



Bergvesenet

Postboks 3021, 7002 Trondheim

Rapportarkivet

Bergvesenet rapport nr BV 1696	Intern Journal nr	Internt arkiv nr	Rapport lokalisering Trondheim	Gradering
Kommer fra ..arkiv	Ekstern rapport nr LV 21	Oversendt fra	Fortrolig pga	Fortrolig fra dato:
Tittel Løkkenmalmens hydrotermale tilførselssone: Geokjemisk dispersjonsmønster og stockwork-mineralisering. Bind II				
Forfatter Grenne, Tor		Dato 05.04 1984	Bedrift Orkla Industrier A/S	
Kommune Meldal	Fylke Sør-Trøndelag	Bergdistrikt Trondheimske	1: 50 000 kartblad 15213	1: 250 000 kartblad
Fagområde Geologi Geokjemi	Dokument type	Forekomster Løkken		
Råstofftype Malm/metall	Emneord			
Sammendrag Rapporten består av bilag til BV 1695.				

ORKLA INDUSTRIER A/S

MINING SECTION
EXPLORATION

GULF ORKLA
LØKKEN VENTURE

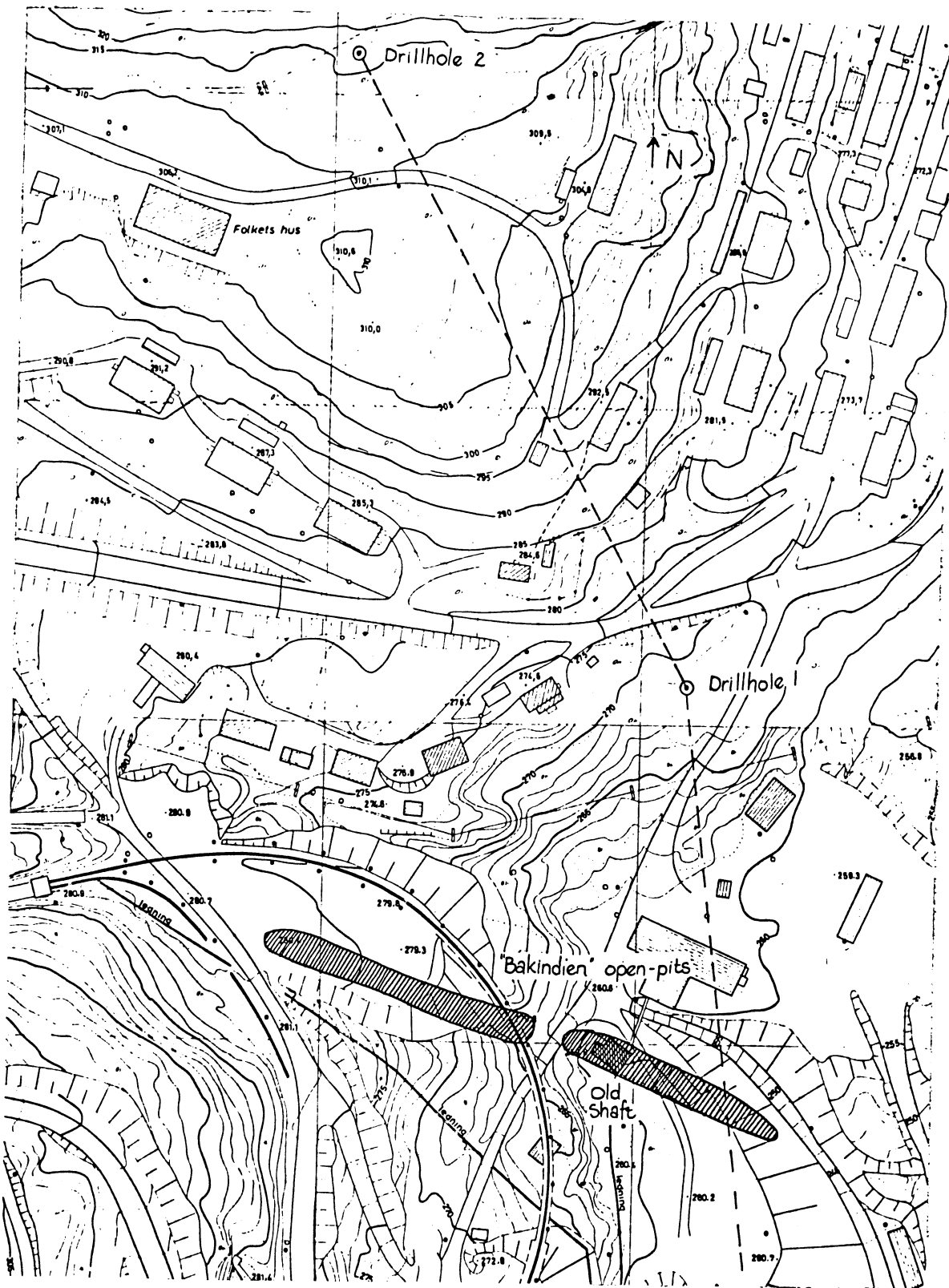
Report no: 21 Date: apr. 84

Title: Enclosures

BILAG (ENCLOSURES)

1. Løkken-Høydal map, 1:50.000
2. Borhullsplassering (Location of drill-holes) 1:5.000
3. Analysetabeller (Table of analyses)
4. Borhullsdiagram (Drill-hole sections) 1:1.000
5. Geologisk vertikalsnitt (Vertical geological cross-section) 1:2.000
6. Gjennomsnittlig sammensetning av Løkkenmetavulkanitter (Average composition of Løkken metavolcanites)
7. Bergartsgeokjemi, variasjonsdiagram Gammelsjaktområdet (Lithogeochemistry, variation diagrams, Old Shaft area)
 - a. SiO_2 , Al_2O_3 , Fe_2O_3 , MgO , CaO , Na_2O , K_2O
 - b. MnO , TiO_2 , P_2O_5 , Zr, Y, V, Sr
 - c. Cr, Ni, Co, Zn, Cu, Pb, S, Hg
 - d. B, Ni/Cr, Y/Zr, TiO_2/Zr
8. Bergartsgeokjemi, variasjonsdiagram borhull 1 (1:1.000) (Lithogeochemistry, variation diagrams, drill-hole 1)
 - a. SiO_2 , Al_2O_3 , Fe_2O_3 , MgO , CaO , Na_2O , K_2O
 - b. MnO , TiO_2 , P_2O_5 , Zr, Y, V, Sr
 - c. Cr, Ni, Co, Zn, Cu, Pb, S, Hg
 - d. B, Ni/Cr, Y/Zr, TiO_2/Zr
9. Bergartsgeokjemi, variasjonsdiagram, borhull 2 (1:1.000) (Lithogeochemistry, variation diagrams, drill-hole 2)
 - a. SiO_2 , Al_2O_3 , Fe_2O_3 , MgO , CaO , Na_2O , K_2O ,
 - b. MnO , TiO_2 , P_2O_5 , Zr, Y, V, Sr
 - c. Cr, Ni, Co, Zn, Cu, Pb, S, Hg
 - d. B, Ni/Cr, Y/Zr, TiO_2/Zr
10. Sulfidårer, geokjemisk variasjonsdiagram Gammelsjaktområdet (Sulphide veins, geochemical variation diagram, Old Shaft area)
 - a. S, Cu, Zn, Ag, Cd, Au
 - b. Mn, Cr, Ni, Co, Pb

11. Sulfidårer, geokjemisk variasjonsdiagram borhull 1 (1:1.000)
(Sulphide veins, geochemical variation diagram, drill-hole 1)
 - a. S, Cu, Zn, Ag, Cd, Au
 - b. Mn, Cr, Ni, Co, Pb
12. Sulfidårer, geokjemisk variasjonsdiagram borhull 2 (1:1.000)
(Sulphide veins, geochemical variation diagram, drill-hole 2)
 - a. S, Cu, Zn, Ag, Cd, Au
 - b. Mn, Cr, Ni, Co, Pb
13. Bergartsgeokjemi, elementfordeling i vertikalsnitt (1:2.000)
(Lithogeochemistry, element distribution patterns, vertical cross-section)
 - a. SiO_2
 - b. Fe_2O_3 (total Fe)
 - c. MgO
 - d. CaO
 - e. Na_2O
 - f. K_2O
 - g. MnO
 - h. Sr
 - i. Cu
 - k. Zn
 - m. Co
 - n. B
 - o. TiO_2/Zr
 - p. Y/Zr
 - q. Ni/Cr
 - r. S
14. Sulfidårer, elementfordeling i vertikalsnitt (1:2.000)
(Sulphide veins, element distribution patterns, vertical cross-section)
 - a. Cu
 - b. Zn
 - c. Pb



Location of drillholes

Orkla Industrier A.s
7332 LØKKEN VERK
Gulf- Orkla Venture

Scale: 1:2000	Draw	TG
	Trac	AM
	Date	apr 8

No :

Enclosure no : 2

Report no: LV21



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SAMPLE NUMBER	ELEMENT UNITS	SiO2 PCT	TiO2 PCT	Al2O3 PCT	Fe2O3† PCT	MnO PCT	MgO PCT	CaO PCT	Na2O PCT	K2O PCT	P2O5 PCT	S PCT
LO-1		61.60	0.76	16.30	11.00	0.14	6.95	0.19	1.02	3.34	0.10	0.38
LO-2		61.00	0.77	13.60	14.20	0.10	7.11	0.05	1.00	1.04	0.15	0.54
LO-3		61.00	0.15	6.80	13.70	<0.01	0.29	0.26	0.18	2.10	0.06	11.40
LO-4		51.70	1.43	13.60	24.00	0.15	7.68	<0.01	0.64	0.36	0.11	1.98
LO-5		54.50	1.18	12.00	24.30	0.13	6.86	0.25	0.10	0.05	0.10	4.65
LO-6		57.40	0.69	8.02	10.50	<0.01	0.42	0.15	0.77	1.08	<0.01	13.10
LO-7		71.70	0.50	8.94	10.40	0.03	1.35	0.06	1.40	0.94	0.06	7.12
LO-8		69.80	0.60	11.60	9.74	0.02	1.36	0.22	1.19	1.40	0.14	5.87
LO-9		65.10	0.18	7.72	10.50	<0.01	0.17	0.12	0.56	1.78	0.01	10.10
LO-10		63.90	0.11	9.28	11.10	0.03	1.46	0.30	0.62	1.56	0.12	5.83
LO-11		68.40	0.42	8.60	10.20	0.04	1.66	0.14	0.42	1.46	0.06	4.36
LO-12		53.40	1.76	14.90	16.90	0.21	8.09	<0.01	0.37	1.02	0.08	2.13
LO-13		42.40	1.48	15.30	10.30	0.21	16.90	1.47	0.45	0.05	0.10	0.55
LO-14		42.20	1.63	15.20	27.80	0.22	9.70	0.04	0.09	0.06	0.09	2.25
LO-15		49.80	1.55	19.70	5.60	0.22	9.81	1.86	3.85	0.39	0.31	0.19
LO-16		63.20	1.05	13.70	7.86	0.18	8.64	1.22	3.27	<0.01	0.23	0.50
LO-30		57.30	1.55	14.90	10.00	0.17	4.88	3.98	6.36	0.09	0.22	0.02
LO-101		44.60	2.07	14.10	15.20	0.21	6.92	10.40	2.68	0.12	0.28	0.29
LO-102		46.80	1.56	14.90	12.70	0.20	8.46	8.93	3.28	0.35	0.20	0.03
LO-103		45.80	2.02	12.90	12.70	0.26	7.65	9.09	2.37	0.06	0.23	<0.01
LO-104		51.40	1.90	16.30	11.50	0.12	10.20	2.04	4.96	<0.01	0.13	<0.01
LO-105		47.30	2.01	16.60	19.00	0.10	7.05	1.99	5.41	0.04	0.11	<0.01
LO-106		48.30	1.49	17.90	5.93	0.16	12.50	2.14	4.12	0.01	0.11	0.02
LO-107		51.80	1.38	18.20	2.87	0.33	13.50	0.84	4.94	<0.01	0.09	0.78
LO-110		40.80	1.46	16.30	20.50	0.45	11.90	<0.01	0.79	0.44	0.07	2.88
LO-112		53.10	1.60	14.30	20.00	0.22	7.89	0.13	0.46	0.69	0.15	2.57
LO-114		52.40	1.83	14.90	14.40	0.32	9.55	0.02	0.32	0.76	0.13	2.19
LO-115		51.80	1.81	13.50	20.50	0.18	9.94	0.21	0.64	0.13	0.13	0.97
LO-118		40.30	1.70	15.70	24.60	0.22	9.93	0.10	0.04	0.10	0.10	2.26
LO-122		36.20	1.90	17.50	26.10	0.20	12.00	0.24	0.71	0.34	0.10	1.37
LO-124		42.50	1.80	17.50	26.50	0.14	9.36	<0.01	0.03	1.04	0.10	3.74
LO-128		37.90	2.32	18.30	24.40	0.23	9.28	<0.01	<0.01	0.86	0.12	2.91
LO-131		47.10	2.64	18.10	5.00	0.21	16.70	<0.01	2.08	<0.01	0.12	0.53
LO-132		51.50	0.42	3.70	3.90	0.10	27.40	12.10	<0.01	<0.01	0.14	0.72
LO-133		64.00	0.98	15.80	6.83	0.08	7.22	0.96	5.29	0.83	0.14	0.25
LO-134		55.70	0.94	13.90	7.08	0.13	4.81	9.69	5.97	0.11	0.13	0.17
LO-135		45.30	0.86	13.30	5.08	0.07	4.74	15.40	4.32	0.11	0.19	0.08
LO-136		43.10	0.80	11.80	6.83	0.09	5.84	15.40	4.48	0.05	0.19	0.26
LO-137		44.40	0.85	11.90	6.62	0.11	4.81	15.10	4.62	0.05	0.20	0.34
LO-138		51.30	1.09	14.50	9.11	0.13	6.37	6.22	5.76	0.17	0.10	0.15



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SAMPLE NUMBER	ELEMENT UNITS	SiO2 PCT	TiO2 PCT	Al2O3 PCT	Fe2O3* PCT	MnO PCT	MgO PCT	CaO PCT	Na2O PCT	K2O PCT	P2O5 PCT	S PCT
LO-139		46.70	1.35	14.80	10.70	0.16	7.03	6.74	4.97	0.09	0.15	<0.01
LO-140		45.40	1.14	18.10	10.00	0.14	8.01	8.45	3.86	1.26	0.14	0.04
LO-141		44.30	0.93	19.30	8.57	0.14	7.80	8.19	4.86	0.71	0.15	0.02
LO-142		47.00	0.80	20.90	7.86	0.17	1.09	3.32	4.23	2.62	0.09	0.05
LO-143		45.30	1.50	14.10	10.40	0.24	9.79	5.70	3.67	0.03	0.16	0.10
LO-144		48.60	1.57	16.50	8.13	0.17	11.40	5.31	5.26	0.07	0.18	0.09
LO-145		46.00	0.89	16.00	8.23	0.18	8.96	7.97	4.53	0.08	0.13	<0.01
LO-147		49.60	2.02	15.60	9.27	0.29	10.30	1.23	3.43	<0.01	0.13	0.26
LO-148		52.30	1.51	14.30	12.20	0.19	8.17	1.51	3.90	0.09	0.12	0.14
LO-150		40.70	1.34	14.00	11.30	0.40	13.10	5.47	1.15	<0.01	0.15	<0.01
LO-151		48.60	1.10	14.10	15.80	0.25	9.20	1.15	2.50	0.07	0.07	0.46
LO-152		29.70	1.14	16.90	32.10	0.21	9.80	1.05	0.02	0.19	0.06	1.50
LO-153		39.60	1.13	16.90	17.80	0.23	10.50	1.03	2.51	0.07	0.08	0.08
LO-155		32.80	1.54	17.00	34.40	0.21	10.80	<0.01	0.72	0.53	0.06	0.78
LO-158		40.20	1.55	13.00	33.90	0.19	10.70	0.69	0.71	<0.01	0.09	0.08
LO-160		35.60	1.33	13.80	35.10	0.22	10.50	0.54	0.11	0.03	0.09	1.73
LO-163		33.90	1.84	14.40	31.50	0.28	10.80	0.79	<0.01	<0.01	0.12	1.40
LO-165		47.70	1.61	14.00	11.30	0.31	11.60	3.31	1.92	<0.01	0.13	0.08
LO-168		47.40	1.18	15.20	10.10	0.45	10.30	3.47	4.20	0.48	0.09	0.26
LO-169		47.00	1.42	13.20	7.85	0.44	9.41	7.48	2.66	0.23	0.14	0.40
LO-170		50.10	1.60	13.80	7.07	0.42	9.64	5.17	4.07	0.04	0.15	0.34
LO-171		49.60	1.42	11.90	9.94	0.25	9.01	8.86	3.59	0.01	0.17	0.06
LO-172		43.80	1.64	15.20	10.40	0.28	10.60	4.32	3.30	<0.01	0.16	1.04
LO-173		48.60	1.65	13.10	10.30	0.21	8.13	7.78	4.03	<0.01	0.15	0.35
LO-174		48.60	1.78	15.20	11.90	0.19	9.03	2.57	4.42	<0.01	0.14	1.06
LO-175		45.50	1.02	18.40	9.10	0.16	9.28	7.58	2.44	3.01	0.13	0.01
LO-176		48.30	1.66	15.00	12.80	0.17	7.00	4.74	4.83	0.20	0.20	0.69
LO-177		46.40	1.64	11.70	11.90	0.20	7.60	9.64	3.97	0.02	0.20	0.16
LO-178		42.60	1.41	13.60	11.70	0.17	8.17	12.00	3.43	0.22	0.20	0.20
LO-179		48.60	1.71	16.70	8.27	0.17	8.62	5.94	4.80	0.31	0.13	0.13
LO-180		46.30	1.40	14.80	8.01	0.13	13.50	2.92	4.63	0.02	0.17	0.75
LO-181		43.80	1.59	16.20	9.38	0.20	13.20	2.66	3.03	<0.01	0.14	0.14
LO-182		49.50	1.58	14.90	6.68	0.18	12.90	2.24	4.07	0.07	0.17	0.31
LO-183		43.10	1.38	14.70	16.20	0.10	12.70	2.43	2.62	0.04	0.12	0.52
LO-184		44.50	2.28	17.30	14.50	0.20	7.54	3.46	4.91	0.26	0.17	0.05
LO-185		45.40	0.94	14.90	10.40	0.15	8.34	10.30	1.40	5.12	0.11	0.03
LO-186		46.60	1.00	13.50	7.27	0.13	8.33	8.84	4.87	0.04	0.14	0.02
LO-187		45.10	0.82	10.60	8.02	0.13	8.27	12.30	3.79	0.05	0.20	0.60
LO-188		37.46	1.05	12.90	11.00	0.17	9.57	11.80	2.85	<0.01	0.18	0.56
LO-189		38.80	0.73	11.70	6.80	0.12	5.45	17.00	4.37	0.41	0.24	0.30

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SAMPLE NUMBER	ELEMENT UNITS	SiO2 PCT	TiO2 PCT	Al2O3 PCT	Fe2O3# PCT	MnO PCT	MgO PCT	CaO PCT	Na2O PCT	K2O PCT	P2O5 PCT	S PCT
L0-211		51.20	1.42	13.40	11.40	0.19	4.89	5.09	5.25	0.12	0.44	0.41
L0-213		47.20	1.54	11.90	11.40	0.27	8.13	9.00	3.23	0.05	0.37	0.26
L0-214		46.90	1.13	13.70	9.91	0.19	9.86	8.31	3.93	0.01	0.15	0.19
L0-216		51.40	1.43	12.20	9.65	0.19	6.81	7.45	4.36	0.05	0.21	0.12
L0-217		45.40	1.11	11.90	12.00	0.13	7.79	13.30	2.52	0.08	0.21	0.08
L0-222		48.70	1.59	12.20	10.80	0.16	9.90	9.15	3.06	<0.01	0.18	0.11
L0-230		48.20	1.44	14.60	9.90	0.22	9.34	3.71	4.18	0.01	0.13	0.09
L0-236		50.70	1.57	14.10	11.80	0.13	8.47	3.75	4.41	0.07	0.17	0.22
L0-238		47.20	1.07	14.80	9.60	0.21	7.81	7.31	4.99	0.28	0.12	0.08
L0-242		46.60	1.37	13.30	10.10	0.19	8.14	9.47	3.89	<0.01	0.19	0.12
L0-243		44.70	1.22	13.40	9.13	0.18	12.70	8.10	2.77	0.12	0.14	0.10
L0-248		45.50	1.31	12.40	7.80	0.18	16.10	7.72	2.53	0.33	0.13	0.19

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SAMPLE NUMBER	ELEMENT UNITS	Sr PPM	Rb PPM	Cr PPM	V PPM	Zr PPM	Ba PPM	Y PPM
LO-139		71	<1	406	334	80	25	34
LO-140		191	5	161	253	67	129	25
LO-141		135	<1	179	173	61	77	16
LO-142		71	19	160	176	50	162	19
LO-143		117	<1	106	297	89	<15	36
LO-144		146	<1	261	328	93	33	35
LO-145		196	<1	131	181	47	40	24
LO-147		33	<1	130	302	106	<15	41
LO-148		15	<1	281	310	93	21	40
LO-150		60	<1	191	251	61	32	29
LO-151		13	<1	211	257	68	40	30
LO-152		2	<1	370	184	42	90	20
LO-153		14	<1	372	212	69	67	24
LO-155		6	1	326	181	42	130	23
LO-158		7	<1	212	230	63	59	26
LO-160		12	<1	171	237	78	84	26
LO-163		2	<1	297	285	71	70	27
LO-165		89	<1	300	308	68	38	32
LO-168		33	3	328	260	74	105	27
LO-169		94	<1	159	290	82	88	33
LO-170		78	<1	197	288	91	71	36
LO-171		125	<1	251	267	87	54	35
LO-172		25	<1	95	341	72	42	33
LO-173		80	<1	202	250	90	41	36
LO-174		26	<1	12	354	96	<15	37
LO-175		193	42	246	178	55	465	20
LO-176		54	<1	<2	323	108	29	42
LO-177		118	<1	173	315	102	45	40
LO-178		278	<1	49	234	85	121	34
LO-179		166	2	315	243	93	80	31
LO-180		29	<1	94	363	76	<15	48
LO-181		46	<1	144	349	78	58	38
LO-182		37	<1	22	349	100	<15	39
LO-183		40	<1	<2	428	78	<15	36
LO-184		49	8	<2	457	107	106	39
LO-185		36	73	364	238	73	381	25
LO-186		75	<1	431	212	80	54	26
LO-187		46	<1	219	177	68	44	27
LO-188		59	<1	553	225	76	42	30
LO-189		81	<1	342	160	64	84	27

