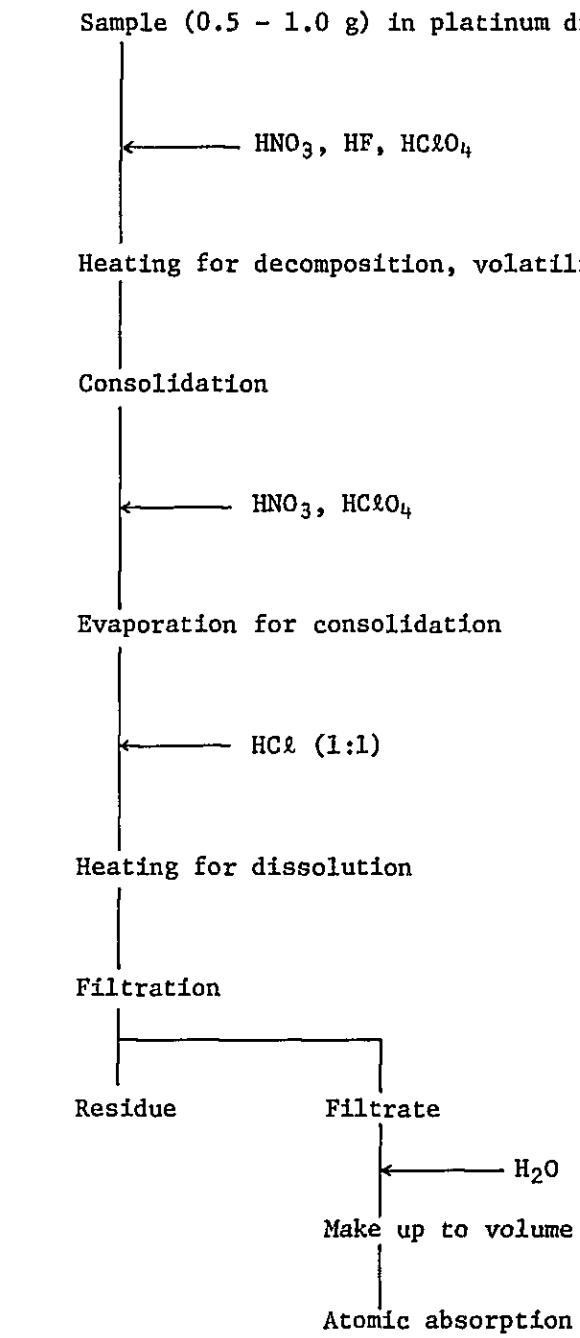
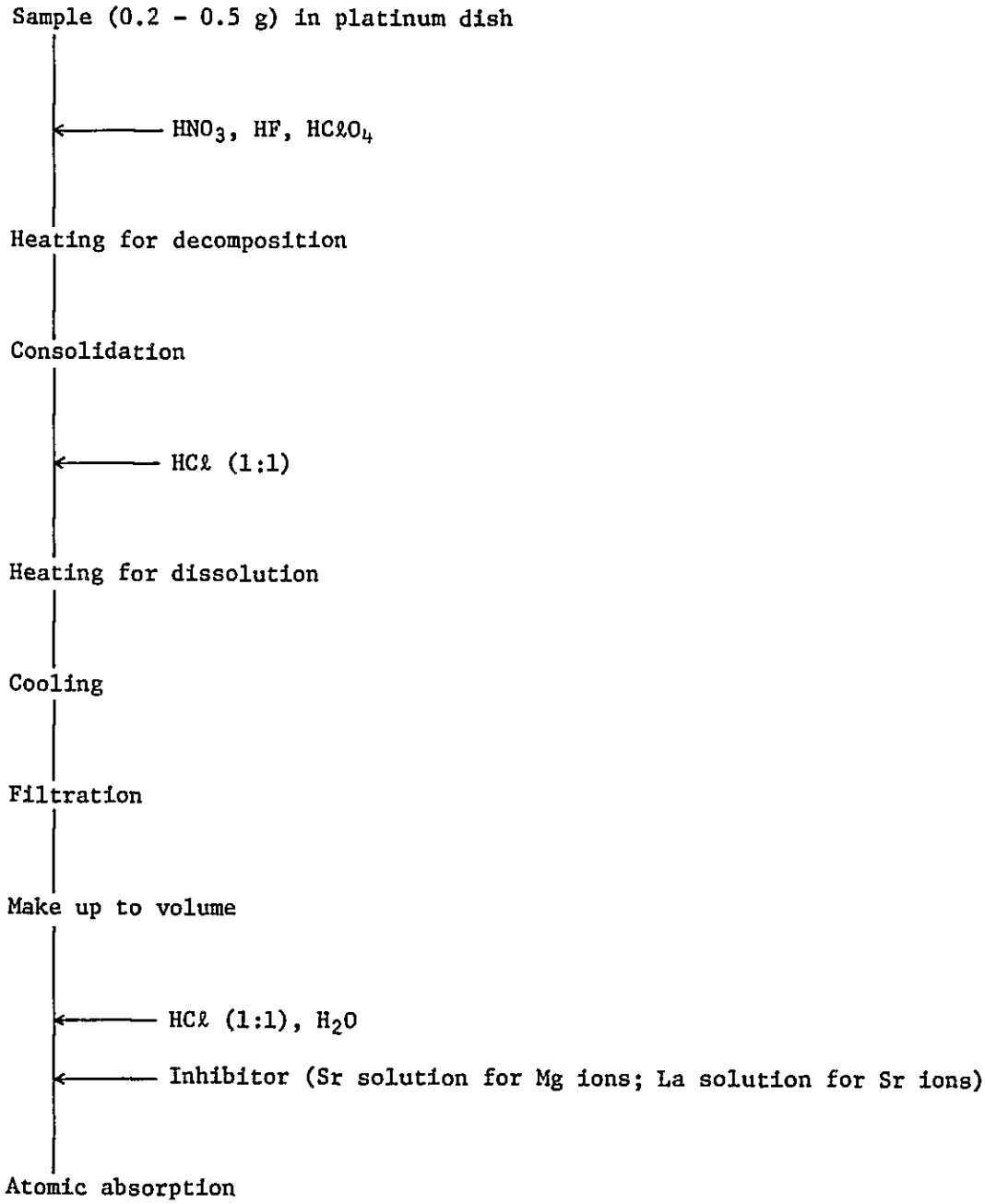
A. I - 12 Flow sheets of chemical analysis.

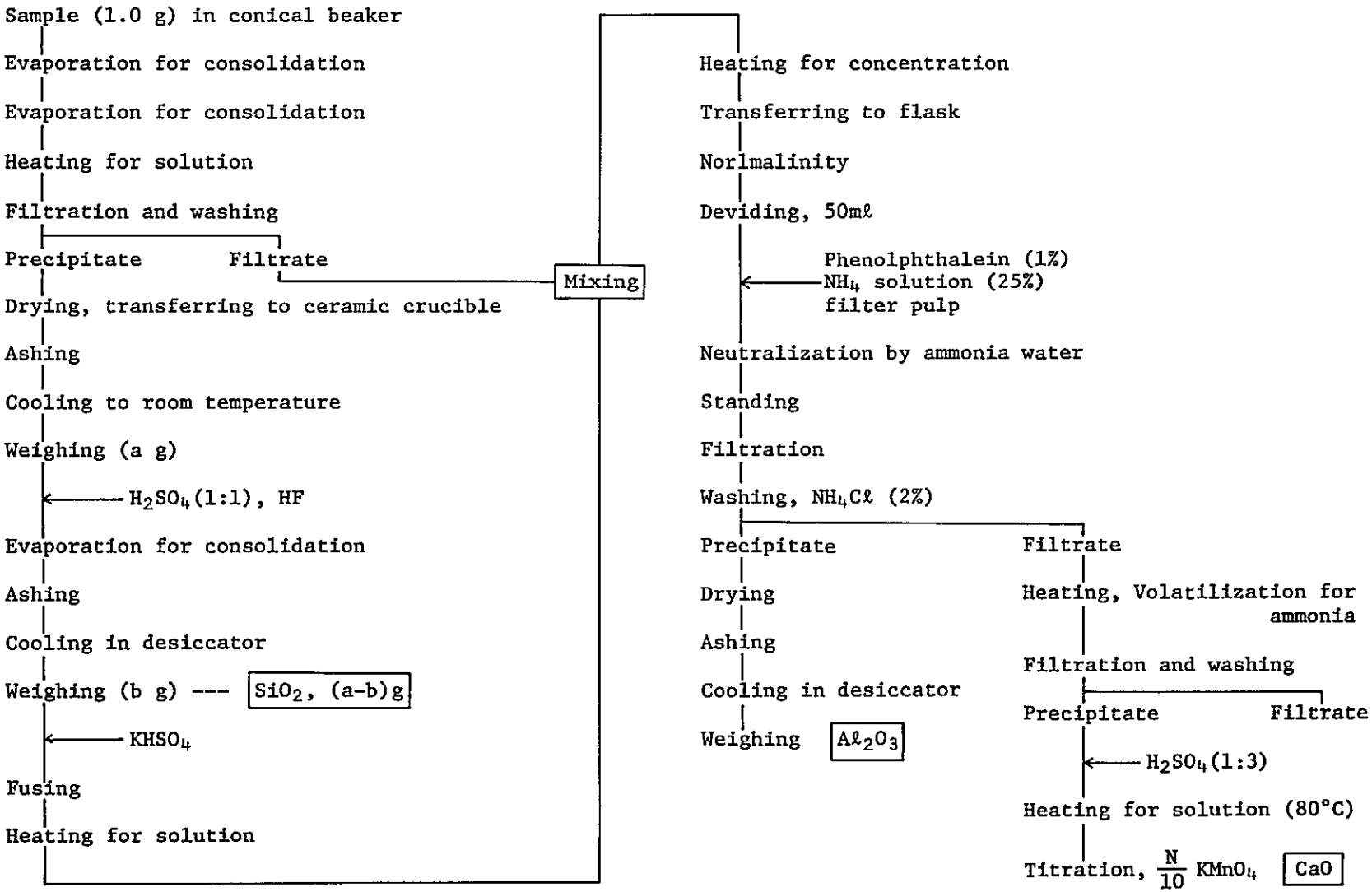
(Cu, Pb, Zn)



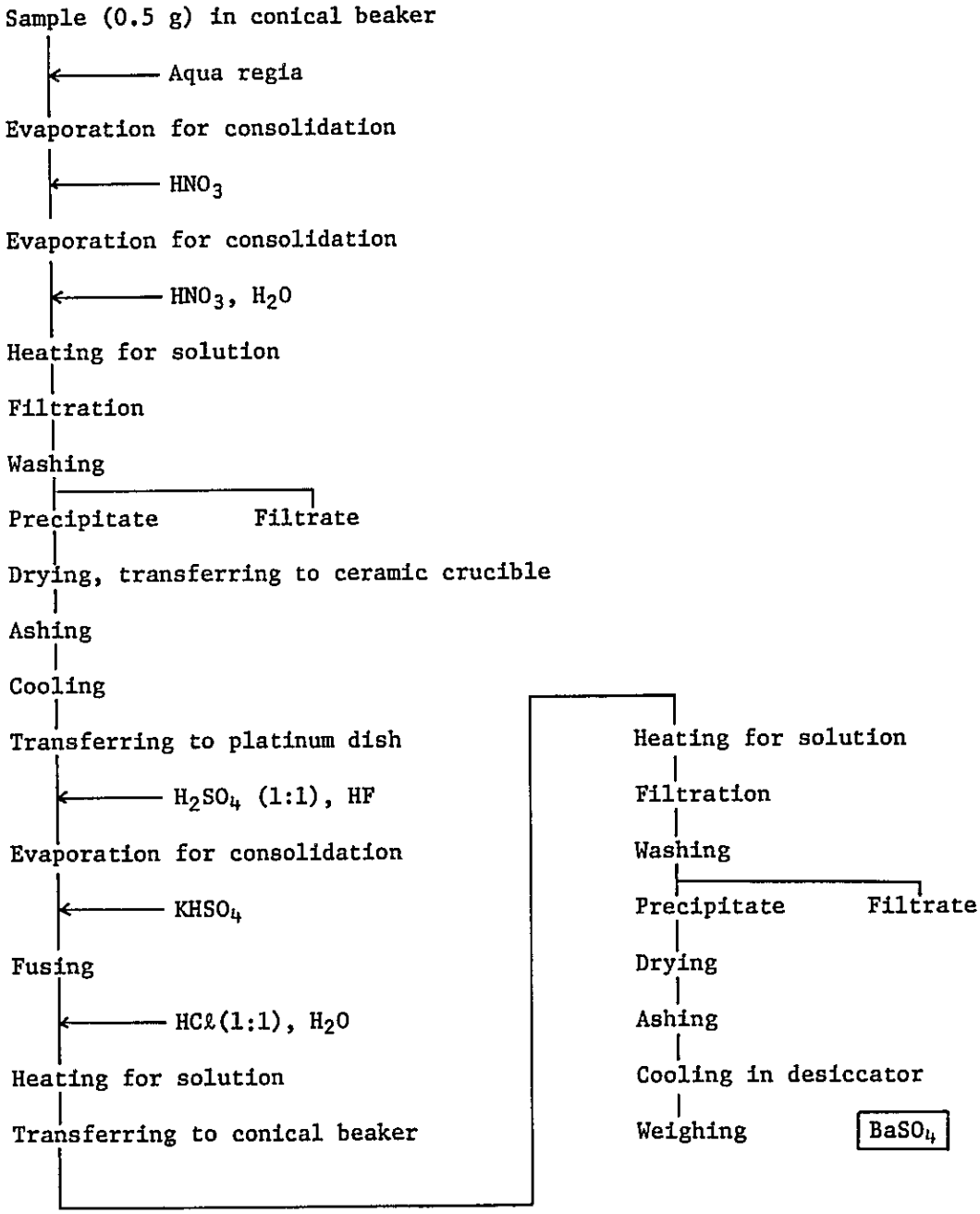
(Mg, Sr)


