N*	Kolsvik / Bogadalen	TERRA MINING A/S
Borhull identitet	Dbh-50	Høyde (m.o.h)	Z-	ca (200)* (i Nebbastollen)
Total hull-lengde	16,7 m	N-S koordinat	X-	ca (798801)* Retning - 270 gon
Kjerneridimensjon	62 mm (T76)	O-V koordinat	Y-	ca (19730)* Helning - horisontal
(-)* = Koordinatsystem ikke eksakt overført fra øk.kart -				
Bordyp	Geo- Bergart	Beskrivelse	Rel. intensitet 1-5	
--> m	sy] - hovedgruppering-	- mineralogi/sek forhold-	Silif. Asp. Py. Tekt. VG	gr/tonn
0 ->	Gneis / mørk	Grovkornig /Ca og bi- rik	1 1 2	0,48
> 1,0	Gneisgranitt	Asp og kloritt sjikt	1 1 2	0,06
> 2,0	Gneis / mørk	m/ granittåre	1	0,02
> 3,0	"	m/ noen Q-ører	1	0,02
> 4,0	Granitt / lysgrø	silifisert/fink./omvandlet	1 1	0,62
> 5,0	Gneisgranitt	Ca-/kl-f. delvis breks.	1 1	0,26
> 6,0	Granitt /	Fink./Q-ører	1 1	1,96
> 7,0	Gneisgranitt	Hydrotermalomv.	1 1	0,08
> 8,0	Quarts-øre	- som ovenfor	1 1 2	0,02
> 9,0	Skarngneis	m/granater/epidot/qu.	2 2	0,03
> 10,0	Granitt / lys	Silifisert	2 1	LT 0,02
> 11,0	"	"	2 1	LT 0,02
> 12,0	Gneisgranitt/mørk	- som ovenfor	1	LT 0,02
> 13,0	Granitt / lys	silifisert/fink./omvandlet	1	LT 0,02
> 14,0	"	"	1	LT 0,02
> 15,0	Gneisgranitt/mørk	- som ovenfor	1	LT 0,02
> 16,0	Granitt / lys	- som ovenfor	1	LT 0,02
> 16,7	"	(granittaktig)	1	LT 0,02
	"	"	2	LT 0,02
	" / Qu-anriket	Qu-ører og slirer	2	0,04
	"	"	2	LT 0,02
	Gneisgranitt/grø	- som ovenfor/silifisert	2	LT 0,02
	"	"	1	LT 0,02
	"	"	1	LT 0,02
	"	"	3	LT 0,02

1986	BINDAL	*N*	Kolsvik / Bogadalen	TERRA MINING A/S
Borhull identitet :	Dbh-51	Høyde (m.o.h.)	Z- ca. (200)* (i Nebbastollen)	
Total hull-lengde :	35,7 m	N-S koordinat	X- ca(797.800)*	Retning - 200 gon
Kjerneridimensjon :	62 mm (T76)	O-V koordinat	Y- ca(19.731)*	Helning - horisontal
(-)* = Koordinatsystem ikke eksakt overført fra øk.kart				
Bordyp	Geo- Bergart :	Beskrivelse :	Rel. intensitet 1-5	Au-info/anal.
--> m	syl. - hovedgruppering-	- mineralogi/sek.forhold-	Silif. Asp. Py. Tekt. VG	gr/tonn

0->	Gneisgranitt	m/5 cm Qu-åre	2	2
> 1,0	"	porfyrisk / epidot på spr.	2	2
	"	m/8 cm Qu-åre	2	1
> 2,0	"	"	2	1
	"	"	2	2
> 3,0	Granitt / lysgrå	Qu-rik/Omvandlet/breks.	2	2
	"	"	2	1
> 4,0	"	"	2	1
	"	"	2	1
> 5,0	"	" m/15cm amfibolittsone	2	1
	"	" m/Qu-åre	2	1
> 6,0	"	"	2	1
	"	"	2	1
> 7,0	"	"	2	1
	"	" m/ Qu-åre/Asp/kloritt	2	2
> 8,0	Gneis / rel mørk	Amfibolittisk?/omvandlet	1	1
	"	"	1	1
> 9,0	"	"	1	1
	"	" m /skarninnslag?	1	2
> 10,0	"	"	1	2
	"	"	1	2
> 11,0	"	"	1	2
	"	"	1	2
> 12,0	Granitt / Qu-anrikt	Pegmatittisk	2	
	" /rel. mørk	Breksjert m/xenoblaster	1	
> 13,0	Gneisgranitt	Omvandlet	1	1
	"	"	2	1
> 14,0	Granitt / lys-grøntlig	Silifisert/fink./omvandl.	2	1
	"	"	2	1
> 15,0	"	" m/Qu-åre	2	1
	"	"	2	1
> 16,0	"	"	2	1
	"	"	2	1
> 17,0	"	"	2	1
	" /grå	Qu-rik breksj. / granater	2	1
> 18,0	Gneis; skarn?	m/granater	2	1
	Skarngneis	/breksjert	1	2
> 19,0	"	"	1	2
	"	" m/Qu-åre v/19,3	1	1
> 20,0	Granitt / lysgrå	rel.fink. og homogen	1	1
	"	en del xenoblaster	1	
> 21,0	"	og skarnfragmenter	1	
	"	"	1	1
> 22,0	"	"	1	1
	"	"	1	1
> 23,0	"	"	1	1
	"	"	1	1
> 24,0	"	"	1	1

1986	BINDAL	*N*	Kolsvik / Bogadalen	TERRA MINING A/S
Borhull identitet	Dbh-52	Høyde (m.o.h)	Z- ca. (196)*	(Ø-siden elva)
Total hull-lengde	59,5 m	N-S koordinat	X- ca(797.760)*	Retning - 77gon
Kjerneridimensjon	62 mm (T76)	Ø-V koordinat	Y- ca(19.712)*	Helning - horisontal
(-)* = Koordinatsystem ikke eksakt overført fra øk.kart.				
Bordyp	Geo- Bergart	Beskrivelse	Rel. intensitet 1-5	Au-info/anal.
--> m	syl. - hovedgruppering-	- mineralogi/sek.forhold-	Silif. Asp. Pu	Tekt VG gr/tonn
0->	Granitt / lysgrø	Silifisert / Qz-rik/rødlig	2 1	3 0,02
> 1,0	"	"	2 1	3 0,02
> 2,0	"	"	2 1	2 0,02
> 3,0	"	"	2 1	2 0,02
> 4,0	"	"	2 2 1	2 0,04
> 5,0	Gneis / lys-mørk	Hetrogen / Bi. Amf. Ca.Qz	2 2	2 0,04
> 6,0	"	"	2 2	2 0,02
> 7,0	"	Overgang m/granater, kl.	2	1 0,02
> 8,0	Granitt / lys	Qz-rik / leptitisk	1	LT 0,02
> 9,0	Skarngneis	Granat, Epidot, Qz, Kalksp.	2 2	2 0,02
> 10,0	"	"	2 2	2 0,02
> 11,0	"	"	2 1	LT 0,02
> 12,0	"	"	1	0,02
> 13,0	"	"	1 2	0,02
> 14,0	Gneisgranitt? / lys	Finkornet, Ca-anrikt, omv.	1	0,03
> 15,0	"	"	1	LT 0,02
> 16,0	"	"	1 1	LT 0,02
> 17,0	Skarngneis	-som ovenfor-	1 1	LT 0,02
> 18,0	"	"	2 2	0,04
> 19,0	Granitt / hvit	Silifisert / grønnlig	2 2	0,07
> 20,0	" / grønhvit	"	2 2	0,16
> 21,0	"	"	1 1	0,05
> 22,0	Gneis / mørk	Amfibol, biotitt-	1 2	0,04
> 23,0	Skarngneis	-som ovenfor-	1 1 2	0,04
> 24,0	"	"	1 1	0,05

Bindal

Dbh-51 forts.

side 2

24->	Granitt	som ovenfor	1	1		
> 25,0	"	"	1	1		LT 0,02
> 26,0	"	"	1			LT 0,02
> 27,0	"	"	1			LT 0,02
> 28,0	"	/silifisert/breksjert	2	1	2	LT 0,02
> 29,0	"	"	2	1	2	LT 0,02
> 30,0	"	m/Qu-ører	1		2	LT 0,02
> 31,0	"	/mer grovkornet	1		2	LT 0,02
> 32,0	"	m/Qu-ører	1			LT 0,02
> 33,0	"	/mer finkornig	1			LT 0,02
> 34,0	"	m/Qu-slire	2			LT 0,02
> 35,0	Skarngneis	m/granater, Qu, epidot,	1			LT 0,02
> 35,7	"	og schelittkorn	1			LT 0,02
		"				LT 0,02

1986	BINDAL	*N*	Kolsvåk / Bogadalen	TERRA MINING A/S				
Borhull identitet : Dbh-53			Høyde (m.o.h)	Z-	ca	(197)*	(Ø-side elva)	
Total hull-lengde : 77,9 m			N-S koordinat	X-	ca	(797.734)*	Retning -	77 gon
Kjerneridimensjon : 62 mm(T76)			Ø-V koordinat	Y-	ca	(19.717)*	Helning -	horizontal
(-)* = Koordinatsystem ikke eksakt overført fra Øk.kart.								
Bordup	Geo-	Bergart :	Beskrivelse :	Rel. intensitet, 1-5				Au-info/anal.
→ m	syl.	- hovedgruppering-	- mineralogi/sek.forhold-	Silif.	Asp	Pu	Tekt	VG gr/tonn
0->		Granitt / lysgrø	Silifisert / rødlig/kl.sjikt	1	1		1	-
> 1,0		"	"	1	1		1	-
> 2,0		"	"	1				-
> 3,0		Gneis / mørk	Tett tekstur / Ca-Kf	1			1	-
> 4,0		Granitt / lys	- som ovenfor-	1				-
> 5,0		Gneis / mørk	Amfibolitisk / Ca-Kf	1		1	1	LT 0,02
> 6,0		Granitt / lys	- som ovenfor-	1			1	LT 0,02
> 7,0		Gneis / mørk	- som ovenfor-	1			1	0,02
> 8,0		Granitt / lys	Gjenomsatt av Qz-ører, Kl	2				0,03
> 9,0		Skarngneis	Epidot, granater, kl., Qz	2		2		0,02
> 10,0		"	"/ 10cm Qz-granittøre	2		2		0,02
> 11,0		Breksje	m/ granitt, skarn, kl, qz	2	2	2	1	0,05
> 12,0		Skarngneis	m/ epidot, Qz	2	2	1		0,19
> 13,0		Gneis / mørk	stirig-granittisert / kl	1		1		LT 0,02
> 14,0		Skarngneis	- som ovenfor-	1		2		LT 0,02
> 15,0		Gneis / mørk	- som ovenfor- / kl, gr, ep.	1		2		-
> 16,0		Skarngneis	- som ovenfor-	1		1		0,02
> 17,0		Granitt / lysgrø	Variabel	2	1			0,02
> 18,0		Gneis / mørk-lys	Silifisert/hvit-grønnlig	1	1			0,03
> 19,0		Granitt / grø-hvit	Stirig/Amf, Skarn, Granitt	2	3			0,28
> 20,0		"	Silifisert / grønnlig	2	3			0,05
> 21,0		"	" / noe pegmatitisk / Qz	2	2	1	1	0,02
> 22,0		"	"	2	1			0,02
> 23,0		"	" / små granater, kl	2	1	1	1	0,03
> 24,0		"	"	2	1	1	1	0,02
		/grønnlig	" / rel. homogen	2	1	1	1	0,02
		"	"	2	2			0,09
		"	" / inhomogen, grov / fink-	2	2			2

Bindal	Dbh-52 forts.					side 2
24->	Skarngneis	-som ovenfor-	1	1	2	
> 25,0	"	"	1	1	2	0,15
> 26,0	Granitt / lys	Silifisert / grønnlig	2	1		0,06
"	"	"	2	1		
> 27,0	"	"	2	1	1	0,06
"	"	"	2	2	1	
> 28,0	"	"	2	2	1	0,11
"	"	m/ Asp på sprekkfl.	2	2		
> 29,0	"	or Qz-årer	2	2		0,26
"	"	"	2	2	2	
> 30,0	"	"	2	2	2	2,14
"	"	"	2	2	1	
> 31,0	"	"	2	2	1	1,78
"	"	"	2	1	1	
> 32,0	"	"	2	1	1	0,53
"	"	"	2	3	2	
> 33,0	"	"	2	3	2	5,07
"	Gneis / mørk	Amfibolitisk m/bi, kl.	1		1	0,30
> 34,0	"	"	1		1	
"	"	"	1		1	0,05
> 35,0	Granitt / lys	Silifisert / grønnlig	2			
"	"	"	2		1	0,04
> 36,0	"	"	2		1	
"	"	"	2			0,04
> 37,0	"	"	2			
"	"	"	2		1	0,04
> 38,0	"	"	2		1	
"	"	"	3	1	1	0,48
> 39,0	"	"	3	1	1	0,05
"	"	"	2		1	
> 40,0	Gneis / mørk	-som ovenfor- Kloritt	1		1	0,04
"	"	"	1		1	
> 41,0	"	"	1		1	0,03
"	"	"	1		1	
> 42,0	"	"	1		1	0,04
"	"	"	1		1	
> 43,0	"	"	1		1	0,05
"	"	"	1		1	
> 44,0	"	"	1		1	0,94
"	"	"	1		1	
> 45,0	"	"	1		1	0,59
"	Granitt / lys	-som ovenfor- breksjert	2	2	1	
> 46,0	"	"	2	2	1	3,84
"	Gneis/mørk (fragm)?	-som ovenfor- breksjert	2	2	1	
> 47,0	"	"	2	2	1	0,33
"	"	"	2	2	1	
> 48,0	"	"	2	2	1	0,25
"	"	m/ klorittisering	1	2	1	
> 49,0	"	"	1	2	1	4,40
"	"	"	1	1	2	
> 50,0	"	"	1	1	2	0,09
"	"	"	1		1	
> 51,0	"	"	1		1	0,03
						3

Bindal		Dbh-52 forts.				side 3	
51,0->		"	"	1	1		
> 52,0		Granitt / lys	Silifisert / grønnlig	2	1	0,04	
		" / grø	"	1	1		
> 53,0		"	"	1	1	0,08	
		" / mørkgrø	"	1	1		
> 54,0		"	"	1	1	0,03	
		"	"	1	2		
> 55,0		"	"	1	2	0,06	
		"	"	1	1		
> 56,0		" / grø	"	1	1	0,04	
		"	"	1	1		
> 57,0		"	"	1	1	0,03	
		"	"	1	1		
> 58,0		"	"	1	1	0,03	
		"	"	1			
> 59,0		"	"	1		0,03	
> 59,5		"	"	1			

Bindal		Dbh-53 forts.						side 2
24->	Granitt / grå	Silifisert / rel homogen	2	1	1			
> 25,0	"	"	2	1	1			0,04
> 26,0	" / gråhvit	"	1	1				0,03
> 27,0	" / lys-grønnlig	"	1	1				0,02
> 28,0	" / hvit-lysgrå	" / noe breksjert og	2					0,02
> 29,0	"	pegmatittisk (skriftgr.)	2	1				0,03
> 30,0	"	m/ Qz, kl, sericite	2	1				0,03
> 31,0	" / lysgrå	" / inhomogen m/klorittsj.	2	1				0,03
> 32,0	"	"	1	1				0,03
> 33,0	"	" / homogen / finkornig	1	1	1			0,15
> 34,0	"	"	1	1	1			0,05
> 35,0	"	" / inhomogen m/klorittsj.	1	1	1			0,05
> 36,0	"	"	1	1	1			0,03
> 37,0	"	"	1	1	1	1		-
> 38,0	"	"	1	1	1	1		-
> 39,0	Gneis / mørk	Klorittisert Ca-førende				1		-
> 40,0	Granitt / lysgrå	m/ fragm. av lys granitt	1	1		1		-
> 41,0	"	Silifisert, m/ innslag av	1	1		1		-
> 42,0	"	hvit flammig granitt og	1	1	1			-
> 43,0	"	Qz-penetrert granitt	1	1	1			-
> 44,0	"	" / Qz-pen.	1	1				0,52
> 45,0	"	"	2	1				LT 0,02
> 46,0	"	"	2	1				-
> 47,0	"	"	1	1	1			-
> 48,0	"	"	1	1	1			-
> 49,0	"	" / pegm.	2	1				LT 0,02
> 50,0	"	"	2	1				LT 0,02
> 51,0	"	"	1	1				-
			1	1				-
								3

51->	Gneis / mørk	Diorittisk?	1	1	1		
> 52,0			1	1	1		
> 53,0	Granitt / lys-mørk	Inhomogen m/Qz. og kl.	1		1		
> 54,0	Gneis / mørk	-som ovenfor-	1		1		
> 55,0			1		1		
> 56,0	Granitt / lys	Amfibolitisk/klorittisert Silifisert	1		1		
> 57,0			1		1		
> 58,0			1		1		
> 59,0			1		1		
> 60,0			1	1			0,06
> 61,0			2	1		1	14,8
> 62,0	Gneis / mørk	Inhomogen/diorittisk? -amfibolitisk	2	1		1	0,38
> 63,0			1	2	1	1	0,04
> 64,0			1	2	1	1	12,4
> 65,0	Granitt / grø	Silifisert / Qz-rik	2	2		1	0,03
> 66,0	/ lys		1	1		2	LT 0,02
> 67,0			1			2	0,04
> 68,0			1				0,08
> 69,0			2		1	2	LT 0,02
> 70,0	/ grø	Inhomogen m/noe Qz. og aplitt-granitt	2		1	2	-
> 71,0	/ hvit-lysgrø	m/klorittslirer	2	1	1		-
> 72,0			2	1	1		1,03
> 73,0		grønntonet m/klorittslirer	2	1			LT 0,02
> 74,0		grønntonet	2	1			LT 0,02
> 75,0			1	1		1	LT 0,02
> 76,0	Gneis / mørk	kl.gliderfl. v/ 75,4 m / porfyriske korn	2	2	1	1	0,04
> 77,0	Granitt / hvit	Aplittisk/grønntonet /kl.	2	2	1	1	LT 0,02
> 77,8	Gneis / mørk	Inhomogen	1		1		
			1		1	1	

1986	BINDAL	*N*	Kolsvik / Bogadalen	TERRA MINING A/S
Borhull identitet	Dbh-54	Høyde (m.o.h)	Z-	ca (198)*
Total hull-lengde	92,3 m	N-S koordinat	X-	ca(797.729)*
Kjerneredimensjon	62 mm (T76)	O-V koordinat	Y-	ca (19.717)*
Retning	-	100gon		
Helning	-	horizontal		
Bordup	Geo- : Bergart :	Beskrivelse :	Rel. intensitet 1-5	Au- info/anal.
--> m	syl. - hovedgruppering-	- mineralogi/sek.forhold-	Silif. Asp. Py. Tekt. VG	gr/tonn
O-40m	kaksboret			*****
40->	Granitt/ lys gråhvit	mu. / Asp. aggregater	1 1	0.18
> 41	+	"" / Asp. spekkebelegg	1 1	0.02
> 42	+	silifisert m/kv.årer	1 1	
> 43	+	""	2 2	
> 44	+	""	2 2	
> 45	+	Gneis/mørk	1 1	
> 46	+	"" biotitt rik m/kv.årer	1 1	
> 47	+	Granitt/ lys gråhvit	2 1	0.58
> 48	+	"" og ørsmå granater	2 1	0.09
> 49	+	"" silifisert	2 1	
> 50	+	"" / grå / spettet	2 1	
> 51	+	foliert		
> 52	+	""		
> 53	+	""		
> 54	+	"" serisittisert?		
> 55	+	"" m/enkelte fragm. av	1 1	
> 56	+	mørkere granitt og små	1 1	
> 57	+	Asp. aggr. på sprekkefl.	1 1	
> 58	+	""	1 1	
> 59	+	""	2 2	LT 0.02
> 60	+	"" gråspettet m/ Asp.aggr.	1 1	LT 0.02
> 61	+	""	1 1	LT 0.02
> 62	+	""	1 1	LT 0.02
> 63	+	""	1 1	LT 0.02
> 64	+	""	1 1	LT 0.02
> 65	+	""	1 1	LT 0.02
> 66	+	""	1 1	LT 0.02
> 67	+	""	1 1	LT 0.02
> 68	+	""	1 1	LT 0.02
> 69	+	""	1 1	LT 0.02
> 70	+	""	1 1	LT 0.02
> 71	+	""	1 1	LT 0.02
> 72	+	""	1 1	LT 0.02
> 73	+	""	1 1	LT 0.02
> 74	+	""	1 1	LT 0.02
> 75	+	""	1 1	LT 0.02
> 76	+	""	1 1	LT 0.02
> 77	+	""	1 1	LT 0.02
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64>		granitt / hvit	kv.rik / småflekket	2	1			
> 65		""	""	2	1			
		""	""	2	1			
> 66		""	""	2	1			
		""	""	2	1			
		""	/ svakt båndet	1				
> 67		""	""	1	1			
		""	""	1				
> 68		""	""	1				
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> 69		""	""					
		""	"spr. m/gr omvandling					
> 70		""	serisitteisering					
		""	lys / "tett" tekstur					
> 71		""	m/ mørk spotting					
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> 72		""	""					
> 73	45	""	m/gl.skifer fragm.					
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> 76		m/kv.øre	m/gl.rikere bånd					
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> 78		""	""					
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> 79		""	m/gl./delvis småfold.					
		""	/forskifret/kv.slirer					
> 80		""	""					
		""	lys/jevn/fink.					
> 81		""	""				LT	0,02
		""	Asp. småpepret		1	1		
> 82	Z	""	""		1	1		
		""	""	2	1			0,90
> 83	Z	""	""	2	1			20,5
		""	Asp. på sprekkeflater	2	3			
> 84	Z	""	""	2	3			27,2
		""	""		2			
> 85		""	""		2			4,21
		""	m/kv.slirer, flekker					
> 86		""	""					1,83
		""	lys m/Asp-aggr.		1			
> 87		""	""		1			0,49
		""	m/ mørke fragm.				1	
> 88		""	m/kl.sleppe				1	1,82
		""	mørkere, forgneiset					
> 89		""	småfoldet/kv.slirer					0,06
		""	""					
> 90		""	""					0,04
		""	""					
> 91		""	""					0,18
		""	""					
> 92		/ grålig	noe tektonisert				1	0,13
		""	enkelte Asp. aggr.		2		1	
> 93.2		**SLUTT**	""	2	2			0,08

Caleb Brett



Caleb Brett Laboratories Ltd.
Lancots Lane, St. Helens,
Merseyside WA9 3ES.
Tel: St. Helens (0744) 611553 Telex: 627844

TS&S

Laboratory Report

To: Terra Mining AB
Box 19030 Hoglandstorget 1
S-16141 BROMMA
SWEDEN

Date: 24-07-1986

Your Ref:

