

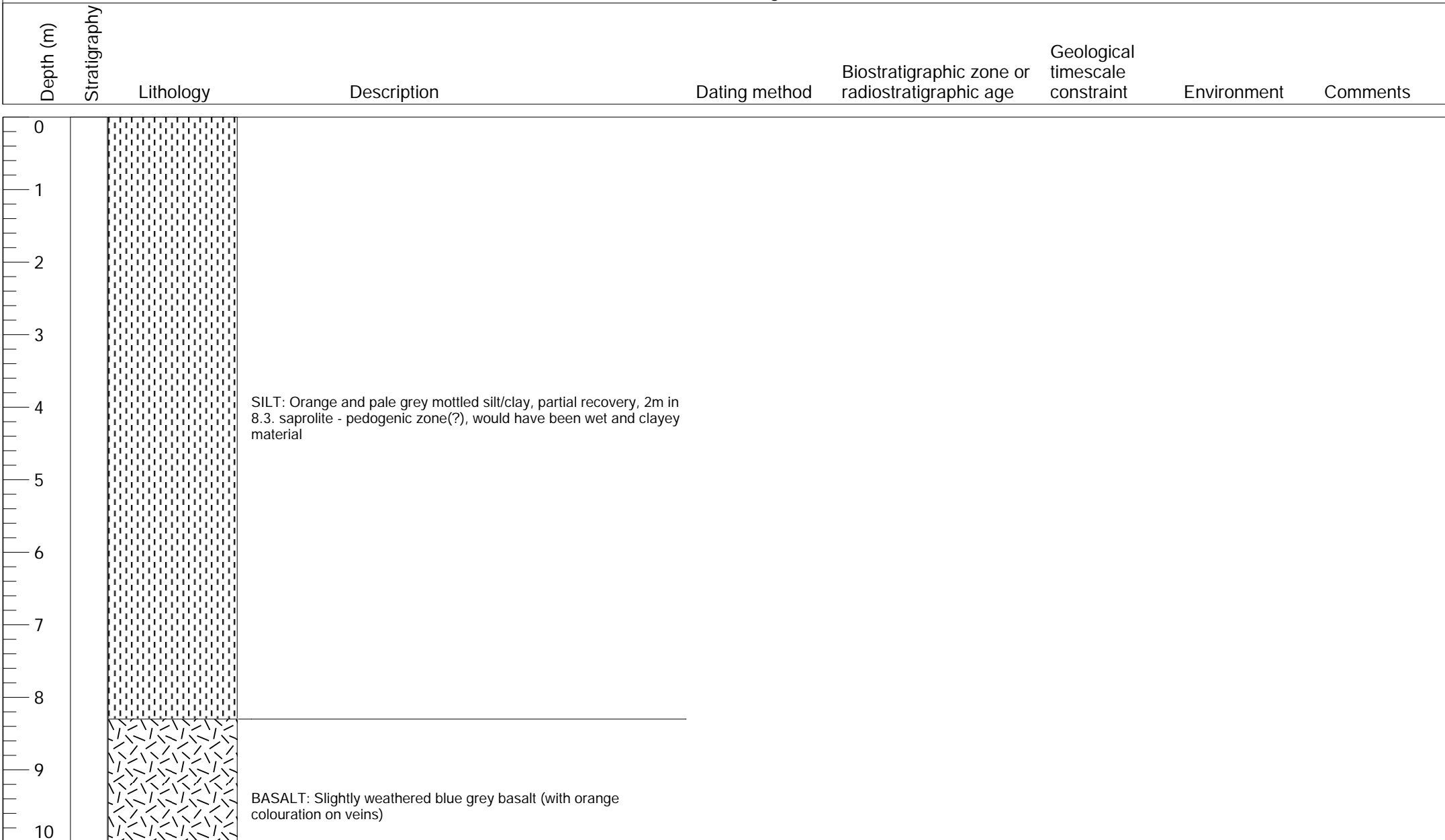
Sponsor: Department of Mines  
 Drill date: 15/08/1984  
 Drilling Method: Diamond  
 Azimuth: 0 degrees Dip: -90  
 Coordinates: 487718mE 5446018mN GDA94 Zone 55 MGA RL: 39.5m AHD

## Launceston Group Stratigraphy

Logged by: University of Canberra: Leah Moore, M Sweeney, K Croft,  
 L Philippa; Palynology: M McPhail; Compiler: C Mazengarb