Sample (0.2 - 0.5 g) in platinum dish
HNO3, HF, HClO4
Heating for decomposition
Consolidation
HCl (1:1)
Heating for dissolution
Cooling
Filtration
Make up to volume
HCl (1:1), H2O
Inhibitor (Sr solution for Mg ions; La solution for Sr ions)
Atomic absorption

(SiO_2, $A\ell_2O_3$, CaO)



($BaSO_4$)


Sample (0.5 g) in conical beaker
Aqua regia
Evaporation for consolidation
HNO_3
Evaporation for consolidation
HNO_3, H_2O
Heating for solution
Filtration
Washing
Precipitate
Filtrate
Drying, transferring to ceramic crucible
Ashing
Cooling
Transferring to platinum dish
H_2SO_4 (1:1), HF
Evaporation for consolidation
$KHSO_4$
Fusing
HCℓ(1:1), H_2O
Heating for solution
Transferring to conical beaker
Heating for solution
Filtration
Washing
Precipitate
Filtrate
Drying
Ashing
Cooling in desiccator
Weighing
$BaSO_4$

A. I-13 Geochemical contents of 4 elements on rocks of the detailed survey area.

Geological Index

Sedimentary rocks

Pucara Group	Dolostone	PDO
	Limestone	PLS
	Sandstone	PSS

Igneous rocks

Tertiary	Quartz porphyry & Granite porphyry	MP

Location Index

Gungapa	GG
Tambo de Vaca	TV
Huarao Grande	HG
San Roque	SR
Tambo Maria Trench	T.T-15
San Roque Trench	S.T-1

Sample No	Location	Field No	Geological Index	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mg (%)
1	TV	A701	PLS	3	21	13	2.1
2	TV	A702	PLS	3	18	8	2.1
3	TV	A703	PDO	3	23	6	12.7
4	TV	A704	PLS	3	24	10	4.8
5	TV	A705	PLS	3	31	10	0.5
6	TV	A707	PLS	2	18	9	0.7
7	TV	A708	PLS	2	18	6	0.2
8	TV	A709	PLS	4	21	10	0.2
9	GG	A723	PLS	3	20	20	0.2
10	GG	A724	PLS	9	40	64	6.1
11	GG	A725	PLS	5	32	19	1.1
12	GG	A726	PLS	4	25	18	10.8
13	GG	A727	PDO	3	21	19	10.7
14	TV	A730	PLS	4	29	91	0.2
15	TV	A732	PLS	6	21	19	10.8
16	TV	A733	PLS	3	15	11	0.2
17	TV	A734	PDO	3	21	12	11.5
18	TV	A735	PDO	2	16	11	12.1
19	TV	A736	PDO	3	21	9	8.5
20	TV	A737	PLS	2	21	12	0.2
21	TV	A738	PLS	4	20	6	1.5
22	TV	A739	PLS	3	22	8	0.2
23	TV	A741	PDO	4	21	8	12.0
24	TV	A743	PDO	2	20	8	12.3
25	TV	A746	PDO	3	23	47	12.4
26	TV	A747	PDO	5	42	8	11.3
27	TV	A748	PLS	3	34	10	0.2
28	TV	A750	PLS	4	17	8	0.4
29	TV	A751	PDO	24	28	11	10.6
30	HG	A753	PDO	6	25	21	12.0
31	HG	A754	PDO	5	23	11	12.4
32	HG	A755	PDO	32	25	17	12.9
33	HG	A756	PLS	6	24	56	2.4
34	HG	A757	PLS	14	23	27	1.3
35	HG	A758	PLS	6	27	18	0.2
36	HG	A760	PDO	4	28	4	12.2
37	HG	A761	PLS	10	25	20	0.9
38	HG	A762	PDO	3	23	13	10.3

Sample No	Location	Field No	Geological Index	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mg (%)
39	HG	A763	PDO	5	22	6	12.8
40	HG	A764	PLS	3	25	8	0.5
41	HG	A765	PLS	4	24	4	11.6
42	HG	A766	PDO	12	31	12	12.4
43	HG	A767	PDO	5	25	8	11.4
44	SR	A768	PDO	5	166	120	11.1
45	SR	A771	PDO	6	67	55	10.9
46	SR	A772	PDO	4	1,120	68	11.3
47	SR	A773	PDO	3	33	27	11.6
48	SR	A774	PDO	3	37	97	11.2
49	SR	A775	PDO	7	78	91	9.4
50	SR	A776	PLS	3	101	90	0.3
51	SR	A777	PLS	10	504	495	8.9
52	SR	A778	PDO	5	123	248	9.5
53	SR	A779	PLS	23	415	895	8.5
54	SR	A780	PDO	5	47	103	11.5
55	SR	A781	PLS	3	164	468	0.5
56	SR	A782	PLS	6	56	715	11.7
57	SR	A783	PLS	3	415	930	0.2
58	SR	A784	PDO	10	117	735	10.0
59	SR	A785	PLS	7	533	413	3.4
60	SR	A786	PLS	9	227	1,420	9.2
61	SR	A787	PDO	2	29	277	11.4
62	SR	A788	PLS	3	23	190	11.0
63	SR	A789	PLS	3	34	16	0.3
64	SR	A790	PDO	5	184	347	9.5
65	S.T-14	L702	PLS	9	238	510	0.2
66	S.T-14	L703	PLS	5	285	237	0.1
67	S.T-14	L706	PLS	8	852	163	1.7
68	S.T-13	L707	PLS	4	54	218	0.3
69	S.T-13	L708	PLS	4	47	152	0.3
70	S.T-13	L709	PDO	8	51	6,120	11.8
71	S.T-13	L710	PDO	7	37	866	9.6
72	S.T-13	L711	PDO	9	47	692	10.4
73	S.T-2	L712	PLS	3	37	342	0.6
74	S.T-2	L713	PLS	8	120	146	0.1
75	S.T-2	L715	PSS	3	150	80	0.1
76	S.T-2	L716	PDO	3	37	146	9.1

Sample No	Location	Field No	Geological Index	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mg (%)
77	S.T-2	L718	PDO	19	118	1,240	9.1
78	S.T-2	L719	PDO	16	417	1,630	8.5
79	S.T-2	L720	PDO	12	265	496	10.1
80	S.T-2	L721	PDO	12	211	733	10.1
81	S.T-2	L722	PDO	16	430	1,430	5.7
82	S.T-2	L723	PDO	6	60	738	7.3
83	S.T-2	L724	PDO	12	90	1,550	5.1
84	S.T-2	L725	PLS	6	51	13	0.3
85	S.T-2	L726	PDO	14	41	207	9.2
86	S.T-2	L727	PDO	7	45	195	8.6
87	S.T-2	L728	PDO	7	283	121	7.6
88	S.T-1	L732	PDO	7	36	54	9.2
89	S.T-1	L733	PDO	5	29	267	8.4
90	S.T-1	L734	PDO	5	31	410	8.6
91	S.T-1	L736	PSS	13	84	53	0.2
92	S.T-1	L737	PSS	6	61	143	0.4
93	S.T-5	L741	PDO	24	24	45	0.3
94	S.T-5	L742	PDO	9	150	690	11.7
95	S.T-5	L744	PDO	3	156	570	11.3
96	S.T-5	L745	PDO	4	192	495	11.2
97	S.T-5	L746	PDO	10	18	195	6.4
98	S.T-5	L747	PLS	4	53	253	0.4
99	S.T-12	L749	PLS	4	93	132	0.3
100	S.T-12	L750	PLS	4	36	631	12.2
101	S.T-12	L751	PLS	8	50	1,651	8.3
102	S.T-12	L753	PLS	4	41	352	5.3
103	S.T-11	L754	PLS	6	1,070	30	0.3
104	S.T-11	L755	PLS	4	39	62	0.3
105	S.T-11	L757	PLS	10	252	378	0.5
106	S.T-11	L758	PLS	6	224	165	1.2
107	T.T-25	L759	PDO	3	170	11	12.8
108	T.T-25	L760	PDO	3	1,500	15	11.7
109	T.T-25	L761	PDO	8	31	19	13.6
110	T.T-25	L762	PDO	3	28	8	13.2
111	T.T-25	L763	PDO	3	25	9	12.9
112	T.T-25	L764	PDO	4	38	9	13.1
113	T.T-24	L766	PDO	6	52	16	23.9
114	T.T-24	L767	PDO	4	27	12	12.2

Sample No	Location	Field No	Geological Index	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mg (%)
115	T.T-24	L768	PDO	3	166	11	11.6
116	T.T-22	L769	PDO	3	27	6	12.5
117	T.T-22	L770	PDO	3	24	40	12.8
118	T.T-22	L772	PDO	6	27	53	13.1
119	T.T-22	L773	PDO	4	31	25	12.7
120	T.T-21	L774	PDO	4	26	13	11.8
121	T.T-21	L776	PDO	4	34	11	12.6
122	T.T-21	L777	PDO	3	27	11	12.0
123	T.T-21	L778	PLS	4	34	70	0.6
124	T.T-21	L779	PDO	3	25	21	12.1
125	T.T-21	L780	PDO	4	85	14	11.5
126	T.T-27	L781	PDO	3	34	7	11.6
127	T.T-27	L782	PDO	3	21	9	12.1
128	S.T-28	L785	PDO	4	257	1,370	12.3
129	S.T-28	L786	PDO	3	78	257	6.8
130	S.T-28	L787	PDO	3	35	235	4.5
131	S.T-28	L788	PDO	4	107	760	11.4
132	S.T-28	L789	PDO	3	19	191	5.4
133	S.T-28	L790	PDO	4	35	778	11.0
134	S.T-28	L791	PDO	5	71	928	8.9
135	S.T-28	L793	PDO	2	47	187	10.2
136	S.T-28	L794	PDO	16	104	741	6.8
137	S.T-28	L795	PDO	3	2,320	7,160	11.3
138	S.T-28	L796	PDO	4	146	558	12.2
139	S.T-28	L797	PDO	6	179	961	11.8
140	SR	L798	PDO	5	53	280	10.3
141	SR	L799	PDO	62	51	53	6.9
142	SR	L800	MP	7	35	18	0.1
143	SR	L801	MP	5	27	229	6.5
144	SR	L802	MP	7	20	32	0.2
145	SR	L803	PLS	3	25	25	11.4
146	SR	L804	PLS	4	60	299	11.6
147	SR	L805	PLS	8	95	274	0.3
148	SR	L806	MP	11	52	207	1.6
149	SR	L807	MP	4	33	27	0.1
150	SR	L808	MP	8	50	40	0.1
151	S.T-29	L811	PDO	40	100	400	10.6
152	S.T-29	L812	PDO	6	100	300	9.1

Sample No	Location	Field No	Geological Index	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mg (%)
153	S.T-29	L814	PDO	5	200	500	7.0
154	TV	N701	PLS	3	23	7	2.1
155	TV	N702	PLS	3	26	5	1.9
156	TV	N703	PDO	2	19	4	12.8
157	TV	N704	PDO	2	23	4	12.5
158	TV	N705	PDO	2	23	6	10.1
159	TV	N706	PDO	2	22	5	12.3
160	TV	N707	PDO	2	19	4	12.7
161	TV	N708	PDO	4	19	5	12.7
162	TV	N709	PDO	3	23	18	12.5
163	HG	N710	PSS	8	27	9	0.4
164	HG	N711	PSS	17	31	43	0.5
165	HG	N712	PDO	2	19	13	12.2
166	TV	N713	PLS	2	20	5	0.5
167	TV	N714	PDO	2	22	7	6.9
168	TV	N715	PDO	2	22	11	2.2
169	TV	N716	PDO	2	19	4	12.5
170	TV	N717	PDO	6	23	31	12.4
171	TV	N718	PDO	2	21	6	12.6
172	TV	N719	PDO	2	23	3	12.8
173	TV	N720	PLS	3	23	8	1.3
174	TV	N721	PLS	3	23	10	4.6
175	TV	N722	PDO	2	22	10	12.1
176	TV	N724	PLS	2	24	5	2.2
177	TV	N725	PDO	3	31	8	11.8
178	TV	N726	PDO	2	20	7	12.9
179	TV	N727	PDO	2	17	11	11.8
180	TV	N728	PDO	3	20	26	0.9
181	TV	N730	PDO	2	20	5	12.6
182	TV	N731	PDO	2	22	8	12.9
183	TV	N732	PDO	2	21	8	12.9
184	TV	N741	PDO	3	24	23	11.7
185	TV	N743	PDO	3	27	8	12.2
186	TV	N747	PDO	2	20	9	5.7
187	TV	N748	PDO	2	20	11	12.5
188	TV	N749	PDO	2	21	5	12.7
189	TV	N752	PLS	3	21	15	0.5
190	TV	N754	PDO	2	22	14	12.3

Sample No	Location	Field No.	Geological Index	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mg (%)
191	TV	N755	PDO	2	20	9	12.3
192	TV	N756	PDO	2	20	6	12.8
193	HG	N758	PLS	5	23	13	10.4
194	HG	N760	PDO	2	22	5	12.8
195	HG	N761	PDO	2	21	4	12.8
196	HG	N762	PDO	2	21	4	12.5
197	HG	N763	PDO	2	21	8	12.0
198	HG	N764	PDO	2	25	19	11.4
199	GG	N769	PLS	3	20	11	0.9
200	GG	N770	PLS	5	21	10	3.5
201	GG	N771	PLS	3	19	11	3.8
202	TV	N774	PDO	2	20	5	12.7
203	TV	N781	PLS	2	21	6	0.3
204	TV	N789	PSS	6	23	8	0.4
205	HG	N790	PDO	2	21	48	12.7
206	HG	N791	PDO	2	24	53	12.6
207	GG	N795	PLS	3	27	25	0.3
208	GG	N796	PDO	2	24	9	12.8
209	GG	N797	PDO	2	23	8	12.5
210	GG	N798	PDO	2	23	13	12.2
211	T.T-16	N804	PLS	6	30	117	0.3
212	T.T-16	N811	PDO	4	27	6	10.9
213	T.T-16	N814	PDO	4	26	14	10.4
214	T.T-16	N815	PDO	2	25	9	12.0
215	T.T-16	N816	PDO	2	24	24	12.1
216	T.T-19	N817	PDO	5	84	84	8.0
217	T.T-19	N820	PDO	3	28	14	11.7
218	T.T-19	N823	PDO	3	25	24	12.4
219	T.T-19	N826	PDO	2	17	9	12.1
220	T.T-20	N827	PDO	3	24	16	12.3
221	T.T-20	N829	PDO	2	31	11	12.2
222	T.T-20	N830	PDO	2	52	39	11.9
223	T.T-20	N831	PDO	62	28	89	4.2
224	T.T-20	N833	PDO	4	51	20	21.4
225	T.T-20	N835	PDO	2	23	36	11.3
226	T.T-20	N837	PDO	2	26	30	12.1
227	T.T-15	N838	PDO	4	39	11	22.7
228	T.T-15	N839	PDO	2	22	7	11.3