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SAMPLE NUMBER	ELEMENT UNITS	Sr PPM	Rb PPM	Cr PPM	V PPM	Zr PPM	Ba PPM	Y PPM
LO-211		126	<1	36	356	75	113	38
LO-213		113	<1	91	241	95	99	40
LO-214		132	<1	335	218	51	141	30
LO-216		144	<1	59	277	87	89	39
LO-217		197	<1	126	219	72	159	27
LO-222		71	<1	337	214	77	104	31
LO-230		98	<1	129	308	85	91	32
LO-236		109	<1	26	302	78	80	37
LO-238		81	<1	219	203	53	132	25
LO-242		134	<1	324	230	85	94	34
LO-243		192	<1	569	209	51	117	28
LO-248		23	1	739	170	73	141	25

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SAMPLE NUMBER	ELEMENT UNITS	Sr PPM	Rb PPM	Cr PPM	V PPM	Zr PPM	Ba PPM	Y PPM
LO-1		2	39	41	9	337	77	100
LO-2		5	5	30	20	299	86	86
LO-3		13	16	35	10	163	134	49
LO-4		5	<1	171	206	62	117	19
LO-5		<1	<1	148	202	56	94	14
LO-6		68	<1	110	190	52	169	12
LO-7		67	4	16	85	221	24	56
LO-8		83	9	<2	52	288	65	70
LO-9		50	13	22	25	212	109	55
LO-10		41	5	19	25	257	114	59
LO-11		23	12	45	35	247	88	66
LO-12		2	1	265	292	47	106	20
LO-13		3	<1	355	356	99	36	38
LO-14		1	<1	258	250	41	115	31
LO-15		127	<1	10	129	213	47	113
LO-16		66	<1	7	95	179	17	68
LO-30		85	<1	<2	246	117	69	52
LO-101		303	<1	72	326	110	79	50
LO-102		291	<1	78	284	87	90	34
LO-103		205	<1	169	368	107	76	40
LO-104		61	<1	<2	414	72	29	37
LO-105		48	<1	<2	462	84	71	36
LO-106		148	<1	247	301	78	<15	30
LO-107		45	<1	242	370	73	<15	24
LO-110		2	<1	241	263	68	100	22
LO-112		4	2	6	320	53	73	42
LO-114		4	2	71	311	102	70	45
LO-115		1	<1	51	307	92	36	30
LO-118		2	<1	306	283	65	50	37
LO-122		6	<1	349	305	86	50	33
LO-124		6	3	278	282	78	102	28
LO-128		<1	2	319	319	73	99	26
LO-131		24	<1	384	367	115	<15	44
LO-132		127	<1	12	97	55	<15	15
LO-133		34	3	11	47	395	44	128
LO-134		139	<1	448	220	87	64	28
LO-135		165	<1	345	171	71	30	33
LO-136		110	<1	341	208	54	<15	28
LO-137		119	<1	281	183	66	49	26
LO-138		61	<1	467	246	61	63	29

Encl. no 3, p. 4

Report no LV 21



REPORT: 112-1297 PROJECT: GGr/ds

PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Pb PPM	Zn PPM	Co PPM	Ni PPM	Hg PPB	Cl PPM	B PPM
LO-1		35	77	615	6	<1	130		55
LO-2		7	10	346	18	<1	35		35
LO-3		840	24	201	50	<1	90		65
LO-4		164	121	517	28	18	200		30
LO-5		156	20	970	32	16	120		20
LO-6		1345	15	76	136	24	50		55
LO-7		319	100	995	30	<1	110		50
LO-8		571	17	219	26	<1	130		60
LO-9		3300	17	64	44	<1	35		60
LO-10		119	39	781	28	2	250	<200	70
LO-11		463	9	157	10	<1	50		45
LO-12		80	23	344	28	32	50		35
LO-13		124	20	403	34	38	25		<10
LO-14		207	18	466	26	24	135		25
LO-15		25	10	79	14	38	25		<10
LO-16		35	14	58	16	8	5		20
LO-30		5	7	43	16	<1	70		15
LO-101		67	11	114	34	30	10		20
LO-102		63	8	101	32	30	10		10
LO-103		69	8	93	28	50	10	<200	35
LO-104		42	10	149	24	4	10		15
LO-105		35	7	79	22	12	10		<10
LO-106		70	7	67	26	64	<5		<10
LO-107		57	11	80	26	84	10		15
LO-110		487	11	586	24	34	20		45
LO-112		37	11	103	28	6	15		45
LO-114		21	10	71	26	22	15		40
LO-115		60	13	51	20	12	25		35
LO-118		5300	17	91	28	28	20		35
LO-122		337	8	79	40	42	10	<200	10
LO-124		104	6	49	54	34	10		60
LO-128		67	<2	123	72	24	80		45
LO-131		96	11	102	34	34	20		15
LO-132		19	10	409	4	2	130		20
LO-133		12	6	65	6	<1	25		<10
LO-134*		46	11	71	24	156	5		<10
LO-135		52	7	51	30	180	10		<10
LO-136		47	7	53	20	178	5		<10
LO-137		56	12	57	20	96	25		<10
LO-138		54	4	88	30	140	5	<200	<10

End. no 3, p.7
 Report no LV 21



REPORT: 112-1297 PROJECT: GGt/so

PAGE 2

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Pb PPM	Zn PPM	Co PPM	Ni PPM	Hg PPB	Cl PPH	B PPH
LO-139		54	11	78	22	144	20		15
LO-140		56	8	61	22	52	10		25
LO-141		41	<2	62	20	72	110		<10
LO-142		37	5	59	18	52	10		25
LO-143		59	5	110	26	40	5		20
LO-144		38	3	55	26	104	10		15
LO-145		180	8	89	22	40	25		15
LO-147		12	9	141	30	28	10		20
LO-148		12	2	143	32	34	10		20
LO-150		6	6	527	34	46	5		25
LO-151		120	5	208	38	58	15		30
LO-152		35	6	96	96	102	15	<200	<10
LO-153		296	8	147	50	122	10		20
LO-155		7	3	49	42	80	10		25
LO-158		18	22	49	48	34	5		20
LO-160		3250	10	62	58	24	80		30
LO-163		32	7	67	70	30	5		30
LO-165		105	5	107	26	34	5		20
LO-168		202	4	595	36	80	30		15
LO-169		62	20	235	32	44	10		25
LO-170		101	6	158	30	54	10		40
LO-171		53	8	75	30	86	10	<200	10
LO-172		42	3	169	26	30	15		20
LO-173		73	8	85	30	56	15		20
LO-174		44	2	90	30	18	10		15
LO-175		75	14	61	28	126	5		50
LO-176		57	6	109	34	6	5		20
LO-177		70	3	73	30	76	5		20
LO-178		68	4	115	35	34	15		20
LO-179		98	7	96	36	70	15		20
LO-180		70	10	108	30	54	15		20
LO-181		57	6	120	35	56	15	<200	25
LO-182		58	12	98	25	33	30		15
LO-183		56	3	128	34	15	50		30
LO-184		28	5	170	40	12	15		25
LO-185*		58	5	78	31	146	10		50
LO-186		68	4	72	32	156	15		25
LO-187		70	3	68	28	98	20		15
LO-188		68	3	85	40	188	30		15
LO-189		54	5	56	26	156	25		20

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Report no LV 21



REPORT: 112-1297 PROJECT: GGr/Go

PAGE 3

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Pb PPM	Zn PPM	Co PPM	Ni PPM	Hg PPB	Cl PPM	B PPM
LO-211		13	5	108	30	12	15		30
LO-213		8	5	85	38	33	10	<200	10
LO-214		88	4	76	38	58	30		25
LO-216		4	2	52	24	30	15		25
LO-217		6	<2	45	22	50	20		220
LO-222		108	2	44	34	56	15		15
LO-230		50	6	100	30	40	35		15
LO-236		34	5	100	25	13	15		20
LO-238		68	5	68	34	102	15		20
LO-242		81	4	104	35	66	10		105
LO-243		136	9	211	38	144	10		15
LO-248		87	3	82	38	234	20		20

Encl. no 3, p.9
 Report no LV 21

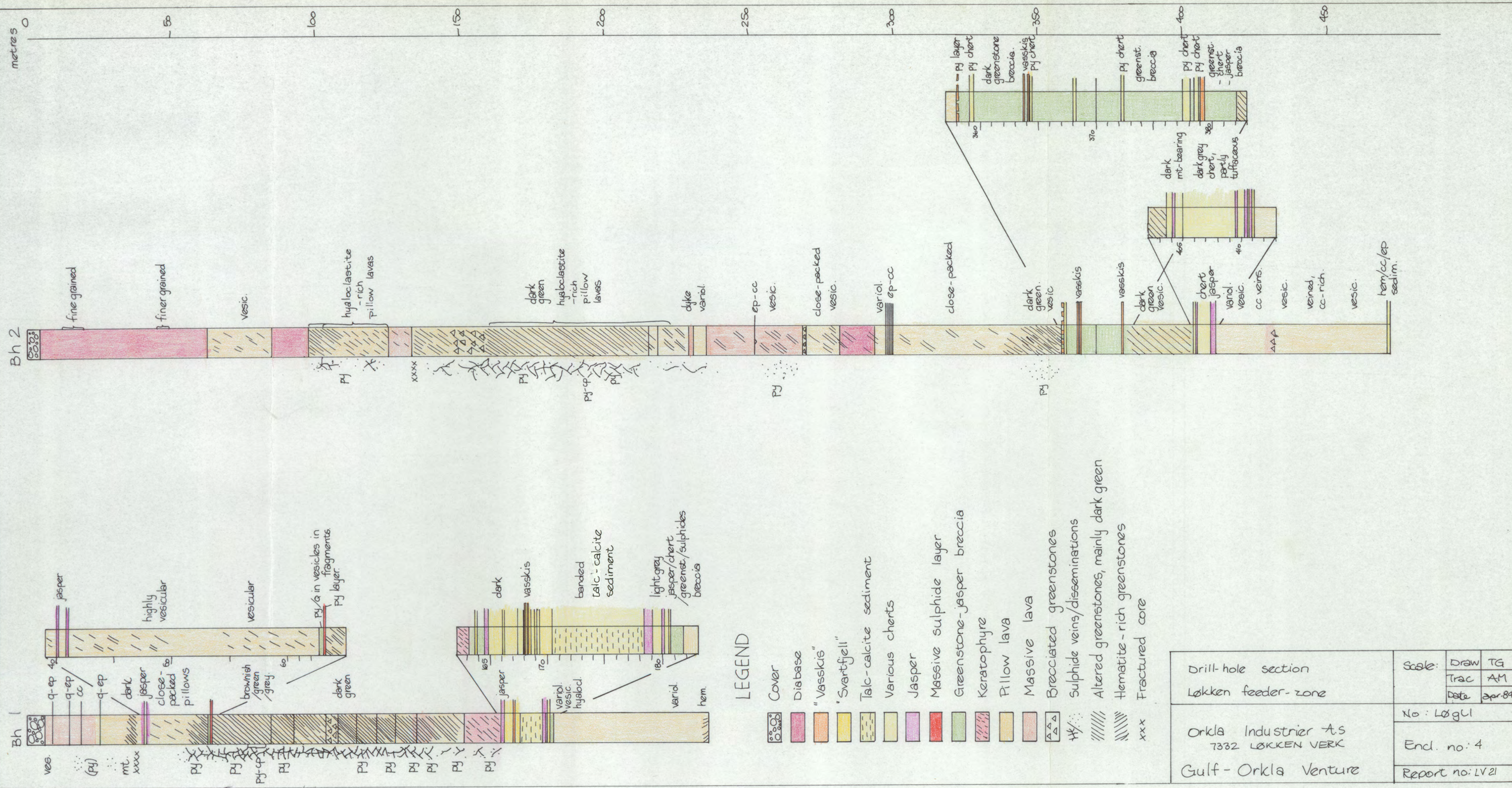


REPORT: 112-1299 PROJECT: GGt/do

PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Pb PPM	Zn PPM	Mn PPM	Ni PPM	Cr PPM	Co PPM	As PPM	Cd PPM	Au PPB	wt/Au GM	P
L0-17		19920	74	2400	130	5	103	81	12.5	12.0	185		44.
L0-18		7060	41	195	33	4	83	201	6.6	0.8	70		36.
L0-19		11660	100	9080	38	6	73	65	10.7	39.2	290		39.
L0-20	> 20000	30	261	152	4	60	262	19.3	1.8	65			46.
L0-21		11720	49	195	200	8	77	81	10.2	0.5	80		42.
L0-22		2120	34	98	33	10	76	196	2.7	0.3	50		47.
L0-23	> 20000	82	1580	11	5	66	161	21.5	7.7	180			48.
L0-24		4780	47	152	18	3	67	103	7.5	0.5	110		34.
L0-25	> 20000	40	1070	48	4	80	97	12.0	5.4	90			35.
L0-26		18340	233	518	18	4	80	42	7.0	2.1	65		27.
L0-27	> 20000	131	> 20000	89	6	64	31	13.2	176.6	100			35.
L0-28		4000	197	492	240	6	97	189	2.7	1.2	210		37.
L0-29	> 20000	209	440	300	14	116	190	7.6	2.7	200			27.
L0-108		2300	37	870	465	5	75	5	2.2	3.7	65		47.
L0-109		1440	46	18360	700	7	99	10	1.7	79.7	35		44.
L0-111		6740	36	360	350	12	81	20	2.8	1.9	50		38.
L0-113		15460	64	162	700	14	68	71	4.6	0.6	90		33.
L0-116		96	7	48	365	11	66	233	0.1	<0.2	10		26.
L0-117		130	18	45	340	11	78	203	0.2	<0.2	50		28.
L0-119		66	11	30	105	10	119	225	0.1	<0.2	30		44.
L0-120		85	7	39	140	6	100	203	<0.1	<0.2	15		40.
L0-121		79	13	37	140	7	94	201	<0.1	<0.2	15		38.
L0-123		86	12	29	172	13	118	236	<0.1	<0.2	5		40.
L0-125		130	8	21	100	13	138	198	<0.1	<0.2	15		44.
L0-126		88	13	21	80	11	86	256	0.1	<0.2	5		27.
L0-127		6000	10	23	74	4	122	234	1.2	<0.2	10		43.
L0-129		388	9	51	280	6	147	623	0.6	<0.2	<5		44.
L0-130	> 20000	87	4300	49	7	108	127	42.0	18.9	100			49.
L0-146		1520	17	3040	500	16	140	94	1.2	12.3	15		24.
L0-149		328	26	62	560	20	143	54	0.7	0.2	20		30.
L0-154		778	16	38	185	15	174	25	2.1	<0.2	30		46.
L0-156		1500	17	23	185	17	112	60	1.2	0.2	35		44.
L0-157		160	17	25	185	19	152	58	0.2	<0.2	70		36.
L0-159	> 20000	9	43	630	17	140	68	14.5	0.8	20			24.
L0-161	> 20000	33	46	184	23	119	96	8.1	1.3	25			43.
L0-162		14720	24	32	310	15	120	192	9.2	0.2	20		41.
L0-164		3620	6	54	900	22	172	194	2.1	<0.2	<5		22.
L0-166		2100	13	62	290	6	141	79	1.3	0.3	20		48.
L0-167		6700	13	165	600	19	153	90	3.4	2.0	20		42.

Encl. no. 3, p.10
Report no LV 21



S

N

100 m

200 m

LEGEND

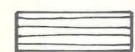
300m



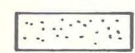
Late intrusives (diabase)



Quartz-sericite alteration



Clorite-quartz alteration



Clorite-albite alteration

400m



Jasper, "vasskis" and related rocks



Stratiform sulphide ore



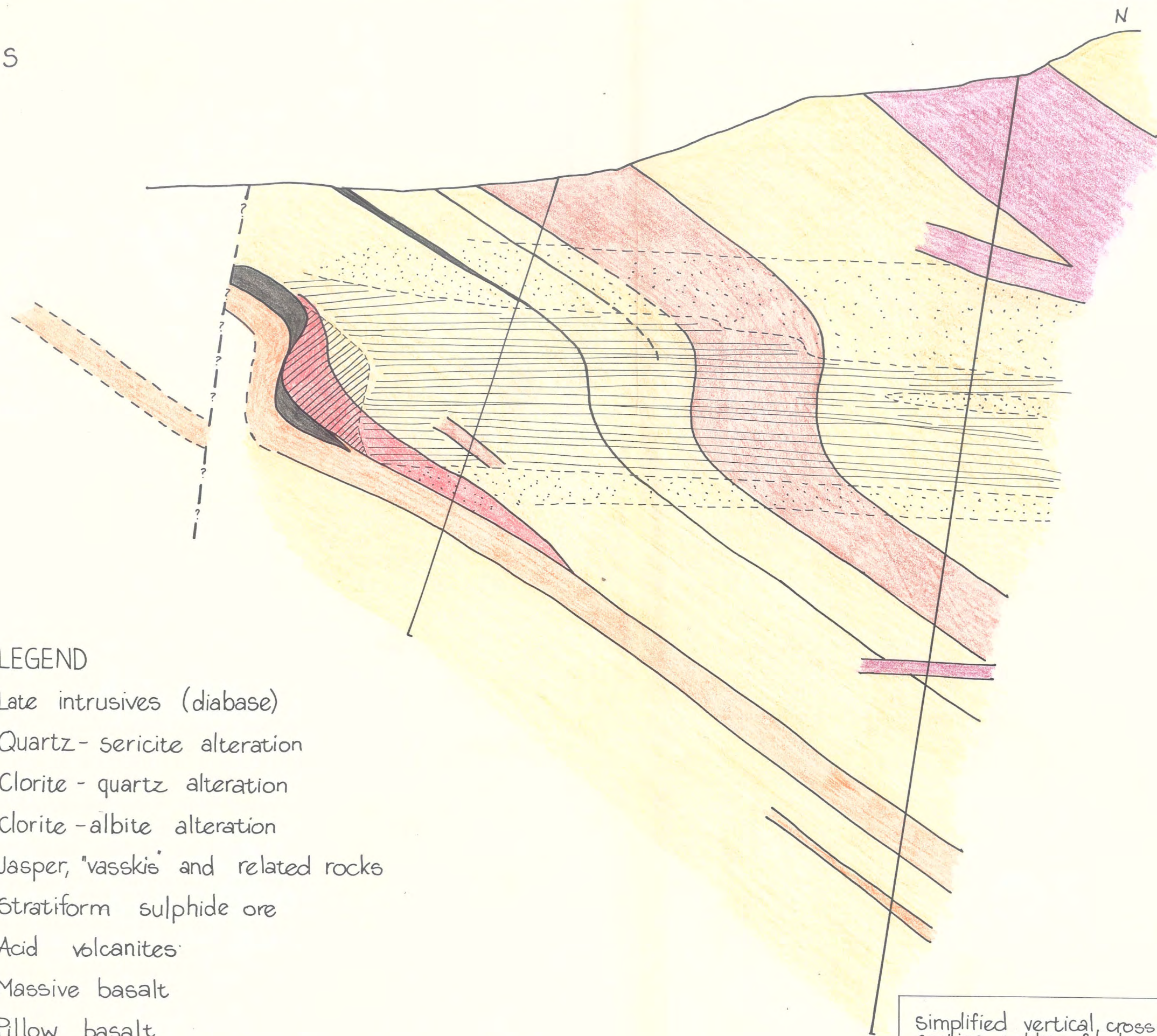
Acid volcanites



Massive basalt



Pillow basalt



Simplified vertical, cross-section, Løkken feeder-zone.
Profile location, see encl. no 2

Scale:

