

## **APPENDIX D1**

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El Galeno drill core geology

## **DRILL CORE LOGGING PROCEDURES**

A total of 15 drill cores that were logged by the author are presented in the following appendix. Seven of these are from the El Galeno deposit (Appendix D1-D2) and eight from the Michiquillay deposit (Appendix D4). Logged drill cores ranged in length from 120 to 530 m. Previous logging of the El Galeno drill cores had been completed and compiled by North Ltd (Peru) geologists prior to initiation of the Ph.D. study. North Ltd. geologists logged intrusive type, alteration assemblage and intensity, vein abundance, plus sulphide type and abundance. Drill core logging by the author focussed on identification of the various lithological units with particular emphasis on documenting and re-evaluating the intrusive history. Drill core logging by the author also involved revising fault/gouge zones, alteration phases and distribution, vein density and sulphide minerals paragenesis. Drill core log sheets by the author were later combined with the logged data from the North geologists in a database format. At Michiquillay, the majority of the drill core logging focussed on identifying the main lithological units, fault/gouge zones and alteration phases. In Appendix D4, Cu grades under column Cu\_%<sub>1</sub> were obtained from drill core assay data compiled by ASRARCO between 1963 and 1965. The remaining metals grades Au(ppb)<sub>2</sub> to Mo(ppm)<sub>2</sub> were obtained from assayed samples run by North Ltd in 1997. Samples assayed were taken at 15 m intervals from the following drill cores; H-22, J-20, K-19.5, M-17 and N-15.5.

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**ABBREVIATIONS**

**El Galeno**

Grv = gravels

P1 = P1 porphyry

P2 = P2 porphyry

P3 = P3 porphyry

P3 Bx = P3 porphyritic breccia

P3 dykes = P3 dykes

MBx = MBx porphyry

**Michiquillay**

D1 = Michiquillay porphyry

Dyke = synmineralisation dyke

**Common**

Qz = quartzites

Slst = siltstones

Bx = breccia

Flt = fault

Mag = magmatic breccia

Hydro Bx = hydrothermal breccia

Altn = dominant alteration

Altn2 = subordinate alteration

K = potassic

Mt = magnetite

Prop = propylitic

Silf = silicic

Phyl = phyllic

Arg = argillic

1 = weak

2 = moderate

3 = strong

4 = intense

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Hole_Id	From	To	Rock	Bx	Altn	Altn 2	K	Phyl	Silc	Prop	qz_a/b_%	Pyr	Mag	Ccp	Cc	Cv	Bn	Mo
DDH-GN-36	0	2	grv															
DDH-GN-36	2	20	P1		phyl	arg		4	1	1	16	2			2	1		1
DDH-GN-36	20	38	qz		phyl			2			19	2			2	1		1
DDH-GN-36	38	54	P1		phyl	arg		4		1	12	2						2
DDH-GN-36	54	56	P1		phyl	arg		4		1	12	1						2
DDH-GN-36	56	69	P1		phyl	arg		4		1	12	1						1
DDH-GN-36	69	74	P1		phyl	arg		4		1	12	1						1
DDH-GN-36	74	76	qz		phyl			2			12	1			1	1		1
DDH-GN-36	76	83	qz		phyl			2			15	1			1	1		1
DDH-GN-36	83	92	qz		phyl			2			14	1						1
DDH-GN-36	92	95	qz		phyl			2			14	1						1
DDH-GN-36	95	107	qz		phyl			2			13	1						1
DDH-GN-36	107	114	qz		phyl			2			11	2			1	1		1
DDH-GN-36	114	118	qz		phyl			2			16	2			1	1		1
DDH-GN-36	118	123	qz		phyl			2			8	1						
DDH-GN-36	123	124	P1		phyl			4			16	1						
DDH-GN-36	124	131	qz		phyl			2			7	2			1	1		1
DDH-GN-36	131	145	qz		phyl			2			12	2			1	1		1
DDH-GN-36	145	148	qz		phyl			2			12	2			1	1		1
DDH-GN-36	148	152	qz		phyl			2			7	2			1			
DDH-GN-36	152	156	qz		phyl			2			7	2			1			
DDH-GN-36	156	162	qz		phyl			2			9	2			1			
DDH-GN-36	162	163	P1		phyl	k	3	4		1	9	2			1			
DDH-GN-36	163	164	qz		phyl			2			12	2			1			1
DDH-GN-36	164	166	qz		phyl			2			12	2			1			1
DDH-GN-36	166	169	qz		phyl			2			14	2			1	1		1
DDH-GN-36	169	170	qz		phyl			2			18	2			1			1
DDH-GN-36	170	171	P1		phyl			2		1	18	2			1			1
DDH-GN-36	171	175	qz		phyl			2			18	2			1			1
DDH-GN-36	175	175	P1		phyl			2		1	18	2			1			1
DDH-GN-36	175	177	qz		phyl			1			18	2			1			1
DDH-GN-36	177	180	qz		phyl			1			18	2			1			1
DDH-GN-36	180	195	qz		phyl			1			5	2			1			1
DDH-GN-36	195	198	P1		phyl	prop		4	1	1	13	2						
DDH-GN-36	198	204	qz		phyl			1				2						
DDH-GN-36	204	205	P1		phyl	prop		4	1	1		2						
DDH-GN-36	205	210	qz		phyl			1				2						
DDH-GN-36	210	211	P1		phyl	prop		4	1	1		2						
DDH-GN-36	211	213	qz		phyl			1				2			1			1
DDH-GN-36	213	215	P1		phyl	prop		4	1	1		2			1			1
DDH-GN-36	215	222	qz		phyl			1				2			1			
DDH-GN-36	222	226	qz		phyl			1			11	2			1			
DDH-GN-36	226	230	qz		phyl			1			13	2			1			1
DDH-GN-36	230	235	qz		phyl			1			14	2			1			
DDH-GN-36	235	236	qz		phyl			1			11	2			1			
DDH-GN-36	236	238	qz		phyl			1			11	2			1			
DDH-GN-36	238	250	qz		phyl			1			11	2			1			
DDH-GN-36	250	251	P1		phyl			4			13	2			1			
DDH-GN-36	251	253	qz		phyl			1			11	2			1			
DDH-GN-36	253	257	P1		phyl			4			14	1			1			
DDH-GN-36	257	265	qz		phyl			1			18	2			1	1		
DDH-GN-36	265	270	qz		phyl			1			15	2			1	1		
DDH-GN-36	270	275	qz		phyl			1			12	2			1	1		
DDH-GN-36	275	283	qz		phyl			1			17	2			1	1		
DDH-GN-36	283	285	qz		phyl			1			11	2			1	1		
DDH-GN-36	285	286	qz		phyl			1			11	2			1	1		
DDH-GN-36	286	287	qz		phyl			1			11	2			1	1		
DDH-GN-36	287	287	qz		phyl			1			11	2			1	1		
DDH-GN-36	287	289	qz		phyl			1			11	2			1	1		
DDH-GN-36	289	292	qz		phyl			1			11	2			1	1		
DDH-GN-36	292	298	qz		phyl			1			18	2			1	1	1	
DDH-GN-36	298	300	qz		phyl			1			18	2			1	1	1	
DDH-GN-36	300	304	qz		phyl			1			26	2			1	1	1	
DDH-GN-36	304	305	qz		phyl			1			26	2						
DDH-GN-36	305	309	qz		phyl			1			26	2						
DDH-GN-36	309	315	qz		phyl			1			17	2						
DDH-GN-36	315	320	qz		phyl			1			17	1			1			
DDH-GN-36	320	332	qz		phyl			1				2			1			
DDH-GN-36	332	335	P1		phyl			4			18	1			1			
DDH-GN-36	335	340	qz		phyl			1				2			1			
DDH-GN-36	340	349	qz		phyl			1			27	2						
DDH-GN-36	349	352	qz		phyl			1				2						
DDH-GN-36	352	357	P1		phyl			4			18	1						
DDH-GN-36	357	361	qz		phyl			1				2			1	1	1	1
DDH-GN-36	361	362	qz		phyl	k	2	1			13	1						
DDH-GN-36	362	365	qz		phyl	k	2	1			13	2			1			
DDH-GN-36	365	367	qz		phyl	k	2	1			13	2			1			
DDH-GN-36	367	368	P1		phyl	k	2	4			13	2			1			
DDH-GN-36	368	369	qz		phyl			1			13	2			1			
DDH-GN-36	369	379	qz		phyl			1			16	2			1	1	1	
DDH-GN-36	379	383	qz		phyl			1			16	1			1			1
DDH-GN-36	383	387	qz		phyl			1			19	1			1			
DDH-GN-36	387	388	qz		phyl			1			19	1			1			
DDH-GN-36	388	399	qz		phyl			1			26	2			1	1	1	

Hole_id	From	To	Rock	Bx	Altn	Altn 2	K	Phyl	Silc	Prop	qz_a/b_	%	Pyr	Mag	Ccp	Cc	Cv	Bn	Mo
DDH-GN-36	399	402	qz		phyl			1			28		2		1	1	1		
DDH-GN-36	402	408	qz		phyl			1			28		2		1	1	1		
DDH-GN-36	408	419	qz		phyl			1	1	31		2		1					

Hole_id	From	To	Rock	Bx	Altn	Altn 2	K	Phyl	Silc	Prop	qz_a/b_	%	Pyr	Mag	Ccp	Cc	Cv	Bn	Mo
DDH-GN-37	0	8	grv																
DDH-GN-37	8	45	? P1	Flt	phyl-arg			4			12		2			2	1		1
DDH-GN-37	45	69	? P1	Flt	phyl-arg			4			12		2			2			1
DDH-GN-37	69	93	? P1	Flt	phyl-arg			4			12		2			2			
DDH-GN-37	93	143	? P1	Flt	phyl-arg			4			12		2			2			1
DDH-GN-37	143	151	P1		arg	phyl		1			10		2			2			1
DDH-GN-37	151	175	? P1	Flt	k		4	1			8		2			2			1
DDH-GN-37	175	181	P1		phyl	phyl	2	4			8		2			2			1
DDH-GN-37	181	205	? P1	Flt	phyl		2	4			8		1		1	1	1		1
DDH-GN-37	205	219	P2		k	phyl	4	1			8		1		1	1	1		1
DDH-GN-37	219	286	P2		k	phyl	4	1			8		1		1	1	1		
DDH-GN-37	285	289	? P1	Flt	k	prop	4	1		2	23		1			1	1		
DDH-GN-37	289	295	? P1	Flt	k	prop	4	1		2	23		1	1	1	1			1
DDH-GN-37	295	304	? P1	Flt	k	prop	4	1		2	23		1	1	1	1			1
DDH-GN-37	304	315	P2		k	prop	4	1		1	17		1	1	1	1			1
DDH-GN-37	315	325	? P1	Flt	k	prop	4			2	17		1	1	1	1			1
DDH-GN-37	325	328	P2		k	phyl		1			20		1	1	1	1			1
DDH-GN-37	328	348	P2		k	phyl	3	1			10		1	1	1	1			1
DDH-GN-37	348	358	P2		k	phyl	2	1			7		1	1	1	1			1
DDH-GN-37	358	360	P3		k	phyl	2	1			7		1	1	1	1			1
DDH-GN-37	360	373	P2		k	phyl	3	1			16		1	1	1	1			1
DDH-GN-37	373	373	P2		k	phyl	2	1			7		1	1	1	1			1
DDH-GN-37	373	391	P2		k	phyl	3	1			16		1	1	1	1			1

Hole_id	From	To	Rock	Bx	Altn	Altn 2	K	Phyl	Silc	Prop	qz_a/b_	%	Pyr	Mag	Ccp	Cc	Cv	Bn	Mo
DDH-GN-39	0	5	grv																
DDH-GN-39	5	6	grv																
DDH-GN-39	6	14	qz		k	phyl	1	1			12		2			1	2		1
DDH-GN-39	14	20	qz		k	phyl	1	1			12		2			2	1		1
DDH-GN-39	20	28	P1		k		4	1			16		2			2	2		1
DDH-GN-39	28	54	P1		k		4	1			16		2			2	2		1
DDH-GN-39	54	69	P1		k		4	1			18		2			2	2		1
DDH-GN-39	69	71	qz		k	phyl	1	1			17		2			2			
DDH-GN-39	71	91	qz		k	phyl	1	1			17		2			2	1		1
DDH-GN-39	91	99	qz		k	phyl	1	1		2	18		2			2	1		1
DDH-GN-39	99	100	qz		k	phyl	1	4			16		2			2	1		1
DDH-GN-39	100	104	qz		k	phyl	1	1			15		2			2	1		1
DDH-GN-39	104	108	qz		k	phyl	1	1	4		15		2			2	1		1
DDH-GN-39	108	113	qz		k	phyl	1	1			15		2			2	1		1
DDH-GN-39	113	124	qz		k	phyl	1	1			13		2			2	1		1
DDH-GN-39	124	139	P1		k		4	1			21		2		1	2	1		1
DDH-GN-39	139	157	P2		k		4	1			16		2		1	2	1		1
DDH-GN-39	157	160	P2		k		4	1			14		2		1	2	1		1
DDH-GN-39	160	169	P2		k		4	1			14		2		1				1
DDH-GN-39	169	189	P2		k		4	1		2	14		2		1				1
DDH-GN-39	189	193	P1		k		4	1			16		2		1				1
DDH-GN-39	193	201	P2		k		4	1			15		2		1				1
DDH-GN-39	201	210	P1		k		3	1			11		2		1				1
DDH-GN-39	210	222	P1		k		3	1			10		2		1				1
DDH-GN-39	222	235	P1		k		3	1			13		2		1				1
DDH-GN-39	235	237	P3 Dyke		k		4	1			10		2		1				1
DDH-GN-39	237	253	P1		k		3	1			13		2		1				1
DDH-GN-39	253	257	P3 Dyke		k		4	1			10		2		1				1
DDH-GN-39	257	271	P1		k		3	1			13		2		1				1
DDH-GN-39	271	290	P1		k		3	1			18		2		1				1
DDH-GN-39	290	311	P1		k		3	1			16		2		1				1
DDH-GN-39	311	317	P3		k		3	1			13		2		1				1
DDH-GN-39	317	322	P1		k		3	1			16		1						1
DDH-GN-39	322	333	P1		k		3	1			20		2		1				1
DDH-GN-39	333	348	P1		k		3	1		1	20		2	1	1				1
DDH-GN-39	348	359	P1		k		3	1			14		2	2	1				
DDH-GN-39	359	367	MBx	Mag	k	phyl	4	1			4		2	2	1				1
DDH-GN-39	367	374	MBx	Mag	k	phyl	2	1			4		2	2	1				1
DDH-GN-39	374	375	MBx	Mag	k	phyl	4	1			4		2	2	1				1
DDH-GN-39	375	389	MBx	Mag	k	phyl	2	1			5		2	1	1				1
DDH-GN-39	389	399	MBx	Mag	k	phyl	2	2		1	5		2	1	1				1
DDH-GN-39	399	407	MBx	Mag	k	phyl	2	2		1	4		2	1	1				1
DDH-GN-39	407	408	MBx	Mag	k		4				4		2	1	1				1
DDH-GN-39	408	410	MBx	Mag	k	phyl	2	1			4		2	1	1				1
DDH-GN-39	410	422	MBx	Mag	k		4				4		2	1	1				1
DDH-GN-39	422	425	MBx	Mag	k	phyl	2	1			4		2	1	1				1
DDH-GN-39	425	428	MBx	Mag	k		4				4		2	1					1
DDH-GN-39	428	431	MBx	Mag	k		2	1			4		2	1					1
DDH-GN-39	431	433	MBx	Mag	k		4				4		2		1				
DDH-GN-39	433	456	MBx	Mag	k		2	1			6		2	1					
DDH-GN-39	456	465	MBx	Mag	k		2				7		2	1					
DDH-GN-39	465	475	P3		k		2				7		2	1	1				

