

Fig. 10. Map showing location of stratigraphic columns within NZMS 260 Sheet V21.

Stratigraphic Column No: 150	Grid Reference: Top	Bottom	NZMS 260 V21 150 1 of 1
Section:	E: 2824241	-	
GPS Waypoint No(s):	N: 6179999	-	
Region: Central Hawkes Bay	Altitude: 115m	-	
Location: Morris's farm below Puketautahi Forest (28 Mar. 2003)			
NZMS 260 Sheet: V21	Author: R. Baggs		

Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Sample no.	Description
Petane Formation Waipatiki Limestone Member	4			G		6	Well sorted sandy limestone with many greywacke pebbles.
	3				C2	5	Shelly cross bedded sand.
	2				C2	2	Large scale cross-bedded sandy limestone.
	1					1	Cross-bedded sandy limestone with liquifaction structures.
					M1	4	Shelly cross bedded sand.
						M1	3
					M1	4	Shelly cross bedded sand.
					M1	4	Shelly cross bedded sand.
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					M1	4	Shelly cross bedded sand.



Stratigraphic Column No: 152

Grid Reference: Top Bottom

NZMS 260 V21

Section:

E: 2825502 -

GPS Waypoint No(s):

N: 6178162 -

Region: Central Hawkes Bay

Altitude: 51m -

Location: Okawa Stream, in stream valley east of shearing shed (14 Jan. 2003)

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Author: R. Baggs

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Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Description									
Petane Formation Waipatiki Limestone Member	3														
	2				S1	Well rounded, mainly spheroidal pebbles. Pebbles are aligned and dip to the south west.									
	1				M1	Trough cross-bedded sand, with small greywacke pebbles. Fossil concentrations, dominated by bivalves.									
					S4	Weakly calcareous, well sorted sand.									
		<table border="1"> <tr><td>mud</td></tr> <tr><td>fine</td></tr> <tr><td>medium</td></tr> <tr><td>coarse</td></tr> <tr><td>fine</td></tr> <tr><td>medium</td></tr> <tr><td>coarse</td></tr> <tr><td>sand</td></tr> <tr><td>gravel</td></tr> </table>	mud	fine	medium	coarse	fine	medium	coarse	sand	gravel				
mud															
fine															
medium															
coarse															
fine															
medium															
coarse															
sand															
gravel															

Stratigraphic Column No: 153	Grid Reference: Top	Bottom	NZMS 260 V21 153 1 of 1
Section:	E: 2828645	-	
GPS Waypoint No(s):	N: 6176915	-	
Region: Central Hawkes Bay	Altitude: 111m	-	
Location: Alness farm Taihape Road (17 Feb. 2003)			
NZMS 260 Sheet: V21	Author: R. Baggs		

Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Description
Petane Formation Waipatiki Limestone Member	4			 	C1	<i>Tawera</i> sp. dominated shell bed, some articulated.
	3			 	S3 C1 S3 C1 S3 C1	Sandy matrix shell concentrations interbedded with slightly fossiliferous silt. Includes <i>Alichthoe arabica</i> , <i>Tugali pliocenica</i> , <i>Pelicaria convexa</i> , <i>Penion subsulcata</i> , <i>Pupurocardia purpurata</i> and <i>Glaphyrnia plicata</i> .
	2					Slump material.
	1				C3	Sandy limestone grading into a shelly sand above.
					C3	Well indurated, biomoulded coarse grained limestone with greywacke fragments.
		<div style="display: flex; justify-content: space-between; font-size: 8px;"> mud fine medium coarse fine medium coarse gravel </div>				

Stratigraphic Column No: 154	Grid Reference: Top	Bottom	NZMS 260 V21 154 1 of 1
Section:	E: 2832869	-	
GPS Waypoint No(s):	N: 6178850	-	
Region: Central Hawkes Bay	Altitude: 42m	-	
Location: Prices Farm (11 Feb. 2003)	Author: R. Baggs		
NZMS 260 Sheet: V21			

Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Sample no.	Description
Petane Formation Waipatiki Limestone Member	9						Pebbly sandy trough cross-bedded limestone.
	8						Very well cemented bidirectional cross-bedded limestone.
	7						Very well cemented bidirectional cross-bedded limestone.
	6					C2	Very well cemented bidirectional cross-bedded limestone.
	5				C		Pebbly cross-bedded limestone with biomoulds
	4						Pebbly cross-bedded limestone with biomoulds
	3						Pebbly cross-bedded limestone with biomoulds
	2						Trough cross-bedded pebbly limestone, becoming more tabular cross-bedded towards bottom of unit.
	1			?			Trough cross-bedded pebbly limestone, becoming more tabular cross-bedded towards bottom of unit.
			<div style="font-size: 8px; display: flex; justify-content: space-between; padding: 0;"> mud fine medium coarse fine medium coarse gravel </div>				

Stratigraphic Column No: 155

Grid Reference:

Top

Bottom

NZMS 260 V21

Section:

E:

2834295

-

GPS Waypoint No(s):

N:

6177940

-

Region: Central Hawkes Bay

Altitude:

-

Location: Swamp Road road cut (28 Oct. 2002)

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Author: R. Baggs

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Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Description
Petane Formation Waipatiki Limestone Member	6		≠		S3	
	5				S4	Well sorted non cemented sand. Herringbone cross bedding. Mudstringers
	4		↙	☉	S4	
	3		=	☉	S4	Fine grained, laminar bedded weakly calcareous sand interbedded with cemented pebbly shell hash/limestone
	2		≠	☉		
	1		≠	☉	S5	Interbedded slightly calcareous siltstones and massive sandstones.
			=		S4	
			≠	☉	S4	
			≠	☉	S4	
			≠	☉	S4	

mud
fine
medium
coarse
sand
fine
medium
coarse
gravel

Stratigraphic Column No: 156	Grid Reference: Top	Bottom	NZMS 260 V21 156 1 of 1
Section:	E: 2835638	-	
GPS Waypoint No(s):	N: 6179801	-	
Region: Central Hawkes Bay	Altitude: 24m	-	
Location: Fenton Kelly's property on Omaranui Rd., bluffs above dam pond (31 Oct. 2002)	Author: R. Baggs		
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Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Description
Petane Formation Waipatiki Limestone Member	8		≠	C		Well cemented sandy limestone with sand concentration at the top.
	7		↙ ↘		C3	Well cemented limestone with liquifaction structures
	6					
	5		Ω		C3	Bidirectionally cross-bedded sandy limestone.
	4					
	3		Ω			
	2		=		C3	well sorted, well cemented sandy limestone, trough cross-bedding.
	1		=			
	0		=			
			<div style="display: flex; justify-content: space-between; font-size: 8px;"> mud fine medium coarse fine medium coarse gravel </div>			

Stratigraphic Column No: 157

Grid Reference: Top

Bottom

NZMS 260 V21

Section:

E: 2835858

-

GPS Waypoint No(s):

N: 6180265

-

Region: Central Hawkes Bay

Altitude: 37m

-

Location: Fenton Kellys - possum cliff (30 Oct. 2002)

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Author: R. Baggs

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Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Description
Petane Formation	6				C3	Weakly cemented cross-bedded sandy limestone
						Weakly cemented sandy limestone.
Waipatiki Limestone Member	5				↓	Well cemented bedded sandy limestone.
						Poorly cemented shelly limestone.
Petane Formation	4					Sandy limestone with low angle cross-bedding. A wedge of what looks like a ripple cross-bed.
						Sandy limestone.
Waipatiki Limestone Member	3					White/grey calcareous mud.
Petane Formation	2					
Waipatiki Limestone Member	1					

mud
fine
medium
coarse
silt
fine
medium
coarse
sand
gravel

Stratigraphic Column No: 161
 Section: Locality 1
 GPS Waypoint No(s):
 Region: Central Hawkes Bay
 Location: Battery Point (1/3)
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Grid Reference: Top Bottom
 E: 2844300 -
 N: 6183400 -
 Altitude: -

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Author: S. Boyle

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MEASURED SECTION SUMMARY SHEET

LOCALITY Battery Point

No. 1

GRID REFERENCES:			
	BASE	TOP V21/448834 locality 1	
SCALE (M)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
20		(=)= Wt 25247	>5m Alternating skeletal sandstone and sandy mudstone cm-bedded Calc. - Calc.
18		Wt 25246	Sandstone beds unindurated, soft, lt orange, moderately sorted Very small scale planar -trough x-bedding, fine sand size
16		Wt 25245	Mudstone beds finely laminated lt brown, well sorted, silt size grains Facies 6 (Member C)
14		Wt 25244	~1.5m Graded Sandstone normally graded, (Calc.), Facies 5 (Member C)
12		Wt 25243	12m Calc. Sandy Siltstone lt brown, fine silt, well-sorted Sorted Massive; extensively bioturbated Facies 4 (Member B)
10		Wt 25241	
8		Wt 25242	
6		Wt 25241	
4		Wt 25241	
2		Wt 25240	

Stratigraphic Column No: 161
 Section: Locality 1
 GPS Waypoint No(s):
 Region: Central Hawkes Bay
 Location: Battery Point (2/3)
 NZMS 260 Sheet: V21

Grid Reference: Top Bottom
 E: 2844300 -
 N: 6183400 -
 Altitude: -

NZMS 260 V21

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Author: S. Boyle

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MEASURED SECTION SUMMARY SHEET
 LOCALITY Battery Point (cont) No. 2