1:2000

Draw

Trac

Date

TG

AM

apr 84

Orkla Industrier A.S
7332 LØKKEN VERK
Gulf-Orkla Venture

No: G

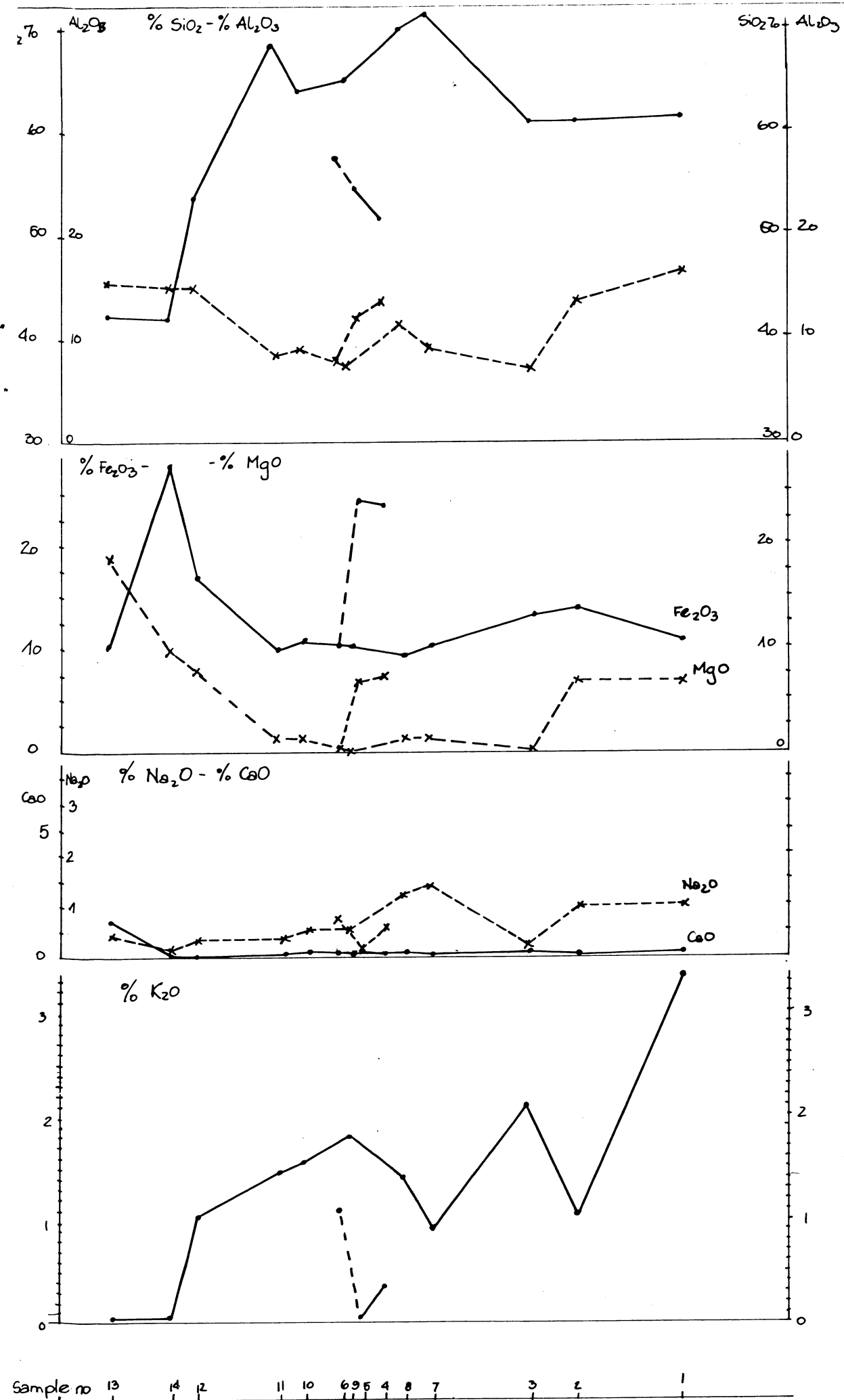
Enclosure no: 5

Report no: LV 21

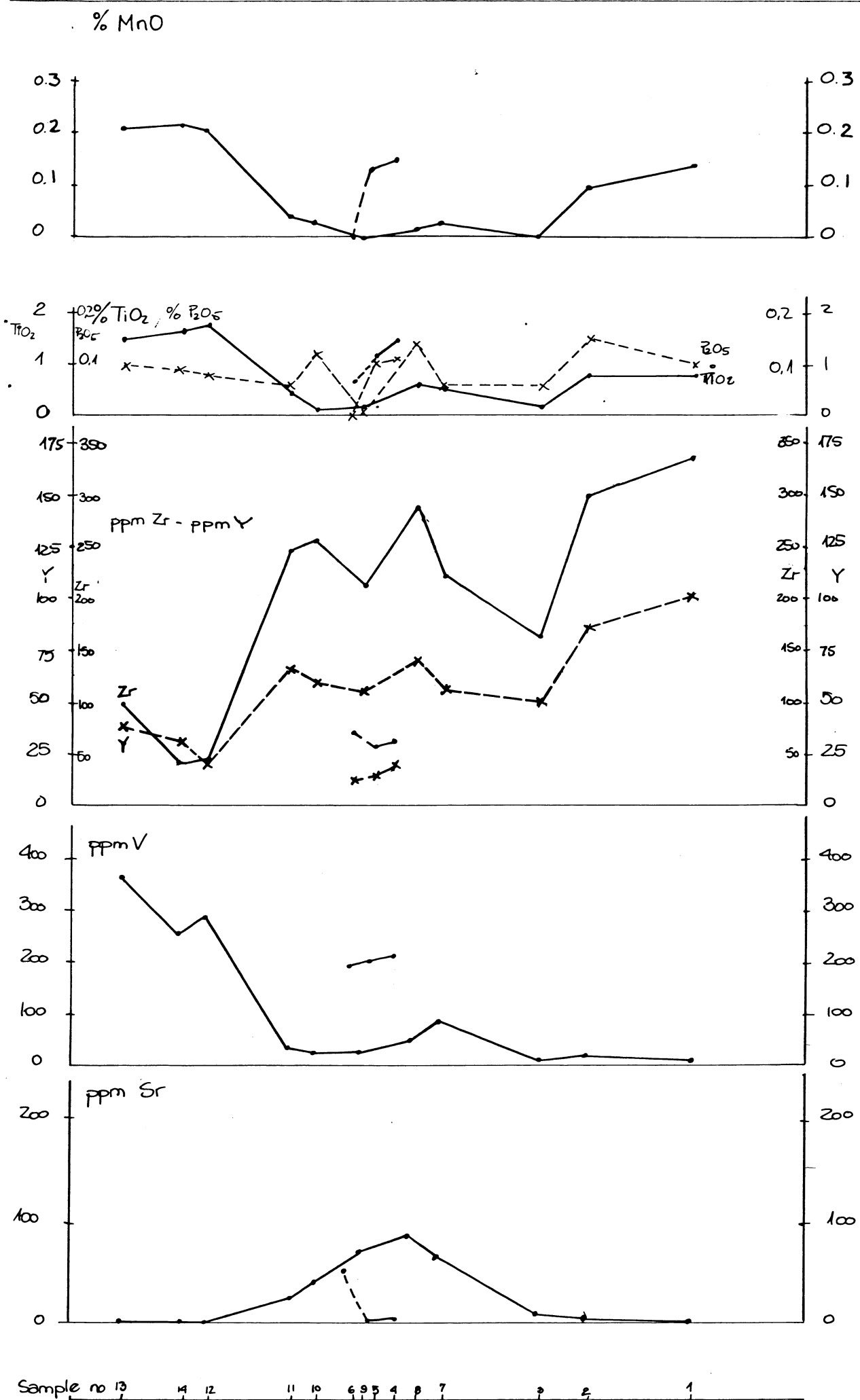
Gjennomsnittlige kjemisk sammensetning av grønnsteiner, kvartskaratofyrer og plagiogranitter fra Løkken ofiolittfragment, samt midt-oceanisk rygg theleiitter.

Average chemical composition of greenstones, quartz, keratophyres and plagiogranites from the Løkken ophiolite fragment, and average mid-ocean ridge tholeiite.

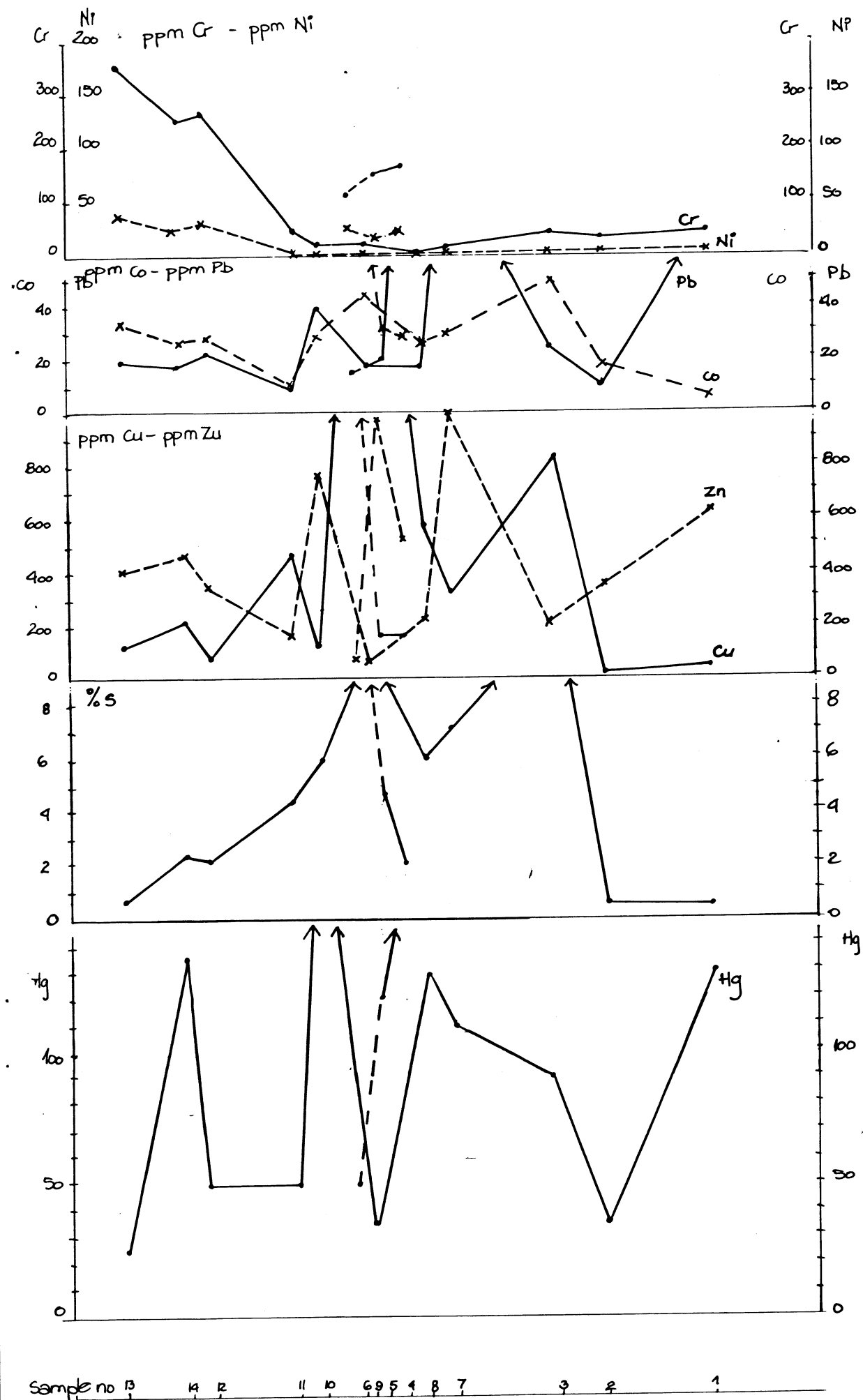
	Greenstones	Qtz.kerat.	Plagiogranite	Average MOR tholeiite
%				
SiO ₂	48,2	74,8	76,4	49,6
Al ₂ O ₃	14,9	12,2	11,8	16,1
FeO(tot)	10,3	3,0	1,8	10,2
MgO	7,9	.4	.2	7,7
CaO	8,4	3,3	2,6	11,3
Na ₂ O	4,0	4,4	5,3	2,8
K ₂ O	.2	.6	.1	.2
P ₂ O ₅	.09	.03	.03	.12
TiO ₂	1,43	.25	.19	1,50
MnO	.19	.05	.02	.18
ppm				
Nb	< 5	< 5	< 5	4
Zr	95	206	324	90
Y	26	61	119	30
Sr	166	383	133	120
Rb	(2)	10	< 5	2
Ba	(18)	170	< 10	20
Zn	85	47	11	87
Cu	43	9	< 5	73
Ni	90	< 5	< 5	106
Cr	264	< 5	< 5	250
V	267	16	5	229
Co	34	-	< 5	50
Number of samples	47	2	4	



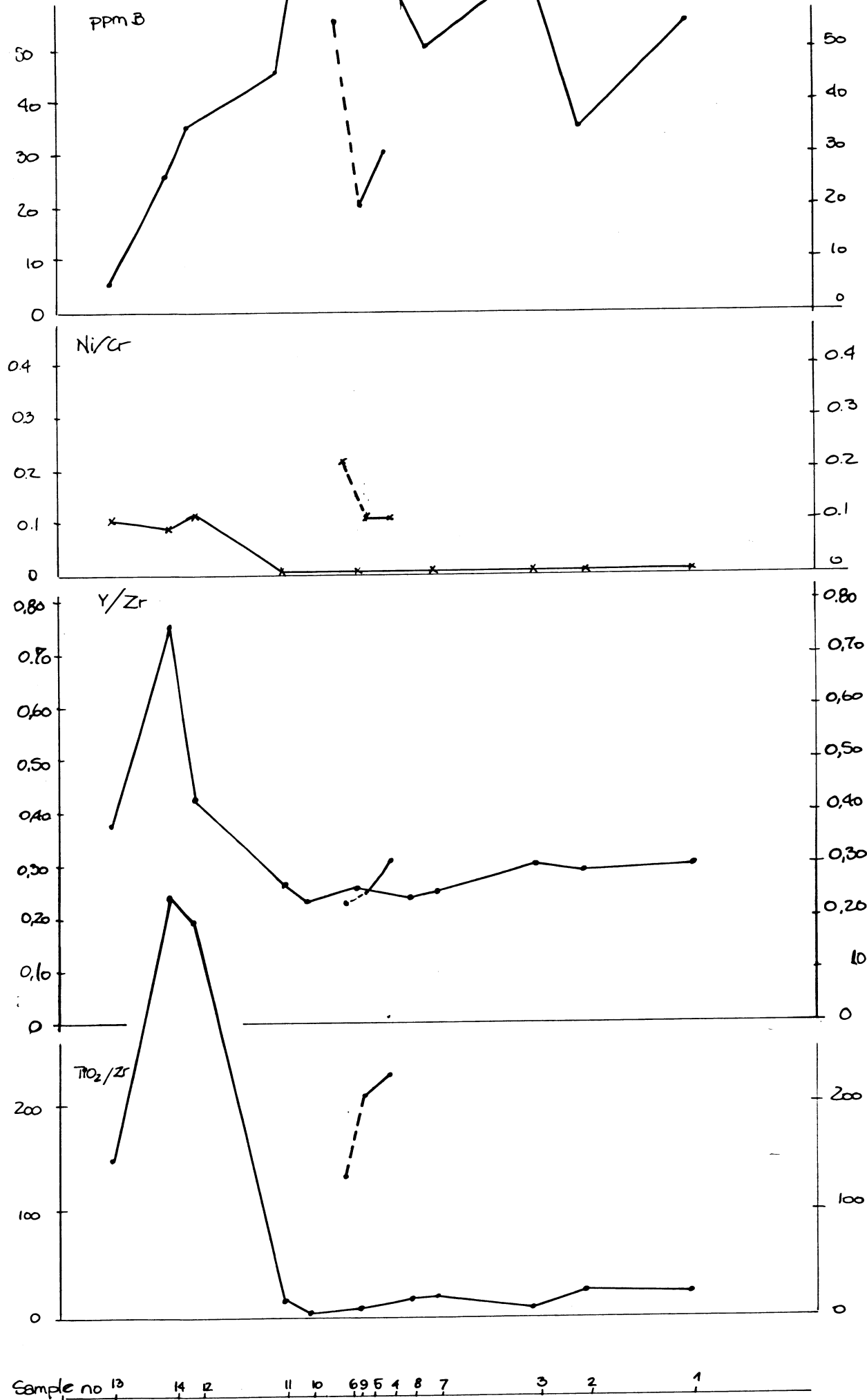
Løkken feeder-zone Løkken Mine, Old Shaft area $\text{SiO}_2, \text{Al}_2\text{O}_3, \text{Fe}_2\text{O}_3, \text{MgO}, \text{Na}_2\text{O}, \text{CaO}, \text{K}_2\text{O}$ In metabasalts	Scale	Draw	TG
	1:1000	Trac	AM
		Date	Apr 83
Orkla Industrier A.s 7332 LØKKEN VERK Gulf - Orkla Venture	No LØgkj 3a		
	Enclosure no: 7a		
	Report no 21		



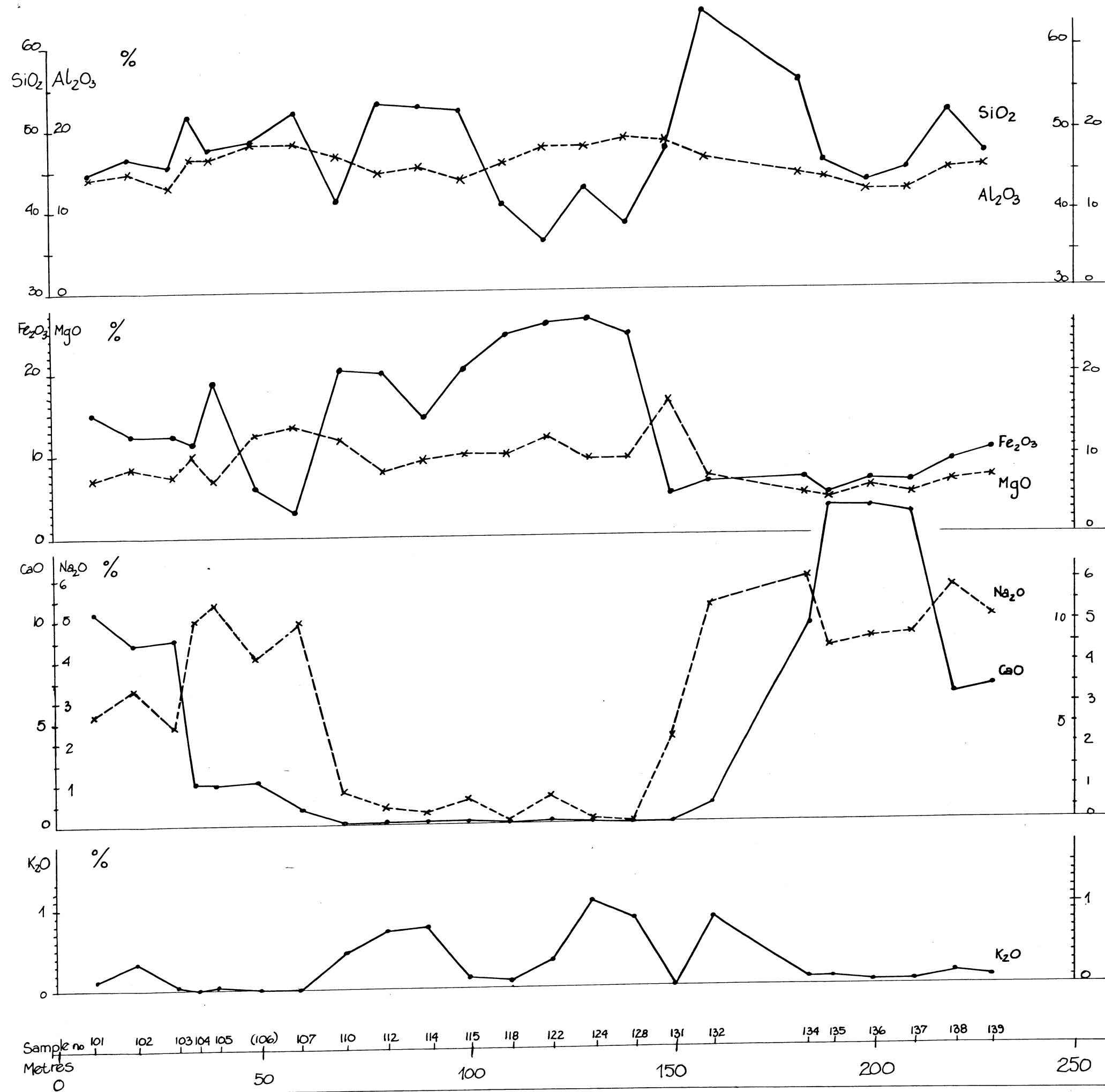
Løkken feeder-zone Løkken Mine, old shaft area MnO, TiO ₂ , P ₂ O ₅ , Zr, Y, V, Sr in metabasalts	Scale	Draw	TG
	1:1000	Trac	AM
		Date	Apr 83
Orkla Industrier A.s 7332 LØKKEN VERK Gulf - Orkla Venture	No Løggj. 3b		
	Enclosure no: 7 b		
	Report no 21		



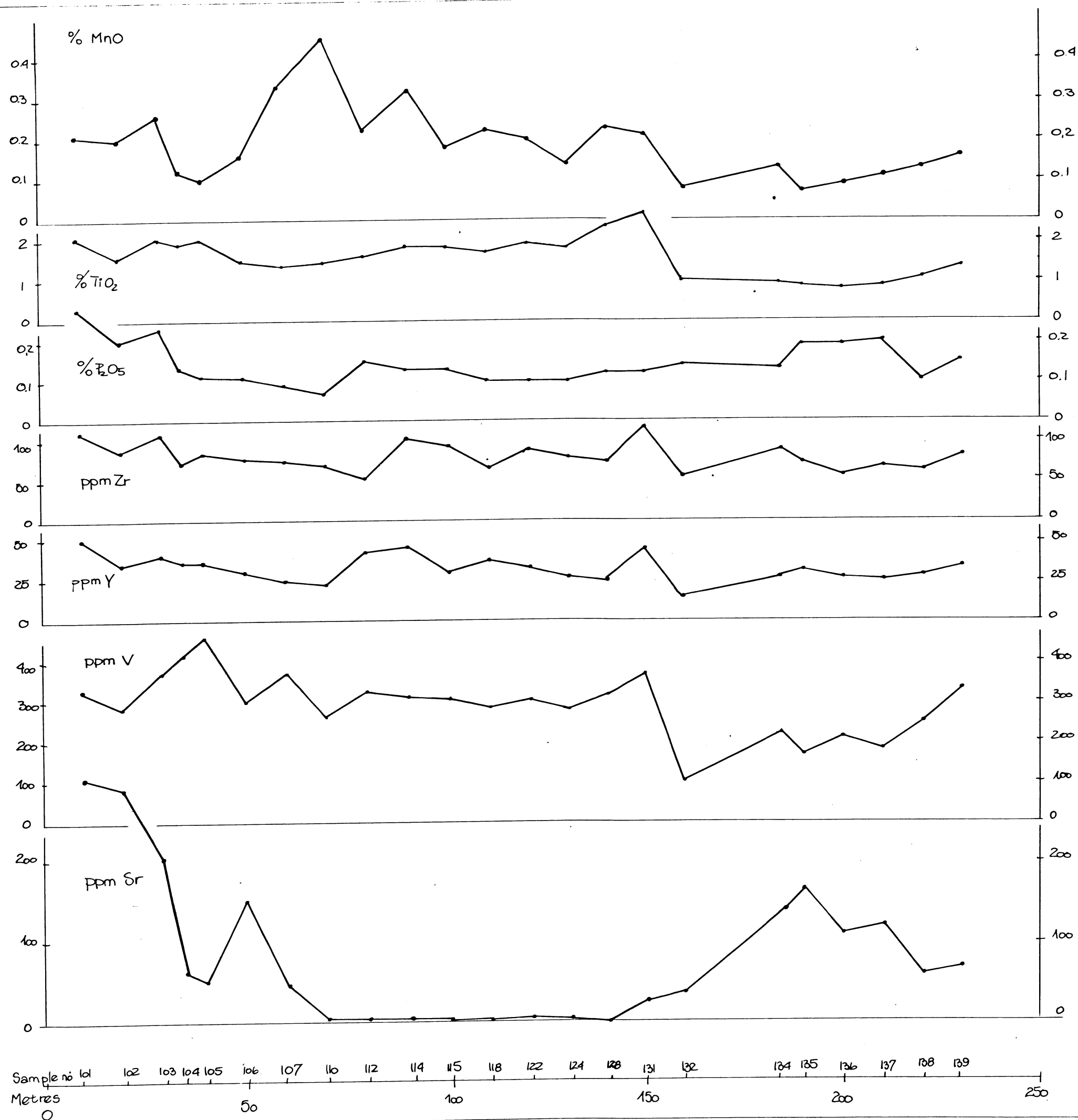
Løkken feeder-zone Løkken Mine, old shaft area Cr, Ni, Co, Cu, Zn, Pb, S, Hg in metabasalts	Scale	Draw	TG
	1:1000	Trac	AM
		Date	Apr 8:
Orkla Industrier A.s 7332 LØKKEN VERK Gulf - Orkla Venture	No Løggj 3d		
	Enclosure no: 7c		
	Report no 21		



