

Fig. 11. Map showing location of stratigraphic columns within NZMS 260 Sheet V22.

Stratigraphic Column No: 221

Grid Reference: Top

Bottom

NZMS 260 V22

GPS Waypoint No(s): 231 - 233

E: 2814076

2814089

Region: Lester Property - Churston Station SH50

N: 6159919

6159838

Location: on top of column number 218

Altitude: 221 m

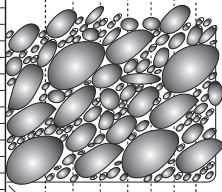

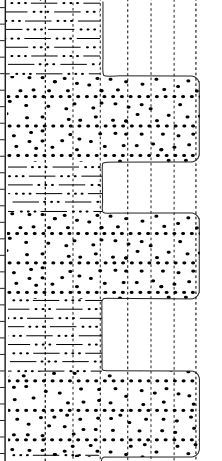

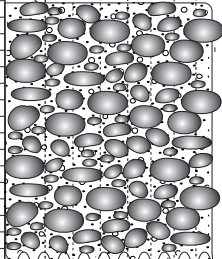

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NZMS 260 Sheet: V22 Waipawa

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Author: S. Dyer

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Stratigraphic Unit	Thick. (m)	Lithology	Structures	Dominant Fossils	Facies Code	WP No.	Description
Okauawa Formation	4				Cg2	233	Massive, poorly sorted, rounded red gravel, slightly imbricated
	3		V 		M4 S4 M4 S4 M4	232	Interbedded, well-sorted coarse sand-sized, rounded pumiceous lapilli and fine pumiceous orangey/tan mm bedded coloured silt
	2		V 		S4	Cg1	231
		<div style="display: flex; justify-content: space-between; font-size: small;"> Mud fine med coarse fine med coarse Gravel </div> <div style="display: flex; justify-content: space-between; font-size: x-small;"> Silt Sand </div>					

Stratigraphic Column No: 222 Grid Reference: Top Bottom
 Section: E: 2814089 2814082
 GPS Waypoint No(s): 230-231 N: 6159838 6159795
 Region: Central Hawkes Bay Altitude: 211 m 206 m
 Location: Lester property - Churston Station on SH50; column is on main farm track that crosses a tributary stream of the Maraekakaho River
 NZMS 260 Sheet: V22 Author: S. Dyer

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Stratigraphic Unit	Thick. (m)	Lithology	Structures	Dominant Fossils	Facies Code	WP No.	Description
Okauawa Formation	6						
	5				Cg ₁		Reddish-brown gravel bed dominated by flattened and elongated greywacke pebbles in a friable, granular matrix.
	4				Cs ₁	231	Blue-grey, well-sorted, calcareous fossiliferous sandy siltstone shellbed. <i>Amalda sp.</i> , <i>Pupurocardia purpurata</i> , <i>Marioculpus</i> , juvenile <i>Ostrea chilensis</i> (nonarticulated), juvenile brachiopods, branching and encrusting bryozoa, echinoderm spines, <i>Atrina zelandica</i> , <i>Pelicaria fossa</i> , <i>Poirieria sp.</i> , <i>Sigapetalla sp.</i> , <i>Cominella kereruensis</i> and <i>Penion sulcatus</i> .
	3				M ₄		Blue-grey, non-calcareous, friable silt
	2			cm	S ₄		Interbedded laminated greyish, non-calcareous, very well-sorted sand and pumiceous silt. Orange stripey discolouration at sand/silt boundaries.
	1				S ₂		Greyish/tan, very friable, non-calcareous, non-fossiliferous, quartz-rich sand of very well sorted, angular grains.
0				Cg ₂	230	Reddish/brown greywacke gravel bed of flat, elongated, subrounded pebbles. Poorly sorted and moderately indurated in a granular matrix of very coarse, poorly-sorted quartz and greywacke sand.	
		Mud fine med coarse Silt fine med coarse Sand Gravel					

Stratigraphic Column No: 224	Grid Reference: Top	Bottom	NZMS 260 V22 224 1 of 1
Section:	E: 2819624	2819645	
GPS Waypoint No(s): SD00a-SD85c, SD86	N: 6159420	6159712	
Region: Central Hawkes Bay	Altitude: 204 m	175 m	
Location: Back of Whakapirau Station, following stream from Raukawa Rd. cross country to Whakapirau Rd., as far as new cattle yards	Author: S. Dyer		
NZMS 260 Sheet: V21/V22			

Stratigraphic Unit	Thick. (m)	Lithology	Structures	Dominant Fossils	Facies Code	WP No.	Description
Torran Limestone Member	30		V		C ₃	SD 86	Undulating, tabular cross bedded, well cemented medium-grained, grainstone interbedded with poorly cemented, laminated, fining upwards grainstone containing continuous lineations of whole barnacles at base of each weakly cemented unit. <i>Zethalia zelandica</i> and <i>Tawera</i> sp. occurring at top of exposure. Thin pumiceous lineations near top (<3 cm).
	28						
	26						
	24						
	22		V		C ₁	SD 85c	Skeletal sandstone, well sorted, weakly cemented, becoming more cemented with height. Grading up from discontinuous lenses within the pumiceous siltstone below.
Maharakeke Mudstone Member	18				M ₁	SD 85b	Pumiceous, massive, weakly cemented calcareous siltstone with small (< 2mm) moulds of shell fragments. Grading upwards into a very pumiceous, non-calcareous white siltstone containing many juvenile <i>Ostrea chilensis</i> , crushed <i>Zeoculpus</i> sp. fragmented <i>Telochlamys</i> sp. and <i>Porieria</i> sp. and discontinuous lenses of weakly cemented skeletal sandstone.
	16		V				
	14		≠				
	12						
	10				S ₁	SD 85a	Calcareous, moderately sorted, massive shelly sandstone, fining upwards with noncalcareous mudstone stringers occurring near the top of exposure.
	8		≠				
	6						Non-calcareous, orangy-brown coloured, well-sorted, friable, wavy bedded, quartz-rich sandstone, becoming more calcareous with height. Overlain sharply by fining upwards shelly sandstone.
	4						
	2						
	0						

Mud fine med. coarse fine med. coarse
Silt Sand

Stratigraphic Column No: 225 Grid Reference: Top Bottom
 Section: E: 2820157 2820438
 GPS Waypoint No(s): RC01-RC03, 103-106 N: 6158134 6158610
 Region: Central Hawkes Bay Altitude: 224 m 159 m
 Location: Road cutting starting at stock yards approx. 200m uphill from Valley Rd. /Raukawa Rd. intersec., stopping 15m downhill from Whakapirau Rd/Raukawa Rd. intersec.
 NZMS 260 Sheet: V22 **Author: S. Dyer**

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Stratigraphic Unit	Thick. (m)	Lithology	Structures	Dominant Fossils	Facies Code	WP No.	Description
Petane Group	0 to 80				Cs ₁ C ₁ C ₂ S ₁ M ₁ Cs ₁ C ₂ C ₃ M ₁ Cs ₁ C ₂	106 103 RC 01C RC 01B RC 01A RC 03	1 - 1.5 m thick shell bed of <i>Ostrea chilensis</i> and <i>Patro undatus</i> in a grey coloured, poorly cemented calcareous sandy silt matrix.
							Horizontally-bedded, differentially cemented, cream coloured skeletal grainstone of medium sand-sized grains coarsening up to a well-cemented coquina-like deposit.
							Blue-grey, massive siltstone, grading up into a quartz-rich, calcareous, medium-grained skeletal sandstone.
							Cross-bedded well-cemented and well-sorted blue-grey grainstone interbedded with cream coloured friable, skeletal sand. Sharply overlain by 1.5 m thick shellbed of <i>Ostrea chilensis</i> and <i>Patro undatus</i> in a tan coloured, poorly cemented silty matrix.
							Blue-grey, massive, weakly friable, well sorted siltstone containing fossiliferous beds. Lowermost shell beds contain <i>Towapectin mariae</i> and <i>Ostra chilensis</i> , middle shellbeds contain <i>Pellicaria convexa</i> , <i>Purpurocardia purpurata</i> and <i>Atrina zelandica</i> . Uppermost shell bed contains <i>Zeoculpus</i> sp. and highly weathered <i>Glycemaris shrimptoni</i> . Grades up into a shelly, fossiliferous, calcareous, medium grained sandstone. Fauna dominated by barnacle clusters, juvenile <i>Ostrea</i> and serpulid tubes.
							Differentially cemented, moderately sorted creamy coloured grainstone. Horizontal to wavy bedding appearing with height. Strongly bioturbated in places, giving a honey comb appearance. Sharply overlain by 1 - 1.5 m thick shell bed of <i>Ostrea chilensis</i> and brachiopods in a greyish tan coloured, cemented calcareous sandy silt matrix.
							Blue-grey, massive to very weakly horizontally bedded, well-sorted, weakly cemented siltstone.

Stratigraphic Column No: 226
 Section: M2
 GPS Waypoint No(s):
 Region: Central Hawkes Bay
 Location: Torran
 NZMS 260 Sheet: V22

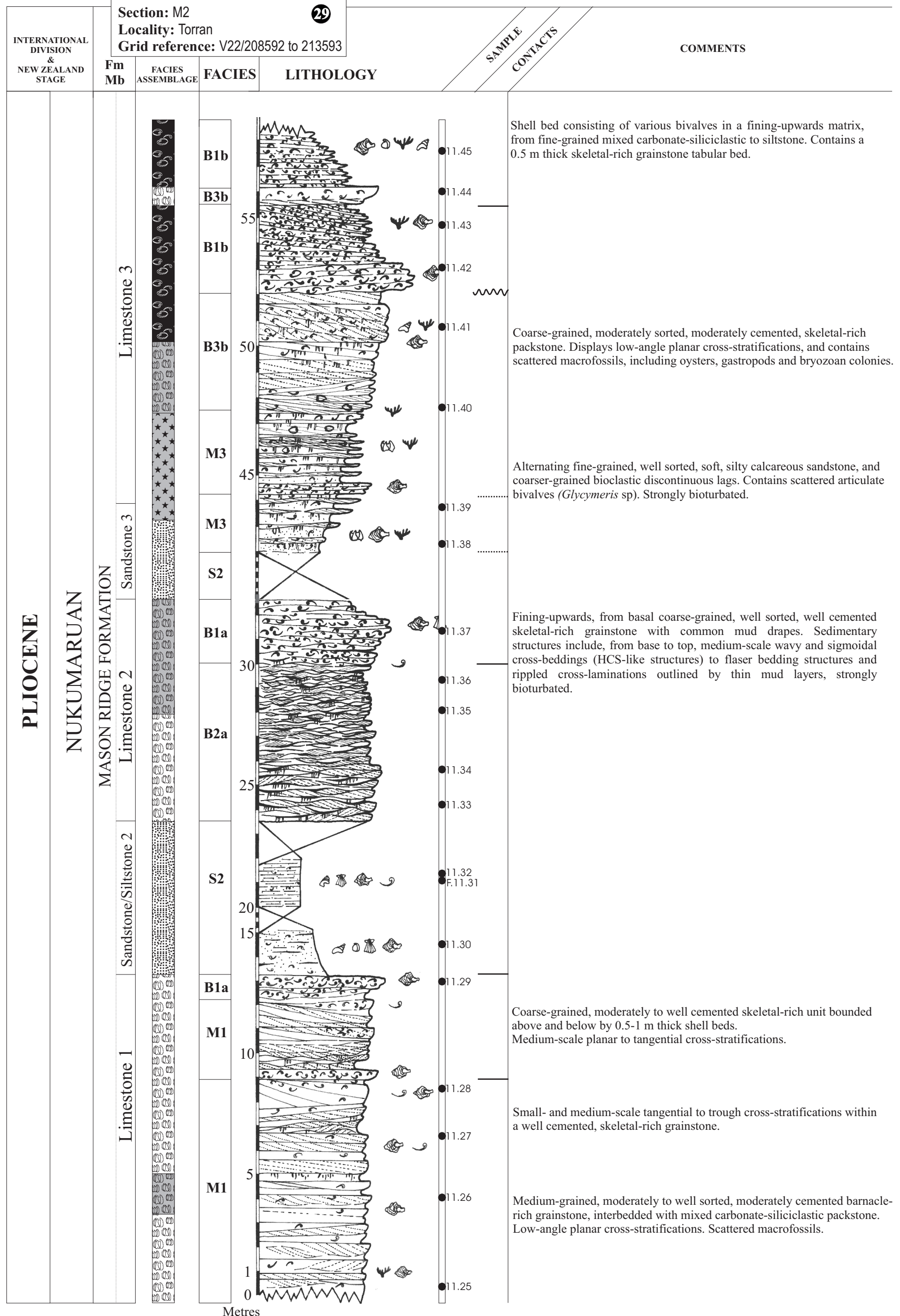
Grid Reference: Top Bottom
 E: 2820800-2821300 -
 N: 6159200-6159300 -
 Altitude: -

Author: V. Caron

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Stratigraphic Column No: 227

