

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)
HOLE No.: MM294-3
Collar Eastings: 533922.00
Collar Northings: 5408760.00
Collar Elevation: 0.00

Collar Inclination: -46.00
Grid Bearing: 130.00
Final Depth: 333.80 metres

Logged by: J.G. Thurlow
Date: Jan. 12/99
Down-hole Survey:

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS				
						WIDTH	Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)
0	4.57	Overburden								
4.57	79.0	Felsic lavas								
4.57	24.8	Medium greenish felsic lava, weakly sericitized and with anomalous disseminated pyrite (several specks in any hand lens view). Primary textures not clear; some nodular structures visible locally. Common leucoxene dust, locally in irregular, parallel strings. 1% small dark sericitic specks may be in part after amphibole. Lighter sericitic entities may be former plagioclase. Fairly badly broken core down to 22m but no fault gouge. Medium hard. k = 0.0. Local minor 1mm long, 0.5mm wide voids aligned in parallel. 40 cm of bleached chilled diabase at basal contact with some evidence of weak shear.								
24.8	34.1	Dark reddish, weakly hematitized felsic lava. Abundant plagioclase phenocrysts and local suggestions of altered amphibole. Primary textures are largely obscured. Minor sections of greener, less hematitic material. Moderately broken core with minor fault gouge. No sulphide. Weak shearing at basal contact. k = 0.02								
34.1	79.0	Felsic lava, texturally inhomogeneous.								

HOLE No: MM294-3

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)
HOLE No.: MM294-3

Page 2

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	WIDTH	Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)	Zn (%)
			ASSAYS								
		Medium green, extensively brecciated (hyaloclastic), feldsparphyric. Leucocratic feldspars stand out against darker background. Both fragmental and pseudofragmental textures. Common dark specks/spots, some of which are acicular and probably were hornblende. Some diabasic-textured xenoliths with abundant leucoxene. Minor small voids, calcite-filled. Larger, less brecciated entities show mottled textures and incipient quench fracturing. Incipient sericitic alteration with trace pyrite in the upper parts of the unit but increasing to anomalous disseminated pyrite and weak sericitic alteration toward the bottom of the unit. Orange-brown harder alteration affects the matrix from 40.2m-44.3m (resembles Pilley's Unit "tu"), Medium to medium hard. k = 0.01. Minor epidote-calcite-filled late fractures. Local fault gouge. Shearing increases toward the bottom of the unit. Fault gouge at lower contact from 78.0m to 79.0m.									
79.0	130.1	Mineralized and altered felsic volcanic and volcanoclastic rocks.	508126	88.40	90.00	1.60	16	0.8	0.22	NIL	NIL
			508127	90.00	91.60	1.60	13	0.7	0.21	NIL	0.01
			508128	109.30	111.10	1.80	73	2.4	0.25	NIL	0.15
79.0	102.3	Mineralized and altered felsic volcanoclastic rocks; light to dark greyish colours. Primary volcanoclastic textures clearly visible. Strong sericite-pyrite alteration with silica redistribution. Quite pyritic with 5%- 10% fine to medium grained disseminated pyrite. Common local traces sphalerite, minor disseminated crystalline barite, rare trace chalcopyrite. Abundant leucoxene specks. Medium hardness.									

HOLE No: MM294-3

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)