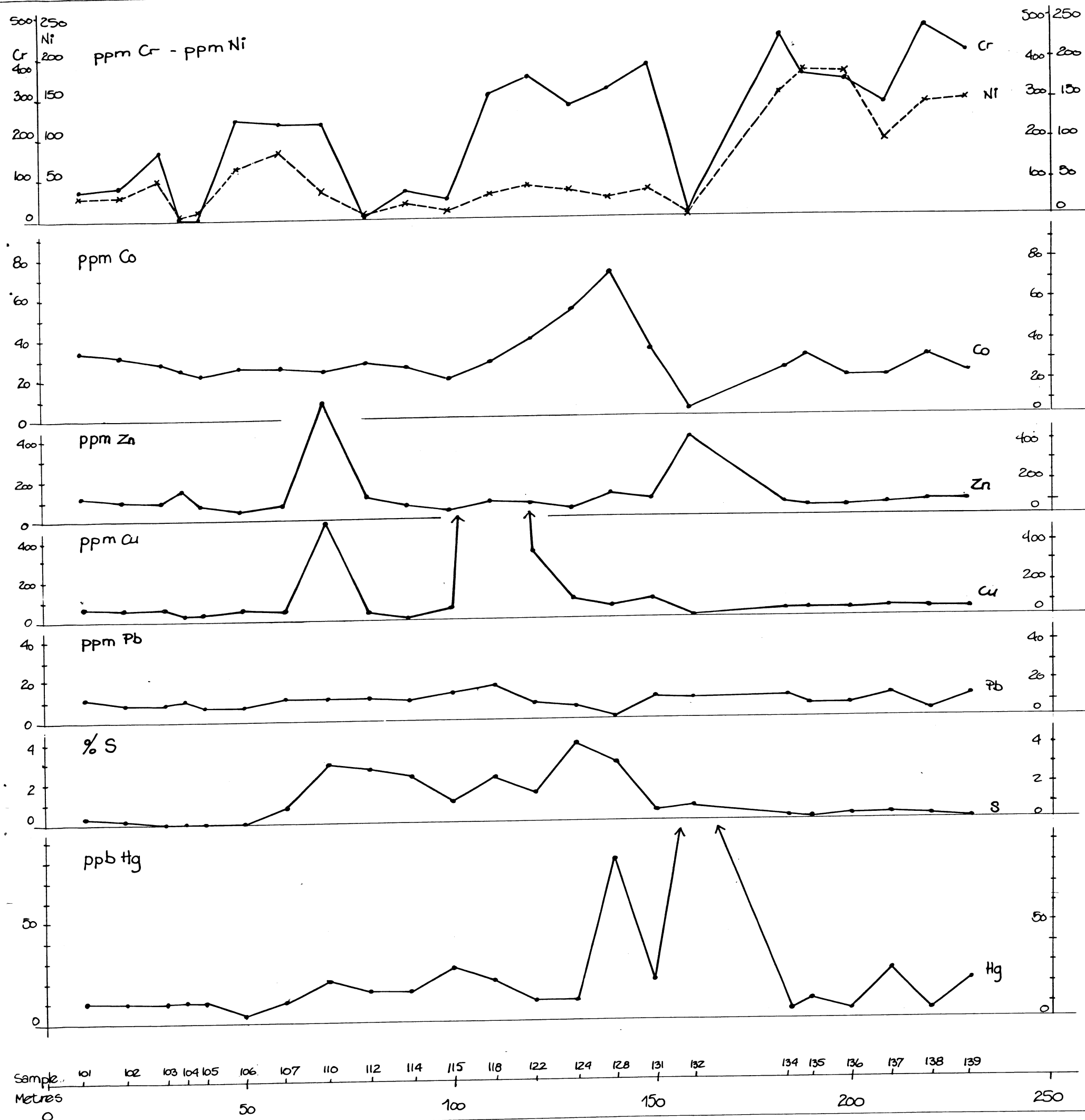
Løkken feeder-zone Løkken Mine, Old shaft area B, Ni/Cr, Y/Zr, TiO ₂ /Zr in metabasalts	Scale	Draw	TG
	1:1000	Trac	AM
		Date	Apr 83
Orkla Industrier A.s 7332 LØKKEN VERK Gulf - Orkla Venture	No. 10. gg 3c		
	Enclosure no : 7d		
	Report no 21		



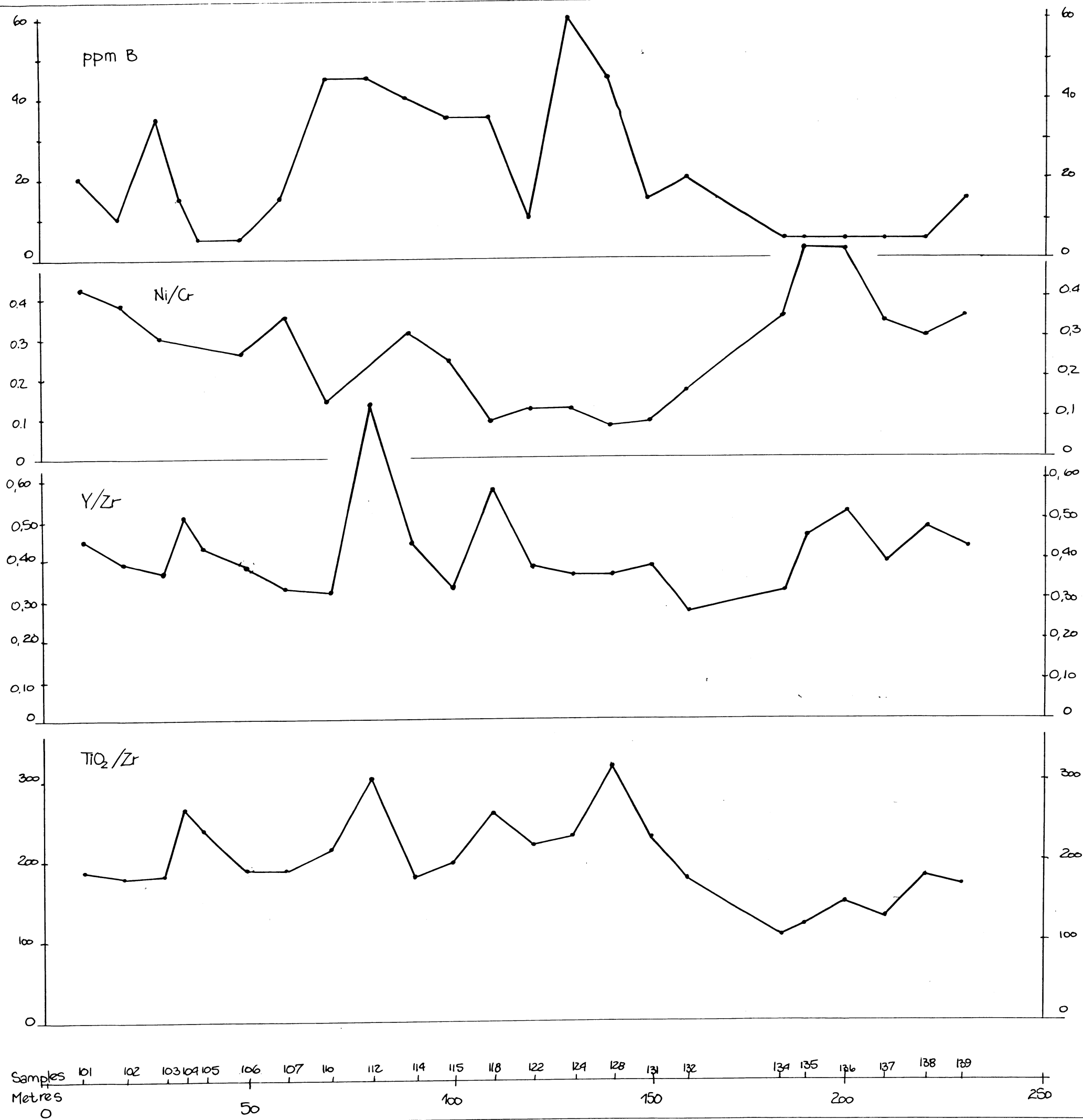
Løkken feeder-zone SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , MgO, CaO, Na ₂ O, K ₂ O Drillhole 1 in metabasalts	Scale:	Draw:	TG
	1:1000	Trac:	AM
		Date:	Apr 83
Orkla Industrier A.S. 7332 LØKKEN VERK Gulf - Orkla Venture	No: LØ gkj 1a		
	Enclosure no: 8a		
	Report no: 21		



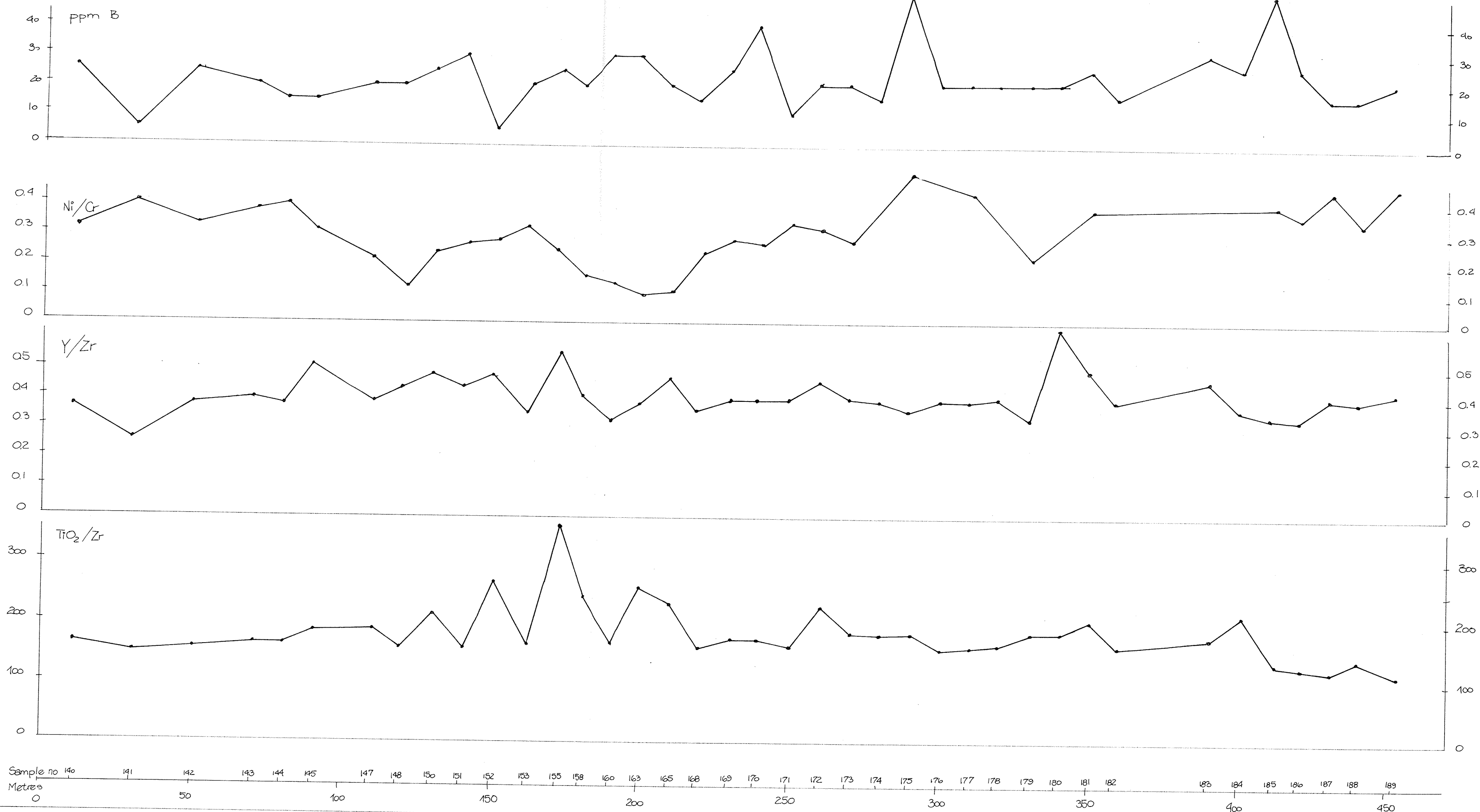
Løkken feeder-zone MnO, TiO ₂ , P ₂ O ₅ , Zr, Y, V, Sr in Drillhole 1 metabasalts	Scale	Draw
	1:1000	Trac
		Date
Orkla Industrier A.s 7332 LØKKEN VERK Gulf - Orkla Venture		No Lø gkj 1b
		Enclosure no: 8
		Report no 21



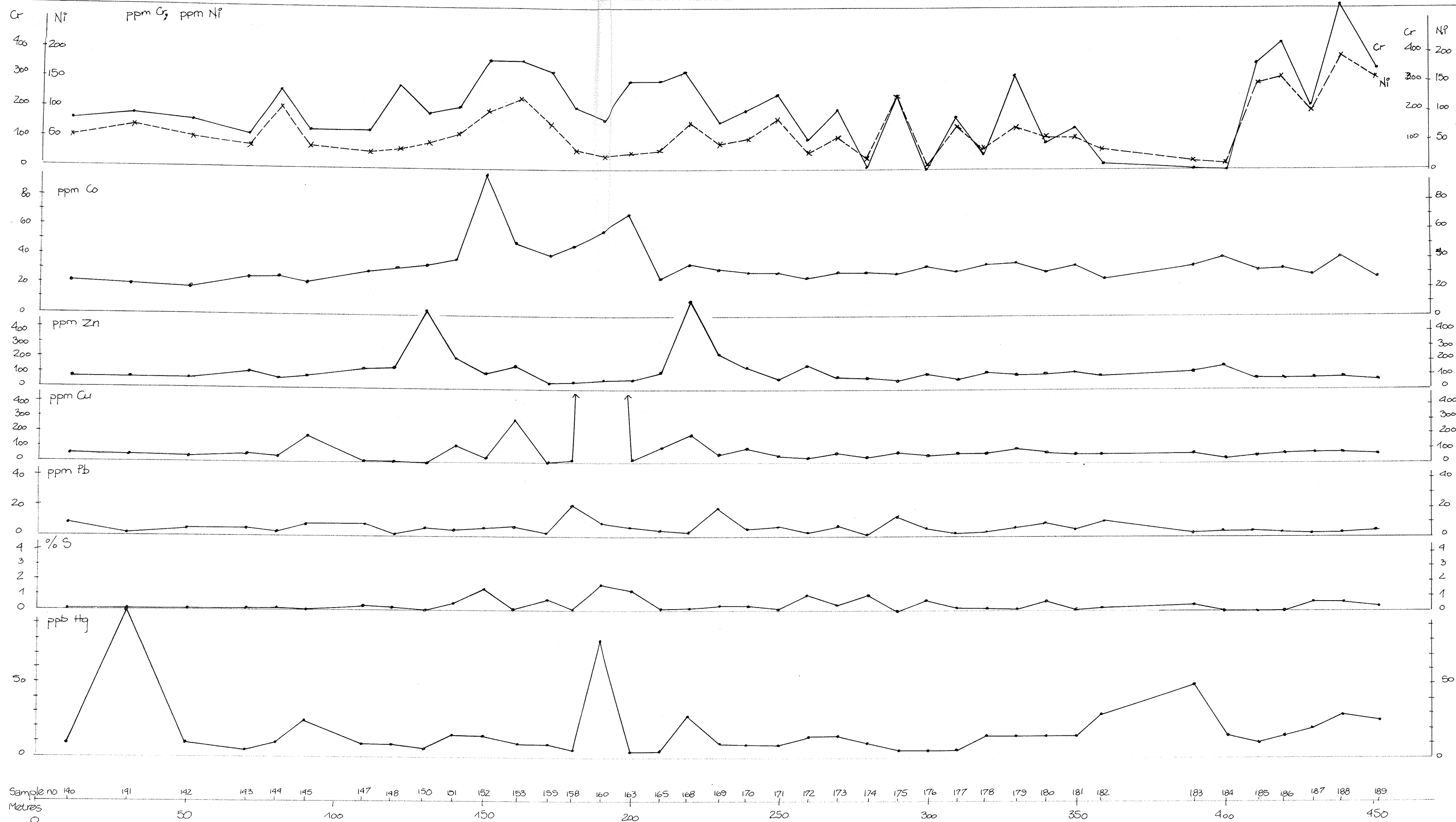
Løkken feeder-zone Cr, Ni, Co, Cu, Zn, Pb, S, Hg in drillhole meta basalt	Scale:	Draw	TG
	1:1000	Trac	AM
		Date:	Apr83
Orkla Industrier A.s. 7332 LØKKEN VERK Gulf - Orkla Venture	No Lø gkj Id		
	Enclosure no : 8c		
	Report no 21		



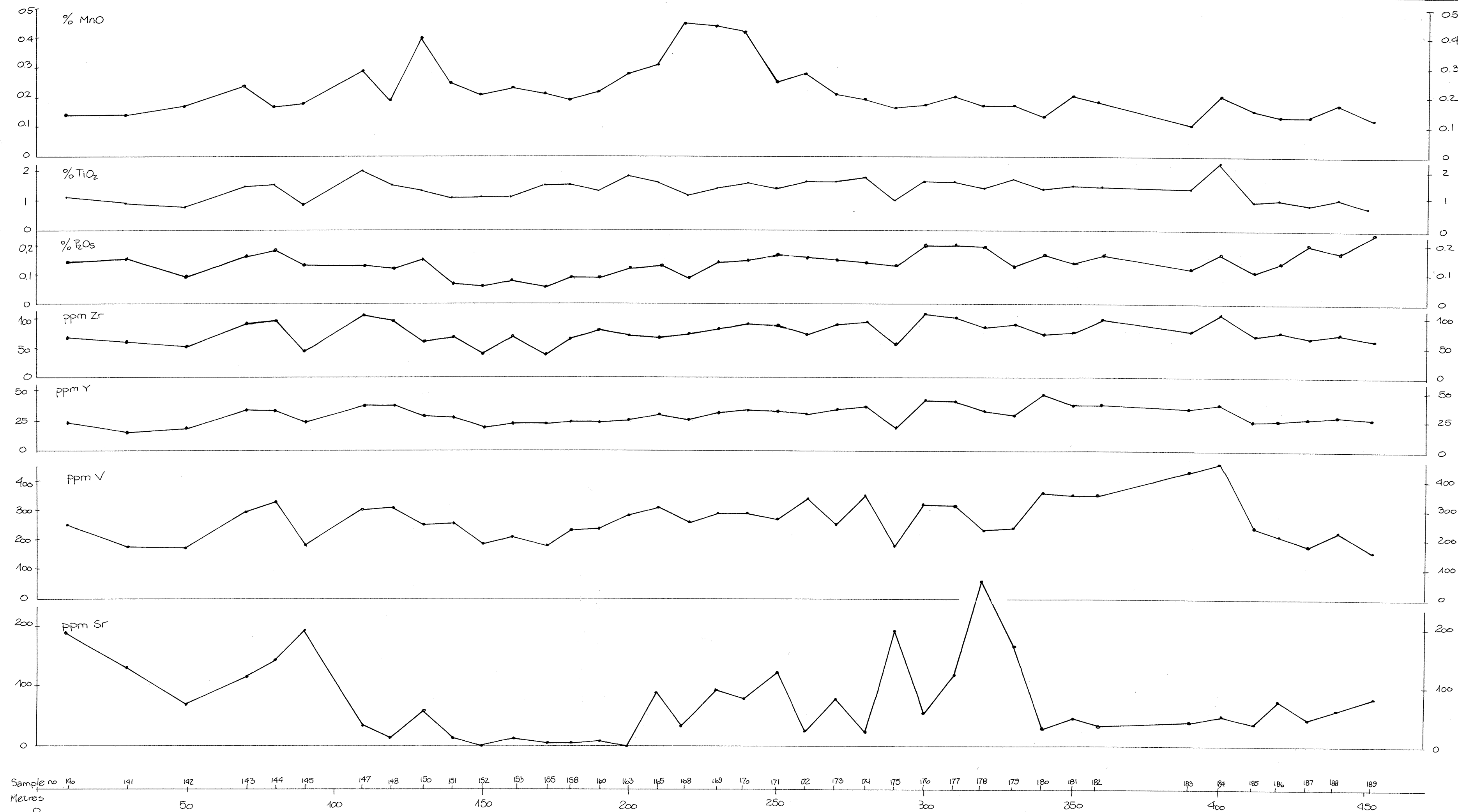
Løkken feeder-zone B, Ni/Cr, Y/Zr, TiO ₂ /Zr Drillhole 1 in metabasalts	Scale: 1:1000	Draw	TGA
		Trac	AM
		Date	April
Orkla Industrier A.s. 7332 LØKKEN VERK Gulf - Orkla Venture	No. Løggj 10		
	Enclosure no: 8d		
	Report no 21		