Sample No	Location	Field No	Geological Index	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mg (%)
229	T.T-15	N842	PDO	3	32	17	12.2
230	T.T-15	N843	PDO	2	191	275	12.2
231	T.T-15	N845	PDO	5	127	158	23.8
232	T.T-15	N846	PDO	2	110	148	11.9
233	T.T-15	N847	PDO	3	32	14	11.4
234	T.T-17	N849	PDO	3	30	6	10.1
235	T.T-17	N850	PDO	3	30	7	11.7
236	T.T-17	N851	PDO	2	23	10	11.9
237	T.T-17	N852	PDO	2	28	9	12.0
238	T.T-17	N853	PDO	2	33	11	11.8
239	T.T-18	N856	PDO	5	31	10	8.2
240	T.T-18	N858	PDO	2	37	24	11.7
241	T.T-18	N861	PDO	2	24	8	12.3
242	T.T-18	N863	PDO	2	27	12	11.3
243	T.T-23	N864	PDO	3	30	7	10.4
244	T.T-23	N865	PDO	2	20	8	10.3
245	T.T-23	N867	PDO	3	26	11	12.1
246	T.T-23	N868	PDO	2	21	8	11.9
247	SR	N869	PDO	7	749	744	9.6
248	SR	N871	PDO	4	27	213	11.8
249	SR	N873	PDO	3	26	64	11.3
250	SR	N875	PDO	3	25	157	11.9
251	SR	N876	PDO	3	34	403	11.4
252	SR	N877	PLS	5	52	115	0.3
253	SR	N878	PLS	6	40	135	0.3
254	SR	N879	PLS	6	62	143	0.2
255	SR	N880	PLS	6	305	145	0.8
256	SR	N881	PLS	4	75	93	0.7
257	SR	N884	PLS	8	240	270	0.5
258	SR	N885	PLS	3	31	598	9.8
259	SR	N887	PLS	4	101	788	0.3
260	SR	N888	PDO	4	167	430	11.1
261	SR	N889	PDO	6	22	208	9.0
262	SR	N890	PLS	4	39	55	1.4
263	SR	N892	PDO	5	37	120	10.5
264	SR	N893	PDO	13	35	418	7.9
265	TV	P701	PLS	3	25	12	2.8
266	TV	P703	PDO	2	24	6	12.1

Sample No	Location	Field No	Geological Index	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mg (%)
267	TV	P705	PLS	3	26	7	0.4
268	TV	P706	PDO	3	25	7	12.2
269	TV	P707	PDO	2	25	10	12.5
270	TV	P710	PDO	4	25	17	12.0
271	TV	P713	PLS	3	26	11	0.2
272	TV	P714	PLS	3	24	14	1.4
273	TV	P717	PLS	3	23	6	1.4
274	TV	P719	PDO	2	24	9	12.3
275	TV	P720	PLS	3	24	13	0.8
276	TV	P721	PDO	4	23	12	11.9
277	TV	P722	PDO	3	23	6	12.5
278	TV	P723	PDO	2	23	13	12.3
279	TV	P725	PDO	2	23	6	12.5
280	TV	P727	PDO	4	23	8	12.1
281	TV	P728	PLS	3	26	51	0.6
282	TV	P729	PLS	3	26	10	0.8
283	TV	P730	PDO	3	27	6	12.5
284	TV	P331	PDO	2	28	8	11.8
285	TV	P737	PDO	2	26	6	11.7
286	TV	P738	PDO	2	25	13	11.7
287	TV	P739	PDO	3	26	12	11.4
288	GG	P750	PLS	3	209	398	1.9
289	GG	P752	PDO	2	42	125	11.0
290	GG	P753	PLS	3	82	530	0.2
291	GG	P754	PLS	5	222	648	0.3
292	GG	P756	PDO	2	28	6	12.0
293	GG	P758	PDO	2	23	7	12.6
294	GG	P762	PDO	3	27	17	1.7
295	GG	P768	PDO	4	26	9	1.0
296	GG	P770	PDO	4	25	14	1.6
297	GG	P771	PLS	3	23	11	0.1
298	GG	P772	PLS	3	23	13	5.2
299	GG	P773	PLS	3	24	52	2.4
300	GG	P775	PLS	3	24	57	0.5
301	GG	P777	PLS	4	25	25	0.1
302	GG	P778	PLS	4	32	29	1.2
303	GG	P779	PLS	4	23	33	0.1
304	GG	P780	PLS	4	25	16	0.1

Sample No	Location	Field No	Geological Index	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mg (%)
305	CG	P782	PLS	3	24	6	0.1
306	CG	P784	PLS	3	24	6	0.1
307	HG	P785	PLS	3	25	14	0.8
308	HG	P786	PLS	5	41	12	0.8
309	HG	P788	PLS	3	23	16	0.6
310	HG	P790	PLS	2	23	16	0.2
311	HG	P792	PLS	3	21	17	0.2
312	HG	P794	PLS	2	24	7	0.1
313	HG	P795	PLS	4	26	19	2.2
314	HG	P797	PLS	3	25	6	0.1
315	HG	P798	PLS	3	20	5	0.3
316	HG	P799	PDO	2	29	6	0.3
317	HG	P800	PLS	3	26	1,270	1.3
318	HG	P801	PDO	2	24	22	6.2
319	HG	P803	PDO	2	26	6	6.3
320	HG	P804	PDO	3	25	14	6.3
321	SR	P809	PLS	8	41	685	0.2
322	SR	P810	PDO	6	57	623	11.6
323	SR	P811	PDO	4	29	226	11.5
324	SR	P813	PLS	3	111	577	9.8
325	SR	P814	PLS	7	68	611	8.6
326	SR	P815	PDO	7	602	1,370	9.9
327	SR	P816	PLS	657	67	270	5.6
328	SR	P817	PLS	26	94	130	5.9
329	SR	P818	PLS	20	189	44	0.4
330	SR	P819	PLS	5	81	125	0.3
331	SR	P820	PLS	16	35	49	0.2
332	SR	P821	PDO	14	460	3,830	0.5
333	SR	P822	PLS	13	96	763	10.5
334	SR	P823	PLS	3	26	896	10.1
335	SR	P824	PDO	2	24	164	11.5
336	SR	P825	PLS	4	29	110	0.4
337	SR	P826	PLS	4	36	91	0.3
338	SR	P827	PLS	5	54	285	0.3
339	SR	P828	PLS	6	133	572	0.3
340	SR	P829	PLS	9	496	321	0.5
341	SR	P830	PLS	6	196	179	0.2
342	SR	P831	PLS	53	30	44	2.4

Sample No	Location	Field No	Geological Index	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mg (%)
343	SR	P832	PLS	4	30	34	0.3
344	TV	S714	PLS	11	10	9	0.1
345	TV	S715	PLS	3	23	7	0.1
346	TV	S716	PDO	3	21	5	0.4
347	TV	S718	PLS	3	25	7	6.4
348	TV	S719	PLS	3	24	5	0.3
349	S.T-4	S721	PDO	9	49	220	12.5
350	S.T-4	S724	PDO	4	45	440	11.2
351	S.T-4	S727	PDO	4	38	319	11.2
352	S.T-4	S728	PDO	3	23	172	7.2
353	S.T-4	S729	PDO	3	43	81	8.2
354	S.T-4	S730	PDO	4	43	231	10.0
355	S.T-4	S732	PDO	7	66	367	20.7
356	S.T-7	S737	PLS	3	25	459	1.7
357	S.T-7	S738	PLS	4	71	69	0.2
358	S.T-6	S742	PLS	6	209	132	0.3
359	S.T-6	S743	PLS	4	31	759	0.3
360	S.T-6	S746	PLS	7	187	153	10.7
361	S.T-6	S747	PLS	16	32	108	8.8
362	S.T-6	S748	PLS	3	72	68	7.8
363	S.T-6	S749	PLS	3	26	78	9.4
364	S.T-8	S751	PLS	3	40	45	1.8
365	S.T-8	S753	PLS	5	66	1,320	1.1
366	S.T-8	S754	PLS	4	27	96	0.3
367	S.T-8	S755	PLS	4	52	29	0.3
368	S.T-8	S756	PDO	4	36	23	10.1
369	S.T-8	S757	PDO	7	62	17,900	5.9
370	S.T-9	S759	PLS	8	51	520	0.3
371	S.T-9	S761	PLS	2	31	2,450	11.6
372	T.T-27	S770	PDO	2	19	7	12.1
373	T.T-27	S772	PDO	2	22	13	12.0
374	T.T-27	S773	PDO	3	21	6	12.0
375	T.T-27	S774	PDO	2	21	34	12.0
376	T.T-27	S775	PDO	3	26	10	11.3
377	T.T-27	S776	PDO	4	25	15	11.2
378	T.T-27	S777	PDO	3	22	9	12.1
379	T.T-26	S779	PDO	3	25	26	12.0
380	T.T-26	S780	PDO	2	21	8	11.8

APPENDICES

PART II

Diamond Drilling

Sample No	Location	Field No	Geological Index	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mg (%)
381	T.T-26	S782	PDO	3	28	12	11.1
382	S.T-10	S785	PLS	4	75	161	0.3
383	S.T-10	S786	PLS	5	35	206	0.4
384	S.T-10	S788	PLS	4	44	18	0.3
385	S.T-10	S789	PDO	3	30	136	12.6
386	HG	Z2	PDO	3	20	22	10.0
387	HG	Z3	PDO	8	20	41	6.4
388	HG	Z4	PDO	2	21	9	13.0
389	HG	Z5	PLS	3	24	7	0.4
390	HG	Z6	PLS	4	25	6	0 3
391	HG	Z7	PDO	2	21	19	12.9
392	HG	Z8	PLS	3	23	39	0.9

Sample No	Location	Field No	Geological Index	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mg (%)
393	HG	Z11	PDO	4	24	13	10.4
394	HG	Z12	PDO	2	21	7	10.9
395	HG	Z13	PDO	2	23	13	12.4
396	HG	Z14	PLS	44	22	9	0.2
397	HG	Z16	PLS	4	24	14	0.2
398	HG	Z17	PLS	7	25	6	2.5
399	HG	Z18	PLS	3	24	27	0.2
400	HG	Z19	PLS	4	25	26	0.3
401	HG	Z20	PLS	4	24	8	1.5
402	GG	Z22	PDO	2	21	10	12.3
403	GG	Z23	PDO	2	23	21	11.0
404	GG	Z24	PLS	3	28	9	0.4

LIST OF APPENDICES

A. II – 1　　Drilling Progress　　No. 53 – MJ – 1

Depth (m)	Log	Lithology
0		Grey fine grained crystalline dolostone
100		Zebra Dolomite
		Grey medium grained crystalline dolostone
200		Zebra Dolomite
		Black fine grained dolostone
		Brecciated dolostone filled by white recryst dolomite
		Grey fine silty dolostone
		Brecciated dolostone
300		Dark grey fine crystalline dolostone
302.10		

Drilling hour / Length (mtr)

0.20　0.40　1.00　1.20

Drilling method

- 6.00 m　HQ-Bit　112ø CP
- 54.50　HQ-WL
- NW CP
- 183.00 m　NQ-WL　BW CP
- 302.10 m　BQ-WL

MAY　JUN.　JUL.

21 22 23 24 25 26 27 28 29 30 31 1 2 3 18 19 20 21 22 23 24 25 26 27 28 29 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Reconnaissance of drill sites, procurement of workers.