Grid Reference: Top

Bottom

NZMS 260 V21

GPS Waypoint No(s): 236 - 241

E: 2821408

2820974

Region: Torran Station

N: 6159780

6158951

Location: Limestone bluffs wrapping around the hillside behind the farm house

Altitude: 201 m

146 m

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NZMS 260 Sheet: V21 Napier and V22 Waipawa

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Author: S. Dyer

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Stratigraphic Unit	Thick. (m)	Lithology	Structures	Dominant Fossils	Facies Code	WP No.	Description
Mahana Limestone Member	0-5				C ₂		
	5-10				C ₃	237	
	10-12				C ₃	238	
	12-15				Cs ₁	238	Sharply overlain by 1.5 m thick shellbed of <i>Ostrea chilensis</i> and <i>Patro undatus</i> in a tan coloured, poorly cemented silty matrix.
Maharakeke Mudstone Member	15-25				M ₁		Blue-grey, massive, calcareous, well-sorted siltstone
	25-40						
Torran Limestone Member	40-42				Cs ₁		2 m thick shellbed of horizontally bedded <i>Ostrea chilensis</i> , in a grey/tan coloured sandy silt matrix.
	42-45						
Pakihirua Limestone Member	45-50				S ₁	239	Friable, tan-yellow coloured, skeletal calcareous sandstone, grading with height into well-cemented skeletal sandstone.
	50-55				C ₁		
	55-60				C ₂		Tan-yellow coloured, moderately sorted, differentially to moderately well-cemented, planar bedded skeletal grainstone, containing scattered rounded, subspherical greywacke pebbles up to 4 cm in diameter. Bivalves scattered throughout unit, mainly articulated <i>Ostrea chilensis</i> , <i>Purpurocardia purpurata</i> and <i>Glycymeris shrimptoni</i> .
	60-65				Cs ₁	241	Shellbed sharply overlying grainstone, grading up from a fine-grained calcareous sandstone matrix to a calcareous siltstone.
	0	Mud					
		fine Silt					
		med coarse Sand					
		fine med coarse Sand					
		Gravel					

Stratigraphic Column No: 228

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: R1

E: 2834500

-

GPS Waypoint No(s):

N: 6158600

-

Region: Central Hawkes Bay

Altitude:

-

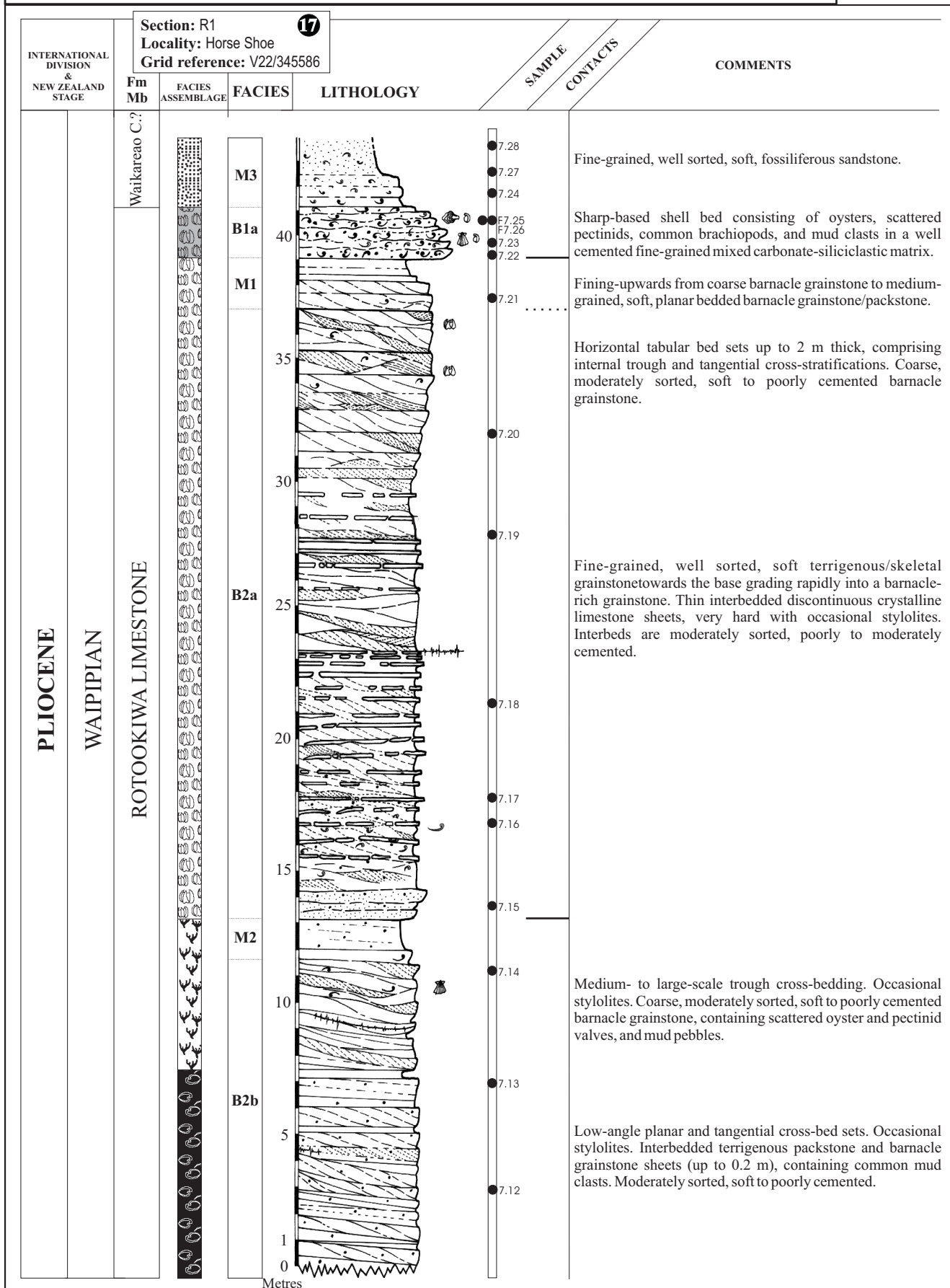
Location: Horse Shoe

Author: V. Caron

NZMS 260 Sheet: V22

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Stratigraphic Column No: 228

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: R1

E: 2834500

-

GPS Waypoint No(s):

N: 6158600

-

Region: Central Hawkes Bay

Altitude:

-

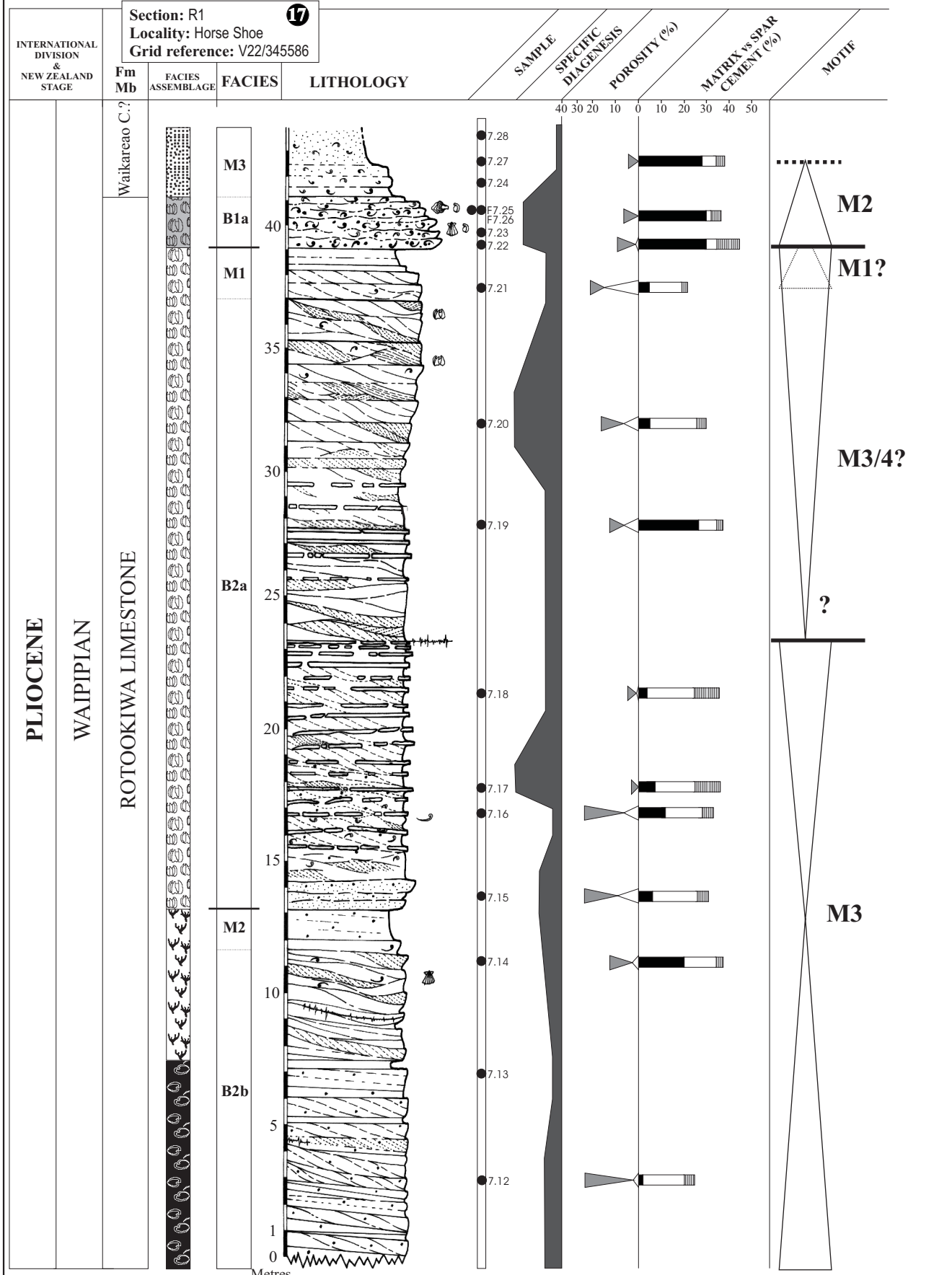
Location: Horse Shoe

NZMS 260 Sheet: V22

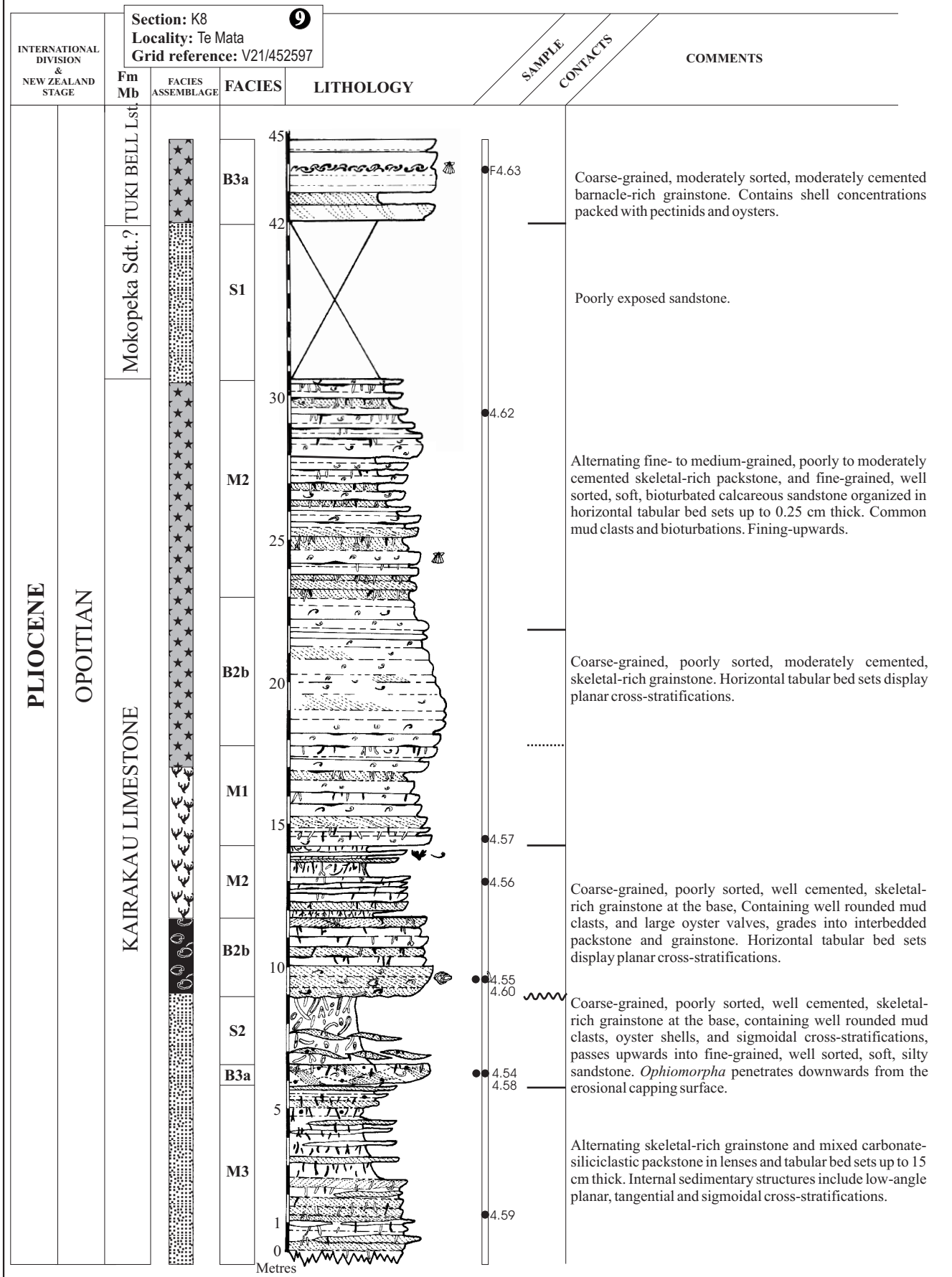
Author: V. Caron

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Stratigraphic Column No: 229	Grid Reference: Top	Bottom	NZMS 260 V22 229 1 of 2
Section: K8	E: 2845200	-	
GPS Waypoint No(s):	N: 6159700	-	
Region: Central Hawkes Bay	Altitude:	-	
Location: Te Mata	Author: V. Caron		
NZMS 260 Sheet: V22			