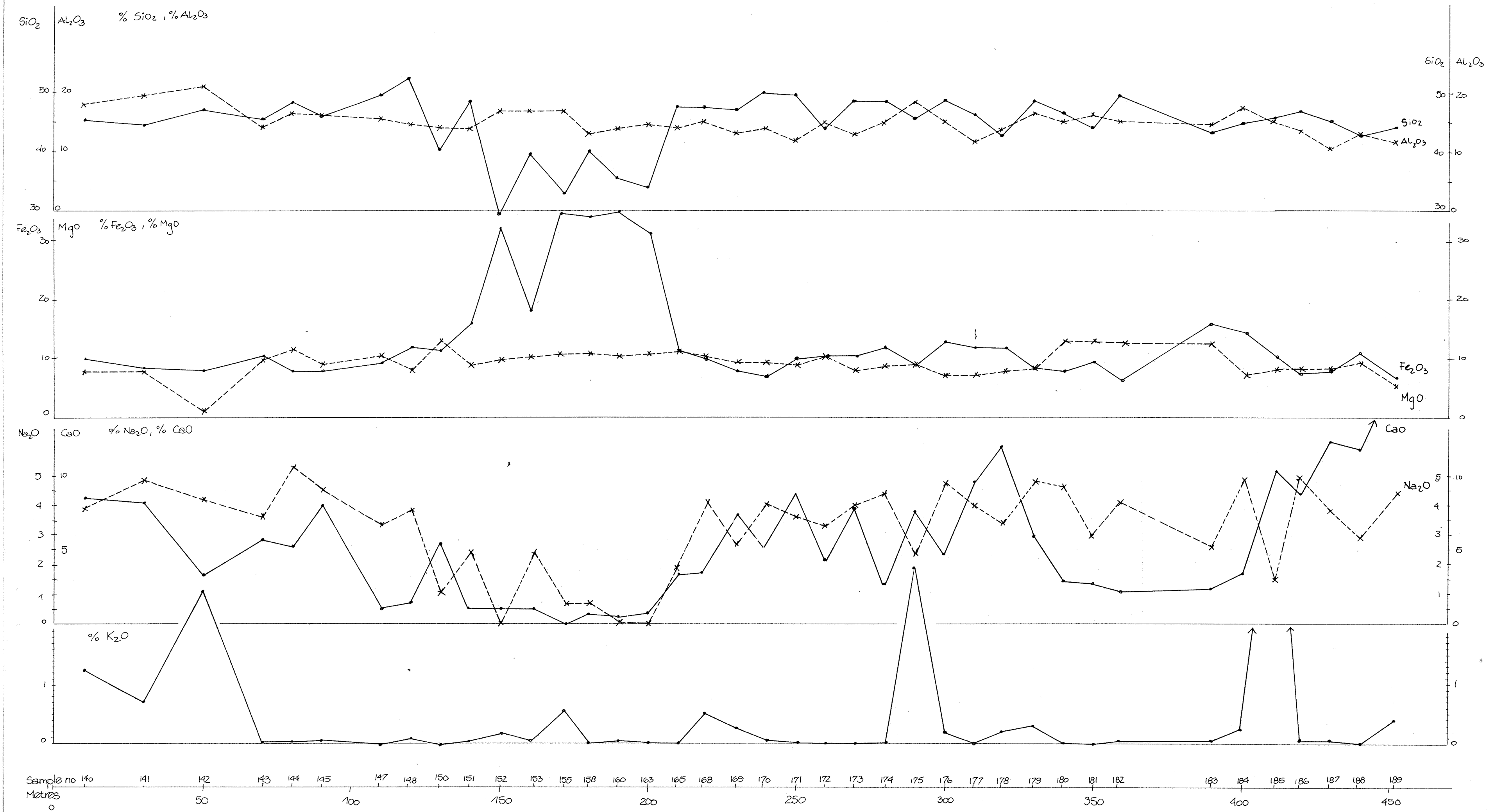
Løkken feeder - zone B, Ni/Cr, Y/Zr, TiO ₂ /Zr Drillhole 2	Scale	Draw	TG
	1:1000	Trac	AM
		Date	Apr 83
No Lø gkj 2c			
Orkla Industrier A.s 7332 LØKKEN VERK			
Gulf-Orkla Venture			
Enclosure no: 0d			



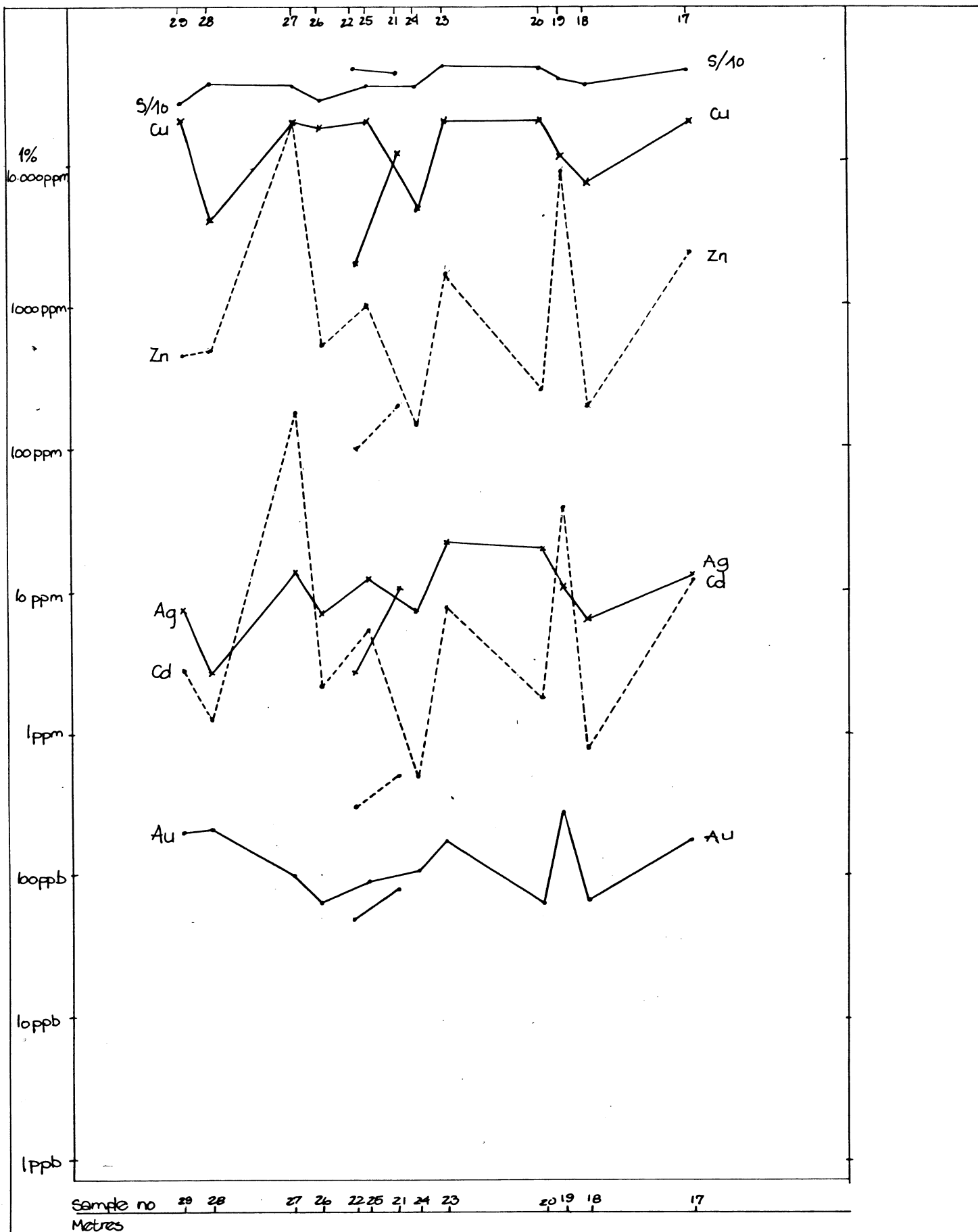
Løkken feeder-zone Cr, Co, Cu, Zn, Pb, S, Hg Bh 2	Scale:	Draw	TG
	1:1000	Trac	AM
		Date	Apr 83
Orkla Industrier A.S. 7332 LØKKEN VERK Gulf-Orkla Venture	No. LØ gkj 2d		
	Enclosure no: 9c		
	Report no 21		



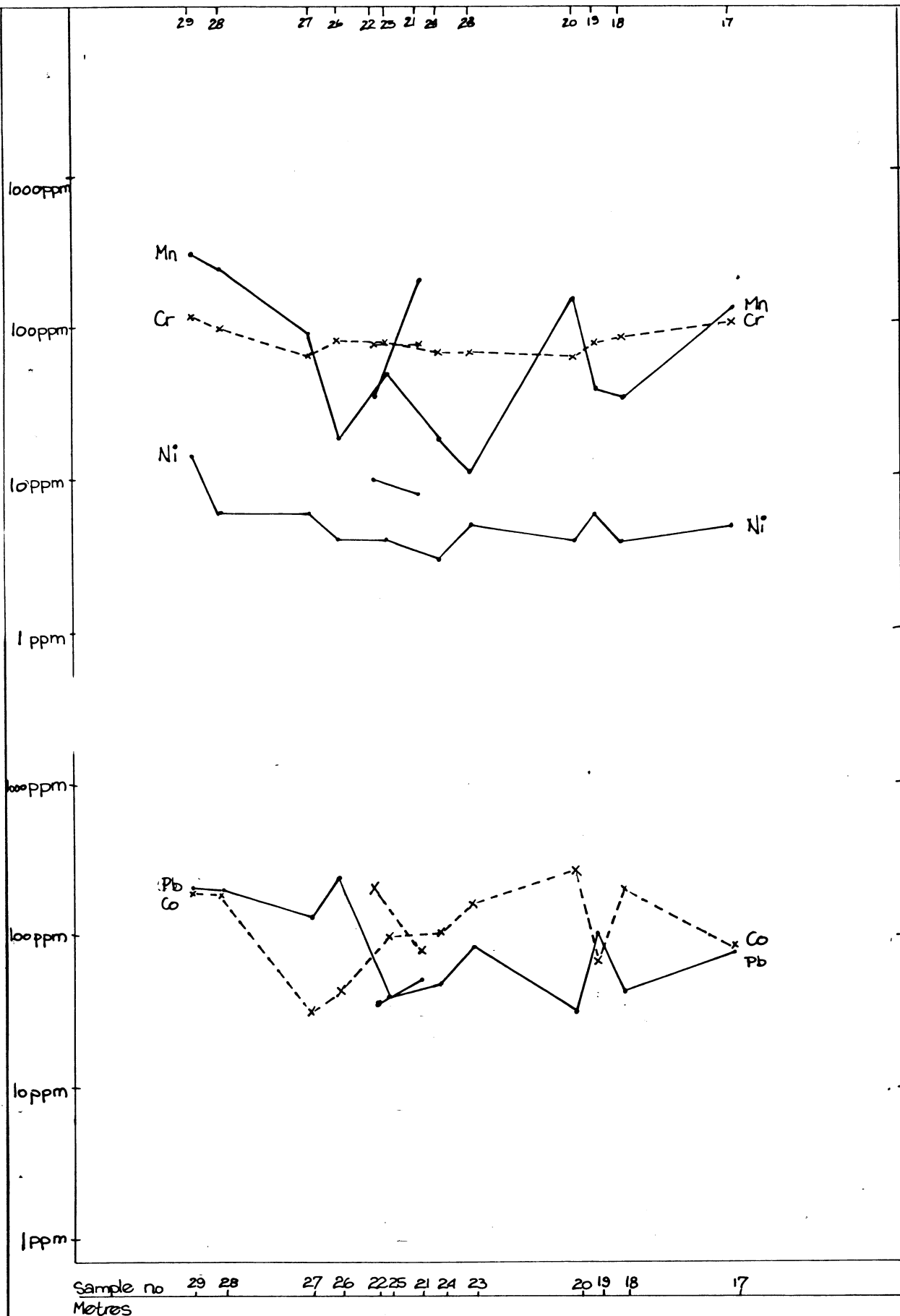
Løkken feeder-zone MnO, TiO ₂ , P ₂ O ₅ , Zr, Y, V, Sr in Drillhole 2 metabasalts	Scale	Draw	TG
	1:1000	Trac	AM
		Date	Apr 83
Orkla Industrier A.s 7332 LØKKEN VERK		No Lø gkj 2a	
Gulf-Orkla Venture		Enclosure no: 9b	
		Report no 21	



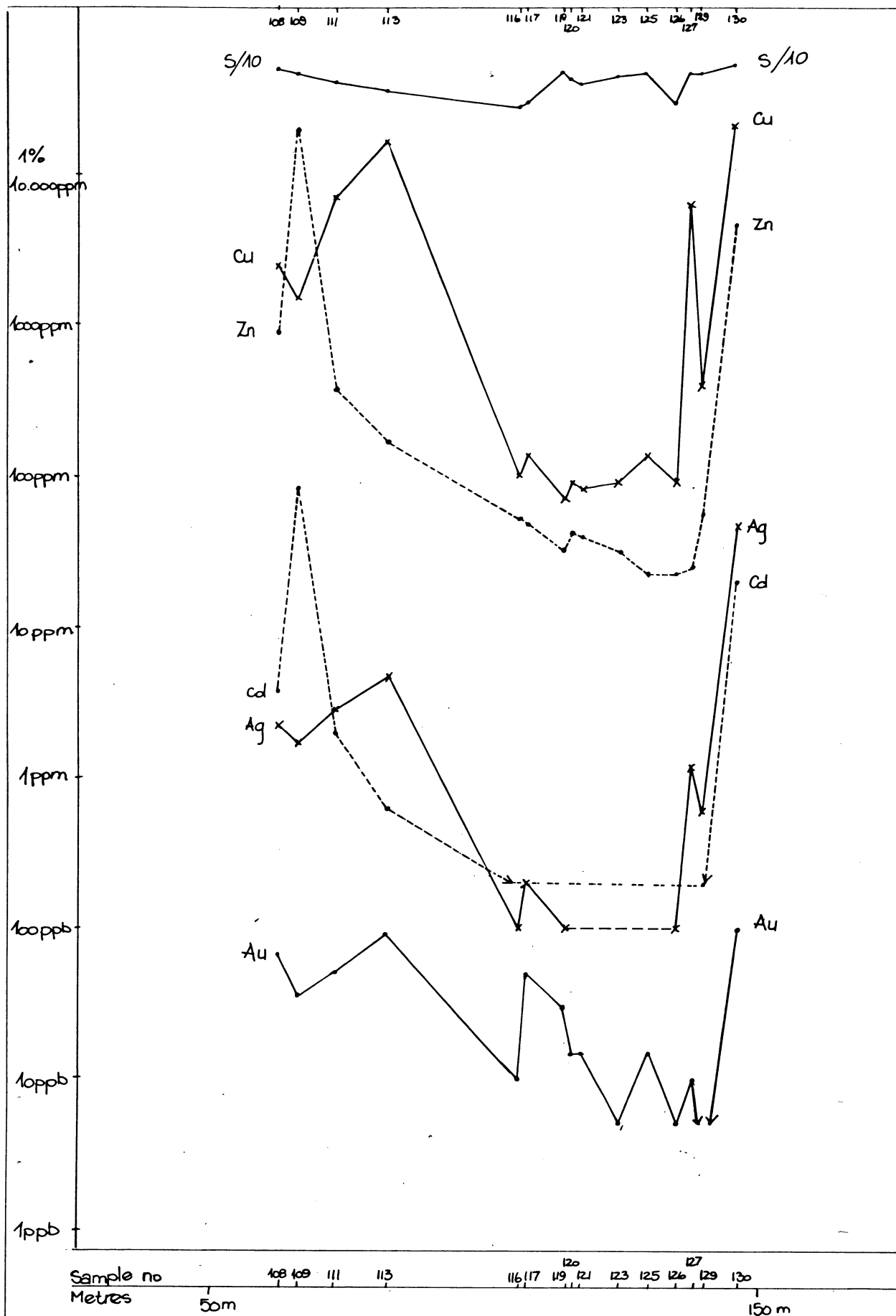
Løkken feeder - zone SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , MgO, Na ₂ O, CaO, K ₂ O Drillhole 2 in metabasalts	Scale	Draw	TG
	1:1000	Trac	AM
		Date	Apr 83
Orkla Industrier A.S. 7332 LØKKEN VERK Gulf-Orkla Venture	No Lø gkj 2b		
	Enclosure no: 9a		
	Report no 21		



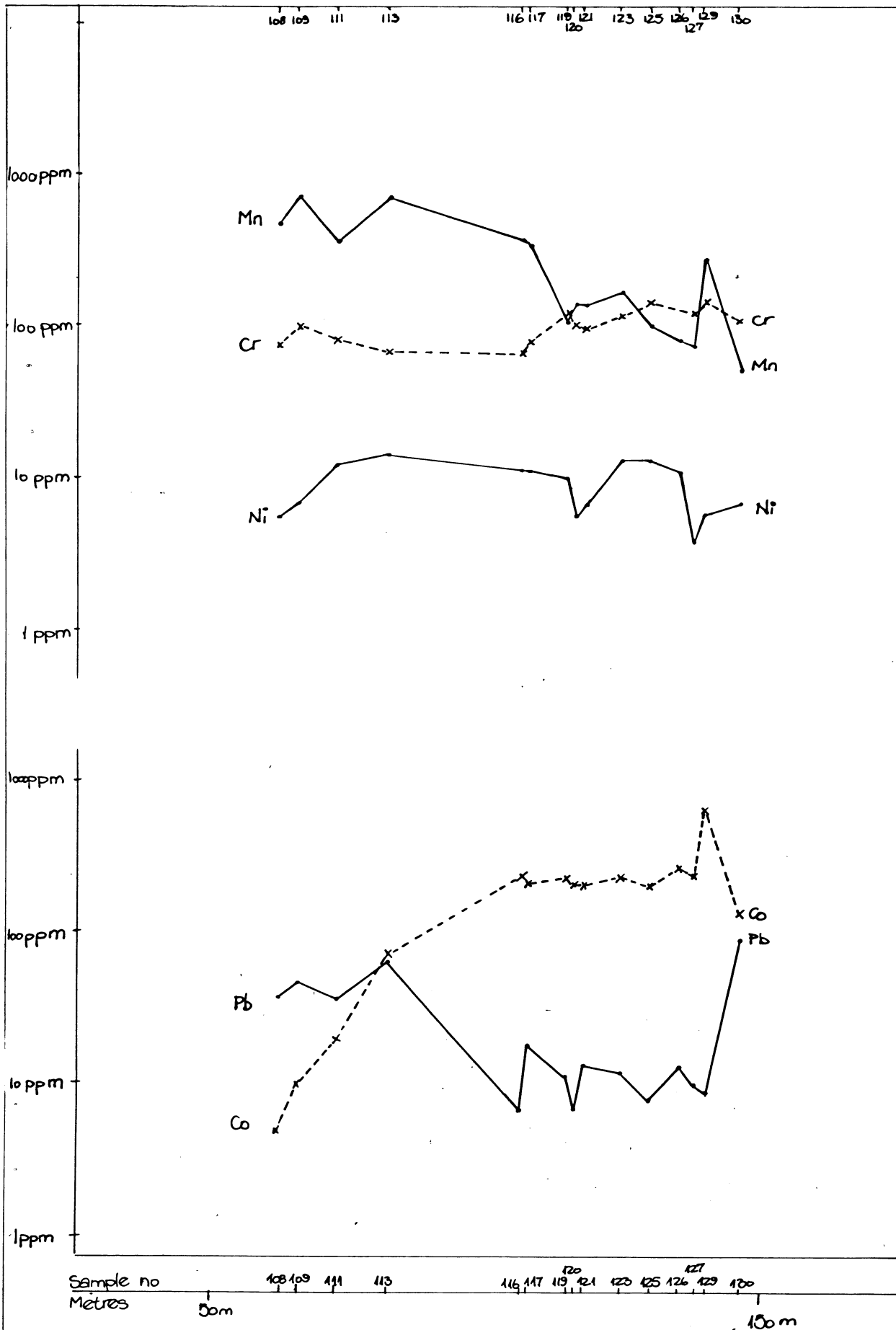
Løkken feeder-zone Løkken Mine, old shaft area S, Cu, Zn, Ag, Au, Cd in sulphide veins	Scale:	Draw	TG
		Trac	AM
		Date	Apr 83
Orkla Industrier A.S 7332 LØKKEN VERK Gulf- Orkla Venture	No		
	Enclosure no.: 10a		
	Report no.: LV 21		



