

1979/22. A diamond drill hole at Deep Bay, Cygnet.

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Abstract

A cored hole at Deep Bay, Cygnet [EN07761496] proved 53.8 m of Deep Bay Formation* beds resting paraconformably on 87.4 m of Bundella Mudstone.

INTRODUCTION

During mapping of the Kingborough Quadrangle it became apparent that there were major differences between the Permian succession at Cygnet and the standard Permian succession of the Hobart area. The most striking difference was the apparent absence of lateral equivalents of the Hobart Grange Mudstone sequence and the Hobart Faulkner Group in the Cygnet area. A hole was therefore sited to explore this part of the succession. The hole was located at Deep Bay, Cygnet. It went to a terminal depth of 141.2 m and proved 53.8 m of Deep Bay Formation* beds resting paraconformably on 87.4 m of Bundella Mudstone. No equivalents of either the Faulkner or Grange Mudstone were found and the results of the bore hole taken in conjunction with local fossil and field information further suggest the absence of the upper part of the Bundella Mudstone (Zone 3 of Clarke and Banks, 1975).

REFERENCE

CLARKE, M.J.; BANKS, M.R. 1975. The stratigraphy of the lower (Permo-Carboniferous) parts of the Parmeener Super-Group, Tasmania, in CAMPBELL, K.S.W.(ed.). *Gondwana geology* : 453-467. ANU Press : Canberra.

[10 July 1979]

* Unpublished formation name.

GEOLOGICAL LOG OF CYGNET NO. 1 (DEEP BAY) DIAMOND DRILL HOLE

Depth (m)	Description	Formation
0.00 - 1.53	Soil, buff and grey, clayey.	DEEP BAY FORMATION
1.53 - 2.08	Soil, light grey and buff, with fragments of grey and brown weathering fossiliferous siltstone.	
2.08 - 2.90	Siltstone, cream and buff, deeply weathered, fossiliferous.	
2.90 - 3.81	Siltstone, bryozoan, dark grey, light grey weathering, fissile. Much fossil debris. Some spiriferids.	
3.81 - 5.64	Siltstone, sandy, light grey and buff weathering, dark grey with many fossils. Bryozoa, <i>Strophalosia</i> , martiniopsids.	
5.64 - 6.10	Siltstone, grey and buff weathering, with much fossil debris and some fairly coarse sand grain size material scattered throughout.	
6.10 - 7.70	Siltstone, deeply weathered, grey and buff, with patches of very sandy siltstone with much coarse sand and granule size material.	
7.70 - 9.22	Siltstone, soft, deeply weathered, bryozoan, brown and buff weathering, dark grey with <i>Strophalosia</i> and small planispiral gastropods. (?small <i>Keeneia</i>).	
9.22 - 10.54	Silty mudstone, bryozoan, dark grey, medium grey and buff weathering, fissile, with <i>Strophalosia</i> and martiniopsids.	
10.54 - 11.76	Silty mudstone, bryozoan, medium to dark grey. <i>Fenestella</i> , <i>Stenopora</i> , spiriferids. Small lamellibranchs. Approaching a mudstone.	
11.76 - 12.65	Silty mudstone, medium grey, bryozoan, deeply weathered.	
12.65 - 13.87	Silty mudstone, bryozoan, medium grey, slightly weathered, some shelly fossils. Much fenestellid material and tubular stenoporids.	
13.87 - 14.63	Siltstone, dark grey, massive, compact, poorly fossiliferous, but with some spiriferids and <i>Fenestella</i> scattered throughout. Weathered along joint planes.	
14.63 - 15.40	Siltstone, hard, compact, medium grey, poorly fossiliferous but with brachiopods (spiriferids) scattered throughout and some scrappy fenestellid debris. A few tubular stenoporids.	
15.40 - 15.60	Siltstone, soft, light grey. Small pecten.	
15.60 - 17.07	Siltstone, hard, compact, dark grey, poorly fossiliferous but with scattered shells and fragments of brachiopods and lamellibranchs. Coarse ribbed pectens. A few scraps of <i>Fenestella</i> . Ostracods common in lowest 300 mm.	