Hole_Id	From	To	Rock	Bx	Altn	Altn 2	K	Phyl	Silc	Prop	qz_a/b_%	Pyr	Mag	Ccp	Cc	Cv	Bn	Mo
DDH-GN-41	0	1	grv															
DDH-GN-41	1	12	P2		k		4	1			20	1			1			
DDH-GN-41	12	16	P2		k		4	1			20	2	1		2	2		
DDH-GN-41	16	25	P2		k		4	1			20	2	1		2	2		
DDH-GN-41	25	28	P2		k		4	1		1	20	2	1		2	2		1
DDH-GN-41	28	33	P2		k		4	1			20	2	1		2	2		
DDH-GN-41	33	40	P2		k		4	1			20	2	1		2	2		
DDH-GN-41	40	46	P2		k		4	1			20	2	1		2	2		
DDH-GN-41	46	48	P2		k		4	1			5	2	1		3	2		
DDH-GN-41	48	56	P2		k	phyl	4	3			21	2	1		1	2		
DDH-GN-41	56	59	P2		k	phyl	4	3			15	2	1		2	1		
DDH-GN-41	59	65	P2		k	phyl	4	3			15	2			2	1		
DDH-GN-41	65	67	P2		k	phyl	4	3		1	15	1			1	1		
DDH-GN-41	67	69	P2		k	phyl	4	3			14	1			2	1		
DDH-GN-41	69	75	P2		k		3	2			16	1			2	1		
DDH-GN-41	75	83	P2		k		4	1			16	1			2			
DDH-GN-41	83	92	P2		k		3	1			16	1		1	1	1		
DDH-GN-41	92	102	P1		k		3	1			19	1	2		1			
DDH-GN-41	102	120	P3		k		2	1			6	2	1	1	1			1
DDH-GN-41	120	124	P3		k		2	1			6	2	1		1			
DDH-GN-41	124	128	P3		k		3	2			6	2	1					
DDH-GN-41	128	132	P3		k		2	1			6	2	2		1			
DDH-GN-41	132	137	P1		k		3	1			16	2	2		1			
DDH-GN-41	137	146	P1		k		3	1			16	2	1		1			1
DDH-GN-41	146	153	P1		k		3	1			16	2	1	1	1			
DDH-GN-41	153	160	P3		k		2	1			6	2	2	1				1
DDH-GN-41	160	166	P3		k		2	1			6	2	2					
DDH-GN-41	166	169	P3		k		2	1			6	2	2					2
DDH-GN-41	169	172	P3		k		2	1			6	2	2	1	1			1
DDH-GN-41	172	176	P3		k		2				6	2	2	1	1			1
DDH-GN-41	176	188	P3		k		2				6	2	1					
DDH-GN-41	188	199	P3		k		2				6	2	2					
DDH-GN-41	199	200	P3		phyl		2	3			5	2	2					
DDH-GN-41	200	208	P3		k		2	3			5	2	1					
DDH-GN-41	208	220	P3		k		2				5	2	1					
DDH-GN-41	220	240	P3		k		2				6	2	1					
DDH-GN-41	240	260	P3		k		2				5	2	1	1				
DDH-GN-41	260	263	P3		k		2				6	2	2					
DDH-GN-41	263	269	P3		k		2				15	2	2					
DDH-GN-41	269	280	P3		k		2				6	2	2					
DDH-GN-41	280	296	P3		k		2				6	2	2					1
DDH-GN-41	296	307	P1		k		3				11	2	3					
DDH-GN-41	307	320	P1		k		3				11	2	3					

Hole_Id	From	To	Rock	Bx	Altn	Altn 2	K	Phyl	Silc	Prop	qz_a/b_%	Pyr	Mag	Ccp	Cc	Cv	Bn	Mo
DDH-GN-42	0	3	grv															
DDH-GN-42	3	14	P2		phyl	k	3	4			9	1	1					
DDH-GN-42	14	29	P2		k		3	2			10	1	1					
DDH-GN-42	29	63	P2		k		3	2			10	2	2	1	2			
DDH-GN-42	63	66	P2		silf	k	3	1	4		10	2	1	1	1			
DDH-GN-42	66	68	P2		silf				4		10	2	1	1	1			
DDH-GN-42	68	97	P2		k		3	2			9	2	1					1
DDH-GN-42	97	98	P2		k		3	2			9	2	1					1
DDH-GN-42	98	103	P2		k		3	2			9	2	1					1
DDH-GN-42	103	104	P2		k		3	2			9	2	1					1
DDH-GN-42	104	117	P2		k		3	2			12	2	1					1
DDH-GN-42	117	128	P2		k		3	2			12	2	1					1
DDH-GN-42	128	142	P2		k		3	2			12	2	1					1
DDH-GN-42	142	148	P2		phyl	silf		4	3		12	2	1					1
DDH-GN-42	148	158	P2		k		3	2	2		12	2	1					1
DDH-GN-42	158	172	P3		k		2			1	4	2	2					1
DDH-GN-42	172	180	P1		k		4			1	10	2	1					1
DDH-GN-42	180	184	P1		silf				4		10	2	1					1
DDH-GN-42	184	195	P1		k		2			1	10	2	1					1
DDH-GN-42	195	206	P1		k		2	1	2	2	12	2	1					1
DDH-GN-42	206	208	P1		k		2	1			12	2	2	1		1		1
DDH-GN-42	208	210	P1		phyl			1			12	2	2	1		1		1
DDH-GN-42	210	220	P1		k		2	1			12	2	2	1		1		1
DDH-GN-42	220	234	P1		k		2		2		12	2	2	1		1		1
DDH-GN-42	234	257	P3		k		2				5	2	2	2				1
DDH-GN-42	257	261	P3		k		2				5	2	2	2				1
DDH-GN-42	261	284	P1		silf	k	3		4	2	8	2	2	1	1	1		1
DDH-GN-42	284	306	P1		k		3	1		2	8	2	2	1		1		1
DDH-GN-42	306	315	P3		k		2				5	2	2	2				1
DDH-GN-42	315	317	P1		phyl		2	3			8	2	2	1		1		1
DDH-GN-42	317	320	P3		silf	k	3	1	4	2	5	2	2	1		1		1
DDH-GN-42	320	341	P1		k		3	1		2	8	2	2	1		1		1
DDH-GN-42	341	344	P3		k		2				5	2	2	1				1
DDH-GN-42	344	356	P1		mt	phyl	2	3	4		8	2	3	1				1
DDH-GN-42	356	360	P3		phyl		2	3		2	5	2	2	1				1

Hole_Id	From	To	Rock	Bx	Altn	Altn 2	K	Phyl	Silc	Prop	qz_a/b_%	Pyr	Mag	Ccp	Cc	Cv	Bn	Mo
DDH-GN-42	360	369	P1		mt		2		4	2	9	2	4	1				
DDH-GN-42	369	370	P3		silf		2		4	2	5	2	2	1				
DDH-GN-42	370	378	P1		mt		2		4	2	10	2	4	1				
DDH-GN-42	378	382	P3		k		2		2	2	5	1	2	1				1
DDH-GN-42	382	387	P1		mt		2		4	2	7	2	4	1				1
DDH-GN-42	387	394	P3		k		2		2	2	5	2	2	1				1
DDH-GN-42	394	401	P1		mt		2		4	2	8	2	4	1				1
DDH-GN-42	401	422	P1		mt		2		4	2	9	2	4	1				1
DDH-GN-42	422	474	P1		mt		2		4	2	9	2	4	1				
DDH-GN-42	474	476	P1		mt		2		2	2	9	2	4	1				
DDH-GN-42	476	480	P3		k		2		2	2	5	2	2	1				
DDH-GN-42	480	481	P3		k		2			2	5	2	2	1				1
DDH-GN-42	481	485	P3		k		2		2	2	5	2	2	1				1
DDH-GN-42	485	488	P1		mt		2		2	2	5	2	3	1				
DDH-GN-42	488	499	P1		mt		2		4	2	5	2	3	1				

Hole_Id	From	To	Rock	Bx	Altn	Altn 2	K	Phyl	Silc	Prop	qz_a/b_%	Pyr	Mag	Ccp	Cc	Cv	Bn	Mo
DDH-GN-45	0	4	grv															
DDH-GN-45	4	8	P1		k	phyl	4	3			5	1						
DDH-GN-45	8	14	P1		k	phyl	4	3			5	1			1	1		1
DDH-GN-45	14	20	P1		k		4	2			18	2			2	1		1
DDH-GN-45	20	27	P1		k		4	2			18	2			2	1		1
DDH-GN-45	27	31	P1		k		4	2			18	2			2	1		2
DDH-GN-45	31	40	P1		k		4	2			18	2			2	1		1
DDH-GN-45	40	42	P1		k		4	2			18	1		1	1	1		2
DDH-GN-45	42	54	P1		k		4	2			18	1		1	1	1		2
DDH-GN-45	54	57	qz		k		1					1		1	1	1		1
DDH-GN-45	57	60	qz		k		1				7	1	2	1	2	1		1
DDH-GN-45	60	64	qz		k		1				12	2		1	1	1		1
DDH-GN-45	64	69	qz		k		1					2		1	1	1		1
DDH-GN-45	69	79	qz		k		1					2		1	1	1		1
DDH-GN-45	79	80	qz		k		1					2		1	1	1		1
DDH-GN-45	80	85	qz		k		1					2		1	2	1		1
DDH-GN-45	85	86	qz		k		1					2		2	2	1		1
DDH-GN-45	86	88	P1		k		4			1	5	3		2	2	1		1
DDH-GN-45	88	92	qz		k		1					1		1	2	1		1
DDH-GN-45	92	95	P1		k		4			1		2		1	2	1		1
DDH-GN-45	95	100	qz		k		1				12	2		1	1	1		1
DDH-GN-45	100	102	qz		k		1				12	1		1	1			1
DDH-GN-45	102	102	qz		k		1				12	2		1	2			2
DDH-GN-45	102	110	qz		k		1				12	1		1	1			2
DDH-GN-45	110	114	qz		k		1				12	1		1	1			2
DDH-GN-45	114	116	qz		k		1				12	1		1	1			1
DDH-GN-45	116	117	qz		k		1				12	1		1	1			1
DDH-GN-45	117	121	qz		k		1				12	2		2	2			1
DDH-GN-45	121	122	qz		k		1				12	2		2	2			1
DDH-GN-45	122	124	qz		k		1				12	2		2	2			1
DDH-GN-45	124	126	qz		k		1				12	2		2	2			1
DDH-GN-45	126	134	qz		k		1				12	2		2	1			1
DDH-GN-45	134	137	P1		k		4	2			22	1		1	1			1
DDH-GN-45	137	138	qz		k		1	1			22	1		1	1			1
DDH-GN-45	138	147	P1		k		4	2			22	1		1	1			1
DDH-GN-45	147	152	qz		k		1				13	2		1	1			
DDH-GN-45	152	155	P1		k		4				9	2	1	1				
DDH-GN-45	155	158	P1		k		4	1			17	2		1				1
DDH-GN-45	158	161	qz		k		1	1			17	2		1	1			2
DDH-GN-45	161	162	P1		k		4	1			17	1	1	1	1			1
DDH-GN-45	162	167	qz		k		1				7	2		1	1			1
DDH-GN-45	167	177	qz		k		1		4		7	2		1	1			1
DDH-GN-45	177	179	qz		k		1				10	2		2	1	1		1
DDH-GN-45	179	182	qz		k		1				10	2		2	1			1
DDH-GN-45	182	187	qz		k		1				10	2		2				
DDH-GN-45	187	192	qz		k		1				10	2		2	1			

Hole_Id	From	To	Rock	Bx	Altn	Altn 2	K	Phyl	Silc	Prop	qz_a/b_%	Pyr	Mag	Ccp	Cc	Cv	Bn	Mo
DDH-GN-46	0	12	P1		k		3	2			2			1				
DDH-GN-46	12	17	P1		k		3	1			2	9	1	2		1		
DDH-GN-46	17	22	P1		k		3	1			2	9	2	2		1	1	1
DDH-GN-46	22	22	P1		k		3	1			2	9	2					
DDH-GN-46	22	24	P1		k		3	1			2	9	2	1				
DDH-GN-46	24	26	P1		k		3	1			2	9	2					
DDH-GN-46	26	28	P1		k		4	1			2	9	2					
DDH-GN-46	28	30	P1		k		4	1			2	17	1	1		1		
DDH-GN-46	30	55	P1		k		4	1			2	17	2	1		1	1	
DDH-GN-46	55	57	P1		k		4	1			2	17	2	1				
DDH-GN-46	57	61	P1		k		4	1			2	17	2	2		1		1
DDH-GN-46	61	69	qz-sltst		k		1				26	2			2	1		
DDH-GN-46	69	70	qz-sltst		k		1				26	2			1	1		
DDH-GN-46	70	78	qz-sltst		k		1				26	2			2			
DDH-GN-46	78	79	qz-sltst		k		1				26	2			1			
DDH-GN-46	79	84	qz-sltst		k		1				26	2			2			
DDH-GN-46	84	86	qz-sltst		k		1				17	2			1	1		