Road construction

Transportation

Holiday

Drilling W/HQ

Drilling W

Ho

Groun

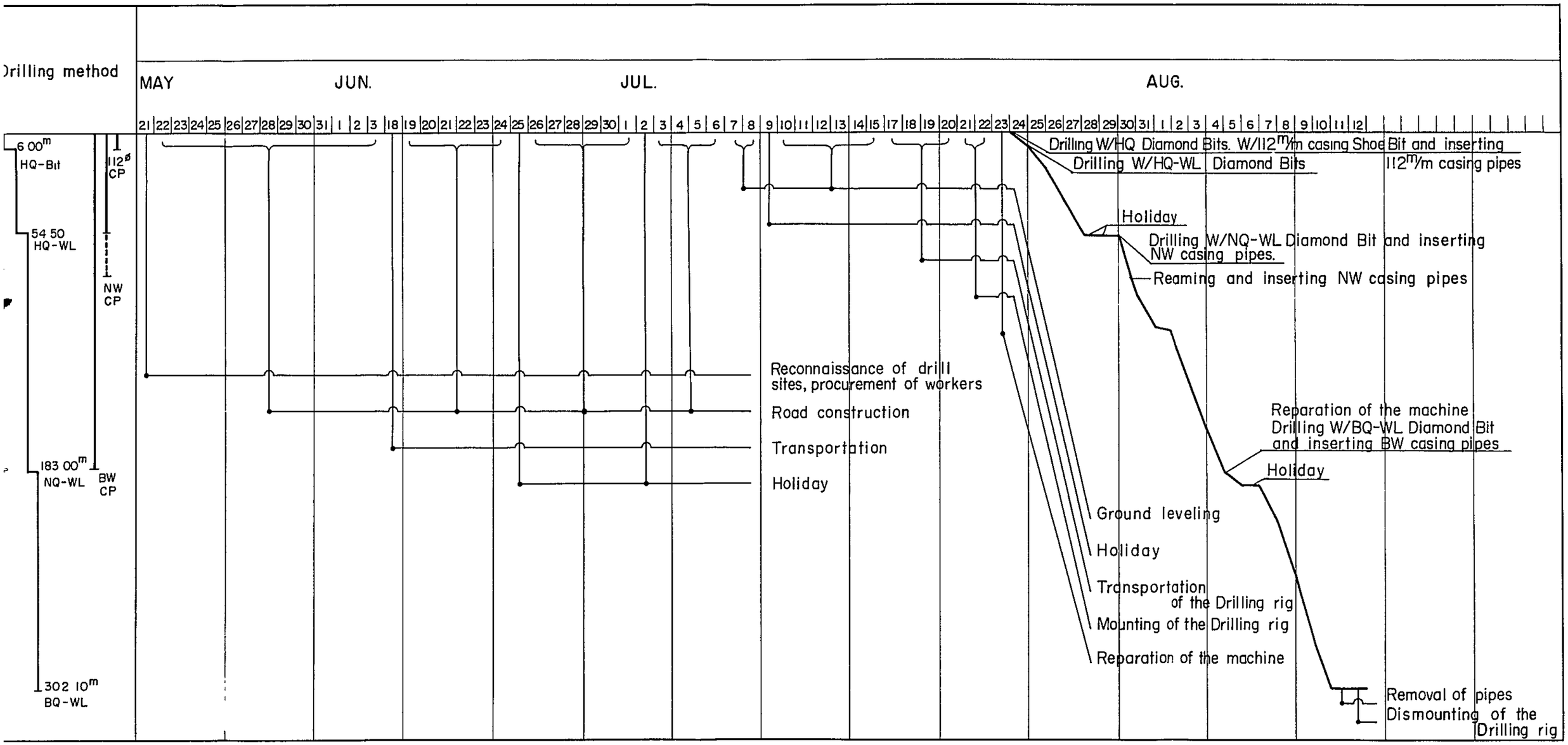
Holid

Trans

Mounti

Repar

Progress No. 53 – MJ – 1



A. II-2 Drilling Progress No. 53-MJ-2

Depth (m) | Drill Log | Lithology | Drilling hour / Length(mtr) 0 20 40 1.00 1.20 | Drilling method

Lithology:
- Grey fine crystalline dolostone
- Dolostone with zebra structure
- Black muddy dolostone
- py Alternation of sandy dolostone & conglomeratic dolostone
- Alternation of sandy dolostone & muddy dolostone
- py Alternation of black ~ dark grey muddy limestone
- Black siltstone
- Black silty limestone

Depth (m): 0, 100, 200, 300

Drilling method:
- 7.10m HQ-Bit
- 60.00m HQ-WL
- 201.00m NQ-WL
- 300.00m BQ-WL
- 112ø CP
- NW CP
- BW CP

JUL. 24 25 26 27 28 29 30 31
AUG. 1 2 3 4 5 6 7 8 9 10 11 13 14 15 16 17 18 19 20 21 22 23
SEP. 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

- Drilling W/HQ Diamond Bits W/112m/m casing pipes and
- Drilling W/HQ-WL Diamond Bits
- Drilling W/NQ-WL Diamond Bits and inserting
- Holiday
- Drilling W/BQ-WL Diamond Bi
- Ground leveling
- Cutting bushes
- Transportation of the Drilling rig
- Mounting of the Drilling rig
- Holiday

rilling Progress No. 53 – MJ – 2

ng

Length(mtr)

40 1.00 120

Drilling method

JUL. AUG. SEP.

24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

7.10m HQ-Bit

60.00m HQ-WL

112ø CP

NW CP

201.00m NQ-WL

BW CP

300.00m BQ-WL

Drilling W/HQ Diamond Bits W/112m/m casing pipes and inserting 112m/m casing pipes.

Drilling W/HQ-WL Diamond Bits.

Drilling W/NQ-WL Diamond Bits and inserting NW casing pipes

Holiday

Drilling W/BQ-WL Diamond Bits and inserting BW casing pipes.

Ground leveling

Cutting bushes

Transportation of the Drilling rig

Mounting of the Drilling rig

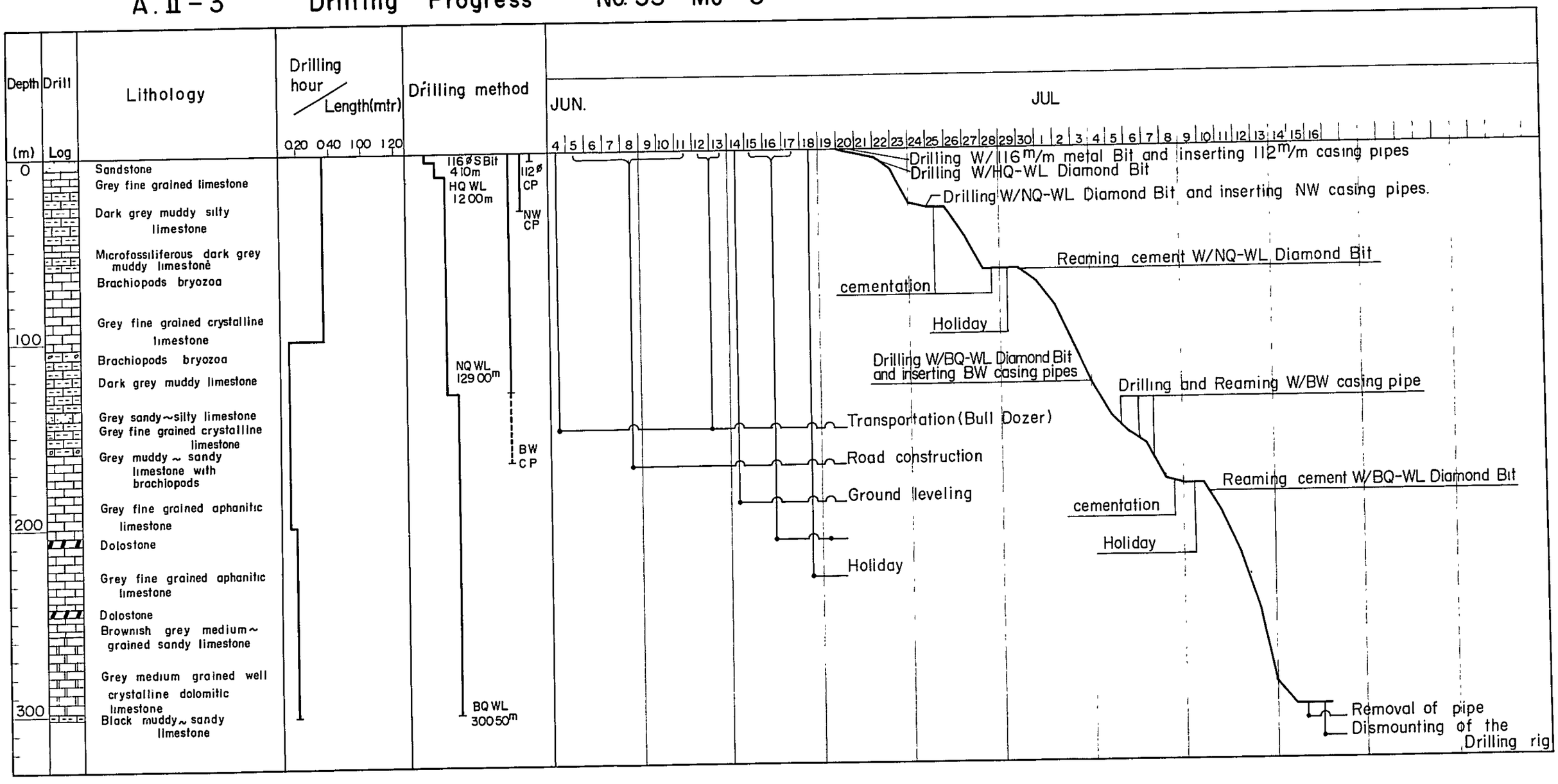
Holiday

Removal of pipes

Dismounting of the Drilling rig

Transportation to OXAPAMPA

A. II – 3 Drilling Progress No. 53 – MJ – 3



A. II-4 List of rock samples(boring core).

No. 53-MJ1

Sample No.	Depth (m)	Chemical Analysis	Thin Section	Polished Section	X-ray Diffraction	Rock Name
53101	14.80	○	○			Grey fine silty dolostone
53102	29.80	○				Grey fine crystalline dolostone
53103	44.80	○				Grey very fine aphanitic dolostone
53104	59.80	○	○			Grey aphanitic dolostone
53105	74.80	○	○	○		Breccia Dolomite
53106	89.80	○	○			Grey medium sandy dolostone
53107	104.80	○	○	○		Light grey medium dolostone
53108	119.80	○				Breccia Dolomite
53109	134.80	○				Grey medium crystalline dolostone
53110	149.80	○				Grey fine crystalline dolostone
53111	164.80	○				Dark grey medium crystalline dolostone
53112	179.80	○				Grey medium well-crystalline dolostone
53113	194.80	○	○	○	○	Zebra Dolomite
53114	209.80	○				Argillized Zebra Dolomite
53115	224.80	○				Breccia Dolomite
53116	239.80	○				Dark grey medium well-crystalline dolostone
53117	254.80	○	○	○	○	Breccia Dolomite
53118	269.80	○				Grey fine crystalline dolostone
53119	284.80	○				Breccia Dolomite
53120	299.80	○				Grey fine crystalline dolostone

No. 53-MJ2

53201	14.80	○				Grey medium crystalline dolostone

Sample No.	Depth (m)	Chemical Analysis	Thin Section	Polished Section	X-ray Diffrac-tion	Rock Name
53202	29.80	○				Grey medium sandy dolostone
53203	44.80	○				Sludge of dolostone
53204	59.80	○				Grey fine dolostone
53205	74.80	○				Fine banded Zebra Dolomite
53206	89.80	○	○	○		Black silty dolostone with breccia
53207	104.80	○				Grey fine-medium crystalline dolostone
53208	119.80	○				Dark grey fine aphanitic dolostone
53209	134.80	○				Dark grey fine silty dolostone
53210	149.80	○				Dark grey fine muddy dolostone
53211	164.80	○	○	○		Dark grey fine sandy dolostone
53212	179.80	○				Dark grey fine silty calcareous dolostone
53213	190.50	○	○	○		Black bituminous mudstone Pyrite concentrated
53214	209.80	○				Black fine calcareous siltstone
53215	224.80	○	○	○	○	Black calcareous siltstone
53216	239.80	○				Black very fine calcareous sandstone
53217	254.80	○				Black bituminous calcareous siltstone
53218	269.80	○				Black calcareous siltstone
53219	284.80	○				Black-dark grey sandy limestone
53220	299.80	○	○			Black silty limestone

No. 53-MJ3

53301	14.80	○				Grey fine crystalline limestone
53302	29.80	○				Black fine muddy limestone

Sample No.	Depth (m)	Chemical Analysis	Thin Section	Polished Section	X-ray Diffraction	Rock Name
53303	44.80	O	O			Dark grey fine crystalline limestone
53304	58.60	O	O	O		Dark grey fine limestone (Gn. imp.)
53305	71.00	O	O	O	O	Grey fine crystalline limestone (Gn. imp.)
53306	89.80	O				Dark grey fine aphanitic limestone
53307	104.80	O	O			Grey fine aphanitic limestone
53308	123.00	O	O	O	O	Grey fine fossiliferous limestone (Gn. imp.)
53309	134.80	O				Grey medium sandy limestone
53310	149.80	O	O			Dark grey muddy limestone
53311	164.80	O				Grey fine silty limestone
53312	179.80	O				Grey fine aphanitic limestone
53313	194.80	O				Dark grey fine aphanitic limestone
53314	209.80	O	O			Grey coarse sandy dolomitic limestone
53315	224.80	O				Grey fine aphanitic limestone
53316	239.80	O				Grey very fine aphanitic limestone
53317	254.80	O				Grey fine aphanitic limestone
53318	269.80	O				Grey medium dolomitic limestone
53319	284.80	O				Grey medium crystalline limestone
53320	299.80	O	O			Grey fine sandy limestone

A. II-5 Microscopic observation of the thin section.

(1)

Sample No.	Location		Group	Rock Name	Microscopic Observations
	Hole No.	Depth (m)			
53101	No.53-MJ1	14.8	PU	Biodolosparite	The rock consists of sparry dolomite (>98%) and calcite (<1%). Sparry dolomite shows mosaic texture of anhedra to subhedra (20 to 100μ in size). The larger dolomite crystals constitute fossils i.e. echinoid spines or algal filaments up to 500μ in size. Very rarely calcite is observed in anhedral form up to 300μ in size. Opaque minerals are very scarcely observed in dolomite crystals or filling cavities of dolomite crystals.
53105	No.53-MJ1	74.8	PU	Dolosparite (Well crystalline dolomite)	The rock consists of sparry dolomite ($\geq$ 95%), chalcedonic quartz ($\leq$ 5%), and calcite (<0.5%). Sparry dolomite shows mosaic texture of subhedra to euhedra. Megacrystals of dolomite up to 1.5 mm x 0.8 mm in size form so-called zebra structure with smaller crystals up to 300μ in size. Rarely micritic dolomite (<5μ in size) fills pores or cavities of sparry dolomite with opaque minerals. Chalcedonic quartz aggregates in irregular shape filling open spaces of dolomite crystals. Calcite exists rarely of anhedra up to 100μ in size. Opaque minerals are recognized filling cavities or pores of dolomite crystals.
53107	No.53-MJ1	104.8	PU	Dolosparite (Well crystalline dolomite)	The rock consists of sparry dolomite ($\geq$ 98%), opaque minerals, quartz, and calcite. Sparry dolomite shows mosaic texture of subhedra to anhedra (20μ to 600μ in size) and is rarely observed megacrystals (0.5 mm x 1 mm in size). Opaque minerals aggregate in veinlet or fill up boundaries between dolomite megacrystals and smaller crystals. Quartz is rarely recognized as chalcedony in irregular shape up to 150μ in size.
53113	No.53-MJ1	194.8	PU	Zebra Dolomite (Well recrystallized dolomite)	The rock consists of almost sparry or well recrystallized dolomite. Megacrystals up to 0.6 mm x 1.8 mm in size shows mosaic texture and construct so-called zebra structure with the band of smaller crystals up to 200μ in size. Chalcedonic quartz is rarely observed forming microspheroid-like or filling cavities of dolomite crystals (100 to 300μ in size). Opaque minerals up to 40μ are very rarely recognized in irregular shape or as microspheroid in the smaller crystals.
53117	No.53-MJ1	254.8	PU	Breccia Dolomite (Dolosparite)	The rock consists of sparry dolomite (>95%), calcite ($\approx$2%), opaque minerals,and quartz ($\approx$1%). Macroscopic observation of the piece sample apparently shows brecciated dolomite, but under the microscope this rock is composed of almost sparry dolomite. The sparry dolomite shows mosaic texture of subhedra to euhedra and may be classified into two parts i.e. megacrystals up to 600μ and smaller crystals (15 to 150μ). Calcite is recognized in anhedra to subhedra developed lamellar twinning up to 100μ. Opaque minerals are recognized as microspheroid or in irregular shape of aggregates up to 20μ in the smaller crystals of dolomite.