Drill length: 340.6m

Drillhole TIGER ID: 13968  
 Name: BB-BH1  
 Location: Bell Bay




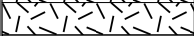
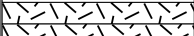





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Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
10	Cenozoic basalt							
11			BASALT: Slightly weathered dark blue-grey basalt					
12			No core					
13			BASALT: Moderately weathered basalt					
14			BASALT: Highly weathered kaolinised basal					
15								
16			BASALT: Slightly weathered basalt, medium blue grey. Vesicular?					
16			BASALT: Moderately weathered basalt, orange on surfaces					
17								
18			No core					
19								
20			BASALT: Slightly weathered basalt. May be relocated downhole.					

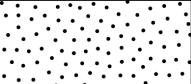
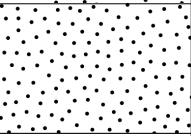
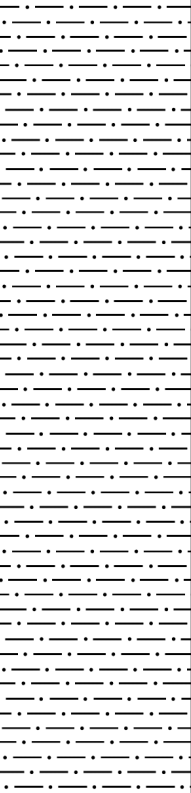
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Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
20			No core					
21			COARSE SAND: Moderately well Orange and white coarse sand unconsolidated, moderately well sorted					
22			FINE SAND: Well sorted Pale brown fine sand					
23								
24								
25								
26								
27								
28								
29			SILT: Well sorted pale brown					
30								

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Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
30								
31								
32								
33								
34								
35			FINE SAND: Well sorted Pale brown fine sand					
36								
37								
38								
39			SILT: Well sorted pale brown					

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40								
41								
42								
43								
44								
45			MEDIUM SAND: Well sorted Medium sand more iron rich (orange) up profile					
46								
47			IRONSTONE: Well sorted Cemented ferruginous interval. Sharp contact					
48								
49			SILT: brown					

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50								
51								
52								
53			CARBONACEOUS SILT: Black carbonaceous silt with plant material, fissile	+ Palynology	<i>Upper Nothofagidites asperus Zone</i>	earliest Oligocene - Early Oligocene	Coastal plain	
54			SILT: brown					
55								
56								
57			FINE SAND: white-pale grey					
58			CARBONACEOUS FINE SAND: Black carbonaceous silt, with plant material, fissile					
59								