Attention of:- Mr. Jan Bida

Our Ref: 86F038

CERTIFICATE OF ANALYSIS

Sample No. Gold by Fire Assay
g/tonne Au

DDH 40 41.0-42.0	0.02
DDH 40 42.0-43.0	0.12
DDH 40 57.0-58.1	0.10
DDH 40 58.1-59.2	0.78
DDH 40 59.2-60.2	1.14
DDH 40 61.2-62.2	0.32
DDH 40 66.8-67.8	2.80
DDH 41 17.0-18.0	0.20
DDH 41 18.0-19.0	0.03
DDH 41 46.5-47.5	0.03

Hull	pröve	gr Au/tonn
Dbh 41	60,9-61,9	0,03
"	61,9-62,9	0,03
"	63,9-64,9	0,04
Dbh 46A *	0,0 - 3,0 (alle 3 pr.)	< 0,02 (deteksjonsgre
" 46B	0,0 - 13,6 (alle 14 pr.)	< 0,02 ("-

DDH 42 33.0-34.0	0.02
DDH 42 34.0-35.0	0.02
DDH 42 35.0-36.0	0.10
DDH 42 38.0-39.0	0.03
DDH 42 66.0-67.0	0.05
DDH 43 13.0-14.0	0.03
DDH 43 14.0-15.0	0.03
DDH 43 15.0-16.0	0.02
DDH 43 17.0-18.0	0.30
DDH 43 18.0-19.0	0.07

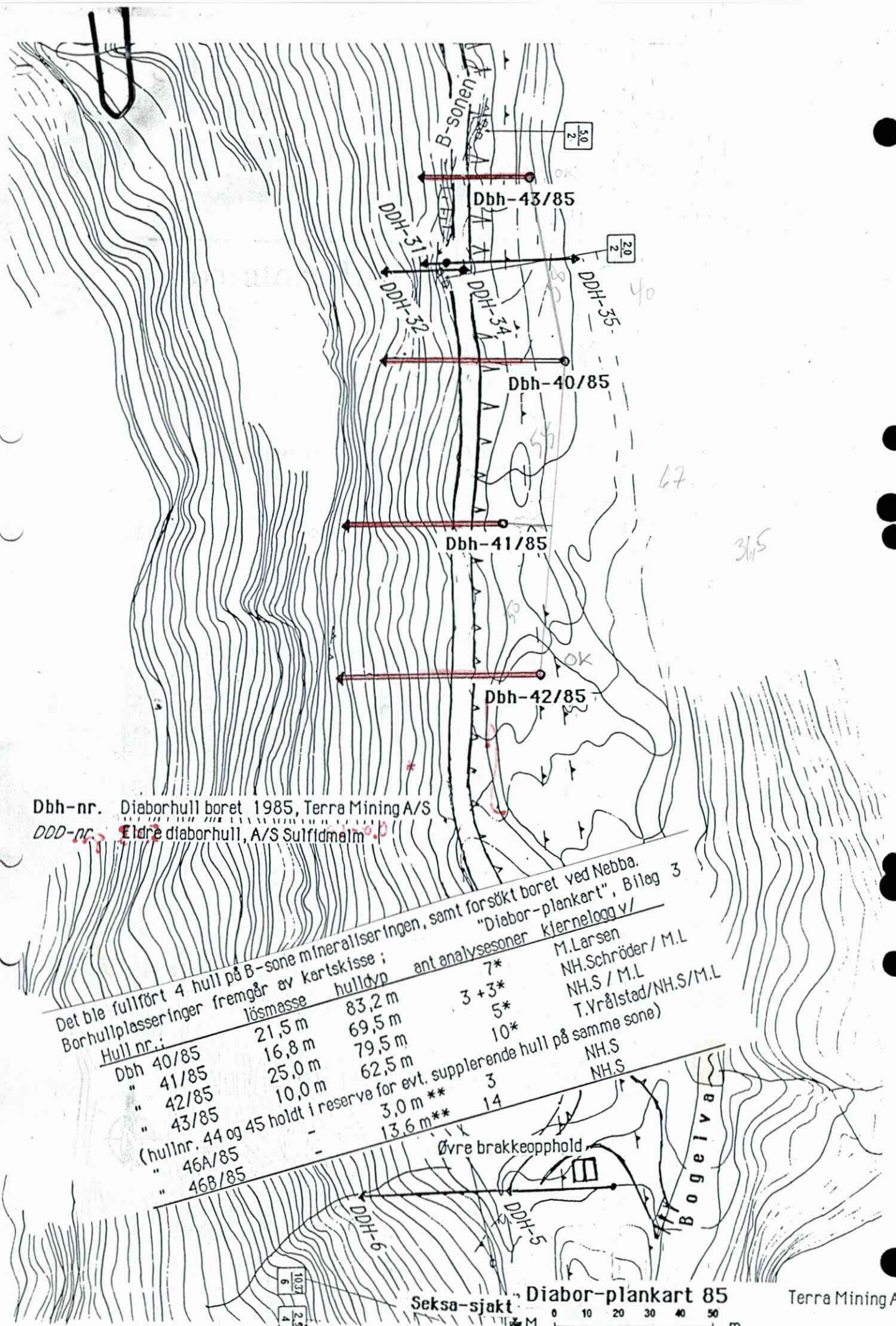
DDH 43 19.0-20.0	0.03
DDH 43 20.0-21.0	0.76
DDH 43 21.0-22.0	0.75
DDH 43 22.0-23.0	1.32
DDH 43 23.0-24.3	0.13

0,0-1,0

5,03 gr.

For and on behalf of
CALEB BRETT LABORATORIES LIMITED

B.G. Forshaw
B.G. Forshaw
Chief Chemist



Dbh-nr. Diaborhull boret 1985, Terra Mining A/S

DDD-nr. Eldre diaborhull, A/S Sulfidmalm

Det ble fullført 4 hull på B-sone mineraliseringen, samt forsøkt boret ved Nebba. "Diabor-plankart", Bilag 3

Borhullplasseringer fremgår av kartskisse; ant analysesoner kjernelogg v/

Hull nr.;	løsmasse	hulldyp	ant analysesoner	kjernelogg v/
Dbh 40/85	21,5 m	83,2 m	7*	M.Larsen
" 41/85	16,8 m	69,5 m	3 + 3*	NH.Schröder / M.L
" 42/85	25,0 m	79,5 m	5*	NH.S / M.L
" 43/85	10,0 m	62,5 m	10*	T.Vrålstad / NH.S / M.L
(hullnr. 44 og 45 holdt i reserve for evt. supplerende hull på samme sone)				
" 46A/85	-	3,0 m **	3	NH.S
" 46B/85	-	13,6 m **	14	NH.S

Seksa-sjakt

Diabor-plankart 85

Terra Mining A/

BOGADALEN

Bilag 3

TO: TERRA MINING , NORWAY (TERRA SWEDEN)
ATTN: TERRABINDAL, MAGNE LARSEN

ATTENTION OF:- TERRA-MINING
TELEX FROM CALEB BRETT LABORATORIES, UK
FOLLOWING RESULTS OBTAINED:-

SAMPLE NO.		GOLD G/TONNE AU	
DBH50	0.0-0.90	0.48	268
DBH50	0.90-1.70	0.06	1.79
DBH50	1.70-2.60	0.02	1.30
DBH50	2.60-3.60	0.02	1.30
DBH50	3.60-4.60	0.62	2.79
DBH50	4.60-5.50	0.26	2.41
DBH50	5.50-6.50	1.96	3.29
DBH50	6.50-7.40	0.08	1.90
DBH50	7.40-8.40	0.02	1.30
DBH50	8.40-9.40	0.03	1.47
DBH50	9.40-10.40	LT 0.02	1.30
DBH50	10.40-11.40	LT 0.02	1.30
DBH50	11.40-12.40	LT 0.02	1.30
DBH50	12.40-13.40	LT 0.02	1.30
DBH50	13.50-14.30	LT 0.02	1.30
DBH50	14.30-15.10	0.04	1.60
DBH50	15.10-16.00	LT 0.02	1.30
DBH50	16.00-16.70	LT 0.02	1.30

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14.40
15.28 ope
ok. 161

ARSENIC RESULTS SHOULD BE AVAILABLE TOMORROW

REGARDS

B.G.FORSHAW

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Televerket

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FONOTELE

TO: TERRA MINING, NORWAY (TERRA SWEDEN)
ATTN: TERRABINDAL, MAGNE LARSEN

ATTENTION OF:- TERRA-MINING
TELEX FROM CALEB BRETT LABORATORIES, UK
FOLLOWING RESULTS OBTAINED:-

SAMPLE NO.	GOLD G/TONNE AU
DBH51 0.0-1.10	0.06 1,79
DBH51 1.10-2.20	0.32 2,50
DBH51 2.20-3.30	0.54 2,73
DBH51 3.30-4.10	2.52 3,40
DBH51 4.10-4.80	1.16 3,06
DBH51 4.80-5.50	0.14 2,15
DBH51 5.50-6.60	0.15 2,18
DBH51 6.60-7.60	0.11 2,04
DBH51 7.60-8.60	1.78 3,25
DBH51 8.60-9.50	4.16 3,62
DBH51 9.50-10.50	0.63 2,80
DBH51 10.50-11.40	0.03 1,48
DBH51 11.40-12.40	0.03 1,48
DBH51 12.40-13.40	0.02 1,36
DBH51 13.40-14.40	0.02 1,30
DBH51 14.40-15.40	LT 0.02 1,30
DBH51 15.40-16.40	LT 0.02 1,30
DBH51 16.40-17.30	LT 0.02 1,30
DBH51 17.30-18.30	LT 0.02 1,30
DBH51 18.30-19.30	0.07 1,85
DBH51 19.30-20.30	LT 0.02 1,30
DBH51 20.30-21.30	LT 0.02 1,30
DBH51 21.30-22.30	LT 0.02 1,30
DBH51 22.30-23.30	LT 0.02 1,30
DBH51 23.30-24.30	LT 0.02 1,30
DBH51 24.30-25.10	LT 0.02 1,30
DBH51 25.10-26.10	LT 0.02 1,30
DBH51 26.10-27.10	LT 0.02 1,30
DBH51 27.10-28.00	LT 0.02 1,30
DBH51 28.00-29.00	LT 0.02 1,30
DBH51 29.00-30.30	LT 0.02 1,30
DBH51 30.30-31.05	LT 0.02 1,30
DBH51 31.05-32.05	LT 0.02 1,30
DBH51 32.05-33.05	LT 0.02 1,30
DBH51 33.05-34.00	LT 0.02 1,30
DBH51 34.00-35.00	LT 0.02 1,30
DBH51 35.00-35.70	LT 0.02 1,30

ARSENIC RESULTS SHOULD BE AVAILABLE TOMORROW

REGARDS

B.G.FORSHAW

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Caleb Brett Laboratories Ltd.
Lancots Lane, St. Helens,
Merseyside WA9 3ES.
Tel: St. Helens (0744) 611553 Telex: 627844

TSAS

Laboratory Report

To: Terra Mining AB
Box 19030
S-161 19 Bromma
SWEDEN

Date:

Your Ref: 17-03-1986

Our Ref:

Attention of:- Mr. Jan Bida

86C009

CERTIFICATE OF ANALYSIS

Sample No.	GOLD by FIRE ASSAY	
	g/tonne Au	
DBH52 0.0-0.95	0.02	1.30
DBH52 0.95-1.80	0.02	1.30
DBH52 1.80-2.80	0.02	1.30
DBH52 2.80-3.70	0.04	1.60
DBH52 3.70-4.70	0.04	1.60
DBH52 4.70-5.60	0.02	1.30
DBH52 5.60-6.60	0.02	1.30
DBH52 6.60-7.60	<0.02	1.30
DBH52 7.60-8.60	0.02	1.30
DBH52 8.60-9.60	0.02	1.30
DBH52 9.60-10.60	<0.02	1.30
DBH52 10.60-11.60	0.02	1.30
DBH52 11.60-12.70	0.02	1.30
DBH52 12.70-13.60	0.03	1.47
DBH52 13.70-14.50	<0.02	1.30
DBH52 14.50-15.50	<0.02	1.30
DBH52 15.50-16.50	<0.02	1.30
DBH52 16.50-17.50	0.04	1.60
DBH52 17.50-18.35	0.08	1.96
DBH52 18.35-19.40	0.07	1.85
DBH52 19.30-20.25	0.16	2.20
DBH52 20.25-21.20	0.05	1.69
DBH52 21.20-22.20	0.04	1.60
DBH52 22.20-23.30	0.04	1.60



Sample No. GOLD by FIRE ASSAY
g/tonne Au

86C009

DBH52	23.30-24.40	0.05	1,70
DBH52	24.40-25.30	0.15	2,18
DBH52	25.30-26.40	0.06	1,79
DBH52	26.40-27.40	0.06	1,79
DBH52	27.40-28.40	0.11	2,04
DBH52	28.40-29.30	0.26	2,41
DBH52	29.30-30.20	2.14	3,33
DBH52	30.20-31.20	1.78	3,25
DBH52	31.20-32.00	0.53	2,72
DBH52	32.00-33.00	5.07	3,76
DBH52	33.00-33.80	0.30	1,48
DBH52	33.80-34.80	0.05	1,70
DBH52	34.80-35.80	0.04	1,60
DBH52	35.80-36.65	0.04	1,60
DBH52	36.65-37.70	0.04	1,60
DBH52	37.70-38.65	0.48	2,68
DBH52	38.65-39.40	0.05	1,70
DBH52	39.40-40.40	0.04	1,60
DBH52	40.40-41.40	0.03	1,48
DBH52	41.40-42.50	0.04	1,60
DBH52	42.50-43.50	0.03	1,48
DBH52	43.50-44.50	0.94	2,97
DBH52	44.50-45.50	0.59	2,77
DBH52	45.50-46.50	3.84	3,58
DBH52	46.50-47.40	0.33	2,52
DBH52	47.40-48.50	0.25	2,40
DBH52	48.50-49.30	4.40	3,64
DBH52	49.30-50.30	0.09	1,95
DBH52	50.30-51.30	0.03	1,48
DBH52	51.30-52.20	0.04	1,60
DBH52	52.20-53.15	0.08	1,90
DBH52	53.15-54.10	0.03	1,48
DBH52	54.10-55.10	0.06	1,79
DBH52	55.10-56.15	0.04	1,60
DBH52	56.15-57.00	0.03	1,48
DBH52	57.00-58.10	0.03	1,48
DBH52	58.10-59.50	0.03	1,48

For and on behalf of
CALEB BRETT LABORATORIES LIMITED

B.G. Forshaw
B.G. Forshaw
Chief Chemist

Caleb Brett



Caleb Brett Laboratories Ltd.
Lancots Lane, St. Helens,
Merseyside WA9 3ES.
Tel: St. Helens (0744) 611553 Telex: 627844

TS&S

Laboratory Report

To: Terra Mining AB
Box 19030 Hoglandstorget 1
S-16141 BROMMA
SWEDEN

Date: 01-05-1986
Your Ref:

Attention of: - Mr. Jan Bida

Our Ref:

86D024

CERTIFICATE OF ANALYSIS

Sample No.	ARSENIC %w/w As	GOLD g/tonne Au	Log 100
DBH53 3.70-4.55	0.01	< 0.02	1.30
DBH53 4.55-5.55	0.01	< 0.02	1.30
DBH53 5.55-6.45	< 0.01	0.02	1.30
DBH53 6.45-7.15	0.01	0.03	1.48
DBH53 7.15-8.20	< 0.01	0.02	1.30
DBH53 8.20-9.10	0.01	0.02	1.30
DBH53 9.10-10.00	0.03	0.05	1.70
DBH53 10.00-10.90	1.08	0.19	2.28
DBH53 10.90-12.00	< 0.01	< 0.02	1.30
DBH53 12.00-13.10	< 0.01	< 0.02	1.30
DBH53 15.00-15.90	0.01	0.02	1.30
DBH53 15.90-16.95	0.03	0.02	1.30
DBH53 16.95-18.13	0.06	0.03	1.48
DBH53 18.13-19.13	0.79	0.28	2.45
DBH53 19.13-19.70	0.20	0.05	1.70
DBH53 19.70-20.80	0.04	0.02	1.30
DBH53 20.80-21.60	0.03	0.02	1.30
DBH53 21.60-22.50	0.03	0.03	1.48
DBH53 22.50-23.40	0.03	0.02	1.30
DBH53 23.40-24.50	0.10	0.09	1.95
DBH53 24.50-25.40	0.03	0.04	1.60
DBH53 25.40-26.20	0.03	0.03	1.48
DBH53 26.20-27.20	< 0.01	0.02	1.30
DBH53 27.20-28.20	0.02	0.02	1.30
DBH53 28.20-29.30	0.05	0.03	1.48
DBH53 29.30-30.20	0.06	0.03	1.48
DBH53 30.20-31.00	0.03	0.03	1.48
DBH53 31.00-31.90	0.04	0.03	1.48
DBH53 31.90-33.00	0.02	0.15	2.18
DBH53 33.00-33.90	0.03	0.05	1.70



CERTIFICATE OF ANALYSIS continued

86D024

Sample No.	ARSENIC %w/w As	GOLD g/tonne Au	
DBH53 33.90-34.90	0.09	0.05	1.70
DBH53 34.90-35.90	0.03	0.03	1.78
DBH53 41.60-42.60	0.02	0.52	2.72
DBH53 42.60-43.60	0.02	< 0.02	1.30
DBH53 47.70-48.75	0.02	< 0.02	1.30
DBH53 48.75-49.75	0.01	< 0.02	1.30
DBH53 59.30-60.40	< 0.01	0.06	1.78
DBH53 60.40-61.40	0.53	14.81	4.17
DBH53 61.40-62.40	0.30	0.38	2.58
DBH53 62.40-63.25	0.01	0.04	1.60
DBH53 63.25-64.25	0.01	12.4	4.09
DBH53 64.25-65.25	0.11	0.03	1.48
DBH53 65.25-66.15	0.01	< 0.02	1.30
DBH53 66.15-67.00	0.01	0.04	1.60
DBH53 67.00-67.90	< 0.01	0.08	1.90
DBH53 67.90-68.90	0.01	< 0.02	1.30
DBH53 70.80-71.80	0.02	1.03	3.01
DBH53 71.80-72.80	0.02	< 0.02	1.30
DBH53 72.80-73.80	< 0.01	< 0.02	1.30
DBH53 73.80-74.80	0.02	< 0.02	1.30
DBH53 74.80-75.80	0.17	0.04	1.60
DBH53 75.80-76.60	0.01	< 0.02	1.30

For and on behalf of
CALEB BRETT LABORATORIES LIMITED

B. G. Forshaw
B. G. Forshaw
Chief Chemist

Caleb Brett



Caleb Brett Laboratories Ltd.
Lancots Lane, St. Helens,
Merseyside WA9 3ES.
Tel: St. Helens (0744) 611553 Telex: 627844

TS&S

Laboratory Report

To: Terra Mining AB
Box 19030 Hoglandstorget 1
S-16141 BROMMA
SWEDEN

Date: 10-07-1986

Your Ref:

Attention of: - Mr. J. Bida

Our Ref: 86F001

CERTIFICATE OF ANALYSIS

Sample No.	GOLD g/tonne Au	
DBH 54 40.00-40.70	0.18	2,26
DBH 54 40.70-41.70	< 0.02	1,30
DBH 54 45.70-46.70	0.58	2,76
DBH 54 46.70-47.70	0.09	1,95
DBH 54 53.20-54.30	< 0.02	1,30
DBH 54 54.30-55.30	< 0.02	1,30
DBH 54 55.30-56.40	< 0.02	1,30
DBH 54 56.40-57.20	< 0.02	1,30
DBH 54 57.20-58.25	< 0.02	1,30
DBH 54 58.25-59.30	< 0.02	1,30
DBH 54 59.30-60.25	< 0.02	1,30
DBH 54 60.25-61.20	< 0.02	1,30
DBH 54 61.20-62.10	< 0.02	1,30
DBH 54 62.10-63.10	< 0.02	1,30
DBH 54 80.60-81.60	< 0.02	1,30
DBH 54 81.60-82.50	0.90	2,95
DBH 54 82.50-83.50	20.5	4,31
DBH 54 83.50-84.40	27.2	4,43
DBH 54 84.40-85.40	4.21	3,62
DBH 54 85.40-86.30	1.83	3,26
DBH 54 86.30-87.30	0.49	2,69
DBH 54 87.30-88.20	1.82	3,26
DBH 54 88.20-89.20	0.06	1,79
DBH 54 89.20-90.30	0.04	1,60
DBH 54 90.30-91.30	0.18	2,26
DBH 54 91.30-92.20	0.13	2,11
DBH 54 92.20-93.20	0.08	1,90



Laboratory Report

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 S-16141 BROMMA
 SWEDEN

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Our Ref: 86F001

CERTIFICATE OF ANALYSIS

Sample No.	GOLD g/tonne Au	ARSENIC % w/w As
DBH 55 4.00-4.80	0.02 1,30	
DBH 55 4.80-5.70	0.37 2,57	1.63
DBH 55 5.70-7.00	125. 5,10	0.20
DBH 55 7.00-8.10	0.28 2,45	0.09
DBH 55 8.00-8.50	2.76 3,44	
DBH 55 8.50-9.50	0.31 2,49	
DBH 55 9.50-10.40	9.10 3,96	
DBH 55 10.40-11.40	1.63 3,21	
DBH 55 11.40-12.30	0.51 2,71	
DBH 55 12.30-13.30	2.42 3,38	
DBH 55 13.30-14.20	0.07 1,85	
DBH 55 14.20-15.20	0.25 2,46	
DBH 55 15.20-16.20	0.24 2,38	
DBH 55 16.20-17.10	0.52 2,72	
DBH 55 17.10-18.10	0.06 1,78	
DBH 55 18.10-19.20	0.04 1,60	
DBH 55 19.20-20.20	2.32 3,37	
DBH 55 20.20-21.20	0.34 2,53	
DBH 55 21.20-22.30	1.25 3,10	
DBH 55 22.30-23.20	0.04 1,60	
DBH 55 23.20-24.20	0.13 2,11	
DBH 55 24.20-25.20	0.03 1,48	
DBH 55 25.20-26.20	0.08 1,90	
DBH 55 26.20-27.10	0.06 1,78	
DBH 55 27.10-28.20	0.04 1,60	
DBH 55 28.20-29.30	0.02 1,30	
DBH 55 29.30-30.30	< 0.02 1,30	
DBH 55 30.30-31.30	< 0.02 1,30	
DBH 55 31.30-32.30	0.07 1,85	
DBH 55 32.30-33.30	0.06 1,78	
DBH 55 33.30-34.30	0.12 2,68	
DBH 55 34.30-35.30	0.10 2,10	
DBH 55 35.30-36.30	0.04 1,60	
DBH 55 36.30-37.40	0.04 1,60	
DBH 55 37.40-38.40	< 0.02 1,30	
DBH 55 38.40-39.30	0.02 1,30	
DBH 55 39.30-40.30	0.03 1,42	