Sample No.	Location		Group	Rock Name	Microscopic Observations
	Hole No.	Depth (m)			
53206	No.53-MJ2	89.8	PU	Silty dolostone (Introdolosparite)	The rock consists of dolomite (≦80%), amorphous material with opaque minerals (≈15%), calcite (≈5%), and quartz (<1%). Dolomite is almost sparry but micritic dolomite is included in amorphous material. Sparry dolomite shows mosaic texture of subhedra to euhedra up to 300μ in size. Amorphous material with opaque minerals formed impure mud shows very low interference color. Sparry calcite shows mosaic texture of anhedra to subhedra up to 100μ in size coexisting with sparry dolomite. Quartz is recognized as chalcedony and detritus. Chalcedonic quartz is composed of very fine grained aggregate up to 50μ in diameter and detrital quartz up to 50μ in size is scattered in the impure mud or in sparry dolomite.
53210	No.53-MJ2	149.8	PU	Dolosparite with strongly disseminated pyrite	The rock consists of sparry dolomite (≈60%), pyrite grains (≦40%), and detrital quartz (≦0.5%). Sparry dolomite shows mosaic texture of anhedra to subhedra. Pyrite spotted or interspersed among dolomite crystals shows cube, elongated cube or aggregate up to 200μ in size.
53211	No.53-MJ2	164.8	PU	Dolosparite (Dolarenite)	The rock consists of sparry dolomite (>90%), opaque minerals (≈5%), amorphous material (≈3%), calcite (<1%), and quartz (<1%). Sparry dolomite shows mosaic texture of subhedra to euhedra up to 300μ in size. Opaque minerals spotted in sparry dolomite or filled cavities of sparry dolomite shows in veinlet shape up to 50μ in width. Amorphous materials are recognized among the smaller dolomite crystals up to 120μ in size with opaque minerals.
53215	No.53-MJ2	224.8	PU	Biopelmicrite	The rock consists of calcite (≈85%), quartz (≈10%), and opaque minerals (<5%). Sparry calcite constitutes brachiopods shells, gastropods, ostracods and others up to 1.5mm in size. Micritic calcite formed matrix up to 5μ in size, partly constitutes pellet up to 450μ in diameter. Quartz, almost detritus, coexists with micrite forming matrix up to 50μ in size. Opaque minerals are recognized in the matrix in aggregate or veinlet shape up to 100μ in size and rarely exist at the inner part of brachiopods shells. Amorphous material may be identified as clayey material but not exactly.

Sample No.	Location		Group	Rock Name	Microscopic Observations
	Hole No.	Depth (m)			
53220	No.53-MJ2	229.8	PU	Sapropelic calcilutite (Bituminous muddy ls.)	The rock consists of calcite (≥50%), amorphous material (≈20%), opaque minerals (≈20%), quartz (≈5%),and plagioclase (<5%). Sparry calcite (≥30%) of anhedra or microspheroid up to 60μ in diameter fills up other materials. Micritic calcite (≈20%) cemented matrix with amorphous or bituminous material shows very fine anhedra up to 10μ in size. Amorphous material shows very dark greyish brown in color and very low interference color. It may be bituminous or saplopelic material. Opaque minerals are recognized in irregular shape partly cubic accompanied with amorphous material. Quartz, almost detrital quartz is rarely observed in the matrix up to 30μ in size. Plagioclase is also observed as fragment up to 20μ in size very rarely and shows albite twinning.
53304	No.53-MJ3	58.6	PU	Detrital sparite (Calcarenite)	The rock consists of calcite (≥70%), detrital quartz (≈25%), chalcedonic quartz (≈1%), opaque minerals (≤1%),and amorphous aggregates (≈2%). Sparry calcite (≈40%) aggregates of 3 crystals or more in subhedra to anhedra. Micritic calcite (30%) formed matrix shows equigranular texture (2 to 5μ in size). Detrital quartz is recognized within the matrix in angular or subangular shape up to 80μ in size. Chalcedonic quartz fills up cavities or pores of calcite crystals up to 150μ in size. Opaque minerals are very rare forming microspheroid or irregular shape. Amorphous aggregates form pellets with quartz fragments and calcite up to 1 mm x 2.5 mm in diameter.
53305	No.53-MJ3	71.0	PU	Bioclasparmicrite (Calcisiltite)	The rock consists of micritic calcite (≈40%), sparry calcite (≈30%), detrital quartz (≈25%), chalcedonic quartz (≈2%), amorphous material (≈2%),and opaque minerals (≈1%). Micritic calcite formed matrix shows very fine grained up to 5μ in size and partly constitutes algal pellets (30 to 80μ in diameter). Sparry calcite built up algal filaments, echinoid spines, fragments of bryozoan and unknown lime clast, shows mosaic texture of anhedra up to 100μ in size. Detrital quartz spotted in matrix (20 to 40μ in size) is angular or subangular fragment. Chalcedonic quartz radiated or shown wave extinction may be derived from fragment of radiolaria (30 to 50μ in size). Amorphous material formed pellet (30 to 60μ in diameter) shows very dark brown in color. Opaque minerals are rarely recognized in very fine grained up to 5μ in size and partly aggregate in irregular shape up to 20μ in size.

(4)

Sample No.	Location		Group	Rock Name	Microscopic Observations
	Hole No.	Depth (m)			
53308	No.53-MJ3	123.0	PU	Bioclasparmicrite (Calcisiltite)	The rock consists of calcite(≦75%), detrital quartz (<20%), amorphous material (<5%), opaque minerals (≦1%),and chalcedonic quartz (≒0.5%). Calcite may be classified into 3 types i.e. sparry calcite, lime clast and micrite. Sparry calcite aggregates of five or more in the matrix (50 to 600μ in size). Lime clast may be derived from algal debris or algal fragments (150 to 800μ). Micritic calcite formed matrix shows very fine grained up to 5μ in size. Detrital quartz is spotted in matrix up to 60μ in size. Amorphous material formed pellet or micro ellipsoid (50 to 200μ in diameter) shows brown to dark brown in color. Opaque minerals are very rare in tiny size (2μ to 40μ) and partly aggregated in irregular shape. Chalcedonic quartz is very rarely observed up to 150μ in size with fine grained opaque minerals.
53314	No.53-MJ3	209.8	PU	Dolomitic limestone (Dolomitic sparite)	The rock consists of sparry calcite (≒55%), sparry dolomite (≒40%), chalcedonic quartz (≒3%), opaque minerals (≒1%),and detrital quartz (≒1%). Sparry calcite shows mosaic texture of anhedra formed megacrystal up to 600μ in size. Sparry dolomite shows also mosaic texture of subhedra to euhedra (50 to 100μ in size). Chalcedonic quartz filled open space of dolomite crystals aggregates in irregular shape (100 to 200μ in size). Opaque minerals are recognized filling cavities among dolomite crystals or gathering in irregular shape (5 to 150μ in size). Detrital quartz are rarely observed in dolomite crystals (10 to 30μ in size).
53320	No.53-MJ3	299.8	PU	Sandy limestone (Pelsparite)	The rock consists of pellets (>55%), sparry calcite (<35%), detrital quartz (≦10%), potash felspar (≦0.5%) and opaque minerals (≦0.5%). Pellet is composed of micritic calcite (1-2μ) and shows microspheroid (30-120μ in diameter). Sparry calcite filled up or cemented pellets shows mosaic texture of anhedra and rarely constructs echinoid spine, ostracods and bryozoan. Detrital quartz is often observed in sparry calcite with chalcedonic quartz (20 to 80μ in size). Detrital potash felspar is rarely recognized in pellet or sparry dolomite (20 to 50μ in size). Opaque minerals are rarely observed in irregular shape partially cubic form (20 to 50μ in size).

A. II-6 Microscopic observation of the polished section.

A. II-6 Microscopic observation of the polished section.

(1)

Sample No.	Location		Rock Name	Microscopic Observations
	Hole No.	Depth (m)		
53105	No.53-MJ1	74.8	Breccia Dolomite	The ore minerals are very few in this specimen. Goethite, pyrite, and sphalerite is observed. Goethite associated with lepidocrocite shows pseudomorph after pyrite in microsphere or framboid up to 10μ in diameter. Pyrite shows framboidal form or microsphere up to 5μ in diameter. Sphalerite is scarcely recognized in irregular shape or bleb-like up to 20μ in size, filling pores and cavities among dolomite crystals. Cu Pb Zn 5 ppm, 27 ppm, 60 ppm
53107	No.53-MJ1	104.8	Dolostone	Galena mono crystal is observed in only the appointed specimen. The galena (600μ X 800μ) is pure white in color observed characteristic triangle pits. Around the rim of galena, cerussite is recognized in grey color and shows worm-eaten-like form up to 20μ in size. Goethite replaced pyrite shows cubic or framboidal form up to 20μ in size in grey bluish tint color. Pyrite, creamy yellow in color, shows microsphere or framboidal form up to 20μ in diameter. Sphalerite is very rare and only recognized in irregular shape up to 30μ in size filling cavities among dolomite crystals. Cu Pb Zn 3 ppm, 24 ppm, 19 ppm
53113	No.53-MJ1	194.8	Zebra Dolomite	The ore minerals are very few in this specimen. Pyrite associated with goethite shows framboidal form or microsphere up to 10μ in diameter. Goethite shows pseudomorph after pyrite in cube and framboid (5-20μ in size). Sphalerite is scarcely observed in framboid or microspheroid (5 to 20μ in diameter). Cu Pb Zn 4 ppm, 27 ppm, 26 ppm
53117	No.53-MJ1	254.8	Breccia Dolomite	The ore minerals are recognized as pyrite and magnetite. Pyrite is generally observed in cube or framboid up to 60μ in size and is scattered as star-flecked sky. Magnetite fragments up to 30μ in size are scarcely observed in only the cavities among dolomite crystals. Cu Pb Zn 5 ppm, 31 ppm, 14 ppm

Sample No.	Location		Rock Name	Microscopic Observations
	Hole No.	Depth (m)		
53206	No.53-MJ2	89.8	Silty dolostone	The ore minerals are determined to almost pyrite and very few sphalerite. Pyrite spotted in star-like up to 50μ in size shows framboidal form among dolomite crystals. In the vicinity of dolomite megacrystals, pyrite grains grow up larger up to 100μ in size. Sphalerite is scarcely recognized in irregular shape up to 20μ in size. Alteration is none. Cu Pb Zn 12 ppm, 69 ppm, 29 ppm
53211	No.53-MJ2	164.8	Sandy dolostone	The ore minerals are almost pyrite in this specimen. Pyrite spotted in the dolomite crystals aggregate together in framboidal or cubic form up to 30μ in size. In the vicinity of dolomite megacrystals, pyrite grains grow up larger up to 100μ in size. Sphalerite is scarcely observed in irregular shape up to 20μ in size near pyrite grains. Alteration is none. Cu Pb Zn 7 ppm, 42 ppm, 29 ppm
53213	No.53-MJ2		Bituminous mudstone with concentrated pyrite	Pyrite is extraordinarily concentrated in this specimen. The pyrite grains that aggregate together in framboids or cubes up to 100μ in size are densely scattered in the matrix. Alteration is none. Sphalerite is ordinarily observed of anhedra up to 200μ in the vicinity of quartz vein and along fractures. Cu Pb Zn 6 ppm, 110 ppm, 19,080 ppm
53215	No.53-MJ2	224.8m	Calcareous siltstone	The ore minerals are rarely observed. Pyrite is mostly recognized as framboidal aggregates up to 15μ, and occasionaly gathers in cubes up to 70μ. Sphalerite in irregular shape up to 50μ in size often associates with pyrite. Alteration is none. Cu Pb Zn 22 ppm, 27 ppm, 128 ppm