GEOLOGICAL LOG OF CYGNET NO. 1 (DEEP BAY) DIAMOND DRILL HOLE (continued)

Depth (m)	Description	Formation
17.07 - 18.48	Siltstone, hard, compact, medium grey; uniform lithology throughout, massive, poorly fossiliferous but with scattered ostracods, brachiopod fragments and <i>Stenopora</i> throughout.	DEEP BAY FORMATION
18.48 - 18.65	Mudstone, dark grey, bryozoan (fenestellid mats).	
18.65 - 19.41	Siltstone, medium to dark grey, massive, upper half poorly fossiliferous. Lower half with a considerable amount of shell debris and shells. Brachiopods and lamellibranchs.	
19.41 - 21.52	Siltstone, medium to dark grey, compact, massive, bioturbate in parts, fossiliferous throughout, mainly brachiopods, a few pebbles.	
21.52 - 23.73	Siltstone, medium to dark grey, fossiliferous throughout, pectens, <i>Stenopora</i> , high-spined gastropods, <i>Strophalosia</i> , ribbed spiriferids. Bioturbate. Jointed.	
23.73 - 24.19	Siltstone, medium grey, hard, bioturbate, heavily fossiliferous in lowest 200 mm. Ribbed spiriferids, martiniopsids, <i>Strophalosia</i> with strong brachial ridges.	
24.19 - 25.91	Siltstone, medium grey, coarse, with much material of granule size throughout. Fauna dominated by small gastropods throughout, though with some ribbed spiriferids and some scraps of tubular stenoporids. Bioturbate.	
25.91 - 29.09	Siltstone, dark grey, hard, compact, bioturbate throughout and in parts heavily bioturbate. A scattering of dropped pebbles (up to 20 mm long) throughout and some granule size clasts. Fairly uniform lithology, no fossils seen. Jointed.	
29.09 - 31.86	Siltstone, dark grey, hard, compact, bioturbate, unfossiliferous.	
31.86 - 32.57	Siltstone, coarse, sandy, some pebbles (up to 20 mm long) and much granule size clastic material. No fossils seen.	
32.57 - 33.66	Silty mudstone, dark grey, fairly smooth, massive, no pebbles, no fossils.	
33.66 - 36.18	As above, (possible shell at 34.66 m).	
36.18 - 37.42	Siltstone, dark grey with many small angular clasts of quartz and ?feldspar. Bioturbate. A few pebbles (up to 20 mm). No fossils seen. Joint plane covered with calcite crystals.	

GEOLOGICAL LOG OF CYGNET NO. 1 (DEEP BAY) DIAMOND DRILL HOLE (continued)

Depth (m)	Description	Formation
37.42 - 38.80	Mudstone, silty, dark grey, massive, uniform lithology. Small amount of granule size clasts. No fossils.	DEEP BAY FORMATION
38.80 - 40.50	Siltstone, coarse, bioturbate, with much pebble and granule size material. ?Pyritised plant fragment at 40.16 m - has fibrous appearance and runs across whole diameter of core. Otherwise no fossils seen.	
40.50 - 42.99	Silty mudstone, dark grey, massive, uniform lithology. No pebbles. No fossils except for a sheet of <i>Stenopora</i> at 42.99 m.	
42.99 - 43.52	Siltstone, coarse with much granule size material - no fossils.	
43.52 - 44.59	Siltstone, coarse with much granular material - no fossils. Small, scattered pebbles throughout.	
44.59 - 45.66	Siltstone, coarse, bioturbate, pebbly and granule size quartz clasts very common. Some shells (spiriferids).	
45.66 - 48.42	Siltstone, dark grey, fairly massive, bioturbate, fossiliferous throughout - mainly spiriferid, but also ?lamellibranchs and a few scraps of spirifer and stenoporids.	
48.42 - 49.54	Siltstone, dark grey, fossiliferous throughout. ? <i>Eurydesma</i> , <i>Grantonia</i> , pectiniform lamellibranchs. A few patches with dropped pebbles (up to 20 mm long). Bioturbate. Much granule size material in lowest 200 mm.	
49.54 - 50.58	Siltstone, dark grey, bioturbate, only a few fossil fragments.	
50.58 - 50.64	Siltstone, full of fossil debris, pebbles up to 40 mm long.	
50.64 - 51.04	Silty mudstone, dark grey, even, uniform lithology, soft, no pebbles, no fossils, no bedding, massive.	
51.04 - 52.82	Siltstone, medium to dark grey with pebbles, boulders and much granule size material - gives rock a speckled appearance. <i>Stenopora</i> at 51.72 m. Very coarse pebbly rock with shells from 52.12 m. Bioturbate throughout.	
52.82 - 53.28	Mudstone, silty, striped, medium grey, ?flaser type bedding. Rock consists of grey mudstone, with thin, (up to 10 mm) but mainly 2.5 mm thick laminations and lenses of cross-laminated sands. No pebbles. No fossils. Junction with beds above and below sharp. About 10% of rock overall is composed of sand.	