GRID REFERENCES: BASE TOP 421/448334 Locality 1			
SCALE (M)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
44		Nt 25294	> 1m Pebbly conglomerate clast supported, polymodal, unstratified ungraded (Facies 9 Member C)
42		(=)	> 2m Calc. muddy sandstone poorly bedded, med-well sorted poorly cemented, lt brown (Facies 7, Member C)
40			> 10m Biocalcarenlite (skeletal limestone) yellow-brown, well cemented, medium grained, moderately-well sorted
38			Small scale, low angle trough cross-beds with bipolar dip directions predominate SW direction Set thicknesses average 0.2-2m. Facies 8 (Member C)
36			
34		Nt 25249	
32			
30			
28			
26			
24		Nt 25248	> 2m Muddy sandstone, Calc. dominantly lt brown, Facies 7 (Member C)

Stratigraphic Column No: 161
 Section: Locality 1
 GPS Waypoint No(s):
 Region: Central Hawkes Bay
 Location: Battery Point (3/3)
 NZMS 260 Sheet: V21

Grid Reference: Top Bottom
 E: 2844300 -
 N: 6183400 -
 Altitude: -

NZMS 260 V21

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Author: S. Boyle

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MEASURED SECTION SUMMARY SHEET

LOCALITY Battery Point

No. 3

GRID REFERENCES:		BASE	TOP
			V21/448834 locality 1
SCALE (m)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
64		Wt 25252	>8m Pumiceous Sandstone lt brown to brown, med-sorted fine grained sand size, extensively bi-turbated incipient horizontal bedding undisturbed cross-lamination Present
62		(=)	Partially lithified mudstone and pumice clasts up to 4mm diameter
60		Wt 25251	(Faces 11, Member D)
58		A	
56			
54		≡	>10m Flaser/Navy/Lenticular bedded terrigenous sand and mud. lt orange - lt brown wdl sorted, fine - v fine grained ripple cross-bedding (planar and trough cross-lamination)
52			(Faces 10, Member D)
50			
48		Wt 25250	
46		A	
		λ	1m terrigenous sandstone lt brown-orange, soft, well sorted

Stratigraphic Column No: 162
 Section: Locality 4
 GPS Waypoint No(s):
 Region: Central Hawkes Bay
 Location: Burke Road
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Grid Reference: Top Bottom
 E: 2844400 -
 N: 6183100 -
 Altitude: -

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MEASURED SECTION SUMMARY SHEET

LOCALITY Burke Road

No. 1

GRID REFERENCES: BASE TOP V21/444831
 Locality 4

SCALE (M)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
10			Dark grey recent soils
8			Loess 2m thick, light brown, blocky well weathered, fine grained Biogenic structures present no obvious bedding
6			Tephra 2m, graded bedding grey-brown, chloroaurite towards base im-bedding Kawakawa Tephra
4			3.5m loess, light brown-brown blocky, granular texture extensively bioturbated
2			White finely laminated Tephra 1.8m thick (Ratua?)

Stratigraphic Column No: 163
 Section: Locality 2
 GPS Waypoint No(s):
 Region: Central Hawkes Bay
 Location: Pandora Point (1/3)
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Grid Reference: Top Bottom
 E: 2844700 -
 N: 6183200 -
 Altitude: -

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MEASURED SECTION SUMMARY SHEET

LOCALITY Pandora Point

No. 1

GRID REFERENCES:	BASE	TOP
		V21/447832 Locality 2

SCALE (m)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
20		(=)	Skeletal Sandstone
16			Not exposed
16		I	
14		○	16 m Sandy Siltstone, Calc. It breaks soft to med hard, med. - well sorted, internally massive extensively bioturbated. Small, calcareous concretions toward top of unit.
12			
10		••••	Facies # (Member B)
8		○	
6			
4			
2		○	
		I	

Stratigraphic Column No: 163
 Section: Locality 2
 GPS Waypoint No(s):
 Region: Central Hawkes Bay
 Location: Pandora Point (2/3)
 NZMS 260 Sheet: V21

Grid Reference: Top Bottom
 E: 2844700 -
 N: 6183200 -
 Altitude: -

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MEASURED SECTION SUMMARY SHEET

LOCALITY Pandora Point

No. 2

GRID REFERENCES:		BASE	TOP
			121/447832 locality 2
SCALE (m)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
42			
42		\neq A	>2m Terrigenous Sandstone V-Soft, fine grained, light orange Fossils present, unstratified Facies 12 (Member D).
38			>12m Finer/wavy/lenticular bedded terrigenous sands and mud
36		A	Facies 11 (Member D)
34			
32			
30			
28			
26		WT 25295	3m Pebbly Conglomerate two pebble bands 30cm thick Separated by terrigenous (calc.) sandstone 1m thick
24		\equiv	inversely graded, poorly sorted horizontally-stratified, matrix-supported Well rounded greywacke pebbles

Stratigraphic Column No: **163**
 Section: Locality 2
 GPS Waypoint No(s):
 Region: Central Hawkes Bay
 Location: Pandora Point (3/3)
 NZMS 260 Sheet: V21

Grid Reference: Top Bottom
 E: 2844700 -
 N: 6183200 -
 Altitude: -

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MEASURED SECTION SUMMARY SHEET

LOCALITY Pandora Point

No. 3

GRID REFERENCES:		BASE	TOP
			V21/447832 locality 2
SCALE (m)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
		<p>(=)</p> <p>Wt 25255</p>	<p>Bonaclerich limestone</p> <p>Medium-coarse grained, internally massive beds incipient to well developed horizontal stratification</p> <p>Moderately sorted</p> <p>(Facies 13 Member E)</p>

Stratigraphic Column No: 164
 Section: Locality 3
 GPS Waypoint No(s):
 Region: Central Hawkes Bay
 Location: Scandinavian Point
 NZMS 260 Sheet: V21

Grid Reference: Top Bottom
 E: 2844800 -
 N: 6182700 -
 Altitude: -

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Author: S. Boyle

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MEASURED SECTION SUMMARY SHEET

LOCALITY Scandinavian Point

No. 1

GRID REFERENCES:			
	BASE	TOP	V21/448827 Locality 3
SCALE (m)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
40			Pleistocene Cover Beds mottled and bioturbated
36			
32			2m Alternating weakly cemented skeletal hash (limestone) and sandy mudstone cm-dm bedded Facies 6 (Member C)
28			
24			
20			
16			
12			>15m # brown-cream, calc. Soft mod hard sandy siltstone moderately - well sorted; massive, extensively bioturbated Facies 4 (Member B)
8			
4			

Stratigraphic Column No: 165

Grid Reference:

Top

Bottom

NZMS 260 V21

Section: Locality 14

E: 2845100

-

GPS Waypoint No(s):

N: 6182600

-

Region: Central Hawkes Bay

Altitude:

-

Location: Master Hire Centre (Hyderabad Road)

Author: S. Boyle

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MEASURED SECTION SUMMARY SHEET

LOCALITY Master Hire Centre (Hyderabad Road) No. 1

GRID REFERENCES:		BASE	TOP
			V21/451826 Locality 14
SCALE	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
	12	≠	2m # brown loess (difficult access)
	11	≠	
	10	≠	
	9	⇒	Tephra (access difficult)
	8	⇒	Tephra brown, friable (v. soft) mm bedding.
	7		
	6		7m brown loess, massive f grained, scattered shell fragments, occ. rootlets
	5		
	4	≠	Strongly burrowed, plenty Norm tubes + burrows
	3	≠	
	2	≠	
	1	≠	Calc. sandy siltstone (Facies 4)

Stratigraphic Column No: 166

Grid Reference: Top

Bottom

NZMS 260 V21

Section: Locality 15

E: 2845300

-

GPS Waypoint No(s):

N: 6182600

-

Region: Central Hawkes Bay

Altitude:

-

Location: Hyderabad Road (next to the Caltex Service Station)

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MEASURED SECTION SUMMARY SHEET

LOCALITY Hyderabad Road (Next to Caltex Service Station) No. 1

GRID REFERENCES:

BASE

TOP

V21/453 826
locality 15

SCALE (M)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
12			
10			Skeletal limestone dark brown exterior, grey interior mod. hard internally massive, incipient bedding, well weathered fossiliferous. (Subfacies of Member A)
8			
6		Wt 25293 (=)	
4			
2		≠	Sandy mudstone Calcareous sandstone mod. hard, strongly burrowed med. grained, mod sorted calc. sandstone, brown, soft.

Stratigraphic Column No: 167

Grid Reference:

Top

Bottom

NZMS 260 V21

Section: Locality 13

E: 2845400

-

GPS Waypoint No(s):

N: 6183700

-

Region: Central Hawkes Bay

Altitude:

-

Location: Intersection of Coronation St. & Battery Rd.

