Amoco Minerals Australia Company

DRILLHOLE Nº ZT-82-10 **Page** 1 of 13 **drill log** metric

PROJECT	ZEEHAN - TASMANIA Nº 7860	**ELEVATION**	181	**COMMENCED**	14-10-82	**CORE HOLE SURVEY**			EASTMAN SINGLE SHOT CAMERA.							
PROSPECT	OCEANA	**DIP COLLAR**	-67½°	**COMPLETED**	23-10-82	Depth	Dip	Bearing	Depth	Dip	Bearing	Depth	Dip	Bearing		
CO-ORDINATES	3415 N 1560 E	**CORE SIZE**	HQ	**TOTAL LENGTH**	190.7m	29	69	216	100	70	215	179	70	209.5		
BEARING	270 G 217 M 228 T	**LOGGED BY**	P.A.J.	ADD F52 WINDRILL DIAMOND DRILL		53	70	214.5	132	70	211.5					
						79	71	216	144	70	211					

METERAGE From	METERAGE To	DESCRIPTION	MINERALIZATION	SAMPLE Nº	METERAGE From	METERAGE To	METERAGE Length	ASSAYS
0.00	21.50	CASING ADVANCER - TRICONE. Drilled through brown to grey siltstones minor quartzite interbeds and black brown clay. NEAR CROTTY QUARTZITE CONTACT.						
21.50	37.70 HQ	INTERBEDDED SHALE, SILTSTONE, CALCLUTITE. Interbedded black to dark grey and grey very calcareous, pyritic laminar, carbonaceous shales and shaley siltstones and grey finely bedded pyritic calclutites and micrites (muddy?). Core extensively broken and extremely weathered. Poor recoveries ≥ 50%.	Trace galena (blebs) Minor pyrite as veinlets and dissem.					
37.70	44.60	SOFT SEDIMENT DEFORMED CALCLUTITE/ DOLOMITE. Chaotically bedded, soft sediment deformed (with numerous stylolitites observed along lithologic boundaries) calcite veined, weakly fossiliferous light grey very weathered and leached calclutites interbedded with dark grey, crystalline, coarse grained, unfossiliferous dolomite (weakly weathered) Two major zones of tectonic breccias 40.9-42.9 and 44.3-44.5 m. Calcite cemented with siderite rimming fragments or as thin cross cutting veinlets. Fragments very angular, show dislocation fractures, offsets and vary between the two dominant lithologies. Calcite matrix is very coarsely crystalline. Minor vughs to 1.5 cm in width calcite rimmed.						

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METERAGE From	METERAGE To	DESCRIPTION	MINERALIZATION	SAMPLE Nº	METERAGE From	METERAGE To	METERAGE Length	ASSAYS
44.60	46.70	INTERBEDDED CALCLUTITE AND DOLOMITE. Weakly soft sediment deformed and load cased pyritic calclutites (with minor quartz sediment component) interbedded with black coarsely crystalline dolomite – argillaceous. Core moderately calcite veined and stylolitized both parallel to and perpendicular to bedding. Bedding 26° to ca @ 46.35 metres.	Trace pink/yellow crystalline sphalerite in coarsely crystalline calcite vein.					
46.70	52.45	RHYTHMICALLY INTERBEDDED FOSSILIFEROUS CALCARENITES, DOLOMITE, CALCLUTITE. Calcarenite horizons (varying from 2 to 10cm in width) are comprised of very shelly bioclastic debris set within a fine grained pyritic and carbonaceous matrix. Concretionary layered pyritic pellets (up to 0.7mm diam) also occur within the horizon both with or without nuclei (generally coarsely crystalline carbonate grains). Minor fragments are partially dolomitized (medium grained, white crystalline, pervasive throughout). The dolomite beds are uniform, in grain size (rhombic crystalline dolomite?) and show up slightly when acid etched. Calclutite is generally non-fossiliferous and fine grained. Bedding surfaces are invariably stylolitized and show signs of slickensiding. Core weakly calcite veined, however, becoming stronger towards base of unit. Possible graded bedding in calcarenite indicating sequence right way up. Bedding 32° to ca @ 46.9m, 35° to ca @ 50.0m.	Minor pyrite – most abundant in calcarenite. Trace pink/yellow fine grained sphalerite within thin calcite veins.					
52.45	75.30	EXTREMELY WEATHERED DOLOMITE AND CALCLUTITE. The zone is comprised of extremely weathered, broken, interbedded black dolomite						