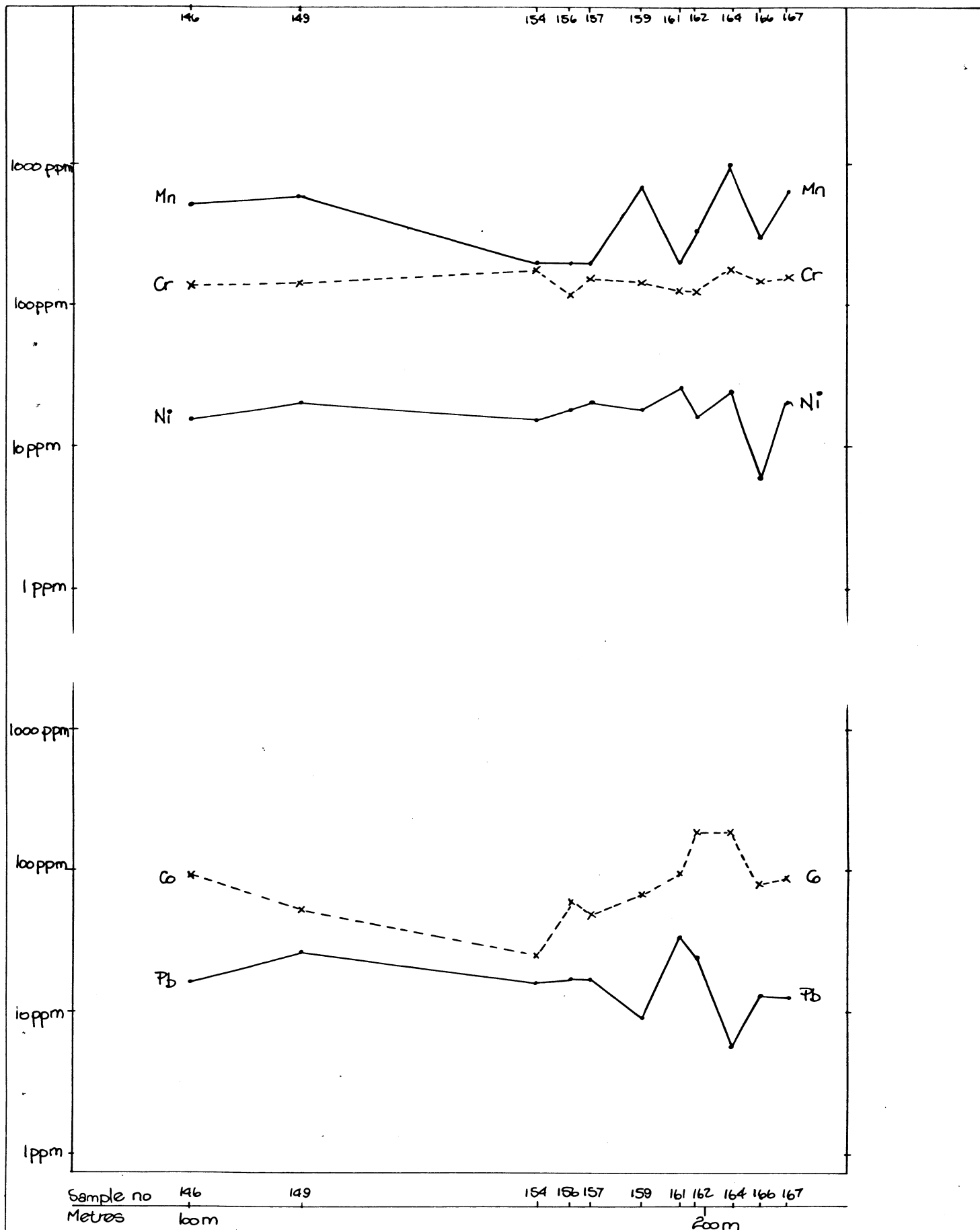
Løkken feeder-zone Løkken Mine, old shaft area Pb, Co, Ni, Cr, Mn in sulphide veins	Scale :	Draw	TG
		Trac	AM
		Date	Apr 83
Orkla Industrier A.S 7332 LØKKEN VERK Gulf-Orkla Venture	No		
	Enclosure no : 106		
	Report no : LV 21		



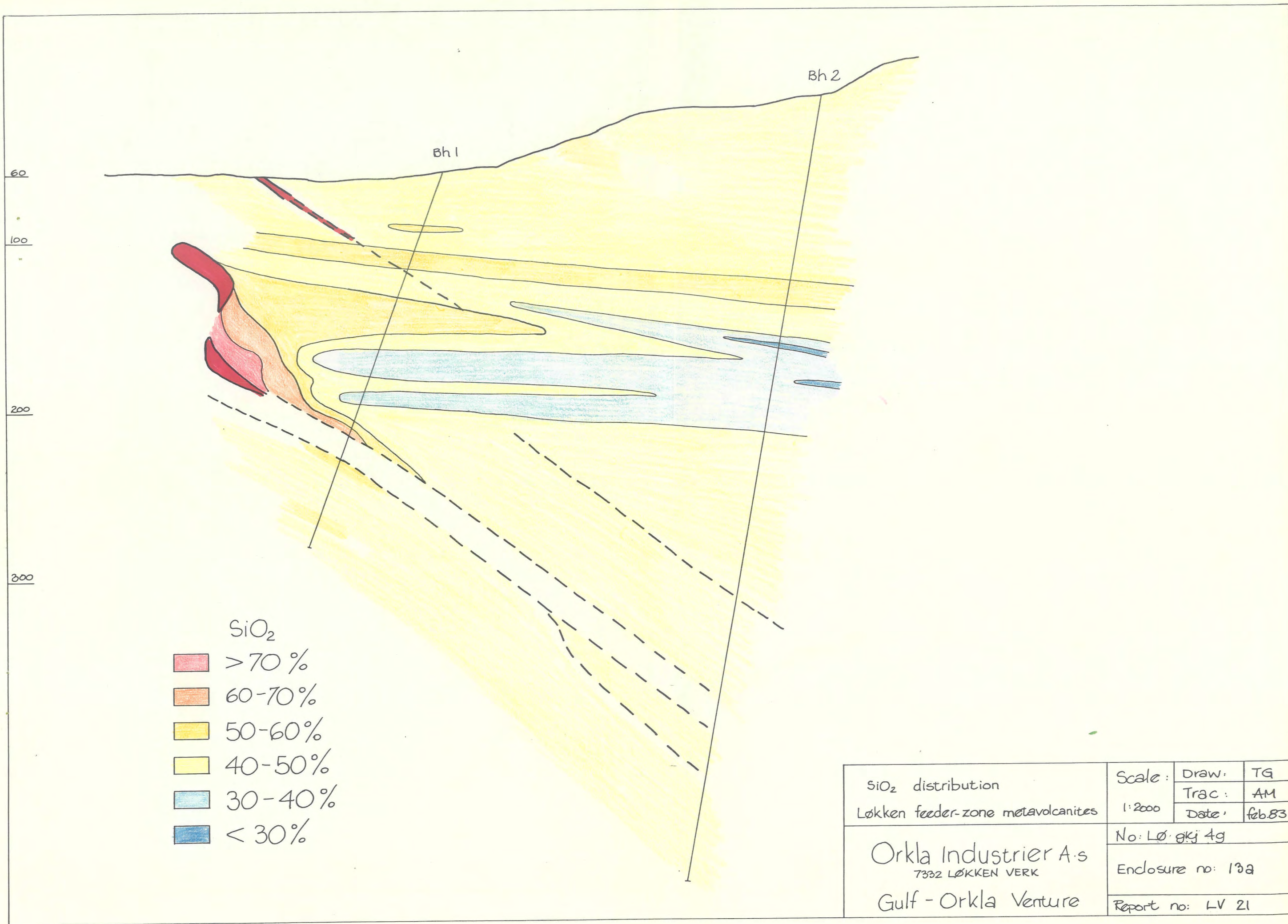
Løkken feeder-zone Drillhole 1 S, Cu, Zn, Ag, Au, Cd in sulphide veins	Scale :	Draw	TG
		Trac	AM
		Date	Apr 83
Orkla Industrier A.S 7332 LØKKEN VERK Gulf-Orkla Venture	No		
	Enclosure no : 11a		
	Report no : LV 21		



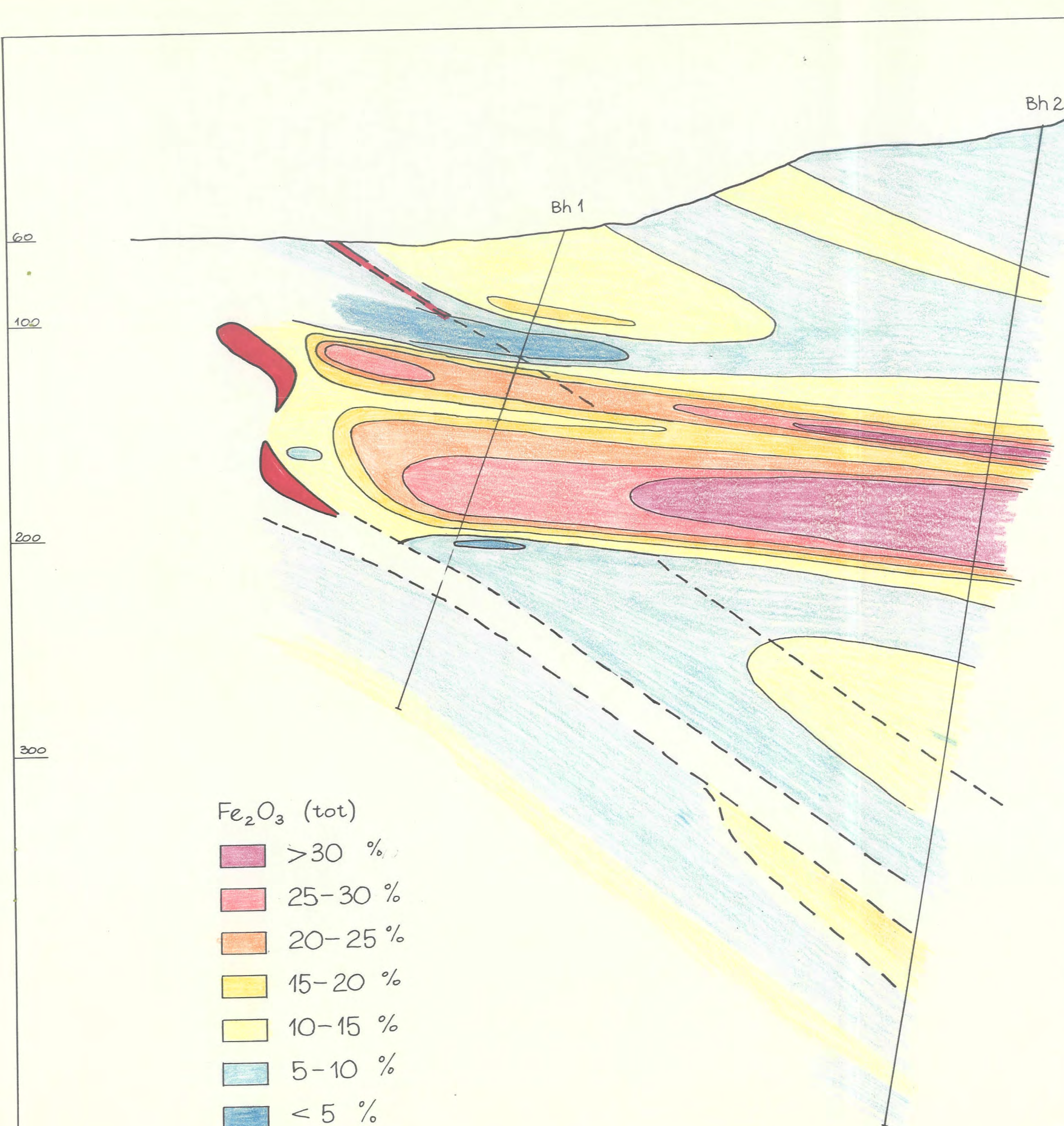
Løkken feeder-zone Drillhole 1 Pb, Co, Ni, Cr, Mn in sulphide veins	Scale :	Draw	TG
		Trac	AM
		Date	Apr 83
Orkla Industrier A.S 7332 LØKKEN VERK Gulf-Orkla Venture	No		
	Enclosure no. 11b		
	Report no. LV 21		



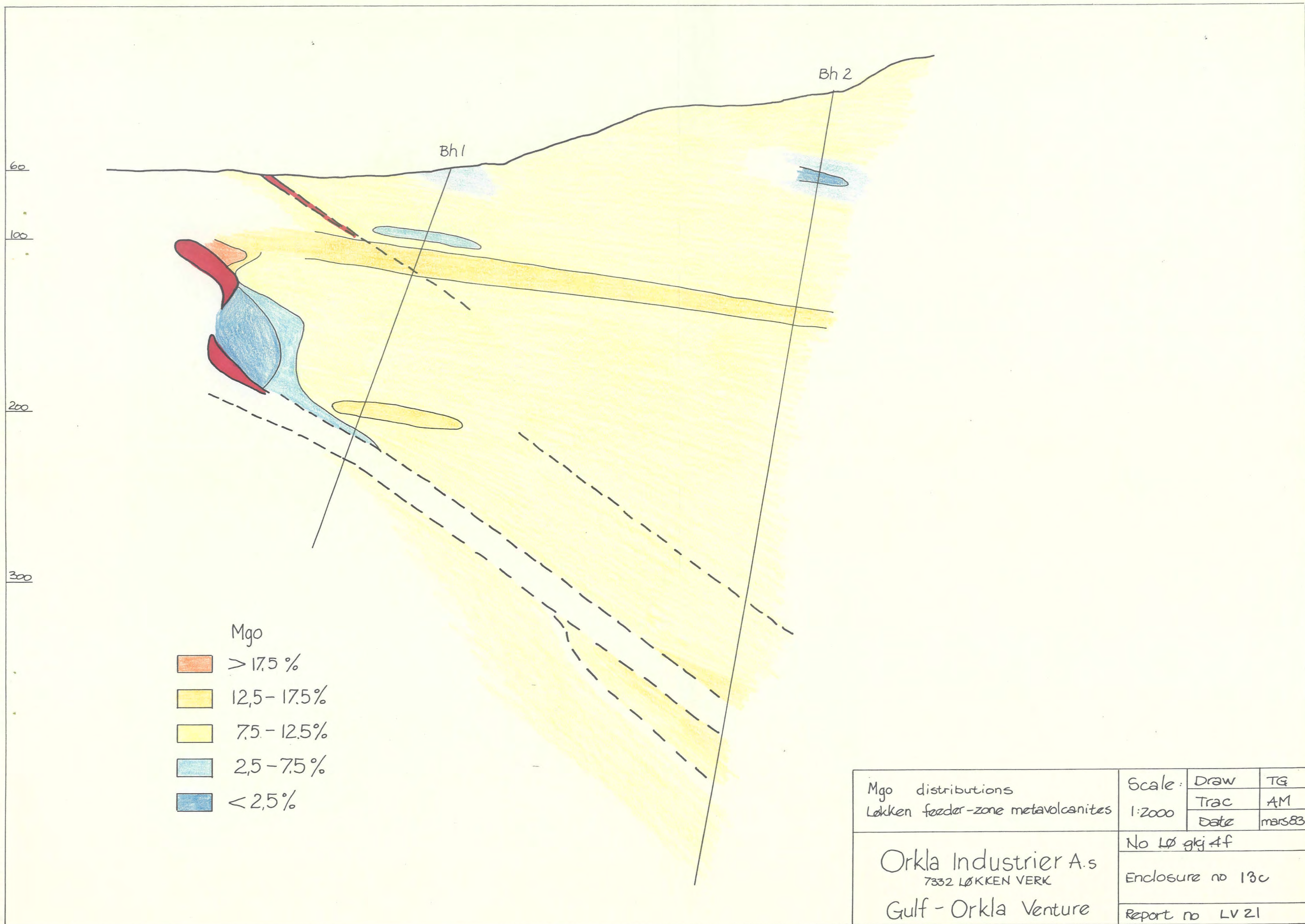
Løkken feeder-zone Drillhole Z Pb, Co, Ni, Cr, Mn in sulphide veins	Scale:	Draw	TG
		Trac	AM
		Date	Apr 83
Orkla Industrier A.S 7032 LØKKEN VEK Gulf-Orkla Venture	No		
	Enclosure no: 12 b		
	Report no: LV 21		

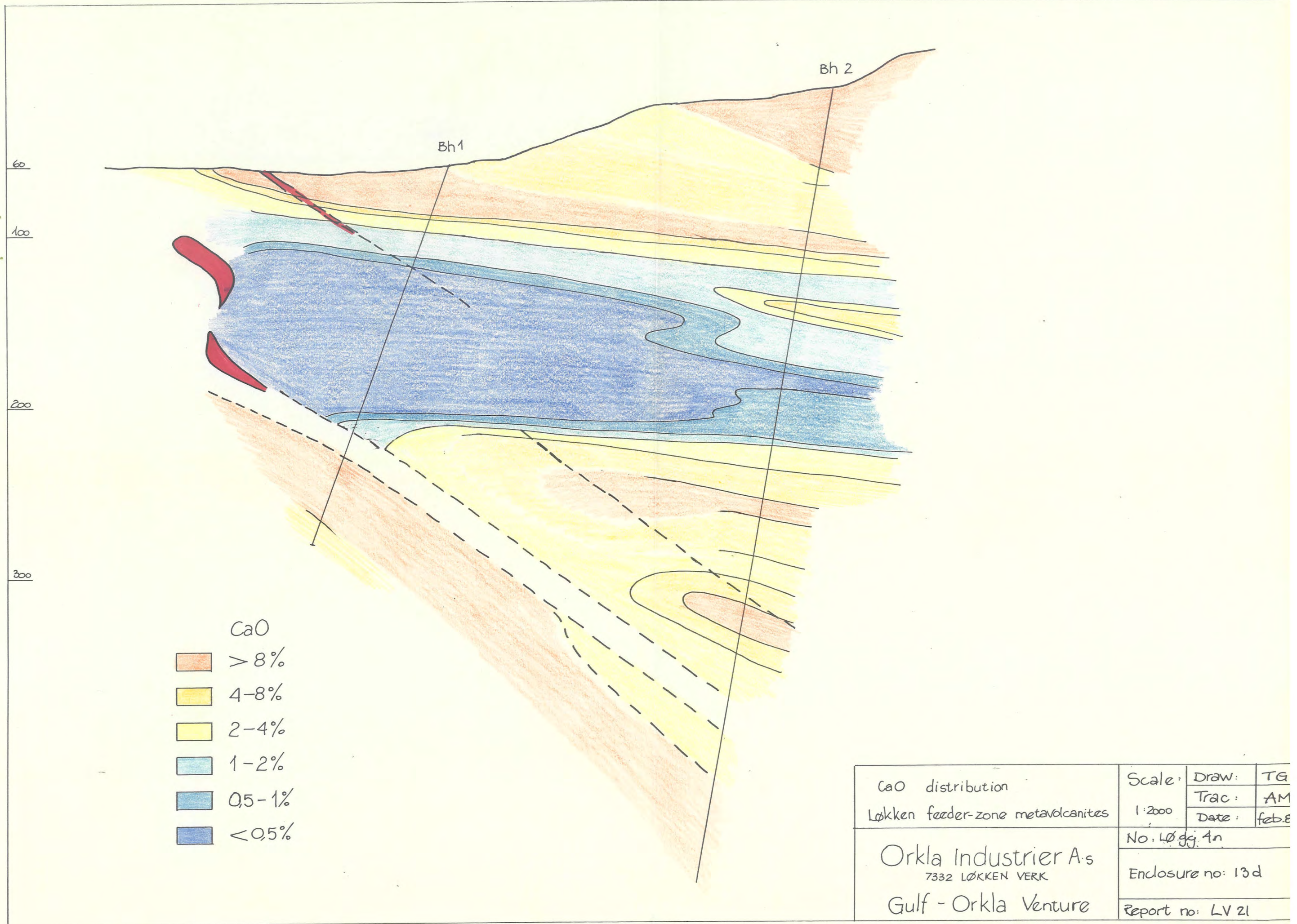


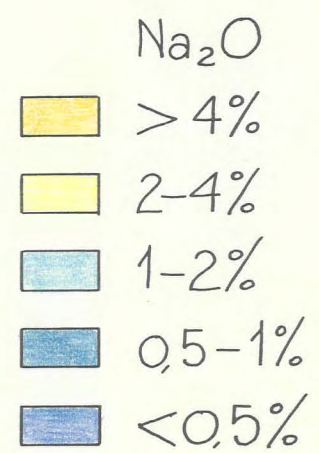
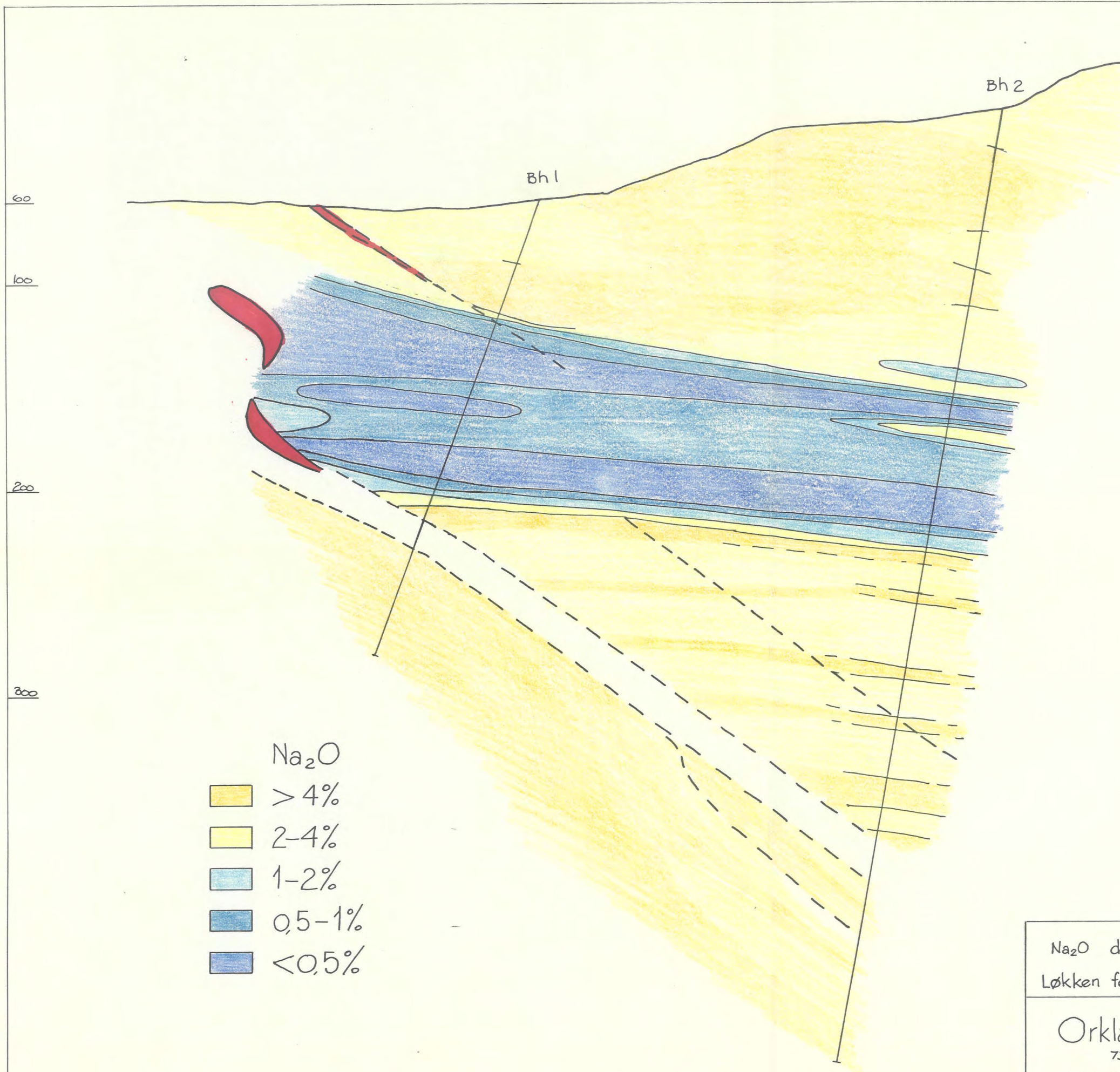
SiO ₂ distribution Løkken feeder-zone metavolcanites	Scale :	Draw. :	TG
	1:2000	Trac. :	AM
		Date :	feb.83
Orkla Industrier A.s 7332 LØKKEN VERK Gulf - Orkla Venture	No: Lø. økj 4g		
	Enclosure no: 13a		
	Report no: LV 21		