Author: S. Boyle

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MEASURED SECTION SUMMARY SHEET

LOCALITY Intersection of Coronation St and Battery Road

No. 1

GRID REFERENCES:

BASE

TOP

V21/454837
locality 13

SCALE (m)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
11			2m light brown silty sandstone (?) mod. hard. massive, fossiliferous mod-well sorted
10			
9			
8		#25291	
7			
6			7m #beige-cream, massive Calc. sandy siltstone very fine grained, bioturbated fossiliferous, mod-well sorted mod weathered.
5			
4			
3			
2		#25290	
1			

Stratigraphic Column No: 168

Grid Reference:

Top

Bottom

NZMS 260 V21

Section: Locality 12

E: 2845500

-

GPS Waypoint No(s):

N: 6183800

-

Region: Central Hawkes Bay

Altitude:

-

Location: Chaucer Steps (off Battery Road)

Author: S. Boyle

NZMS 260 Sheet: V21

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1 of 1

MEASURED SECTION SUMMARY SHEET

LOCALITY Chaucer Steps (off Battery Rd)

No. 1

GRID REFERENCES:

BASE

TOP

V21/455838
locality 12

SCALE (M)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
<p>14</p> <p>12</p> <p>10</p> <p>8</p> <p>6</p> <p>4</p> <p>2</p>		<p>≠</p>	<p>Dark grey recent soil</p> <hr/> <p>light brown boss, Firm in place and in hand Very fine grained, porous, mod. permeability + mod-well weathered, highly bioturbated massive</p>

Stratigraphic Column No: 169

Grid Reference:

Top

Bottom

NZMS 260 V21

Section: Locality 11

E: 2845700

-

GPS Waypoint No(s):

N: 6184000

-

Region: Central Hawkes Bay

Altitude:

-

Location: Battery Road, Opposite B.P. Tanks

Author: S. Boyle

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1 of 1

NZMS 260 Sheet: V21

MEASURED SECTION SUMMARY SHEET

LOCALITY Battery Road, Opposite B.P. Tanks

No. 1

GRID REFERENCES:			
SCALE (m)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
			V21/457840 locality 11
7			Calc. mudstone ft grey/brn fine grained, med. bed, slight horiz. slabficate
6			Calc. Sandstone ft brn-cream, massive, fine grained, bidurbated Med sorted, fossiliferous
5		Nt 25289	Skeletal limestone, v hard, blue/gray, coarse grained, med. sorted, numerous dissolution cavities
4		Nt 25288	Sandstone, brn, med grained crude med bed, soft, fossiliferous
3		Nt 25287	Skeletal limestone grey, v hard, fossiliferous internally massive
2		Nt 25286	
1		Nt 25285	crudely bed, brn, med. grained med. sorted, soft limestone
		Nt 25284	grey, v. fossiliferous hard skeletal limestone

Stratigraphic Column No: 170

Grid Reference:

Top

Bottom

NZMS 260 V21

Section: Locality 10

E: 2845900

-

GPS Waypoint No(s):

N: 6184200

-

Region: Central Hawkes Bay

Altitude:

-

Location: Old Gun Emplacement, Battery Road

Author: S. Boyle

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MEASURED SECTION SUMMARY SHEET

LOCALITY Old Gun Emplacement, Battery Road

No. 1

GRID REFERENCES:

BASE

TOP

V21/459842
Locality 10

SCALE (m)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
<p>11</p> <p>10</p> <p>9</p> <p>8</p> <p>7</p> <p>6</p> <p>5</p> <p>4</p> <p>3</p> <p>2</p> <p>1</p> <p>0</p>		<p>(=)</p> <p>Nt 25283</p> <p>≠</p> <p>Nt 25282</p>	<p>6m thick Muddy Sandstone 11 grey/brown, fine grained, moderately hard, slight horizontal stratification fossiliferous, strongly bioturbated well sorted.</p> <p>Calc. sandstone 11 brown-cream, massive, v fine grained, bioturbated well sorted, fossiliferous, (disarticulated bivalves present)</p>

Stratigraphic Column No: 171

Grid Reference:

Top

Bottom

NZMS 260 V21

Section: Locality 9

E: 2846600

-

GPS Waypoint No(s):

N: 6184500

-

Region: Central Hawkes Bay

Altitude:

-

Location: Opposite Gate 3, Napier Port

Author: S. Boyle

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1 of 1

MEASURED SECTION SUMMARY SHEET

LOCALITY Opposite Gate 3, Napier Port.

No. 1

GRID REFERENCES:		BASE	TOP
			V21 / 466845 Locality 9
SCALE (m)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
40			Peistocene Cover Beds
36		Nt 25293	Skeletal limestone
32		≠	Subfacies 2b (Member A)
28		Nt 25282	
24		≠	Calc. sandy s. Hstone
20		Nt 25280	Facies 4(?)
16		≠	Skeletal limestone (16 m thick)
12		Nt 25279	internally massive
8		≠	med-coarse grained, poorly sorted, light grey/blue dissolution holes prevalent
4		Nt 25278	Subfacies 2b (Member A)
		≠	8m Calc. Sandstone
		⇒	thickly bedded, dk-H brown, extensively mottled, med-coarse grained, moderately sorted
		☺	Facies 3 (Member A)

Stratigraphic Column No: 172

Grid Reference:

Top

Bottom

NZMS 260 V21

Section: Sc1

E: 2847200

-

GPS Waypoint No(s):

N: 6184300

-

Region: Central Hawkes Bay

Altitude:

-

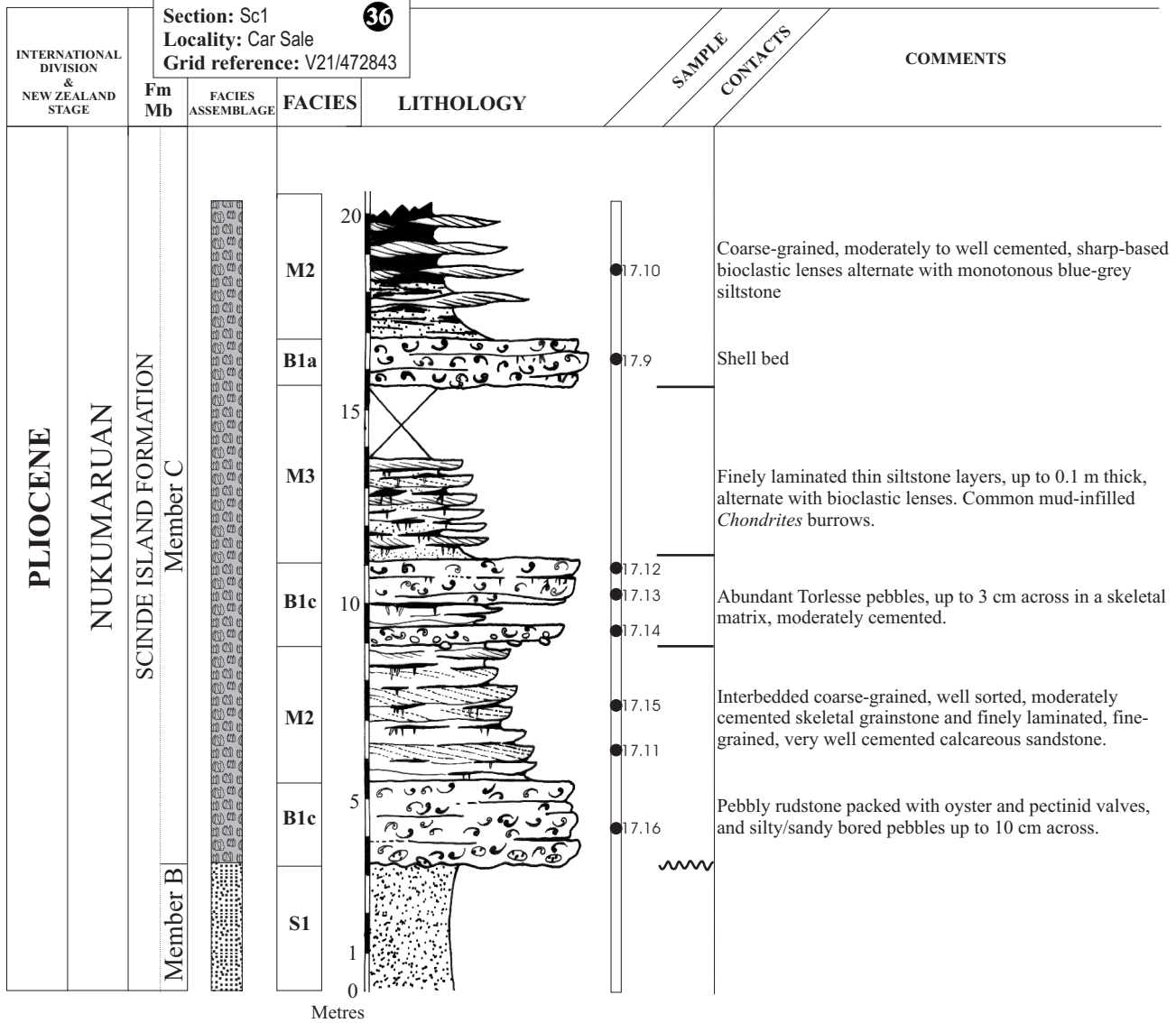
Location: Car Sale

NZMS 260 Sheet: V21

Author: V.Caron

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Stratigraphic Column No: 172

Grid Reference: Top

Bottom

NZMS 260 V21

Section: Sc1

E: 2847200

-

GPS Waypoint No(s):

N: 6184300

-

Region: Central Hawkes Bay

Altitude:

-

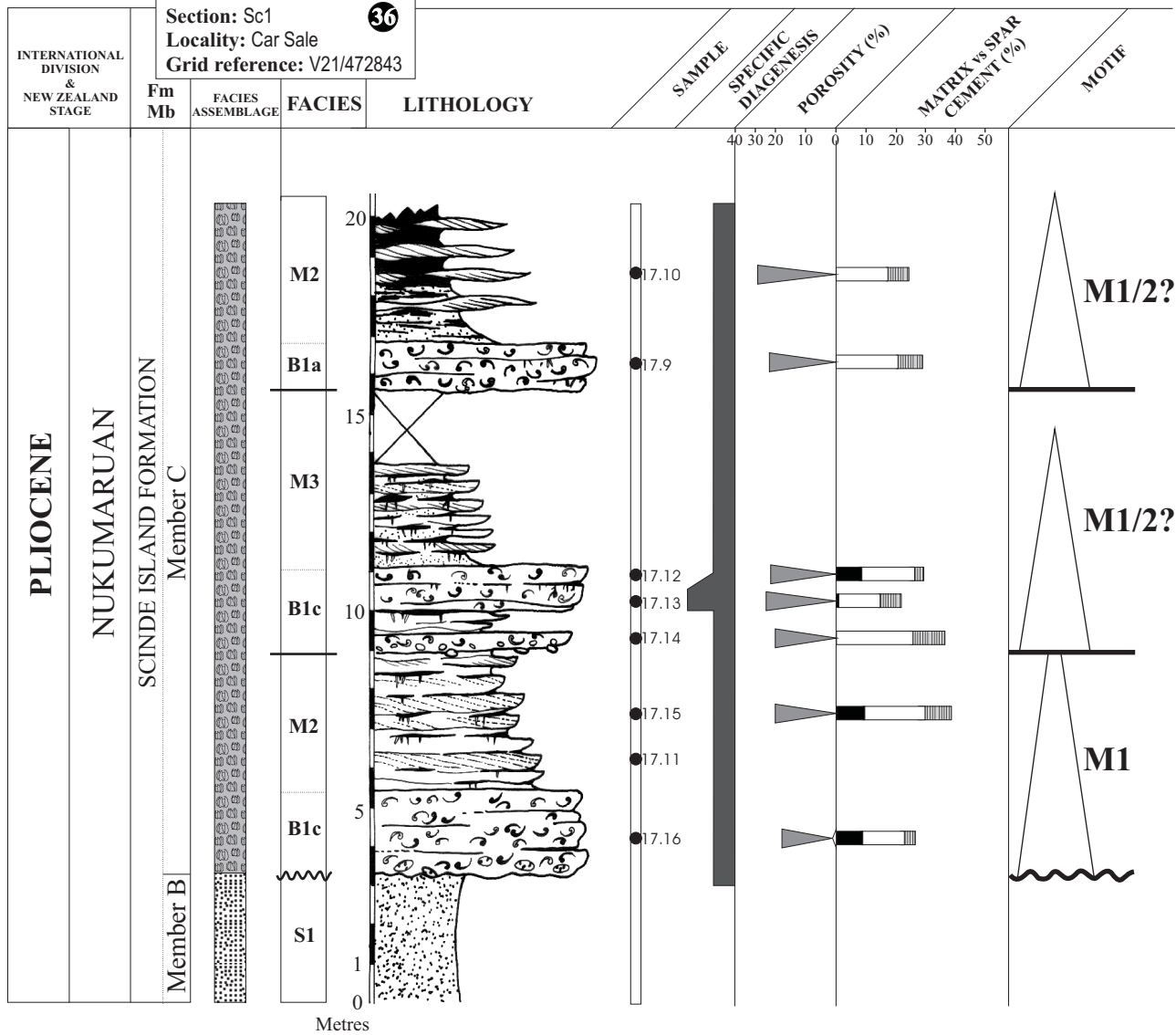
Location: Car Sale

NZMS 260 Sheet: V21

Author: V.Caron

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Stratigraphic Column No: 173

Grid Reference:

Top

Bottom

NZMS 260 V21

Section: Locality 5

E: 2847000

-

GPS Waypoint No(s):

N: 6183900

-

Region: Central Hawkes Bay

Altitude:

-

Location: Centennial Gardens (west)

NZMS 260 Sheet: V21

Author: S. Boyle

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MEASURED SECTION SUMMARY SHEET

LOCALITY Centennial Gardens (West)

No. 1

GRID REFERENCES:		BASE	TOP
			V21/470 839 locality 5
SCALE (m)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
40			Peistocene Cover Beds
36		Nt 25265	2m Calc. Sandy Siltstone Facies 4 (Member B)
32		Nt 25264	16m Limestone blue/grey, calcitic cement, moderately sorted, fine-coarse grained, dissolution holes present, poorly bedded
28		Nt 25263	decrease in terrigenous sand content towards the top of the unit Facies 2b (Member A)
24		Nt 25262	Calc. Sandstone (>6m thick) preferentially cemented, large- scale tabular cross-beds.
16		Nt 25261	Fossils draped by thin mud layers, fossiliferous, med. grained, med-well sorted Subfacies 1b (Member A)
12		Nt 25260	Calc. Sandstone (12m thick) dm bedded with internal m.m. bedding It brown; med. weathered; Strongly burrowed, med. cemented
8		Nt 25259	Large scale trough cross-beds in sets up to 1m thick with southwest facing foresets
4		Nt 25258 Nt 25257 Nt 25256	Subfacies 1a (Member A)

Stratigraphic Column No: 174

Grid Reference:

Top

Bottom

NZMS 260 V21

Section: Locality 6

E: 2847200

-

GPS Waypoint No(s):

N: 6183900

-

Region: Central Hawkes Bay

Altitude:

-

Location: Centennial Gardens (east 1/2)

Author: S. Boyle

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NZMS 260 Sheet: V21

MEASURED SECTION SUMMARY SHEET

LOCALITY Centennial Gardens (East)

No. 1

GRID REFERENCES:		BASE	TOP
			V21/472839 locality 6
SCALE (m)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
40			
36			
32			
28		≡	
24			
20		Nr 25271	Calc. Sandstone 20m thick, Giant foresets dipping Predominantly South
16		Nr 25270	Separated from overlying unit by an erosional boundary
12		≡	Tabular cross-bedding with internal mm bedding + cross- lamination
8		Nr 25269	
4		Nr 25268	Sandy limestone, poorly bedded dark grey, coarse grained, med sorted Subfaces 2a (Member A)

Stratigraphic Column No: 174

Grid Reference:

Top

Bottom

NZMS 260 V21

Section: Locality 6

E: 2847200

-

GPS Waypoint No(s):

N: 6183900

-

Region: Central Hawkes Bay

Altitude:

-

Location: Centennial Gardens (east 2/2)

Author: S. Boyle

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MEASURED SECTION SUMMARY SHEET

LOCALITY Centennial Gardens (East)

No. 2

GRID REFERENCES:

BASE

TOP

V21/472 839
Locality 6

SCALE (m)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
<p>76-</p> <p>72-</p> <p>68-</p> <p>64-</p> <p>60-</p> <p>56-</p> <p>52-</p> <p>48-</p> <p>44-</p>		<p>≠</p> <p>≡</p>	<p>Reislaene color Beds</p> <p>Calc. sandy siltstone</p> <p>Facies 4 (Member B)</p> <p>Interbedded calc. sandstone and skeletal limestone</p> <p>Cont fragments dip to Northeast</p> <p>Sandstone is preferentially cemented ("flocgy" appearance)</p> <p>(subfacies 1b + 2b)</p>

Stratigraphic Column No: 175
 Section: Locality 7
 GPS Waypoint No(s):
 Region: Central Hawkes Bay
 Location: Marine Parade (1/2)
 NZMS 260 Sheet: V21

Grid Reference: Top Bottom
 E: 2847200 -
 N: 6183800 -
 Altitude: -

NZMS 260 V21

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Author: S. Boyle

MEASURED SECTION SUMMARY SHEET

LOCALITY Marine Parade

No. 1

GRID REFERENCES:		BASE	TOP V21/472838 Locality 7
SCALE (M)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
50-	I		
45-	I		Skateld limestone 5m thick internally massive medium grained, moderately sorted.
40-	I		Calc. sandstone. Chert fragments dip predominantly to NE medium - coarse grained, med - well sorted. Occasional shell beds (Ostrea) up to 20 cm thick.
35-			
30-			
25-	I		Erosion Boundary
20-	I		Calc. Sandstone 2.5m thick, interbedded with 1ft brown muddy calcareous sandstone facies
15-			3. Chert fragments dip SE med - well sorted, medium grained Preferentially cemented.
10-	I		
5-	I		

Stratigraphic Column No: 175
 Section: Locality 7
 GPS Waypoint No(s):
 Region: Central Hawkes Bay
 Location: Marine Parade (2/2)
 NZMS 260 Sheet: V21

Grid Reference: Top Bottom
 E: 2847200 -
 N: 6183800 -
 Altitude: -

NZMS 260 V21

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Author: S. Boyle

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MEASURED SECTION SUMMARY SHEET

LOCALITY Marine Parade

No. 2

GRID REFERENCES:			
	BASE	TOP	V21/472838 Locality 7
SCALE (M)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
		<p>≠</p> <p>≡</p>	<p>Preistocene Cover Beds</p> <p>Calc. Sandy Siltstone (Facies 4)</p> <p>Skeletal Limestone subfacies 2b (Member A)</p> <p>Calc. Sandstone light brown-gray, cont foresets dip NE. Internal beds - cm bedding cross-lamination within larger scale features Medium grained, moderately sorted, preferentially cemented</p>

Stratigraphic Column No: 176
 Section: Locality 8
 GPS Waypoint No(s):
 Region: Central Hawkes Bay
 Location: Bluff Hill
 NZMS 260 Sheet: V21

Grid Reference: Top Bottom
 E: 2847200 -
 N: 6183400 -
 Altitude: -

NZMS 260 V21

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Author: S. Boyle

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MEASURED SECTION SUMMARY SHEET

LOCALITY Bluff Hill

No. 1

GRID REFERENCES:

BASE

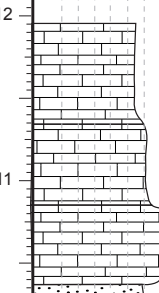
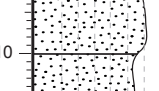
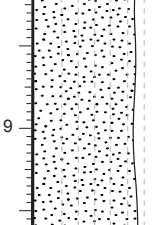
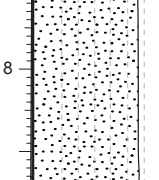
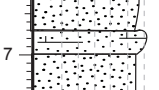
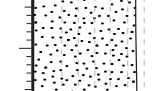
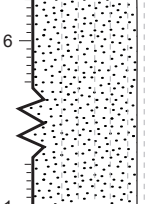
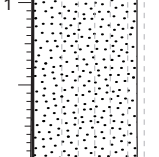
TOP

V21/472 834

Locality 8

SCALE (M)	GRAPHIC LOG	ADD. GRAPHIC	DESCRIPTION
70			Calc. sandy siltstone Faces 4+ (Member B)
60			
50			Skeletal limestone medium grained, med-well sorted light grey Subfaces ab (Member A)
40		Nt 25277	
30		Nt 25276	Calc. sandstone Giant faceted sp SSE fine-med grained, light brown moderately sorted, preferentially cemented. extensively bioturbated Faces 1b (Member A)
20		Nt 25275	
10		Nt 25274	
		Nt 25273	

Stratigraphic Column No: 177	Grid Reference: Top	Bottom	NZMS 260 V21
Section:	E: 2834860	-	177
GPS Waypoint No(s):	N: 6176770	-	
Region: Central Hawkes Bay	Altitude: 41m	-	
Location: Quarry attempt, Swamp Road	Author: R. Baggs		1 of 1
NZMS 260 Sheet: V21			

Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Description
Petane Formation	12		=		C3	Recalcification of fossils, in well sorted grey beige limestone. Mud clasts also present.
						Grey, well cemented tabular bedded limestone with many <i>Sigapatella</i> sp. fossils.
Tangoio Limestone Member	11		=		C3	Grey, well cemented limestone with small biomoulds.
						Fossil rich, weakly cemented sand. Includes barnacles, bivalves, bryozoan, solitary coral and serpulids.
	10					
	9		≠			
	8					
	7				S4	Cemented section of sand above and below
	6		≠		S4	Tan/orange well sorted sand.
	1					

mud
 fine
 medium
 coarse
 fine
 medium
 coarse
 gravel

Stratigraphic Column No: 178	Grid Reference: Top	Bottom	NZMS 260 V21 178 1 of 1
GPS Waypoint No(s): Wp 286	E: 2834530	-	
Region: Omaha	N: 6175121	-	
Location: Farm track off Taihape Road east of Omaha	Altitude: 34m	-	
NZMS 260 Sheet: V21 Napier	Page 1 of 1	Author: K. Bland	

Age	Strat. Unit		Lithology	Sampling interval	Facies	WP No.	Samples	Contacts	Description
	Int.	N.Z.							
Early Pleistocene	Upper Nukumaru								
	Mangaheia Group/Petane Formation Waipatiki Limestone Member								
Late Pliocene									

Stratigraphic Column No: 179	Grid Reference: Top	Bottom	NZMS 260 V21 179 1 of 1
Section:	E: 2833859	-	
GPS Waypoint No(s):	N: 6175589	-	
Region: Central Hawkes Bay	Altitude: 11m	-	
Location: Property opposite Pirau Rd. , small bluffs on drive way just after crossing flat fields	Author: R. Baggs		
NZMS 260 Sheet: V21			

Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Description
Petane Formation Waipatiki Limestone Formation	3		=		C3	Well sorted, tabular very weathered well cemented limestone.
	2		≠		↓	Poorly cemented, well sorted massive limestone
	1					Moderately sorted, weakly cemented, sandy limestone. Biomoulds.
						Tabular bedded, well sorted sandy limestone.
			≠		M1	Tabular cross-bedded, red brown, well sorted limestone. Affected by meteoric fluids?

mud
 fine
 medium
 coarse
 fine
 medium
 coarse
 gravel

Stratigraphic Column No: 180	Grid Reference: Top	Bottom	NZMS 260 V21 180 1 of 1
Section:	E: 2832574	2832878	
GPS Waypoint No(s): 98-111, 166-171	N: 6172368	6172184	
Region: Central Hawkes Bay	Altitude: 57 m	32 m	
Location: Composite column of the Fernhill outcrops overlooking the Fernhill Tavern and intersec. of SH50 and ?	Author: S. Dyer		
NZMS 260 Sheet: V21			

Stratigraphic Unit	Thick. (m)	Lithology	Structures	Dominant Fossils	Facies Code	WP No.	Description
Park Island Limestone	35				C ₃	98	Grey, well-cemented, moderately-sorted, crystalline trough cross-bedded packstone with abundant aragonitic biomoulds infilled with orange calcareous mud. Crossbeds decrease in dimensions with height from approx. 1-1.5 m long x 0.3 m thick to 0.3 m wide by 0.10 m thick, and moulds increase in density with height.
	30				C ₄	171	Grey, well-cemented, moderately-sorted, crystalline packstone with abundant aragonitic biomoulds with calcite crystals growing inside but not completely infilling moulds. Prevalent tabular crossbedding becoming horizontally bedded to massive at the top.
	25				C ₂	104	Coarse, yellow/tan coloured, weakly-cemented skeletal grainstone composed of poorly-sorted and horizontally-bedded subangular medium sand-sized grains and barnacle clusters measuring approx. 7 cm across by 5 cm high.
	20				S ₁	111	Golden yellow, fine-grained, well-sorted, massive to weakly horizontally-bedded, friable calcareous, quartz-rich sandstone with discontinuous tabular well cemented lenses of same lithology. Lineations of weathered <i>Patro undatus</i> within friable sandstone.
	15					100	Orange/brown coloured, fine-grained, bioturbated moderately-sorted, massive to weakly laminated, friable, quartz sandstone with shell fragments. Shell content and cementation increases with height. Creamy/tan coloured, fine-grained, very well-sorted, massive, friable, shelly sandstone with juvenile barnacle clusters (no more than 0.5 cm in diameter). Separated from overlying sandstone by sharp, irregular, wavy boundary.
Taradale Mudstone	10				Ms ₁	169	Dark blue/grey, calcareous, bioturbated siltstone with abundant angular shell fragments interbedded with creamy/tan, fine-grained well-sorted, massive, calcareous, quartz-rich sandstone with juvenile <i>Tawera</i> sp. Siltstone units thinning and sandstone beds thickening with height, replacing the siltstone.
	5				M ₁	168	Dark blue/grey, calcareous, horizontally-bedded siltstone with orange mottles and abundant angular shell fragments
	0	Mud fine med coarse Silt fine med coarse Sand coarse Gravel					

Stratigraphic Column No: 181	Grid Reference: Top	Bottom	NZMS 260 V21 181 1 of 2
Section:	E: 2831809	-	
GPS Waypoint No(s):	N: 6174637	-	
Region: Central Hawkes Bay	Altitude: 54m	-	
Location: Fernhill Stud, bluffs just before steep track for highest vantage point (18 Feb. 2002)	Author: R. Baggs		
NZMS 260 Sheet: V21			

Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Description
Petane Formation Waipatiki Limestone Member	9		=			Well cemented, horizontal bedded pebbly limestone with mud stringers.
	8		=		C2	Horizontally bedded pebbly limestone with increasing pebble concentration up the bed.
	7		=			Calcareous mud. Pebbly shell bed.
	6		▲		C2	Pebbly coarse grained, biomoulded limestone.
	5		=			Tabular bedded pebbly limestone.
	4		=			Interbedded sand and mud, horizontal bedding.
	3		=	⊕	M1	Weakly cemented shelly sand, interbedded with mud in the lower units.
	2		=			
	1		=			

mud
 fine
 medium
 coarse
 silt
 fine
 medium
 coarse
 sand
 gravel

Stratigraphic Column No: 181	Grid Reference: Top Bottom	NZMS 260 V21
Section:	E: 2831809 -	181
GPS Waypoint No(s):	N: 6174637 -	
Region: Central Hawkes Bay	Altitude: 54m -	
Location: Fernhill Stud, bluffs just before steep track for highest vantage point (18 Jan. 2002)	Author: R. Baggs	
NZMS 260 Sheet: V21		2 of 2

Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Description
Petane Formation Waipatiki Limestone Member					C2 M1 C2 C2	<p>Coarse well sorted sandy cross-bedded weathered trough cross-bedded limestone.</p> <p>Weakly cemented, well sorted shelly sand. Bidirectional cross-bedding with burrows.</p> <p>Fine grained pebble limestone, tabular bedding with the pebbles increasing up the bed.</p> <p>Very calcareous mud</p> <p>Tabular cross-bedded pebbly limestone.</p>
		mud fine medium coarse silt fine medium coarse gravel				

Stratigraphic Column No: 182	Grid Reference: Top	Bottom	NZMS 260 V21 182 1 of 2
Section: Ma2	E: 2829400	-	
GPS Waypoint No(s):	N: 6175100	-	
Region: Central Hawkes Bay	Altitude:	-	
Location: Ohiwia	Author: V.Caron		
NZMS 260 Sheet: V21			