HOLE No.: MM294-3

Page 3

		LITHOLOGICAL DESCRIPTION	ASSAYS								
FROM	TO		SAMPLE No.	FROM	TO	WIDTH	Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)	Zn (%)
		good solid core. Minor brittle shears with minor gouge. Minor silica-pyrite stringers. Primary lithology is a somewhat sorted, poly lithic, resedimented volcanic breccia. Dominantly felsic clasts, but some scoriaceous-looking mafic and rare anomalous yellow-green mafic clast. Local trace anomalous bright green alteration and trace anomalous blue colouration. Common quench fracturing and related pseudofragmental textures within some larger felsic clasts; local perlitic cracks. Some clasts are more altered and pyritized than their enclosing matrix, suggesting alteration elsewhere. From 88.4m - 94.0m disseminated chalcopyrite is common and homogeneously distributed, with minor trace sphalerite and local crystalline barite. Basal contact conformable.									
	102.3 130.1	Altered and pyritized felsic flow with widespread pseudofragmental textures developed along pervasive quench fractures. Generally dark grey. No phenocrysts. Some nodular texture resembles that seen in surface trenches. Strong sericite alteration with silica redistribution. 1%-3% disseminated pyrite. Common specks disseminated sphalerite and chalcopyrite and rare patches or veinlets of crystalline barite. Local minor brittle shears 50 to 55 degrees to core axis. Local bleaching alteration adjacent to pyritic-sphaleritic hairline stringers. 15 cm of relatively innocuous-looking shearing at basal contact.									
130.1	181.3	Variably altered and mineralized basaltic rocks. Chlorite-	508129	139.60	141.75	2.15	1275	16.1	0.07	0.36	1.31

HOLE No: MM294-3

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)
HOLE No.: MM294-3

Page 4

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS					
						WIDTH	Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)	Zn (%)
		calcite-silica-sericite alteration with disseminated and veinlet pyrite-sphalerite-(chalcopyrite-barite).	508149	173.80	175.30	1.50	152	0.9	0.02	0.12	0.19
			508150	175.30	176.80	1.50	99	0.7	0.02	0.06	0.14
			508151	176.80	178.30	1.50	53	0.3	0.01	0.03	0.07
130.1	147.0	Basalt, medium grey-green, weakly-moderately altered (chlorite-silica-calcite) and mineralized. 1% - 3% pyrite overall, but locally more. Common calcite amygdulites filled with amorphous carbonate and lesser silica; local trace barite. Disseminated sphalerite-chalcopyrite-(galena), especially associated with calcite. Some base-metal-rich stringers (e.g., 139.6m-141.75m). Local anomalous green alteration. Arbitrary, gradational basal contact. Weak shearing and broken core in this general area.	508152	178.30	179.80	1.50	21	0.3	0.01	0.02	0.10
			508153	179.80	181.30	1.50	5	1.4	0.01	0.01	0.09
		147.0 181.3 Basaltic pillow lava, weakly altered but less mineralized than subunit above. Sericitic alteration dominant. Anomalous disseminated pyrite, rare veinlet/amygdulite sphalerite-chalcopyrite-barite (e.g. @ 156.85m). Resembles pillow lavas at top of MM-294-1, but these are somewhat more altered. Alteration/mineralization increases somewhat from 173.8m to bottom of unit. Chilled diabase dykelet from 179.45m-179.6m.									
181.3	191.7	Felsic (intrusive?) rock, pre-mineralization. Upper contact is sharp, unshaped and strongly suggests that this unit is intrusive.									
		181.3 187.75 Light-medium grey-green felsic intrusive.									

HOLE No: MM294-3

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)

HOLE No.: MM294-3

Page 5

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS						
						WIDTH	Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)	Zn (%)	
		Local barite-sphalerite-calcite-filled voids and veinlets. Local "nodular" texture created by leucocratic halos around silica-filled amygdulcs.										
	187.75	187.95	Chilled diabase									
	187.95	188.7	Sheared basaltic screen									
	188.7	191.7	Strongly sericitized felsic intrusive with several streaks/veinlets of chalcopyrite-pyrite.									
191.7	193.4	Significant fault/shear zone										
	191.7	192.3	Sheared, sericitized felsic intrusive. 20 cm shearing and gouge at basal contact.									
	192.3	192.8	Sheared, chilled diabase, approximately 30cm core missing at basal contact. The entire zone of this contact probably represents a significant fault.									
	192.8	193.4	Sheared, mineralized chloritic mafic volcanic with a couple 5cm-wide ovoids of silica-pyrite-chalcopyrite- sphalerite which resemble the mineralized vein material in trench above MM-294-1. 30 cm lost core in this section.									
193.4	298.4	Peripheral VMS stringer zone within dominantly basaltic host rocks.	508130	194.40	195.00	0.60	59	6.9	0.38	0.33	3.80	
			508131	195.00	196.60	1.60	23	3.8	0.09	0.16	2.69	
			508132	196.60	198.20	1.60	21	3.8	0.12	0.83	3.30	
	193.4	258.8	Moderate to moderately strongly altered, chlorite-pyrite-(calcite-sericite) alteration. This is the	508133	198.20	199.80	1.60	33	7.6	0.14	1.45	5.50
			508134	199.80	201.40	1.60	16	4.4	0.12	1.14	3.40	