Stratigraphic Column No: 229

Grid Reference: Top

Bottom

NZMS 260 V22

Section: K8

E: 2845200

-

GPS Waypoint No(s):

N: 6159700

-

Region: Central Hawkes Bay

Altitude:

-

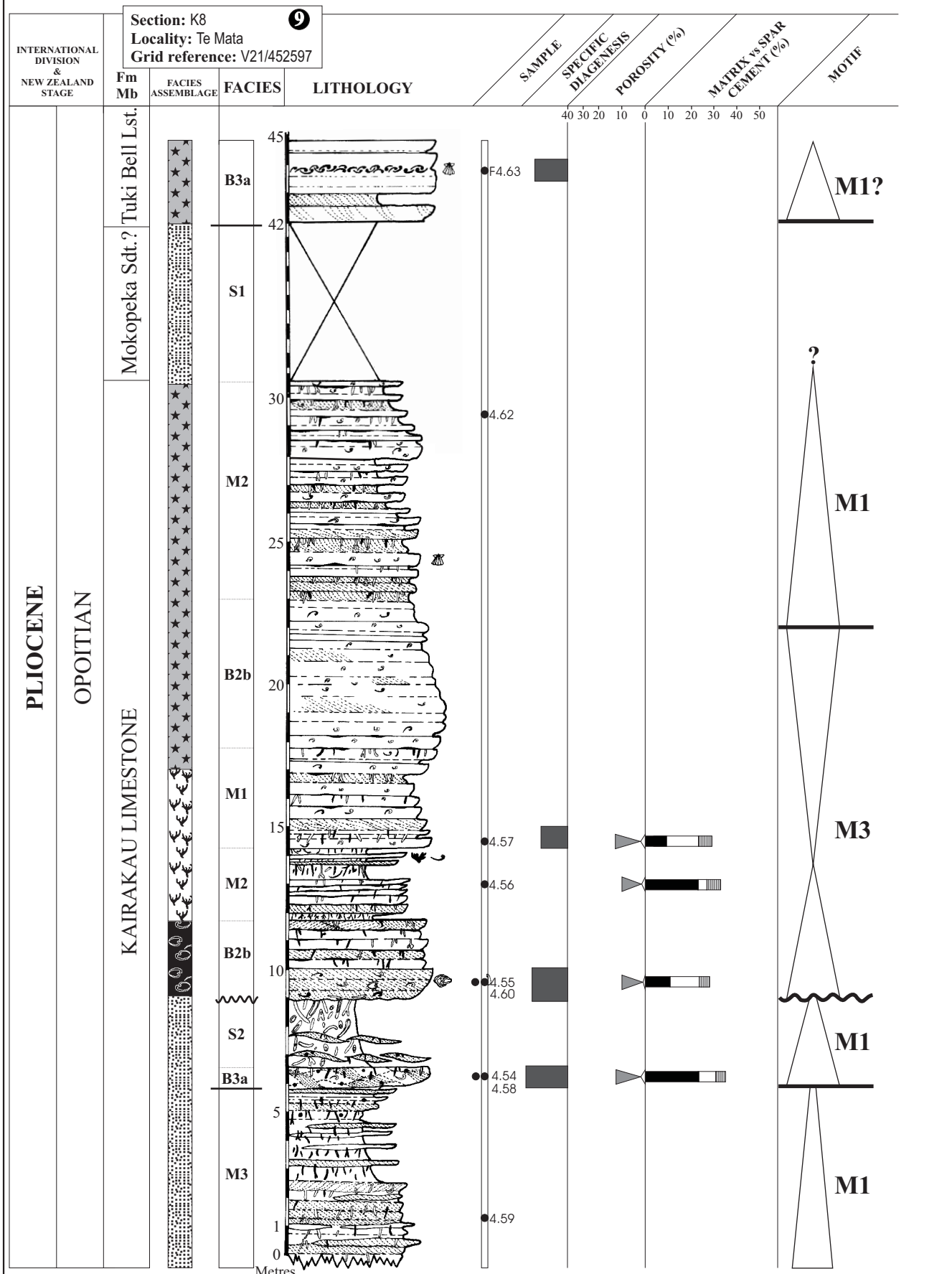
Location: Te Mata

NZMS 260 Sheet: V22

Author: V. Caron

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Stratigraphic Column No: 230

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: K6

E: 2842600 -

GPS Waypoint No(s):

N: 6151800-6155800 -

Region: Central Hawkes Bay

Altitude: -

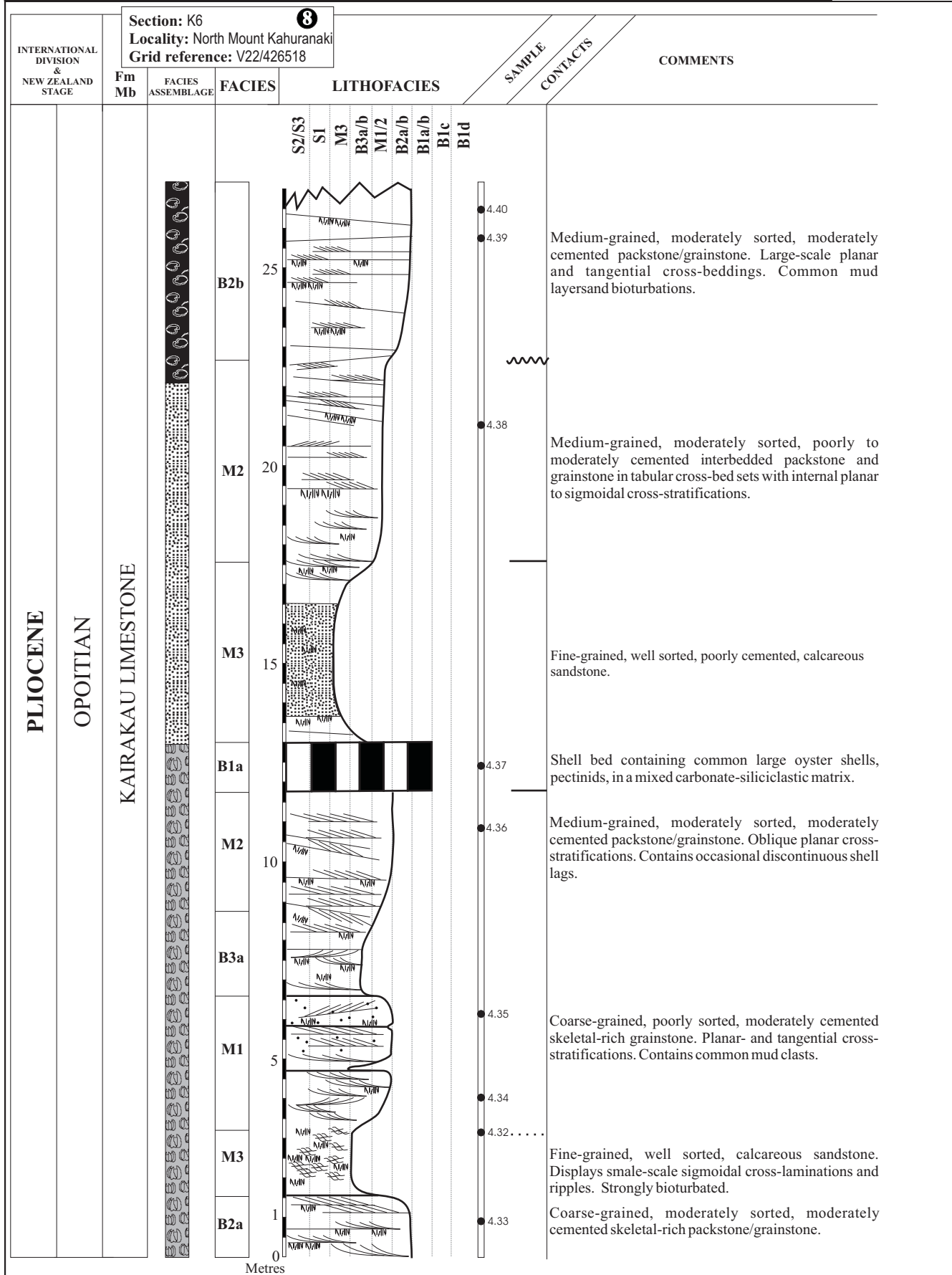
Location: North Mount Kahuranaki/Mangangara

NZMS 260 Sheet: V22

Author: V. Caron

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Stratigraphic Column No: 230

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: K6

E: 2842600

-

GPS Waypoint No(s):

N: 6151800-6155800

-

Region: Central Hawkes Bay

Altitude:

-

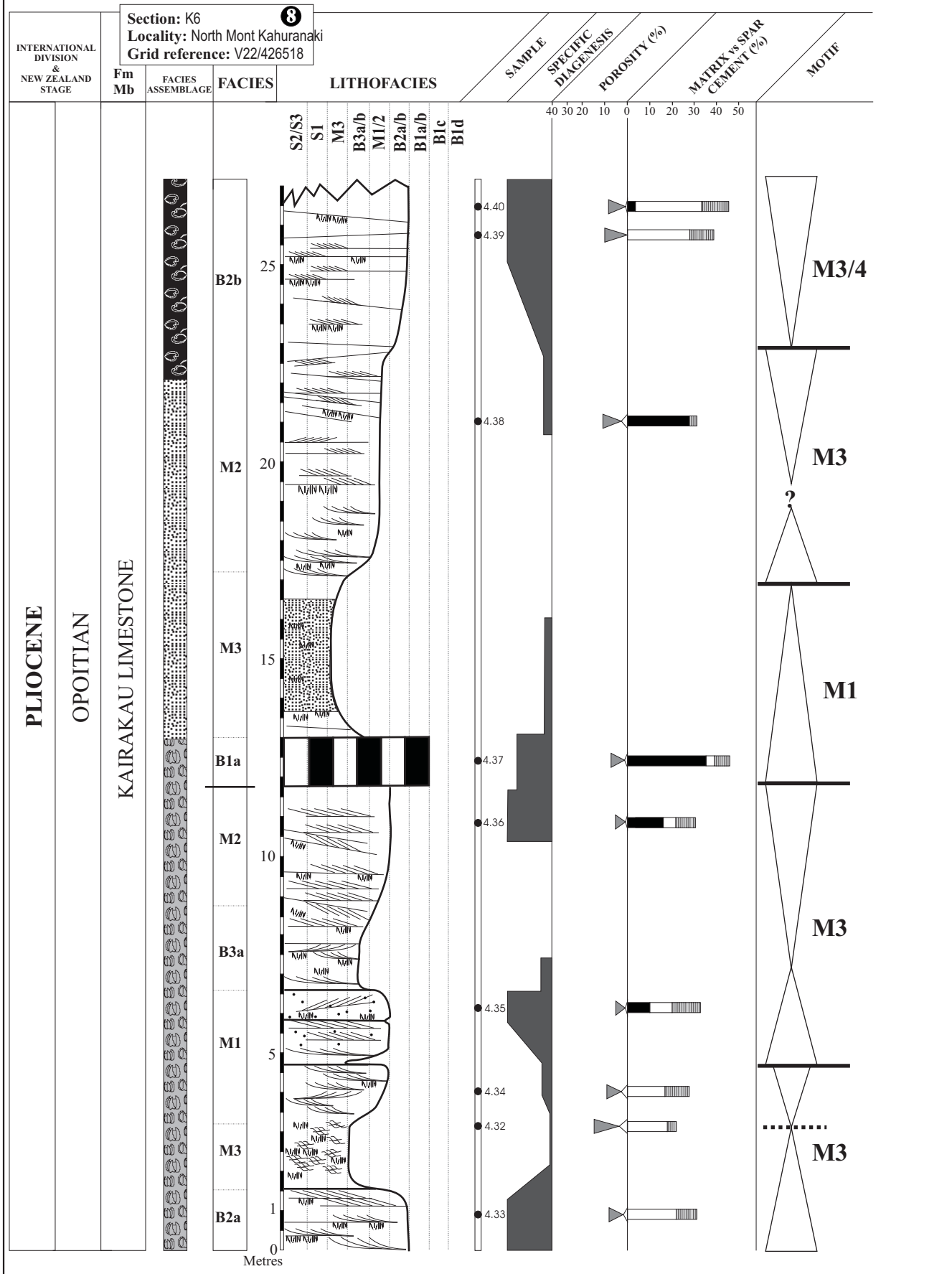
Location: North Mount Kahuranaki/Mangangara