INTERNATIONAL DIVISION & NEW ZEALAND STAGE		Fm Mb	FACIES ASSEMBLAGE	FACIES	LITHOLOGY	SAMPLE CONTACTS	COMMENTS
PLIOCENE NUKUMARUAN WAIPATIKI LIMESTONE MEMBER							<p>Medium- to coarse-grained, moderately sorted, moderately to well cemented skeletal-rich grainstone beds separated by a strongly bioturbated horizon (<i>Skolithos</i>-type burrows).</p> <p>Trough and tangential cross-bedded, well-sorted, moderately to well cemented coarse skeletal grainstone, rich in (now) calcitized aragonitic bivalves.</p> <p>Very well cemented sharp-based shell bed packed with abundant calcitized shells, and recognizable <i>Tawera</i> and <i>Glycymeris</i> shells, separated by a strongly bioturbated horizon (<i>Skolithos</i>-type burrows).</p> <p>Fine-grained soft mixed carbonate-siliciclastic sediments.</p>

Stratigraphic Column No: 182

Grid Reference:

Top

Bottom

NZMS 260 V21

Section: Ma2

E: 2829400

-

GPS Waypoint No(s):

N: 6175100

-

Region: Central Hawkes Bay

Altitude:

-

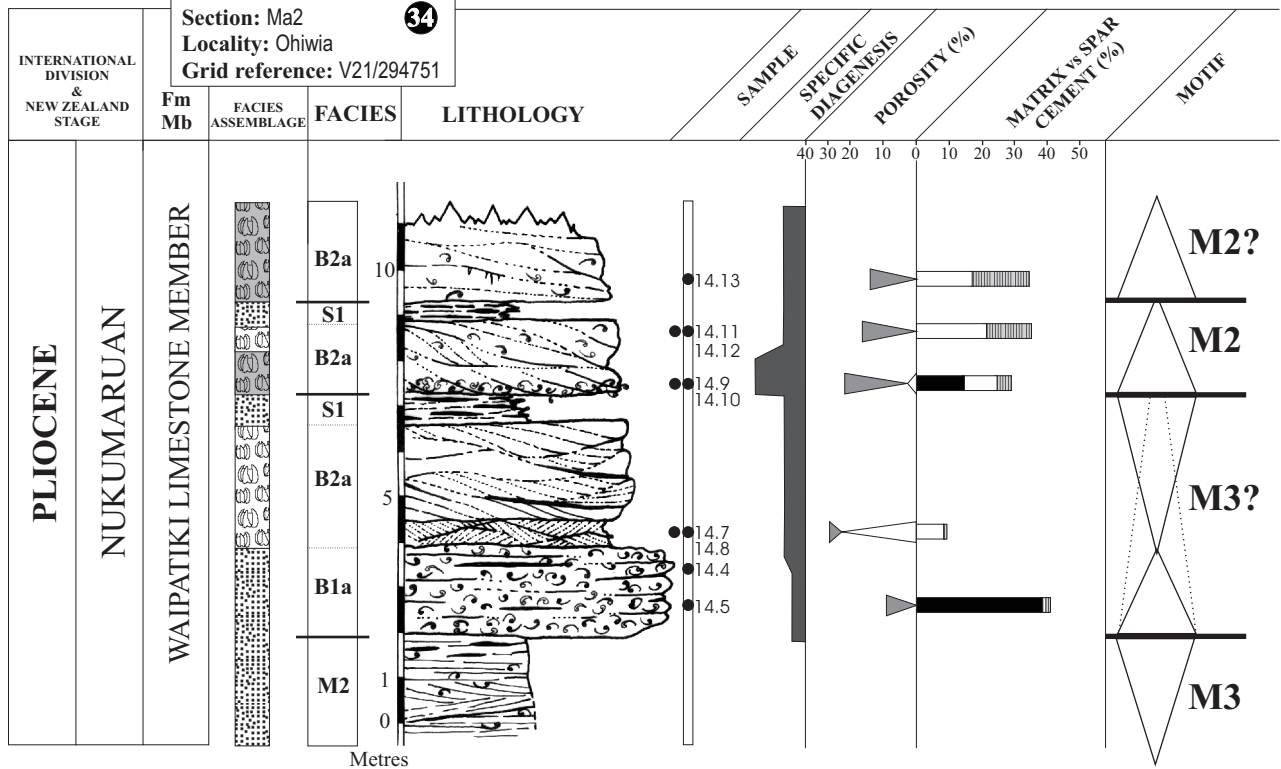
Location: Ohiwia

NZMS 260 Sheet: V21

Author: V.Caron

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Stratigraphic Column No: 183	Grid Reference: Top	Bottom	NZMS 260 V21 183 1 of 1
Section:	E: 2829382	-	
GPS Waypoint No(s):	N: 6174909	-	
Region: Central Hawkes Bay	Altitude: 31m	-	
Location: Road cut, on windy part of Taihape Rd. (10 Jan. 2003)			
NZMS 260 Sheet: V21	Author: R. Baggs		

Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Description	
Mangaheia Group Kaiwaka Formation					C2	Poorly sorted, massive? pebbly limestone.	
							Well sorted, laminated sand. Clasts of volcanically derived muds within unit.
					M1	Large scale trough cross bedding? Shell concentrations within a sandy matrix	
						M1	Scattered shells within cross bedded sand layers
					C1	Pebbly shellbed with concentration of shells in the top 5cm.	
					C1	Pebbly shell bed	
					C1	Pebbly shellbed, with mud stringers.	
					M1	Moderately sorted shelly sand, with fossil concentrated in lenses and layers within the bed.	

mud
 fine
 medium
 coarse
 silt
 fine
 medium
 coarse
 sand
 gravel

Stratigraphic Column No: 184	Grid Reference: Top	Bottom	NZMS 260 V21 184 1 of 1
Section:	E: 2829893	-	
GPS Waypoint No(s):	N: 6174031	-	
Region: Central Hawkes Bay	Altitude: 25m	-	
Location: Cornes property, on Napier - Taihape Rd. side (07 Mar. 2003)			
NZMS 260 Sheet: V21	Author: R. Baggs		

Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Sample no.	Description											
Petane Formation Waipatiki Limestone Member	2		≠		S6		Weakly calcareous white silt.											
	1				C1		Poorly sorted pebbly shell bed. <i>Tawera</i> dominating, with lesser amounts of <i>Crepidula radiata</i> , <i>Pupurocardia</i> sp., <i>Glycemeris</i> sp. and <i>Ostrea</i> .											
				cm dm				Interbedded well sorted pebbly sand and calcareous mud.										
					M1		Horizontally bedded pebbly sand.											
		<table border="1" style="font-size: 8px;"> <tr><td>mud</td></tr> <tr><td>fine</td></tr> <tr><td>medium</td></tr> <tr><td>coarse</td></tr> <tr><td>silt</td></tr> <tr><td>fine</td></tr> <tr><td>medium</td></tr> <tr><td>coarse</td></tr> <tr><td>sand</td></tr> <tr><td>coarse</td></tr> <tr><td>gravel</td></tr> </table>	mud	fine	medium	coarse	silt	fine	medium	coarse	sand	coarse	gravel					
mud																		
fine																		
medium																		
coarse																		
silt																		
fine																		
medium																		
coarse																		
sand																		
coarse																		
gravel																		

Stratigraphic Column No: 185	Grid Reference: Top Bottom	NZMS 260 V21
Section:	E: 2828994 -	185
GPS Waypoint No(s):	N: 6173631 -	
Region: Central Hawkes Bay	Altitude: 48m -	
Location: Track cut on Alan Gunns Property (26 Mar. 2003)		
NZMS 260 Sheet: V21	Author: R. Baggs	1 of 1

Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Description
Petane Formation		Deviils Elbow Mudstone Member				
	4				M1	Moderately sorted bidirectional cross-bedded shelly sand with mud stringers.
	3				C1	Shellbed, rare greywacke pebbles, <i>Patro</i> sandy matrix.
	2				M1	Well sorted shelly sand with mudstingers.
	1				C1?	Sandy shellbed, cross-bedded, moderately cemented, gastropods, <i>Tawera</i> and caapucino whirls.

Stratigraphic Column No: 186

Grid Reference:

Top

Bottom

NZMS 260 V21

Section: Ma1

E: 2830000

-

GPS Waypoint No(s):

N: 6173300-6173400

-

Region: Central Hawkes Bay

Altitude:

-

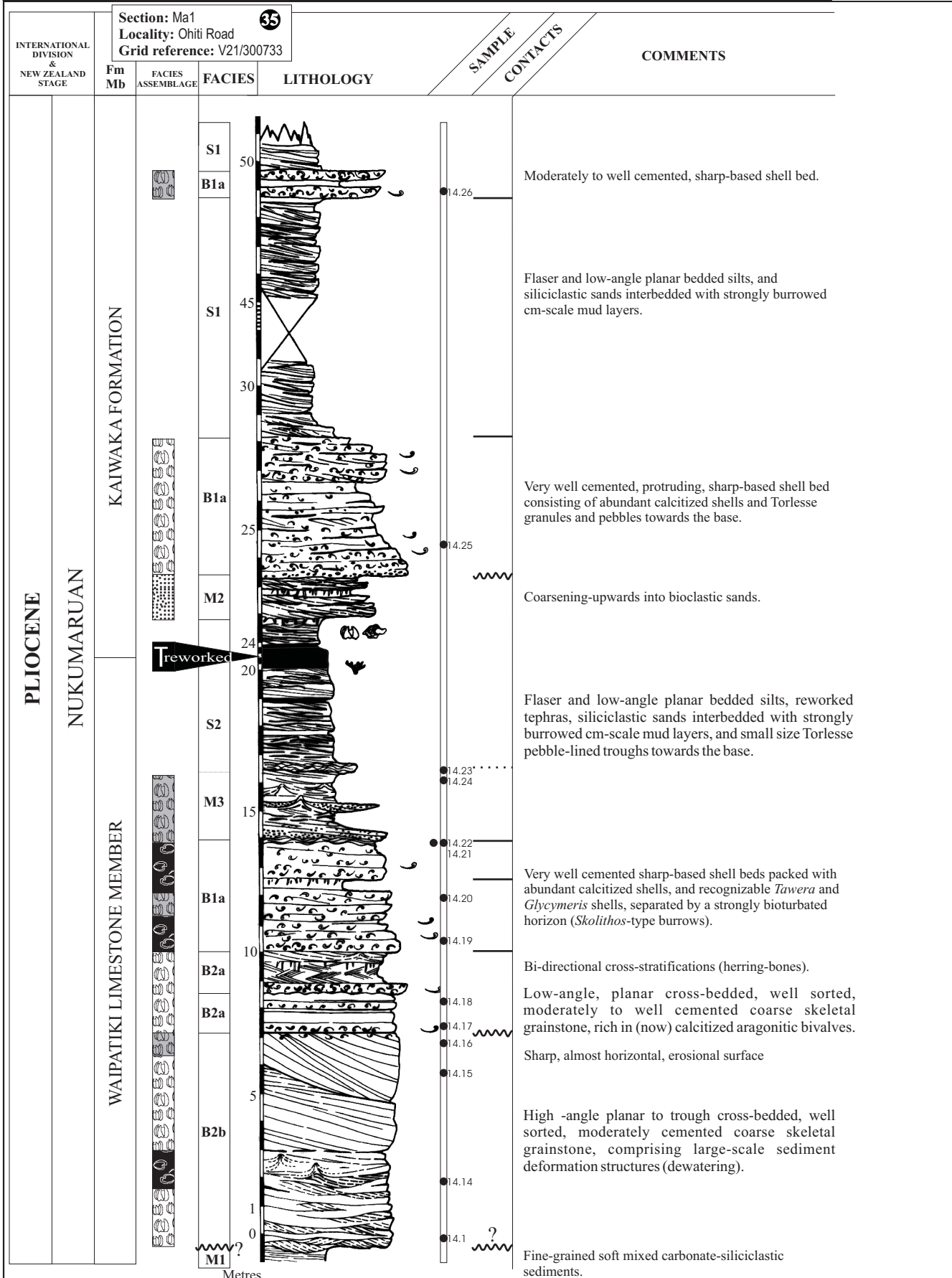
Location: Ohiti Road

NZMS 260 Sheet: V21

Author: V.Caron

186

1 of 2



Stratigraphic Column No: 186

Grid Reference:

Top

Bottom

NZMS 260 V21

Section: Ma1

E: 2830000

-

GPS Waypoint No(s):

N: 6173300-6173400

-

Region: Central Hawkes Bay

Altitude:

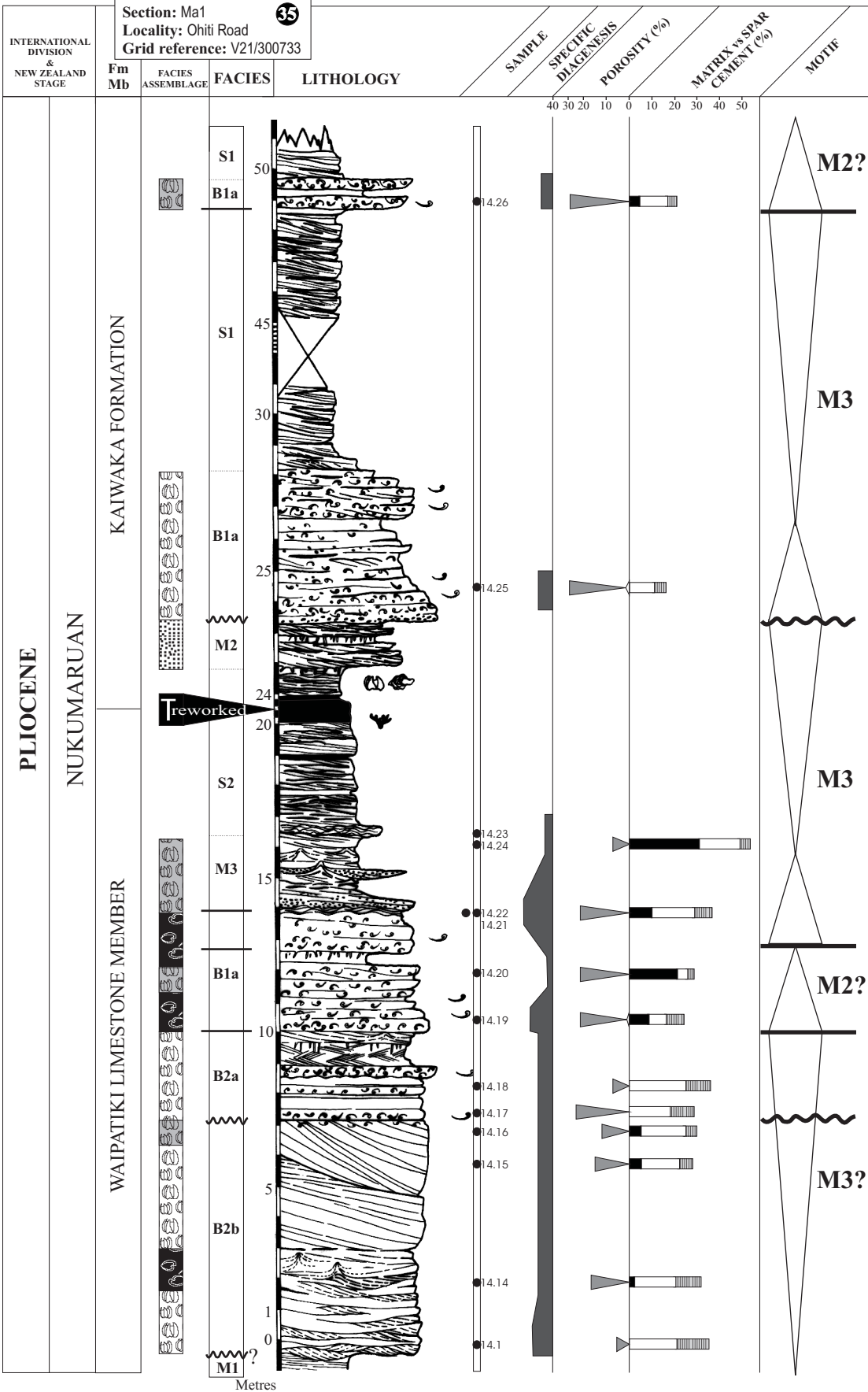
-

Location: Ohiti Road

Author: V.Caron

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Stratigraphic Column No: 189	Grid Reference: Top	Bottom	NZMS 260 V21 189 1 of 1
Section:	E: 2828991	2829575	
GPS Waypoint No(s): 74-77; 129-135	N: 6170238	6170195	
Region: Central Hawkes Bay	Altitude: 103 m	76 m	
Location: Composite column of Roys Hill outcrops, from outcrops overlooking SH50 and the Ngaruroro River (1/2 southern side)	Author: S. Dyer		
NZMS 260 Sheet: V21			

Stratigraphic Unit	Thick. (m)	Lithology	Structures	Dominant Fossils	Facies Code	WP No.	Description	
Park Island Limestone	38				S ₅	77	Shell bed of poorly sorted, friable broken bivalve shells and disarticulated bivalves, in a shelly sand matrix.	
	36				C ₃	74	Dark grey, well-cemented, crystalline, trough-crossbedded, moderately sorted, mouldic grainstone. Moulds dominantly of whole bivalve shells, gastropods and articulated bivalves, lined with orange calcareous mud and calcite crystals. Large scale, low angle crossbeds at base decrease in dimension with height.	
	32							
	30							
	28							
	26					C ₄	129	Dark grey, well-cemented, slightly silty, crystalline, tabular-bedded, moderately sorted, mouldic grainstone. Moulds at base dominantly of angular shell fragments, increasing in size with height to whole bivalve shells, gastropods and articulated bivalves. Tabular beds grade with height to trough-crossbedding.
	24							
	22							
	20					C ₄		Pale grey, well-cemented, tabular-bedded, moderately sorted, mouldic packstone, separated from overlying grainstone by angular unconformity.
	18							
Taradale Mudstone	16				C ₂	76	Creamy/white, moderately-cemented, horizontally bedded, poorly sorted, coarse skeletal sand/shell hash, composed of angular mollusc, bryozoan, barnacle and echinoderm fragments. Honey comb appearance common due to intense bioturbation near top.	
	14							
	12			dm =			133	Horizontally-bedded, well-cemented, calcareous quartz-dominated sandstone. Bedding disrupted by water escape structures.
	10							
	8					S ₂		Dark brown, non-calcareous, friable, weakly laminated sandstone. With height, becomes more calcareous and more cemented and laminations become strongly convoluted. Discontinuous siltstone laminations also occur with height.
	6							Tan-coloured, weakly calcareous, massive siltstone, containing abundant angular bivalve shell fragments.
	4				Cs ₁		Dark grey calcareous massive siltstone, containing 2 shell beds. Lower shell bed dominated by <i>Atrina zelandica</i> , <i>Patro undatus</i> and <i>Telochlamys</i> sp. all encrusted with barnacles and bryozoans. Clusters of branching bryozoans common.	
	2				M ₁	131	Upper shell bed dominated by <i>Patro undatus</i> , fragmented <i>Telochlamys</i> sp. rare <i>Atrina zelandica</i> , <i>Austrovenus</i> sp. brachiopods, <i>Ostrea ?chilensis</i> at base, echinoderm spines and barnacles.	
	0				Cs ₁			
		Mud fine med. Silt coarse fine med. Sand coarse Gravel						