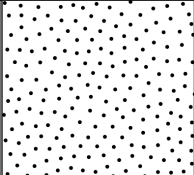
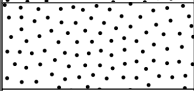
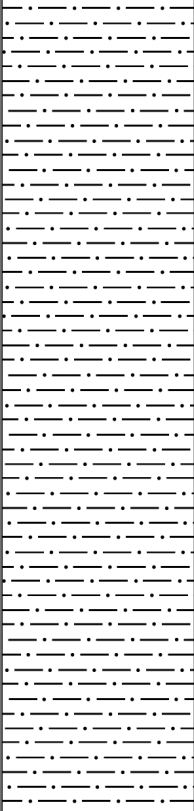
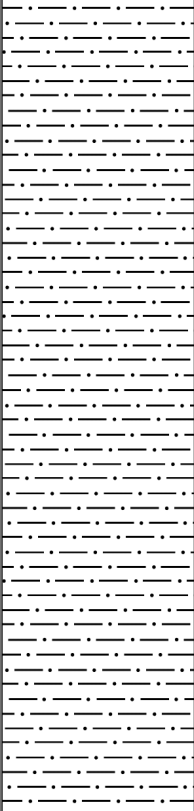
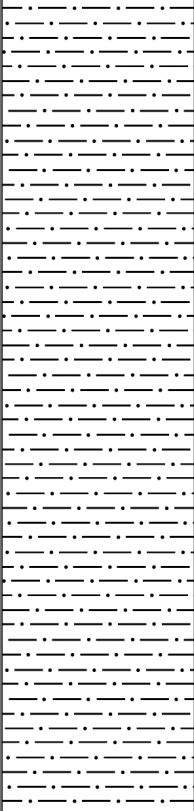
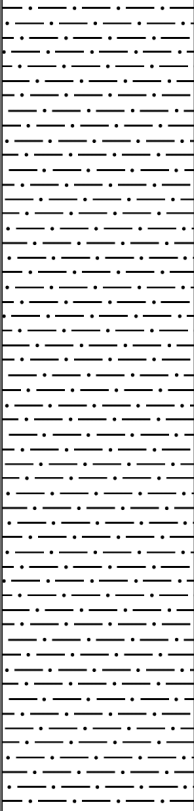
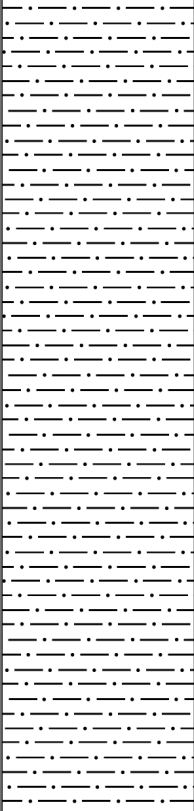
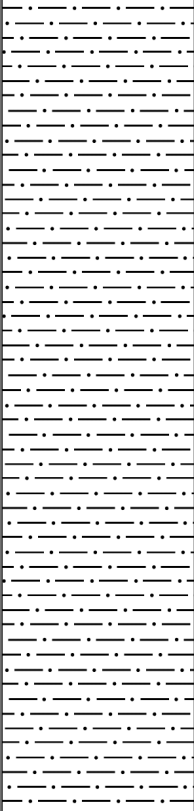
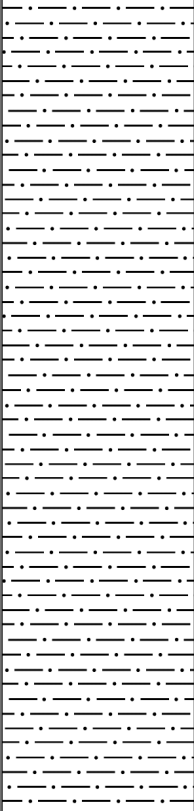
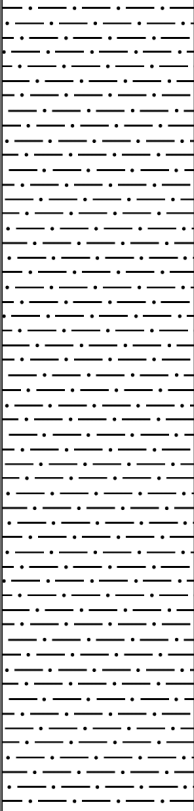
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Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
60			FINE SAND: White pale grey					
61			FINE SAND: brown					
62			SILT: brown					
63								
64								
65								
66								
67								
68								
69								

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Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
70								
71								
72								
73								
74			SILT: leaf fossils reserved in lamination/fracture					
75			FINE SAND: grey					
76								
77								
78								
79								

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Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
80								
81								
82								
83								
84			SILT: brown					
85								
86								
87								
88								
89								

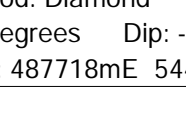
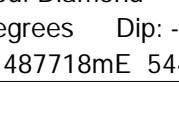

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Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
90								
91								
92								
93			SILT: pale grey					
94								
95			FINE SAND: purple (fine sand interval)					
			SILT: pale grey					
			COARSE SAND: pale grey					
96			CONGLOMERATE: pale grey (bleached?) conglomerate with coarse sand matrix, small pebble conglomerate					
97								
98								
99								

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100			CONGLOMERATE: dolerite conglomerate, poorly sorted pebble conglomerate, matrix supported, between large dolerite cobbles and boulders up to 30 cm. Matrix = yellow fine sand at base of section, but transitions into moderately brown coarse sand for balance of section .					
101								
102								
103								
104								
105								
106								
107								
108								
109								

Possible

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Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
110								unconformity
111			FINE SAND: very pale grey silt grading up to fine sand					
112								
113								
114			SILT: dark brown silt with bioturbation?	+ Palynology	<i>Proteacidites asperopolus</i> Zone	mid Early Eocene-early Eocene	Fen	
115			SILT: pale grey					
116			SILT: pale brown to brown up profile, bioturbated? Silt					
117								
118			FINE SAND: pale grey fine sand grading up into pale grey silt					
119			FINE SAND: pale grey					
			SILT: black carbonaceous silt, fracture fabric approximately 35-40					