NZMS 260 Sheet: V22

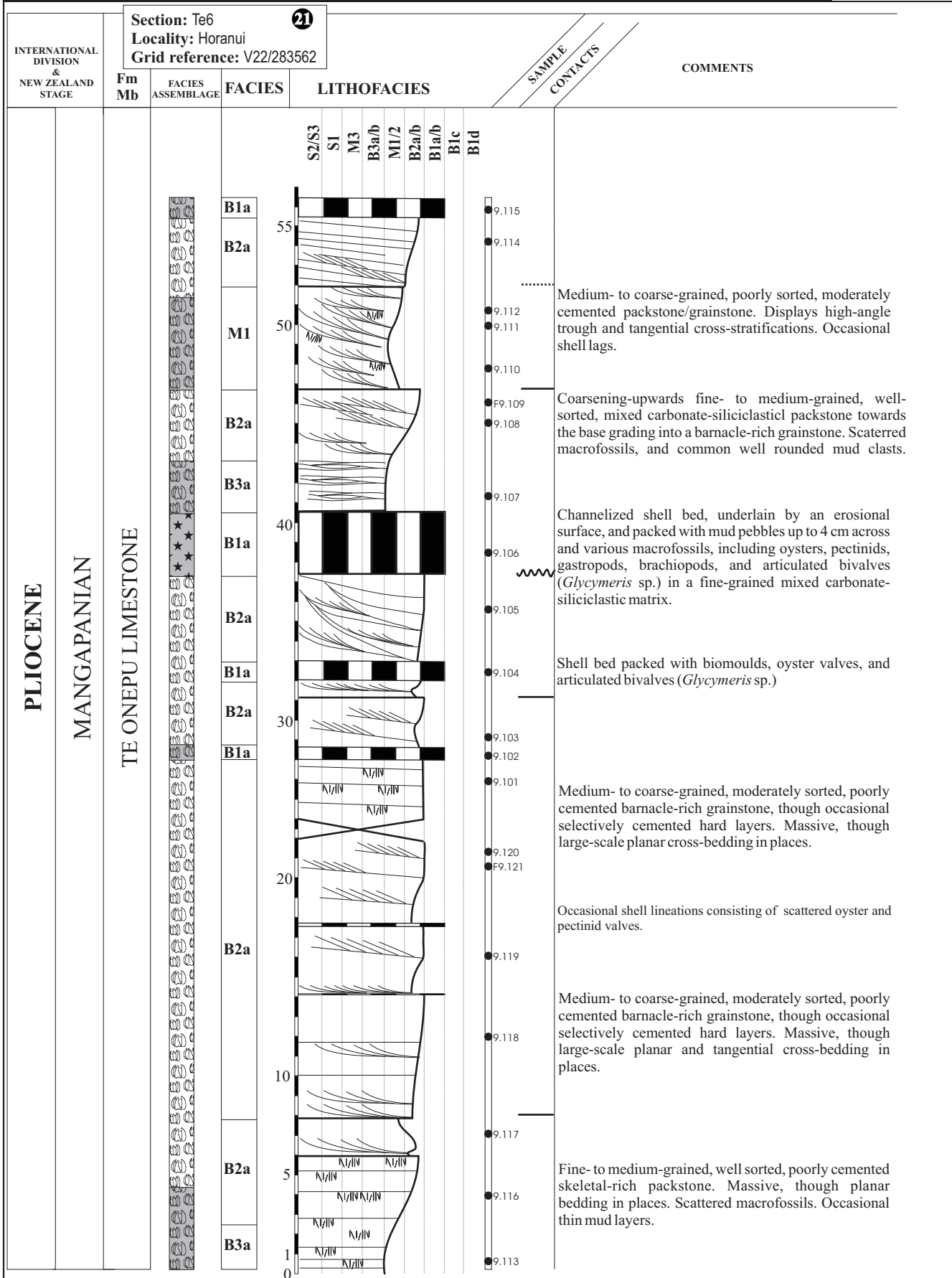
Author: V. Caron

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Stratigraphic Column No: 231	Grid Reference: Top	Bottom	NZMS 260 V22 231 1 of 2
Section: Te6	E: 2828300	-	
GPS Waypoint No(s):	N: 6156200	-	
Region: Central Hawkes Bay	Altitude:	-	
Location: Horanui	Author: V. Caron		
NZMS 260 Sheet: V22			



Stratigraphic Column No: 231

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: Te6

E: 2828300

-

GPS Waypoint No(s):

N: 6156200

-

Region: Central Hawkes Bay

Altitude:

-

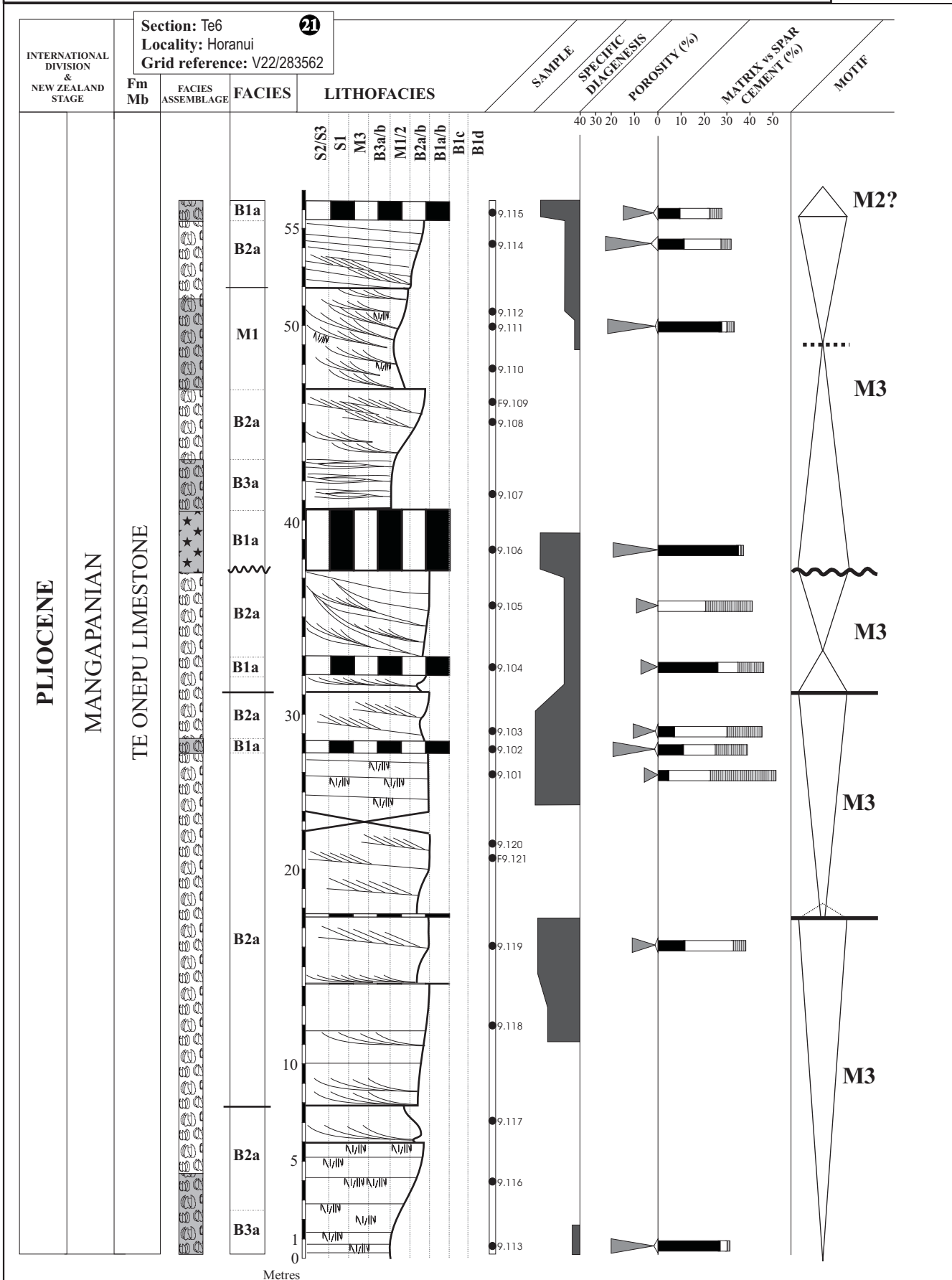
Location: Horanui

NZMS 260 Sheet: V22

Author: V. Caron

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Stratigraphic Column No: 232

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: Te5

E: 2825900

-

GPS Waypoint No(s):

N: 6154900

-

Region: Central Hawkes Bay

Altitude:

-

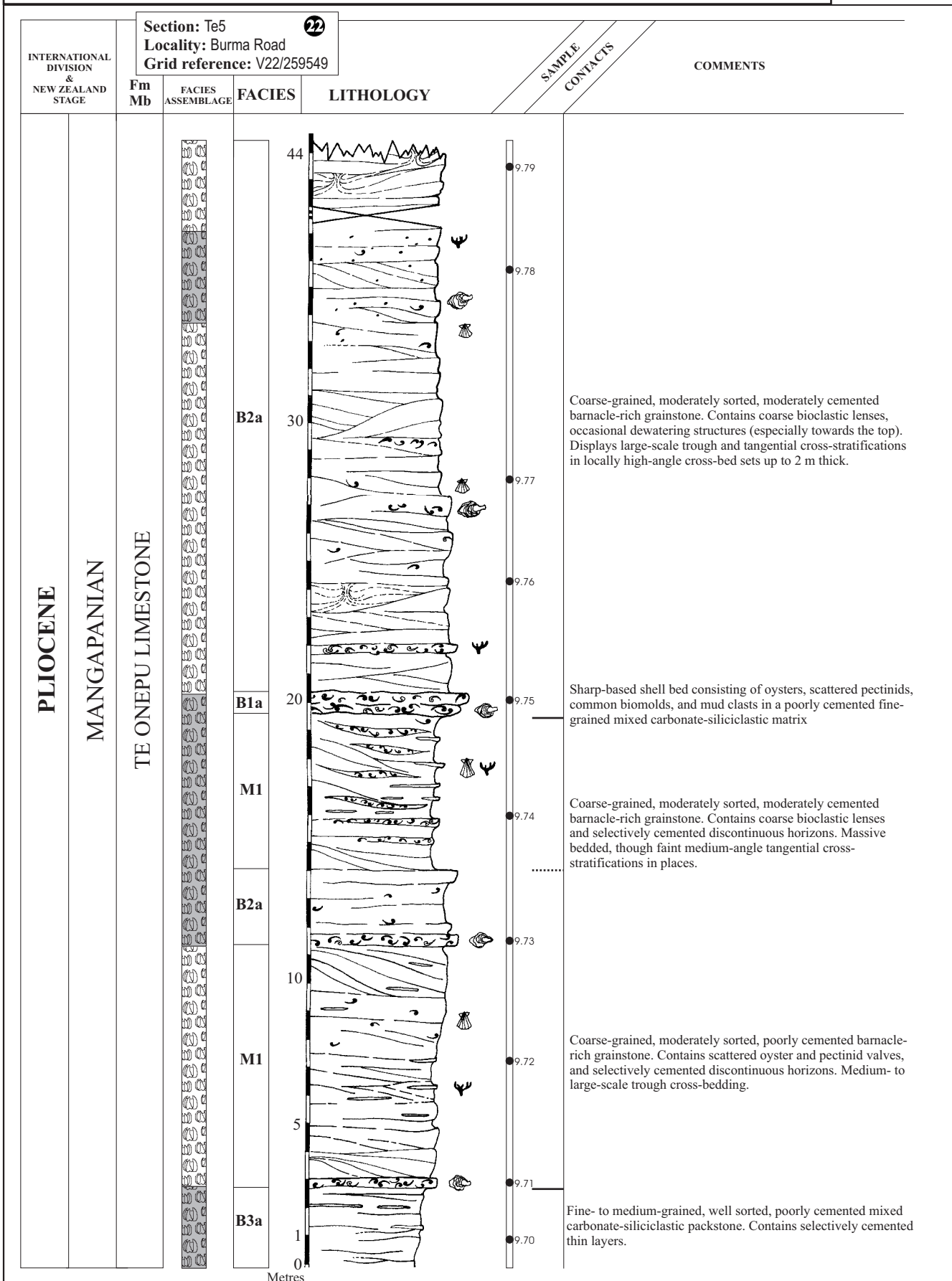
Location: Burma Road

NZMS 260 Sheet: V22

Author: V. Caron

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Stratigraphic Column No: 232