Stratigraphic Column No: 190	Grid Reference: Top	Bottom	NZMS 260 V21 190 1 of 1
Section:	E: 2827095	2827660	
GPS Waypoint No(s): 3, 196, 179, 180, 182, 197	N: 6168264	6168495	
Region: Central Hawkes Bay	Altitude: 141 m	54 m	
Location: Composite column of Roys Hill outcrops, from outcrops overlooking SH50 and the Ngaruroro River (2/2 northern side)	Author: S. Dyer		
NZMS 260 Sheet: V21			

Stratigraphic Unit	Thick. (m)	Lithology	Structures	Dominant Fossils	Facies Code	WP No.	Description
Park Island Limestone	38						
	36						
	32						
	30					182	
	28				C4	180	Dark grey, well-cemented, crystalline, trough-crossbedded, moderately sorted, mouldic grainstone. Moulds dominantly of whole bivalve shells, gastropods and articulated bivalves, lined with orange calcareous mud and calcite crystals. Large scale, low angle crossbeds at base decrease in dimension with height.
	26						
	24				C3	179	
	22						
	20				S2	196	Dark grey, well-cemented, slightly silty, crystalline, tabular-bedded, moderately sorted, mouldic grainstone. Moulds at base dominantly of angular shell fragments, increasing in size with height to whole bivalve shells, gastropods and articulated bivalves. Tabular beds grade with height to trough-crossbedding.
	18						
	16				S2	003	Pale yellow, friable, weakly bedded to laminated, well-sorted, calcareous quartz-rich, shelly sandstone. Laminations laterally become convoluted and distorted. With height, discontinuous mud stringers approx. 5 cm thick by 30 cm long occur. Cemented about vertical bioturbation structures at top. Rare, discontinuous, white pumiceous fine-grained silt/mudstone scattered throughout.
	14						
	12				M1	197	Dark brown, non-calcareous, friable, massive quartz-rich sandstone.
	10						
	8				M1	197	Dark tan, weakly calcareous massive siltstone,
	6						
Taradale Mudstone	4				M1		
	2						
	0						

Mud fine med. coarse
Silt med. coarse
Sand fine med. coarse
Gravel

Stratigraphic Column No: 191	Grid Reference: Top	Bottom	NZMS 260 V21 191 1 of 1
Section:	E: 2824600	-	
GPS Waypoint No(s):	N: 6168660	-	
Region: Central Hawkes Bay	Altitude: 132m	-	
Location: Tirohia - top of slip scarp, overlooking Ngaruroro River (16 Dec. 2002)	Author: R. Baggs		
NZMS 260 Sheet: V21			

Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Description
Petane Formation Waipatiki Limestone Member	5		=			Creamy beige, moderately indurated, poorly sorted, limestone. Aragonite moulds of bivalves and gastropods. Moderately indurated, sandy limestone with gastropod and bivalve moulds.
	4				↑ C2 ↓	Well indurated, tabular bedded, sorted calcarenite with aragonite moulds mainly bivalves, some gastropods.
	3					Massive, well sorted sandy limestone. Bivalves and gastropod moulds.
	2					Well sorted shelly sand.
	1					Well cemented sandy limestone. Bivalves, gastropods and bryozoan.
		<div style="display: flex; justify-content: space-between; font-size: 8px;"> mud fine medium coarse fine medium coarse gravel </div>				

Stratigraphic Column No: 192	Grid Reference: Top	Bottom	NZMS 260 V21 192 1 of 1
Section:	E: 2825069	-	
GPS Waypoint No(s):	N: 6169559	-	
Region: Central Hawkes Bay	Altitude: 96m	-	
Location: Matapiro Hill (12 Dec. 2002)	Author: R. Baggs		
NZMS 260 Sheet: V21			

Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Description
Petane Formation Te Ngaru Mudstone Member	1.5		=		M1	Moderately sorted tabular bedded, fossiliferous sand.
	1		=		M1	Moderately sorted, tabular bedded, shelly sand. ↑ Very porous. ↓
	0.5		≠		M1	Weakly cemented, well sorted, massive shelly sand.
						Moderately calcareous, volcanically derived mud with shelly sand clasts within it.

Stratigraphic Column No: 193	Grid Reference: Top	Bottom	NZMS 260 V21 193 1 of 1
Section:	E: 2824953	-	
GPS Waypoint No(s):	N: 6169572	-	
Region: Central Hawkes Bay	Altitude: 117m	-	
Location: Matapiro Station (12 Dec. 2002)	Author: R. Baggs		
NZMS 260 Sheet: V21			

Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Description
Petane Formation Waipatiki Limestone Member	1		=		C2	Well cemented, moderately sorted, tabular bedded limestone with aragonite moulds.
	0.5		≠		M1	Grading upwards from a non cemented fossiliferous sand to a weak to moderately cemented, well sorted shelly sand <div style="text-align: center;"> ↑ Non-cemented ↓ </div>
	0					

Stratigraphic Column No: 195	Grid Reference: Top	Bottom	NZMS 260 V21 195 1 of 1
Section:	E: 2823429	-	
GPS Waypoint No(s):	N: 6170071	-	
Region: Central Hawkes Bay	Altitude: 89m	-	
Location: Northern boundary of Matapiro Station, beside stream (12 Dec. 2002)	Author: R. Baggs		
NZMS 260 Sheet: V21			

Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Description
Petane Formation	Waipatiki Limestone Member	1.5			C1	Well cemented shell bed with small greywacke pebbles. Matrix grain sizes decreases from medium sand at top of bed to a mud at the bottom of the bed.
		1				Grades into a laminated mud, continues to alternate between with a less cemented shell bed in a sandy matrix.
Petane Formation	Te Ngaru Mudstone Member	0.5			S4	Fine grained, well sorted massive sand.

mud
 fine
 medium
 coarse
 fine
 medium
 coarse
 sand
 gravel

Stratigraphic Column No: 196	Grid Reference: Top	Bottom	NZMS 260 V21 196 1 of 1
Section:	E: 2823237	-	
GPS Waypoint No(s):	N: 6175086	-	
Region: Central Hawkes Bay	Altitude:	-	
Location: Property on the edge of Waitio Stream, at the northern boundary of Matapiro Station	Author: R. Baggs		
NZMS 260 Sheet: V21			

Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Description									
Petane Formation					C2 C2 C2	Very pebbly, trough cross-bedded limestone.									
						Tabular bedded moderately cemented pebbly limestone with common biomoulds.									
						Pebbly cross-bedded limestone with common biomoulds									
		<table border="1"> <tr><td>mud</td></tr> <tr><td>fine</td></tr> <tr><td>medium</td></tr> <tr><td>coarse</td></tr> <tr><td>fine</td></tr> <tr><td>medium</td></tr> <tr><td>coarse</td></tr> <tr><td>gravel</td></tr> </table>	mud	fine	medium	coarse	fine	medium	coarse	gravel					
mud															
fine															
medium															
coarse															
fine															
medium															
coarse															
gravel															

Stratigraphic Column No: 197	Grid Reference: Top	Bottom	NZMS 260 V21
Section:	E: 2822914	-	197
GPS Waypoint No(s):	N: 6173560	-	
Region: Central Hawkes Bay	Altitude: 82m	-	
Location: Alan Gunns property (26 Mar. 2003)			Author: R. Baggs
NZMS 260 Sheet: V21			1 of 1

Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Description
Petane Formation	3		=	C	C3	Very weathered sandy limestone.
Devils Elbow Mudstone Member	1		≠	C	S3	White calcareous massive mudstone. <i>Tawera sp.</i> dominates.
			≠	S	M1	Coarse shelly sand interbedded with the overlying mudstone unit.

mud
 fine
 medium
 coarse
 silt
 fine
 medium
 coarse
 sand
 gravel

Stratigraphic Column No: 198	Grid Reference: Top Bottom	NZMS 260 V21
Section:	E: 2821981 -	198
GPS Waypoint No(s):	N: 6171891 -	
Region: Central Hawkes Bay	Altitude: 211m -	
Location: Below trig point on Matapiro Hill, side looking down on stock yards (08 Nov. 2002)	Author: R. Baggs	
NZMS 260 Sheet: V21		1 of 1

Stratigraphic Unit	Thickness (m)	Lithology	Structures	Fossils	Facies code	Sample no.	Description
Kaiwaka Formation Puketautahi Limestone			<p style="text-align: center;">=</p> <p style="text-align: center;">=</p> <p style="text-align: center;">=</p> <p style="text-align: center;">≠</p>		<p style="text-align: center;">C3</p> <p style="text-align: center;">C3</p> <p style="text-align: center;">C3</p> <p style="text-align: center;">C3</p>		<p>Moderately sorted, very weathered limestone with common biomoulds and calcsitisation of bivalves.</p> <p>Well sorted, tabular bedded limestone with abundant biomoulds. Very small (2-3 mm) greywacke pebbles.</p> <p>Moderately sorted, calcitised bivalve dominated limestone. Large burrows filled with a orange/rust coloured fine silt material.</p> <p>Moderately sorted, well cemented limestone. Common calcitised shells.</p>
		mud fine medium coarse silt fine medium coarse sand gravel					