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Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
120			degrees from horizontal					
			SILT: bleached interval around 20cm inclined					
			SILT: black carbonaceous silt, fracture fabric approximately 35-40 degrees from horizontal					
121								
122			FINE SAND: pale grey fine sand, inclined fabric ~ 40-45 degrees from horizontal					
123								
			SILT: brown silt fracture fabric spaced ~ 35-40 degrees from horizontal					
			FINE SAND: 5cm interval, similarly inclined					
124			SILT: brown silt fracture fabric spaced ~ 35-40 degrees from horizontal					
125								
			SILT+ FINE SAND: alternating black silt and brown fine sand mm scale laminations, well developed fracture fabric ~ 40-45 from horizontal (sample looks like stacked pringles).					
126								
127								
128			FINE SAND: pale medium grey fine sand-silt					
129								
			SILT: brown silt with black carbonaceous plant material fracture					

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130			fabric~ 40-45 degrees from horizontal					
131								
132			SILT: brown silt broadly spaced fracture fabric~4cm spacing, ~45-50 degrees from horizontal					
133								
134								
135			SILT: pale grey/pale brown					
135			IRONSTONE: Cemented ferruginous interval(~5cm)					
136								
137								
138			SILT: pale grey/pale brown					
139								

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140								
141			SILT: dark brown					
142								
143			SILT: grey/black carbonaceous silt with plant material, fracturing fabric ~35-40 degrees from horizontal					
144			SILT: pale grey					
145								
146								
147								
148								
149			SILT: pale yellow brown					

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150	Launceston Group							
151								
152								
153								
154				SILT: black carbonaceous silt interval ~ 30cm with plant material				
155				SILT: pale grey				
156				SILT: dark grey carbonaceous silt~ 20cm with plant material				
157				SILT: pale grey				
158								
159				COARSE SAND: Moderately pale grey				

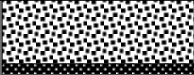
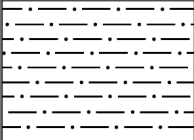
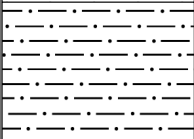
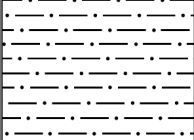
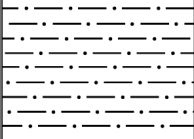
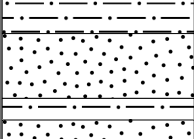
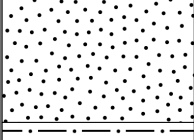
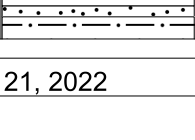



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160			IRONSTONE: Cemented ferruginous interval (~5cm)					
161			SILT: brown silt with ~ 5cm interval of yellow brown fine to medium sand (gradual boundary)					
162								
163								
164			SILT: yellow brown					
165								
166								
167								
168			FINE SAND: yellow brown fine sand interval ~ 50 cm with vegetation					
169			SILT: yellow brown					
			FINE SAND: yellow brown					
			SILT: yellow brown silt interval~ 20 cm					
			FINE SAND: yellow brown					

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170								
171			SILT: yellow brown					
172								
173			FINE SAND: Yellow brown					
			SILT: Yellow brown silt interval (20cm)					
174			FINE SAND: Yellow brown fine sand					
175								
176			SILT: Brown grey					
177			FINE SAND: Yellow brown					
178								
179			SILT: Brown grey					
			CARBONACEOUS SILT: Black carbonaceous silt with plant	+ Palynology	<i>undifferentiated Malvacipollis diversus Zone</i>	early Early Eocene-mid Early Eocene	Fen	

Sponsor: Department of Mines  
 Drill date: 15/08/1984  
 Drilling Method: Diamond  
 Azimuth: 0 degrees Dip: -90  
 Coordinates: 487718mE 5446018mN GDA94 Zone 55 MGA RL: 39.5m AHD

## Launceston Group Stratigraphy

Logged by: University of Canberra: Leah Moore, M Sweeney, K Croft,  
 L Philippa; Palynology: M McPhail; Compiler: C Mazengarb

Drill length: 340.6m

Drillhole TIGER ID: 13968  
 Name: BB-BH1  
 Location: Bell  
 Bay

Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
180			material. Transitional base from medium sand					
181								
182			MEDIUM SAND: Well sorted, pale grey medium sand					
183								
184								
185			MEDIUM SAND TO FINE SAND: Fining upward medium grey medium sand to pale gret fine sand					
186			FINE SAND: Black carbonaceous mm-laminated interval (sandy) ~20cm					
187			SILT: yellow brown					
188								
189			MEDIUM SAND: yellow brown fine to medium sand					