Sample No.	Location		Rock Name	Microscopic Observations
	Hole No.	Depth (m)		
53304	No.53-MJ3	58.6m	Limestone	A few galena grains (1 mm x 1.5 mm - 2 mm x 3 mm) are observed in this specimen. Galena of subhedra is replaced by cerussite along cleavage oscillately and around the rim. Cerussite is recognized in lattice form or in worm-eaten-like up to 20μ in width surrounding galena. Goethite shows pseudomorph after pyrite in cubes or in framboid up to 120μ in diameter. Pyrite, the remnant of replacement in creamy yellow color, exists rarely in framboid up to 10μ in diameter. Cu Pb Zn 3 ppm, 533 ppm, 299 ppm
53305	No.53-MJ3	71.0	Limestone	A few galena grains (1 mm x 1 mm to 2 mm x 3 mm) are observed in this specimen. Galena filled pores of calcite crystals is replaced by cerussite along cleavage and arround the rim. Cerussite derived from galena shows worm-eaten-like form and lattice shape up to 200μ in width. Goethite is recognized as the pseudomorph of after pyrite in cube or framboid up to 50μ in size. Pyrite, the relict of alteration, shows microsphere, framboid or aggregate up to 20μ in size. Sphalerite is rarely observed in microspheroid or subrounded form up to 30μ in diameter. Cu Pb Zn 4 ppm, 686 ppm, 299 ppm
53308	No.53-MJ3	123.0	Limestone	The ore minerals are rare in this specimen. Pyrite spotted in the matrix of calcite crystals, shows in framboidal or cubic form up to 20μ in diameter. Goethite shows pseudomorph after pyrite of framboid or cube up to 50μ in size. Sphalerite is scarcely observed in irregular shape of anhedra up to 30μ in size. Cu Pb Zn 6 ppm, 158 ppm, 277 ppm

A. II-7 Fossils under microscopic observation.

Sample No.	Hole No.	Stratigraphical Units	Fossils	Estimated Age
53104	No.53-MJ1	Pucara Group	Shell fragments (not identified)	Jurassic
53106	No.53-MJ1	Pucara Group	Not identified	Jurassic
53303	No.53-MJ3	Pucara Group	Shell fragments (not identified)	Jurassic
53307	No.53-MJ3	Pucara Group	Echinoid spine and shell	Jurassic
53310	No.53-MJ3	Pucara Group	Shell fragments of gastropods and bivalves	Jurassic

A. II-8 Photomicrographs of rocks, ores, and fossils.

(1) Thin Section of Rocks

Sample No.	Hole No.	Rock Name
53105	53-MJ1	Breccia Dolomite
53107	53-MJ1	Dolostone
53117	53-MJ1	Breccia Dolomite
53210	53-MJ2	Muddy dolostone
53215	53-MJ2	Calcareous siltstone
53220	53-MJ2	Silty limestone
53304	53-MJ3	Limestone
53305	53-MJ3	Limestone with Echinoid
53308	53-MJ3	Limestone with Algal
53314	53-MJ3	Dolomitic limestone
53320	53-MJ3	Limestone

Abbreviations

Al : Algal Bit : Bituminous Brp : Brachiopod

cal : calcite dol : dolomite Pel : Pellet

Py : Pyrite qz : quartz

(2) Polished Section of Ores

Sample No.	Hole No.	Rock Name
53107	53-MJ1	Dolostone with galena
53206	53-MJ2	Silty dolostone
53211	53-MJ2	Dolostone with pyrite
53213	53-MJ2	Dolostone with ore
53304	53-MJ3	Limestone with ore
53305	53-MJ3	Limestone with ore
53308	53-MJ3	Limestone with pyrite

Abbreviations

cal : calcite Crs : Cerussite dol : dolomite

Gn : Galena Py : Pyrite Sp : Sphalerite

(3) Fossils

Fig. 1. Slightly recrystallized oolitic limestone with shell fragments, 53104.

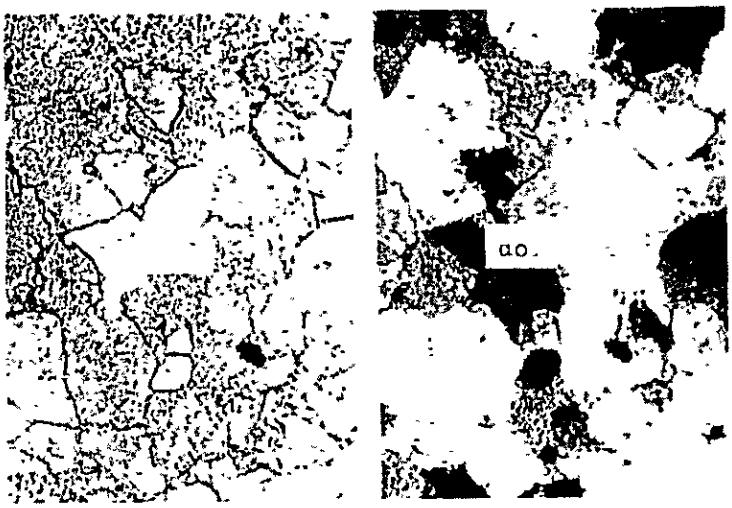
Fig. 2. Distinctly dolomitized limestone, 53106.

Fig. 3. Slightly recrystallized muddy limestone with shell fragments, 53303.

Fig. 4. Slightly dolomitized muddy limestone with echinoid spine and shell, 53307.

Fig. 5. Slightly recrystallized muddy limestone with shell fragments of gastropods and bivalves, 53310.

All figs. x 5.