Hole Id	From	To	Rock	Bx	Altn	Altn 2	K	Phyl	Silc	Prop	qz_a/b_%	Pyr	Mag	Ccp	Cc	Cv	Bn	Mo
DDH-GN-46	86	93	qz-sltst		k		1				17	2			2	1		
DDH-GN-46	93	94	qz-sltst		k		1				10	1						
DDH-GN-46	94	98	qz-sltst		k		1				17	2			1			
DDH-GN-46	98	101	qz-sltst		k		1				17	2			1	1		
DDH-GN-46	101	120	qz-sltst		k		1				17	2						1
DDH-GN-46	120	123	qz-sltst		k		1				17	2		1	1			
DDH-GN-46	123	139	qz-sltst		k		1				20	2	1		1			1
DDH-GN-46	139	141	qz-sltst		k		1				20	2						
DDH-GN-46	141	141	qz-sltst		k		1				20	2		1	1			
DDH-GN-46	141	143	qz-sltst		k		1				20	2						2
DDH-GN-46	143	146	qz-sltst		k		1				20	2			1			
DDH-GN-46	146	147	qz-sltst		k		1				10	1			1			
DDH-GN-46	147	152	qz-sltst		k		1				14	2	1	1	2			
DDH-GN-46	152	154	qz-sltst		k		1				14	2		1				1
DDH-GN-46	154	165	P1		k		4				5	2		1	1			1
DDH-GN-46	165	172	P1		k		4				5	2		2	1			
DDH-GN-46	172	173	P1		k		4				5	2		2	2			1
DDH-GN-46	173	179	P1		k		4				5	2		2	1			
DDH-GN-46	179	181	P1		k		4				5	2		2	1			
DDH-GN-46	181	182	P1		k		4				5	2		2	2			1
DDH-GN-46	182	183	P1		k		4				5	2		2	1			1
DDH-GN-46	183	191	P1		k		4				5	2		2	1			
DDH-GN-46	191	194	qz-sltst		k		1				20	2		2	1			2
DDH-GN-46	194	195	qz-sltst		k		1				20	2		2	1			
DDH-GN-46	195	196	qz-sltst		k		1				18	2	1					
DDH-GN-46	196	198	qz-sltst		k		1				13	2		1				1
DDH-GN-46	198	204	qz-sltst		k		1				13	2		1	2			1
DDH-GN-46	204	207	qz-sltst		k		1				13	2						
DDH-GN-46	207	216	qz-sltst		k		1				13	2		1	1			
DDH-GN-46	216	225	qz-sltst		k		1				13	2		2	1			
DDH-GN-46	225	238	qz-sltst		k		1				21	2		2				
DDH-GN-46	238	243	qz-sltst		k		1				13	2		2				
DDH-GN-46	243	247	P1		k		4				14	2	2	1				1
DDH-GN-46	247	250	qz-sltst		k		1				15	2	1	2	1			1



## **APPENDIX D2**

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El Galeno drill core assay data



























Hole Id	From	To	Rock	Au g/t	Cu %	Mo ppm	Ag ppm	As ppm	Bi ppm	Pb ppm	Sb ppm	Zn ppm
DDH-GN-50	48	50	qz	0.01	0.01	0	5	10	-5	8	-5	9
DDH-GN-50	50	52	qz	0.01	0.01	0	5	15	-5	28	-5	12
DDH-GN-50	52	54	qz	0.01	0.01	0	4	7	-5	7	-5	9
DDH-GN-50	54	56	qz	0.01	0.01	0	6	5	-5	6	-5	9
DDH-GN-50	56	58	qz	0.03	0.01	0	15	6	-5	7	-5	8
DDH-GN-50	58	60	qz	0.02	0.03	0	6	81	-5	22	6	8
DDH-GN-50	60	62	qz	0.02	0.02	0	15	14	-5	12	-5	7
DDH-GN-50	62	64	qz	0.02	0.02	0	7	14	-5	13	-5	6
DDH-GN-50	64	66	qz	0.03	0.18	0	15	185	-5	14	5	9
DDH-GN-50	66	68	qz	0.03	0.07	0	14	196	-5	-2	7	7
DDH-GN-50	68	70	qz	0.03	0.13	0	26	215	-5	11	-5	14
DDH-GN-50	70	72	qz	0.02	0.12	0	29	275	-5	11	-5	7
DDH-GN-50	72	74	qz	0.03	0.09	0	12	201	-5	36	-5	10
DDH-GN-50	74	76	qz	0.03	0.05	0	9	137	-5	8	-5	8
DDH-GN-50	76	78	qz	0.02	0.21	0	20	546	-5	9	-5	14
DDH-GN-50	78	80	qz	0.02	0.10	0	20	229	-5	8	-5	10
DDH-GN-50	80	82	qz	0.01	0.01	0	22	16	-5	15	-5	6
DDH-GN-50	82	84	qz	0.01	0.01	0	12	18	-5	9	-5	6
DDH-GN-50	84	86	qz	0.01	0.01	0	8	19	-5	9	-5	5
DDH-GN-50	86	88	qz	0.01	0.01	0	11	8	-5	35	-5	7
DDH-GN-50	88	90	qz	0.02	0.02	0	4	27	-5	11	-5	8
DDH-GN-50	90	92	qz	0.01	0.03	0	21	35	-5	20	-5	10
DDH-GN-50	92	94	qz	0.01	0.02	0	10	19	-5	34	-5	8
DDH-GN-50	94	96	qz	0.02	0.03	0	9	26	-5	9	-5	8
DDH-GN-50	96	98	qz	0.01	0.04	0	21	101	-5	8	-5	6
DDH-GN-50	98	100	qz	0.02	0.06	0	9	87	-5	12	6	21
DDH-GN-50	100	102	qz	0.02	0.05	0	7	73	-5	12	-5	10
DDH-GN-50	102	104	qz	0.02	0.05	0	24	122	-5	15	-5	17
DDH-GN-50	104	106	qz	0.02	0.05	0	6	157	-5	40	-5	11
DDH-GN-50	106	108	qz	0.02	0.11	1	21	240	-5	19	8	16
DDH-GN-50	108	110	qz	0.02	0.04	0	32	137	-5	18	-5	10
DDH-GN-50	110	112	qz	0.01	0.50	13	16	1560	-5	61	136	111
DDH-GN-50	112	114	qz	0.02	0.06	1	49	149	-5	16	8	10
DDH-GN-50	114	116	qz	0.03	0.06	0	21	147	-5	10	-5	9
DDH-GN-50	116	118	qz	0.01	0.02	0	7	49	-5	16	-5	7
DDH-GN-50	118	120	qz	0.01	0.02	0	123	29	-5	-2	-5	6
DDH-GN-50	120	122	qz	0.01	0.02	0	11	39	-5	10	-5	7
DDH-GN-50	122	124	qz	0.01	0.03	0	50	61	-5	23	-5	13
DDH-GN-50	124	126	qz	0.01	0.06	0	58	111	-5	9	-5	9
DDH-GN-50	126	128	qz	0.01	0.08	0	15	208	-5	8	-5	11
DDH-GN-50	128	130	qz	0.01	0.05	0	94	37	-5	8	-5	7
DDH-GN-50	130	132	qz	0.01	0.03	1	61	76	-5	22	10	42
DDH-GN-50	132	134	qz	0.01	0.21	6	39	668	-5	34	121	144
DDH-GN-50	134	136	qz	0.02	0.15	3	28	418	-5	44	68	160
DDH-GN-50	136	138	qz	0.02	0.04	1	102	92	-5	28	23	87
DDH-GN-50	138	140	qz	0.03	0.06	1	104	179	-5	28	21	75
DDH-GN-50	140	142	qz	0.02	0.10	3	41	309	-5	35	59	179
DDH-GN-50	142	144	qz	0.02	0.20	3	79	491	-5	20	65	209
DDH-GN-50	144	146	qz	0.01	0.13	3	94	346	-5	14	50	114
DDH-GN-50	146	148	qz	0.02	0.27	5	82	799	-5	17	101	213
DDH-GN-50	148	150	qz	0.03	0.20	3	142	603	-5	14	47	117
DDH-GN-50	150	152	qz	0.04	0.27	4	366	785	-5	16	76	233
DDH-GN-50	152	154	qz	0.02	0.26	1	59	122	-5	20	6	65
DDH-GN-50	154	156	qz	0.02	0.19	2	78	198	-5	21	25	70
DDH-GN-50	156	158	qz	0.01	0.26	2	157	282	-5	17	52	122
DDH-GN-50	158	160	qz	0.01	0.32	1	216	314	-5	53	13	92
DDH-GN-50	160	162	qz	0.01	0.26	1	65	296	-5	15	7	66
DDH-GN-50	162	164	qz	0.03	0.38	2	71	330	-5	10	6	132
DDH-GN-50	164	166	qz	0.07	0.55	4	143	617	-5	58	26	498
DDH-GN-50	166	168	qz	0.05	0.41	2	310	413	-5	23	6	187
DDH-GN-50	168	170	qz	0.03	0.28	1	273	143	-5	21	-5	88
DDH-GN-50	170	172	qz	0.02	0.24	1	126	24	-5	15	-5	74
DDH-GN-50	172	174	qz	0.06	0.75	13	142	1340	-5	26	303	486
DDH-GN-50	174	176	qz	0.03	0.35	1	193	105	-5	10	6	63
DDH-GN-50	176	178	qz	0.03	0.33	1	154	24	-5	12	-5	49
DDH-GN-50	178	180	qz	0.03	0.23	1	136	5	-5	25	-5	80
DDH-GN-50	180	182	qz	0.02	0.20	1	242	4	-5	8	-5	35
DDH-GN-50	182	184	qz	0.01	0.22	1	220	44	-5	25	-5	41
DDH-GN-50	184	186	qz	0.04	0.31	8	192	925	-5	53	125	396
DDH-GN-50	186	188	qz	0.03	0.27	4	166	736	-5	64	40	236
DDH-GN-50	188	190	qz	0.03	0.27	1	93	15	-5	17	-5	51
DDH-GN-50	190	192	qz	0.02	0.27	1	75	5	-5	10	-5	50
DDH-GN-50	192	194	qz	0.02	0.25	1	96	91	-5	42	-5	60
DDH-GN-50	194	196	qz	0.02	0.26	1	257	194	-5	8	6	78
DDH-GN-50	196	198	qz	0.07	0.33	1	134	-3	-5	17	-5	23
DDH-GN-50	198	200	qz	0.07	0.44	1	202	6	-5	13	-5	51
DDH-GN-50	200	202	qz	0.12	0.48	1	784	-3	-5	14	-5	57
DDH-GN-50	202	204	qz	0.02	0.25	2	174	402	-5	25	10	92
DDH-GN-50	204	206	qz	0.01	0.24	1	210	321	-5	29	6	59
DDH-GN-50	206	208	qz	0.03	0.26	1	185	205	-5	36	10	95
DDH-GN-50	208	210	qz	0.03	0.41	1	305	22	-5	21	-5	53
DDH-GN-50	210	212	qz	0.03	0.43	1	359	46	-5	12	-5	42
DDH-GN-50	212	214	qz	0.02	0.44	1	432	56	-5	22	-5	51
DDH-GN-50	214	216	qz	0.03	0.44	2	274	544	-5	28	6	77
DDH-GN-50	216	218	Flt Zone	0.12	0.50	2	528	236	-5	14	-5	38
DDH-GN-50	218	220	qz	0.03	0.38	3	124	842	-5	23	16	125
DDH-GN-50	220	222	qz	0.06	0.53	2	114	406	-5	36	5	63
DDH-GN-50	222	224	Flt Zone	0.11	0.69	3	246	28	-5	40	-5	41
DDH-GN-50	224	226	Flt Zone	0.19	0.55	2	235	16	-5	27	-5	35
DDH-GN-50	226	228	Flt Zone	0.03	0.61	2	416	120	-5	30	-5	35
DDH-GN-50	228	230	Flt Zone	0.11	0.41	1	153	9	-5	6	-5	20
DDH-GN-50	230	232	Flt Zone	0.11	0.56	2	218	159	-5	5	-5	31

## **APPENDIX D3**

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X-ray diffraction analyses

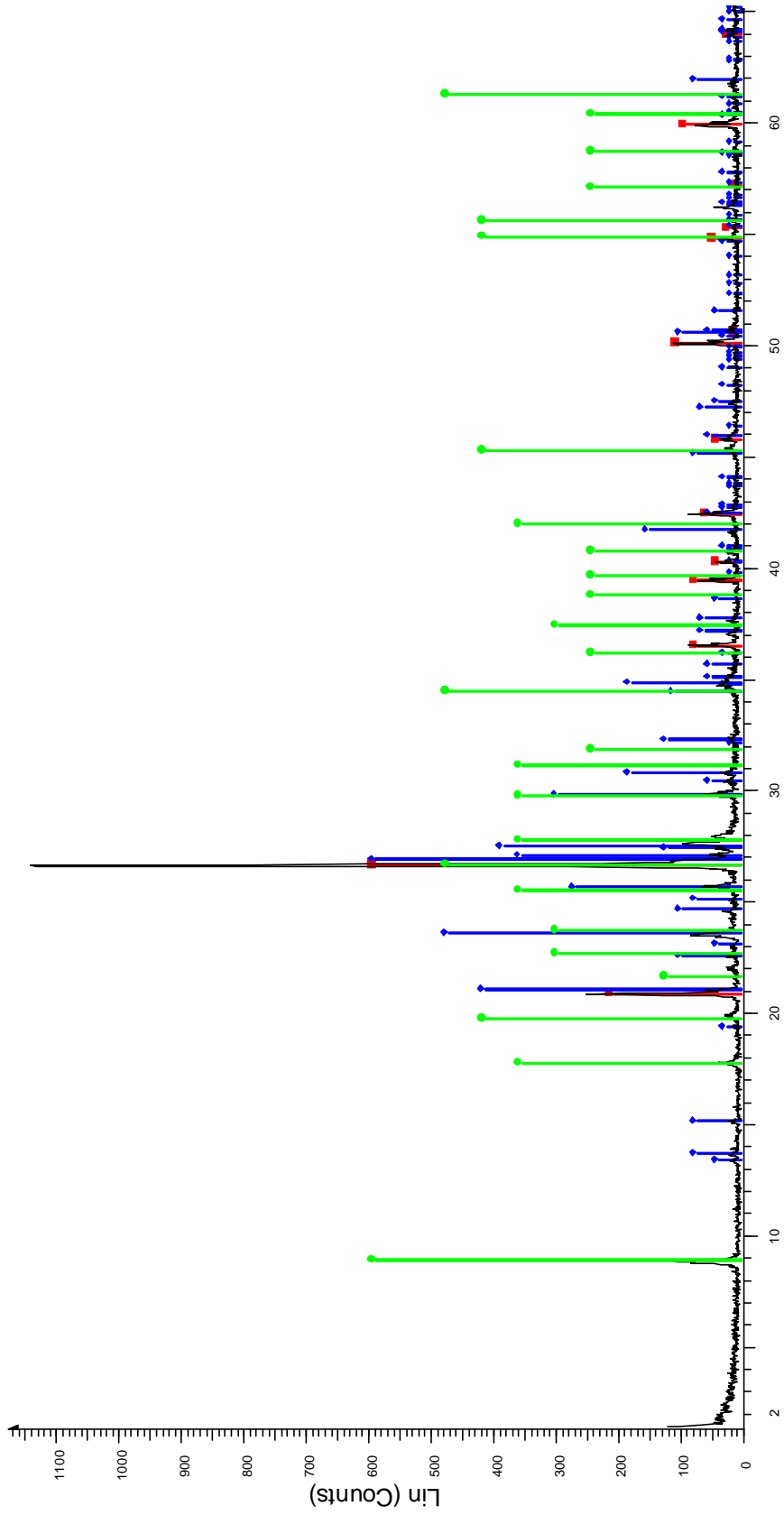
## **ANALYTICAL TECHNIQUES FOR X-RAY DIFFRACTION**

Four samples from the El Galeno deposit and two from Michiquillay were selected for X-ray diffraction (XRD) analyses. Samples were crushed into a fine powder using in a clean agate bowl and a Rocklabs mill. Splits of the crushed samples were lightly pressed onto a glass disk and analysed using a Siemens D-5000 X-ray diffractometer in the Advance Analytical Centre (AAC) lab at James Cook University. Mineralogical phases were deduced using the computer software programme Eva. The programme matches diffraction patterns and peaks with reference patterns.