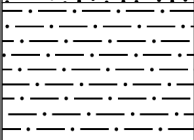
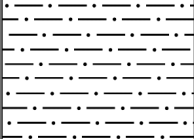
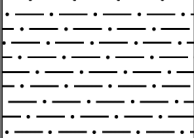
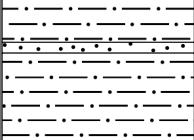
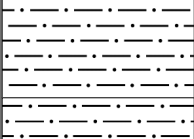
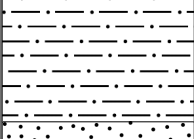
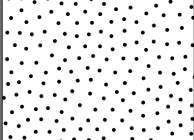
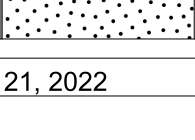

Sponsor: Department of Mines  
 Drill date: 15/08/1984  
 Drilling Method: Diamond  
 Azimuth: 0 degrees Dip: -90  
 Coordinates: 487718mE 5446018mN GDA94 Zone 55 MGA RL: 39.5m AHD

## Launceston Group Stratigraphy

Logged by: University of Canberra: Leah Moore, M Sweeney, K Croft,  
 L Philippa; Palynology: M McPhail; Compiler: C Mazengarb

Drill length: 340.6m

Drillhole TIGER ID: 13968  
 Name: BB-BH1  
 Location: Bell  
 Bay

Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
190								
191			SILT: yellow brown					
192								
193								
194								
195								
195								
196								
197			SILT: grey carbonaceous silt					
198								
199			FINE SAND: medium grey brown alternating silt and fine sand					

Sponsor: Department of Mines  
 Drill date: 15/08/1984  
 Drilling Method: Diamond  
 Azimuth: 0 degrees Dip: -90  
 Coordinates: 487718mE 5446018mN GDA94 Zone 55 MGA RL: 39.5m AHD

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Drill length: 340.6m

Drillhole TIGER ID: 13968  
 Name: BB-BH1  
 Location: Bell  
 Bay

Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
200								
201								
202			FINE SAND: medium grey brown fine sand					
203			FINE SAND: pale grey					
204			SILT: pale brown grey					
205			IRONSTONE: Cemented ferruginous interval (~5cm)					
206								
207								
208								
209			SILT: pale brown grey					

Sponsor: Department of Mines  
 Drill date: 15/08/1984  
 Drilling Method: Diamond  
 Azimuth: 0 degrees Dip: -90  
 Coordinates: 487718mE 5446018mN GDA94 Zone 55 MGA RL: 39.5m AHD

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Drill length: 340.6m

Drillhole TIGER ID: 13968  
 Name: BB-BH1  
 Location: Bell Bay

Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
210								
211								
212								
213								
214								
215			MEDIUM SAND: pale brown grey fine to medium sand					
216								
217			SILT: pale brown grey					
			LOOSE SAND: loose sand possibly associated with core loss?					
218								
219			NO CORE					

Sponsor: Department of Mines  
 Drill date: 15/08/1984  
 Drilling Method: Diamond  
 Azimuth: 0 degrees Dip: -90  
 Coordinates: 487718mE 5446018mN GDA94 Zone 55 MGA RL: 39.5m AHD

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Drill length: 340.6m

Drillhole TIGER ID: 13968  
 Name: BB-BH1  
 Location: Bell  
 Bay

Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
220			SILT: pale-medium grey silt/clay					
221			FINE SAND: pale- medium grey					
222								
223			SILTY FINE SAND: dark grey carbonaceous silty fine sand					
224								
225			VERY FINE SAND: medium grey very fine sand with mottles above ferruginous interval					
226			IRONSTONE: Cemented ferruginous interval (~5cm)					
227								
228			VERY FINE SAND: medium grey very fine sand with silty intervals and minor plant material					
229								