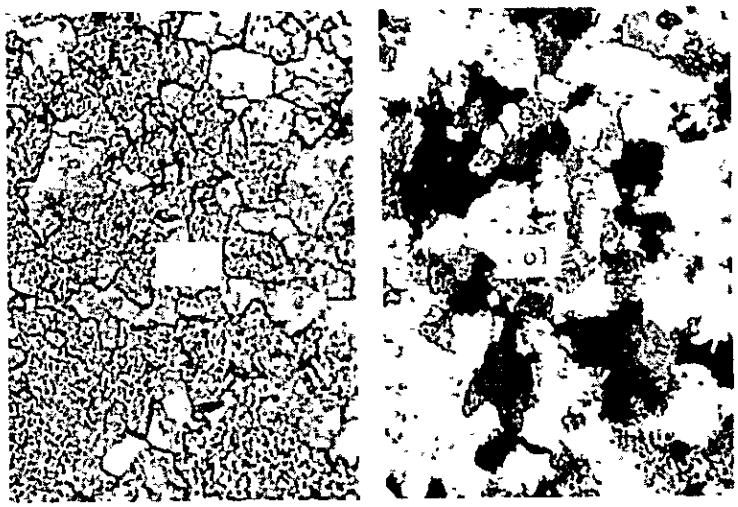


Sample No. 53105

Rock name,
Breccia Dolomite

Left: Open nicol

Right: Crossed nicols

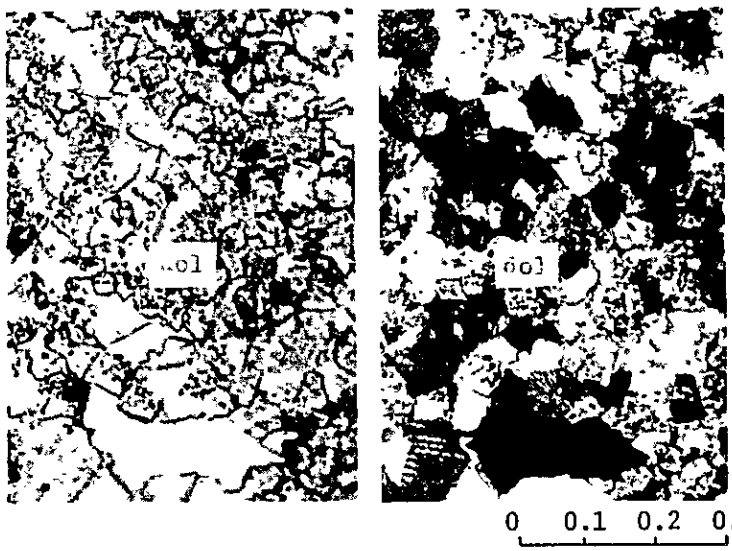


Sample No. 53107

Rock name,
Dolostone

Left: Open nicol

Right: Crossed nicols

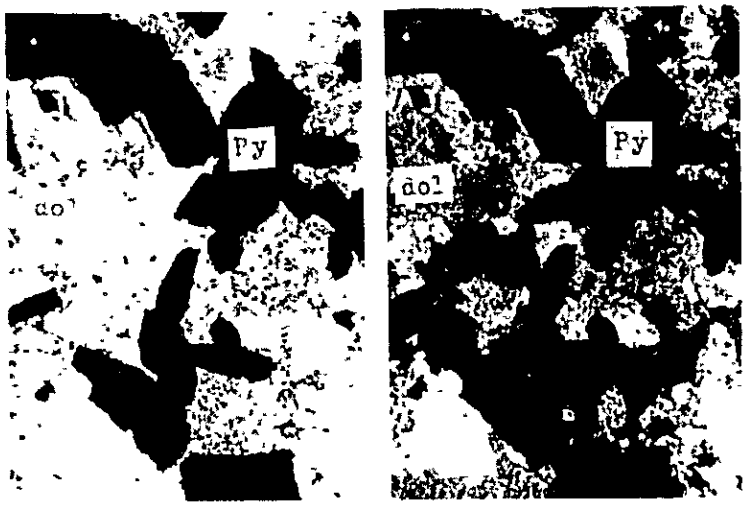


Sample No. 53117

Rock name,
Breccia Dolomite

Left: Open nicol

Right: Crossed nicols



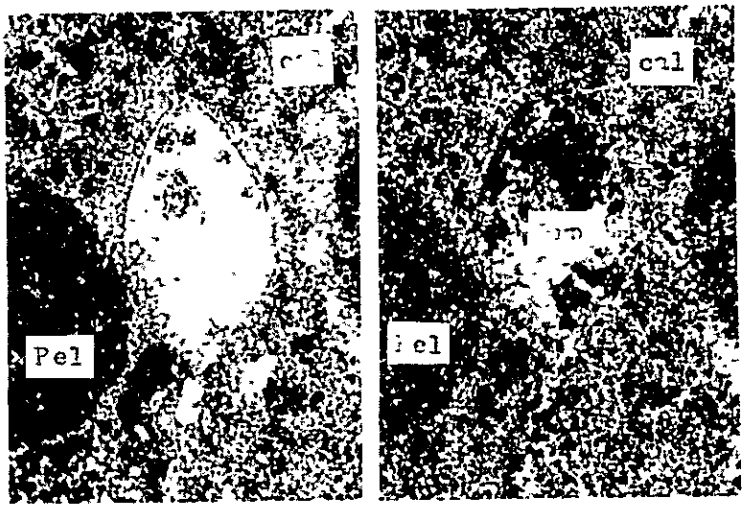
Sample No. 53210

Rock name,
Muddy dolostone

Left: Open nicol

Right: Crossed nicols

0 0.1 0.2 0.3mm



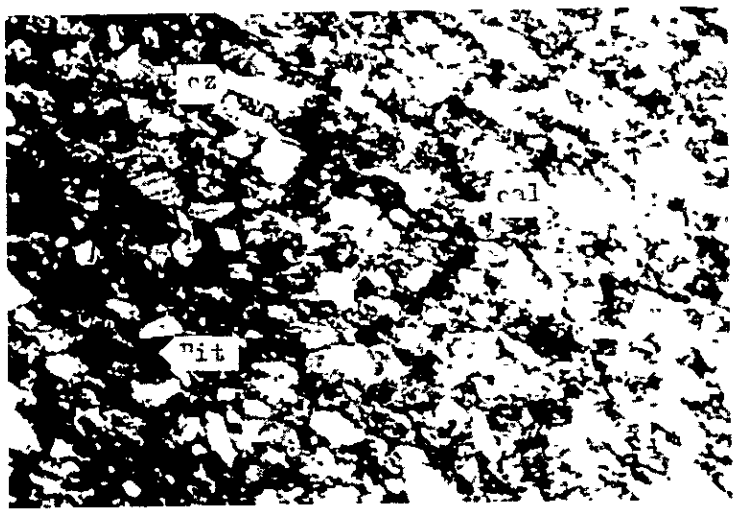
Sample No. 53215

Rock name,
Calcareous siltstone

Left: Open nicol

Right: Crossed nicols

0 0.1 0.2 0.3mm

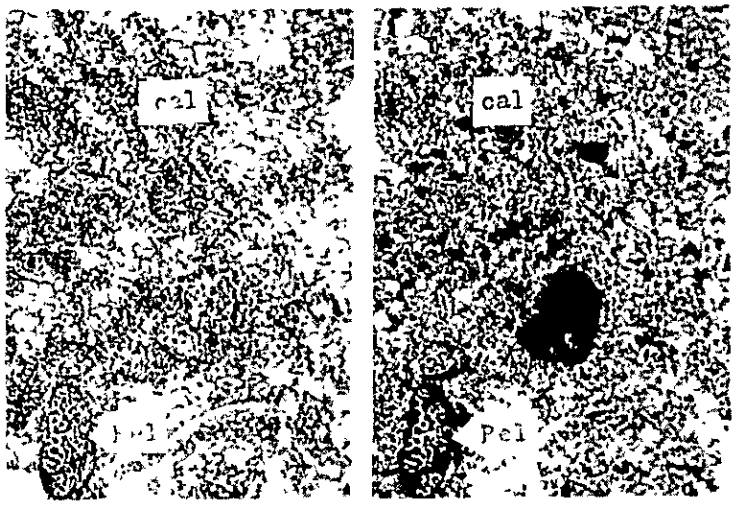


Sample No. 53220

Rock name,
Silty limestone

Open nicol

0 0.1 0.2 0.3mm

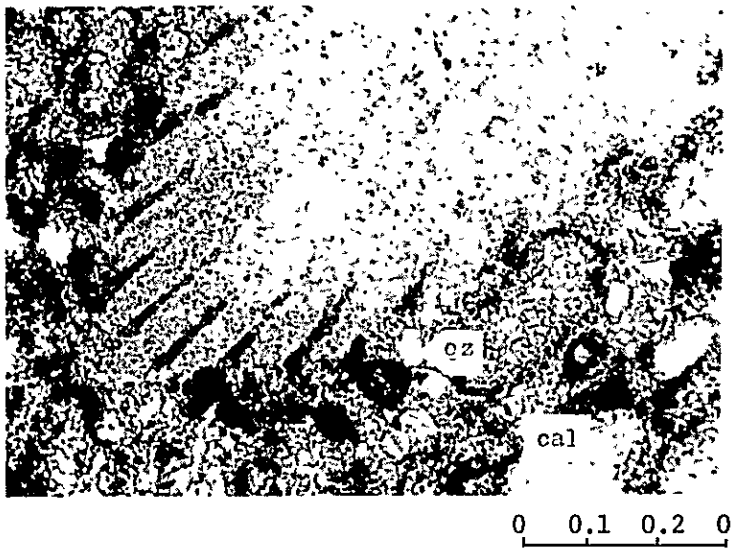


Sample No. 53304

Rock name,
Limestone

Left: Open nicol

Right: Crossed nicols

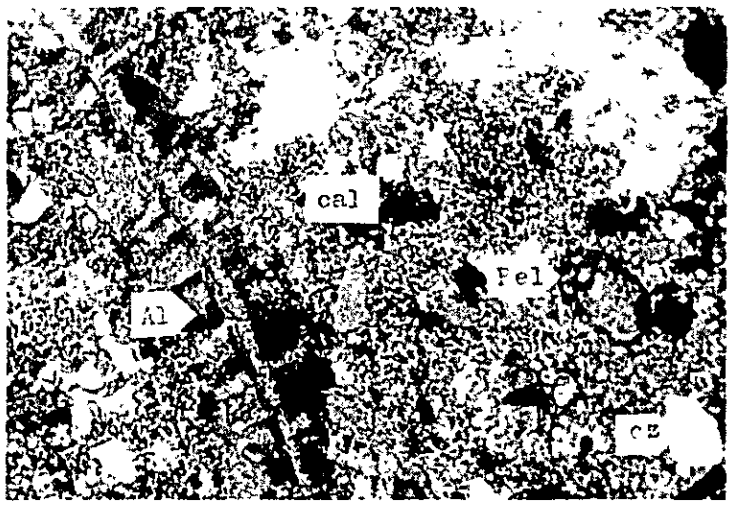


Sample No. 53305

Rock name,
Limestone with Echinoid

Ech --- Echinoid spine

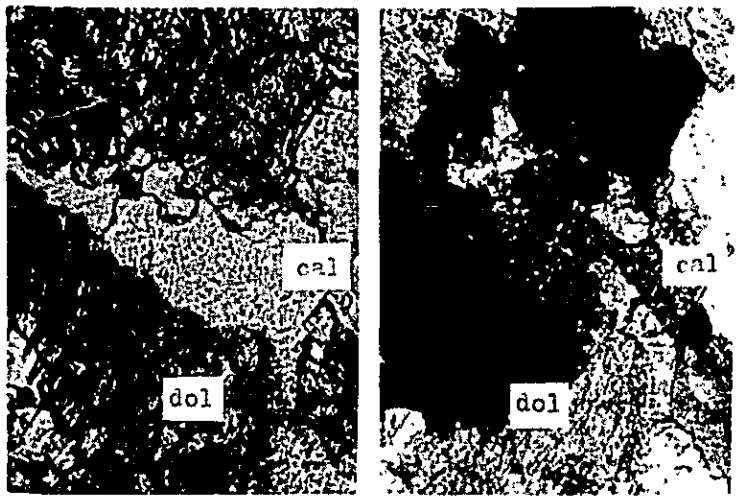
Open nicol



Sample No. 53308

Rock name,
Limestone with Algal.

Open nicol



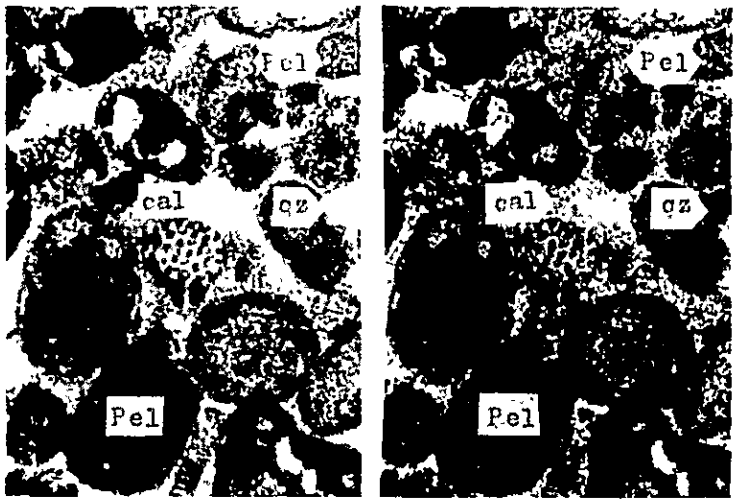
Sample No. 53314

Rock name,
Dolomitic Limestone

Left: Open nicol

Right: Crossed nicols

0 0.1 0.2 0.3mm



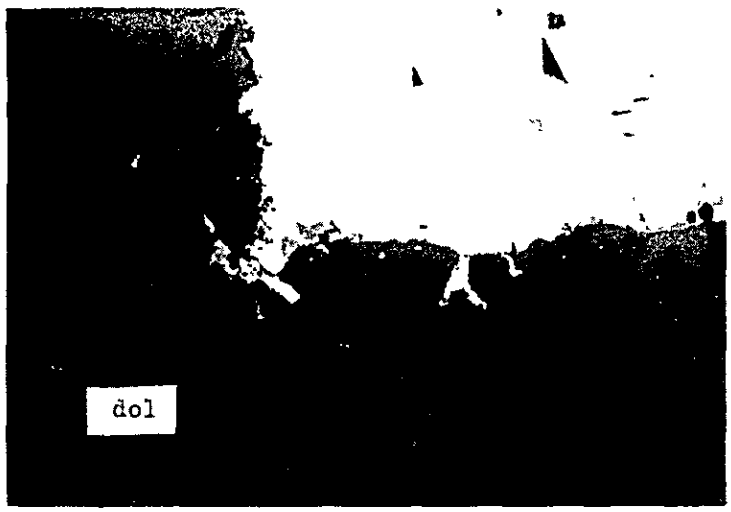
Sample No. 53320

Rock name,
Limestone

Left: Open nicol

Right: Crossed nicols

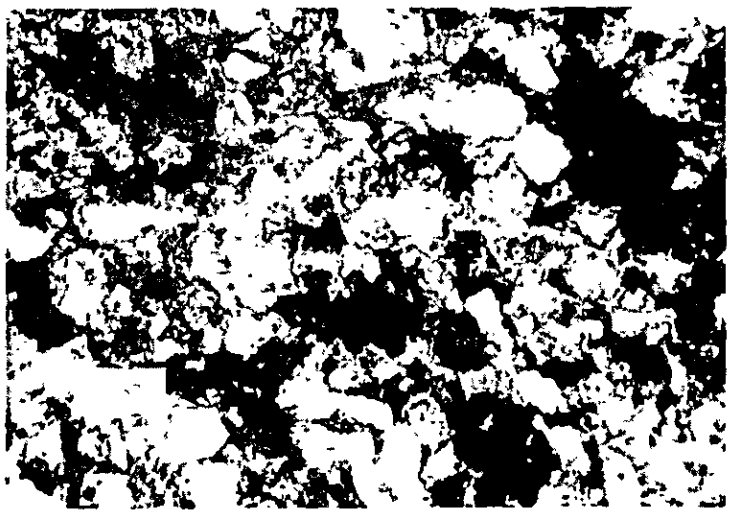
0 0.1 0.2 0.3mm



0 0.1 0.2 0.3mm

Sample No. 53107

Rock name,
Dolostone with galena



0 0.1 0.2 0.3mm

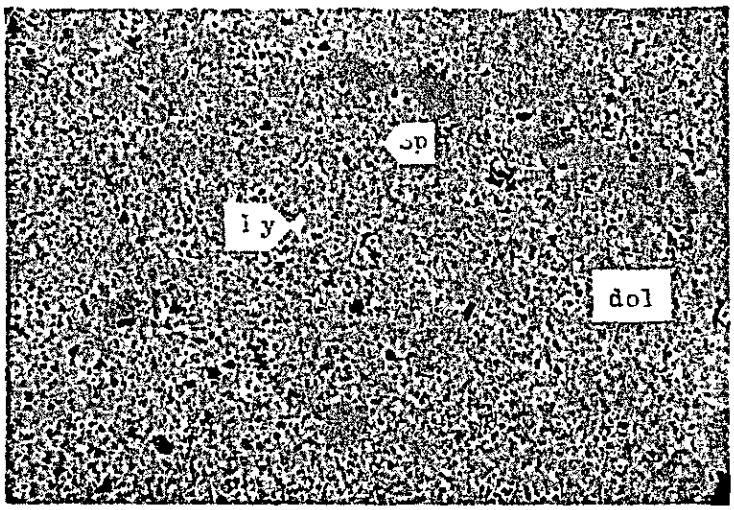
Sample No. 53206

Rock name,
Silty dolostone

0 0.1 0.2 0.3mm

Sample No. 53211

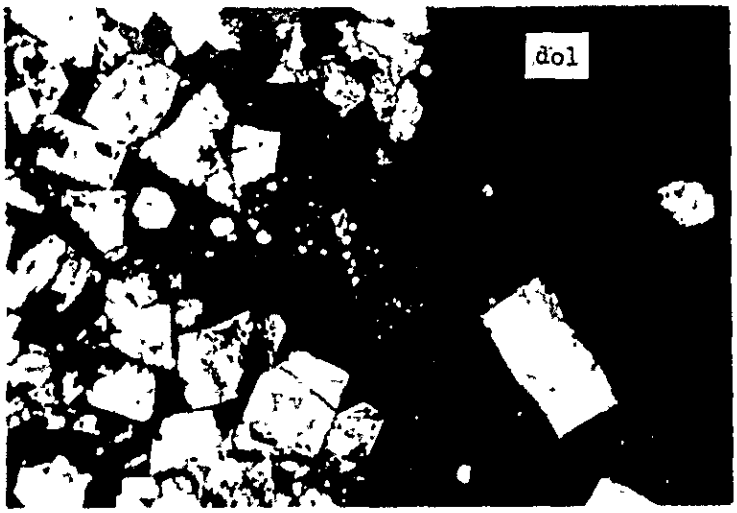
Rock name,
Dolostone with pyrite.



0 0.1 0.2 0.3mm

Sample No. 53213

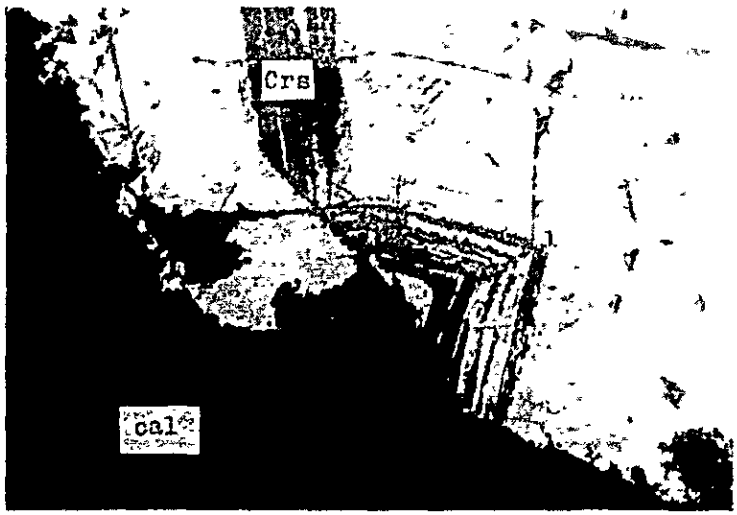
Rock name,
Dolostone with ore.



0 0.1 0.2 0.3mm

Sample No. 53213

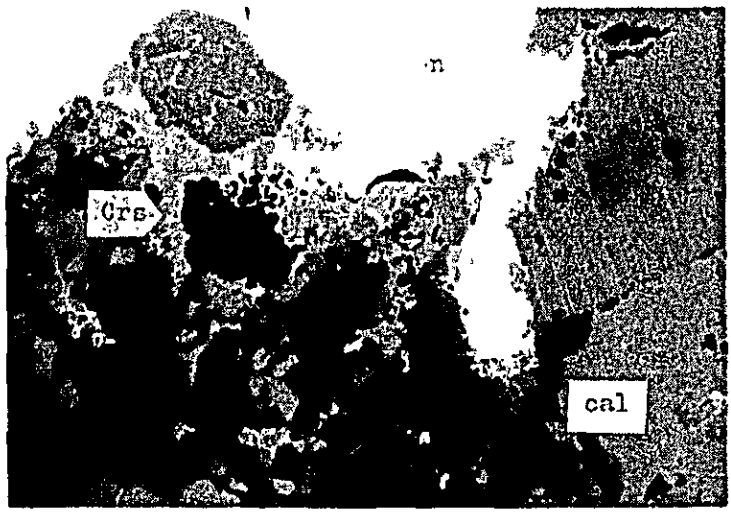
Rock name,
Dolostone with pyrite.



0 0.1 0.2 0.3mm

Sample No. 53304

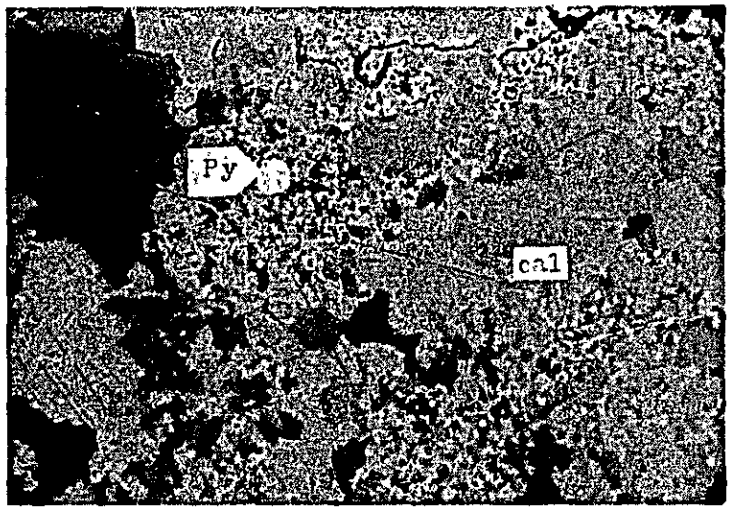
Rock name,
Limestone with ore.