Laboratory Report

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 SWEDEN

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Our Ref: 86F001

CERTIFICATE OF ANALYSIS

Sample No.	GOLD g/tonne Au	ARSENIC % w/w As
DBH 55 4.00-4.80	0.02 1,30	
DBH 55 4.80-5.70	0.37 2,54	1.63
DBH 55 5.70-7.00	125. 5,10	0.20
DBH 55 7.00-8.10	0.28 2,45	0.09
DBH 55 8.00-8.50	2.76 3,44	
DBH 55 8.50-9.50	0.31 2,49	
DBH 55 9.50-10.40	9.10 3,96	
DBH 55 10.40-11.40	1.63 3,21	
DBH 55 11.40-12.30	0.51 2,71	
DBH 55 12.30-13.30	2.42 3,38	
DBH 55 13.30-14.20	0.07 1,85	
DBH 55 14.20-15.20	0.25 2,40	
DBH 55 15.20-16.20	0.24 2,38	
DBH 55 16.20-17.10	0.52 2,72	
DBH 55 17.10-18.10	0.06 1,78	
DBH 55 18.10-19.20	0.04 1,60	
DBH 55 19.20-20.20	2.32 3,37	
DBH 55 20.20-21.20	0.34 2,53	
DBH 55 21.20-22.30	1.25 3,10	
DBH 55 22.30-23.20	0.04 1,60	
DBH 55 23.20-24.20	0.13 2,11	
DBH 55 24.20-25.20	0.03 1,48	
DBH 55 25.20-26.20	0.08 1,90	
DBH 55 26.20-27.10	0.06 1,78	
DBH 55 27.10-28.20	0.04 1,60	
DBH 55 28.20-29.30	0.02 1,30	
DBH 55 29.30-30.30	< 0.02 1,30	
DBH 55 30.30-31.30	< 0.02 1,30	
DBH 55 31.30-32.30	0.07 1,85	
DBH 55 32.30-33.30	0.06 1,78	
DBH 55 33.30-34.30	0.12 2,08	
DBH 55 34.30-35.30	0.10 2,00	
DBH 55 35.30-36.30	0.04 1,60	
DBH 55 36.30-37.40	0.04 1,60	
DBH 55 37.40-38.40	< 0.02 1,30	
DBH 55 38.40-39.30	0.02 1,30	
DBH 55 39.30-40.30	0.03 1,42	

Caleb Brett



Caleb Brett Laboratories Ltd.
Lancots Lane, St. Helens,
Merseyside WA9 3ES.
Tel: St. Helens (0744) 611553 Telex: 627844

TS&S

Laboratory Report

To: Terra Mining AB
Box 19030 Hoglandstorget 1
S-16141 BROMMA
SWEDEN

Date: 10-07-1986

Your Ref:

Attention of: - Mr. J. Bida

Our Ref: 86F001

CERTIFICATE OF ANALYSIS

Sample No.	GOLD g/tonne Au	
DBH 56 0.00-3.00	0.11	2.04
DBH 56 3.00-4.00	0.02	1.30
DBH 56 4.00-4.90	0.04	1.60
DBH 56 4.90-5.80	0.04	1.60
DBH 56 5.80-6.90	0.04	1.60
DBH 56 6.90-7.70	0.04	1.60
DBH 56 7.70-8.60	2.92	3.42
DBH 56 8.60-9.60	0.27	2.43
DBH 56 9.60-10.60	< 0.02	1.30
DBH 56 10.60-11.60	< 0.02	1.30
DBH 56 11.60-12.60	< 0.02	1.30
DBH 56 12.60-13.70	< 0.02	1.30
DBH 56 13.70-14.60	< 0.02	1.30
DBH 56 14.60-15.60	0.10	2.00
DBH 56 15.60-16.50	< 0.02	1.30
DBH 56 16.50-17.50	0.22	2.34
DBH 56 17.50-19.40	0.05	1.70
DBH 56 19.40-21.00	1.33	3.12
DBH 56 21.00-23.00	0.26	2.41
DBH 56 23.00-24.85	0.06	1.78
DBH 56 24.85-26.85	0.02	1.30
DBH 56 26.85-28.50	< 0.02	1.30
DBH 56 28.50-30.70	0.03	1.48
DBH 56 30.70-32.50	< 0.02	1.30
DBH 56 32.50-34.40	< 0.02	1.30
DBH 56 34.40-36.30	0.08	1.90
DBH 56 36.30-38.00	0.64	2.81
DBH 56 38.00-40.00	1.21	3.08
DBH 56 40.00-42.00	0.30	2.48



CERTIFICATE OF ANALYSIS continued

86F001

Sample No.	GOLD g/tonne Au
DBH 56 42.00-44.00	0.13 2.11
DBH 56 44.00-45.80	0.12 2.08
DBH 56 45.80-47.70	1.23 3.09
DBH 56 47.70-49.70	0.05 1.70
DBH 56 49.70-51.40	< 0.02 1.30
DBH 56 51.40-53.40	< 0.02 1.30
DBH 56 53.40-55.40	< 0.02 1.30
DBH 56 55.40-57.40	< 0.02 1.30
DBH 56 57.40-59.40	< 0.02 1.30
DBH 56 59.40-61.50	0.03 1.48
DBH 56 61.50-63.40	< 0.02 1.30
DBH 56 63.40-65.60	< 0.02 1.30
DBH 56 65.60-67.60	< 0.02 1.30
DBH 56 67.60-68.60	< 0.02 1.30
DBH 56 68.60-69.60	< 0.02 1.30
DBH 56 69.60-70.50	< 0.02 1.30
DBH 56 70.50-71.50	< 0.02 1.30
DBH 56 71.50-72.50	< 0.02 1.30
DBH 56 72.50-73.50	0.03 1.48
DBH 56 73.50-74.50	< 0.02 1.30
DBH 56 74.50-75.50	< 0.02 1.30
DBH 56 75.50-76.50	< 0.02 1.30
DBH 56 76.50-77.50	0.02 1.30
DBH 56 77.50-78.40	0.02 1.30
DBH 56 78.40-79.40	< 0.02 1.30
DBH 56 79.40-80.40	< 0.02 1.30
DBH 56 80.40-81.40	< 0.02 1.30
DBH 56 81.40-82.30	< 0.02 1.30
DBH 56 82.30-83.30	0.06 1.78
DBH 56 83.30-84.40	0.24 2.38
DBH 56 84.40-85.50	0.02 1.30
DBH 56 85.50-86.50	0.13 2.11
DBH 56 86.50-87.50	< 0.02 1.30
DBH 56 87.50-88.40	< 0.02 1.30
DBH 56 88.40-89.30	< 0.02 1.30
DBH 56 89.30-90.40	< 0.02 1.30
DBH 56 90.40-91.40	0.15 2.18
DBH 56 91.40-92.40	< 0.02 1.30
DBH 56 92.40-93.40	0.05 1.70
DBH 56 93.40-94.70	< 0.02 1.30

Caleb Brett



Caleb Brett Laboratories Ltd.
Lancots Lane, St. Helens,
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Tel: St. Helens (0744) 611553 Telex: 627844

TS&S

Laboratory Report

To: Terra Mining AB
Box 19030 Hoglandstorget 1
S-16141 BROMMA
SWEDEN

Date: 01-05-1986

Your Ref:

86D024

Attention of: - Mr. Jan Bida

Our Ref:

CERTIFICATE OF ANALYSIS

Sample No.	ARSENIC %w/w As	GOLD g/tonne Au
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DDH 46A 0-1	< 0.01	5.03
DDH 46A 1-2	< 0.01	< 0.02
DDH 46A 2-3	< 0.01	< 0.02
DDH 46B 0-1	< 0.01	< 0.02
DDH 46B 1-2	< 0.01	< 0.02
DDH 46B 2-3	< 0.01	< 0.02
DDH 46B 3-4	< 0.01	< 0.02
DDH 46B 4-5	< 0.01	< 0.02
DDH 46B 5-6	< 0.01	< 0.02
DDH 46B 6-7	< 0.01	0.03
DDH 46B 7-8	< 0.01	0.06
DDH 46B 8-9	< 0.01	< 0.02
DDH 46B 9-10	< 0.01	< 0.02
DDH 46B 10-11	< 0.01	< 0.02
DDH 46B 11-12	< 0.01	< 0.02
DDH 46B 12-13	< 0.01	< 0.02
DDH 46B 13-13.60	< 0.01	< 0.02

For and on behalf of
CALEB BRETT LABORATORIES LIMITED


B. G. Forshaw
Chief Chemist

GEOCHEMICAL ICP ANALYSIS

.500 GRAM SAMPLE IS DIGESTED WITH JML 3-1-2 HCL-HNO₃-H₂O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN, FE, CA, P, CR, MG, BA, TI, B, AL, NA, K, V, SI, ZR, CE, SM, Y, NB AND TA. AU DETECTION LIMIT BY ICP IS 3 PPM.
- SAMPLE TYPE: CUTTINGS AU: ANALYSIS BY FA+AA FROM 30 GRAM SAMPLE.

DATE RECEIVED: JAN 21 1986

DATE REPORT MAILED:

Jan 27/86

ASSAYER: *D. Toye* DEAN TOYE, CERTIFIED B.C. ASSAYER.

TERRA SWEDE FILE # 86-0074

PAGE 1

SAMPLE#	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Au#	Total/s
	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	%	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	%	%	PPM	PPM	%	PPM	%	PPM	%	%	%	PPM	PPB	%
K-0001	1	3	6	14	.1	4	1	182	.27	213	5	ND	12	35	1	2	3	2	1.27	.07	18	1	.04	10	.01	2	.36	.05	.12	1	55	.001
K-0002	1	6	3	15	.1	13	1	226	.57	156	5	ND	9	54	1	2	2	7	1.90	.14	14	17	.30	10	.01	2	.60	.07	.15	2	340	.007
K-0003	1	10	2	51	.7	32	7	329	1.64	52	6	ND	11	121	1	2	3	36	2.45	.20	28	59	1.16	42	.11	2	1.32	.08	.52	2	9	.016
K-0004	1	4	2	15	.2	13	2	186	.57	151	5	ND	10	43	1	2	2	8	1.21	.08	16	9	.26	16	.02	2	.57	.07	.18	2	15	.008
K-0005	1	7	6	26	.2	21	2	231	.80	58	5	ND	12	57	1	2	2	13	1.40	.10	22	18	.43	22	.06	2	.71	.08	.28	1	150	.010
K-0006	1	4	2	36	1.1	42	21	351	4.03	30608	5	4	8	48	1	14	10	19	1.67	.08	13	48	.84	17	.03	2	.94	.04	.26	1	13600	1.895
K-0007	1	5	2	15	.2	11	2	253	.60	1151	5	ND	8	48	1	2	2	7	1.85	.05	15	10	.26	13	.02	3	.55	.05	.20	5	240	.023
K-0008	2	7	2	35	.9	20	4	287	1.25	2071	5	6	13	83	1	2	2	17	3.63	.11	28	18	.58	16	.03	2	.82	.03	.34	9	4150	.101
K-0009	1	3	7	7	.1	8	1	101	.46	1626	5	ND	7	21	1	2	2	3	.63	.04	7	4	.05	8	.01	2	.22	.05	.11	6	1900	.054
K-0010	2	11	2	36	.1	12	2	734	1.30	706	6	ND	6	137	1	5	6	9	8.01	.13	9	5	.21	11	.02	2	.66	.03	.18	40	2700	.137
K-0011	1	23	2	19	.5	17	5	270	.90	182	5	ND	4	765	1	2	6	11	23.66	.08	6	10	.32	15	.05	2	.63	.06	.13	8	105	.086
BSL-001K	3	9	2	9	.2	9	1	114	.35	949	8	ND	6	80	1	2	2	1	2.04	.07	8	8	.05	8	.01	3	.27	.07	.10	59	390	.037
BSL-004K	3	5	5	53	.5	12	3	86	2.05	17374	5	3	6	24	1	6	2	2	.84	.03	6	3	.06	9	.01	2	.22	.06	.11	21	2100	1.025
BSN-001K	2	25	7	34	.5	17	5	396	1.58	2485	9	ND	12	93	1	2	2	21	4.22	.09	25	25	.64	40	.04	2	.97	.04	.31	4	95	.108
STD C/FA-AU	19	60	38	140	7.0	74	28	1192	3.98	41	15	9	33	45	18	17	21	59	.48	.16	37	52	.88	173	.07	39	1.73	.06	.11	14	50	-

✓ Regular Assay required for correct result.

S for
stall
NEBDA

Borker
Bolident
Holt
Bolident

IM

CALEB BRETT LABORATORIES LIMITED

=====

Scientific and Technical Services
Lancots Lane,
St. Helens,
Merseyside.
WA9 3ES

St. Helens 611553

Telex : 627844 CALBRE G

Date of reporting 06/12/85

Our reference Number 85L009

Your reference Number -Letter 20/11/1985

Your consignment Number ---

ASSAY Results for gold, in gm/tonne Au, for 5 samples

Authorised for release by :- *Me*

Sample identity gm/tonne Au 85L009

N001	0.73
N002	< 0.05
85N005 K	< 0.05
85N006 K	< 0.05
85N007 K	< 0.05

12/12/85
12/12/85
12/12/85

ACME ANALYTICAL LABORATORIES LTD.

852 E. HASTINGS ST. VANCOUVER B.C. V6A 1R6

PHONE 253-3158

DATA LINE 251-1011

GEOCHEMICAL/ASSAY CERTIFICATE

.500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN.FE.CA.P.CR.MG.BA.TI.D.AL.NA.K.W.SI.ZR.CE.SN.Y.NB AND TA. AU DETECTION LIMIT BY ICP IS 3 PPM.
SAMPLE TYPE: DRILL PULP ANALYSIS BY AA FROM 30 GRAM SAMPLE. SOIL/SILT

DATE RECEIVED: MARCH 27 1986

DATE REPORT MAILED:

APR 1/86

ASSAYER: D. J. DEAN TOYE. CERTIFIED B.C. ASSAYER.

TERRA SWEDE FILE # 86-0390

PAGE 1

SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe I	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca I	P I	La PPM	Cr PPM	Mg I	Ba PPM	Ti I	B PPM	Al I	Na I	K I	W PPM	Au*** PPM	S I
DBH 54 15-18	1	71	2	64	.1	13	8	1452	3.59	163	5	ND	4	39	1	2	2	23	5.40	.03	9	14	.15	5	.11	2	1.30	.02	.05	7	4	.84
DBH 54 18-21	1	75	7	52	.1	7	9	575	2.38	437	8	ND	2	33	1	2	2	6	2.33	.05	7	5	.09	5	.03	4	.72	.06	.09	8	16	.84
DBH 54 21-24	2	30	6	81	.1	8	4	268	1.20	1092	5	ND	5	22	1	2	2	3	1.11	.02	9	8	.10	16	.02	3	.50	.06	.15	15	190	.20
DBH 54 24-27	1	14	4	48	.1	5	2	152	.89	713	5	ND	6	18	1	2	2	6	.68	.03	10	6	.20	10	.01	4	.55	.07	.16	8	23	.05
DBH 54 27-30	2	17	4	58	.1	3	2	157	.68	294	6	ND	10	25	1	2	2	2	.88	.03	16	5	.07	10	.01	4	.41	.07	.15	12	3	.03
DBH 54 30-33	2	16	3	60	.1	4	2	138	.65	243	6	ND	9	23	1	2	2	2	.79	.03	15	5	.06	9	.01	3	.45	.08	.16	15	8	.03
DBH 54 33-36	2	15	5	65	.1	5	2	95	.57	173	6	ND	6	14	1	2	2	1	.54	.02	10	5	.06	7	.01	2	.38	.07	.14	12	24	.01
DBH 54 36-39	2	18	7	74	.1	7	2	96	.61	266	6	ND	6	14	1	2	2	1	.45	.02	10	6	.06	6	.01	2	.34	.07	.13	18	180	.02
KBH 101 2-3	1	1	9	34	.1	2	2	75	.46	2419	5	ND	8	21	1	2	2	1	.44	.02	9	1	.05	8	.01	2	.16	.04	.08	14	450	.08
KBH 101 3-4	2	5	19	37	.7	3	4	111	1.58	14429	6	8	9	26	1	6	2	1	.62	.02	9	1	.07	8	.01	3	.18	.04	.07	26	3000	.06
KBH 101 4-5	3	6	19	19	.6	3	5	338	4.61	46056	12	5	6	52	1	13	2	1	1.64	.02	8	3	.06	7	.01	3	.15	.04	.07	160	5000	2.36
KBH 101 5-6	2	5	9	22	.1	1	1	155	.70	3876	7	ND	9	26	1	2	2	2	.80	.02	11	3	.07	8	.01	4	.21	.05	.08	22	2100	.12
KBH 101 6-7	2	9	13	56	.2	5	3	192	1.19	8917	8	2	9	31	1	3	2	2	1.01	.02	11	5	.07	8	.01	2	.22	.05	.09	45	1800	.38
KBH 101 7-8	2	5	8	24	.2	5	2	133	.72	3914	5	ND	9	29	1	2	2	1	.81	.02	13	5	.06	8	.01	2	.25	.06	.11	23	730	.15
KBH 101 8-9	2	5	4	15	.1	4	1	96	.55	2076	5	ND	9	21	1	2	2	1	.57	.02	13	4	.05	6	.01	2	.21	.05	.09	25	350	.06
KBH 101 9-10	2	3	8	10	.1	3	1	69	.67	4133	5	ND	7	17	1	2	3	1	.45	.02	10	6	.06	8	.01	8	.20	.05	.08	7	1900	.15
KBH 101 10-11	4	12	27	18	.4	3	8	82	4.04	38896	10	2	6	15	1	15	2	4	.38	.02	8	3	.06	8	.01	8	.20	.05	.08	7	1900	.15
KBH 101 11-12	2	5	12	13	.1	2	2	63	1.14	9472	5	ND	6	12	1	5	2	1	.42	.01	7	2	.05	8	.01	2	.19	.05	.08	1	1400	2.13
KBH 101 12-13	1	5	7	11	.1	1	1	73	.47	1781	7	ND	8	14	1	2	2	2	.49	.02	10	3	.05	5	.01	3	.22	.05	.10	5	140	.07
KBH 101 13-14	4	5	8	15	.1	4	6	68	.80	5606	13	ND	9	11	1	2	2	1	.38	.02	10	2	.05	7	.01	3	.23	.05	.11	23	390	.25
KBH 101 14-15	2	5	4	18	.1	2	3	64	.59	2838	5	ND	8	9	1	2	2	1	.39	.02	12	3	.06	5	.01	2	.19	.04	.07	6	180	.11
KBH 101 15-16	2	5	7	20	.1	2	3	74	.62	2603	8	ND	10	11	1	2	2	1	.42	.02	14	5	.05	6	.01	2	.25	.06	.11	18	130	.09
KBH 101 16-17	2	14	8	49	.1	9	4	214	1.26	921	9	ND	9	33	1	2	5	15	.66	.07	29	7	.43	73	.11	3	.70	.06	.36	9	42	.15
KBH 101 17-18	2	10	11	26	.1	4	2	106	1.06	4701	5	ND	9	15	1	2	3	3	.40	.03	17	4	.15	17	.03	4	.39	.06	.17	5	210	.22
KBH 101 18-19	1	5	8	34	.1	1	1	102	.84	1199	7	ND	5	8	1	2	3	2	.29	.03	9	2	.12	9	.03	2	.40	.04	.15	4	80	.04
KBH 101 19-20	3	7	6	34	.1	3	2	101	.73	974	8	ND	11	11	1	2	2	2	.33	.02	17	3	.09	10	.02	2	.39	.05	.16	8	60	.05
KBH 102 1-2	3	5	10	30	.2	6	3	126	.68	3193	5	ND	9	26	1	2	2	2	.66	.02	11	5	.07	10	.01	2	.24	.05	.10	19	2100	.14
KBH 102 2-3	2	5	14	30	1.3	4	3	111	.75	4439	6	ND	8	23	1	3	3	1	.58	.02	10	3	.07	8	.01	2	.22	.05	.09	19	670	.20
KBH 102 3-4	3	5	8	34	.2	9	3	130	.80	3902	5	ND	9	27	1	2	2	1	.64	.02	12	6	.07	10	.01	2	.25	.06	.10	22	1400	.17
KBH 102 4-5	1	4	8	10	.1	3	1	111	.56	224	6	ND	12	24	1	2	2	1	.70	.02	18	3	.07	8	.01	3	.21	.05	.09	34	60	.01
KBH 102 5-6	1	5	5	14	.1	2	1	99	.39	265	7	ND	11	17	1	2	2	1	.56	.02	14	3	.06	8	.01	2	.24	.05	.09	18	70	.01
KBH 102 6-7	1	2	4	9	.3	3	1	83	.35	768	7	ND	8	20	1	2	2	1	.38	.02	11	3	.05	8	.01	2	.19	.05	.09	25	3000	.03
KBH 102 7-8	2	1	5	6	.3	3	1	61	.27	323	7	ND	8	14	1	2	2	1	.38	.01	10	3	.04	6	.01	2	.19	.05	.09	6	80	.01
KBH 102 8-9	1	4	6	8	.2	2	1	59	.27	314	8	ND	9	13	1	2	2	1	.40	.01	12	4	.03	5	.01	2	.18	.05	.10	5	160	.02
KBH 102 9-10	2	3	5	11	.1	3	1	84	.33	360	12	ND	8	20	1	2	2	1	.61	.02	10	2	.04	8	.01	2	.23	.06	.10	8	1900	.03
KBH 102 10-11	3	4	5	12	.1	4	1	69	.41	1319	9	ND	8	17	1	2	2	1	.47	.02	10	4	.04	8	.01	2	.20	.06	.10	11	500	.06
STD C/F-A-AU	22	59	40	137	7.0	71	30	1193	3.97	41	15	8	33	48	18	17	19	59	.48	.11	37	60	.90	178	.08	36	1.71	.06	.11	12	51	-