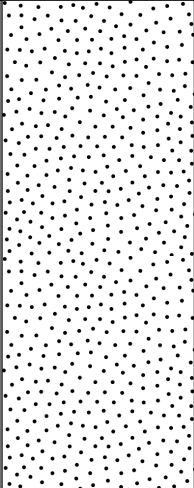
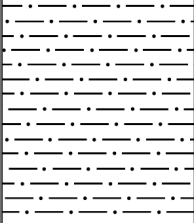
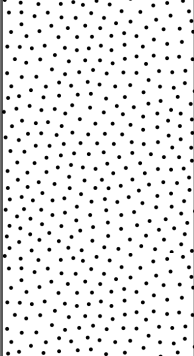
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 Drill date: 15/08/1984  
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Drill length: 340.6m

Drillhole TIGER ID: 13968  
 Name: BB-BH1  
 Location: Bell  
 Bay

Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
230								
231								
232			VERY FINE SAND: medium grey very fine sand with silty intervals and minor plant material in irregular orientation					
233								
234								
235								
236			SILT: grading upward pale- medium grey silt to fine sand no carbonaceous material					
237								
238								
239			FINE SAND: medium grey					

Sponsor: Department of Mines  
 Drill date: 15/08/1984  
 Drilling Method: Diamond  
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Drill length: 340.6m

Drillhole TIGER ID: 13968  
 Name: BB-BH1  
 Location: Bell Bay

Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
240								
241								
242								
243			FINE SAND: medium grey fine sand with intervals of carbonaceous material (<20%, dark)					
244			FINE SAND: fine sand with subvertical laminations parallel ?slump horizon					
245			FINE SAND: formerly saturated? Fine sand slump horizon? Formerly saturated was a slurry, irregular shape SILT: black carbonaceous silt with mm laminated (fissile) lignite	+ Palynology	<i>undifferentiated Malvacipollis diversus Zone</i>	early Early Eocene-mid Early Eocene	Fen	
246			FINE/MEDIUM SAND: medium grey fine to medium sand with irregularly spaced ~1cm subhorizontal plant material					
247			IRONSTONE: Cemented ferruginous interval (~10cm)					
248								
249			FINE/MEDIUM SAND: medium grey fine to medium sand with					

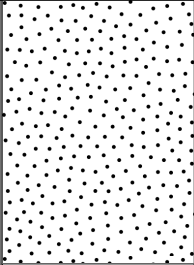
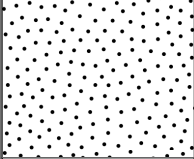

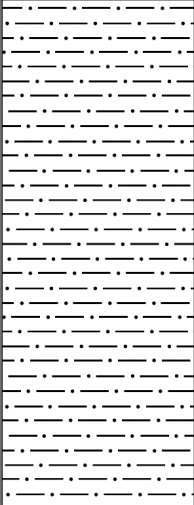
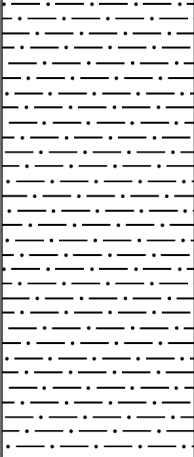
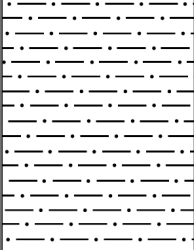
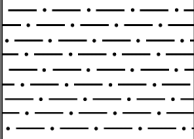

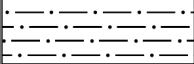


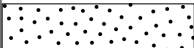
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Drill length: 340.6m

Drillhole TIGER ID: 13968  
 Name: BB-BH1  
 Location: Bell Bay

Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
250			irregularly spaced ~1cm subhorizontal plant material					
251								
252								
253								
254								
255			SILT: medium grey silt with intervals of fine sand					
256								
257			IRONSTONE: Cemented ferruginous interval (~10cm)					
258			SILT: medium grey silt with intervals of fine sand					
258			FINE/MEDIUM SAND: pale grey fine to medium sand (<3% plant material)					
258			IRONSTONE: Cemented ferruginous interval (~10cm)					
259								

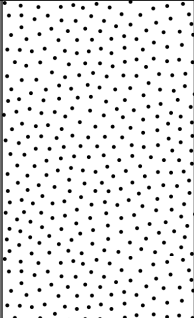
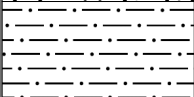
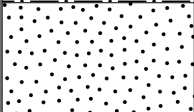
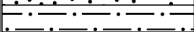
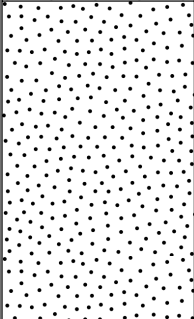
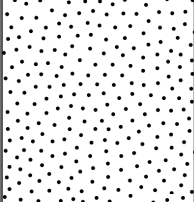
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 Coordinates: 487718mE 5446018mN GDA94 Zone 55 MGA RL: 39.5m AHD