0 0.1 0.2 0.3mm

Sample No. 53305

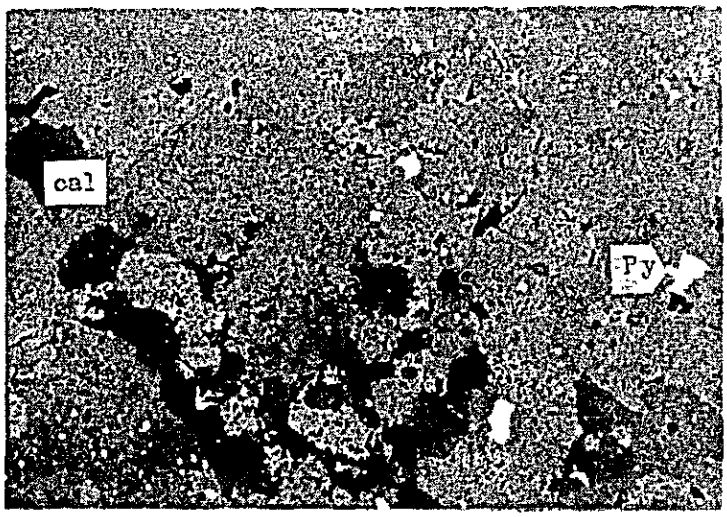
Rock name,
Limestone with ore.



0 0.1 0.2 0.3mm

Sample No. 53305

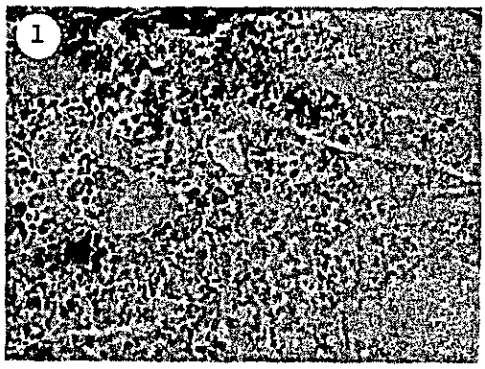
Rock name,
Limestone with pyrite.



0 0.1 0.2 0.3mm

Sample No. 53308

Rock name,
Limestone with pyrite.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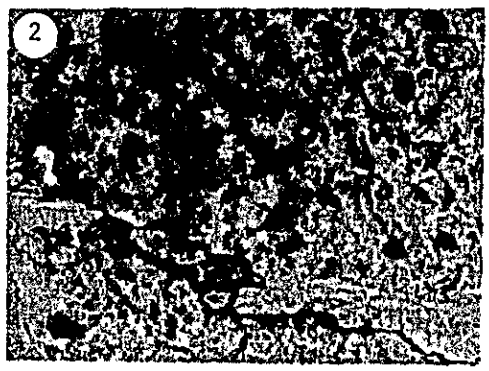
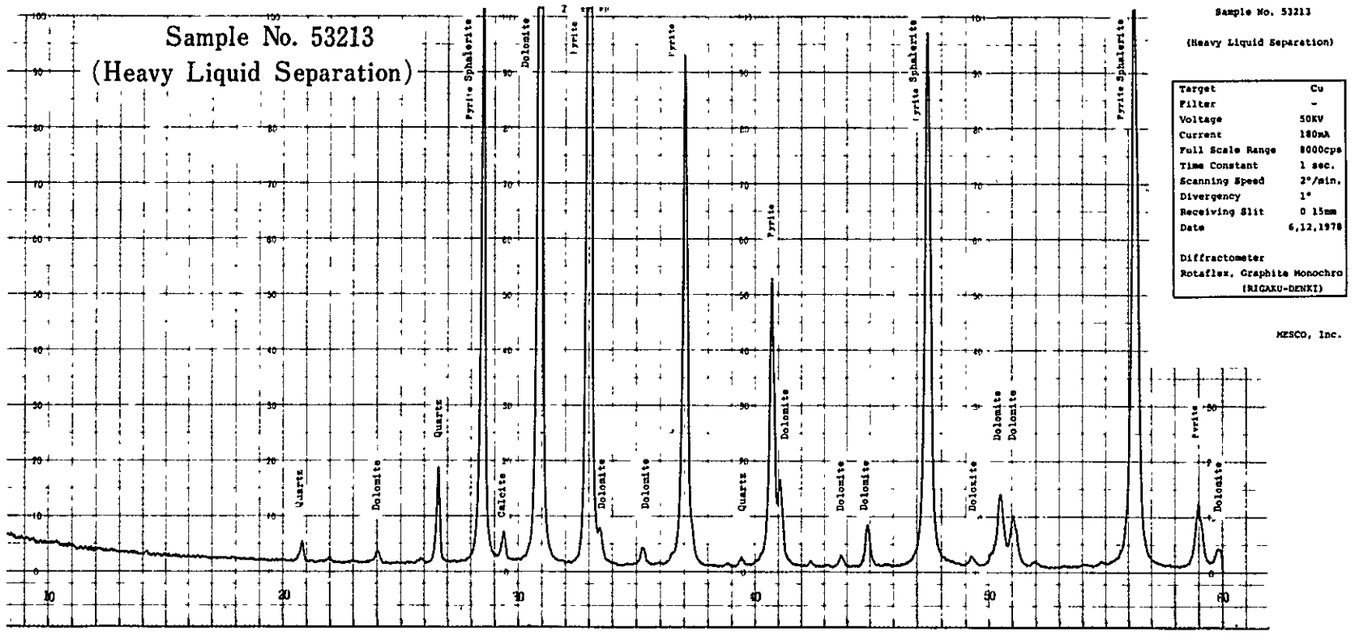

2


3


4


5

A. II-9 Chart of X-ray diffraction test.



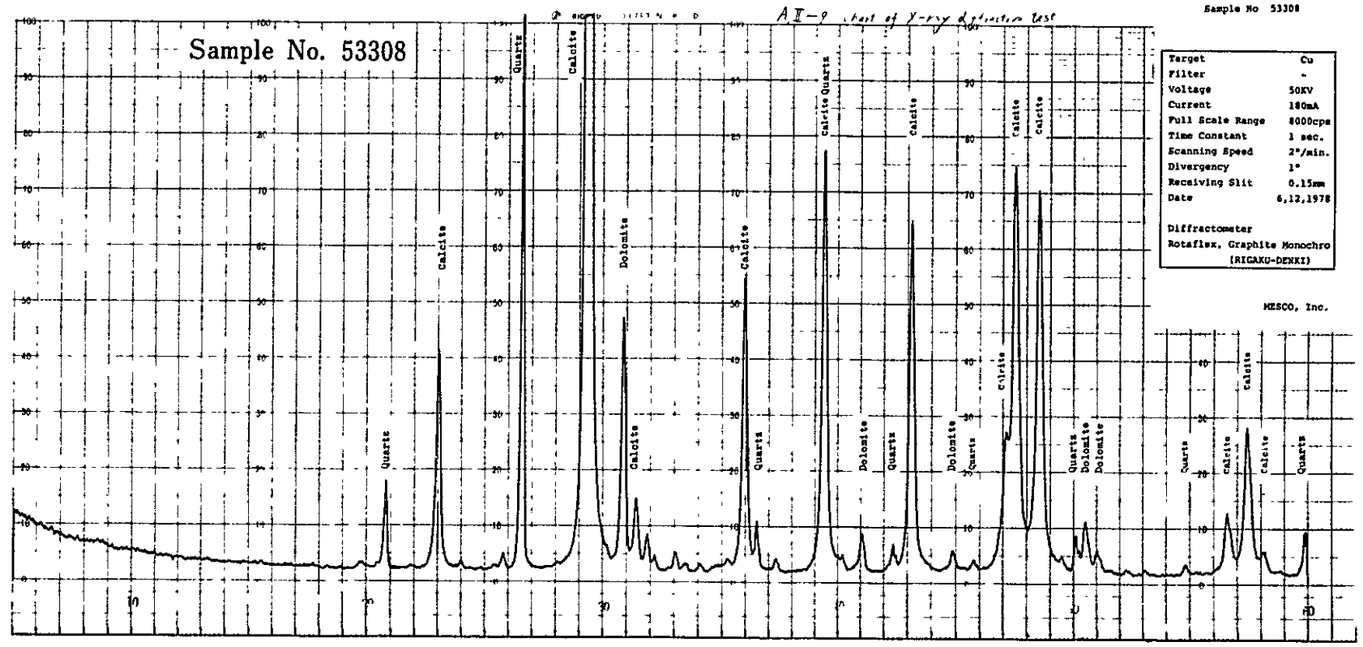
Sample No. 53213

(Heavy Liquid Separation)

Target	Cu
Filter	-
Voltage	50KV
Current	180mA
Full Scale Range	8000cps
Time Constant	1 sec.
Scanning Speed	2°/min.
Divergency	1°
Receiving Slit	0.15mm
Date	6,12,1978

Diffractometer
Rotaflex, Graphite Monochro
(RIGAKU-DENKI)

MESCO, Inc.



Sample No 53308

Target	Cu
Filter	-
Voltage	50KV
Current	180mA
Full Scale Range	8000cps
Time Constant	1 sec.
Scanning Speed	2°/min.
Divergency	1°
Receiving Slit	0.15mm
Date	6,12,1978

Diffractometer
Rotaflex, Graphite Monochro
(RIGAKU-DENKI)

MESCO, Inc.

A. II-10 Results of X-ray diffraction test.

Sample No. \ Minerals	Quartz	Calcite	Dolomite	Sericite	Sphalerite	Pyrite
53113	•	•	◎			
53117	o	o	◎			•
*53213	o	•	◎		○	◎
*53215	○	○	o		○	◎
53305	○	◎	•	•		
53308	○	◎	○			

* Heavy liquid separation

A. II-11 Chemical analysis of boring core samples.

No. 53-MJ1

Sample No.	Depth (m)	Assay			
		Cu (ppm)	Pb (ppm)	Zn (ppm)	Mg (%)
53101	14.80 ∿ 15.00	6	36	31	11.6
53102	29.80 ∿ 30.00	6	28	22	12.2
53103	44.80 ∿ 45.00	17	27	328	12.0
53104	59.80 ∿ 60.00	4	24	13	10.7
53105	74.80 ∿ 75.00	5	27	60	11.8
53106	89.80 ∿ 90.00	3	26	8	12.5
53107	104.80 ∿ 105.00	3	24	19	12.4
53108	119.80 ∿ 120.00	3	25	10	12.6
53109	134.80 ∿ 135.00	2	25	10	12.4
53110	149.80 ∿ 150.00	3	27	28	12.3
53111	164.80 ∿ 165.00	3	24	20	12.9
53112	179.80 ∿ 180.00	3	24	19	13.0
53113	194.80 ∿ 195.00	4	27	26	12.7
53114	209.80 ∿ 210.00	8	30	122	11.1
53115	224.80 ∿ 225.00	4	24	54	11.2
53116	239.80 ∿ 240.00	5	31	15	11.3
53117	254.80 ∿ 255.00	5	31	14	11.6
53118	269.80 ∿ 270.00	4	26	13	12.1
53119	284.80 ∿ 285.00	4	27	10	11.6
53120	299.80 ∿ 300.00	3	24	12	11.9

No. 53-MJ2

53201	14.80 ∿ 15.00	4	27	42	12.7
53202	29.80 ∿ 30.00	3	27	15	13.1
53203	44.80 ∿ 45.00	4	28	41	12.6
53204	59.80 ∿ 60.00	3	24	12	12.7

Sample No.	Depth (m)	Assay			
		Cu (ppm)	Pb (ppm)	Zn (ppm)	Mg (%)
53205	74.80 ∿ 75.00	3	21	11	11.2
53206	89.80 ∿ 90.00	12	69	29	9.7
53207	104.80 ∿ 105.00	30	56	36	9.1
53208	119.80 ∿ 120.00	4	27	12	12.7
53209	134.80 ∿ 135.00	8	40	22	8.3
53210	149.80 ∿ 150.00	17	87	71	11.0
53211	164.80 ∿ 165.00	7	42	29	10.5
53212	179.80 ∿ 180.00	8	42	20	10.6
53213	190.50 ∿ 190.70	6	110	19,080	5.2
53214	209.80 ∿ 210.00	18	33	23	1.8
53215	224.80 ∿ 225.00	22	27	128	0.8
53216	239.80 ∿ 240.00	19	27	29	0.9
53217	254.80 ∿ 255.00	36	30	57	1.4
53218	269.80 ∿ 270.00	14	27	320	0.7
53219	284.80 ∿ 285.00	16	25	243	1.4
53220	299.80 ∿ 300.00	16	26	70	0.7

No. 53-MJ3

53301	14.80 ∿ 15.00	4	77	120	2.1
53302	29.80 ∿ 30.00	5	50	165	0.2
53303	44.80 ∿ 45.00	5	283	384	5.0
53304	58.60 ∿ 58.80	3	533	299	0.4
53305	71.00 ∿ 71.20	4	686	299	0.3
53306	89.80 ∿ 90.00	8	178	291	0.2
53307	104.80 ∿ 105.00	16	59	507	1.8
53308	123.00 ∿ 123.20	6	158	277	0.8
53309	134.80 ∿ 135.00	11	600	643	2.7

Sample No.	Depth (m)	Assay			
		Cu (ppm)	Pb (ppm)	Zn (ppm)	Mg (%)
53310	149.80 ∿ 150.00	12	50	560	1.7
53311	164.80 ∿ 165.00	7	34	205	0.4
53312	179.80 ∿ 180.00	5	32	107	0.3
53313	194.80 ∿ 195.00	5	40	157	0.3
53314	209.80 ∿ 210.00	3	27	451	10.0
53315	224.80 ∿ 225.00	6	38	160	0.2
53316	239.80 ∿ 240.00	6	41	275	0.4
53317	254.80 ∿ 255.00	39	390	883	6.2
53318	269.80 ∿ 270.00	10	44	2,210	9.6
53319	284.80 ∿ 285.00	4	30	453	10.9
53320	299.80 ∿ 300.00	8	55	259	0.3