GEOLOGICAL LOG OF CYGNET NO. 1 (DEEP BAY) DIAMOND DRILL HOLE (continued)

Depth (m)	Description	Formation
53.28 - 53.35	Siltstone, coarse, bioturbate, with granule size clasts.	BUNDELLA MUDSTONE
53.35 - 53.91	Sandstone, coarse, quartzitic, pebbly, irregular bedding with fragments of mudstone and siltstone. Pecten.	
53.91 - 56.22	Sandstone, silty, speckled, bioturbate, pebbles (up to 10 mm) in abundance. Particularly lowest 300 mm.	
56.22 - 56.30	Silty mudstone, with cross-bedded, fine-grained sandstone laminations and lenses.	
56.30 - 56.50	Sandstone, coarse-grained, with thin (2 mm) partings of siltstone. No fossils.	
56.50 - 56.61	Mudstone, dark grey to black with sandy laminations.	
56.61 - 56.66	Coarse sandstone.	
56.66 - 58.28	Siltstone, muddy, dark grey to black with fine-grained cross-bedded sandy laminations. With a number of small-scale sedimentary structures. Striped beds.	
58.28 - 58.84	Sandstone, very coarse-grained, pebbly (up to 10 mm) with siltstone pellets and some thin siltstone laminations.	
58.84 - 63.16	Siltstone, hard, dark grey, bioturbate, fossiliferous. Mainly stenoporids but also <i>Eurydesma</i> . Pyrite along joint planes. Small area of slickensiding at 59.05 m. Fossils fairly frequent and distributed throughout core. <i>Trigonotreta stokesi</i> at 62.78 m.	
63.16 - 64.30	Siltstone, medium and dark grey, massive, bioturbate, no fossils, uniform lithology throughout.	
64.30 - 64.64	Siltstone, dark to medium grey, with a few shells and some <i>Fenestella</i> . Very hard.	
64.64 - 65.09	Siltstone, medium to dark grey, bioturbate, no fossils.	
65.09 - 65.35	Siltstone, as above but with some shells (? <i>Grantonia</i>).	
65.35 - 66.18	Siltstone, dark, hard, grey, uniform lithology, no marked bioturbation. No fossils.	
66.18 - 67.84	Siltstone, dark grey, bioturbate, fossiliferous, pecten, <i>Stenopora</i> . Fossils mainly bryozoa.	
67.84 - 68.45	Siltstone, medium grey, bioturbate, fossiliferous.	
68.45 - 68.50	<i>Eurydesma</i> , <i>Stenopora</i> , <i>Fenestella</i> , ribbed spiriferids. Mudstone, soft, light grey.	

GEOLOGICAL LOG OF CYGNET NO. 1 (DEEP BAY) DIAMOND DRILL HOLE (continued)