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: Te5

E: 2825900

-

GPS Waypoint No(s):

N: 6154900

-

Region: Central Hawkes Bay

Altitude:

-

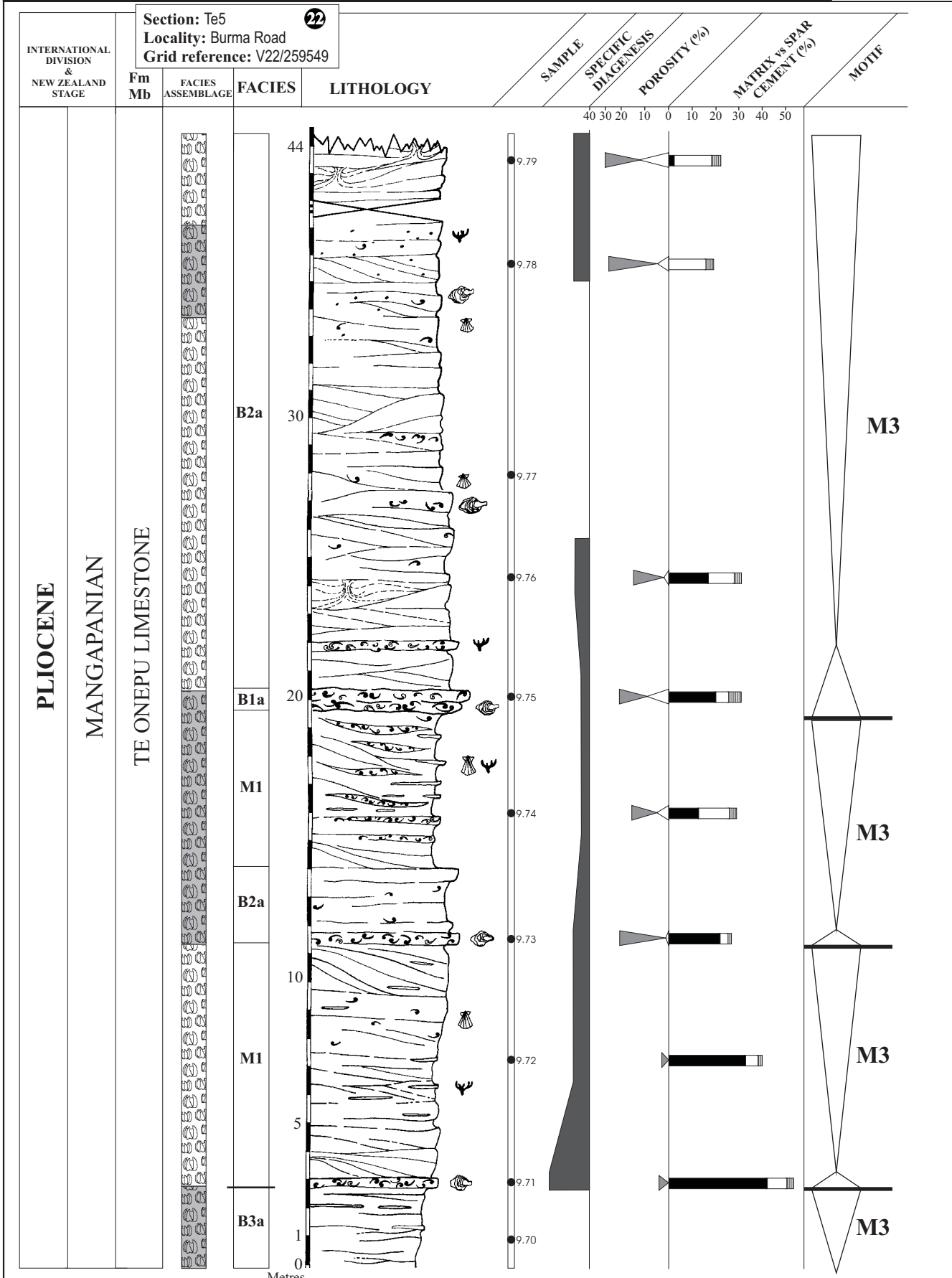
Location: Burma Road

NZMS 260 Sheet: V22

Author: V. Caron

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Stratigraphic Column No: 233

Grid Reference:

Top

Bottom

NZMS 260 V22

Section:

E: 2824871

-

GPS Waypoint No(s): 207

N: 6155095

-

Region: Central Hawkes Bay

Altitude: 217 m

-

Location: Summit of Burma Road, road cutting in vicinity of entrance to Kerunga Station

Author: S. Dyer

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Stratigraphic Unit	Thick. (m)	Lithology	Structures	Dominant Fossils	Facies Code	WP No.	Description
Te Onepu Limestone	14		=		C ₁		Creamy/white, well-cemented, tabular-bedded, well-sorted coarse grainstone composed from dominantly bryozoan and bivalve fragments and barnacle plates.
	10						
	8		=		M ₂		Creamy/white, wavy tabular interbedded weakly-cemented, well-sorted, massive, weakly pumiceous, calcareous medium-grained, grainstone with moderately-cemented, weakly-bedded, moderately-sorted coarse grainstone composed dominantly from moderately-rounded bryozoan and bivalve fragments and barnacle plates.
	6						
	4		≠		C ₂	207	With height, weakly-cemented units become increasingly silty and pumiceous and thin out, while cemented units thicken and dominate the outcrop.
	2						
	0						Base of cemented units dominated by well-preserved, whole juvenile sea urchins, <i>Phialopecten thompsoni</i> and entire barnacles.
		Mud fine med coarse Silt fine med coarse Sand					

Stratigraphic Column No: 234 **Grid Reference: Top** **Bottom** **NZMS 260 V22**
GPS Waypoint No(s): **E:** 2819126 2819196
Region: Glen Aros Station, off Raukawa Road. **N:** 6155125 6155119
Location: Cliffs cropping out above Pakihirua **Altitude:** 289 m 229 m
Stream, and along farm track leading down to stream from farm house
NZMS 260 Sheet: V22 Waipawa **Page 1 of 1** **Author:** S. Dyer **1 of 1**

Stratigraphic Unit	Thick. (m)	Lithology	Structures	Dominant Fossils	Facies Code	WP No.	Description
Pakihirua Limestone Member	80				Cs ₁		Sharply overlying shell bed composed dominantly of <i>Ostrea chilensis</i> within a grey silty calcareous matrix.
	75		=		C ₂	202	Creamy-yellow, moderately-sorted and moderately-cemented, massive, coarse-grained skeletal grainstones interbedded with medium-grained, poorly cemented packstones. Grainstone beds typically contain aragonitic bivalve and gastropod biomoulds. Scattered rounded greywacke pebbles (< 4 cm diameter).
Whakapirau Mudstone Member	70				C ₁	204	Massive, poorly cemented skeletal sandy grainstone with vertical burrowing down into the siltstone, infilled with medium-grained shell material.
	65				M ₁	205	Massive, calcareous, poorly cemented sandstone grading upwards into a blue-grey, well sorted, weakly indurated, massive sandy siltstone.
Torran Limestone Member	60				Cs ₁		Sharply overlying shell bed composed dominantly of <i>Ostrea chilensis</i> within a greyish-yellow silty calcareous matrix.
	55				C ₁	203	Creamy-yellow, moderately-sorted and moderately-cemented, massive, coarse-grained skeletal grainstones interbedded with medium-grained, poorly cemented packstones. Vertical burrows down into the underlying sandstone.
Maharakeke Mudstone Member	50				S ₅	201	Blue-grey well sorted, weakly indurated, massive sandy siltstone, grading rapidly upwards into a massive, calcareous silty sandstone, containing fragments of greywacke.
	45				Cs ₁		Sharply overlying shell bed composed dominantly of <i>Ostrea chilensis</i> within a greyish-yellow silty calcareous matrix.
Mahana Limestone Member	40		≠		C ₁	206	Creamy-yellow coarsening upwards interbedded skeletal grainstones and packstones. Moderately sorted and moderately cemented with planar bedding.
	35		=		C ₂	200	Creamy-yellow coarse sandy skeletal pumiceous grainstone. Poorly sorted, moderately cemented, massive to weakly planar bedded.
Makaretu Mudstone	30		≠				Massive green-grey calcareous sandy siltstone still containing thin (< 5 cm) sandy shell lineations of juvenile <i>Ostrea chilensis</i> and weathered <i>Zeaculpus</i> sp., <i>Atrina zelandica</i> , brachiopods and clusters of barnacles.
	25		≠				
	20		≠				
	15		≠		Ms ₁	199	Massive blue-grey calcareous siltstone with thin (< 5 cm) sandy shell lineations of juvenile <i>Ostrea chilensis</i> and weathered <i>Zeaculpus</i> sp., <i>Atrina zelandica</i> , brachiopods and clusters of barnacles.
	10		≠				
	5		≠				
	0						
		Mud					
		fine Silt					
		med Silt					
		coarse Silt					
		fine Sand					
		med Sand					
		coarse Sand					
		Gravel					

Stratigraphic Column No: 235
 Section: M3
 GPS Waypoint No(s):
 Region: Central Hawkes Bay
 Location: Pakihirua
 NZMS 260 Sheet: V22

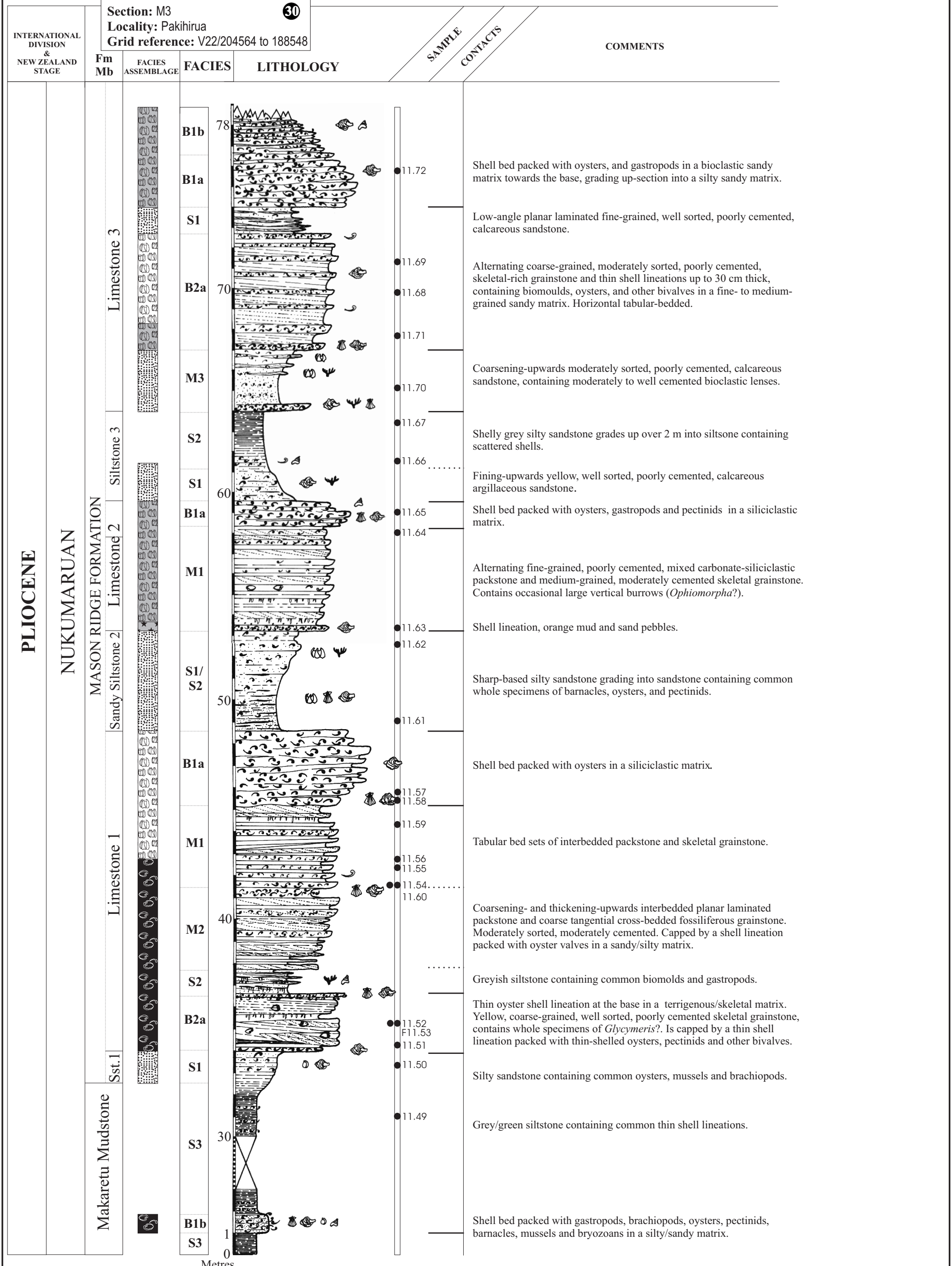
Grid Reference: Top Bottom
 E: 2820400-2818800 -
 N: 6156400-6154800 -
 Altitude: -