Analyzed for correct result

SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe %	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca %	P %	La PPM	Cr PPM	Mg %	Ba PPM	Ti %	B PPM	Al %	Na %	K %	N PPM	Au** PPB	S %
KBH 102 11-12	3	5	6	9	.2	11	10	61	1.83	17026	5	ND	6	12	1	5	2	4	.30	.02	7	7	.04	8	.01	3	.17	.04	.09	7	540	.76
KBH 102 12-13	2	5	6	19	.1	8	3	94	.86	5194	6	ND	9	16	1	2	2	3	.47	.02	12	5	.06	8	.01	3	.26	.05	.11	14	330	.23
KBH 102 13-14	2	10	5	28	.1	4	3	118	.66	1142	6	ND	12	19	1	2	2	3	.57	.03	20	6	.11	11	.01	6	.41	.06	.15	8	90	.05
KBH 102 14-15	2	9	5	16	.1	6	3	83	.56	933	5	ND	8	13	1	2	2	2	.47	.03	12	9	.06	8	.01	3	.28	.05	.12	7	390	.04
KBH 102 15-16	3	5	5	27	.1	9	2	117	.69	1240	11	ND	13	17	1	2	2	2	.53	.03	19	11	.10	11	.01	5	.38	.07	.15	13	170	.05
KBH 102 16-17	2	5	4	18	.1	4	1	101	.45	349	8	ND	13	16	1	2	2	1	.57	.02	17	6	.06	8	.01	6	.29	.06	.12	7	100	.02
KBH 102 17-18	2	5	4	22	.1	1	1	101	.48	221	5	ND	11	16	1	2	2	1	.51	.02	16	6	.06	8	.01	2	.32	.06	.12	6	42	.02
KBH 102 18-19	1	5	3	24	.1	3	1	101	.54	193	6	ND	11	10	1	2	2	1	.40	.02	16	5	.06	8	.02	6	.31	.05	.13	5	28	.02
KBH 102 19-20	1	5	6	20	.1	2	1	93	.50	106	8	ND	11	10	1	2	2	1	.41	.02	16	4	.06	7	.01	5	.30	.06	.11	6	80	.02
KBH 103 2-3	1	16	4	93	.1	5	2	1968	1.82	173	5	ND	8	86	1	2	2	15	7.35	.06	14	6	.16	10	.06	8	1.76	.04	.12	11	17	.06
KBH 103 3-4	1	63	15	97	.2	4	6	3353	4.59	80	6	ND	3	124	1	2	2	35	11.37	.02	9	6	.24	8	.07	5	1.75	.02	.15	12	6	.43
KBH 103 4-5	2	45	16	66	.3	13	8	2128	3.54	147	13	ND	2	284	1	2	2	34	12.94	.06	9	20	.55	11	.10	2	1.49	.02	.31	50	780	.40
KBH 103 5-6	3	20	16	66	.5	47	13	982	4.59	22258	5	2	9	109	1	5	17	51	5.35	.08	23	86	1.13	42	.07	6	1.50	.03	.45	25	2300	1.36
KBH 103 6-7	2	38	4	94	.3	20	16	595	4.03	5288	5	ND	18	164	1	2	14	58	2.90	.19	84	22	1.32	77	.22	4	1.52	.07	.72	2	350	1.03
KBH 103 7-8	2	18	6	126	.4	16	14	680	4.03	1371	5	ND	22	199	1	2	2	72	3.01	.28	107	13	1.67	109	.30	3	1.71	.10	.91	1	80	.84
KBH 103 8-9	2	9	53	134	.5	23	16	688	4.34	3672	5	ND	20	267	1	2	2	78	3.44	.33	97	12	2.07	116	.25	5	2.00	.09	.98	1	120	.61
KBH 103 9-10	1	26	34	148	.5	14	12	601	3.65	3071	5	ND	20	186	1	2	2	62	2.95	.25	107	10	1.52	75	.23	2	1.72	.08	.61	1	70	.44
KBH 103 10-11	2	36	58	129	.6	17	15	609	3.86	5854	5	ND	18	148	1	2	7	50	3.00	.22	95	14	1.39	64	.18	6	1.66	.06	.75	1	80	.89
KBH 103 11-12	2	26	30	153	.5	12	10	501	2.62	4155	5	ND	16	100	1	2	5	32	2.40	.14	60	11	.81	45	.14	5	1.19	.07	.50	8	100	.45
KBH 103 12-13	2	11	9	54	.2	10	3	202	1.23	3218	5	ND	10	37	1	2	2	9	.91	.05	23	12	.24	19	.05	2	.53	.06	.22	28	130	.21
KBH 103 13-14	2	9	13	55	.1	10	3	156	.86	1876	7	ND	13	29	1	2	2	5	.76	.04	21	13	.16	12	.02	8	.40	.06	.16	19	150	.11
BSN 012K	2	14	5	63	.1	87	14	469	2.87	1547	5	ND	11	99	1	2	2	64	3.26	.13	36	187	2.47	88	.22	3	2.21	.06	1.20	1	80	.10
BSN 013K	2	15	2	61	.1	113	15	445	2.77	409	5	ND	12	108	1	2	4	57	3.09	.12	36	170	2.57	99	.20	5	2.15	.05	1.03	1	8	.04
BSN 014K	2	10	2	66	.1	89	13	462	2.51	306	5	ND	11	89	1	2	2	53	2.77	.13	32	172	2.20	84	.20	2	1.92	.05	.96	1	13	.05
BSN 015K	2	9	4	54	.1	83	13	423	2.53	503	5	ND	9	109	1	2	2	62	3.19	.15	38	153	2.37	97	.22	2	1.96	.06	1.21	1	11	.06
BSN 016K	2	15	2	12	.1	15	3	194	.60	1301	5	ND	8	60	1	2	3	8	1.98	.11	16	17	.25	17	.02	6	.64	.06	.23	8	34	.08
BSN 017K	2	12	6	56	.1	56	11	459	2.37	250	5	ND	11	128	1	2	2	53	3.16	.14	33	134	1.84	48	.17	5	1.71	.06	.82	1	7	.05
BSN 018K	2	12	2	38	.1	52	8	305	1.61	974	5	ND	8	79	1	2	5	33	2.30	.12	25	95	1.21	61	.10	4	1.30	.06	.60	6	16	.07
BSN 019K	3	11	8	19	.2	22	4	214	.89	1457	5	ND	8	61	1	2	4	12	1.74	.07	18	28	.43	23	.04	4	.79	.06	.28	11	35	.07
BSN 020K	1	11	3	13	.1	16	3	151	.58	853	5	ND	7	56	1	2	2	8	1.26	.04	16	20	.31	19	.04	7	.57	.06	.24	6	110	.04
BSN 021K	2	11	14	43	.4	25	9	340	2.09	1983	5	ND	12	76	1	2	2	31	3.03	.07	28	41	1.10	42	.07	4	1.45	.04	.45	7	230	.10
BSN 022K	2	12	9	45	.2	24	8	370	2.05	763	5	ND	13	88	1	2	2	35	3.48	.08	30	38	1.07	56	.10	8	1.52	.05	.52	6	60	.05
ROT 8601	3	22	14	88	.1	16	6	367	1.76	3226	5	ND	12	56	1	2	2	15	1.64	.07	28	13	.36	24	.07	7	.73	.07	.27	25	160	.37
STD C/FA-AU	20	61	39	139	7.0	74	30	1217	3.99	39	16	8	34	49	19	17	20	61	.51	.11	37	61	.85	165	.08	38	1.72	.06	.11	13	50	-

Fakt. nr.

SEK 7.610,36

Caleb Brett



Caleb Brett Laboratories Ltd.
Lancots Lane, St. Helens,
Merseyside WA9 3ES.
Tel: St. Helens (0744) 611553 Telex: 627844

TS&S

Laboratory Report

To: Terra Mining AB,
Box 19030
S-16119 BROMMA
Sweden

Date: 04-04-1986

Your Ref:

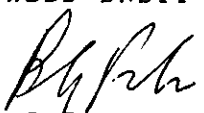
Our Ref: 86C047

Attention of: - Mr. Jan Bida

CERTIFICATE OF ANALYSIS

Sample No.	GOLD g/tonne Au
KBH101 2-3	0.43
KBH101 3-4	2.32
KBH101 4-5	4.27
KBH101 5-6	1.53
KBH101 6-7	1.40
KBH101 7-8	0.63
KBH101 8-9	0.59
KBH101 9-10	0.77
KBH101 10-11	1.99
KBH101 11-12	1.00
KBH101 12-13	0.22
KBH101 13-14	0.32
KBH101 14-15	0.18
DDH41 60.90-61.90	0.03
DDH41 61.90-62.90	0.03
DDH41 63.90-64.90	0.04
65N009C	0.10

For and on behalf of
CALEB BRETT LABORATORIES LIMITED


B. G. Forshaw
Chief Chemist

GENERAL TERMS AND CONDITIONS OF BUSINESS OF CALEB BRETT LABORATORIES LIMITED

1. DEFINITION

In these general terms and conditions where the context so admits:-

1.1 "Caleb Brett" means Caleb Brett Laboratories Limited, a Company incorporated under the Companies Acts and having its Registered Office at International House, Mitre Square, Twenty Six to Twenty Eight Creechchurch Lane, London, EC3A 5ED.

1.2 "customer" means the person (as defined) with whom Caleb Brett contracts for the provision of services, employees, materials or equipment.

1.3 "person" means any individual, partnership, company, corporation, body or organisation.

2. INTERPRETATION

In these general terms and conditions where the context so admits:-

2.1 Words importing the masculine include the feminine and neuter and words importing the neuter include the masculine and feminine.

2.2 Words importing the singular include the plural and vice versa.

3. PRICES

3.1 Caleb Brett may provide services, employees, materials and equipment to the customer. The customer will pay Caleb Brett for services, employees, materials and equipment supplied according to the rate of fees, outlays and other charges in Caleb Brett's list of prices and charges in use at the time a contract is entered into with the customer with the addition of Value Added Tax or any other taxes imposed on that supply.

3.2 If the performance of a contract with a customer is not completed by twelve months from the time the contract is entered into, Caleb Brett may propose a variation of the rate of fees, outlays and other charges to take effect from and after the expiry of the said twelve months. If Caleb Brett and the customer fail to reach agreement on any such proposal within one month from the making of the proposal, the contract shall terminate.

3.3 If Caleb Brett provides services, employees, materials or equipment, or incurs outlays for which no provision is made in such list of prices and charges the customer shall pay a reasonable price for these items.

3.4 The customer shall pay Caleb Brett undisputed amounts in invoices and notify Caleb Brett of any objections to invoices within thirty days after the receipt by the customer of each invoice. Interest at the rate of two per cent per annum above the minimum lending rate of the National Westminster Bank PLC at the time shall be payable by the customer on undisputed amounts remaining unpaid after thirty days from the first receipt by the customer of an invoice claiming that amount and on unpaid disputed amounts after thirty days from the settlement on the dispute. Interest shall not run before the expiry of the said periods of thirty days.

4. OPERATING CONDITIONS

4.1 When in order to perform its obligations under a contract it is necessary for Caleb Brett's employees, agents, representatives, materials or equipment to go to an offshore base the customer shall, at its expense, transport such employees, agents, representatives, equipment or materials between the local air base (or such other place if specially agreed) ("the home base") and the offshore base. The customer shall be responsible for the supervision, safety, protection and well-being of such employees, agents, representatives, and the supervision, safety and protection of such materials and equipment whilst in transit between the home base and the offshore base or between two or more offshore bases and whilst situated on offshore bases and the customer shall indemnify Caleb Brett and its employees, agents and representatives against any claim, demand, loss, expense or liability (including but not limited to the cost of litigation) in respect of a breach of its obligations arising from such responsibility under this Clause by the customer irrespective of any contributory negligence on the part of the person indemnified.

4.2 While employees, agents or representatives of Caleb Brett are on an offshore base or are being transported to or from it by the customer the customer shall, at its expense, provide food and accommodation for such employees, agents or representatives to a standard not less than that which the customer provides, or would provide, for its employees if they were carrying out similar work.

4.3 While on an offshore base the employees, agents or representatives of Caleb Brett shall not be required to work for more than twelve hours in any day unless in exceptional circumstances. This requirement is made in the interest of the accuracy of the work to be performed.

4.4 In the event that the customer shall allow Caleb Brett the use of an employee of the customer that employee shall remain the employee of the customer and shall not become pro hac vice the employee of Caleb Brett whether for the purposes of contractual delictual liability or otherwise.

4.5 Where reasonably practicable the customer shall provide, at its expense, telephone and telex facilities at offshore bases for use by the employees, agents or representatives of Caleb Brett for the purpose of communicating with the offices of Caleb Brett.

4.6 For the purpose of these general terms and conditions "offshore base" includes any offshore installation, ship, hovercraft or place outside the mainland of the United Kingdom including, without prejudice to that generality, bases on the Scottish Islands.

5. COMPLIANCE WITH SAFETY RULES

The customer shall comply with all relevant legislation and safety standards affecting the performance of a contract. In the event of a breach of this clause Caleb Brett shall be entitled to remove its employees, agents or representatives or any materials or equipment from any area affected by the breach until the breach is remedied. The customer shall indemnify Caleb Brett against any claim, demand, loss expense or liability (including but not limited to the cost of litigation) arising by reason of such breach.

6. LIMITATION OF LIABILITY

6.1 The liability of Caleb Brett and its employees, agents or representatives for claims, other than claims for death or personal injury arising out of contractual, quasi contractual, delictual, quasi delictual or statutory liability of liability arising in any other manner whatever shall be limited in total for any incident to the sum of Fifty Thousand Pounds (£50,000) Sterling.

6.2 This limitation of liability applies whether or not the claim arises from intentional or negligent acts of Caleb Brett, its employees, agents or representatives.

7. INDEMNITY

7.1 The customer shall indemnify, hold harmless and defend Caleb Brett and its employees, agents and representatives from and against any claim, demand, loss, expense of liability (including but not limited to the cost of litigation) in connection with any contract (connection being direct or indirect):-

7.1.1 arising by reason of claims by Governmental authorities or others of any actual or asserted failure of the customer to comply with any law, ordinance, regulation, rule or order of any Governmental or Judicial Body;

7.1.2 arising by reason of actual or asserted infringement or improper appropriation or use by the customer of trade secrets, proprietary information, know-how, copyright rights or patented or unpatented inventions or for actual or alleged unauthorised imitation of the work of others, arising out of the use of methods, processes, designs, information or other things originating with the customer, its employees, agents, representatives, vendors or sub-contractors, and furnished or communicated to Caleb Brett or its employees, agents or representatives by the customer or used by Caleb Brett or its employees, agents or representatives in connection with the performance of the contract;

7.1.3 being a claim or demand from, or liability to, or loss or expense by reason of a liability to any person other than the customer ("any person" in this context for the avoidance of doubt includes but is not limited to employees of Caleb Brett and the customer) in respect of personal injury or death, damage to or destruction or loss of property belonging to any person or in any other respect or manner whatever provided neither Caleb Brett, its employees, agents or representatives have been negligent.

7.2 The indemnity in paragraph 7.1.3 shall only apply where the circumstances preclude the application of particular indemnities set out elsewhere in these general terms and conditions.

8. EXTENSION OF BENEFIT

8.1 In so far as paragraphs 4.1, 5, 6, 7 and 11 or any other part of these terms and conditions purport to exclude liability of, or give the benefit of indemnification to anyone other than Caleb Brett, Caleb Brett is or shall be deemed to be acting as agent or Trustee on their behalf for their benefit.

8.2 The invalidity or unenforceability of any particular exclusion or restriction of liability provision or any indemnity provision of these general terms and conditions or part thereof shall not affect the validity or enforceability of the remaining provisions or any part thereof.

9. UNUSED SAMPLE PORTIONS

Unused portions of analysis samples are retained by Caleb Brett for one month after completion of the analysis and then disposed of (except those of a dangerous nature where disposal is immediate). The customer may arrange to have such portions retained for a longer period for which facility Caleb Brett will require a storage charge.

10. DURATION OF HIRE CONTRACTS

The hire period for equipment rental commences on the day on which the hired equipment is made available at the relevant Caleb Brett premises in a suitably packaged state for despatch, and terminates on the day of return to the same premises or such other agreed premises.

11. OFF PREMISES SERVICES AND INSTALLATION/COMMISSIONING OF EQUIPMENT

Should the services of Caleb Brett employees, agents or representatives be required at a location other than Caleb Brett's premises ("the foreign location") and/or to install/commission equipment on the customer's site this will be charged at Caleb Brett's normal rates plus travel and living expenses where appropriate. The customer shall be responsible for the supervision, safety and well-being of such employees, agents or representatives whilst they are at the foreign location or on the customer's site and the customer shall indemnify Caleb Brett and its respective employees, agents or representatives against any claim, demand, loss, expense or liability (including but not limited to the cost of litigation) in respect of a breach of its obligations arising from such responsibility under this Clause by the customer irrespective of any contributory negligence.

12. FREIGHT CHARGES

All carriage charges for hired equipment to and from such Caleb Brett premises will be charged to the hirer at cost.

13. INSURANCE

Insurance for the full value of hired equipment to cover loss or damage during the period of hire and while hired equipment is in transit is the responsibility of the hirer. Such insurance should also provide for the loss of rental payment in the event of hired equipment being damaged, destroyed or lost. By prior agreement Caleb Brett can provide suitable insurance cover to be charged "at cost" to the customer.

14. LOSS OR DAMAGE

14.1 Loss - Should hired equipment or any part thereof be lost during the period of rental or whilst in transit to and from site location or locations, the customer shall pay the full replacement cost of hired equipment whether or not it is replaced and all loss of profits to Caleb Brett.

14.2 Damage - Should hired equipment be damaged whilst in use or in transit as above the customer shall pay the cost of repairs necessary to restore it to its original condition at the beginning of the lease period or for the full replacement cost (even if not replaced) whichever is the lower and all loss of profits to Caleb Brett.

15. SERVICE AND REPAIR

15.1 The customer shall bear the cost of all repairs and maintenance to hired equipment. Such repair and maintenance shall be carried out by Caleb Brett. With the consent of Caleb Brett the customer may carry out such repairs or maintenance or arrange for these to be done by others approved by Caleb Brett. Should hired equipment need emergency repair or maintenance while it is outside the premises of Caleb Brett, the Customer may, without the consent of Caleb Brett, arrange for repairs or maintenance to be carried out up to a cost of Fifty Pounds Sterling for each emergency and shall inform Caleb Brett of the instructions for emergency repair or maintenance as soon as reasonably practicable.

15.2 The customer shall allow Caleb Brett reasonable facilities to enable Caleb Brett to carry out such repair and maintenance. On being given reasonable notice the customer shall allow Caleb Brett to inspect the hired equipment.

16. ALTERATION

Any alteration of these general terms and conditions shall not be binding unless it is in writing and signed on behalf of all the parties to the contract.

17. TERMINATION

Caleb Brett may by notice to the customer terminate any contract if the customer is in material breach of the provisions of that contract or if the customer is declared bankrupt or notout bankrupt or goes into liquidation (other than a members voluntary liquidation for reconstruction or amalgamation purposes) or has a receiver appointed in respect of any of its property or undertaking or generally makes any arrangement or composition with its creditors.

18. FORCE MAJEURE

Neither Caleb Brett nor the customer shall be liable for failure to fulfil any contract if fulfilment is delayed, hindered or prevented by strikes, walk-outs or labour disputes of any kind, acts of God, war, riot, civil disturbances or acts of terrorism. If such delay, hindrance or prevention lasts for more than a continuous period of thirty days, either party may by notice to the other party terminate the contract.

19. NON-ASSIGNMENT

The customer shall not be entitled to assign a contract or any part of it or the benefit under it without the consent of Caleb Brett.

20. SECRECY

20.1 All information (other than information generally available to the public) on the properties or activities of the customer shall be held by Caleb Brett, its employees, agents and representatives in strictest confidence.

20.2 All information (other than information generally available to the public) on the properties or activities of Caleb Brett shall be held by the customer, its employees, agents and representatives in strictest confidence.

20.3 The obligations under this clause shall survive the completion or termination of a contract howsoever caused, and, without prejudice to that generality, it caused by or arising from frustration, fundamental breach or material breach.

21. APPLICATION OF CONDITIONS

21.1 These general terms and conditions shall apply to all contracts between Caleb Brett and the customer or any of the customer's affiliates unless and until these general terms and conditions are altered or excluded by express provision in writing signed on behalf of both parties. These general terms and conditions shall supersede all terms and conditions of contract of the customer and unless sooner accepted shall be deemed to be accepted on provision of services, employees, materials or equipment under the contract.

21.2 "Affiliate" for the purpose of this Clause means any holding, subsidiary or associated company of the customer. "Holding and subsidiary company" shall have the meanings set out in Section 154 of the Companies Act 1948 and "associated company" means a company while not being a subsidiary or holding company within the aforesaid meanings is directly connected through a chain of holding and/or subsidiary companies.

22. CHOICE OF LAW

Any contract shall be construed under and governed by the laws of England.

Caleb Brett



Caleb Brett Laboratories Ltd.
Lancots Lane, St. Helens,
Merseyside WA9 3ES.
Tel: St. Helens (0744) 611553 Telex: 627844

TS&S

Laboratory Report

To:
Terra Mining AB
Box 19030
S-16119 BROMMA
Sweden

Date: 18.04.1986

Your Ref:

86C047

Attention of: - Mr. Jan Bida

Our Ref:

CERTIFICATE OF ANALYSIS

Sample No.	ARSENIC %w/w AS	LITHIUM %w/w LI
KBH101 2-3	0.27	< 0.002
KBH101 3-4	1.50	< 0.002
KBH101 4-5	4.80	< 0.002
KBH101 5-6	0.86	< 0.002
KBH101 6-7	0.80	< 0.002
KBH101 7-8	0.44	< 0.002
KBH101 8-9	0.33	< 0.002
KBH101 9-10	0.53	< 0.002
KBH101 10-11	3.72	< 0.002
KBH101 11-12	1.18	< 0.002
KBH101 12-13	0.30	< 0.002
KBH101 13-14	0.56	< 0.002
KBH101 14-15	0.33	< 0.002
DDH41 60.90-61.90	0.01	0.003
DDH41 61.90-62.90	0.01	0.003
DDH41 63.90-64.90	0.03	0.003
85N009C	0.74	< 0.002

For and on behalf of
CALEB BRETT LABORATORIES LIMITED

B. G. Forshaw
Chief Chemist

GENERAL TERMS AND CONDITIONS OF BUSINESS OF CALEB BRETT LABORATORIES LIMITED

1. DEFINITION

In these general terms and conditions where the context so admits:-

1.1 "Caleb Brett" means Caleb Brett Laboratories Limited, a Company incorporated under the Companies Acts and having its Registered Office at International House, Mitre Square, Twenty Six to Twenty Eight Creechchurch Lane, London, EC3A 5ED.

1.2 "customer" means the person (as defined) with whom Caleb Brett contracts for the provision of services, employees, materials or equipment.

1.3 "person" means any individual, partnership, company, corporation, body or organisation.

2. INTERPRETATION

In these general terms and conditions where the context so admits:-

2.1 Words importing the masculine include the feminine and neuter and words importing the neuter include the masculine and feminine.

2.2 Words importing the singular include the plural and vice versa.

3. PRICE

3.1 Caleb Brett may provide services, employees, materials and equipment to the customer. The customer will pay Caleb Brett for services, employees, materials and equipment supplied according to the rate of fees, outlays and other charges in Caleb Brett's list of prices and charges in use at the time a contract is entered into with the customer with the addition of Value Added Tax or any other taxes imposed on that supply.

3.2 If the performance of a contract with a customer is not completed by twelve months from the time the contract is entered into, Caleb Brett may propose a variation of the rate of fees, outlays and other charges to take effect from and after the expiry of the said twelve months. If Caleb Brett and the customer fail to reach agreement on any such proposal within one month from the making of the proposal, the contract shall terminate.