Fe_2O_3 (total iron) distribution Løkken feeder-zone metavolcanites	Scale:	Draw:	TG
	1:2000	Trac:	AM
		Date:	feb 83
Orkla Industrier A.s 7332 LØKKEN VERK Gulf - Orkla Venture	No: LØ. gg. 4k		
	Enclosure no: 13 b		
	Report no: LV 21		







Na₂O distribution
Løkken feeder-zone metavolcanites

Scale: 1:2000	Draw:	T
	Trac:	A
	Date:	fe

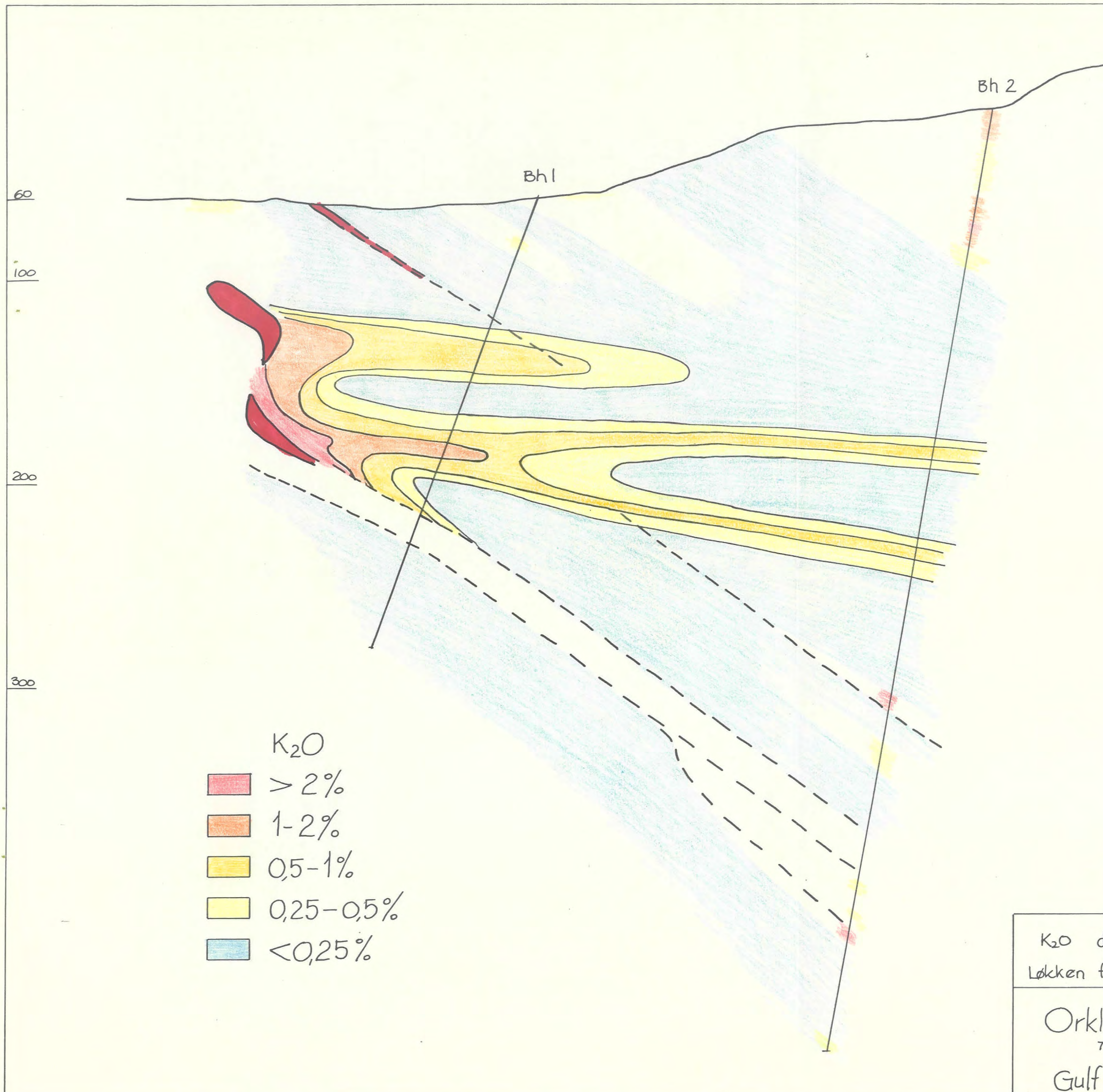
Orkla Industrier A.s
7332 LØKKEN VERK

Gulf - Orkla Venture

No: Løggj. 4 m

Enclosure no: 13e

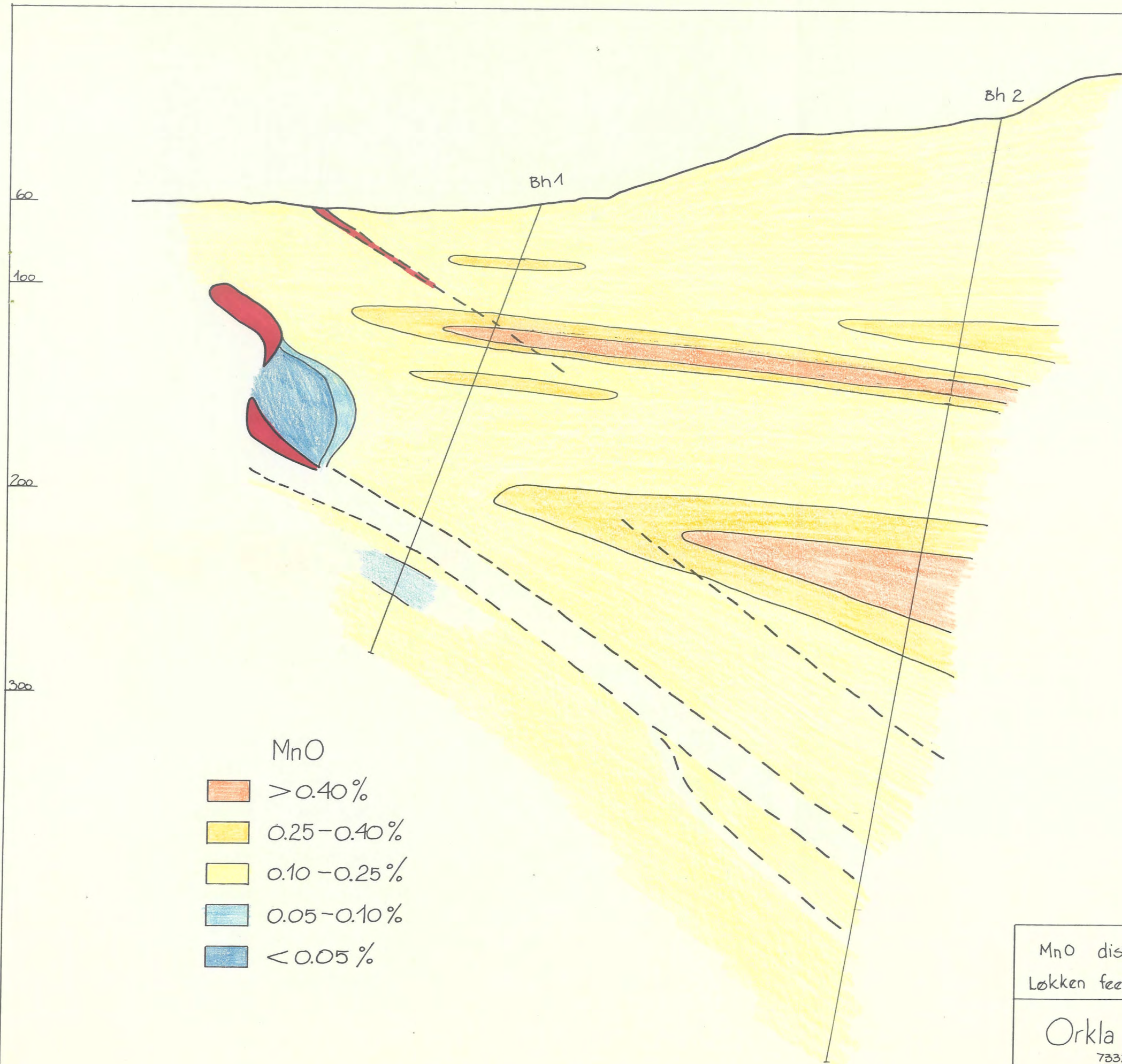
Report no: LV 21



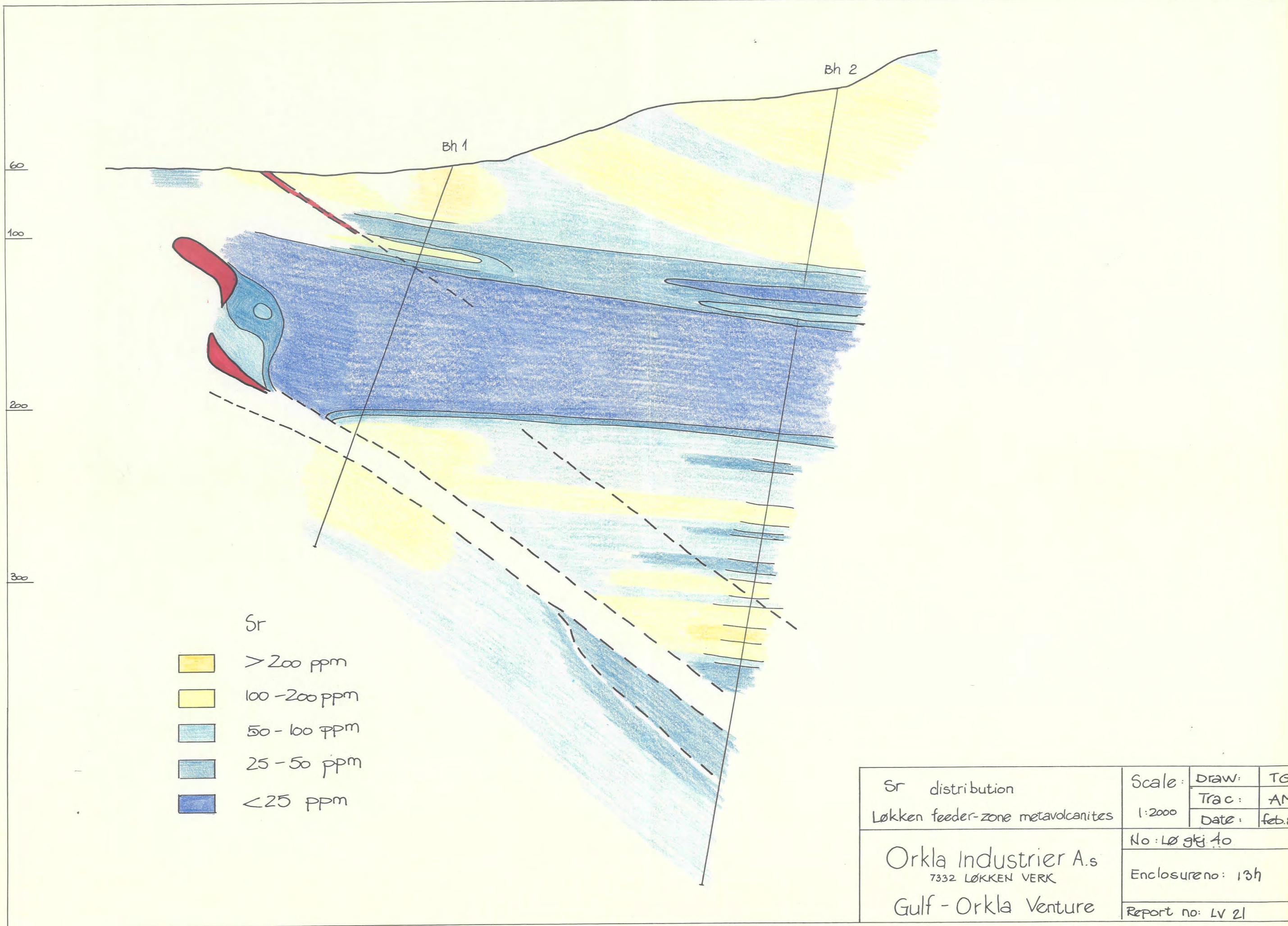
K₂O

- > 2%
- 1-2%
- 0,5-1%
- 0,25-0,5%
- < 0,25%

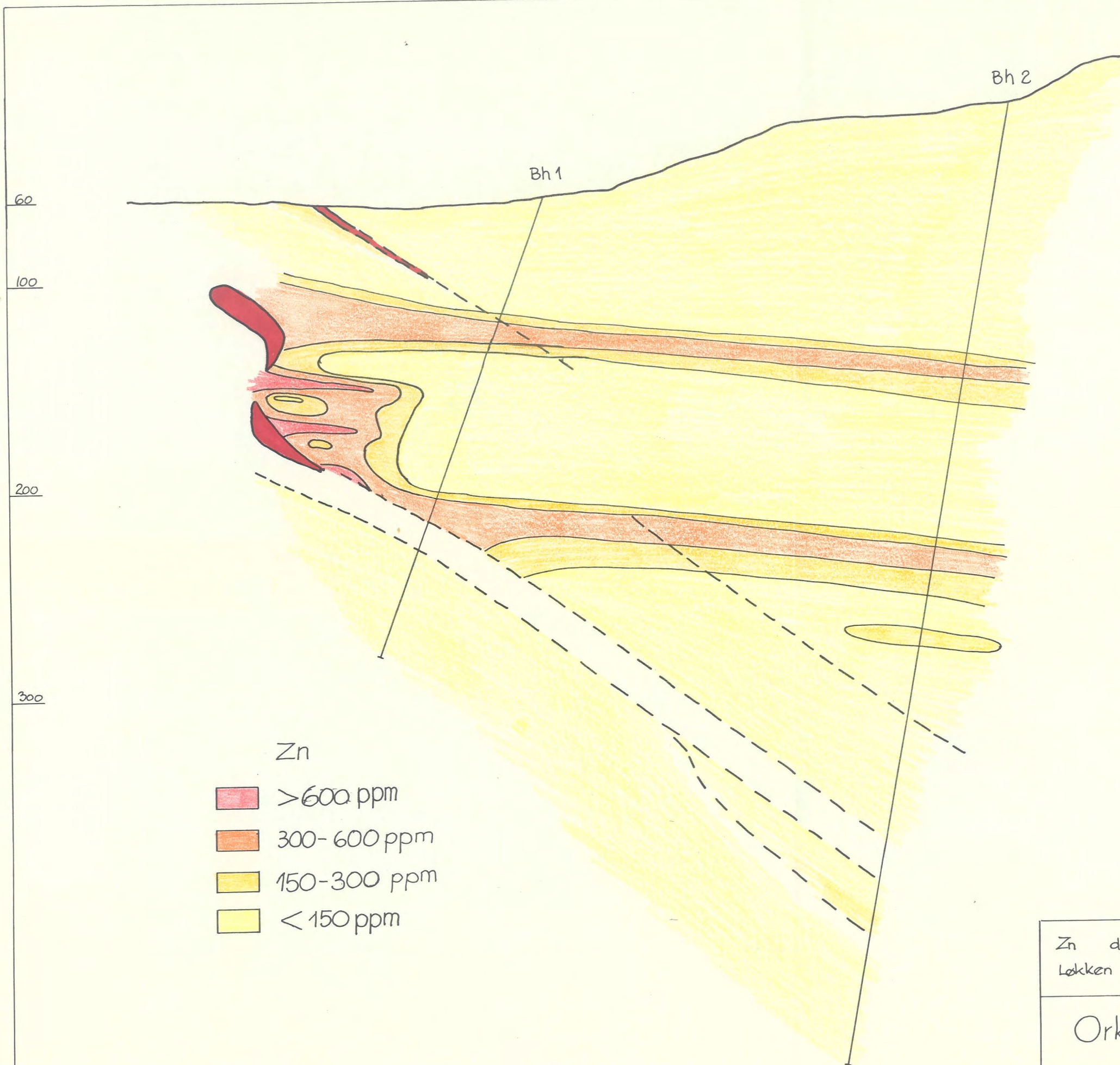
K ₂ O distribution Løkken feeder-zone metavolcanites	Scale:	Draw:	TG
	1:2000	Trac:	AM
		Date:	feb 83
Orkla Industrier A.s 7332 LØKKEN VERK Gulf - Orkla Venture	No: Lø gg. 4i		
	Enclosure no: 13f		
	Report no: LV 21		



MnO distribution Løkken feeder-zone metavolcanites	Scale :	Draw :	TG
	1:2000	Trac :	AM
		Date :	feb.83
Orkla Industrier A.s 7332 LØKKEN VERK Gulf - Orkla Venture	No: Lø gkj 4h		
	Enclosure no: 13g		
	Report no: LV 21		





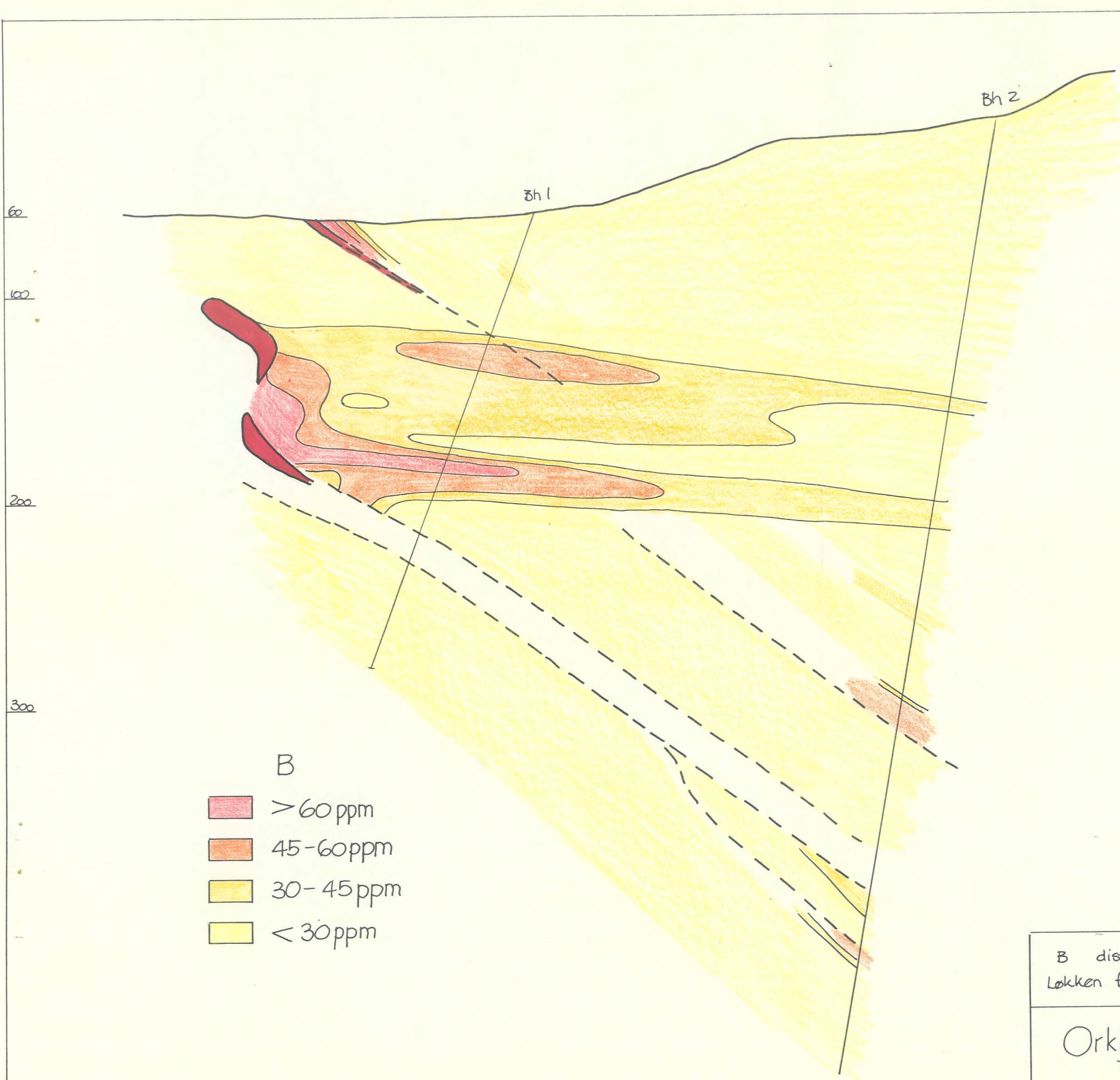


Zn

	>600 ppm
	300-600 ppm
	150-300 ppm
	<150 ppm

Zn distribution Løkken feeder-zone metavolcanites	Scale:	Draw:	TC
	1:2000	Trac:	AM
		Date:	feb.
Orkla Industrier A.s 7332 LØKKEN VERK Gulf - Orkla Venture	No: LØ gkj 4c		
	Enclosure no: 13k		
	Report no: LV 21		





- B
- >60 ppm
 - 45-60 ppm
 - 30-45 ppm
 - <30 ppm

B distribution Løkken feeder-zone metavolcanites	Scale:	Draw:	TG
	1:2000	Trac:	AM
		Date:	mar83
Orkla Industrier A.s 7332 LØKKEN VERK Gulf - Orkla Venture	No: LØ 9149		
	Enclosure no: 13n		
	Report no: LV 21		