HOLE No: MM294-3

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)
HOLE No.: MM294-3

Page 6

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS					
						WIDTH	Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)	Zn (%)
		strongest section of alteration within mafic rocks in the entire hole. Homogeneous lithology, alteration and mineralization. Common stringers of silica-calcite-sphalerite-galena-chalcopryite (which resemble the BP boulders), especially within the section near the top of the unit and again toward the bottom of the unit. Overall, most sections have 2%-4% pyrite, locally more. Trace barite in veinlets. Abundant calcite-(quartz-pyrite-base-metal)-filled amygdulcs. Fairly good coring with only minor broken zones. Minor bleached sections with anomalous bright green alteration which seem to overprint the chlorite-pyrite alteration. Common irregular, early calcite-(quartz-pyrite) veinlets cut the earlier chlorite.	508135	201.40	203.00	1.60	26	6.9	0.12	1.20	3.70
			508136	203.00	204.50	1.50	31	5.0	0.13	0.48	3.20
			508137	204.50	206.00	1.50	17	3.4	0.09	0.90	1.50
			508138	206.00	207.50	1.50	32	5.8	0.12	0.93	3.00
			508139	207.50	209.00	1.50	27	7.9	0.13	1.97	3.80
			508140	209.00	210.50	1.50	42	9.6	0.14	1.58	3.20
			508141	210.50	212.00	1.50	21	3.1	0.13	1.10	1.89
			508142	212.00	213.50	1.50	11	1.9	0.10	0.71	1.18
			508143	213.50	215.00	1.50	30	4.6	0.15	1.88	2.33
			508154	215.00	216.50	1.50	5	0.2	0.02	NIL	0.02
			508155	216.50	218.00	1.50	5	0.7	0.02	0.06	0.03
			508156	249.80	251.30	1.50	33	3.8	0.01	0.32	0.75
<u>MINERALIZED ZONE: Core Angle: 90 True Width: 20.60</u>			194.40	215.00	20.60	26	5.3	0.13	1.08	3.02	
			508157	251.30	252.80	1.50	5	1.3	0.02	0.08	0.42
258.8	261.5	Light greenish, sericitic felsic synvolcanic intrusive?) lithology. Shearing 45 degrees to core at both upper and lower contacts at 45 degrees to core. Weakly foliated throughout. Moderate sericite alteration. Somewhat lower pyrite content than enclosing host rocks (approx. 1%) and with minor sphalerite-barite-bearing veinlets. 10 cm of bleached, chilled and sheared diabase at lower contact.	508158	252.80	254.30	1.50	14	1.7	0.01	0.03	0.04
			508159	254.30	255.80	1.50	5	1.2	NIL	0.02	0.04
			508160	255.80	257.30	1.50	5	0.5	NIL	NIL	0.02
			508161	257.30	258.80	1.50	5	0.5	NIL	0.01	0.03
			508144	261.50	263.00	1.50	12	3.4	0.07	0.38	0.88
			508145	263.00	264.50	1.50	5	4.2	0.03	0.66	1.02
			508146	264.50	266.00	1.50	5	1.3	0.02	0.43	0.60
			508147	266.00	267.50	1.50	5	2.7	0.04	0.53	1.32
261.5	268.6	Altered and mineralized basalt. Fairly strong chlorite-sericite-pyrite alteration with widespread disseminated, amygdule and veinlet sphalerite. 1% - 3% disseminated pyrite, trace barite, galena, cpy. "Good-looking" rock.	508148	267.50	268.60	1.10	5	2.6	0.05	0.52	1.26
			508162	283.50	284.85	1.35	15	0.7	0.01	0.01	0.30
			508163	284.85	286.20	1.35	33	2.3	0.05	0.02	1.41