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5009-01

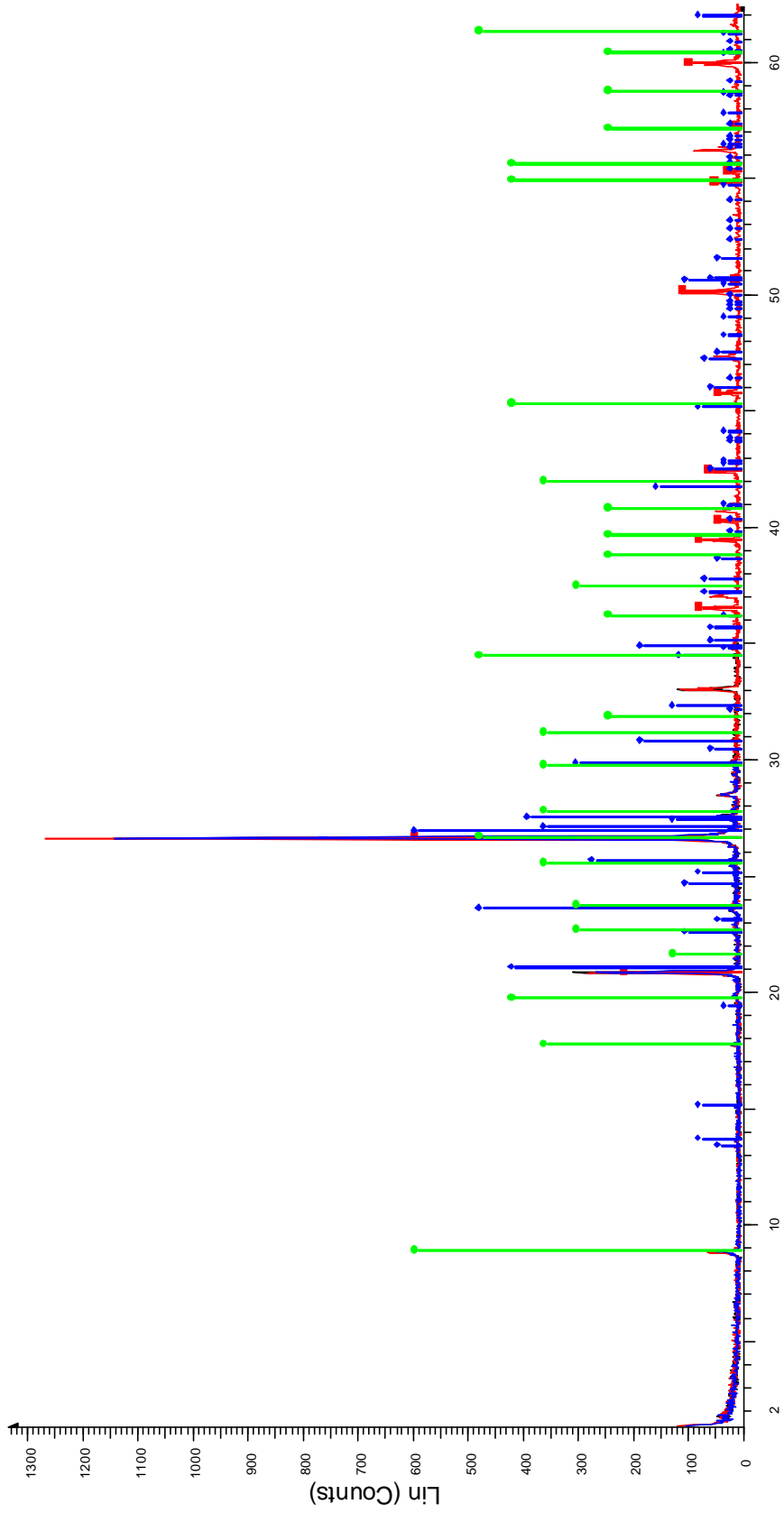


2-Theta - Scale

File: 5009-01.RAW - Type: 2Th/Th locked - Start: 1.300 ° - End: 65.300 ° - Step: 0.020 ° - Step time: 2.4 s - Temp.: 25 °C (Room) - Time Started: 18 s - 2-Theta: 1.300 ° - Theta: 0.650 ° - Phi: 0.00 ° - Aux1:  
Operations: X Offset 0.050 | Import  
05-0490 (D) - Quartz, low - SiO2 - Y: 50.00 % - d x by: 1, - WL: 1.54056 - Hexagonal - I/c PDF 3.6 -  
31-0966 (\*) - Orthoclase - KAlSi3O8 - Y: 50.00 % - d x by: 1, - WL: 1.54056 - Monoclinic -  
02-0055 (D) - Muscovite - H2KAl3Si3O12 - Y: 50.00 % - d x by: 1, - WL: 1.54056 - Monoclinic -

Galeno GN-39 (216m) Qtz-Musc-Pyr Vn

5009-02



**2-Theta - Scale**

GA-04 (174m) Hyd Bx - File: 5009-02G.RAW - Type: 2Th/Th locked - Start: 1.500 ° - End: 35.000 ° - Si ■ 02-0055 (D) - Muscovite - H2KAl3Si3O12 - Y: 46.30 % - d x by: 1. - WL: 1.54056 - Monoclinic -  
Operations: Import

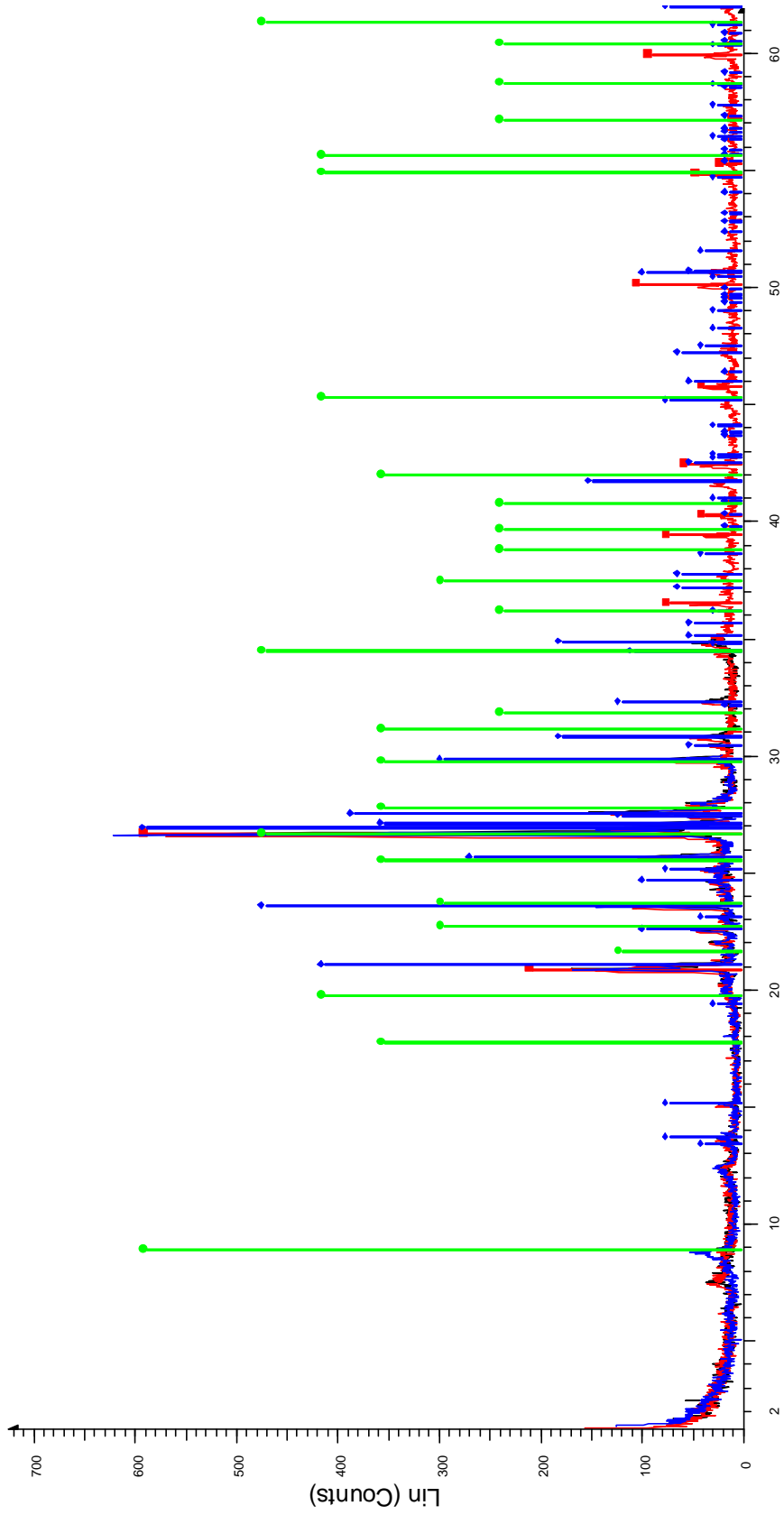
smear - File: 5009-02.RAW - Type: 2Th/Th locked - Start: 1.300 ° - End: 65.300 ° - Step: 0.020 ° - Step  
Operations: Import

C:\DIFFDAT\15409-02.RAW - File: 5409-02.RAW - Type: 2Th/Th locked - Start: 1.300 ° - End: 30.000 °  
Operations: Import

05-0490 (D) - Quartz, low - SiO2 - Y: 46.30 % - d x by: 1. - WL: 1.54056 - Hexagonal - I/c PDF 3.6 -  
31-0966 (\*) - Orthoclase - KAIS308 - Y: 46.30 % - d x by: 1. - WL: 1.54056 - Monoclinic -

**Galeno GA-04 (174m) Hydrothermal Breccia**

5009-03



**2-Theta - Scale**

GN-43 (14.9m) Phyl Zone - File: 5009-03G.RAW - Type: 2Th/Th locked - Start: 1.500 ° - End: 35.000 ° - ■ 02-0055 (D) - Muscovite - H2KAl3Si3O12 - Y: 41.77 % - d x by: 1. - WL: 1.54056 - Monoclinic -  
Operations: Import

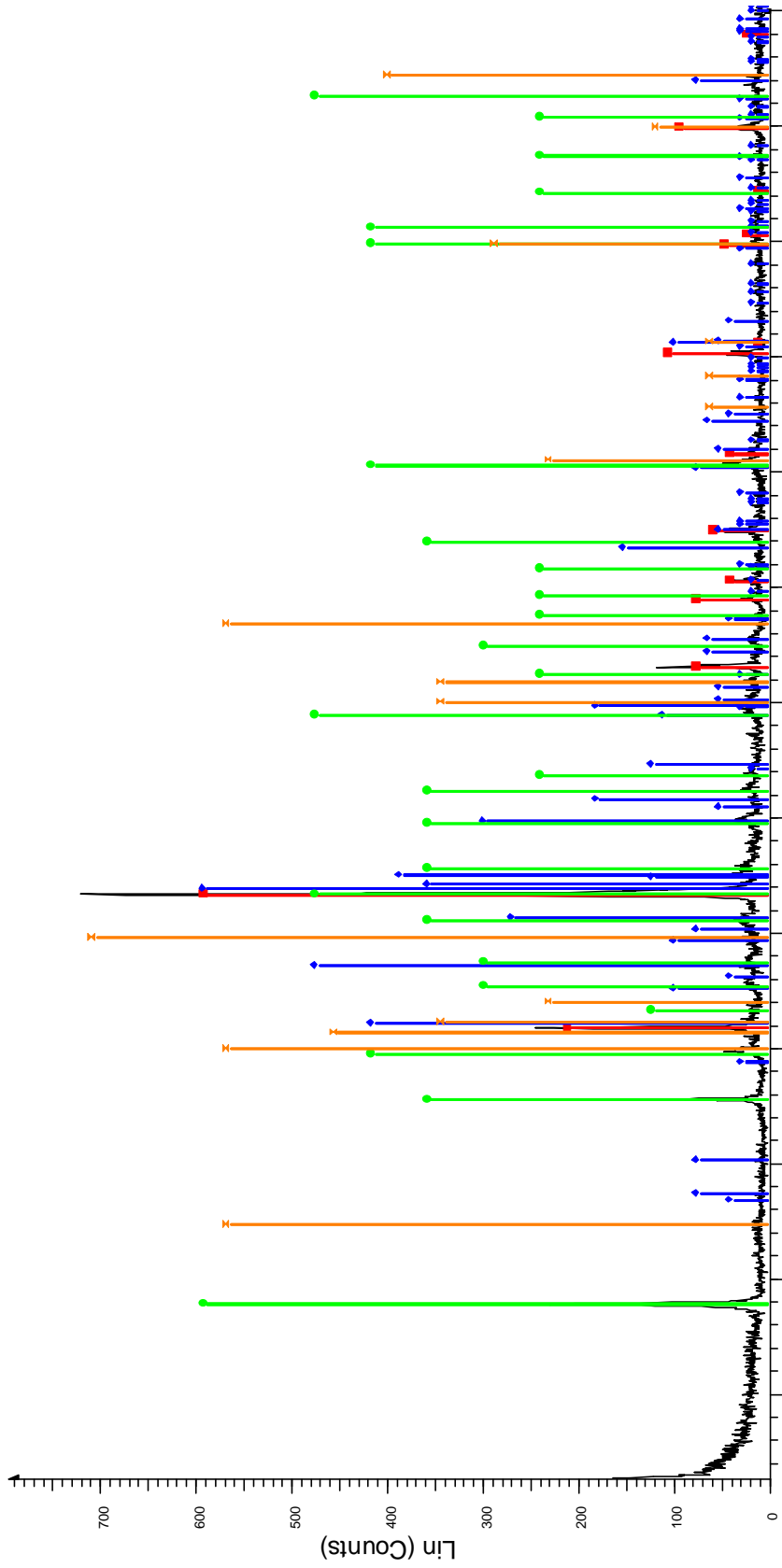
smear - File: 5009-03.RAW - Type: 2Th/Th locked - Start: 1.300 ° - End: 65.300 ° - Step: 0.020 ° - Step  
Operations: X Offset -0.083 | Import