3.3 If Caleb Brett provides services, employees, materials or equipment, or incurs outlays for which no provision is made in such list of prices and charges the customer shall pay a reasonable price for these items.

3.4 The customer shall pay Caleb Brett undisputed amounts in invoices and notify Caleb Brett of any objections to invoices within thirty days after the receipt by the customer of each invoice. Interest at the rate of two per cent per annum above the minimum lending rate of the National Westminster Bank PLC at the time shall be payable by the customer on undisputed amounts remaining unpaid after thirty days from the first receipt by the customer of an invoice claiming that amount and on unpaid disputed amounts after thirty days from the settlement on the dispute. Interest shall not run before the expiry of the said period of thirty days.

4. OPERATING CONDITIONS

4.1 When in order to perform its obligations under a contract it is necessary for Caleb Brett's employees, agents, representatives, materials or equipment to go to an offshore base the customer shall, at its expense, transport such employees, agents, representatives, equipment or materials between the local air base (or such other place (if specially agreed) ("the home base") and the offshore base. The customer shall be responsible for the supervision, safety, protection and well-being of such employees, agents, representatives, and the supervision, safety and protection of such materials and equipment whilst in transit between the home base and the offshore base or between two or more offshore bases and whilst situated on offshore bases and the customer shall indemnify Caleb Brett and its employees, agents and representatives against any claim, demand, loss, expense or liability (including but not limited to the cost of litigation) in respect of a breach of its obligations arising from such responsibility under this Clause by the customer irrespective of any contributory negligence on the part of the person indemnified.

4.2 While employees, agents or representatives of Caleb Brett are on an offshore base or are being transported to or from it by the customer the customer shall, at its expense, provide food and accommodation for such employees, agents or representatives to a standard not less than that which the customer provides, or would provide, for its employees if they were carrying out similar work.

4.3 While on an offshore base the employees, agents or representatives of Caleb Brett shall not be required to work for more than twelve hours in any day unless in exceptional circumstances. This requirement is made in the interest of the security of the work to be performed.

4.4 In the event that the customer shall allow Caleb Brett the use of an employee of the customer that employee shall remain the employee of the customer and shall not become pro hoc vice the employee of Caleb Brett whether for the purpose of contractual or delictual liability or otherwise.

4.5 Where reasonably practicable the customer shall provide, at its expense, telephone and telex facilities at offshore bases for use by the employees, agents or representatives of Caleb Brett for the purpose of communicating with the offices of Caleb Brett.

4.6 For the purpose of these general terms and conditions "offshore base" includes any offshore installation, ship, hovercraft or place outside the mainland of the United Kingdom including, without prejudice to that generality, bases on the Scottish Islands.

5. COMPLIANCE WITH SAFETY RULES

The customer shall comply with all relevant legislation and safety standards affecting the performance of a contract. In the event of a breach of this clause Caleb Brett shall be entitled to remove its employees, agents or representatives or any materials or equipment from any area affected by the breach until the breach is remedied. The customer shall indemnify Caleb Brett against any claim, demand, loss expense or liability (including but not limited to the cost of litigation) arising by reason of such breach.

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7. INDEMNITY

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7.1.1 arising by reason of claims by Governmental authorities or others of any actual or asserted failure of the customer to comply with any law, ordinance, regulation, rule or order of any Governmental or Judicial Body;

7.1.2 arising by reason of actual or asserted infringement or improper appropriation or use by the customer of trade secrets, proprietary information, know-how, copyright rights or patented or unpatented inventions or for actual or alleged unauthorised imitation of the work of others, arising out of the use of methods, processes, designs, information or other things originating with the customer, its employees, agents, representatives, vendors or sub-contractors, and furnished or communicated to Caleb Brett or its employees, agents or representatives by the customer or used by Caleb Brett or its employees, agents or representatives in connection with the performance of the contract.

7.1.3 being a claim or demand from, or liability to, or loss or expense by reason of a liability to any person other than the customer ("any person" in this context for the avoidance of doubt includes but is not limited to employees of Caleb Brett and the customer) in respect of personal injury or death, damage to or destruction or loss of property belonging to any person or in any other respect or manner whatever provided neither Caleb Brett, its employees, agents or representatives have been negligent.

7.2 The indemnity in paragraph 7.1.3 shall only apply where the circumstances preclude the application of particular indemnities set out elsewhere in these general terms and conditions.

8. EXTENSION OF BENEFIT

8.1 In so far as paragraphs 4, 5, 6, 7 and 11 or any other part of these terms and conditions purport to exclude liability of, or give the benefit of indemnification to anyone other than Caleb Brett, Caleb Brett is or shall be deemed to be acting as agent or Trustee on their behalf for their benefit.

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15. SERVICE AND REPAIR

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15.2 The customer shall allow Caleb Brett reasonable facilities to enable Caleb Brett to carry out such repair and maintenance. On being given reasonable notice the customer shall allow Caleb Brett to inspect the hired equipment.

16. ALTERATION

Any alteration of these general terms and conditions shall not be binding unless it is in writing and signed on behalf of all the parties to the contract.

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Caleb Brett may by notice to the customer terminate any contract if the customer is in material breach of the provisions of that contract or if the customer is declared bankrupt or notout bankrupt or goes into liquidation (other than a members voluntary liquidation for reconstruction or amalgamation purposes) or has a receiver appointed in respect of any of its property or undertaking or generally makes any arrangement or composition with its creditors.

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The customer shall not be entitled to assign a contract or any part of it or the benefit under it without the consent of Caleb Brett.

20. SECRECY

20.1 All information (other than information generally available to the public) on the properties or activities of the customer shall be held by Caleb Brett, its employees, agents and representatives in strictest confidence.

20.2 All information (other than information generally available to the public) on the properties or activities of Caleb Brett shall be held by the customer, its employees, agents and representatives in strictest confidence.

20.3 The obligations under this clause shall survive the completion or termination of a contract howsoever caused, and, without prejudice to that generality, if caused by or arising from frustration, fundamental breach or material breach.

21. APPLICATION OF CONDITIONS

21.1 These general terms and conditions shall apply to all contracts between Caleb Brett and the customer or any of the customer's affiliates unless and until these general terms and conditions are altered or excluded by express provision in writing signed on behalf of both parties. These general terms and conditions shall supersede all terms and conditions of contract of the customer and unless sooner accepted shall be deemed to be accepted on provision of services, employees, materials or equipment under the contract.

21.2 "Affiliates" for the purpose of this Clause means any holding, subsidiary or associated company of the customer. "Holding and subsidiary company" shall have the meanings set out in Section 184 of the Companies Act 1948 and "associated company" means a company while not being a subsidiary or holding company within the aforesaid meanings is directly connected through a chain of holding and/or subsidiary companies.

22. CHOICE OF LAW

Any contract shall be construed under and governed by the laws of England.

Caleb Brett



Caleb Brett Laboratories Ltd.
Lancots Lane, St. Helens,
Merseyside WA9 3ES.
Tel: St. Helens (0744) 611553 Telex: 627844

TS&S

Laboratory Report

To:
Terra Mining AB,
Box 19030
S-16119 BROMMA,
Sweden

Date: 11-04-1986

Your Ref:

Our Ref:

Attention of: - Mr. Jan Bida

86D004

CERTIFICATE OF ANALYSIS

Sample No.	GOLD g/tonne Au
KBH102 1-2	1.09
KBH102 2-3	.97
KBH102 3-4	1.01
KBH102 4-5	.16
KBH102 5-6	.08
KBH102 6-7	.77
KBH102 7-8	.40
KBH102 8-9	.16
KBH102 9-10	1.08
KBH102 10-11	.47
KBH102 11-12	.86
KBH102 12-13	.28
KBH103 2-3	.11
KBH103 3-4	.07
KBH103 4-5	.74
KBH103 5-6	3.07
KBH103 6-7	.55

For and on behalf of
CALEB BRETT LABORATORIES LIMITED


B. G. Forshaw
Chief Chemist

Copy sent to: Mr. M. Larsen, Terrak, Norway.

GENERAL TERMS AND CONDITIONS OF BUSINESS OF CALEB BRETT LABORATORIES LIMITED

1. DEFINITION

In these general terms and conditions where the context so admits:-

1.1 "Caleb Brett" means Caleb Brett Laboratories Limited, a Company incorporated under the Companies Act and having its Registered Office at International House, Mitre Square, Twenty Six to Twenty Eight Creechchurch Lane, London, EC3A 5ED.

1.2 "customer" means the person (as defined) with whom Caleb Brett contracts for the provision of services, employees, materials or equipment.

1.3 "person" means any individual, partnership, company, corporation, body or organisation.

2. INTERPRETATION

In these general terms and conditions where the context so admits:-

2.1 Words importing the masculine include the feminine and neuter and words importing the neuter include the masculine and feminine.

2.2 Words importing the singular include the plural and vice versa.

3. PRICE

3.1 Caleb Brett may provide services, employees, materials and equipment to the customer. The customer will pay Caleb Brett for services, employees, materials and equipment supplied according to the rate of fees, outlays and other charges in Caleb Brett's list of prices and charges in use at the time a contract is entered into with the customer with the addition of Value Added Tax or any other taxes imposed on that supply.

3.2 If the performance of a contract with a customer is not completed by twelve months from the time the contract is entered into, Caleb Brett may propose a variation of the rate of fees, outlays and other charges to take effect from and after the expiry of the said twelve months. If Caleb Brett and the customer fail to reach agreement on any such proposal within one month from the making of the proposal, the contract shall terminate.

3.3 If Caleb Brett provides services, employees, materials or equipment, or incurs outlays for which no provision is made in such list of prices and charges the customer shall pay a reasonable price for these items.

3.4 The customer shall pay Caleb Brett undisputed amounts in invoices and notify Caleb Brett of any objections to invoices within thirty days after the receipt by the customer of each invoice. Interest at the rate of two per cent per annum above the minimum lending rate of the National Westminster Bank PLC at the time shall be payable by the customer on undisputed amounts remaining unpaid after thirty days from the first receipt by the customer of an invoice claiming that amount and on unpaid disputed amounts after thirty days from the settlement on the dispute. Interest shall not run before the expiry of the said periods of thirty days.

4. OPERATING CONDITIONS

4.1 When in order to perform its obligations under a contract it is necessary for Caleb Brett's employees, agents, representatives, materials or equipment to go to an offshore base the customer shall, at its expense, transport such employees, agents, representatives, equipment or materials between the local air base (or such other place if specially agreed) ("the home base") and the offshore base. The customer shall be responsible for the supervision, safety, protection and well-being of such employees, agents, representatives, and the supervision, safety and protection of such materials and equipment whilst in transit between the home base and the offshore base or between two or more offshore bases and whilst situated on offshore bases and the customer shall indemnify Caleb Brett and its employees, agents and representatives against any claim, demand, loss, expense or liability (including but not limited to the cost of litigation) in respect of a breach of its obligations arising from such responsibility under this Clause by the customer irrespective of any contributory negligence on the part of the person indemnified.

4.2 While employees, agents or representatives of Caleb Brett are on an offshore base or are being transported to or from it by the customer the customer shall, at its expense, provide food and accommodation for such employees, agents or representatives to a standard not less than that which the customer provides, or would provide, for its employees if they were carrying out similar work.

4.3 While on an offshore base the employees, agents or representatives of Caleb Brett shall not be required to work for more than twelve hours in any day unless in exceptional circumstances. This requirement is made in the interest of the accuracy of the work to be performed.

4.4 In the event that the customer shall allow Caleb Brett the use of an employee of the customer that employee shall remain the employee of the customer and shall not become pro hac vice the employee of Caleb Brett whether for the purposes of contractual liability or otherwise.

4.5 Where reasonably practicable the customer shall provide, at its expense, telephone and telex facilities at offshore bases for use by the employees, agents or representatives of Caleb Brett for the purpose of communicating with the offices of Caleb Brett.

4.6 For the purpose of these general terms and conditions "offshore base" includes any offshore installation, ship, hovercraft or place outside the mainland of the United Kingdom including, without prejudice to that generality, bases on the Scottish Islands.

5. COMPLIANCE WITH SAFETY RULES

The customer shall comply with all relevant legislation and safety standards affecting the performance of a contract. In the event of a breach of this clause Caleb Brett shall be entitled to remove its employees, agents or representatives or any materials or equipment from any area affected by the breach until the breach is remedied. The customer shall indemnify Caleb Brett against any claim, demand, loss expense or liability (including but not limited to the cost of litigation) arising by reason of such breach.

6. LIMITATION OF LIABILITY

6.1 The liability of Caleb Brett and its employees, agents or representatives for claims, other than claims for death or personal injury arising out of contract, quasi contractual, delictual, quasi delictual or statutory liability of liability arising in any other manner whatever shall be limited in total for any incident to the sum of Fifty Thousand Pounds (£50,000) Sterling.

6.2 This limitation of liability applies whether or not the claim arises from intentional or negligent acts of Caleb Brett, its employees, agents or representatives.

7. INDEMNITY

7.1 The customer shall indemnify, hold harmless and defend Caleb Brett and its employees, agents and representatives from and against any claim, demand, loss, expense or liability (including but not limited to the cost of litigation) in connection with any contract (connection being direct or indirect):-

7.1.1 arising by reason of claims by Governmental authorities or others of any actual or asserted failure of the customer to comply with any law, ordinance, regulation, rule or order of any Governmental or Judicial Body;

7.1.2 arising by reason of actual or asserted infringement or improper appropriation or use by the customer of trade secrets, proprietary information, know-how, copyright rights or patented or unpatented inventions or for actual or alleged unauthorised initiation of the work of others, arising out of the use of methods, processes, designs, information or other things originating with the customer, its employees, agents, representatives, vendors or sub-contractors, and furnished or communicated to Caleb Brett or its employees, agents or representatives by the customer or used by Caleb Brett or its employees, agents or representatives in connection with the performance of the contract.

7.1.3 being a claim or demand from, or liability to, or loss or expense by reason of a liability to any person other than the customer ("any person") in this context for the avoidance of doubt includes but is not limited to employees of Caleb Brett and the customer in respect of personal injury or death, damage to or destruction or loss of property belonging to any person or in any other respect or manner whatever provided neither Caleb Brett, its employees, agents or representatives have been negligent.

7.2 The indemnity in paragraph 7.1.3 shall only apply where the circumstances preclude the application of particular indemnities set out elsewhere in these general terms and conditions.

8. EXTENSION OF BENEFIT

8.1 In so far as paragraphs 4, 5, 6, 7 and 11 or any other part of these terms and conditions purport to exclude liability of, or give the benefit of indemnification to anyone other than Caleb Brett, Caleb Brett is or shall be deemed to be acting as agent or Trustee on their behalf for their benefit.

8.2 The invalidity or unenforceability of any particular exclusion or restriction of liability provision or any indemnity provision of these general terms and conditions or part thereof shall not affect the validity or enforceability of the remaining provisions or any part thereof.

9. UNUSED SAMPLE PORTIONS

Unused portions of analysis samples are retained by Caleb Brett for one month after completion of the analysis and then disposed of (except those of a dangerous nature where disposal is immediate). The customer may arrange to have such portions retained for a longer period for which facility Caleb Brett will require a storage charge.

10. DURATION OF HIRE CONTRACTS

The hire period for equipment rental commences on the day on which the hired equipment is made available at the relevant Caleb Brett premises in a suitably packaged state for despatch, and terminates on the day of return to the same premises or such other agreed premises.

11. OFF PREMISES SERVICES AND INSTALLATION/COMMISSIONING OF EQUIPMENT

Should the services of Caleb Brett employees, agents or representatives be required at a location other than Caleb Brett's premises ("the foreign location") and/or to install/commission equipment on the customer's site this will be charged at Caleb Brett's normal rates plus travel and living expenses where appropriate. The customer shall be responsible for the supervision, safety and well-being of such employees, agents or representative whilst they are at the foreign location or on the customer's site and the customer shall indemnify Caleb Brett and its respective employees, agents or representatives against any claim, demand, loss, expense or liability (including but not limited to the cost of litigation) in respect of a breach of its obligations arising from such responsibility under this Clause by the customer irrespective of any contributory negligence.

12. FREIGHT CHARGES

All cartage charges for hired equipment to and from such Caleb Brett premises will be charged to the hirer at cost.

13. INSURANCE

Insurance for the full value of hired equipment to cover loss or damage during the period of hire and while hired equipment is in transit is the responsibility of the hirer. Such insurance should also provide for the loss of rental payment in the event of hired equipment being damaged, destroyed or lost. By prior agreement Caleb Brett can provide suitable insurance cover to be charged "at cost" to the customer.

14. LOSS OR DAMAGE

14.1 Loss - Should hired equipment or any part thereof be lost during the period of rental or whilst in transit to and from site location or locations, the customer shall pay the full replacement cost of hired equipment whether or not it is replaced and all loss of profits to Caleb Brett.

14.2 Damage - Should hired equipment be damaged whilst in use or in transit as above the customer shall pay the cost of repairs necessary to restore it to its original condition at the beginning of the lease period or for the full replacement cost (even if not replaced) whichever is the lower and all loss of profits to Caleb Brett.

15. SERVICE AND REPAIR

15.1 The customer shall bear the cost of all repairs and maintenance to hired equipment. Such repair and maintenance shall be carried out by Caleb Brett. With the consent of Caleb Brett the customer may carry out such repairs or maintenance or arrange for these to be done by others approved by Caleb Brett. Should hired equipment need emergency repair or maintenance whilst it is outside the premises of Caleb Brett, the Customer may, without the consent of Caleb Brett, arrange for repairs or maintenance to be carried out up to a cost of Fifty Pounds Sterling for each emergency and shall inform Caleb Brett of the instructions for emergency repair or maintenance as soon as reasonably practicable.

15.2 The customer shall allow Caleb Brett reasonable facilities to enable Caleb Brett to carry out such repair and maintenance. On being given reasonable notice the customer shall allow Caleb Brett to inspect the hired equipment.

16. ALTERATION

Any alteration of these general terms and conditions shall not be binding unless it is in writing and signed on behalf of all the parties to the contract.

17. TERMINATION

Caleb Brett may by notice to the customer terminate any contract if the customer is in material breach of the provisions of that contract or if the customer is declared bankrupt or notor bankrupt or goes into liquidation (other than a members voluntary liquidation for reconstruction or amalgamation purposes) or has a receiver appointed in respect of any of its property or undertakes or generally makes any arrangement or composition with its creditors.

18. FORCE MAJEURE

Neither Caleb Brett nor the customer shall be liable for failure to fulfil any contract if fulfilment is delayed, hindered or prevented by strikes, walk-outs or labour disputes of any kind, acts of God, war, riot, civil disturbances or acts of terrorism. If such delay, hindrance or prevention lasts for more than a continuous period of thirty days, either party may by notice to the other party terminate the contract.

19. NON-ASSIGNMENT

The customer shall not be entitled to assign a contract or any part of it or the benefit under it without the consent of Caleb Brett.

20. SECRECY

20.1 All information (other than information generally available to the public) on the properties or activities of the customer shall be held by Caleb Brett, its employees, agents and representatives in strictest confidence.

20.2 All information (other than information generally available to the public) on the properties or activities of Caleb Brett shall be held by the customer, its employees, agents and representatives in strictest confidence.

20.3 The obligations under this clause shall survive the completion or termination of a contract howsoever caused, and, without prejudice to that generality, if caused by or arising from frustration, fundamental breach or material breach.

21. APPLICATION OF CONDITIONS

21.1 These general terms and conditions shall apply to all contracts between Caleb Brett and the customer or any of the customer's affiliates unless and until these general terms and conditions are altered or excluded by express provision in writing signed on behalf of both parties. These general terms and conditions shall supersede all terms and conditions of contract of the customer and unless sooner accepted shall be deemed to be accepted on provision of services, employees, materials or equipment under the contract.

21.2 "Affiliate" for the purpose of this Clause means any holding, subsidiary or associated company of the customer. "Holding and subsidiary company" shall have the meanings set out in Section 154 of the Companies Act 1948 and "associated company" means a company while not being a subsidiary or holding company within the aforesaid meanings is directly connected through a chain of holding and/or subsidiary companies.

22. CHOICE OF LAW

Any contract shall be construed under and governed by the laws of England.

Caleb Brett



Caleb Brett Laboratories Ltd.
Lancots Lane, St. Helens,
Merseyside WA9 3ES.
Tel: St. Helens (0744) 611553 Telex: 627844

TS&S

Laboratory Report

To:

Terra Mining AB
Box 19030
S-16119 BROMMA
Sweden

Date:

18. 04. 1986

Your Ref:

Our Ref:

86D005

Attention of: - Mr. Jan Bida

CERTIFICATE OF ANALYSIS

Sample No.	ARSENIC %w/w AS	LITHIUM %w/w LI
KBH102 1-2	0.38	< 0.002
KBH102 2-3	0.46	< 0.002
KBH102 3-4	0.40	< 0.002
KBH102 4-5	0.03	< 0.002
KBH102 5-6	0.04	< 0.002
KBH102 6-7	0.07	< 0.002
KBH102 7-8	0.04	< 0.002
KBH102 8-9	0.05	< 0.002
KBH102 9-10	0.05	< 0.002
KBH102 10-11	0.16	< 0.002
KBH102 11-12	2.16	< 0.002
KBH102 12-13	0.50	< 0.002
KBH103 2-3	0.03	< 0.002
KBH103 3-4	0.02	0.002
KBH103 4-5	0.03	0.002
KBH103 5-6	2.80	0.004
KBH103 6-7	1.00	0.004

For and on behalf of
CALEB BRETT LABORATORIES LIMITED


B. G. Forshaw
Chief Chemist

GENERAL TERMS AND CONDITIONS OF BUSINESS OF CALEB BRETT LABORATORIES LIMITED

1. DEFINITION

In these general terms and conditions where the context so admits:-

1.1 "Caleb Brett" means Caleb Brett Laboratories Limited, a Company incorporated under the Companies Acts and having its Registered Office at International House, Mitre Square, Twenty Six to Twenty Eight Creechchurch Lane, London, EC3A 5ED.

1.2 "customer" means the person (as defined) with whom Caleb Brett contracts for the provision of services, employees, materials or equipment.

1.3 "person" means any individual, partnership, company, corporation, body or organisation.

2. INTERPRETATION

In these general terms and conditions where the context so admits:-

2.1 Words importing the masculine include the feminine and neuter and words importing the neuter include the masculine and feminine.

2.2 Words importing the singular include the plural and vice versa.

3. PRICE

3.1 Caleb Brett may provide services, employees, materials and equipment to the customer. The customer will pay Caleb Brett for services, employees, materials and equipment supplied according to the rate of fees, outlays and other charges in Caleb Brett's list of prices and charges in use at the time a contract is entered into with the customer with the addition of Value Added Tax or any other taxes imposed on that supply.

3.2 If the performance of a contract with a customer is not completed by twelve months from the time the contract is entered into, Caleb Brett may propose a variation of the rate of fees, outlays and other charges to take effect from and after the expiry of the said twelve months. If Caleb Brett and the customer fail to reach agreement on any such proposal within one month from the making of the proposal, the contract shall terminate.