Author: V. Caron

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Stratigraphic Column No: 236	Grid Reference: Top	Bottom	NZMS 260 V22 236 1 of 1
Section:	E: 2819352	2818730	
GPS Waypoint No(s): 139 - 143	N: 6153206	6153172	
Region: Central Hawkes Bay	Altitude: 321 m	296 m	
Location: Composite column from exposures along farm track on Mahana Station, end of Anaroa Rd., facing Raukawa Range		Author: S. Dyer	
NZMS 260 Sheet: V22			

Stratigraphic Unit	Thick. (m)	Lithology	Structures	Dominant Fossils	Facies Code	WP No.	Description
Mahana Limestone Member	36		≠		Cs ₁	143	Shell bed capping limestone dominated by <i>Ostrea chilensis</i> within a tan/grey weakly cemented siltstone matrix.
	34		(=)		C ₂		
	32						
	30						
	28		≠		C ₁	142	Creamy/grey moderately-sorted, poorly cemented, grainstone dominated by angular bivalve, barnacle and bryozoan fragments. Coarsening upwards, base is massive and grades upwards to horizontally bedded at the top. Contain fragments of <i>Phialopecten triphooki</i> and rare valves of <i>Towaipecten mariae</i> .
Makaretu Mudstone	26						
	24				C ₂	139	
	22						
	20						
	18		≠		M ₁		Blue-grey, friable, massive, poorly-sorted, sandy siltstone containing abundant angular bryozoan, barnacle, bivalve and gastropod fragments and juvenile brachiopods.
	16						
	14						
	12						
	10		≠		M ₃		Grey, massive, fossiliferous calcareous siltstone containing rare angular shell fragments (1-2 mm).
	8						
	6						
	4						
	2						
	0						

Stratigraphic Column No: 237

Grid Reference: Top

Bottom

NZMS 260 V22

GPS Waypoint No(s): 112 - 117

E: 2818372

2818408

Region: Southern end of Pakihirua Stream

N: 6154093

6154233

Location: Cliffs above Pakihirua Stream, south of Ibstone Station, Raukawa Rd.

Altitude: 264 m

215 m

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NZMS 260 Sheet: V22 Waipawa

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Author: S. Dyer

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Stratigraphic Unit	Thick. (m)	Lithology	Structures	Dominant Fossils	Facies Code	WP No.	Description	
Torran Limestone Member	34							
	32		=		Cs ₁	117	Shell bed capping limestone dominated by <i>Ostrea chilensis</i> and brachiopods within a tan/grey weakly cemented siltstone matrix.	
	30				C ₁			
	28		≠		Cs ₁	112	2 shell linations (< 0.10 m thick) dominated by articulated and weathered <i>Ostrea chilensis</i> , <i>Patro undatus</i> and <i>Glycymeris shrimptoni</i> within a tan/grey weakly cemented siltstone matrix, seperated by a weakly cemented grainstone composed of well-sorted, rounded bryozoan, barnacle and bivalve fragments.	
	26				C ₁			
	24				C ₂			
	22			≠		C ₃	114	Interbedded differentially-cemented, massive, well sorted, skeletal sandstone and well-cemented, well-sorted, weakly pumiceous grainstone. Grainstone units are laterally discontinuous trough-crossbeds.
	20				C ₂			
	18				C ₃			
	16					C ₂		
14			↗		C ₃			
Maharakeke Mudstone Member	12		=		C ₃	116	Creamy/grey moderately-sorted, poorly cemented, grainstone dominated by angular bivalve, barnacle and bryozoan fragments. Coarsening upwards, base is massive and grades upwards to horizontally bedded and becomes strongly trough-crossbedded at the top.	
	10		≠		C ₁			
	8			≠		M ₁	Grey, massive, fossiliferous calcareous siltstone with orange mottles and angular shell fragments (1-2 mm). Dominated by juvenile <i>Ostrea chilensis</i> and <i>Tawera</i> sp.	
	6			≠		C ₁	113	Creamy/tan, weakly cemented, well-sorted, massive skeletal sand dominated by <i>Tawera</i> sp., <i>Ostrea chilensis</i> , barnacle clusters, and bryozoans. Initially coarsening upwards, then fining upwards to a sandy siltstone.
	4				C ₁			
	2		(=)					
	0							
		Mud fine med. coarse Silt fine med. coarse Sand Gravel						

Stratigraphic Column No: 238

Grid Reference: Top

Bottom

NZMS 260 V22

GPS Waypoint No(s):

E: 2816700

Region: Taheke Station, at end of Taheke Road.

N: 6155400

Location: Exposed along tributary of the Maraekakaho River.

Altitude: 215 m








238

NZMS 260 Sheet: V22 Waipawa

Page 1 of 1

Author: S. Dyer

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Stratigraphic Unit	Thick. (m)	Lithology	Structures	Dominant Fossils	Facies Code	WP No.	Description
Torran Limestone Member	16						
	15						
	14						
	13						
	12						
	11			≠		M ₁	Massive, moderately sorted, poorly cemented, blue-grey sandy mudstone, underlain sharply by nonfossiliferous, mudstone unit.
	10			//// ≠		M ₂	
	9						
	8					Cs ₁	Massive, moderately sorted, <i>Ostrea chilensis</i> dominated shell bed. Poorly cemented, blue-grey/tan sandy siltstone matrix
	7						
	6						
	5			=		C ₁	Well-cemented and interbedded skeletal-rich grainstones and terrigenous packstones dominated by bryozoan and barnacle fragments. Tabular beds steepen upsection, and are truncated by erosional contact.
	4						
3							
2							
1							
0							
		Mud fine med Silt coarse fine med Sand coarse					
		Gravel					

Stratigraphic Column No: 239

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: M5

E: 2816700

-

GPS Waypoint No(s):

N: 6155400

-

Region: Central Hawkes Bay

Altitude:

-

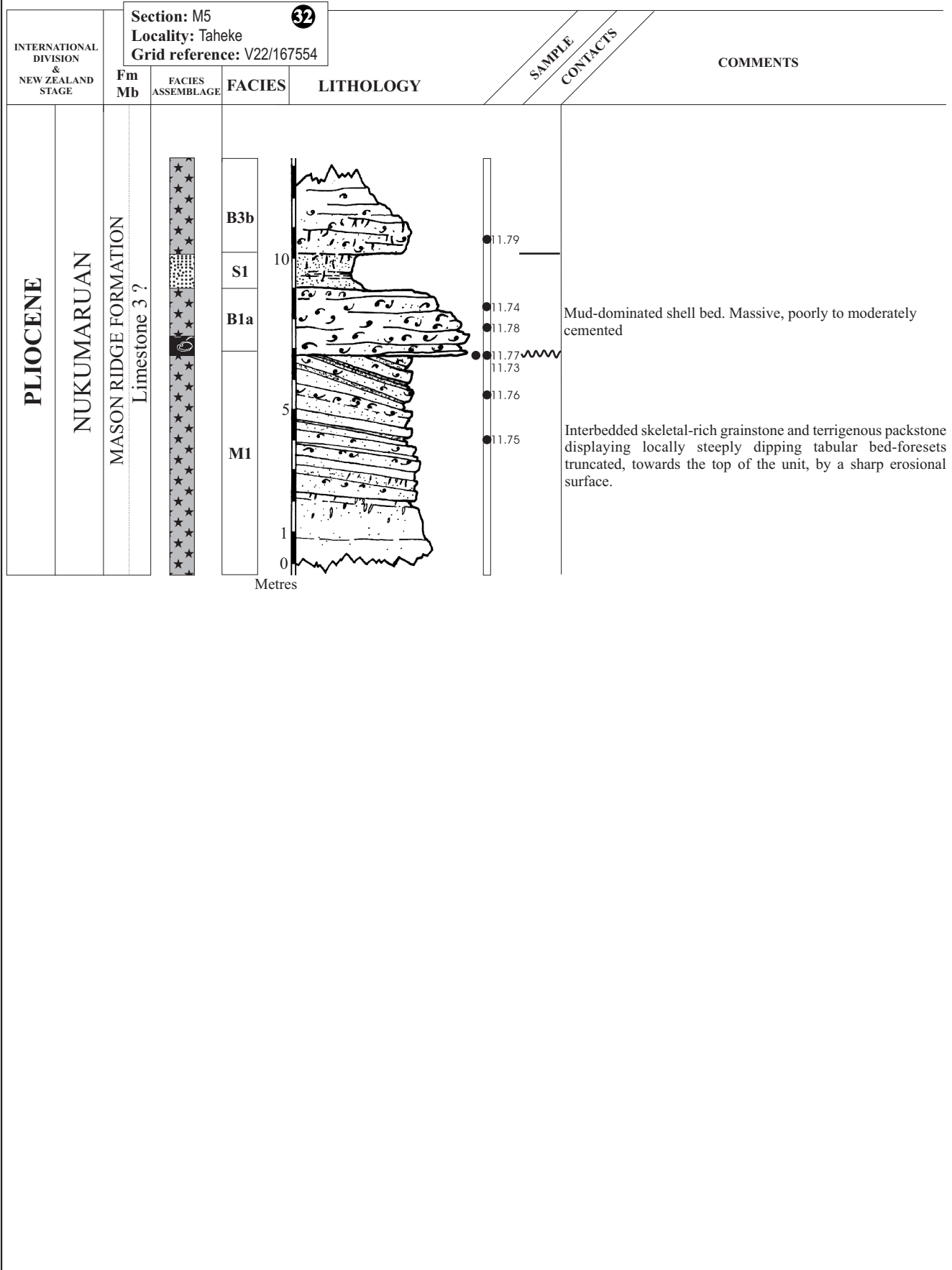
Location: Taheke

NZMS 260 Sheet: V22

Author: V. Caron

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1 of 2



Stratigraphic Column No: 239

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: M5

E: 2816700

-

GPS Waypoint No(s):

N: 6155400

-

Region: Central Hawkes Bay

Altitude:

-

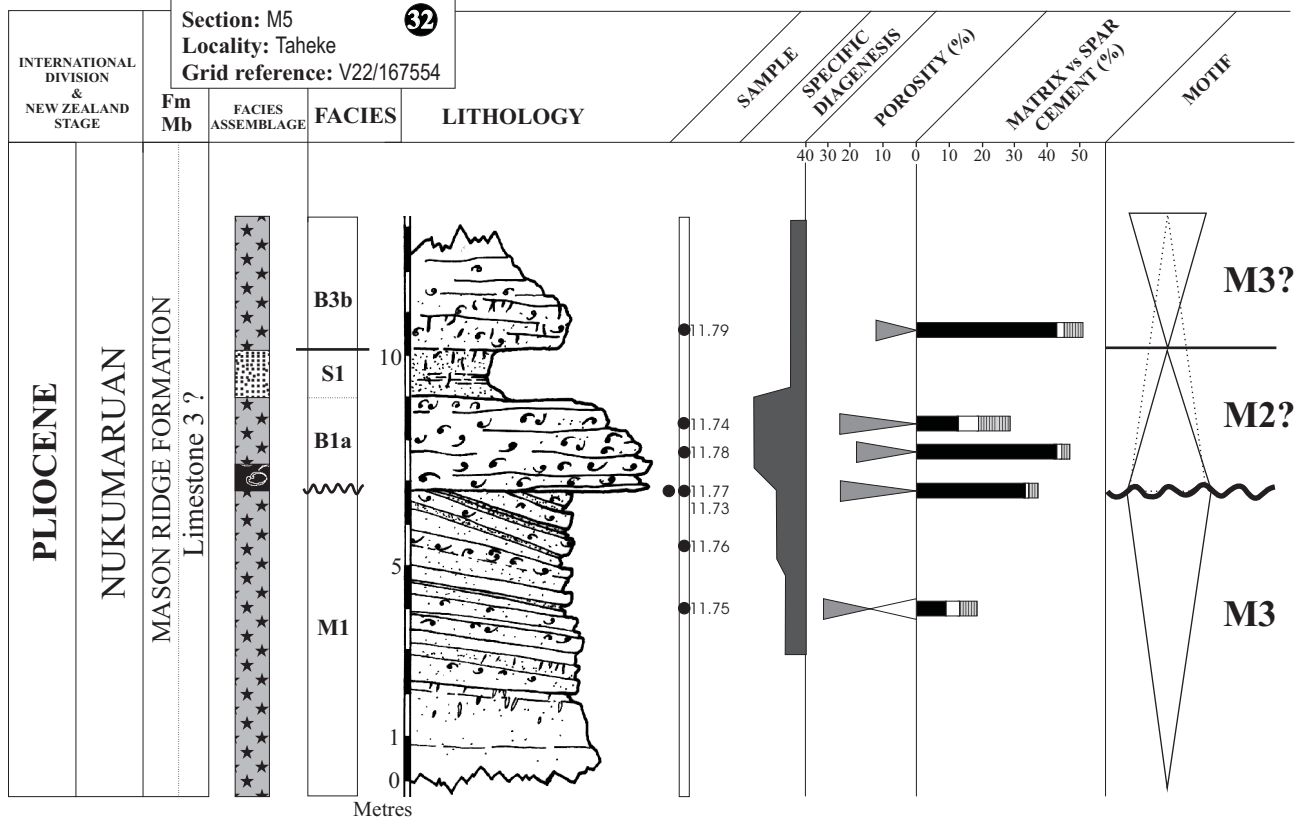
Location: Taheke

NZMS 260 Sheet: V22

Author: V. Caron

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2 of 2



Stratigraphic Column No: 240

Grid Reference: Top

Bottom

NZMS 260 V22

GPS Waypoint No(s): 209 - 212

E: 2813818

2813108

Region: Aomarama Station, off SH50.