## Launceston Group Stratigraphy

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 L Philippa; Palynology: M McPhail; Compiler: C Mazengarb

Drill length: 340.6m

Drillhole TIGER ID: 13968  
 Name: BB-BH1  
 Location: Bell  
 Bay

Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
260			FINE/MEDIUM SAND: pale grey fine to medium sand with regularly spaced intervals plant material (<3%)					
261								
262								
263			SILT: medium grey silt with minor plant material (~10%)					
264			FINE SAND: pale to medium grey					
265			SILT: medium grey silt, ~1 cm cemented ferruginous material at contact - ironstone/ferricrete					
266								
267								
268								
269			FINE SAND: pale grey fine sand with minor plant material, interval of coarse sand at 271, gradational boundary					

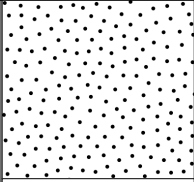
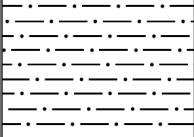
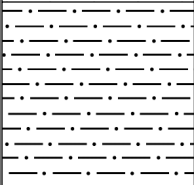
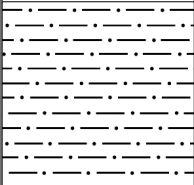
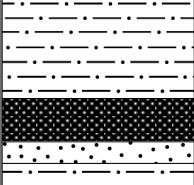
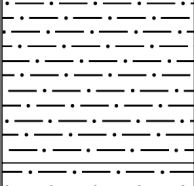
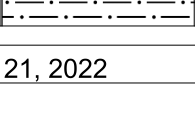
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 Azimuth: 0 degrees Dip: -90  
 Coordinates: 487718mE 5446018mN GDA94 Zone 55 MGA RL: 39.5m AHD

## Launceston Group Stratigraphy

Logged by: University of Canberra: Leah Moore, M Sweeney, K Croft,  
 L Philippa; Palynology: M McPhail; Compiler: C Mazengarb

Drill length: 340.6m

Drillhole TIGER ID: 13968  
 Name: BB-BH1  
 Location: Bell  
 Bay

Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
270								
271								
272			SILT: medium grey (up silt, down organic) mm laminated very fine sand					
273								
274			SILT: black carbonaceous silt mm laminated (fissile) plant material, gradational contact. ?Lignite					
275								
276			SILT: grading upwards					
277			IRONSTONE: Cemented ferruginous interval, ironstone/ferricrete					
278			VERY FINE SAND: pale grey					
279			SILT: black carbonaceous silt mm laminated (fissile) intervals of pale silt up to 10cm plant material. ?Lignite					

Sponsor: Department of Mines  
 Drill date: 15/08/1984  
 Drilling Method: Diamond  
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Drill length: 340.6m

Drillhole TIGER ID: 13968  
 Name: BB-BH1  
 Location: Bell  
 Bay

Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
280			SILT: pale grey					
281								
282			VERY FINE SAND: very fine sand grey/white					
283			SAND: Gradational boundary from coarse to fine sand.					
284			COARSE SAND: (mud matrix) with lignite intervals (2-4cm)					
285			LIGNITE					
286				+	Palynology	<u>Upper <i>Lygistepollenites balmei</i> Zone</u>	<u>Late Thanetian</u>	Conifer forest
287				+	Palynology	<u>Upper <i>Lygistepollenites balmei</i> Zone</u>	<u>Late Thanetian</u>	Conifer forest
288			SILT: black carbonaceous silt mm laminated fissile subhorizontal fabric plant material varying amounts of mud vs. carbonaceous material. ?Lignite					
289				+	Palynology	<u>Lower <i>Lygistepollenites balmei</i></u>	<u>Danian -Thanetian</u>	Conifer forest
				+	Palynology	<u>Lower <i>Lygistepollenites balmei</i></u>	<u>Danian -Thanetian</u>	Conifer forest