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METERAGE From	METERAGE To	DESCRIPTION	MINERALIZATION	SAMPLE Nº	METERAGE From	METERAGE To	METERAGE Length	ASSAYS
52.45	75.30	CON'T: (generally less weathered and resistant) and light grey very calcareous, porous and leached weakly fossiliferous calclutite. Zone in part brecciated. Minor vughs calcite infilled. No bedding angles possible, however, possibly 20-30° to c.a. Parts of core very carbonaceous (generally in dolomitic sections) with black dolomite and carbonaceous fragments in a calcareous clayey matrix. Poor recoveries of 35%.						
75.30	81.70	INTERBEDDED CALCLUTITE, CALCARENITE DOLOMITE. Thin interbeds of calclutite and calcarenite generally 5-10 cm with thinner beds of crystalline dolomite interspersed throughout. Calclutites are fine grained, when acid etched have a black matrix, are pyritic. Bioclastic calcarenites are comprised of broken shelly debris, finer grained than further up the hole, minor crinoid ossicles? occasional pellets with calcite nuclei. Matrix also pyritic. Dolomite is not pyritic, is comprised of coarsely crystalline white crystals set within a black carbonaceous matrix. Core moderately to strongly calcite veined. Calcite veining in turn is occasionally rimmed by by yellow cream siderite. Veins vary in thickness from <1mm to 1.5 cm in width both perpendicular to and parallel to bedding. Bedding 20° to ca @ 76.8m. Bedding soft sediment deformed and rather chaotic in places.	Calclutites and Calcarenites have fine grained pyrite in the matrix.					
81.70	84.30	WEAKLY LAMINAR CALCLUTITES AND DOLOMITIZED CALCLUTITES. Fawn grained, medium grained crystalline dolomite appears to be selectively replacing certain beds within the laminar	Trace sphalerite as disseminated blebs.					

METERAGE From	METERAGE To	DESCRIPTION	MINERALIZATION	SAMPLE Nº	METERAGE From	METERAGE To	METERAGE Length	ASSAYS Cu	Pb	Zn	Ag	Mn
81.70	84.30	CONT: sequence. The bedding laminations are enhanced by carbonaceous filled stylolites parallel to bedding. Core is moderately calcite veined with trace siderite. Bedding 15° to ca @ 83.8 metres.										
84.30	85.50	SOFT SEDIMENT DEFORMED INTERBEDDED DOLOMITE, CALCLUTITE. Soft sediment deformed, load cast textured interbedded fine grained, unfossiliferous calclutites and uniformly crystalline sugary textured dolomite. Core moderately calcite veined, minor siderite. Core becoming increasingly veined and brecciated downhole. Trace sphalerite as thin veinlets associated with calcite veining.	Trace sphalerite as thin veinlets.									
85.50	90.00	TECTONIC ANGULAR CALCITE HEALED BRECCIA. Calclutites and dolomites appear to have been brecciated insitu with angular fragments occurring within a calcite cement. Numerous fragments are shot through with myriads of calcite veinlets. Both the footwall and hangingwall sections of the breccia have disseminated fine grained galena and a trace sphalerite as disseminations, blebs or as stringers running angular fragments. Estimates range up to 1% gn + sl. Minor pyrite is also associated with it. The calcite is coarsely crystalline. Minor stylolitikes carbonaceous infilled.	Disseminated galena and trace sphalerite up to 1% SL.	79701	85	86	1	30	2250	2000	—	5650
				79702	86	87	1	15	1150	560	1	1.35%
				79703	87	88	1	15	1400	1500	—	5500
				79704	88	89	1	20	2650	1250	1.5	6000
				79705	89	90	1	20	3450	2300	4.5	6000
90.00	94.30	STRONGLY VEINED, INTERBEDDED CALCLUTITE AND THIN DOLOMITES. Massive, fine grained weakly fossiliferous, weakly pyritic calclutites interbedded with thin (< 1.5 cm wide) black, crystalline,	Trace sphalerite as blebs in thin calcite veinlets.									