N: 6157096

6159295

Location: Composite column of outcrops on Aomaram Station, from SH50 east to Taheke Road.

Altitude: 280 m

263 m

NZMS 260 Sheet: V21 Napier and V22 Waipawa

Page 1 of 1

Author: S. Dyer

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1 of 1

Stratigraphic Unit	Thick. (m)	Lithology	Structures	Dominant Fossils	Facies Code	WP No.	Description
Poutaki Pumiceous Formation	18						
	16						
	14		≠		Cg ₁	212	Reddish, poorly-sorted, massive greywacke and chert gravel composed of subrounded, subspherical pebbles and cobbles in a coarse friable sandy matrix.
	12		≠				White/grey, welded ignimbrite of massive, pumiceous lapill.
	10		≠		S ₄	210	Pale tan-coloured, massive, well-sorted, friable, pumiceous sandstone.
	8		≠		Cg ₃		Reddish, poorly-sorted, rounded greywacke and pumice weakly trough-crossbedded gravel, eroding down into the underlying pumiceous unit. Crossbeds grading with height to horizontally bedded, and coarsening upwards from ~ 2 cm diameter pebbles to 15 cm diameter cobbles. At top of outcrop, gravel interbedded with friable, massive, poorly-sorted, pumiceous silty sandstone.
	6		≠			211	Red/brown, non-calcareous, weakly pumiceous, massive, discontinuous lenses (~ 50 cm long) of siltstone interbedded with white, friable, very pumiceous, laminated siltstone. Interbeds 1 - 2 cm thick.
4		≠		S ₄		Red/brown, poorly-sorted, friable, quartz and lithic-rich, trough-crossbedded sandstone. Troughs ~ 30 cm long x 10 cm thick, and are graded from coarse, opaque mineral and quartz-rich sand at base of troughs to pebbly gravel at top. Troughs become low-angle and grade to mm-laminated sandstone with height. Small pumice pebbles appear at top of crossbedded unit (< 3 cm diameter).	
2		≠			209	Dark brown wavy interbedded fine, pumiceous sandstone and siltstone. sst and zst interbeds measure <2 cm.	
0		≠		S ₄		Brown, very well-sorted, pumiceous sandstone. Strongly crossbedded at base, becoming low-angle crossbeds with height. Base of crossbeds lined with weathered pumice and greywacke pebbles and granules. Layer of weathered pumice pebbles separate crossbeds from overlying horizontally laminated sandstone. Pebbles decrease in diameter from west to east.	
0		≠		M ₄	208	Pale tan, non-calcareous, pumiceous, friable, massive mica-rich siltstone.	
		Mud fine med coarse Silt fine med coarse Sand Gravel					

Stratigraphic Column No: 241

Grid Reference: Top

Bottom

NZMS 260 V22

GPS Waypoint No(s): RC07

E: 2814313

Region: Te Ranga Station, Te Ranga Road.

N: 6154540

Altitude: 326 m

Location: Road cutting opposite entrance to farm quarry.

NZMS 260 Sheet: V22 Waipawa

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Author: S. Dyer

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Stratigraphic Unit	Thick. (m)	Lithology	Structures	Dominant Fossils	Facies Code	WP No.	Description
Poutaki Pumiceous Formation	9						
	8						
	7						
						Cg ₃	Well-sorted, unconsolidated trough-crossbedded gravel of rounded, spherical greywacke, chert and pumice granules, and pebbles, within a matrix of coarse quartz, titanomagnetite, feldspar and lithic-rich sand.
						Cg ₁	Poorly-sorted, massive, unconsolidated gravel of subrounded, subspherical and slightly elongated greywacke and chert granules, pebbles and cobbles and well-rounded, oblate pumice pebbles.
	6					S ₄	
						M ₄	
						S ₄	Interbedded non-calcareous, pumiceous, tan coloured massive siltstone and tan coloured, friable, non-calcareous, pumiceous, weakly trough-crossbedded sandstone.
	5					M ₄	
						S ₄	Poorly-sorted, unconsolidated gravel of subrounded, subspherical and slightly elongated greywacke and chert granules, pebbles and cobbles and well-rounded, oblate pumice pebbles.
4					Cg ₁		
					S ₂		
							Pale yellow/tan, non-calcareous, pumiceous, massive to laminated, siltstone, grading upwards into an orange/red friable, well sorted, horizontally-bedded, quartz-rich sandstone.
3					M ₄		
2							
					Cg ₁		Poorly-sorted, unconsolidated gravel of subrounded, subspherical and slightly elongated greywacke and chert granules, pebbles and cobbles.
1					S ₄		Pale tan/white, friable, weakly bedded, pumiceous sandstone with blue/grey, non-calcareous, massive siltstone clasts
0							

Stratigraphic Column No: 242

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: M1

E: 2816300

-

GPS Waypoint No(s):

N: 6149400

-

Region: Central Hawkes Bay

Altitude:

-

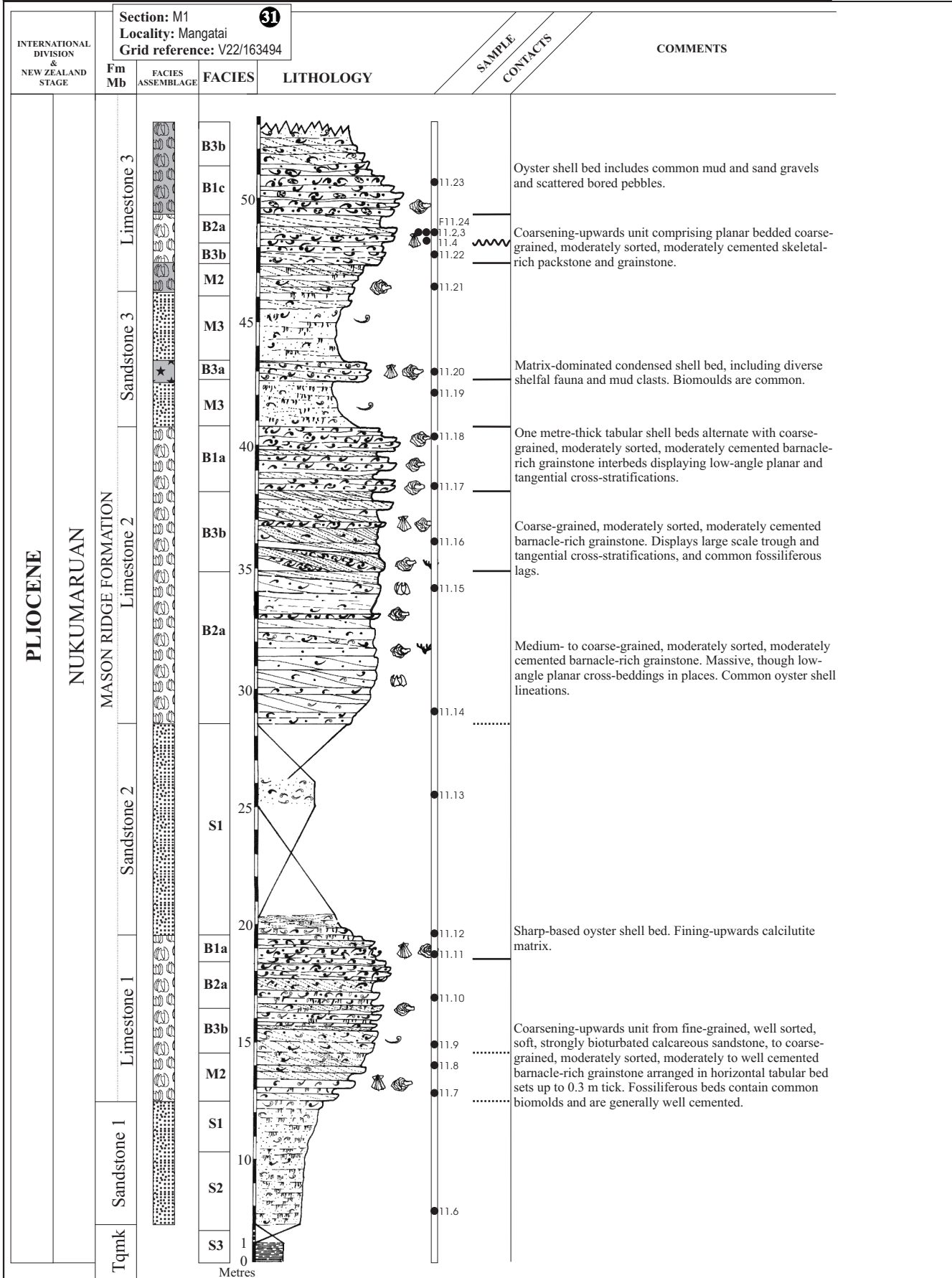
Location: Mangatai

NZMS 260 Sheet: V22

Author: V. Caron

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Stratigraphic Column No: 242

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: M1

E: 2816300

-

GPS Waypoint No(s):

N: 6149400

-

Region: Central Hawkes Bay

Altitude:

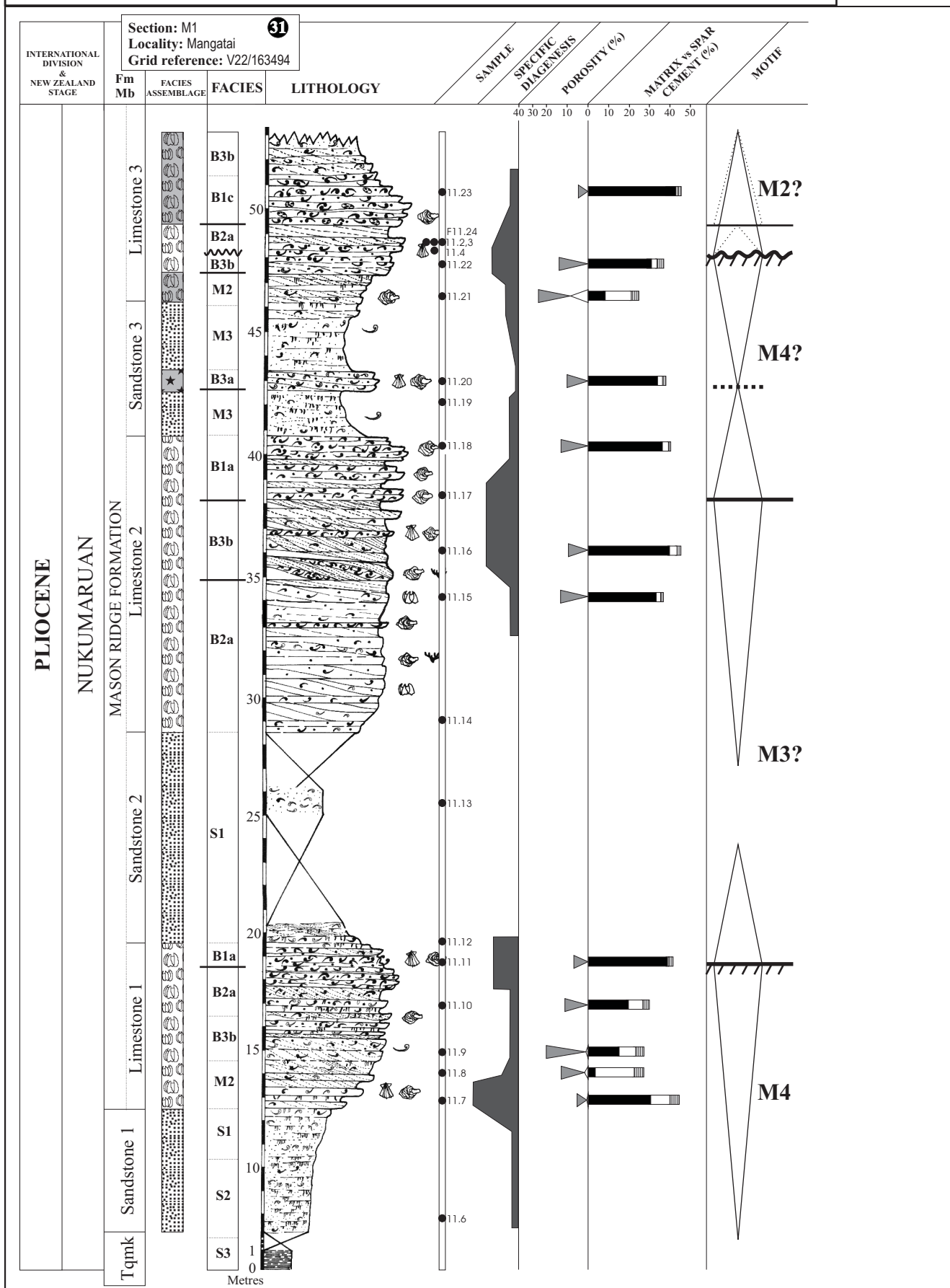
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Location: Mangatai