3.3 If Caleb Brett provides services, employees, materials or equipment, or incurs outlays for which no provision is made in such list of prices and charges the customer shall pay a reasonable price for these items.

3.4 The customer shall pay Caleb Brett undisputed amounts in invoices and notify Caleb Brett of any objections to invoices within thirty days after the receipt by the customer of each invoice. Interest at the rate of two per cent per annum above the minimum lending rate of the National Westminster Bank PLC at the time shall be payable by the customer on undisputed amounts remaining unpaid after thirty days from the first receipt by the customer of an invoice claiming that amount and on unpaid disputed amounts after thirty days from the settlement on the dispute. Interest shall not run before the expiry of the said periods of thirty days.

4. OPERATING CONDITIONS

4.1 When in order to perform its obligations under a contract it is necessary for Caleb Brett's employees, agents, representatives, materials or equipment to go to an offshore base the customer shall, at its expense, transport such employees, agents, representatives, equipment or materials between the local air base (or such other place if specially agreed) ("the home base") and the offshore base. The customer shall be responsible for the supervision, safety, protection and well-being of such employees, agents, representatives, and the supervision, safety and protection of such materials and equipment whilst in transit between the home base and the offshore base or between two or more offshore bases and whilst situated on offshore bases and the customer shall indemnify Caleb Brett and its employees, agents and representatives against any claim, demand, loss, expense or liability (including but not limited to the cost of litigation) in respect of a breach of its obligations arising from such responsibility under this Clause by the customer irrespective of any contributory negligence on the part of the person indemnified.

4.2 While employees, agents or representatives of Caleb Brett are on an offshore base or are being transported to or from it by the customer the customer shall, at its expense, provide food and accommodation for such employees, agents or representatives to a standard not less than that which the customer provides, or would provide, for its employees if they were carrying out similar work.

4.3 While on an offshore base the employees, agents or representatives of Caleb Brett shall not be required to work for more than twelve hours in any day unless in exceptional circumstances. This requirement is made in the interest of the accuracy of the work to be performed.

4.4 In the event that the customer shall allow Caleb Brett the use of an employee of the customer that employee shall remain the employee of the customer and shall not become pro hac vice the employee of Caleb Brett whether for the purposes of contractual or delictual liability or otherwise.

4.5 Where reasonably practicable the customer shall provide, at its expense, telephone and telex facilities at offshore bases for use by the employees, agents or representatives of Caleb Brett for the purpose of communicating with the offices of Caleb Brett.

4.6 For the purpose of these general terms and conditions "offshore base" includes any offshore installation, ship, hovercraft or place outside the mainland of the United Kingdom including, without prejudice to that generality, bases on the Scottish Islands.

5. COMPLIANCE WITH SAFETY RULES

The customer shall comply with all relevant legislation and safety standards affecting the performance of a contract. In the event of a breach of this clause Caleb Brett shall be entitled to remove its employees, agents or representatives or any materials or equipment from any area affected by the breach until the breach is remedied. The customer shall indemnify Caleb Brett against any claim, demand, loss expense or liability (including but not limited to the cost of litigation) arising by reason of such breach.

6. LIMITATION OF LIABILITY

6.1 The liability of Caleb Brett and its employees, agents or representatives for claims, other than claims for death or personal injury arising out of contractual, quasi contractual, delictual, quasi delictual or statutory liability of liability arising in any other manner whatever shall be limited in total for any incident to the sum of Fifty Thousand Pounds (£50,000) Sterling.

6.2 This limitation of liability applies whether or not the claim arises from intentional or negligent acts of Caleb Brett, its employees, agents or representatives.

7. INDEMNITY

7.1 The customer shall indemnify, hold harmless and defend Caleb Brett and its employees, agents and representatives from and against any claim, demand, loss, expense of liability (including but not limited to the cost of litigation) in connection with any contract (connection being direct or indirect):-

7.1.1 arising by reason of claims by Governmental authorities or others of any actual or asserted failure of the customer to comply with any law, ordinance, regulation, rule or order of any Governmental or Judicial Body;

7.1.2 arising by reason of actual or asserted infringement or improper appropriation or use by the customer of trade secrets, proprietary information, know-how, copyright rights or patented or unpatented inventions or for actual or alleged unauthorised imitation of the work of others, arising out of the use of methods, processes, designs, information or other things originating with the customer, its employees, agents, representatives, vendors or sub-contractors, and furnished or communicated to Caleb Brett or its employees, agents or representatives by the customer or used by Caleb Brett or its employees, agents or representatives in connection with the performance of the contract;

7.1.3 being a claim or demand from, or liability to, or loss or expense by reason of a liability to any person other than the customer ("any person") in this context for the avoidance of doubt includes but is not limited to employees of Caleb Brett and the customer) in respect of personal injury or death, damage to or destruction or loss of property belonging to any person or in any other respect or manner whatever provided neither Caleb Brett, its employees, agents or representatives have been negligent.

7.2 The indemnity in paragraph 7.1.3 shall only apply where the circumstances preclude the application of particular indemnities set out elsewhere in these general terms and conditions.

8. EXTENSION OF BENEFIT

8.1 In so far as paragraphs 4.1, 5, 6, 7 and 11 or any other part of these terms and conditions purport to exclude liability of, or give the benefit of indemnification to anyone other than Caleb Brett, Caleb Brett is or shall be deemed to be acting as agent or Trustee on their behalf for their benefit.

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Unused portions of analysis samples are retained by Caleb Brett for one month after completion of the analysis and then disposed of (except those of a dangerous nature where disposal is immediate). The customer may arrange to have such portions retained for a longer period for which facility Caleb Brett will require a storage charge.

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Should the services of Caleb Brett employees, agents or representatives be required at a location other than Caleb Brett's premises ("the foreign location") and/or to install/commission equipment on the customer's site this will be charged at Caleb Brett's normal rates plus travel and living expenses where appropriate. The customer shall be responsible for the supervision, safety and well-being of such employees, agents or representatives whilst they are at the foreign location or on the customer's site and the customer shall indemnify Caleb Brett and its respective employees, agents or representatives against any claim, demand, loss, expense or liability (including but not limited to the cost of litigation) in respect of a breach of its obligations arising from such responsibility under this Clause by the customer irrespective of any contributory negligence.

12. FREIGHT CHARGES

All carriage charges for hired equipment to and from such Caleb Brett premises will be charged to the hirer at cost.

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14.2 Damage - Should hired equipment be damaged whilst in use or in transit as above the customer shall pay the cost of repairs necessary to restore it to its original condition at the beginning of the lease period or for the full replacement cost (even if not replaced) whichever is the lower and all loss of profits to Caleb Brett.

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15.2 The customer shall allow Caleb Brett reasonable facilities to enable Caleb Brett to carry out such repair and maintenance. On being given reasonable notice the customer shall allow Caleb Brett to inspect the hired equipment.

16. ALTERATION

Any alteration of these general terms and conditions shall not be binding unless it is in writing and signed on behalf of all the parties to the contract.

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Caleb Brett may by notice to the customer terminate any contract if the customer is in material breach of the provisions of that contract or if the customer is declared bankrupt or not a bankrupt or goes into liquidation (other than a members voluntary liquidation for reconstruction or amalgamation purposes) or has a receiver appointed in respect of any of its property or undertaking or generally makes any arrangement or composition with its creditors.

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20.2 All information (other than information generally available to the public) on the properties or activities of Caleb Brett shall be held by the customer, its employees, agents and representatives in strictest confidence.

20.3 The obligations under this clause shall survive the completion or termination of a contract howsoever caused, and, without prejudice to that generality, if caused by or arising from frustration, fundamental breach or material breach.

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21.1 These general terms and conditions shall apply to all contracts between Caleb Brett and the customer or any of the customers' affiliates unless and until these general terms and conditions are altered or excluded by express provision in writing signed on behalf of both parties. These general terms and conditions shall supersede all terms and conditions of contract of the customer and unless sooner accepted shall be deemed to be accepted on provision of services, employees, materials or equipment under the contract.

21.2 "Affiliates" for the purpose of this Clause means any holding, subsidiary or associated company of the customer. "Holding and subsidiary company" shall have the meanings set out in Section 154 of the Companies Act 1948 and "associated company" means a company while not being a subsidiary or holding company within the aforesaid meanings is directly connected through a chain of holding and/or subsidiary companies.

22. CHOICE OF LAW

Any contract shall be construed under and governed by the laws of England.



Forskningscenter Porsgrunn

Fordeling Orig. til reg./sirk. B. Therkelsen (fors.) V. Dannow, Prosp.avd. T. Vrålstad, " A. Munthe-Kaas C. Hansteen G. Wefring A. Åsheim E. Einungbrekke J.B. Jakobsen	Emneord BINDAL; DRIFTSLABORATORIUM; GULL; -FORPROSJEKT		
	(5X)		
	Fortrolig ☐ Ugradert ☒	Reg.nr. 85-0277	
	Tittel Forslag til oppbygging av drifts- laboratorium på Kolsvik gull- forekomst, Bindal - Nordland.		Dok.nr. 4649Q
	Forfatter(e) E. Einungbrekke C. Hansteen J.B. Jakobsen G. Wefring A. Åsheim		Arkiv nr. Sider/bilag Ref. GW/Ka Godkj. (sign.) <i>A.M.K.</i>
Dato 24.4.1985			

Resyme: konklusjon, anbefaling

Verner Dannow, NH-Prospekteringsavdeling, Økern, har bedt Analytisk avdeling om å gi en samlet vurdering for oppbygging av et driftslaboratorium ved Bindal gullforekomst.

I vårt forslag inngår en foreløpig oversikt over utstyrsbehov, instrumenteringsalternativer, leveringstider, kostnader og bemanning.

Notatet omhandler også prosedyrer for prøvetilberedning i eget knuselaboratorium, og for oppslutning og analyse. Her gjenstår imidlertid noe utprøving på aktuelle prøver for å vurdere best egnet utstyr og framgangsmåte.

Forslag til innredning av analyse- og knuselaboratorium er også vedlagt. I tillegg kommer liste vedrørende laboratorieutstyr, instrumentering og kjemikalier, med orienterende priser.

Besøk ved et laboratorium for gull-analyser, eksempelvis Caleb Brett, bør gjennomføres for best mulig vurdering av knuse-, røste-, oppslutning- og analyse-prosedyre.

Porsgrunn, 24.4.1985

G. Wefring

FORSKNINGSSENTERET PORSGRUNN ,
JAN B. JAKOBSEN ,
16-APR-1985 .

FORSLAG TIL PROSEDYRE FOR PRØVETILBEREDNING VED DRIFTSLABORATORIET
PÅ KOLSVIK AU-FOREKOMST , BINDAL - NORDLAND .
MOTTAK , REGISTRERING , KNUSING , NEDDELING OG ARKIVERING AV
PRØVENE .

PRØVEMOTTAK

Levering av dagens prøver til prøvetilberedningslaboratoriet.

Foreslår at disse plasseres i et reolsystem (ev. med avdeling), dette vil spare plass , og gi grei oversikt .

Reolene kan ev. plasseres på utsiden av brakkevegg under et halvtেকে , men dette er ikke så gunstig for videre reg.

Reolsystemet utformes slik at det starter litt oppe på veggen . I vanlig skrivehøyde plasseres en skriveplate , ca. 40 cm bredere enn reolene for registrering .

REGISTRERING/
MERKING

Først registreres dagens prøver i en laboratoriejournal , som minimum må inneholde :

LAB.REG.NR . PRØVE MERKET DATO ANM.

Foreslår at prøvene registreres v.h.a. et eget laboratorieregistreringsnummer , som gjerne kan starte på 1 og være fortløpende gjennom driftsperioden .

Det anskaffes et stempel med mulighet for minst 10 ganger repetering av hvert tall . 10 merkelapper av passende størrelse stemples så med lab.reg.nr. (L.nr.)

EVENTUELL
TØRKING

Dersom noen av prøvene er fuktige (f.eks. bore-støvprøver) må disse tørkes før videre behandling . Dette må noteres i lab.journal i anmerkningsrubrikken . F.eks: Prøven fuktig , tørket i varmeskap v/110 °C over natt .

Dette vil sannsynligvis være tilstrekkelig tørretid , men det medfører at disse prøvene må analyseres sammen med neste dags prøver . Vanlige steinprøver som ev.er fuktige på utsiden, kan enten tørres av , tørkes med acetone , eller de rett og slett tørker av seg selv .

GROVKNUSING
STOR KJ.TYGGER

Er prøvene for store for åpningen for den store kjeftekyggen (8 x 12 cm) , må de først slås i stykker v.h.a. hammer . Jeg synes dette gjøres best med en 1.5 kg slager med kort skaft . I en av brosjyrene så jeg dette antydte utført på en passende stor stålplate plassert på gulvet . Dette tror jeg skulle være meget brukbart , men på et brakkegulv bør nok denne fundamenteres særskilt . Ref. FORSLAG TIL INNREDNING AV PRØVETILBEREDNINGSLAB. BILAG 1 .

Kjefteåpningen stilles på største åpning for raskest mulig gjennomløp (3.5 cm) .

Når prøven er ferdig kjeftekygget overføres den til et plastspann (5-10liter) og merkes. Her kan en av nummerlappene benyttes . Denne limes opp på f.eks. et A5 ark og plasseres oppi bøtta med prøven .

FINKNUSING
LITEN KJ.TYGGER

Den grovknuste prøven overføres nå til den lille kjeftetyggeren , som er stillet på minimum åpning . Dette skulle gi en malegrad med ca. 60 % < 0.2 mm og jeg mener dette skulle være godt nok for splitting .

Prøven overføres til plastspannet igjen med merkelappen . DET ER VIKTIG MED GOD

ORDENSANS , NUMMERLAPPENE MA FØLGE PRØVEN GJENNOM HELE PROSEDYREN .

SPLITTING
2-DELER

Prøven er nå klar til neddeling til 500 g . Dette gjøres v.h.a. et vanlig splitteapparat , en såkalt 2-deler . Beholderne må avpasses til prøvenes størrelse , kan ev. lages spesielt slik at de passer . (Bør ha minst 3 stk.) .

Prøven splittes så mange ganger som nødvendig for å komme nærmest mulig 1/2 kg .

VEIING AV
FRASPLITTET PR.

Ved erfaring kan dette kanskje gjøres meget enkelt ved å se an prøvemengden , men jeg tror at det vil trenge en form for vekt . Det er iallefall litt viktig at det ikke blir under 400 gram for da vil det bli litt lite for analyseringen , med 50 g innv.

Det enkleste og raskeste (men kanskje ikke det rimligste) alternativ blir en elektronisk skål- vekt . Denne kunne også komme til anvendelse dersom man ønsket å innføre PRØVE MOTTATT I GRAM ved lab.journalen . (Vekten må da dimensjoneres til formålet , f.eks. SARTORIUS Type 1907 går til 5,500 kg) .

ARKIVERING AV
OVERSKYTENDE PR.

Etter splitting og ev. veiling overføres den delen av prøven som skal gå til finmaling til et mindre plastspann (f.eks. 1-2 liter), sammen med merkelappen (lnr) . Overskuddet arkiveres .

Ved frasplittingen av 500 grams prøven vil det bli en rest varierende fra 1.5 - 4.5 kg som skal lagres / arkiveres . Denne kan bli aktuell å gjøre flere splitt på for en senere kontroll , også for å teste splitteprosedyren .

Foreslår at denne lagres i 2 liters plastbokser, fordi disse kan fåes i en firkantet utførelse og er greie å lagre . 50 prøver om dagen vil gi drøyt 10.000 prøver pr. år og vil derfor kreve mye lagerplass.

I de fleste tilfeller er 2 liters boksen stor nok. Den merkes nå med Lnr.(lapp nr.2). Eventuelt benyttes 2 bokser dersom det ikke er plass ; skriv da en lapp med Lnr. for hånd . VIKTIG OGSA Å MERKE BEGGE BOKSENE MED H.H.V BOKS NR.1 OG BOKS NR.2 FOR SENERE Å FINNE DISSE I ARKIVET .

Det ville ev. også være en fordel om dette ble satt i anm. rubrikken i lab.journalen dersom det blir tid til det .

FINMALING AV
500 GRAMS PRØVEN

Den frasplittede prøven blir nå finmalt på skive-svingmølle .

Dette kan enten utføres v.h.a. en ; helst to stk. kontinuerlig arbeidende møller (Siebtechnik T250).

Eventuelt kan det utføres med skive-svingmølle med 6 maleinnsatser i hengende utførelse . (Siebtechnik 6-topf) .

De kontinuerlig arbeidende møllene vil sannsynligvis være å foretrekke , fordi de ikke behøver taes ut & tømmes . Man sparer da denne operasjon. Istedet kan det f.eks. mellom hver 5 prøve kjøres en renkvartsprøve , som eventuelt kan merkes og inngå i analyseringen .

(Ref. brev til Ballestad , BILAG 2 .)

Etter mølling overføres prøven til plastspannet igjen sammen med nummerlapp , og prøven er klar for splitting til analyse . 70-90 % skal nå ifølge spesifikasjonene være $< 63\mu$.

SPLITTING I 8-DELER

Den ferdig finmalte prøven er nå klar til splitting på roterende splitteapparat , Retsch Probenteiler PTZ .

Prøven overføres til vibramateren og apparatet startes .Prøven fødes automatisk , men splittingen krever ettersyn p.g.a. at prøven er så finmalt og derfor lett baker . Etter at prøven nå er splittet i 8 like deler , overføres disse til 100 ml plastflasker . Disse merkes med de resterende 8 merkelappene som ble laget ved registreringen .

Ettersom alle splittene i prinsippet er like , mener jeg det ikke skulle være nødvendig med nummerering av disse .

LAGRING AV
FERDIGSPLITTEDE
PRØVER

For lagring av analyse-splittene , kunne jeg f.eks. tenke meg en pappembalasje tilpasset til 100 ml plastflaskene .

Ettersom antallet prøver til analyse ved Driftslab. vil variere mellom 3-5 splitt , samt at noen vil bli sendt til kontroll-analyse ved andre laboratorium , kan man f.eks. bestemme seg for en størrelse på pappesken beregnet for 5 ev. 10 prøver totalt .

Esken dimensjoneres til å romme f.eks. 5 el. 6 splitt pr. prøve , de øvrige blir forbrukt under analyseringen .

Prøvene til Driftslab. (det minimum antall splitt som man til enhver tid finner det hensiktsmessig å analysere) , settes direkte på plastbrett .HELST ETTER LNR. FOR Å LETTE ARBEIDET VED LABORATORIET. Disse kan lages ved plastverksted i ønsket dimensjon . Blir det for enkelte av prøvene aktuelt å analysere ekstra splitt ,kan disse hentes fra lager .

Lageret (iallefall siste måneds prøver) bør utføres med et reolsystem avpasset til prøveeskene slik at det hele tiden blir lett å finne tilbake til kontrollsplitt .

BEMANNINGEN

Minimum bemanning dersom dette i det hele tatt skal kunne utføres må bli 2 mann .

Jeg tenker meg da følgende arbeidsfordeling
Vi kaller de MANN A og MANN B .

Begge går sammen om registreringen av prøvene . En leser prøvemerkenes mens den andre skriver journalen .

MANN B : stempler det nødvendige antall merkelapper . Her lager vi oss et system slik at vi har et ark med lapper for hver prøve .

1.lapp limes straks opp på et A5 ark .

Deretter legges arkene og lappene hver for seg i nummer- rekkefølge i noen spesial-tilpassede plastkammer bare med hjørner for lett tilegning av lappene / arkene .

MANN A har allerede startet kjeftetyggingen av prøvene . Han betjener både stor og liten kjeftetygger , samt splitteapparatet (2-deleren) med splitting til 500 grams prøve. I tillegg har han også ansvaret for å arkivere den frasplittede delen .

MANN B skal nå være klar til å begynne med møllingen . Avhengig av hvor mye dødtid han vil få , avgjøres arbeidsfordelingen på de neste operasjonene . På grunn av en viss gjennomløpstid på den kontinuerlig arbeidende skive-svingmølla skulle han nå ha tid til å starte oppliming av merkelapper på 100 ml flasker , samt splitting på 8-deler .

Ved eventuelt bruk av skive-svingmølle med 6 maleinnsatser vil denne måtte kjøres i 5 min. for hver prøve . Dette blir dødtid for MANN B og kan da benyttes til f.eks. splitting på Retsch Probenteiler (8-deler) . Basert på erfaring må kanskje endel av arbeidsoperasjonene omfordes noe , men utgangspunktet bør være at mann A styrer begge kjeftetyggerne og mann B kjører skive-svingmølla / møllene .

Dessuten bør det sørges for en best mulig ambulering av jobbene , slik at en bytter arbeidsoperasjoner ofte .

DIV. UTSTYR /
VERNEUTSTYR

Til rengjøring vil det trenge endel koster. Dessuten vil det sikkert være greit med en støvsuger . For grundig rengjøring benytter jeg såpe og vann og tørking med aceton , men det er neppe så greit i brakke , med mindre det like gjerne støpes helt gulv med sluk . Av verneutstyr vil det trenge hansker , øyevern , øreklokker og støvmasker .

I forslag til innredning har jeg tatt med mulighet for bespisning på stedet . Dette kan også ev. fungere som et lite møterom . Ting som radio , kaffetrakter , kjøleskap regner jeg med må være tilstede .

Vaskemuligheter må innredes i nær tilknytning til laboratoriet , helst også med dusj.

Analytisk avdeling , 16. APR. 1985

Jan B. Jakobsen
Jan B. Jakobsen (s.)

FORSKNINGSSENTERET PORSGRUNN ,
JAN B. JAKOBSEN ,
18-APR-1985 .

BILAG 1

INNREDNING AV PRØVETILBEREDNINGSLABORATORIUM VED KOLSVIK
AU-FOREKOMST ; BINDAL-NORDLAND .