METERAGE From	METERAGE To	DESCRIPTION	MINERALIZATION	SAMPLE Nº	METERAGE From	METERAGE To	METERAGE Length	ASSAYS Cu	Pb	Zn	Ag	Mn
90.00	94.30	CON'T: pyritic dolomite. Bedding contacts invariably stylolitized, show signs of load casting and are faulted by thin <1cm wide calcite veins. Minor brecciation within calcite veins. Bedding 30° to c.a @ 92m.										
94.30	97.70	TECTONIC ANGULAR BRECCIA. Host rock calclutites have been literally blown apart by infusion of calcite cement as thin veinlets generally <5mm in width. Core strongly calcite cemented with minor zones of thicker veining present (1-5cm in width). Minor brecciated dolomite interbeds present <1.5cm in width.										
97.70	104.50	COARSE GRAINED CALCITE VEIN. Coarsely crystalline, white calcite containing minor zones of brecciated limestone and larger blocks of calcite veined calclutites. Minor carbonaceous veining.	Trace galena.									
104.5	105.9	INTERBEDDED CALCLUTITE, DOLOMITE. Massive, generally weakly to unfossiliferous, competent, extremely fine grained pyritic calclutites varying in width from 4-10 cm, interbedded with thin, <1cm in width, black weakly carbonaceous, fine grained, pyritic (fine grained) dolomite. Core moderately calcite veined and stylolitized. Bedding 45° to c.a @ 104.80 metres.	Pyrite in both calclutite and dolomite.	79706	105	106	1	20	1550	3150	6	2300
105.9	106.75	BRECCIA: Pb-Zn MINERALIZED. The breccia is composed of both large and very small fragments (2-5cm in width down to <1mm) predominantly of dolomite and calclutite which would have to have been moved into position as the surrounding rocks couldn't have supplied	Galena, sphalerite as fine grained disseminations within matrix and around fragment boundaries. ≅1.5% Gn-Sl.	79707	106	107	1	25	1750	3200	6.5	3000

METERAGE From	METERAGE To	DESCRIPTION	MINERALIZATION	SAMPLE Nº	METERAGE From	METERAGE To	METERAGE Length	ASSAYS
105.9	106.75	CON'T: the material. The matrix appears to be a combination of ground dolomite and calclutite with only minor calcite. Galena and sphalerite occur as blebs and dissemin-ations throughout but occur near fragment boundaries more often than not. Extremely fine grained pyrite occurs in the matrix also. Calcite veining appears to have cut the core later. Fragments are both angular to sub-angular possibly indicating movement. The overall appearance is of a dark coloured breccia very similar to that observed in ZT-81A-7 @ 50.2 to 52.2m.						
106.75	114.10	INTERBEDDED CALCLUTITE, DOLOMITE, CALCARENITE. Massive to well bedded calclutites are inter-bedded with very fossiliferous (shells up to 1.5cm in diam, minor coral fragments, pellets and other debris) horizons of bioclastic calcarenite, generally 5cm in width. Thinner ≤ 1cm wide, black dolomite beds occur sporadically throughout. Core strongly calcite veined and weakly siderific. Veining occurs as thick units to very thin ≤1 mm veinlets. Siderite rims fragments, found with veins and disseminated sphalerite occasionally occurs with the siderite. Bedding 30° to ca @ 112.5m. Lot of bedding attitudes disturbed by stylolitization and by cleavage?, shearing out bedding. Very competent, good recoveries.	Trace sphalerite.					
114.10	117.70	TECTONIC BRECCIA. Very competent, good recoveries. Predominant-ly calclutite fragments with minor dolomite, they are very angular, show signs of complete invasion and brecciation by						