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Drill length: 340.6m

Drillhole TIGER ID: 13968  
 Name: BB-BH1  
 Location: Bell Bay

Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
290								
291								
292			CONGLOMERATE: granule/small pebble conglomerate in mud matrix (basal conglomerate, some mud clasts) clast supported near top, plus bottom matrix supported in centre. Sharp boundary with underlying dolerite	+ Palynology	<u>Lower <i>Lygistepollenites balmei</i></u>	<u>Danian -Thanetian</u>	Conifer forest	
293			DOLERITE: sharp upper boundary, highly weathered gradational lower boundary. Completely weathered (kaolinitic) dolerite					Unconformity
294			DOLERITE: completely weathered dolerite, with slightly weathered core stones up to 80cm					
295			DOLERITE: completely weathered dolerite, with slightly weathered core stones up to 80cm					
296			DOLERITE: completely weathered dolerite, with slightly weathered core stones up to 80cm					
297			DOLERITE: sharp upper boundary, resinous green with slickensides, weathered (Fe smectites?) completely weathered dolerite					
298			DOLERITE: sharp upper boundary, resinous green with slickensides, weathered (Fe smectites?) completely weathered dolerite					
299			DOLERITE: sharp upper boundary, resinous green with slickensides, weathered (Fe smectites?) completely weathered dolerite					


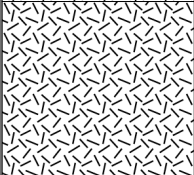


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Drill length: 340.6m

Drillhole TIGER ID: 13968  
 Name: BB-BH1  
 Location: Bell  
 Bay

Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments
300			DOLERITE: highly weathered dolerite upper and lower boundaries gradational					
301								
302								
303								
304			DOLERITE: slightly weathered dolerite					
305								
306								
307								
308								
309								

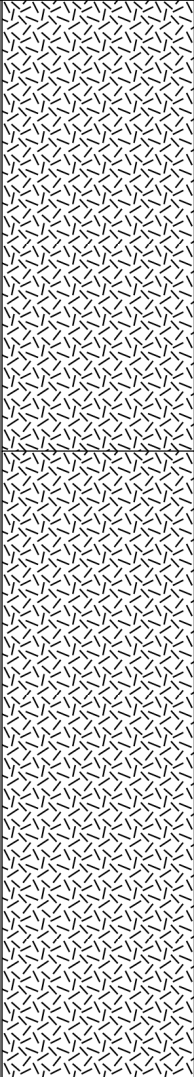
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## Launceston Group Stratigraphy

Logged by: University of Canberra: Leah Moore, M Sweeney, K Croft,  
 L Philippa; Palynology: M McPhail; Compiler: C Mazengarb

Drill length: 340.6m

Drillhole TIGER ID: 13968  
 Name: BB-BH1  
 Location: Bell Bay

Depth (m)	Stratigraphy	Lithology	Description	Dating method	Biostratigraphic zone or radiostratigraphic age	Geological timescale constraint	Environment	Comments	
310	Tasmanian (Jurassic) Dolerite Formation		DOLERITE: slightly weathered dolerite. ~4cm highly weathered joint at base						
311									
312									
313									
314									
315									
316									
317									
318					DOLERITE: slightly weathered. ~10cm highly weathered joint at base				
319									

Sponsor: Department of Mines  
 Drill date: 15/08/1984  
 Drilling Method: Diamond  
 Azimuth: 0 degrees Dip: -90  
 Coordinates: 487718mE 5446018mN GDA94 Zone 55 MGA RL: 39.5m AHD

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320								
321								
322								
323								
324				DOLERITE: slightly weathered dolerite				
325								
326								
327								
328								
329								

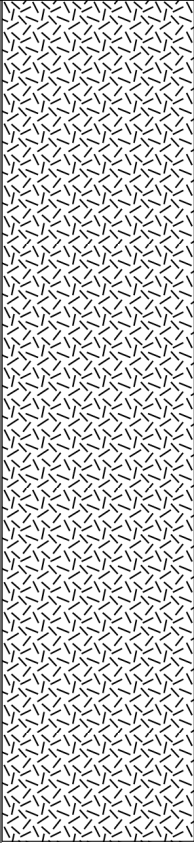
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330			DOLERITE: slightly weathered dolerite with occasional weathered joints. Isolated crystalline veins of ?calcite					
331								
332								
333								
334								
335								
336								
337								
338								
339								Drillers log indicates drilled to 340m, but core ends at 337.6

Sponsor: Department of Mines  
 Drill date: 15/08/1984  
 Drilling Method: Diamond  
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340								
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