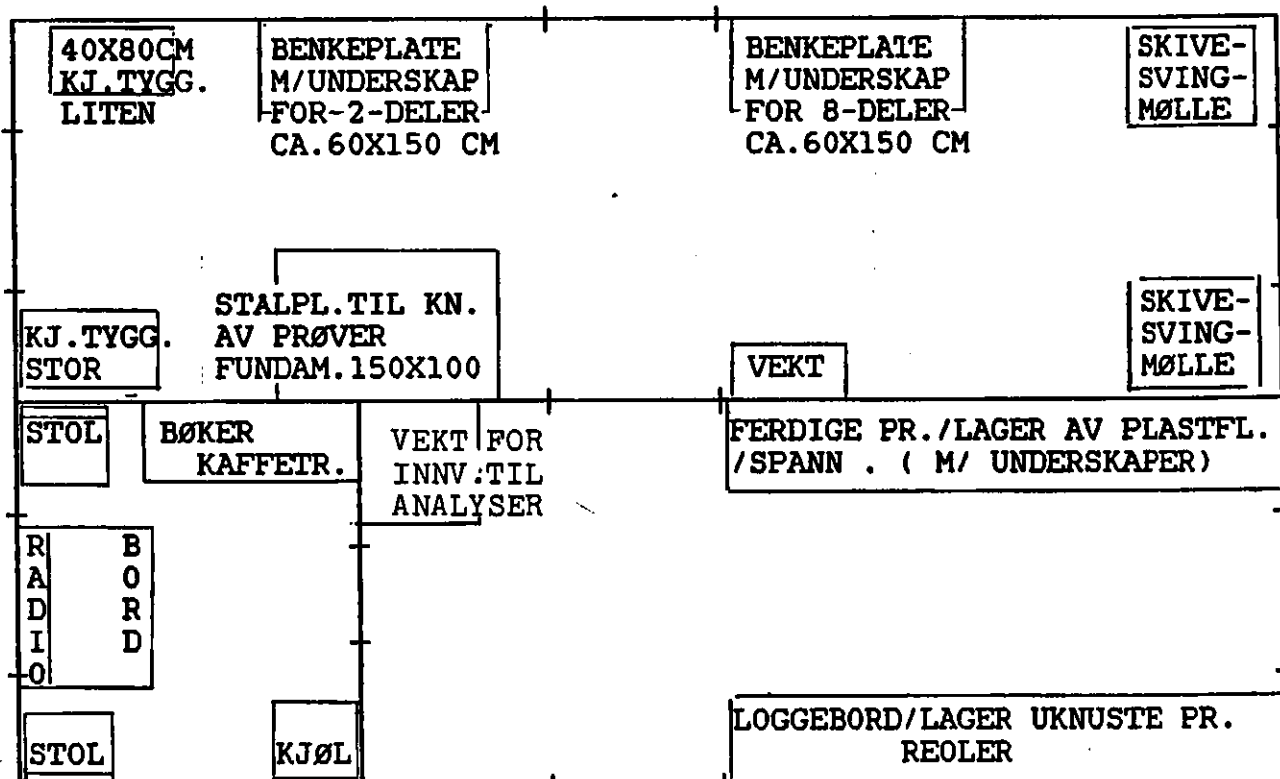
Foreslår at det f.eks. benyttes 2 stk. Moelven-brakker , som stilles sammen med dør i mellom .

Brakkenes mål er 2.50 m x 3.80 til 8.60 m i 5 størrelser med modul 1.2 m . Tar utgangspunkt i de største .

Alt tyngere knuseutstyr må fundamenteres fra marken ved at det skjæres hull i gulvet , støpes fundament og blokkes opp til gulvhøyde.

Det vil bli noe støving , derfor bør det sannsynligvis innstalleres avtrekk . Dette krever innluft og gjøres best med et temperasjons-aggregat .

Jeg synes det kan være praktisk å innrede mulighet for bespisning i nærmest mulig tilknytning til arbeidsstedet og har tegnet inn dette . Oppstillingen kan jeg tenke meg omtrent slik .



Analytisk avdeling , 18. APR. 1985

Jan B. Jakobsen
Jan B. Jakobsen (s.)

Reidar Ballestad .

Dette er kun ment som en uforpliktende forespørsel om generell pris ,
leveringstid samt kapasiteter på endel prøvebehandlingsutstyr tenkt
brukt ved et eventuelt laboratorium i Bindal .

Det er ennå ikke besluttet om det blir noe av prosjektet , vi gjør bare
undersøkelsene nå for dersom prosjektet blir en realitet i år vil det
bli hastverk .

Kunne du klare endel av dette innen torsdag kveld hadde det vært fint
for da skal vi ha et nytt møte .

	TYPE	PRIS	LEVERINGSRAMME	KAPASITET
KJEFTETYGGER , STOR MORGARDSHAMMER	AR 12	50.000,-	ca.6 uker	200-550 kg/t
KJEFTETYGGER , LITEN	BB1/A			
RETSCH	220 V 380 V	28.800,- 30.600,-	ca.6 uker "	
SPLITTEAPPARAT 1/2" VANLIG MEKANISK 2-DELER (32KAMMER)	20mm	2.550,-		
SKIVE-SVINGMØLLE KONTINUERLIG SIEBTECHNIK	T250 T5	25.445,- 34.185,-	ca.6 uker	innebygd
Innsats 250mm Cr W		9.375,- 68.415,-		
SKIVE-SVINGMØLLE HENGENDE UTFØRELSE 6 MALEINNSATSER SIEBTECHNIK	6-topf N H	30.735,- 49.135,-	ca.6 uker	50cm Cr 100cm Agat
PRØVEDELER (PROBENTEILER) 8-DELER	PTZ	15.250,-	ca.6 uker	
RETCH M/VIBRAMATER	(DR 40)			

FORSLAG TIL ANALYSEUTSTYR VED DRIFTSLABORATORIET PÅ KOLSVIK
AU-FOREKOMST , BINDAL - NORDLAND

RØSTEOVN

Ovn eller ovner med luftgjennomgang.Temp.600 °C

Det bør være en gjennomgående kapasitet på 250
prøver pr.dag.

Pris ?

SANDBAD

Termostatstyrte sandbad med plass til 250 begerglass.

Sandbad med arbeidsflate 600 x 450 mm, 4500 W,
art.nr.269.474-64, koster kr.4800,-. 4 bad av denne

typen skulle dekke behovet.Det er fra Kebo-Bredal

antydnet 6 ukers leveringstid.Samlet pris for 4 stk.

Kr. 19200,-

KOKEPLATER

625 W kokeplate.Senco m/røreverk.2 stk.

Kr. 6000,-

VEKTER

Lab.vekt m/2 desimaler.Mettler/Sartorius.

Kr. 12000,-

Analysevekt m/4 desimaler. Mettler/Sartorius.

Kr. 17000,-

Butikkvekt/elektronisk vekt.(10 kg)

Kr. 10000,-

KJØLESKAP

Vanlig husholdningskap.

Kr. 3000,-

VARMESKAP

Stort varmeskap til tørking av våte prøver.

Kr. 5000,-

STALSKAP

Skap til oppbevaring av ildsfarlige kjemikalier.
Litt avhengig av lagrings forholdene.

AVTREKKSKAP

Avtrekkskap komplett med vifter og lys.

Det er mulig at dette må spesialbestilles. Vi tar utgangspunkt i de minste skapene som vi har på laboratoriene i analytisk avd.

Pris pr.skap med underskap kr.15000,-

Vi har regnet med 4 stk.

Kr. 60000,-

VANNRENSLEANLEGG

Milli-q fra millipore

Kr. 18000,-

GLASSUTSTYR

2 stk.2000 ml begerglass	kr.	57,- pr.stk.	
5 " 1000 "	kr.	25,- "	
5 " 400 "	kr.	15,50 "	
500" 250 "	kr.	13,- "	Kr. 6817,-
100" 100 ml målekolber	kr.	29,- "	
10 " 500 "	kr.	58,- "	
10 " 1000 "	kr.	86,- "	
2 " 5000 "	kr.	255,- "	Kr. 4850,-
2 " 5 ml pipette	kr.	7,75 "	
2 " 10 "	kr.	10,25 "	
2 " 15 "	kr.	15,25 "	
2 " 20 "	kr.	17,- "	
2 " 25 "	kr.	17,50 "	
2 " 30 "	kr.	20,75 "	
2 " 50 "	kr.	20,50 "	Kr. 218,-

1	"	50 ml målesylinder	kr.	10,50	"	
1	"	100	kr.	12,25	"	
1	"	250	kr.	23,75	"	
1	"	500	kr.	27,-	"	Kr. 74,-

DISPENSERE

Justerbar 0 - 50 ml	kr.	1550,- pr.stk.	
" 0 - 30 "	kr.	1425,-	"
" 0 - 10 "	kr.	990,-	"
Vi har behov for 6 dispensere.			Kr. 7930,-

URGLASS

250 stk.(plast)	kr.	3,- pr.stk.	Kr. 750,-
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EKSTRAKSJONSUTSTYR

100 stk.målekolber eller målesylindere.			
Disse må være utstyrt med plastpropp.			
Pris for målesylindere(250ml.)	kr.	40,- pr.stk.	Kr. 4000,-
Omtrent samme pris for målekolber			
100 stk. 50 ml. reagensrør.			
med bakkelite kork.	Kr.	20,- pr.stk.	Kr. 2000,-
Ristemaskin. Mod SM-25 med plass til 25 målekolber			Kr. 11000,-
Vibrator for reagensglass.IKA-VIBRO-FIX			Kr. 3000,-

REAGENSER

Au standard fra Merck.

As " "

Kaliumdikromat.

Svovelsyre

Aceton tekn.

Saltsyre. Kr.27,50 pr.l

Salpetersyre. Kr.52,- "

Methylisobutylketon. Kr.100,- "

Etanol. Kr.200,- "

LAB.UTSTYR GENERELT.

3 stk.vannstrålepumper (ejektor)

Sakser

Spatler

Skjeer

Magneter

Vaskering

Kaffetrakter

Polyetylen slanger

Plast "

Gummi "

Bunsen brennere

TFLO "

Stativer

Digeltenger

Parafilm

Gummihansker, Triflex hansker, arbeidshansker.

Plastbøtter (10 - 12 liter)	2 stk.à	Kr.30,60	Kr. 62,-
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Plastspann (5 - 10 liter)	60 " "	4.90	Kr. 294,-
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Plastbokser (2 liter,4 kant)Pris pr.stk. " 4,20

Det er behov for 50 stk.pr.dag.

Plastflasker (100 ml.) Pris pr.stk " 3,10

Det er behov for 400 stk.pr.dag.Etter analysering
blir det tilbakeført 150 - 250 tomme flasker som da
kan brukes på nytt.

UTSTYR FORØVRIG

Verktøykasse med verktøy.

Søppelbøtte for ildsfarlig avfall.

" for vanlig avfall

Koster,kluter,håndklær.

Stålull

Såper

GASS

6 flasker acetylen. Pris pr. flaske kr. 150,- Kr. 900,-
2 i drift, 2 på lager og 2 til fylling.

Leie Kr. 300 pr. år. pr. flaske.

Ventiler til gassflaskene. Kr. 400 pr. ventil Kr. 800,-

2 propan beholdere (11 kg) Kr. 9,40 pr. kg.

Leie som for acetylenfl.

DIVERSE

Bord , skrivebord.

Stoler

Telefoner.

Skrivemaskin.

Kontorrekvisita.

Herøya 23.4.85

Asheim / Einungbrekke

Asmund Asheim b. Einungbrekke

ANALYSELABORATORIUM VED KOLSVIK Au- FOREKOMST, BINDAL, NORDLAND.

Denne oversikten omfatter aktuelle ATOMABSORBSJONS-INSTRUMENTER, tilkoblet datastasjon for bearbeiding av resultatene og rapportering.

Instrumentene kan leveres fra firma PERKIN ELMER.

Prisene er gitt av PE v/Bernt Næss over telefon, og er ikke ment som et formelt tilbud.

AVTREKKSYSYSTEM FOR AAS-INSTRUMENT.

Avtrekkvifte m/trakt p.no.: 0303 0406 kr. 7.000,-

Avtrekkslange str.o. kr. 200,- /m.

REGULERINGSYSYSTEM FOR LUFT- OG GASS-TILFØRSEL FOR AAS-INSTR.

Balstone luftfilter, to filter med reg.vent. og festebrakett, egnet for tilkobling til kompressorluft. kr. 1.900,-

System for sammenkobling av to acetylenflasker med reg.vent.

Str.o. kr. 1.500,- (Henvises til liste for analyseutstyr.)

ATOMABSORBSJONSINSTRUMENTER MED DIV. TILBEHØR OG DATASTASJON-TILKOBLING.

ALTERNATIV 1.

AAS 2380 p.no.: 060 0249 kr. 215.000,-
med autom. gassboks, brennersystem
m/quick change m., Bg.-korr., enkel
lampeholder.

HULKATODELAMPE- Au p.no.: 0303 6031 kr. 5.270,-

DATASTASJON 3600 p.no.: 0290 536
med operativsystem.

LABDATA MAN.M softw. p.no.: 0057 2785
Samlet pris kr. 99.500,-

PRINTER/PLOTTER PR100 p.no.: 0047-0811 kr. 28.000,-

Totalt kr. 347.770,-

ALTERNATIV 2.

AAS 3030 p.no.: 144-656	kr. 266.000,-
med autom. gassboks, brennersystem	
med quick change m., Bg.-korr., enkel	
lampeholder.	
 HULKATODELAMPE-Au p.no.: 0303 6031	 kr. 5.270,-
 PRINTER/PLOTTER PR100 p.no.: 0047-0811	 kr. 28.000,-
 Totalt	 kr. 299.270,-

AAS 3030 har innebygget datadel og monitor. Datadelen kan bl.a. arbeide med metode, analyseresultatene, bakgrunnseffekter, rapport etc. Den kan også manipulere med rapportformen. Desuten inneholder datadelen "KOKEBOK". Skjermbildet kan dumpes ut på PR100. Ønskes grafikkmodul, betyr det et tillegg på kr. 8.400,-
Datastasjon 3600 kan IKKE tilkobles AAS 3030.
Det er en påstand at det normalt ikke vil være nødvendig med en ekstra datastasjon i tilknytting til AAS 3030.

Med hensyn til AAS 3030/AAS 2380 er alle speil i optikken like, men den optiske benken er forskjellig. Det oppgis at langtidsstabiliteten er bedre for AAS 3030.

DATASTASJON 3600.

3600-pakken må spesifiseres for det AAS-instrument man ønsker, p.g.a. interf. Prisen er den samme.

ALTERNATIV 3.

AAS 5000 p.no.: 040 0474 kr. 466.500,-
med autom. gassboks, brennersystem
med quick change m., Bg-korr., enkel
lampeholder.

HULKATODELAMPE- Au p.no.: 0303 6031 kr. 5.270,-

DATASSTASJON 3600 p.no.: 0290 536
med operativsystem.
LABDATA MAN.M. softw. p.no.: 0057 2785

Samlet pris kr. 99.500,-

PRINTER/PLOTTER PR100 p.no.: 0047-0811 kr. 28.000,-

Totalt kr. 599.270,-

ALTERNATIV 4.

AAS 5000 p.no.: 040 0474 kr. 466.500,-
med autom. gassboks, brennersystem
med quick change m., Bg-korr., enkel
lampeholder.

HULKATODELAMPE-Au p.no.: 0303 6031 kr. 5.270,-

DATASSTASJON 7500 kr. 300.000,-

PRINTR/PLOTTER PR100 p.no.: 0047-0811 kr. 28.000,-

Totalt kr. 799.770,-

DATASTASJON 7500.

Det er viktig å merke seg, at dersom man av datatekniske grunner ønsker DATASTASJON 7500, MÅ MAN OGSÅ VELGE AAS 5000 SOM ANALYSEINSTRUMENT, da denne datastasjonen ikke kan tilkobles de andre instrumentalternativene.

Man kan ikke ta endelig stilling til AAS-instrument, før man har valgt datastasjon.

RESERVEDELER.

Reservedelkit.

Komplett Ir/Pt-nebul. p.no.: 0303 0299	kr. 6.000,-
Brennkammer/enspaltbrenner p.no.: 057 0988	kr. 5.000,-
Pakningsett og to drain-slanger	kr. 400,-

Originale drain-slanger lev. fra PERKIN ELMER er ikke aktuelt, da de ikke tåler MIBK over tid.

Det er aktuelt å benytte polyetylenslange. Kostnadene er minimale.

TILLEGGSUTSTYR FOR ARSEN-ANALYSE.

Dersom muligheten for analyse av As ønskes, vil ett av de to flg. alt. være nødvendig.

1. HULKATODELAMPE-As p.no.: 0303 6011	kr. 5.110,-
2. EDL-As p.no.: 0303 6211	kr. 4.810,-
EDL-POWERSUPL. enkelt, p.no.: 0057 0762	kr. 22.400,-

LEVERINGSTID.

Leveringstid er normalt 3-4 uker etter at fabrikken har mottatt bestillingen. Samlet vil det bety 4-5 uker etter at den norske representanten har mottatt formell bestilling.

Dersom man presiserer at det haster, kan levering i løpet av en uke være mulig.

PERKIN ELMER, Oslo, har et demo.-instr. type AAS 3030 disponibelt i løpet av mai 1985.

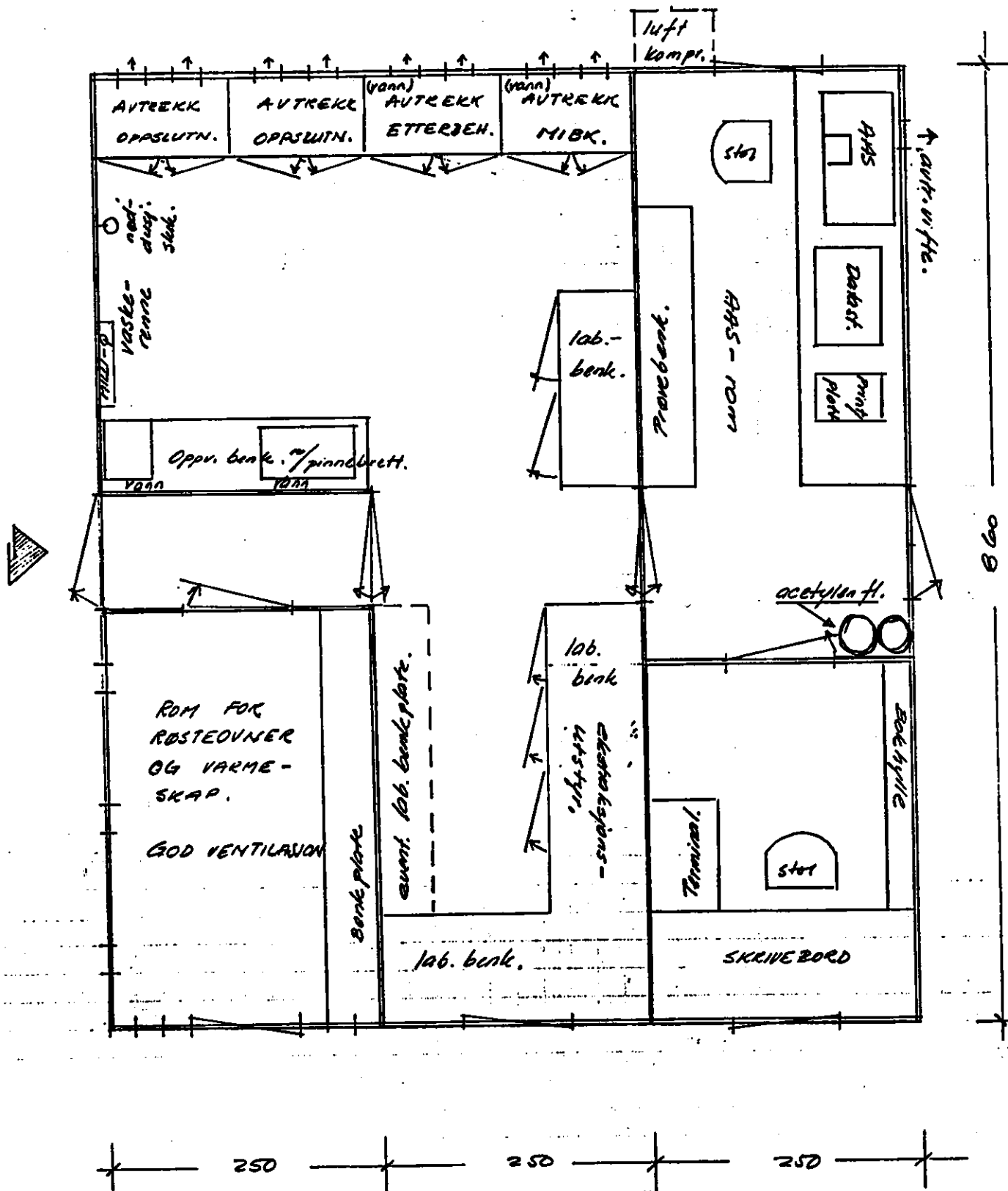
F-SENER, Analyt.avd. 23.04.85

Asheim / Einungbrekke

Ansvarlig: Einungbrekke

Forslag til analyselaboratorium, Kolsvik Au-forekomst,
Bindal, Nordland.

Forslaget baserer seg på bruk av 3 stk. Høelund-
bunker.



PROSEDYRE FOR INNVEIING, RØSTING, OPPSLUTNING, EKSTRAKSJON, ANALYSE OG RAPPORTERING.

Prosedyren er ikke ferdig gjennomarbeidet.

Besøk hos et analyselaboratorium for gullanalyser, eksempelvis Caleb Brett, bør gjennomføres.

Slike laboratorier behandler kontinuerlig et stort antall prøver, og har opparbeidet erfaring vi kan dra nytte av.

Etter at prøvene er ferdig knust, malt og splittet, vil følgende være en aktuell framgangsmåte.

Fra de splittene som ønskes analysert, veies det inn 50 g prøve i en 80 mm porselensskål.

Prøven plasseres deretter i en røsteovn v/600 C i 1 time.

Prøven avkjøles og overføres til et 250 ml begerglass (høy form).

Det tilsettes 30 ml HCl og etter endt reaksjon tilsettes 10 ml HNO_3 .

Begerglassene dekkes med urglass.

Etter tilsats av HCl og HNO_3 , plasseres begerglassene på varmt sandbad.

Etter at den første kraftige reaksjonen med aq.reg. har avtatt, fjernes urglassene og prøven dampes inn til tørrhet på sandbadet.

Prosedyren fra tilsats av HCl/ HNO_3 til prøvene er tørre, bør kunne gjennomføres iløpet av omkring 4 timer.

Det er antakelig nødvendig med små justeringer i framgangsmåten.

De tørre prøvene gjenløses i 25 ml HCl og 75 ml H_2O , (varmt sandbad).

Hele prøveløsningen overføres til en 250 ml målekolbe med plastpropp (alternativt målesylinder m/plastpropp)

Prøveløsningen vaskes ut av begerglasset med minst mulig 3 M HCl.

Det tilsettes 10 ml MIBK, og løsningen ekstraheres i 1 min., v.h.å. en ristemaskin.

Etter faseskille suges MIBK-fasen over i et 20 ml reagensrør m/skrukork.

Det tilsettes 10 ml 0,2 M HCl, og MIBK-fasen vaskes med hensyn på medekstrahert Fe, ved å riste på reagensrøret, (IKA mini-risteverk).

MIBK-ekstraktet analyseres på Au v.h.a. AAS-flammeteknikk/BG-korr., mot blind og Au-standarder/MIBK.

For å klarlegge det beste standardområdet er det nødvendig å utføre noen undersøkelser.

Med hensyn til ekstraksjonen utført i målekolbe på ufiltrert prøve, er det også nødvendig med noen undersøkelser.

For hver femte prøveavlesning på AAS-instrumentet, skal instrumentet rekalkibreres v.h.a. reslope-funksjon.