Depth (m)	Description	Formation
68.50 - 68.88	Siltstone, medium grey, unfossiliferous.	BUNDELLA MUDSTONE
68.88 - 72.71	Siltstone, medium grey, bioturbate, fossiliferous. Fauna dominated by stenoporids but with minor amounts of <i>Fenestella</i> and some brachiopod fragments. Uniform lithology throughout.	
72.71 - 74.19	Siltstone, coarse, medium grey, massive, but with occasional wispy laminae of mudstone. Fossiliferous throughout. Mainly sheets of bryozoa but with some ribbed spiriferids and some other shells.	
74.19 - 74.44	Siltstone, wispy bedded, with thin laminae of fine sand. Lowest 50 mm with coarse sand. Heavily bioturbate.	
74.44 - 75.86	Siltstone, massive, medium grey, bioturbate, bryozoan with some ribbed spiriferids - core jointed.	
75.86 - 76.04	Siltstone, medium grey, with stenoporids, and with numerous irregular laminae of mudstone.	
76.04 - 76.45	Siltstone, darker grey than above, massive, bioturbate, with bryozoa and shells.	
76.45 - 77.33	Siltstone, dark grey, more muddy than beds immediately above. Fossiliferous throughout, <i>Stenopora</i> , fenestellids. Core irregularly jointed and broken - with calcite veining along joints. Slickensides on ends of some core sections. Pyrite on joints.	
77.33 - 77.44	Mudstone, dark grey, soft, very broken, most of core fragments show slickensiding and polished surfaces.	
77.44 - 77.54	No fossils seen. ?Small fault. Mudstone, silty, dark grey, bryozoan.	
77.54 - 77.69	Mudstone, light grey, with greenish tinge, all crushed and broken - heavily slickensided and polished throughout.	
77.69 - 78.00	Siltstone, medium grey, hard, upper 300 mm bioturbate, with brachiopods and bryozoa.	
78.00 - 78.51	Siltstone, hard, dark grey, finely laminated. No fossils.	
78.51 - 82.32	Siltstone, hard, medium grey, bioturbate, speckled in parts. Much fossil material throughout - mainly stenoporids and fenestellid bryozoans - but also <i>Grantonia</i> and other shell debris.	

GEOLOGICAL LOG OF CYGNET NO. 1 (DEEP BAY) DIAMOND DRILL HOLE (continued)

Depth (m)	Description	Formation
82.32 - 86.90	Siltstone, medium grey, hard, massive, bioturbate. Fossiliferous throughout. Stenoporids, fenestellids, <i>Eurydesma</i> . Pyrite along joint planes. Calcite filled joint cavity at 83.27 m. Only slight variations in lithology throughout core. <i>Eurydesma</i> at 85.80 m.	BUNDELLA MUDSTONE
86.90 - 91.92	Siltstone, medium grey, hard, uniform lithology throughout. Fossiliferous - mainly <i>Stenopora</i> but with some shells. Pyrite along joint plain at 88.20 m. Open joints at 88.69 m covered with calcite crystals. A few small dropped pebbles.	
91.92 - 96.04	Siltstone, medium to dark grey, massive, mainly bryozoan (stenoporids) but with scattered shells throughout. Pyrite and ?pyrite alteration products (dark green) on joint planes at 94.18 m.	
96.04 - 96.65	Siltstone, dark grey, even, uniform lithology, very few fossils (a few scraps of <i>Stenopora</i>). A few dropped pebbles.	
96.65 - 96.80	Brecciated, vein material - cavities calcite filled. Apparently only small movement - not a major fault.	
96.80 - 97.66	Siltstone, dark grey, with shells and stenoporids throughout. Some dropped pebbles. Pyrite and calcite down joint faces.	
97.66 - 99.14	Siltstone, light grey, coarse, speckled, bioturbate, with dropped pebbles, sandy in lower part, possible grading into a fine-grained sandstone at base. Irregular carbonaceous or mudstone laminae; wispy bedded.	
99.14 - 99.44	Muddy siltstone, dark grey, massive, few fossils but a few shell fragments.	
99.44 - 101.75	Siltstones and sandy siltstones; light and dark grey, bioturbate, shelly throughout. Speckled in part. Alternations and gradations of various siltstones down core. No sharp junctions.	
101.75 - 102.18	Siltstone, dark grey, bioturbate, some dropped pebbles. <i>Stenopora</i> and shells.	
102.18 - 102.44	Sandy siltstone, or fine-grained sandstone; light grey, bioturbate, base irregular.	
102.44 - 106.63	Siltstone, medium and dark grey, bioturbate throughout. Passes into units of more sandy material and back to siltstone again several times. Bedding very disturbed, very fossiliferous. Ribbed spirifers throughout. Some stenoporids, wispy mudstone laminae in places. Pyrite associated with mudstone laminae. Some dropped pebbles.	