METERAGE From	METERAGE To	DESCRIPTION	MINERALIZATION	SAMPLE Nº	METERAGE From	METERAGE To	METERAGE Length	ASSAYS Cu	Pb	Zn	Ag	Mn
114.10	117.70	CON'T : calcite veinleting, set within a calcite (coarsely crystalline, white, minor carbonaceous lamellae and to a lesser degree pale yellow siderite) matrix. The siderite appears to post date the calcite veining.										
117.70	118.80	VEINED CALCLUTITE. Moderately calcite veined massive calc-lutite lying in between two zones of intense calcite veining and brecciation.										
118.80	122.70	INTENSELY VEINED AND BRECCIATED CALCLUTITE, DOLOMITE. An interbedded sequence of calclutite/dolomite generally unfossiliferous has been subjected to intense calcite veinleting and in the process, brecciation. Zones within the unit could be classified as tectonic breccias. All bedding attitudes have been obliterated. Minor siderite occurs within the zone. A patch of coarsely crystalline galena (av ≈ 4% Gn-Sl over ½ m) sphalerite occurs at 120.5 m. Further fine grained disseminated sphalerite occurs around this zone. A further zone of sphalerite-galena occurs @ 121.40m average ≈ 2% Gn-Sl over 0.5 metre.	Coarsely crystalline yellow/pink sphalerite with minor galena occurs at 120.5 av ≈ 4% gn/sl over 0.5m.	79645	120.0	120.5	0.5	5	795	3150	2.5	2150
				79646	120.5	121.0	0.5	10	875	2.64%	4.0	2200
				79647	121.0	121.5	0.5	<1	865	2550	0.5	2900
122.70	132.10	INTERBEDDED SLUMPY TEXTURED CALCLUTITES, CALCARENITES, DOLOMITE. Strongly calcite veined, interbedded massive calclutites and thickly bedded calcarenites (comprised of coral stromatoporoids, oncolites and pellets and shelly debris) with minor thin dolomitic interbeds. Bedding very chaotic early on in the unit (possibly due to slumping) however, becoming very											

METERAGE From	METERAGE To	DESCRIPTION	MINERALIZATION	SAMPLE Nº	METERAGE From	METERAGE To	METERAGE Length	ASSAYS
122.7	132.1	CON'T: apparent with sharp contacts towards the base of the unit. Zone weakly stylolitized. More intense veining from 126.9 – 130.0 m. Bedding 40° to ca@ 131.2 metres.						
132.1	138.8	VEINED AND BRECCIATED INTERBEDDED CALCLUTITE DOLOMITE. An interbedded sequence of massive unfossiliferous calclutites, generally <5cm in width minor weakly fossiliferous thin calcarenites and thin black carbonaceous dolomites (usually < 1cm in width) has been invaded by pulses of calcite veining causing brecciation and intense local veinletting. Areas devoid of veining show weak soft sediment deformation: 35° to ca @ 135.7. Slickensiding and the formation of carbonaceous films occur in certain veins. Core badly broken – good recovery						
138.8	142.8	RHYTHMICALLY INTERBEDDED CALCLUTITE/DOLOMITE/MINOR CALCARENITE. 5 to 15 cm wide, massive to weakly bedded, weakly fossiliferous (shelly debris alligned parallel to bedding) calclutites interbedded with thin (< 1cm width) black carbonaceous and pyritic dolomite interbeds and minor thin (< 2cm wide) very shelly bioclastic calcarenites. Unit well bedded, contacts intensely stylolitized, minor soft sediment deformation. Bedding 45° to ca @ 139.4 m, 50° to ca. @ 141.40. Minor crystalline dolomite occurs pervasively throughout the unit – dolomitization secondary? Moderate calcite veining throughout.	Disseminated pyrite throughout thin dolomite interbeds					