C:\DIFFDAT\5409-03.RAW - File: 5409-03.RAW - Type: 2Th/Th locked - Start: 1.300 ° - End: 30.000 °  
Operations: Import

05-0490 (D) - Quartz, low - SiO2 - Y: 41.77 % - d x by: 1. - WL: 1.54056 - Hexagonal - I/c PDF 3.6 -  
01-0966 (\*) - Orthoclase - KAlSi3O8 - Y: 41.77 % - d x by: 1. - WL: 1.54056 - Monoclinic -

### Galeno GN-43 (14.9m) Phyllic Alteration Zone

5009-04

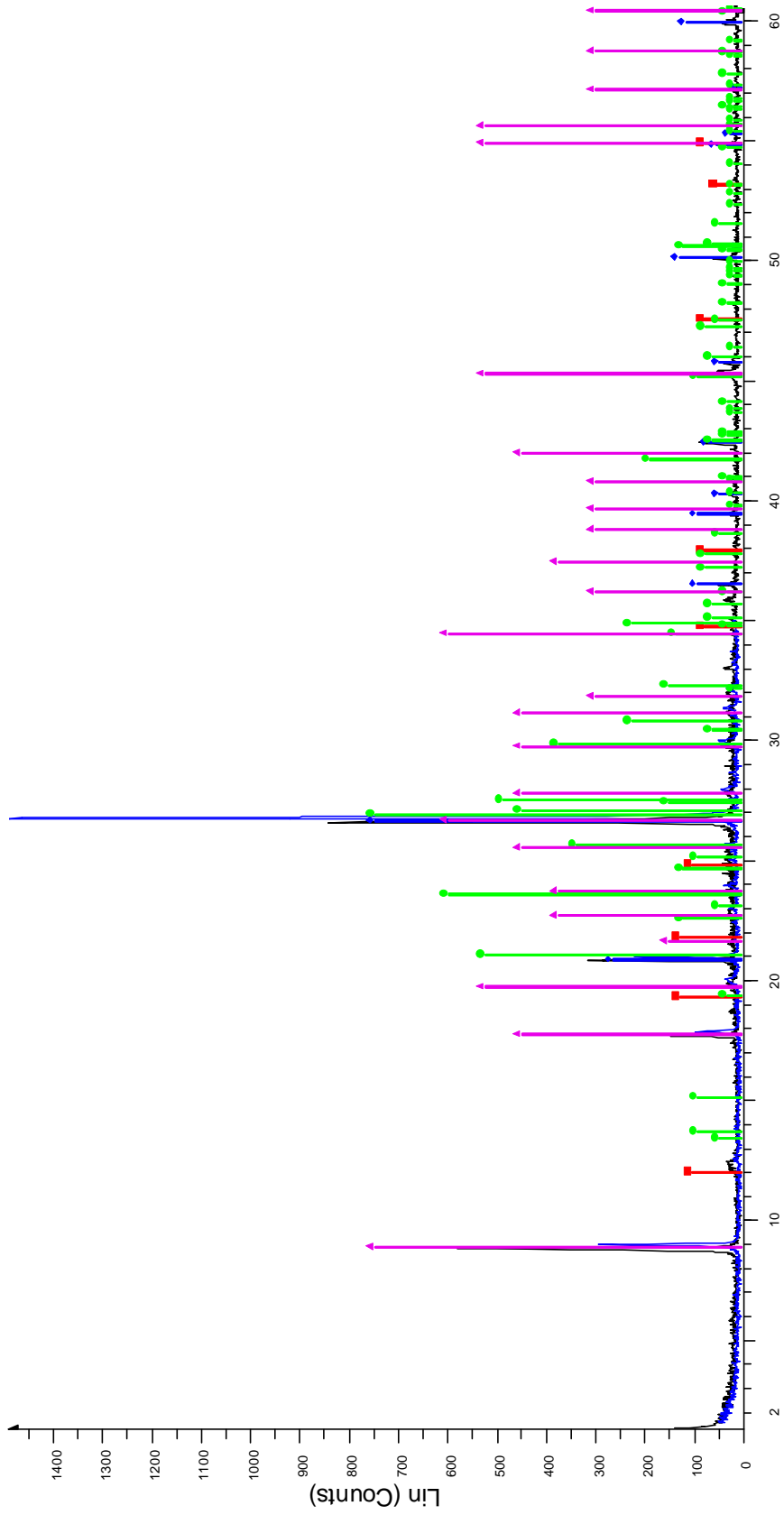


2-Theta - Scale

Operations: Import  
File: 5009-04.RAW - Type: 2Th/Th locked - Start: 1.300 ° - End: 65.300 ° - Step: 0.020 ° - Step time: 2.4 s - Temp.: 25 °C (Room) - Time Started: 18 s - 2-Theta: 1.300 ° - Theta: 0.650 ° - Phi: 0.00 ° - Aux1:  
D5-0490 (D) - Quartz, low - SiO2 - Y: 73.93 % - d x by: 1, - WL: 1.54056 - Hexagonal - I/Ic PDF 3.6 -  
B1-0966 (\*) - Orthoclase - KAlSi3O8 - Y: 73.93 % - d x by: 1, - WL: 1.54056 - Monoclinic -  
D2-0055 (D) - Muscovite - H2KAl3Si3O12 - Y: 73.93 % - d x by: 1, - WL: 1.54056 - Monoclinic -  
D1-0527 (D) - Kaolinite - Al2Si2O5(OH)4 - Y: 88.51 % - d x by: 1, - WL: 1.54056 - Triclinic -

Galeno GN-43 (14.9m) Qtz-Musc-Pyr Vn

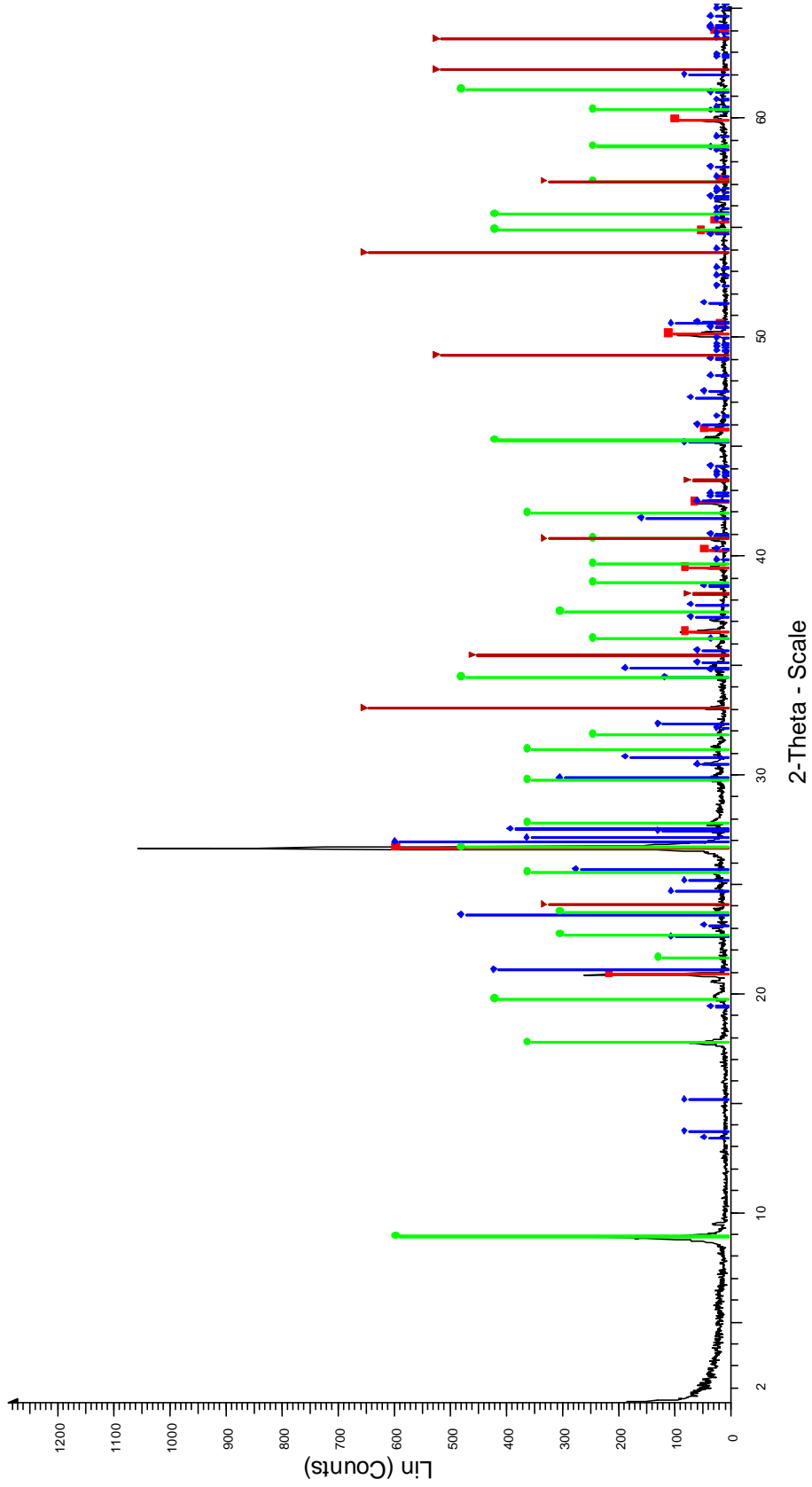
5009-05



smear - File: 5009-05.RAW - Type: 2Th/Th locked - Start: 1.300 ° - End: 65.300 ° - Step: 0.020 ° - Step time: 2.4 s - Temp.: 25 °C (Room) - Time Started: 18 s - 2-Theta: 1.300 ° - Theta: 0.650 ° - Phi: 0.00 ° - Aux1:  
 Operations: Import  
 L-17.5 (180m) Phy Zone - File: 5009-05ahj.RAW - Type: 2Th/Th locked - Start: 1.500 ° - End: 35.000 ° - Step: 0.020 ° - Step time: 2.4 s - Temp.: 25 °C (Room) - Time Started: 52 s - 2-Theta: 1.500 ° - Theta: 0.750 °  
 Operations: Import  
 02-0204 (D) - Kaolinite - (Al<sub>2</sub>Si<sub>2</sub>(O,OH)<sub>9</sub>  
 05-0490 (D) - Quartz, low - SiO<sub>2</sub>  
 31-0966 (\*) - Orthoclase - KAlSi<sub>3</sub>O<sub>8</sub>  
 02-0055 (D) - Muscovite - H<sub>2</sub>KAl<sub>3</sub>Si<sub>3</sub>O<sub>12</sub>

**Michiquillay L-17.5 (180m) Phyllic Alteration Zone**

5009-06



mear - File: 5009-06.RAW - Type: 2Th/Th locked - Start: 1.300 ° - End: 65.300 ° - Step: 0.020 ° - Step time: 2.4 s - Temp.: 25 °C (Room) - Time Started: 18 s - 2-Theta: 1.300 ° - Theta: 0.650 ° - Phi: 0.00 ° - Aux1:  
 Operations: Import  
 05-0490 (D) - Quartz, low - SiO<sub>2</sub> - Y: 45.73 % - d x by: 1, - WL: 1.54056 - Hexagonal - I/c PDF 3.6 -  
 31-0966 (C) - Orthoclase - KAlSi<sub>3</sub>O<sub>8</sub> - Y: 45.73 % - d x by: 1, - WL: 1.54056 - Monoclinic -  
 02-0055 (D) - Muscovite - H<sub>2</sub>KAl<sub>3</sub>Si<sub>3</sub>O<sub>12</sub> - Y: 45.73 % - d x by: 1, - WL: 1.54056 - Monoclinic -  
 03-0800 (D) - Hematite - Fe<sub>2</sub>O<sub>3</sub> - Y: 50.00 % - d x by: 1, - WL: 1.54056 - Rhombohedral -

Michiquillay I-23 (269m) Qtz-Musc-Pyr Vn

## **APPENDIX D4**

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Michiquillay drill core geology and assay data

Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
H-22	3	5	D1	k	phyl	0.65	168	1.6	1.02	95	55
H-22	5	8	D1	k	phyl	0.76					
H-22	8	9	D1	k	phyl	0.66					
H-22	9	11	D1	k	phyl	0.64					
H-22	11	14	D1	k	phyl	1.35					
H-22	14	16	D1	k	phyl	1.09					
H-22	16	18	D1	k	phyl	1.15					
H-22	18	21	D1	k	phyl	1.33	177	2.6	1.04	206	54
H-22	21	24	D1	k	phyl	1.40					
H-22	24	27	D1	k	phyl	1.23					
H-22	27	29	D1	k	phyl	1.05					
H-22	29	32	D1	k	phyl	1.12					
H-22	32	34	D1	k	phyl	1.43	266	2.8	1.22	50	44
H-22	34	38	D1	k	phyl	1.40					
H-22	38	41	D1	k	phyl	1.70					
H-22	41	44	D1	k	phyl	1.35					
H-22	44	47	D1	k	phyl	1.29					
H-22	47	50	D1	k	phyl	1.27	94	3.4	0.87	89	35
H-22	50	52	qz	phyl	arg	0.93					
H-22	52	55	qz	phyl	arg	1.18					
H-22	55	58	qz	phyl	arg	0.81					
H-22	58	62	qz	phyl	arg	0.93					
H-22	62	65	qz	phyl	arg	0.88	77	3.2	0.81	91	36
H-22	65	67	qz	phyl	arg	0.78					
H-22	67	71	qz	phyl	arg	0.81					
H-22	71	75	qz	phyl	arg	1.06					
H-22	75	78	qz	phyl	arg	1.03					
H-22	78	81	qz	phyl	arg	0.88	80	1.8	0.81	54	36
H-22	81	84	qz	phyl	arg	0.80					
H-22	84	87	qz + Dyke	phyl	k	0.78					
H-22	87	88	qz	phyl	arg	0.93					
H-22	88	91	qz	phyl	arg	0.83					
H-22	91	94	qz	phyl	arg	0.87	86	2.3	0.82	65	25
H-22	94	98	qz	phyl	arg	0.88					
H-22	98	102	qz	phyl	arg	0.71					
H-22	102	105	qz + D1	phyl	arg	1.16					
H-22	105	108	qz	phyl	arg	0.89					
H-22	108	111	qz	phyl	arg	1.06	121	2.8	1.06	106	76
H-22	111	114	qz	phyl	arg	1.30					
H-22	114	115	qz	phyl	arg	1.17					
H-22	115	119	qz	phyl	arg	1.05					
H-22	119	122	qz	phyl	arg	1.16					
H-22	122	125	qz	phyl	arg	0.95	68	1.4	0.89	72	47
H-22	125	127	qz	phyl	arg	1.15					
H-22	127	131	qz	phyl	arg	1.07					
H-22	131	134	qz	phyl	arg	1.05					
H-22	134	137	qz	phyl	arg	0.88					
H-22	137	140	qz	phyl	arg	0.77	40	0.3	0.20	46	26
H-22	140	143	Dyke	k		0.82					
H-22	143	146	D1	k	phyl	0.29					
H-22	146	149	Dyke	k		0.15					
H-22	149	152	D1	k	phyl	0.08					
H-22	152	154	D1	k	phyl	0.14	66	0.4	0.11	47	12
H-22	154	158	Dyke	k		0.09					
H-22	158	161	Dyke	k		0.21					
H-22	161	164	Dyke	k		0.11					
H-22	164	167	Dyke	k		0.05					
H-22	167	170	D1	k	phyl	0.14	36	-0.3	0.05	40	8
H-22	170	173	D1	k	phyl	0.08					
H-22	173	176	D1	k	phyl	0.06					
H-22	176	178	D1	k	phyl	0.05					
H-22	178	181	Dyke	k		0.06					
H-22	181	184	Dyke	k		0.11					
H-22	184	186	Dyke	k		0.09	32	-0.3	0.06	31	22
H-22	186	189	Dyke	k		0.13					
H-22	189	191	D1	k	phyl	0.07					
H-22	191	194	D1	k	phyl	0.08					
H-22	194	197	D1	k	phyl	0.05					
H-22	197	200	D1	k	phyl	0.04	35	-0.3	0.07	24	6
H-22	200	203	D1	k	phyl	0.06					
H-22	203	205	D1	k	phyl	0.06					
H-22	205	208	Dyke	k		0.04					
H-22	208	210	Dyke	k		0.10					
H-22	210	213	Dyke	k		0.14					
H-22	213	216	Dyke	k		0.12	36	0.3	0.11	41	11
H-22	216	219	Dyke	k		0.07					
H-22	219	221	Dyke	k		0.12					
H-22	221	222	Dyke	k		0.12					
H-22	222	224	Dyke	k		0.17					
H-22	224	227	Dyke	k		0.26					
H-22	227	230	Dyke	k		0.15	33	-0.3	0.11	28	36
H-22	230	234	D1	k		0.17					
H-22	234	237	Dyke	k		0.13					
H-22	237	240	Dyke	k		0.11					
H-22	240	244	Dyke	k		0.12					
H-22	244	247	Dyke	k		0.36	87	0.9	0.51	36	59
H-22	247	249	Dyke	k		0.31					
H-22	249	252	Dyke	k		0.10					
H-22	252	255	Dyke	k		0.86					



Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
H-22	255	257	Dyke	k		0.77					
H-22	257	261	Dyke	k		0.95	143	1.2	0.72	22	127
H-22	261	264	D1	k		0.82					
H-22	264	267	D1	k		0.92					
H-22	267	270	D1	k		0.94					
H-22	270	273	D1	k		0.72					
H-22	273	276	Dyke	k		0.18					
H-22	276	278	Dyke	k		0.21					
H-22	278	281	Dyke	k		0.50					
H-22	281	284	D1	k	arg	0.44					

Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
I-21	23	27	D1	phyl	k	1.73					
I-21	27	30	D1	phyl	k	0.68					
I-21	30	34	D1	phyl	k	0.73					
I-21	34	36	D1	phyl	k	0.54					
I-21	36	38	D1	phyl	k	1.07					
I-21	38	41	Hydro Bx	phyl		0.45					
I-21	41	44	Hydro Bx	phyl		0.37					
I-21	44	46	Flt Zone	arg		0.49					
I-21	46	50	Flt Zone	arg		0.34					
I-21	50	52	D1	phyl	k	0.28					
I-21	52	55	D1	phyl	k	0.64					
I-21	55	58	D1	phyl	k	0.58					
I-21	58	61	D1	phyl	k	0.55					
I-21	61	66	D1	phyl	k	0.47					
I-21	66	69	D1	k	phyl	0.83					
I-21	69	71	D1	k	phyl	0.43					
I-21	71	74	D1	k	phyl	0.23					
I-21	74	76	D1	k	phyl	0.15					
I-21	76	79	D1	k	phyl	0.10					
I-21	79	80	D1	k	phyl	0.11					
I-21	80	83	D1	k		0.14					
I-21	83	87	D1	k		0.18					
I-21	87	89	D1	k		0.28					
I-21	89	92	D1	k		0.25					
I-21	92	93	D1	k		0.26					
I-21	93	96	D1	k		0.28					
I-21	96	99	D1	k		0.31					
I-21	99	102	D1	k		0.26					
I-21	102	104	D1	k		0.33					
I-21	104	106	D1	k		0.38					
I-21	106	109	D1	k		0.22					
I-21	109	111	D1	k		0.43					
I-21	111	114	D1	k		0.28					
I-21	114	117	D1	k		0.18					
I-21	117	120	D1	k		0.13					
I-21	120	121	D1	k		0.23					

Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
J-20	28	31	D1	phyl	k	1.20	164	1.2	0.83	24	76
J-20	31	32	D1	phyl	k	5.16					
J-20	32	35	D1	phyl	k	2.33					
J-20	35	39	D1	phyl	k	1.87					
J-20	39	42	D1	phyl	k	5.55					
J-20	42	45	D1	phyl	k	1.28	195	1.4	0.94	57	146
J-20	45	48	D1	phyl	k	1.15					
J-20	48	51	D1	phyl	k	0.79					
J-20	51	53	D1	phyl	k	0.93					
J-20	53	56	D1	phyl	k	0.84					
J-20	56	59	D1	phyl	k	0.88	161	1.3	0.68	42	25
J-20	59	62	D1	phyl	k	0.78					
J-20	62	64	D1	phyl	k	0.99					
J-20	64	68	D1	phyl	k	1.05					
J-20	68	70	D1	phyl	k	0.87					
J-20	70	73	D1	phyl	k	0.89					
J-20	73	76	D1	phyl	k	0.78	123	1.0	0.59	44	29
J-20	76	78	D1	phyl	k	1.01					
J-20	78	81	D1	phyl	k	1.53					
J-20	81	82	D1	phyl	k	1.28					
J-20	82	85	D1	phyl	k	1.00					
J-20	85	88	D1	phyl	k	0.94	182	1.1	0.84	33	16
J-20	88	91	D1	phyl	k	1.08					
J-20	91	94	D1	phyl	k	0.91					
J-20	94	97	D1	k	phyl	0.74					
J-20	97	98	D1	k	phyl	0.88					
J-20	98	100	D1	k	phyl	1.82					
J-20	100	104	D1	k	phyl	1.26	185	1.5	0.85	61	40
J-20	104	107	D1	k	phyl	0.90					
J-20	107	109	D1	k	phyl	0.65					
J-20	109	112	D1	k	phyl	0.78					
J-20	112	114	D1	k	phyl	1.18					
J-20	114	116	D1	k	phyl	1.11					
J-20	116	119	D1	k	phyl	1.02	198	1.5	0.94	53	40
J-20	119	121	D1	k	phyl	0.96					
J-20	121	124	D1	k	phyl	0.94					
J-20	124	127	D1	k	phyl	0.92					

Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
J-20	127	130	D1	k	phyl	1.19					
J-20	130	133	D1	k	phyl	1.16					
J-20	133	136	D1	k	phyl	1.05	228	1.5	1.04	35	97
J-20	136	139	D1	k	phyl	0.85					
J-20	139	141	D1	k	phyl	0.73					
J-20	141	145	D1	k	phyl	0.58					
J-20	145	147	D1	k	phyl	0.90					
J-20	147	150	D1	k	phyl	0.82	235	2.9	1.14	244	31
J-20	150	153	D1	k	phyl	0.85					
J-20	153	155	D1	k	phyl	1.08					
J-20	155	158	D1	k	phyl	0.79					
J-20	158	160	D1	k	phyl	1.14					
J-20	160	163	D1	k	phyl	1.14	92	1.1	0.63	82	87
J-20	163	166	D1	k	phyl	0.92					
J-20	166	169	D1 + Dyke	k		0.99					
J-20	169	172	D1	k	phyl	0.79					
J-20	172	175	D1	k	phyl	0.74					
J-20	175	179	Dyke	k		0.53	140	1.0	0.84	43	57
J-20	179	182	Dyke	k		0.71					
J-20	182	185	D1	k	phyl	0.87					
J-20	185	188	D1	k	phyl	0.77					
J-20	188	191	D1	k	phyl	1.48					
J-20	191	194	D1	k	phyl	1.12	142	1.2	0.74	41	64
J-20	194	198	Dyke	k		0.66					
J-20	198	201	Dyke	k		0.25					
J-20	201	203	D1	k	phyl	0.94					
J-20	203	206	D1	k	phyl	1.00					
J-20	206	209	D1	k		0.78	141	1.0	0.79	19	87
J-20	209	212	D1	k		0.99					
J-20	212	216	D1	k		0.88					
J-20	216	219	D1	k		1.05					
J-20	219	222	D1	k		0.99					
J-20	222	225	D1	k		0.89	162	1.2	0.92	31	58
J-20	225	228	D1	k		0.97					
J-20	228	232	D1	k	phyl	1.14					
J-20	232	235	D1	k	phyl	1.02					
J-20	235	238	D1	k	phyl	1.00					
J-20	238	241	D1	k		0.95	95	0.6	0.55	34	39
J-20	241	244	Dyke	k		0.68					
J-20	244	247	D1	k		1.10					
J-20	247	250	D1	k		0.84					
J-20	250	253	D1	k		1.12					
J-20	253	256	D1	k		0.95	94	0.9	0.72	33	67
J-20	256	259	D1	k		0.97					
J-20	259	262	D1	k		0.97					
J-20	262	265	D1	k		1.28					
J-20	265	268	D1	k		1.44					
J-20	268	271	D1	k		1.56	160	1.0	0.87	30	85
J-20	271	273	D1	k		1.53					
J-20	273	276	D1	k		1.22					
J-20	276	281	D1	k		0.72					
J-20	281	282	D1	k		0.35					
J-20	282	285	D1	k		0.48	91	1.2	0.88	61	69
J-20	285	288	D1	k		0.28					
J-20	288	290	D1	k		0.19					
J-20	290	293	D1	k		0.48					
J-20	293	296	D1	k		0.78					
J-20	296	298	D1	k		1.36	89	1.2	0.77	45	67
J-20	298	301	D1	k		0.93					
J-20	301	304	D1	k		1.00					
J-20	304	308	D1	k		0.83					
J-20	308	310	D1	k		0.88					
J-20	310	313	D1	k		0.82					
J-20	313	315	D1	k		0.80	82	0.8	0.56	34	75
J-20	315	318	D1	k		0.80					
J-20	318	321	D1	k		0.73					
J-20	321	324	D1	k		0.73					
J-20	324	327	D1	k		0.81					
J-20	327	329	D1	k		0.96	95	1.3	0.70	68	124
J-20	329	331	D1	k		0.92					
J-20	331	334	D1	k		1.27					
J-20	334	337	D1	k		1.19					
J-20	337	340	D1	k		0.89					
J-20	340	343	D1	k		0.90	63	0.6	0.53	20	91
J-20	343	346	D1	k		1.24					
J-20	346	349	D1	k		1.07					
J-20	349	352	D1	k		0.85					
J-20	352	353	D1	k		0.56					
J-20	353	357	D1	k		0.49					
J-20	357	359	D1	k		0.55					
J-20	359	364	D1	k		0.51					
J-20	364	367	D1	k		0.85					
J-20	367	369	D1	k		0.52					
J-20	369	372	D1	k		0.59					
J-20	372	375	D1	k		0.74					
J-20	375	377	D1	k		1.00					
J-20	377	380	D1	k		1.13					
J-20	380	382	D1	k		0.75					
J-20	382	386	D1	k		0.82					

Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
J-20	386	389	D1	k		1.01					
J-20	389	390	D1	k		0.93					
J-20	390	393	D1	k		1.07					
J-20	393	396	D1	k		0.84					
J-20	396	399	D1	k		0.99					
J-20	399	401	D1	k		0.76					
J-20	401	405	D1	k		1.14					
J-20	405	408	D1	k		0.93					
J-20	408	411	D1	k		0.68					
J-20	411	413	D1	k		0.61					
J-20	413	416	D1	k		0.70					
J-20	416	419	D1	k		1.14					
J-20	419	422	D1	k		0.95					
J-20	422	426	D1	k		0.60					
J-20	426	429	D1	k		0.46					
J-20	429	432	D1	k		0.49					
J-20	432	435	D1	k		0.66					
J-20	435	439	D1	k		0.54					
J-20	439	440	D1	k		0.79					
J-20	440	443	D1	k	phyl	0.55					
J-20	443	446	D1	k		0.71					
J-20	446	449	D1	k		0.65					
J-20	449	453	D1	k		0.85					
J-20	453	456	D1	k		0.65					
J-20	456	459	D1	k		0.64					
J-20	459	463	D1	k		0.49					
J-20	463	466	D1	k		0.59					
J-20	466	469	D1	k		0.41					
J-20	469	471	D1	k		0.48					
J-20	471	474	D1	k		0.46					
J-20	474	477	D1	k		0.70					
J-20	477	481	D1	k		0.70					
J-20	481	483	D1	k		0.69					
J-20	483	486	D1	k		0.60					
J-20	486	489	D1	k		0.59					
J-20	489	491	D1	k		0.58					
J-20	491	495	D1	k		0.72					
J-20	495	499	D1	k	phyl	0.83					
J-20	499	501	D1	k	phyl	0.93					

Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
K-19	47	50	D1	phyl	arg	1.32					
K-19	50	53	D1	phyl	arg	1.41					
K-19	53	56	D1	phyl	arg	1.28					
K-19	56	59	D1	phyl	arg	1.27					
K-19	59	62	D1	phyl	arg	1.44					
K-19	62	64	D1	phyl	arg	1.83					
K-19	64	67	D1	phyl	arg	1.61					
K-19	67	70	D1	phyl	arg	1.89					
K-19	70	73	D1	phyl	arg	1.70					
K-19	73	75	D1	phyl	arg	1.17					
K-19	75	78	D1	phyl	arg	1.42					
K-19	78	80	D1	phyl	arg	1.22					
K-19	80	84	D1	phyl	arg	1.06					
K-19	84	87	D1	phyl	arg	1.29					
K-19	87	90	D1	phyl	arg	1.09					
K-19	90	93	D1	phyl	arg	0.59					
K-19	93	96	D1	phyl	arg	0.47					
K-19	96	99	D1	phyl	arg	0.48					
K-19	99	102	D1	phyl	arg	0.80					
K-19	102	103	D1	phyl		0.56					
K-19	103	106	D1	phyl		0.60					
K-19	106	108	D1	phyl		0.55					
K-19	108	111	D1	phyl		0.63					
K-19	111	114	D1	phyl		0.73					
K-19	114	116	D1	phyl		0.64					
K-19	116	119	D1	phyl		0.63					
K-19	119	122	D1	phyl		0.65					
K-19	122	125	D1	phyl		0.81					
K-19	125	128	D1	phyl		0.72					
K-19	128	131	D1	phyl		0.62					
K-19	131	134	D1	phyl		0.69					
K-19	134	137	D1	phyl		0.66					
K-19	137	140	D1	phyl		0.72					
K-19	140	141	D1	phyl		0.60					
K-19	141	143	D1	phyl		0.56					
K-19	143	144	D1	phyl		0.64					
K-19	144	147	D1	phyl		0.69					
K-19	147	150	D1	phyl		0.68					
K-19	150	153	D1	phyl		0.54					
K-19	153	156	D1	phyl		0.67					
K-19	156	159	Flt Zone	arg	phyl	0.74					
K-19	159	162	Flt Zone	arg	phyl	0.90					
K-19	162	165	Flt Zone	arg	phyl	0.75					
K-19	165	166	Flt Zone	arg	phyl	0.69					
K-19	166	169	Flt Zone	arg	phyl	0.54					
K-19	169	171	Flt Zone	arg	phyl	0.48					
K-19	171	172	Flt Zone	arg	phyl	0.38					

Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
K-19	172	174	Flt Zone	arg	phyl	0.22					
K-19	174	175	Flt Zone	arg	phyl	n/a					
K-19	175	177	D1	phyl		0.38					
K-19	177	179	D1	phyl		0.58					
K-19	179	181	D1	phyl		0.64					

Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
K-19.5	0		D1	arg	phyl		122	1.7	1.04	71	304
K-19.5	15		D1	arg	phyl		119	0.8	1.20	26	621
K-19.5	30		D1	arg	phyl		170	1.0	1.09	20	625
K-19.5	45		D1	arg	phyl		133	0.9	0.59	63	536
K-19.5	60		D1 + Flt	arg	phyl		138	1.2	0.64	34	405
K-19.5	75		D1	arg	phyl		145	1.6	0.58	302	683
K-19.5	90		D1	arg	phyl		120	3.0	0.66	371	449
K-19.5	105		D1	arg	phyl		221	2.1	0.71	144	379
K-19.5	120		D1	arg	phyl		114	3.6	0.74	186	505
K-19.5	135		D1	arg	phyl		105	1.3	0.55	65	655
K-19.5	150		D1 + Flt	arg	phyl		138	1.5	0.71	21	669
K-19.5	165		D1	arg	phyl		137	1.3	0.65	75	586
K-19.5	180		D1	arg	phyl		125	1.5	0.68	29	505
K-19.5	195		D1	arg	phyl		382	1.4	0.82	66	864
K-19.5	210		D1	phyl	arg		164	1.8	0.98	55	468
K-19.5	228		D1	phyl	arg		129	1.4	0.79	29	407
K-19.5	245		D1	phyl	arg		180	1.2	0.68	23	452
K-19.5	260		D1	phyl	arg		96	1.1	0.66	32	452
K-19.5	275		D1	phyl	arg		45	2.8	0.33	206	96
K-19.5	290		D1	phyl	arg		69	1.4	0.71	149	216
K-19.5	305		D1	phyl	arg		115	1.5	0.90	497	412
K-19.5	320		D1	phyl	arg		95	1.0	0.76	39	303
K-19.5	335		D1	phyl	arg		81	0.8	0.60	18	209
K-19.5	350		D1	phyl	arg		35	0.6	0.32	53	44
K-19.5	365		D1	phyl	arg		60	0.8	0.47	120	49
K-19.5	380		D1	phyl	arg		68	0.8	0.60	34	47
K-19.5	395		D1	phyl			23	0.5	0.35	30	64
K-19.5	410		D1	phyl			72	0.5	0.37	32	95
K-19.5	425		D1	phyl			40	0.5	0.42	24	104
K-19.5	440		D1	phyl			46	0.6	0.46	30	117
K-19.5	455		D1	phyl			103	0.8	0.63	30	243
K-19.5	470		D1	phyl			76	0.8	0.70	33	196
K-19.5	485		D1	phyl			58	0.6	0.59	31	277
K-19.5	500		D1	phyl			51	0.6	0.61	39	250
K-19.5	515		D1	phyl			49	0.8	0.65	36	142
K-19.5	530		D1	phyl			52	0.9	0.64	69	148

Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
L-17.5	123	126	D1	phyl	arg	0.03					
L-17.5	126	128	D1	phyl	arg	0.05					
L-17.5	128	131	D1	phyl	arg	0.09					
L-17.5	131	137	D1	phyl	arg	0.06					
L-17.5	137	141	D1	phyl	arg	0.08					
L-17.5	141	144	D1	phyl	arg	0.10					
L-17.5	144	147	D1	phyl	arg	0.09					
L-17.5	147	151	D1	phyl	arg	0.09					
L-17.5	151	154	D1	phyl	arg	0.34					
L-17.5	154	157	D1	phyl	arg	0.57					
L-17.5	157	162	D1	phyl	arg	0.91					
L-17.5	162	164	D1	phyl	arg	0.40					
L-17.5	164	165	D1	phyl	arg	0.58					
L-17.5	165	168	D1	phyl	arg	0.85					
L-17.5	168	171	D1	phyl	arg	0.91					
L-17.5	171	173	D1	phyl		0.82					
L-17.5	173	176	D1	phyl		0.29					
L-17.5	176	179	D1	phyl		1.28					
L-17.5	179	182	D1	phyl		1.36					
L-17.5	182	184	D1	phyl		0.53					
L-17.5	184	186	D1	phyl		0.64					
L-17.5	186	190	D1	phyl		0.92					
L-17.5	190	193	D1	phyl		0.79					
L-17.5	193	195	D1	phyl		0.79					
L-17.5	195	196	D1	phyl		0.69					
L-17.5	196	200	D1	phyl		1.06					
L-17.5	200	204	D1	phyl		0.86					
L-17.5	204	207	D1	phyl		0.96					
L-17.5	207	210	D1	phyl		0.94					
L-17.5	210	212	D1	phyl		0.91					
L-17.5	212	215	D1	phyl		0.87					
L-17.5	215	218	D1	phyl		0.72					
L-17.5	218	221	D1	phyl		0.64					
L-17.5	221	224	D1	phyl		0.48					
L-17.5	224	228	D1	arg	phyl	0.44					
L-17.5	228	231	D1	phyl		0.53					
L-17.5	231	233	D1	phyl		0.65					
L-17.5	233	236	D1	phyl		0.68					
L-17.5	236	239	D1	phyl		0.73					
L-17.5	239	242	D1	phyl		0.64					
L-17.5	242	243	D1	phyl		0.44					
L-17.5	243	246	D1	phyl		0.59					

Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
L-17.5	246	248	D1	phyl		0.60					
L-17.5	248	251	D1	phyl		0.32					
L-17.5	251	255	D1	phyl		0.31					
L-17.5	255	258	D1	phyl		0.39					
L-17.5	258	262	D1	phyl		0.54					
L-17.5	262	265	D1	phyl		0.33					
L-17.5	265	269	D1	phyl		0.55					
L-17.5	269	273	D1	phyl		0.77					
L-17.5	273	276	D1	phyl		0.54					
L-17.5	276	279	D1	phyl		0.56					
L-17.5	279	281	D1	phyl		0.25					
L-17.5	281	283	D1	phyl		0.44					
L-17.5	283	286	D1	phyl		0.32					
L-17.5	286	289	D1	phyl		0.47					
L-17.5	289	292	D1	phyl		0.57					
L-17.5	292	294	D1	phyl		0.73					
L-17.5	294	296	D1	phyl		0.45					
L-17.5	296	298	D1	phyl		0.51					
L-17.5	298	301	D1	phyl		0.74					
L-17.5	301	302	D1	phyl		0.53					
L-17.5	302	306	D1	phyl		0.48					
L-17.5	306	309	D1	phyl		0.72					
L-17.5	309	314	D1	phyl		0.67					
L-17.5	314	317	D1	phyl		0.69					
L-17.5	317	320	D1	phyl		0.30					
L-17.5	320	323	D1	phyl		0.78					
L-17.5	323	327	D1	phyl		0.67					
L-17.5	327	329	D1	phyl		0.43					
L-17.5	329	332	D1	phyl		0.62					
L-17.5	332	335	D1	phyl		0.70					
L-17.5	335	337	D1	phyl		0.64					
L-17.5	337	339	D1	phyl		0.53					
L-17.5	339	325	D1	phyl		0.73					
L-17.5	325	346	D1	phyl	arg	0.77					
L-17.5	346	349	D1	phyl	arg	0.77					
L-17.5	349	352	D1	arg	phyl	0.86					
L-17.5	352	356	D1	arg	phyl	0.61					
L-17.5	356	357	D1	arg	phyl	0.71					
L-17.5	357	360	D1	arg	phyl	0.33					
L-17.5	360	362	D1	phyl	arg	0.85					
L-17.5	362	366	D1	phyl	arg	0.49					
L-17.5	366	370	D1	phyl	arg	0.51					
L-17.5	370	372	D1	phyl		0.58					
L-17.5	372	375	D1	phyl		0.36					
L-17.5	375	377	D1	phyl		0.31					
L-17.5	377	380	D1	phyl		0.26					
L-17.5	380	382	D1	phyl		0.42					
L-17.5	382	383	D1	phyl		0.37					
L-17.5	383	385	D1	phyl		0.39					
L-17.5	385	388	D1	phyl		0.36					
L-17.5	388	390	D1	phyl		0.30					
L-17.5	390	392	D1	phyl		0.29					
L-17.5	392	396	D1	arg	phyl	0.33					
L-17.5	396	399	D1	arg	phyl	0.27					
L-17.5	399	401	D1	arg	phyl	0.24					
L-17.5	401	403	D1	arg	phyl	0.29					
L-17.5	403	407	D1	arg	phyl	0.28					
L-17.5	407	410	D1	phyl	arg	0.38					
L-17.5	410	413	D1	arg	phyl	0.32					
L-17.5	413	415	D1	arg	phyl	0.32					
L-17.5	415	419	D1	arg	phyl	0.29					
L-17.5	419	422	D1	phyl	arg	0.30					
L-17.5	422	427	D1	phyl	arg	0.33					
L-17.5	427	429	D1	phyl	arg	0.37					
L-17.5	429	431	D1	arg	phyl	0.36					
L-17.5	431	434	D1	arg	phyl	0.30					
L-17.5	434	438	D1	arg	phyl	0.27					
L-17.5	438	441	D1	arg	phyl	0.61					
L-17.5	441	445	D1	arg	phyl	0.46					
L-17.5	445	447	D1	arg	phyl	0.39					
L-17.5	447	449	D1	arg	phyl	0.31					
L-17.5	449	453	D1	arg	phyl	0.36					
L-17.5	453	455	D1	arg	phyl	0.52					
L-17.5	455	459	D1	arg	phyl	0.39					
L-17.5	459	461	D1	arg	phyl	0.31					
L-17.5	461	465	D1	arg	phyl	0.36					
L-17.5	465	468	D1	arg	phyl	0.55					
L-17.5	468	470	D1	arg	phyl	0.63					
L-17.5	470	473	D1	arg	phyl	0.63					
L-17.5	473	477	D1	arg	phyl	0.53					
L-17.5	477	479	D1	arg	phyl	0.50					
L-17.5	479	482	D1	arg	phyl	0.63					
L-17.5	482	485	D1	arg	phyl	0.48					
L-17.5	485	488	D1	arg	phyl	0.44					
L-17.5	488	491	D1	arg	phyl	0.37					
L-17.5	491	494	D1	arg	phyl	0.48					
L-17.5	494	497	D1	arg	phyl	0.44					
L-17.5	497	500	D1	arg	phyl	0.64					
L-17.5	500	503	D1	phyl	arg	0.44					

Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
L-17.5	503	506	D1	phyl	arg	0.55					
L-17.5	506	509	D1	arg	phyl	0.69					
L-17.5	509	511	D1	arg	phyl	0.80					
L-17.5	511	515	D1	arg	phyl	0.50					
L-17.5	515	517	D1	arg	phyl	0.45					
L-17.5	517	520	D1	arg	phyl	0.54					
L-17.5	520	523	D1	arg	phyl	0.42					
L-17.5	523	525	D1	arg	phyl	0.25					

Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
M-17	0						59	0.3	0.31	-5	15
M-17	15						60	-0.3	0.28	12	10
M-17	30						76	0.7	0.55	162	24
M-17	45						156	0.4	0.31	17	12
M-17	60						62	-0.3	0.15	19	30
M-17	75						41	0.3	0.14	22	12
M-17	90						41	-0.3	0.13	28	12
M-17	105						52	-0.3	0.17	29	30
M-17	120						32	-0.3	0.11	32	15
M-17	135						46	-0.3	0.11	27	28
M-17	150						36	-0.3	0.11	29	27
M-17	165						33	-0.3	0.11	-5	35
M-17	180						41	-0.3	0.13	11	25
M-17	195						56	-0.3	0.19	17	63
M-17	210						35	-0.3	0.19	11	45
M-17	225						38	-0.3	0.19	5	95
M-17	240						36	0.4	0.18	8	84
M-17	255						43	0.4	0.20	14	146
M-17	270						46	0.3	0.19	14	55
M-17	285						39	0.3	0.21	19	34
M-17	300						37	-0.3	0.24	9	42
M-17	315						42	-0.3	0.23	18	43
M-17	330						43	0.3	0.27	12	25
M-17	345						39	0.5	0.32	19	18
M-17	360						36	0.6	0.24	141	105
M-17	375						46	0.5	0.33	89	51
M-17	390						66	0.4	0.34	14	112
M-17	405						63	0.4	0.42	25	27
M-17	420						63	0.8	0.44	18	26
M-17	435						46	0.5	0.38	51	58
M-17	450						66	1.6	0.44	104	24
M-17	465						41	4.5	0.33	232	127
M-17	480						50	1.3	0.35	371	96

Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
M-16	67	69	D1	phyl		N/A					
M-16	69	97	D1	phyl							
M-16	97	110	D1	phyl							
M-16	110	138	D1	phyl							
M-16	138	146	D1	k + Flt Zone	phyl						
M-16	146	149	D1	k	phyl						
M-16	149	195	D1	phyl							
M-16	195	197	D1	k							
M-16	197	203	D1	phyl							
M-16	203	207	D1	k	phyl						
M-16	207	214	D1	phyl							
M-16	214	227	D1	phyl							
M-16	227	232	Flt Zone	arg							
M-16	232	234	D1	arg	phyl						
M-16	234	240	D1	phyl							
M-16	240	242	D1	k							
M-16	242	247	D1	phyl							
M-16	247	260	D1	phyl							
M-16	260	288	D1	phyl	arg						
M-16	288	295	D1	phyl							
M-16	295	301	D1	phyl	arg						
M-16	301	306	D1	phyl							
M-16	306	313	D1	phyl							
M-16	313	321	D1	phyl							
M-16	321	324	Flt Zone	phyl							
M-16	324	339	D1	phyl							
M-16	339	343	Flt Zone	phyl							
M-16	343	383	D1	phyl							

Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
N-15	25	26	D1	phyl		2.46					
N-15	26	29	D1	phyl		2.76					
N-15	29	32	D1	phyl		2.76					
N-15	32	35	D1	k	phyl	1.59					
N-15	35	38	D1	k	phyl	1.61					
N-15	38	41	D1	k	phyl	1.71					
N-15	41	44	D1	k	phyl	1.62					
N-15	44	46	D1	k	phyl	2.01					
N-15	46	49	D1	k	phyl	1.57					
N-15	49	52	D1	k	phyl	1.82					
N-15	52	54	D1	k	phyl	1.70					

Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
N-15	54	57	D1	k	phyl	1.30					
N-15	57	61	Flt Zone	arg		1.41					
N-15	61	63	Flt Zone	arg		0.86					
N-15	63	65	D1	k	phyl	0.77					
N-15	65	68	D1	k	phyl	0.67					
N-15	68	71	D1	k	phyl	0.80					
N-15	71	74	D1	k	phyl	0.83					
N-15	74	77	D1	k	phyl	0.70					
N-15	77	81	D1	k	phyl	0.45					
N-15	81	84	Flt Zone	arg		0.45					
N-15	84	87	D1	k	phyl	0.41					
N-15	87	90	D1	k	phyl	0.63					
N-15	90	93	D1	k	phyl	0.98					
N-15	93	96	D1	k	phyl	0.88					
N-15	96	99	D1	k	phyl	0.85					
N-15	99	102	D1	k	phyl	0.77					
N-15	102	105	D1	k	phyl	0.66					
N-15	105	108	D1	k	phyl	0.72					
N-15	108	111	D1	k	phyl	0.75					
N-15	111	113	D1	k	phyl	1.14					
N-15	113	117	D1	k	phyl	1.17					
N-15	117	120	D1	k	phyl	1.20					
N-15	120	123	D1	k	phyl	0.98					
N-15	123	126	D1	k	phyl	1.06					
N-15	126	129	D1	k	phyl	1.01					
N-15	129	132	D1	k	phyl	1.30					
N-15	132	135	D1	k	phyl	1.50					
N-15	135	138	D1	k	phyl	1.13					
N-15	138	141	D1	k	phyl	0.98					
N-15	141	144	D1	k	phyl	1.44					
N-15	144	148	D1	k	phyl	1.19					
N-15	148	150	D1	k	phyl	1.24					

Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
N-15.5	0						457	1.3	2.26	12	-5
N-15.5	15						359	1.3	1.21	20	6
N-15.5	30						270	1.2	0.80	21	5
N-15.5	45						240	1.4	0.82	30	22
N-15.5	60						322	1.2	0.80	30	-5
N-15.5	75						309	1.7	0.85	27	-5
N-15.5	90						283	1.1	0.83	26	-5
N-15.5	105						225	1.4	0.63	28	-5
N-15.5	120						212	0.8	0.55	17	-5
N-15.5	135						221	1.1	0.67	24	-5
N-15.5	150						176	0.6	0.47	18	9
N-15.5	165						112	0.7	0.36	24	7
N-15.5	180						81	0.3	0.29	9	-5
N-15.5	195						49	0.5	0.20	12	25
N-15.5	210						50	-0.3	0.18	14	33
N-15.5	225						42	-0.3	0.17	16	14
N-15.5	240						43	-0.3	0.13	24	20
N-15.5	250.96						32	-0.3	0.17	21	15

Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
O-14	57	59	D1	phyl	k	0.42					
O-14	59	62	D1	phyl	k	0.28					
O-14	62	65	D1	phyl	k	0.26					
O-14	65	67	D1	phyl	k	0.38					
O-14	67	69	D1	phyl	k	0.45					
O-14	69	72	D1	phyl	k	0.73					
O-14	72	74	D1	phyl	k	0.62					
O-14	74	76	D1	phyl	k	0.31					
O-14	76	79	D1	phyl	k	0.43					
O-14	79	81	D1	phyl	k	0.38					
O-14	81	85	D1	phyl	k	0.48					
O-14	85	90	D1	phyl	k	0.37					
O-14	90	92	D1	phyl	k	0.30					
O-14	92	94	D1	phyl	k	0.47					
O-14	94	96	D1	phyl	k	0.50					
O-14	96	99	D1	phyl	k	0.46					
O-14	99	102	D1	phyl	k	0.44					
O-14	102	104	D1	phyl	k	0.52					
O-14	104	106	D1	phyl	k	0.48					
O-14	106	108	D1	phyl	k	0.50					
O-14	108	111	D1	phyl	k	0.56					
O-14	111	114	D1	phyl	k	0.45					
O-14	114	117	D1	k		0.36					
O-14	117	119	D1	k		0.79					
O-14	119	121	D1	k		0.68					
O-14	121	124	D1	k		0.83					
O-14	124	127	D1	k		0.65					
O-14	127	130	D1	k		0.53					
O-14	130	134	D1	k		0.48					
O-14	134	136	D1	k		0.48					
O-14	136	138	D1	k		0.41					
O-14	138	141	D1	k		0.29					
O-14	141	144	D1	k		0.39					

Hole N°	From	To	Rock	Altn	Altn 2	Cu_% <sub>1</sub>	Au(ppb) <sub>2</sub>	Ag(ppm) <sub>2</sub>	Cu_% <sub>2</sub>	Zn(ppm) <sub>2</sub>	Mo(ppm) <sub>2</sub>
O-14	144	146	D1	k		0.43					
O-14	146	147	D1	k		0.40					
O-14	147	150	D1	k		0.38					
O-14	150	153	D1	k		0.53					
O-14	153	157	D1	k		0.53					
O-14	157	160	D1	k		0.80					
O-14	160	163	D1	k		0.55					
O-14	163	165	Flt Zone	arg		0.65					
O-14	165	167	Flt Zone	arg		0.70					
O-14	167	171	D1	phyl		0.51					
O-14	171	173	D1	phyl		0.45					
O-14	173	175	D1	phyl		0.81					
O-14	175	177	D1	phyl	k	0.85					
O-14	177	180	D1	phyl	k	0.81					
O-14	180	182	D1	phyl	k	0.84					
O-14	182	184	D1	phyl	k	0.68					
O-14	184	186	D1	phyl	k	0.82					
O-14	186	187	D1	phyl	k	0.59					
O-14	187	190	D1	phyl	k	0.85					
O-14	190	191	D1	phyl	k	0.54					
O-14	191	193	D1	k	phyl	0.60					
O-14	193	195	D1	k	phyl	0.53					
O-14	195	197	D1	k	phyl	0.80					
O-14	197	199	D1	k	phyl	0.53					
O-14	199	202	D1	k	phyl	0.44					
O-14	202	205	Dyke	k		0.59					
O-14	205	206	Dyke	k		0.77					
O-14	206	208	D1	k	phyl	0.63					
O-14	208	210	D1	k	phyl	0.63					
O-14	210	213	D1	k	phyl	0.78					
O-14	213	215	D1	k	phyl	0.82					
O-14	215	217	D1	k	phyl	0.56					
O-14	217	218	D1	k	phyl	0.76					
O-14	218	221	D1	k	phyl	0.80					
O-14	221	223	D1	k	phyl	1.08					
O-14	223	225	D1	k	phyl	0.92					
O-14	225	228	D1	k	phyl	0.70					
O-14	228	230	D1	k	phyl	0.63					
O-14	230	232	D1	k	phyl	0.11					
O-14	232	235	D1	k	phyl	0.80					
O-14	235	237	D1	k	phyl	0.74					
O-14	237	239	D1	k	phyl	0.98					
O-14	239	242	D1	k	phyl	0.61					
O-14	242	245	D1	k	phyl	0.77					
O-14	245	247	D1	k	phyl	0.76					
O-14	247	248	D1	k	phyl	0.80					



## **APPENDIX D5**

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Pb isotope analytical procedures and raw data

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## ANALYTICAL TECHNIQUES FOR Pb ISOTOPE ANALYSES

The following procedures for sulphide Pb isotope analyses were conducted at the University of British Columbia. Trace lead sulphide samples were prepared from 10-50 mg of handpicked pyrite or chalcopyrite crystals, which were leached in dilute hydrochloric acid to remove surface contamination before dissolution in nitric acid. Separation and purification of Pb employed ion exchange column techniques. The samples were converted to bromide, and the solution was passed through ion exchange columns in hydrobromic acid, and the lead eluted in 6N hydrochloric acid.

Approximately 10-25 ng of the lead in chloride form was loaded on a rhenium filament using a phosphoric acid-silica gel emitter, and isotopic compositions were determined in peak-switching mode using a modified VG54R thermal ionisation mass spectrometer. The measured ratios were corrected for instrumental mass fractionation of 0.12%/amu (Faraday collector) or 0.43%/amu (Daly collector) per mass unit based on repeated measurements of the N.B.S. SRM 981 Standard Isotopic Reference Material and the values recommended by Thirlwall (2000). Errors were numerically propagated including all mass fractionation and analytical errors, using the technique of Roddick (1987). All errors are quoted at the  $2\sigma$  level. Age assignments follow the time scale of Harland *et al.* (1990).

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## Lead isotope data from the University of British Columbia

Sample No.	$^{206}\text{Pb}/^{204}\text{Pb}$	Pb64 abs err	Pb64 % err	$^{207}\text{Pb}/^{204}\text{Pb}$	Pb74 abs err	Pb74 % err	$^{208}\text{Pb}/^{204}\text{Pb}$	Pb84 abs err	Pb84 % err	$^{207}\text{Pb}/^{206}\text{Pb}$	Pb76 abs err	Pb76 % err	$^{208}\text{Pb}/^{206}\text{Pb}$	Pb86 abs err	Pb86 % err	Deposit
G1-CCP	18.7813	0.0245	0.13	15.6597	0.0214	0.14	38.7608	0.0598	0.15	0.8338	0.0003	0.036	2.0638	0.0011	0.055	El Galeno
G1-PYR	18.7440	0.0084	0.04	15.6633	0.0103	0.07	38.7405	0.0338	0.09	0.8356	0.0002	0.023	2.0668	0.0009	0.043	El Galeno
G4-CCP	18.7071	0.0333	0.18	15.6348	0.0286	0.18	38.6853	0.0749	0.19	0.8358	0.0003	0.031	2.0680	0.0009	0.046	El Galeno
MY-PYR	18.7248	0.0623	0.33	15.6439	0.0522	0.33	38.6349	0.1329	0.34	0.8355	0.0004	0.047	2.0633	0.0013	0.063	Michiquillay
MY-PYR	18.7826	0.0274	0.15	15.7000	0.0239	0.15	38.8606	0.0640	0.16	0.8359	0.0003	0.031	2.0690	0.0009	0.045	Michiquillay
MY-CCP	18.7865	0.0159	0.08	15.6577	0.0128	0.08	38.8215	0.0447	0.12	0.8335	0.0005	0.057	2.0665	0.0010	0.049	Michiquillay
YANA-PYR	18.6234	0.0187	0.10	15.5742	0.0173	0.11	38.4688	0.0483	0.13	0.8363	0.0002	0.024	2.0656	0.0009	0.044	Yanacocha
MC-CCP	18.6980	0.0111	0.06	15.6132	0.0103	0.07	38.6605	0.0388	0.10	0.8350	0.0004	0.044	2.0676	0.0011	0.053	Minas Conga
MC-CCP	18.7342	0.0118	0.06	15.6536	0.0124	0.08	38.7507	0.0381	0.10	0.8356	0.0002	0.024	2.0685	0.0009	0.044	Minas Conga
MC-PYR	18.7778	0.0205	0.11	15.6968	0.0235	0.15	38.8161	0.0771	0.20	0.8359	0.0004	0.054	2.0672	0.0020	0.099	Minas Conga
MC-PYR	18.7781	0.0204	0.11	15.6878	0.0236	0.15	38.8013	0.0763	0.20	0.8355	0.0004	0.050	2.0664	0.0020	0.095	Minas Congaco

Analyses by Janet Gabites, Geochronology Laboratory, Department of Earth and Ocean Sciences, The University of British Columbia.

Results have been normalized using a fractionation factor of 0.15% based on multiple analyses of NBS981 standard lead, and the values in Thirlwall (2000).

Minerals analysed: pyr = pyrite, ccp = chalcopyrite