HOLE No: MM294-3

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)

HOLE No.: MM294-3

Page 7

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	WIDTH	ASSAYS				
							Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)	Zn (%)
MINERALIZED ZONE: Core Angle: 90 True Width: 7.10			261.50	268.60	7.10	6	2.9	0.04	0.50	1.00	
268.6	277.2	Altered, synvolcanic mafic dyke with contacts subparallel to core. Upper contact sharp and unsheared. Dyke is massive, less altered and pyritized (1% pyrite) than basaltic host (probably because of lower permeability) but still contains several sphalerite-bearing veinlets. Lower contact is broken, but not significantly sheared.									
277.2	283.5	Light-medium green, sericitic, synvolcanic felsic intrusive rock. Much less altered and mineralized than 258m-261m. Weak sericite alteration with waxy sericite after plagioclase phenocrysts. Minor disseminated pyrite, common leucoxene. Lower contact is broken, but not significantly sheared.									
283.5	286.2	Altered mafic volcanics and synvolcanic intrusives. Moderately strong chlorite-pyrite alteration, with common disseminated, amygdule and veinlet sphalerite, as 261m-268m.									
286.2	298.4	Moderately altered synvolcanic felsic intrusive, typical of the felsic lithology mapped in the area. More altered than 277m-283m. Sericite alteration with 1%-2% disseminated and stringer pyrite. Minor disseminated and veinlet silica-chalcopryrite-sphalerite. Common medium grained leucoxene. Elongate voids. Some quench fracturing, inhom-									

HOLE No: MM294-3

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)
HOLE No.: MM294-3

Page 8

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS					
						WIDTH	Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)	Zn (%)
		geneous alteration and pseudofragmental textures. 10cm fault gouge at lower contact.									
298.4	333.8	Weakly altered basaltic rocks. Lithology unchanged but with less alteration and mineralization than unit above. Calcite-filled amygdules, commonly with pyrite-sphalerite-(chalcopyrite), some base-metal-bearing calcite-barite veinlets. Below 306m, considerably less mineralization and alteration becomes more domainal with darker chloritic alteration in more permeable inter-fragment/interpillow zones. Change to lesser alteration is gradational, no faults. Fairly scoriaceous.									
End of hole 333.8											
83 core trays											
Waterline is 496m, measured with hip chain.											
Hole Started:January 4/99											
Hole Completed:January 11/99											
No tropari testing (no instrument on site)											
NQ core, NW casing left in hole											
Hole was not lined with plastic pipe.											
UTM Coordinates are Zone 21, NAD 27											

Three Lithogeochemical samples:

MM-294-3-105.3: Moderately sericitized-silicified-pyritized

HOLE No: MM294-3

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)
HOLE No.: MM294-3

Page 9

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS				
						WIDTH	Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)

felsic lithology. Well developed pseudofragmental textures.
2% disseminated pyrite, trace barite.

MM-294-3-252.2: Moderately-strongly chloritized and sericitized
basalt with 3% disseminated pyrite. Minor anomalous bright
green mica.

MM-294-3-292.9: Moderately sericitized synvolcanic felsic
intrusive rock. Quench fractured and with pseudofragmental
textures. 1% disseminated pyrite.

DOWN-HOLE SURVEY DATA

DEPTH	INCLINATION	BEARING
333.80	-46.00	

HOLE No: MM294-3