METERAGE From	METERAGE To	DESCRIPTION	MINERALIZATION	SAMPLE Nº	METERAGE From	METERAGE To	METERAGE Length	ASSAYS
142.8	144.8	VEINED AND BRECCIATED CALCLUTITE MINOR DOLOMITE. Bedded calclutites, dolomite and minor fine grained calcarenites (comprised of fine skeletal debris) have been intensely riddled with calcite veins causing brecciation and disintergration of the host rock. A further pulse of calcite veining and healing caused further cross cutting (but larger diameter veins) but less brecciation and more healing of fractures. Zone is heavily stylolitized (carbonaceous infill). Minor pervasive dolomitization in the form of fine crystal aggregates.						
144.8	153.0	INTERBEDDED DOLOMITE / CALCLUTITE / CALCARENITE. This unit is predominantly dolomitic hence the overall dark grey to black appearance. The dolomite is very fine grained, carbonaceous but only weakly pyritic and in some cases is fossiliferous with pyritized coral fragments observed with the longest axis lying parallel to bedding. The width of the dolomite units vary from 15cm down to ± 1cm (av. 1.5cm). Rhythmically interbedded with the dolomites are thinly bedded calclutites and calcarenites. Both are very fossiliferous the latter being bioclastic. Matrix for both appears to be black (carbonaceous!) and very pyritic micrite. Numerous coral fragments are observed as well as pellets and minor shell fragments. Average width of these units are from 1 to 1.5 cm. Minor pervasive dolomitization is still evident. The zone is intensely cleaved, good bedding attitudes especially in the more carbonaceous dolomite sections. Bedding 15° to ca @ 144.6m, 15° to ca @ 146.2m, 30° to ca 149.4m. Core badly broken towards						

METERAGE From	METERAGE To	DESCRIPTION	MINERALIZATION	SAMPLE Nº	METERAGE From	METERAGE To	METERAGE Length	ASSAYS
144.8	153.0	CONT: base of unit (150.5-153.0) Cleavage parallel to core axis at 145.2 as is bedding? Core weakly calcite veined (generally <2mm diam.)						
153.0	163.6	VEINED AND BRECCIATED CALCLUTITE / CALCARENITE / DOLOMITE. The sequence at the top of the unit is predominantly massive calclutites with thin interbeds of dolomite (<0.5cm wide). Core shows signs of soft sediment deformation. Core from 155 to 159.7m is intensely calcite veined and brecciated with only strong to moderate veining surrounding this zone. Carbonaceous infilling occurs throughout the badly veined section of core. Core from 159.7 to 163.60m is predominantly dolomite with calclutite and calcarenite interbeds. Large coral fragments and fossiliferous zones occur in a chaotically interbedded sequence indicative of slumping. Small ovoid clasts within calcarenites are filled with a sparry calcite matrix. Sections of dolomite very pyritic	Dolomite occasionally pyritic.					
163.6	164.6	LAMINAR CALCLUTITE/CALCARENITE/ DOLOMITE. Very laminar and thinly interbedded massive calclutite, fossiliferous calcarenites (with fossil fragments and rock fragments? dolomitized and set in a black brown pyritic matrix) and black argillaceous dolomite lamellae. Trace crystalline, lemon coloured sphalerite disseminated throughout. Bedding 25° to a at 164.0 metres.	Trace sphalerite.					
164.6	175.4	SOFT SEDIMENT DEFORMED CALCLUTITE/ CALCARENITE / DOLOMITE. Interbedded, moderately soft sediment deformed, unfossiliferous calclutites and very fossiliferous (bioclastic - shelly, eucalith	Trace sphalerite and pyrite within calcite vein @ 175.45m.					