Det benyttes cons. mode og instrumentet settes opp slik at ppm Au leses direkte ut.

For prøver med konsentrasjoner større enn standardområdet, gjøres mellomfortynning med MIBK. Disse analyseres omigjen mot slutten av serien.

Analyseresultatene leses direkte fra AAS-instrumentet til DATA-stasjonen, hvor rapporten lages og lagres. Printer tilkoblet DATA-stasjonen skriver ut analysebevis.

FORSKNINGSSENTERET, PORSGRUNN 03.05.85.

Einungbrekke/Asheim.

E. Einungbrekke *Asheim*

FLYTSKJEMA OMFATTENDE ANALYSEPROSEDYRE FOR Au .

150 - 250 prøver / dag

Innveiling
50 gram prøve

Røsting 600 °C
i 1 time

Tilsats av HCl + HNO₃
Aq.reg.

Prøvene er overført til 250 ml begerglass

Inndamping til
tørhet

Gjnløsing i
HCl + H₂O

Overføring til
målekolbe

Tilsats av MIBK og
ekstraksjon i 1 min.

Vasking av MIBK-fasen
med 0.2 M HCl

MIBK-fasen er overført til 20 ml reagensrør

Analyse av Au
FAAS

Rapport

Oct 16/8 15

Hitec Ore Process Inc.
att: Douglas Brown
6535 Millcreek Drive
Unit 44

MISSISSAUGA ONT.

CANADA L5N 2M2

Referring to ltr contact between
our Jan Bida and yours
Douglas Brown I have to day
send by air 2 parcels
containing approximately 5 kg
of An-asp. one each.

The two types C and F are
thought to represent the
two extremes in our deposits

Type C - g-rich, VG

Type F - asp rich, no VG.

This type C is hand picked and
probably more g rich and An rich
than in normal C type ore.

This is due to lack of

more representative material
from @ type in office

Best regards

~~O. V. V. V. V.~~

Tore Vrålstad
EXPL MANAGER

POC. TERRA MINING A.S.
% NORSE HYDRO.
Bygøy ALLE 2
Oslo 2
NORWAY.

① Grav.

Flot

Reste
(Treyke luting)

ew
LAKC

↑
C (CIL)

FILMER

↑
C (CIP)

Au C - Slt. Au

fast
+ Elektro
winning
Stahl

Zn - STDV.

Au Zn. Bonat SO₂ H₂ → Au
Smelte → Au

(GRAVITY.) Direct Leaching — Zn. — Slt — C Au —
Filtre — Kolonne C —
form. + Zn —

Refractory malay = Reste
also Treyke lute H₂S
Free Milling Au filz purpur
Hgt @ inn hsl Problem

F. Dybckel:
07-55 8522



Norsk Hydro

Forsøgsanlæg Risø

Proceskemi,

4000 Roskilde

DANMARK

Deres ref.

Deres brev av

Vår ref.

Dato 13/2 1985

Kære Jørgen Jensen,

Hermed følger to prøver til opredningsforsøg. Skulle disse falde heldigt ud vil vi sandsynligvis gå videre med sagen. Vi er specielt interesseret i de miljømæssige aspekter ved processen, så hvis I har noget skriftligt om dette, eventuelt fra det canadiske anlæg, vil vi være taknemmelige for at modtage en kopi. Også en beskrivelse af processen vil være af interesse.

Regningen for forsøgene kan sendes til mig på nedenstående adresse; venligst mærk konvolutten med "Prospekteringsafdelingen".

Med venlig hilsen,

Frank Pedersen

Senior Geolog

PRØVELISTE

PRØVE 3741034 ER PÅ CA. 3.2 KG OG BESTÅR AF
FØLGENDE 0.4 KG'S PRØVER:

		AU G/T	AS %	
3741034	1-2	12.17	0.98	} 0,94
— " —	3-4	12.08	0.98	
— " —	5-6	12.16	0.97	
— " —	7-8	12.50	0.97	
— " —	9-10	12.42	0.96	
— " —	35-36	12.96	0.89	
— " —	37-38	12.96	0.98	
— " —	39-40	11.96	0.88	

PRØVE 3741028 ER PÅ CA. 3.2 KG OG BESTÅR AF
FØLGENDE 0.4 KG'S PRØVER:

		AU G/T	AS %
3741028	3-4	20.16	1.22
— " —	5-6	18.00	1.30
— " —	7-8	18.92	1.33
— " —	9-10	16.92	1.24
— " —	11-12	18.50	1.40
— " —	13-14	19.92	1.24
— " —	15-16	17.33	1.22
— " —	17-18	18.42	1.29

KORNSTØRRELSE AF PRØVEMATERIALE ER -200 MESH.

RISØ

Forsøgsanlæg Riso

Postboks 49
4000 Roskilde
Tlf. (02) 371212, Telex 43116
Telegramadr. Risatom

Dato 28. februar 1985
Deres ref.
Vor ref. 35950-68-85/JJ/hk
Afdeling Proceskemi

Norsk Hydro
Prospekteringsafdelingen
Postbox 2594 Solli
0203 Oslo 2
Norge

Kære Frank Pedersen,

Tak for dit brev og de tilsendte prøver. Vi har nu gennemført de orienterende forsøg og resultaterne fremsendes hermed. Som det ses er ekstraktionsresultaterne fra thiourea-forsøgene ikke opmuntrende, hvorimod parallelforsøget med cyanid er godt.

Forsøg 1, thiourea-ekstraktion.

Reagens: Thiourea $\text{CS}(\text{NH}_2)_2$ 5 o/oo
Væske/faststof: 10:1
Iltningsmiddel: Ferriklorid
Surhedsgrad: pH 1,5 afstemt med H_2SO_4
Ekstraktionstid: Op til 24 timer

Udbytte Au: 0%.

Forsøg 2, thiourea-ekstraktion.

Malmen forbehandlet ved ristning.
I øvrigt som forsøg 1.

Udbytte Au: ca. 25%.

Forsøg 3, cyanid-ekstraktion

Reagens: Natriumcyanid NaCN 1 o/oo

Væske/faststof: 5:1

Surhedsgrad: pH 11 afstemt med NaOH.

Ekstraktionstid: 24 timer

Udbytte Au: 99%.

Konklusion: De orienterende undersøgelser viser, at malmen vanskeligt kan behandles ved anvendelse af thiourea-metoden. Om et flotationskoncentrat vil være mere medgørligt, er vanskeligt at sige, da vi bl.a. ikke kender malmens mineralogi.

Cyanidekstraktionsmetoden virker umiddelbart anvendelig. Vi har anvendt et væske/faststof forhold på 5 til 1. Det er højst sandsynlig at dette kan reduceres væsentligt. Hvad angår neutralisering af cyanidrester i tailings, vil vi anbefale destruktion med SO₂+luft (INCO-processen).

Såfremt det har din interesse, vil vi meget gerne tilbyde vor assistance ved udvikling af cyanidprocessen til anvendelse på den fremsendte malm.

Jeg kan nævne, at vi igennem de sidste 5 år har foretaget omfattende investeringer i udstyr til mineraloparbejdning, og vi råder i dag over et af Europas mest moderne pilotanlæg for hydrometallurgisk behandling af malm og andre råstoffer. Jeg vil i den forbindelse gerne gentage min invitation til et besøg her hos os, for mere detaljeret information om vort arbejde og for drøftelse af eventuelt nærmere samarbejde.

Til orientering vedlægger jeg lidt materiale, som illustrerer lidt af vor virksomhed. I den canadiske rapport har jeg slettet kundens navn, da vi ikke har indhentet firmaets tilladelse til offentliggørelse.

Jeg imødeser dit svar.

Med venlig hilsen


Jørgen Jensen



A lump of rock...

What does it contain? Can it be extracted? Will it be worth it?



Risø has gained invaluable experience in the mountains of Greenland.



Samples of ore are removed for piloting.



Risø's laboratories undertake all types of mineral analysis.

A mountain filled with uranium

On the west coast of Greenland, some 400 km from Cape Farewell, lies Kvanefjeld. Kvanefjeld is the highest point on a mountain plateau placed about 8 km north-east of the town of Narssaq. The plateau covers an area of 2.5 km² and contains a very large occurrence of uranium. The existence of this deposit has been known since 1956, and during the following years technical and scientific investigations of varying intensity were conducted with the object of extracting the uranium.

In 1976 it was revealed that Kvanefjeld contains about 80 million tons of ore with an average yield of 340 g of uranium per ton. In 1977 a comprehensive investigation project was therefore initiated to investigate the technical, economical and environmental factors involved.

In order to extract uranium from this ore our engineers developed a new method based on the principle of carbonate pressure leaching.

Play safe – ask Risø

Gone are the days when diamonds could be shovelled up from the topsoil and oil or gold might be struck almost anywhere.

Today you have to dig deep.

It means big investments.

If unforeseen technical problems should arise, a lot of money will be at stake.

But risks can be minimized by asking plenty of good questions – and getting expert answers.

How far, for example, is it wise to pursue investigations into geological factors and mining techniques before clarifying the technical and chemical problems which extraction may present?

How costly is the extraction process likely to prove?

How much is predictable?

Can a reliable feasibility study be made?

Does an extraction process for the mineral in question even exist as yet?

What about by-products? How can they be extracted? Will it be profitable?

Today, thanks to technological advances, questions like these – and many others – can be answered before serious commitments are made.

Risø – one of the most advanced pilot plants in the world

If you are considering a major investment in what you hope could be a highly profitable mining venture, we at RISØ can probably help you.

We have been conducting research on uranium and other types of metal extraction for more than 20 years.

This has resulted in the development of a pilot plant that is one of the most advanced of its kind in the world, operating on the principle of carbonate pressure leaching.

This pilot plant was established at RISØ in 1981 on the basis of far-reaching laboratory tests and analyses.

We are now in a position to place these unique facilities at your disposal.

Operational flexibility

The pilot plant is complete and self-contained. The entire extraction process can be covered right from the crushing station and grinding mill to the final precipitation of concentrates.

A high degree of operational flexibility has been achieved. The various processes can operate either as an integral whole or separately according to the nature of the crushed material and how far it is desired to carry through the process.

The plant is simple to operate and is instrumented with a view to assembling a wide range of precise data. It has been designed to handle a variety of ore types and minerals, which can be produced under alkaline or neutral conditions.

The heart of the plant is a pipe reactor which makes continuous treatment of the suspension possible and reduces the reaction time to a few minutes.

Our laboratories are naturally equipped to undertake metal extraction investigations of all kinds.

We make cost analyses and feasibility studies and can also help you with all aspects of process and engineering design.

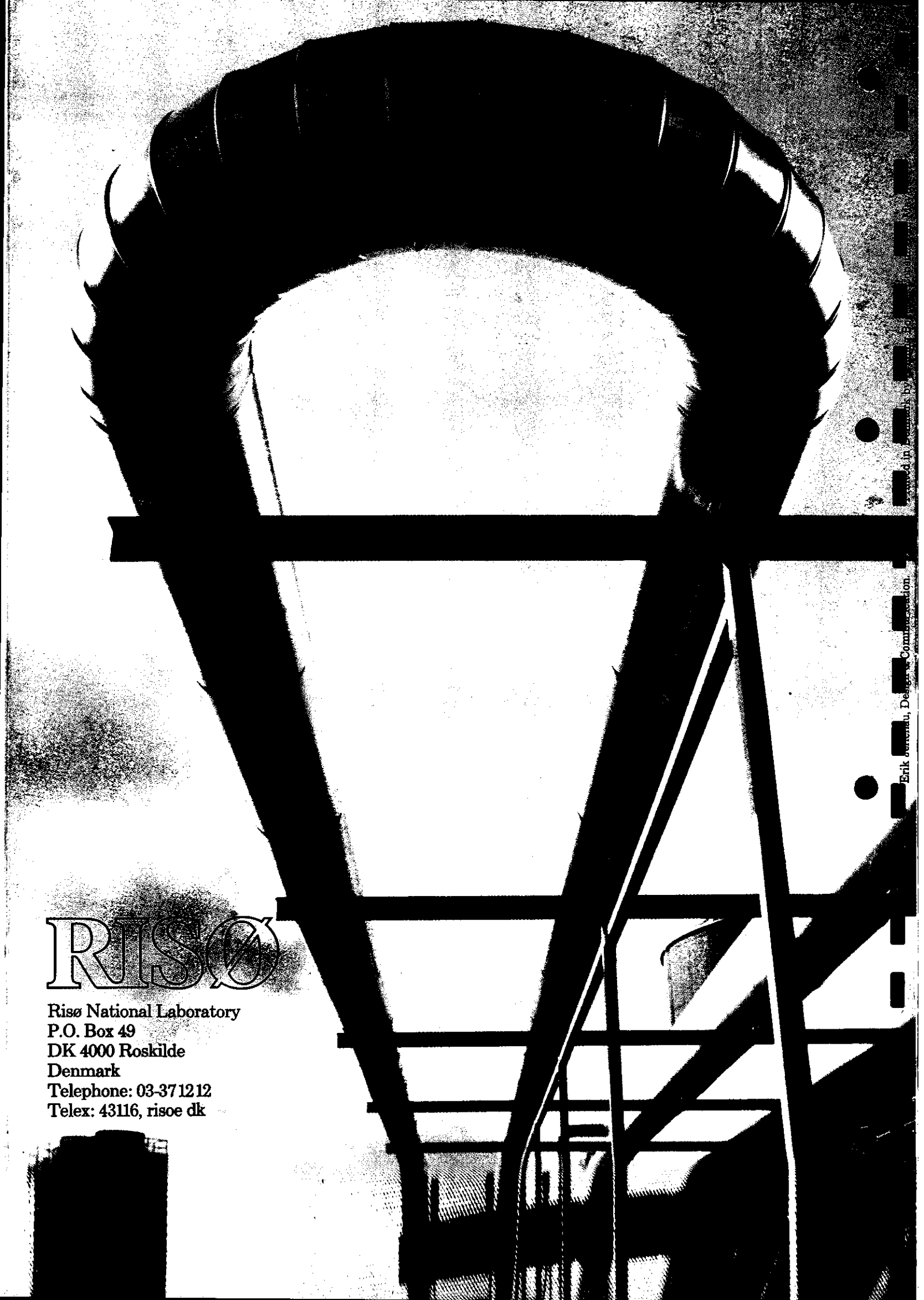
Risø National Laboratory

Located in beautiful surroundings beside Roskilde Fjord near the historical town of Roskilde, the RISØ NATIONAL LABORATORY is the largest research institute in Denmark.

The institute was created in 1956 to undertake research and development on peaceful exploitation of atomic energy for the benefit of society as a whole. Until 1976, RISØ was operated under the auspices of the Danish Atomic Energy Commission. From the very outset, the laboratory's activities included research in all areas of nuclear science as well as basic and technological research in such fields as physics, chemistry, meteorology, metallurgy, agriculture, radiation technology, etc.

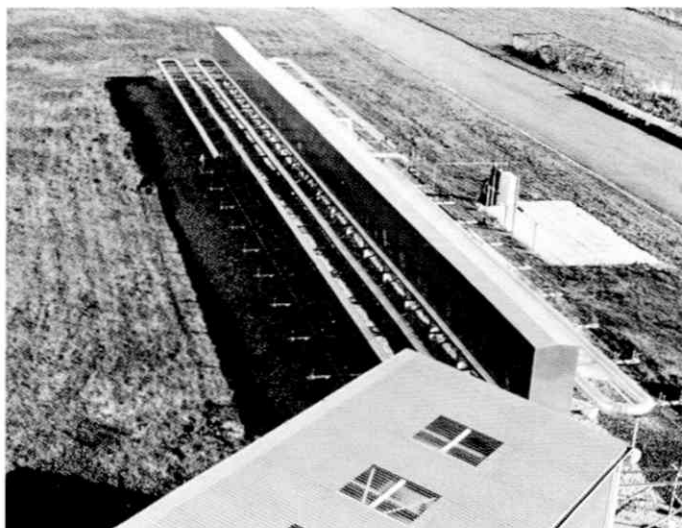
By the Energy Policy Measures Act of 1976, RISØ became a National Laboratory under a new governing board of 10 members and a board of management with a director and three assistant directors. This Act moreover widened the scope of the laboratory's activities to include non-nuclear energy research and contract research for other parties.

The broadly-based experience and knowledge gained by RISØ's staff over the years can now be utilized to a far greater extent for the benefit of all who choose to avail themselves of the opportunity.

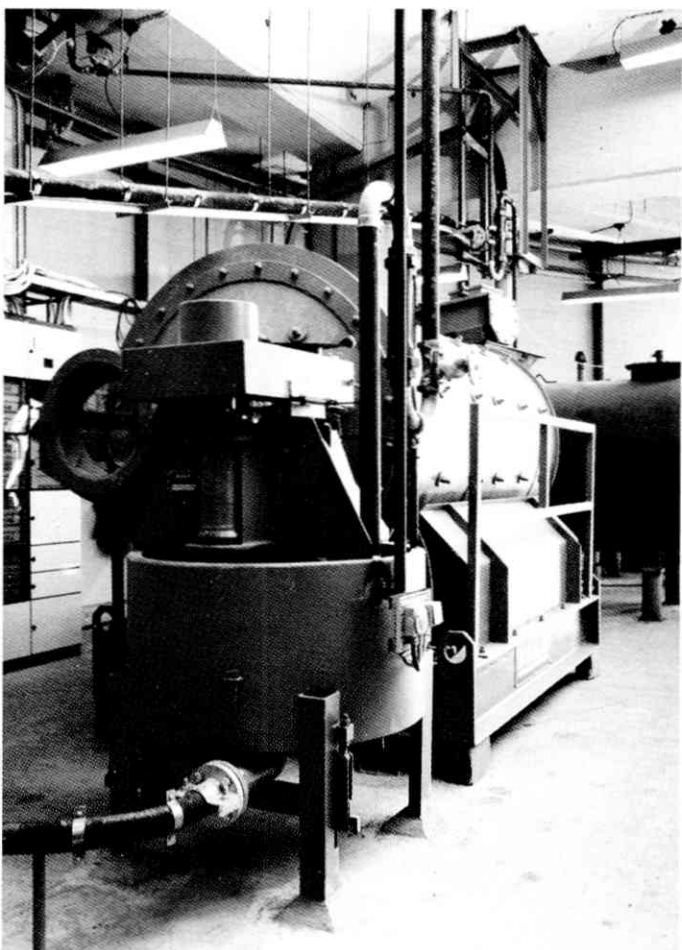


RISØ

Risø National Laboratory
P.O. Box 49
DK 4000 Roskilde
Denmark
Telephone: 03-371212
Telex: 43116, risoe dk



Pipe autoclave for continuous leaching of minerals.



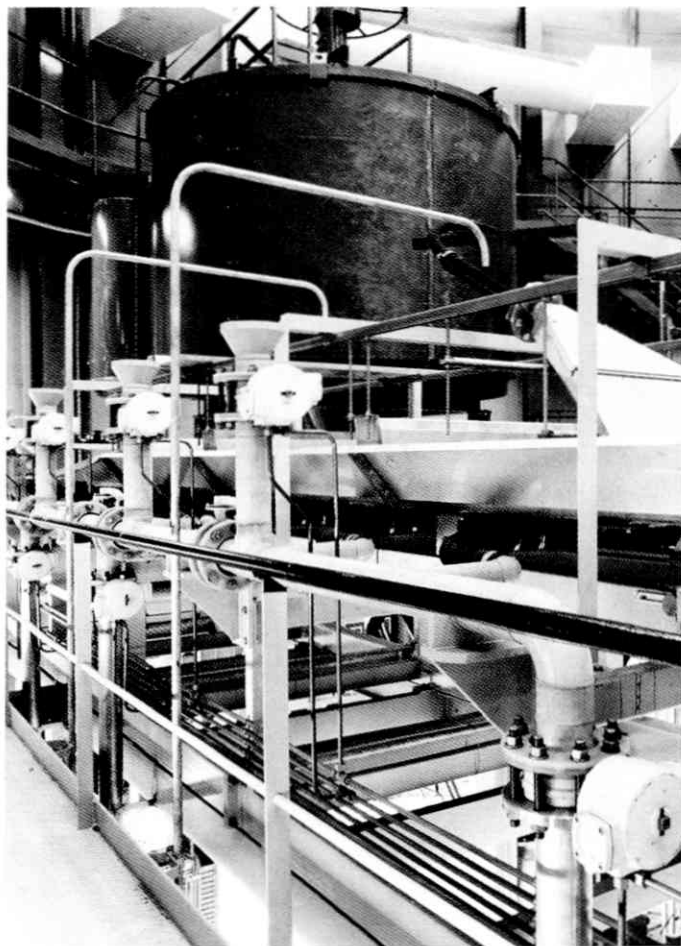
Ball mill for wet grinding.

Pilot plant operation

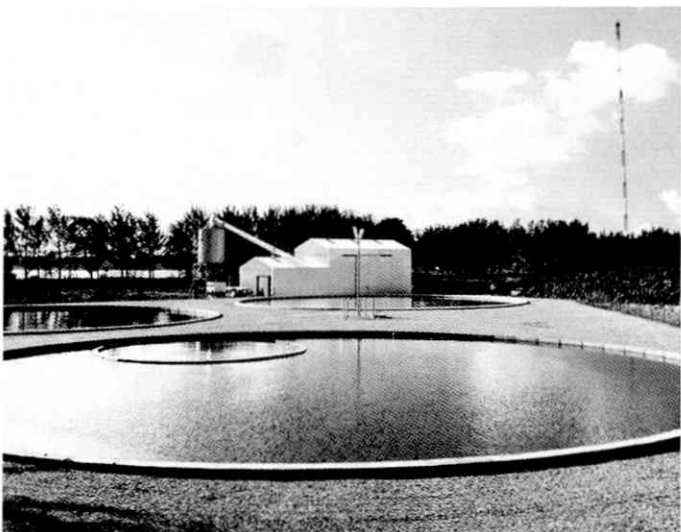
The Risø pilot plant includes different operations. The ore is delivered to the crusher plant.

The crushed material, ground to between 0 and 6 mm, is delivered to the feed bin of the ball mill. The ball mill is incorporated in the leaching circuit, the grinding fluid being the carbonate leach solution.

The ground slurry is adjusted to the desired liquid/solid ratio and introduced into the pipe autoclave by means of the piston membrane pump. The slurry is



Vacuum belt filters for counter-current washing.



Tailings basins also assist enviromental research.

then heated to the reaction temperature. After the addition of oxygen it is passed through a length of tube corresponding to the time of the reaction. It gives off heat to the incoming suspension and leaves the system through a tube with reduced bore.

On the belt filter, the cake is washed three times in counter current, whereupon the filter-cake is repulped with water in a thickener to remove what might be left of water-soluble matter. The surplus overflow is passed through an ion exchanger.

Risø carbonate pressure leaching process pilot plant

Flow sheet for uranium extraction

Ore type: alkaline igneous rock called lujavrite. 340 ppm U. An important accessory is NaF (villiaumit, 1%).