60

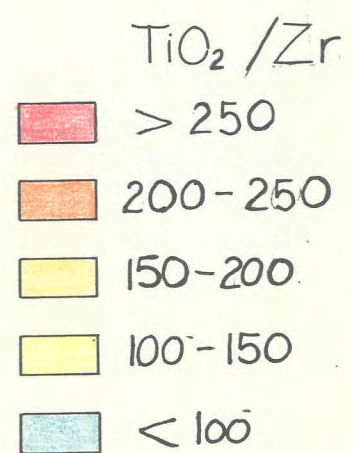
100

200

300

Bh 2

Bh 1

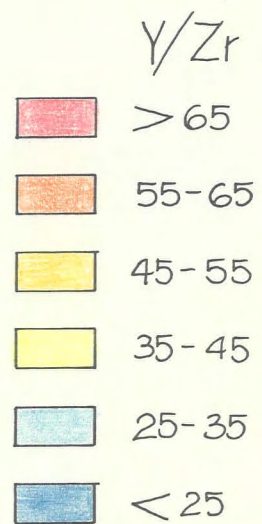
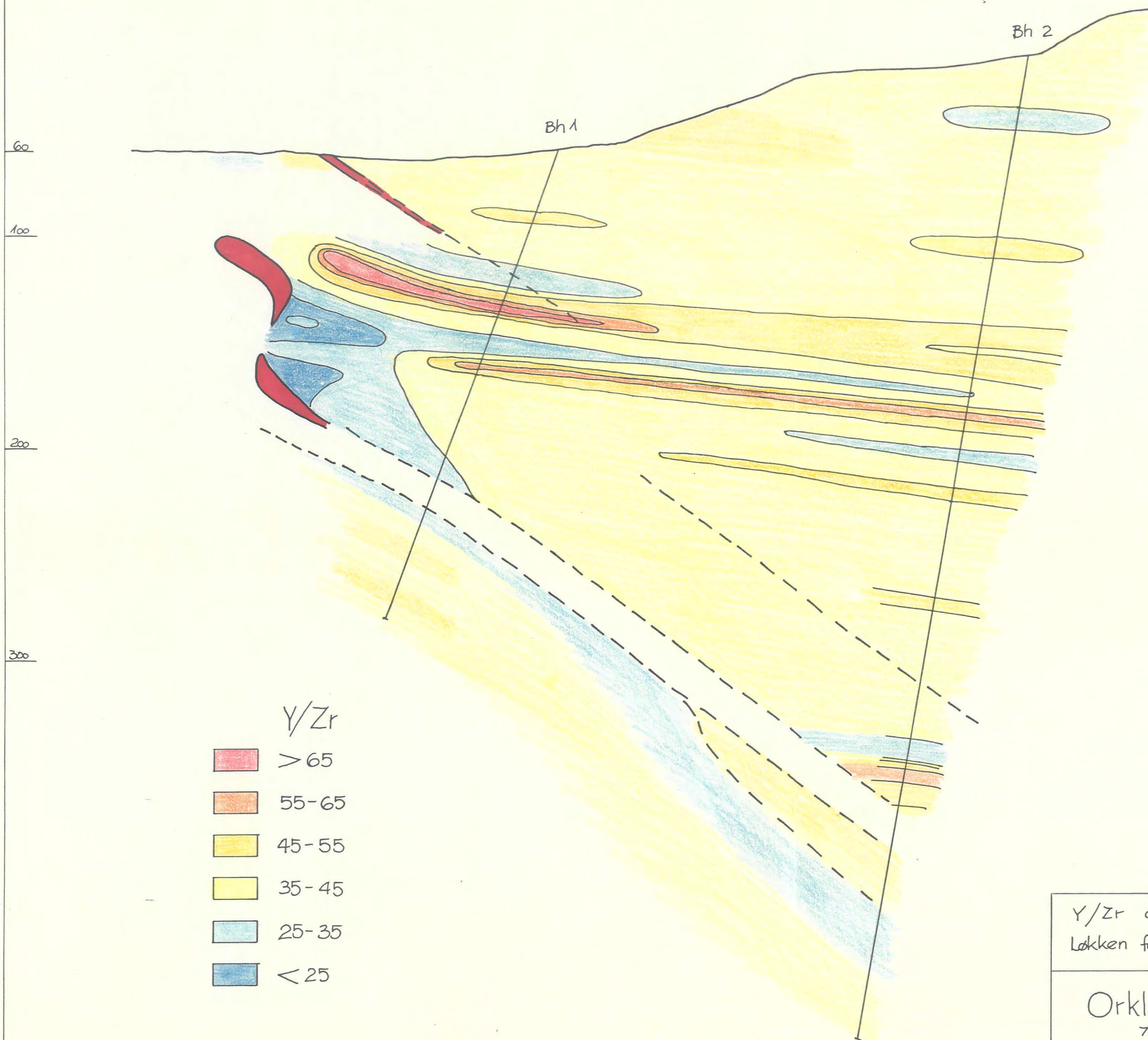


TiO_2/Zr distribution
Løkken feeder-zone metavolcanites

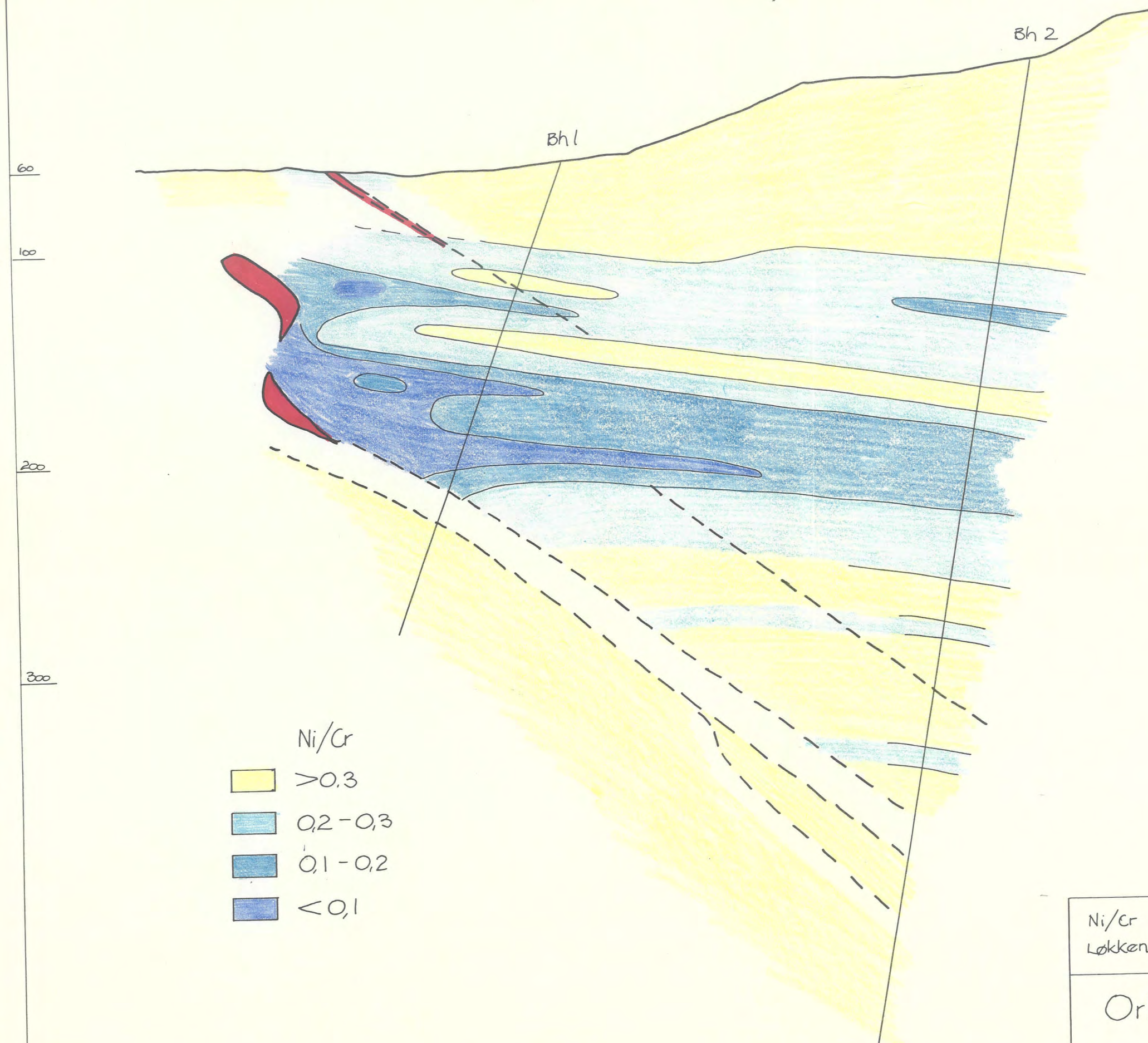
Scale: 1:2000	Draw:	TG
	Trac:	AM
	Date:	feb.83

Orkla Industrier A.s
7332 LØKKEN VERK
Gulf - Orkla Venture

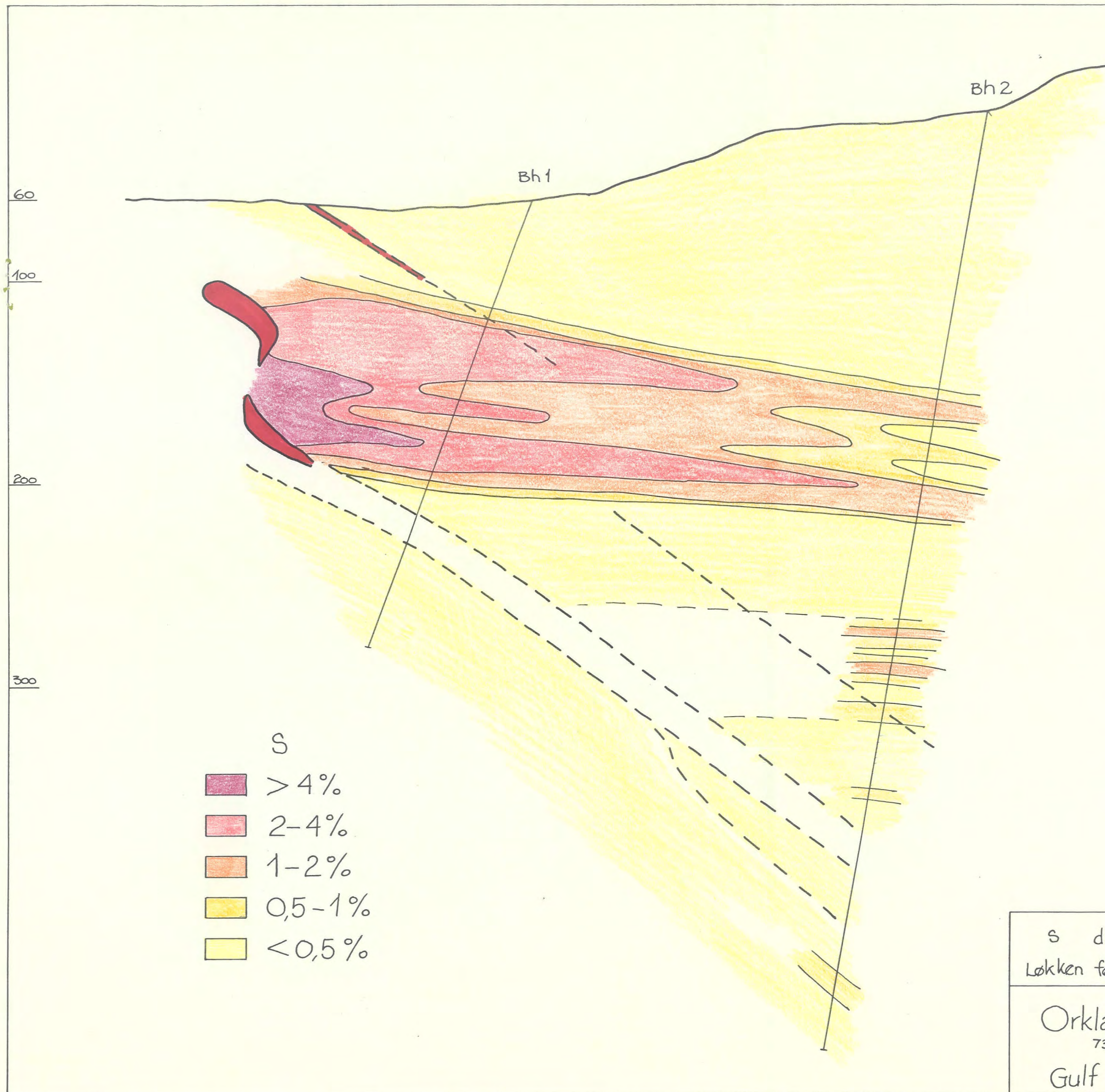
No: Løggj. 41
Enclosure no: 130
Report no: LV 21



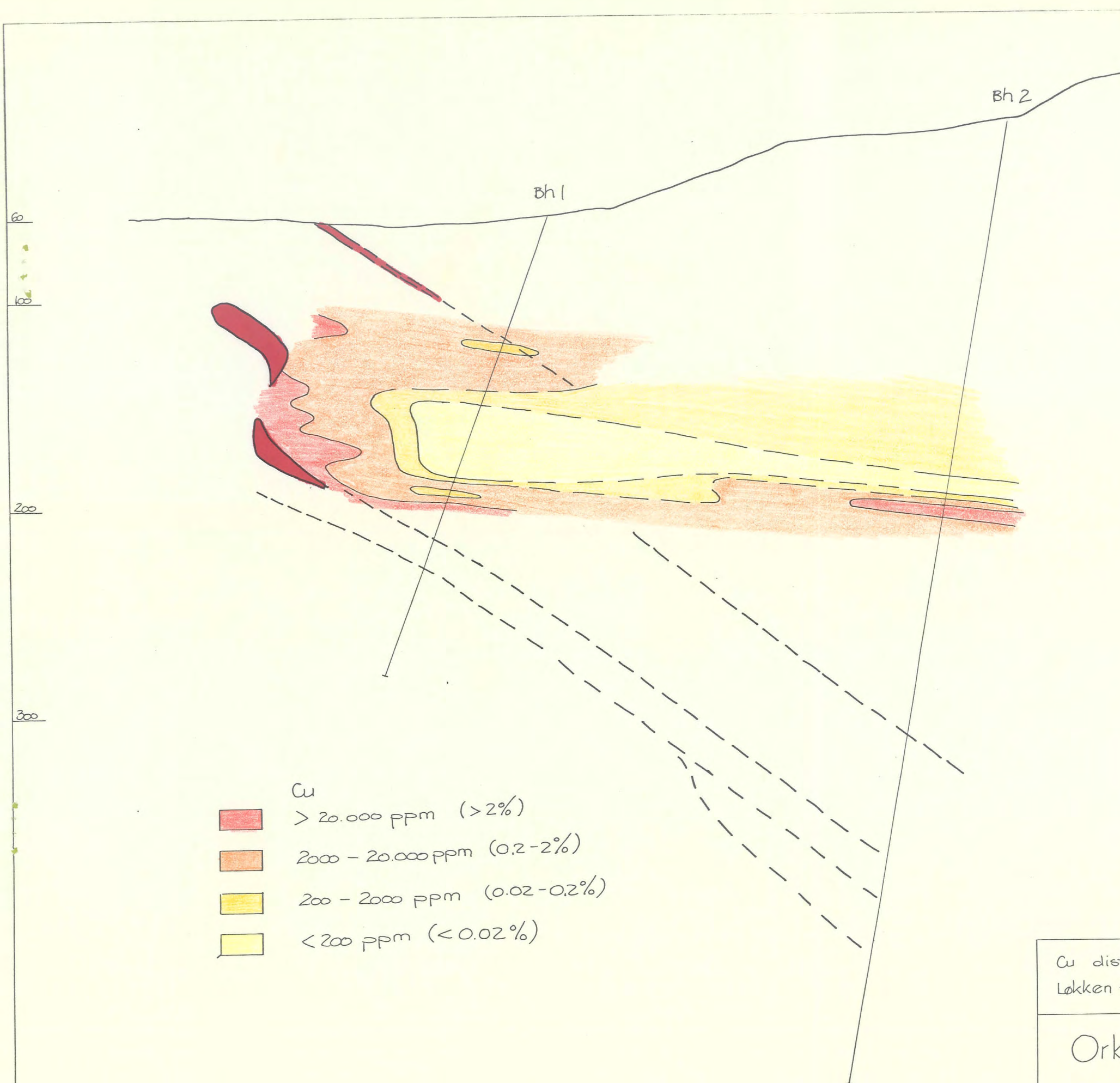
Y/Zr distribution Løkken feeder-zone metavolcanites	Scale:	Draw	T.
	1:2000	Trac	A
		Date:	me
Orkla Industrier A.s 7332 LØKKEN VERK Gulf - Orkla Venture	No: LØ gj 4r		
	Enclosure no 13p		
	Report no: LV 21		



Ni/Cr distributions Løkken feeder-zone metavolcanites	Scale:	Draw	T
	1:2000	Trac	A
		Date	ms
Orkla Industrier A.s 7332 LØKKEN VERK Gulf - Orkla Venture	No: Løkken 4e		
	Enclosure no 139		
	Report no LV 21		



S distribution Løkken feeder-zone metavolcanites	Scale:	Draw:	TG
	1:2000	Trac:	AM
		Date:	feb. 83
Orkla Industrier A.s 7332 LØKKEN VERK Gulf - Orkla Venture	No: LØ.gkj.4d		
	Enclosure no: 13r		
	Report no: LV21		



Cu distribution Løkken feeder-zone sulphide veins	Scale:	Draw	TG
	1:2000	Trac	AM
		Date	mar 83
Orkla Industrier A.s 7332 LØKKEN VERK Gulf - Orkla Venture	No Gk A25a		
	Enclosure no 14 a		
	Report no LV21		

60

100

200

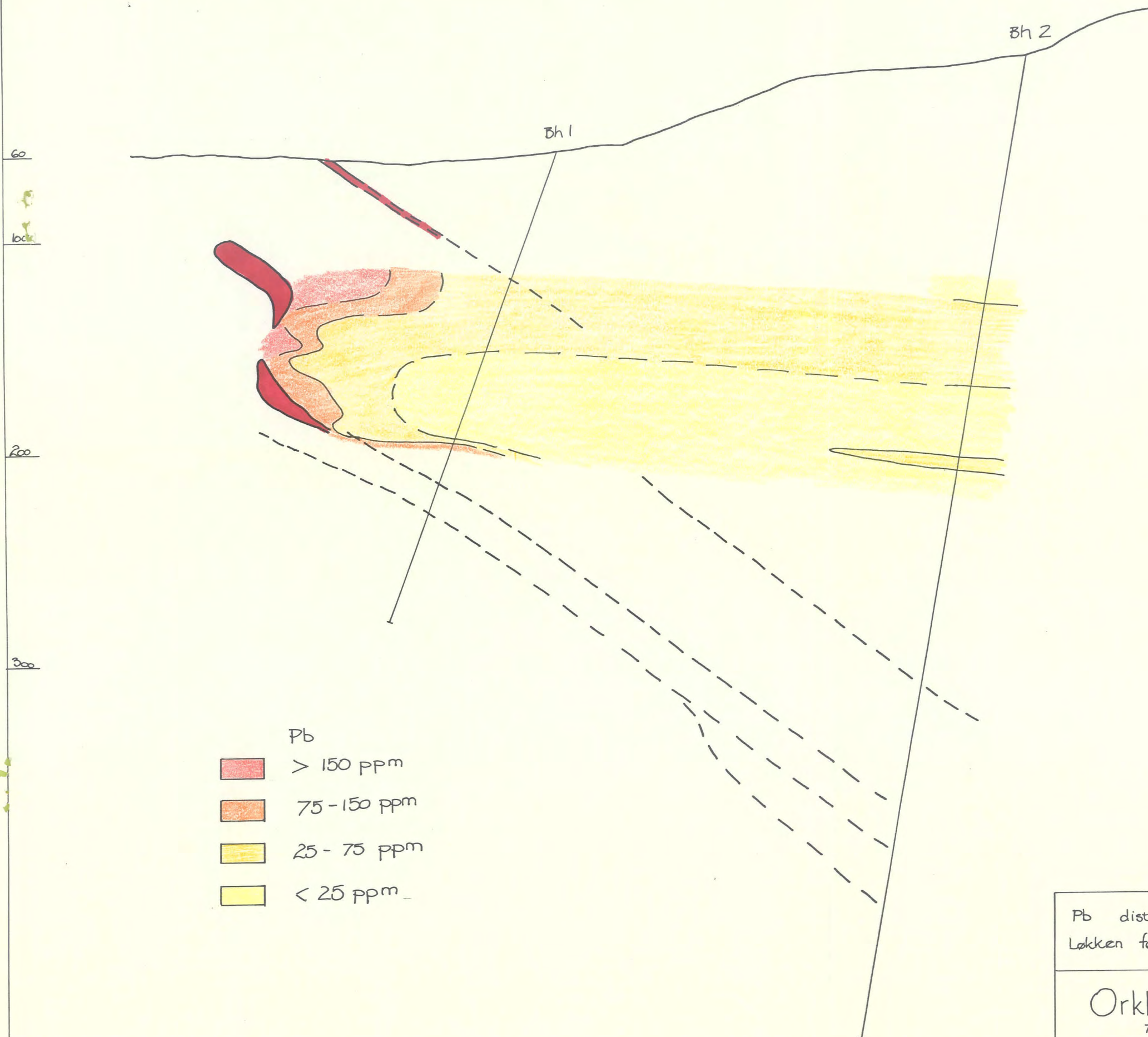
300

Bh 2

Bh 1

- Zn
- > 10.000 ppm (> 1%)
 - 1000 - 10.000 ppm (0.1 - 1%)
 - 100 - 1000 ppm (0.01 - 0.1%)
 - < 100 ppm (< 0.01%)

Zn distribution Løkken feeder-zone sulphide veins	Scale:	Draw	TG
	1:2000	Trac	AM
		Date	mars83
Orkla Industrier A.s 7332 LØKKEN VERK Gulf - Orkla Venture	No		
	Enclosure no 14 b		
	Report no LV 21		



- Pb
- > 150 ppm
 - 75 - 150 ppm
 - 25 - 75 ppm
 - < 25 ppm

Pb distribution Løkken feeder-zone sulphide veins	Scale:	Draw	TG
	1:2000	Trac	AM
		Date:	mars83
Orkla Industrier A.s 7832 LØKKEN VERK Gulf - Orkla Venture	No: 10 8kj 5c		
	Enclosure no 14c		
	Report no LV 21		