METERAGE From	METERAGE To	DESCRIPTION	MINERALIZATION	SAMPLE Nº	METERAGE From	METERAGE To	METERAGE Length	ASSAYS
164.6	175.4	CON'T: and pellets) calcarenites with a carbonaceous and very pyritic matrix occasionally showing pervasive dolomitization. Interbedded within this are thin beds (1-5cm in width) of laminar to massive medium grained carbonaceous dolomite. Core is mod. to strongly calcite veined, trace siderite. Numerous bedding attitudes are stylolitized and carbonaceous infilled. Bedding 38° to ca @ 168.9 m, 42° to ca @ 175.6m, Minor tectonic breccia @ 176.85 - 176.95m comprised of angular calcite and host rock fragments set within a black carbonate matrix.						
175.4	180.45	INTERBEDDED DOLOMITE/CALCLUTITE. Dark grey to black massive, thickly bedded (15-20cm) very pyritic (diss. and as veinlets) carbonaceous fine crystalline dolomite is interbedded with pelletal (concretionary layered pellets up to 0.6 cm diam., occasionally alternating layers comprised of pyrite, some have a nucleus of calcite, others none) and fossiliferous (bryozoan frags, shelly debris) laminar to massive (foliated or soft sediment slumped?) pyritic calclutites and calcarenites. Overall unit is very dark, distinctly dolomitic. Unit is well bedded with sharply defined contacts: 40° to ca @ 176.7m. Minor to moderate calcite veining occurs as veinlets <1cm in width generally later infilled by cream coloured siderite. The dolomite shows zones of rounded to ellipsoidal frag's, paralleling bedding set within a dolomite matrix (possibly rip up clasts?)	Trace sphalerite. Abundant pyrite 1-4% within dolomite and calclutite. Pyrite blebs generally occur with calcite. Diss. Pyrite on its own.					

METERAGE From	METERAGE To	DESCRIPTION	MINERALIZATION	SAMPLE Nº	METERAGE From	METERAGE To	METERAGE Length	ASSAYS
180.45	185.5	CALCAREOUS QUARTZ ARENITE. Soft sediment slumped (zones containing very laminar and cross bedded fragments set in a laminar matrix), laminar calcareous fine grained quartz arenites containing rip-up clasts and flame structures. Unit mottled light and dark grey in colour. Core showing no distinct clear cut bedding due to slumping. Core moderately calcite veined and brecciated containing minor siderite infilling. Tectonic breccia 185.0 - 185.2 metres.						
185.5	186.7	SLUMPED PYRITIC NODULAR CALCLUTITE DOLOMITE. Rounded to subrounded clasts and deformed beds of very nodular (pelletal) - concretionary layered, usually with pyritic layers, some with calcite nuclei, and fossiliferous calclutite and calcarenite set within a matrix of black fine grained very pyritic carbonaceous dolomite. Numerous pellets are also rimmed by pyrite or rim the clast boundaries. Dolomite matrix decreases down hole.	Minor to 1-3% Pyrite					
186.7	189.6	LAMINAR INTERBEDDED CALCLUTITE / DOLOMITE. Pale grey massive to finely laminar calclutites with minor thin interbeds of calclutite containing ovoid clasts of sparry calcite. Grading down hole into a 60/40 ratio of calclutite and darker dolomite with interbeds generally <0.5 cm and average from 1 to 3 mm. Bedding 28° to c.a. @ 189.4 metres. Stylolitization parallel to bedding is very evident - Weak calcite veining.	Minor pyrite					

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METERAGE From	METERAGE To	DESCRIPTION	MINERALIZATION	SAMPLE Nº	METERAGE From	METERAGE To	METERAGE Length	ASSAYS
189.6	190.7	SOFT SEDIMENT DEFORMED CALCLUTITE Massive very foliated and heavily stylolitized calclutite with moderate to strong calcite veining and brecciation. Trace siderite.						
		HOLE ABANDONED AT 190.7 metres (after breaking off drill string — and failing to retrieve hole).						