GEOLOGICAL LOG OF CYGNET NO. 1 (DEEP BAY) DIAMOND DRILL HOLE (continued)

Depth (m)	Description	Formation
106.63 - 111.59	Siltstones and sandy siltstones; dark and medium grey, hard, massive, with dropped pebbles and a ?brecciated boulder at 109 m. Siltstones and sandy siltstones alternate at 150 mm - 200 mm intervals. Highly fossiliferous. Mainly coarse ribbed pecten and <i>Trigonotreta</i> . Much of core highly bioturbate. Pyrite associated with more muddy bands. Has speckled appearance in places. Very fossiliferous.	BUNDELLA MUDSTONE
111.59 - 112.12	Siltstone, hard, dark grey, compact, bioturbate, shell material throughout.	
112.12 - 114.89	Siltstones and muddy siltstones, highly fossiliferous throughout. In places crowded with shell material. Fossils mainly spiriferids - little or no bryozoan material.	
114.89 - 115.22	Mudstone, calcareous, dark grey, very hard, compact, massive, shelly, fine-grained, dense, with <i>Strophalosia</i> . Cement is calcite.	
115.22 - 116.39	Silty mudstones and siltstones, dark grey, crowded with shells. Spiriferids(ribbed) and <i>Strophalosia</i> . Pyrite in places. Slickensiding around fossils in muddiest parts (shell bed).	
116.39 - 121.32	Siltstones and sandy siltstones, grey, massive, with dropped pebbles, bioturbate. Pyrite along both bedding planes and joint planes. Highly fossiliferous; mainly shells but some stenoporids. <i>Eurydesma</i> , ribbed spiriferid, <i>Strophalosia</i> .	
121.32 - 122.05	Siltstone, dark grey, with bryozoan fragments, few shells. Disseminated pyrite.	
122.05 - 122.87	Sandy siltstone, verging on fine-grained sandstone; bioturbate, some dropped pebbles, and ?large boulder at 122.83 m. A few shell fragments in lower half. Light grey.	
122.87 - 124.06	Sandy siltstone, light grey, compact, massive, bioturbate, occasional shells and some stenoporids.	
124.06 - 124.19	Laminated siltstone and fine sandstone, laminations disturbed by bioturbidity.	
124.19 - 126.09	Siltstone and sandy siltstone; medium grey, hard, massive, scattered <i>Stenopora</i> , and a few shell fragments. Disseminated pyrite throughout. Small scattered pebbles.	
126.09 - 128.73	Siltstone, sandy, hard, compact, massive, bioturbate in part, few fossils (a few shells and a few stenoporids).	

GEOLOGICAL LOG OF CYGNET NO. 1 (DEEP BAY) DIAMOND DRILL HOLE (continued)

Depth (m)	Description	Formation
128.73 - 129.01	Siltstone, darker grey than above, no fossils, pyrite.	BUNDELLA MUDSTONE
129.01 - 129.24	Siltstone, very dense, very hard, with <i>Eurydesma</i> , pyritic.	
129.24 - 129.78	Speckled sandy siltstone; some shells, bioturbate, much granule size material.	
129.78 - 132.32	Siltstone, fine to muddy, dark grey, hard, dense, fossiliferous throughout, <i>Stenopora</i> , <i>Trigonotreta stokesi</i> , high-spined gastropods. Much pyrite disseminated through core and along joint planes.	
132.32 - 132.88	Siltstone, hard, dense, bioturbate, a few scraps of fossils, preservation of fossils partly in pyrite. Lamellibranchs.	
132.88 - 133.38	Siltstone, coarse, sandy, bioturbate, no fossils seen. Disseminated pyrite, many granule size clasts.	
133.38 - 133.94	Siltstone, hard, grey, no fossils, massive, with veins, and disseminated pyrite.	
133.94 - 135.75	Siltstones and sandy siltstones, irregular wispy bedded. Bioturbate, a few scattered fossils. Pyrite associated with calcite of fossils and along joint planes.	
135.75 - 140.55	Siltstones, grey, hard, fossiliferous, (scattered through core). <i>Trigonotreta</i> , <i>Stenopora</i> , <i>Fenestella</i> , <i>Deltopecten</i> . Fossils partly preserved in pyrite. Dropped boulder at 138.99 m.	
140.55 - 140.98	Siltstone, hard, compact, fine to muddy, dark grey, a few dropped pebbles. <i>Strophalosia</i> . Stenoporids.	
140.98 - 141.29	Siltstone, sandy, fossils in top 100-150 mm. Pyrite in joint planes.	
Hole terminated at 141.29 m.		