NZMS 260 Sheet: V22

242

2 of 2



Stratigraphic Column No: 243

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: Te2

E: 2819300

-

GPS Waypoint No(s):

N: 6148400

-

Region: Central Hawkes Bay

Altitude:

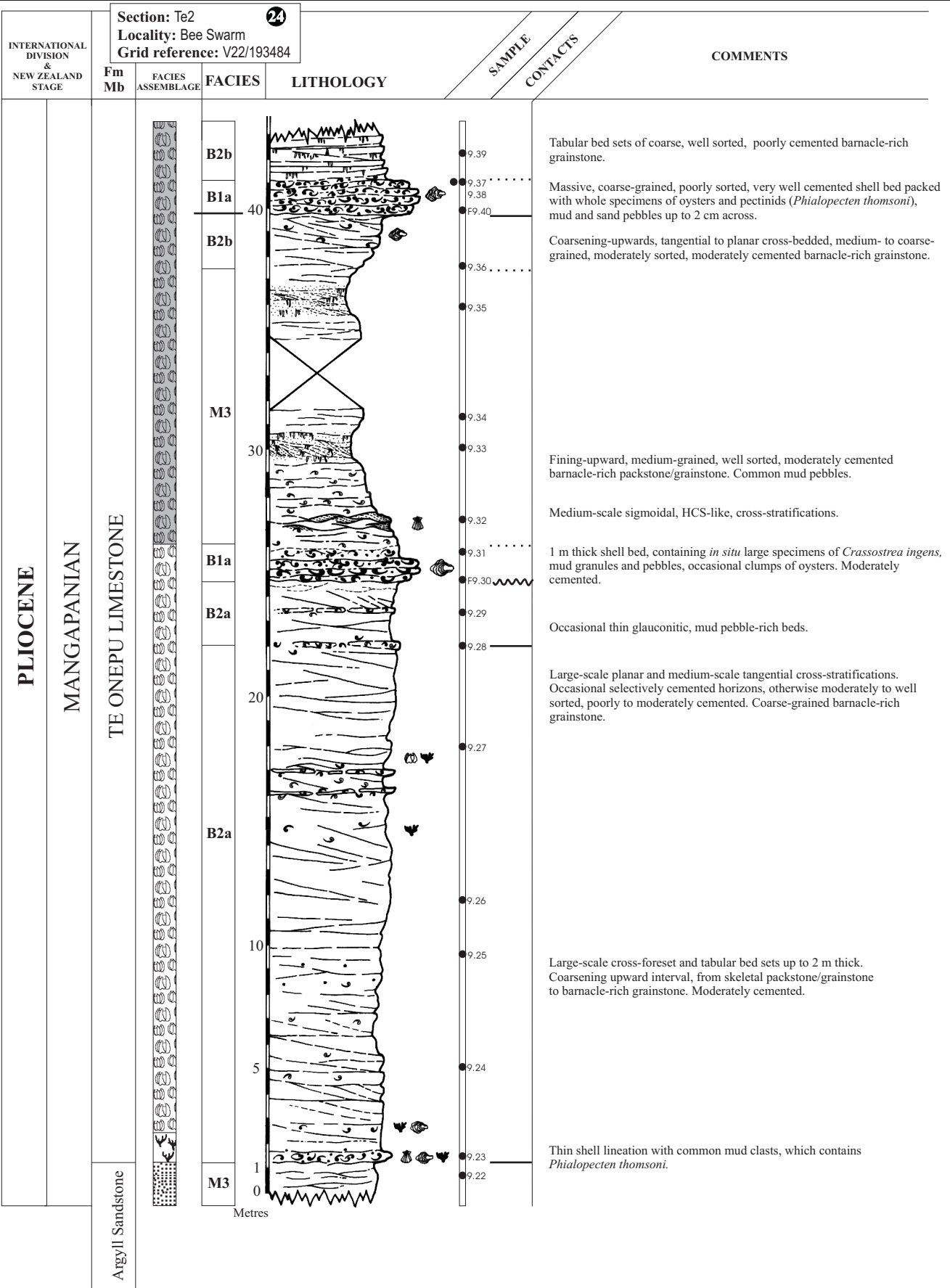
-

Location: Bee Swarm

Author: V. Caron

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Stratigraphic Column No: 243

Grid Reference: Top

Bottom

NZMS 260 V22

Section: Te2

E: 2819300

-

GPS Waypoint No(s):

N: 6148400

-

Region: Central Hawkes Bay

Altitude:

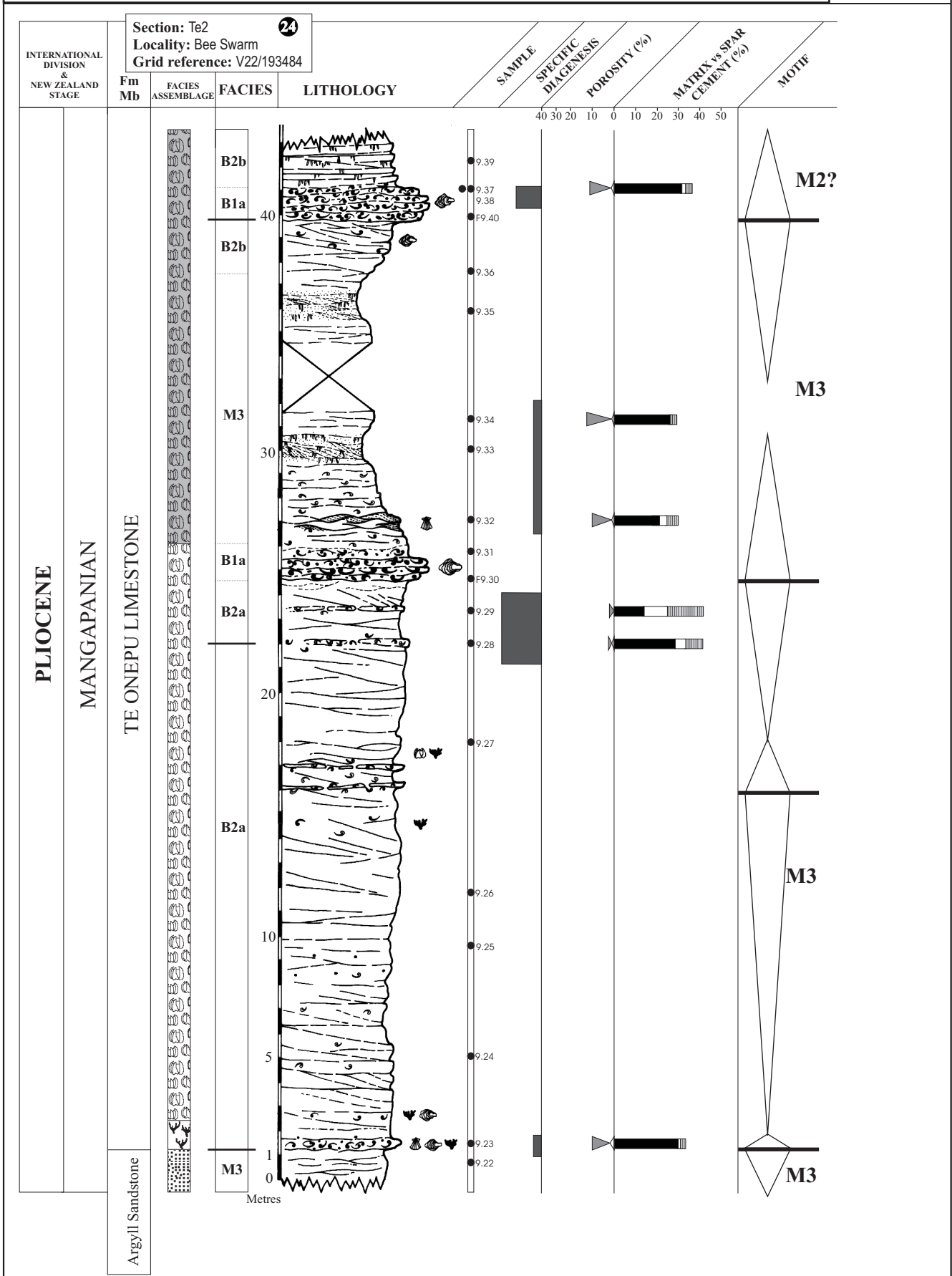
-

Location: Bee Swarm

243

NZMS 260 Sheet: V22

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Stratigraphic Column No: 244

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: Te1

E: 2819800

-

GPS Waypoint No(s):

N: 6149100

-

Region: Central Hawkes Bay

Altitude:

-

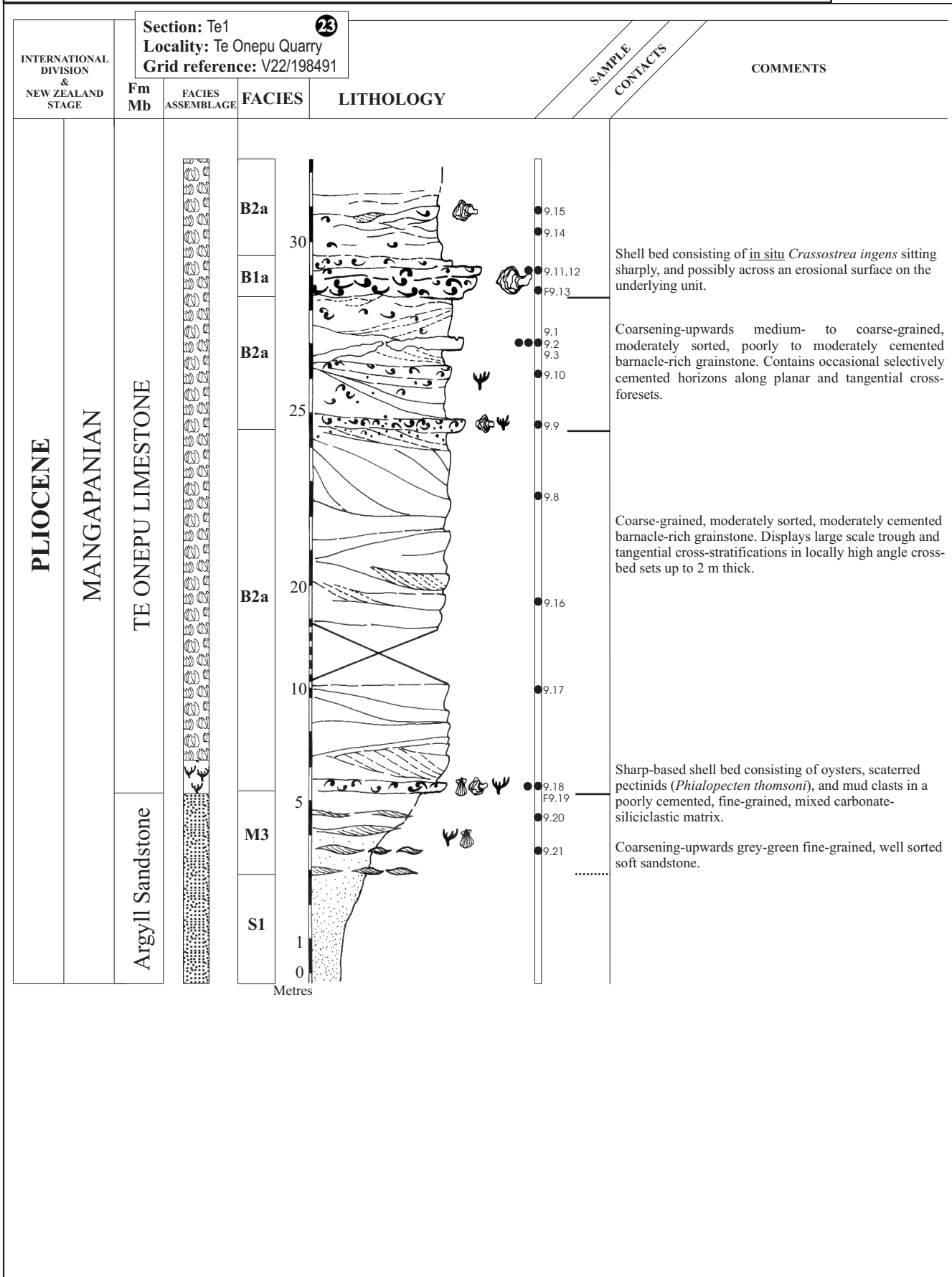
Location: Te Onepu Quarry

NZMS 260 Sheet: V22

Author: V. Caron

244

1 of 2



Stratigraphic Column No: 244

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: Te1

E: 2819800

-

GPS Waypoint No(s):

N: 6149100

-

Region: Central Hawkes Bay

Altitude:

-

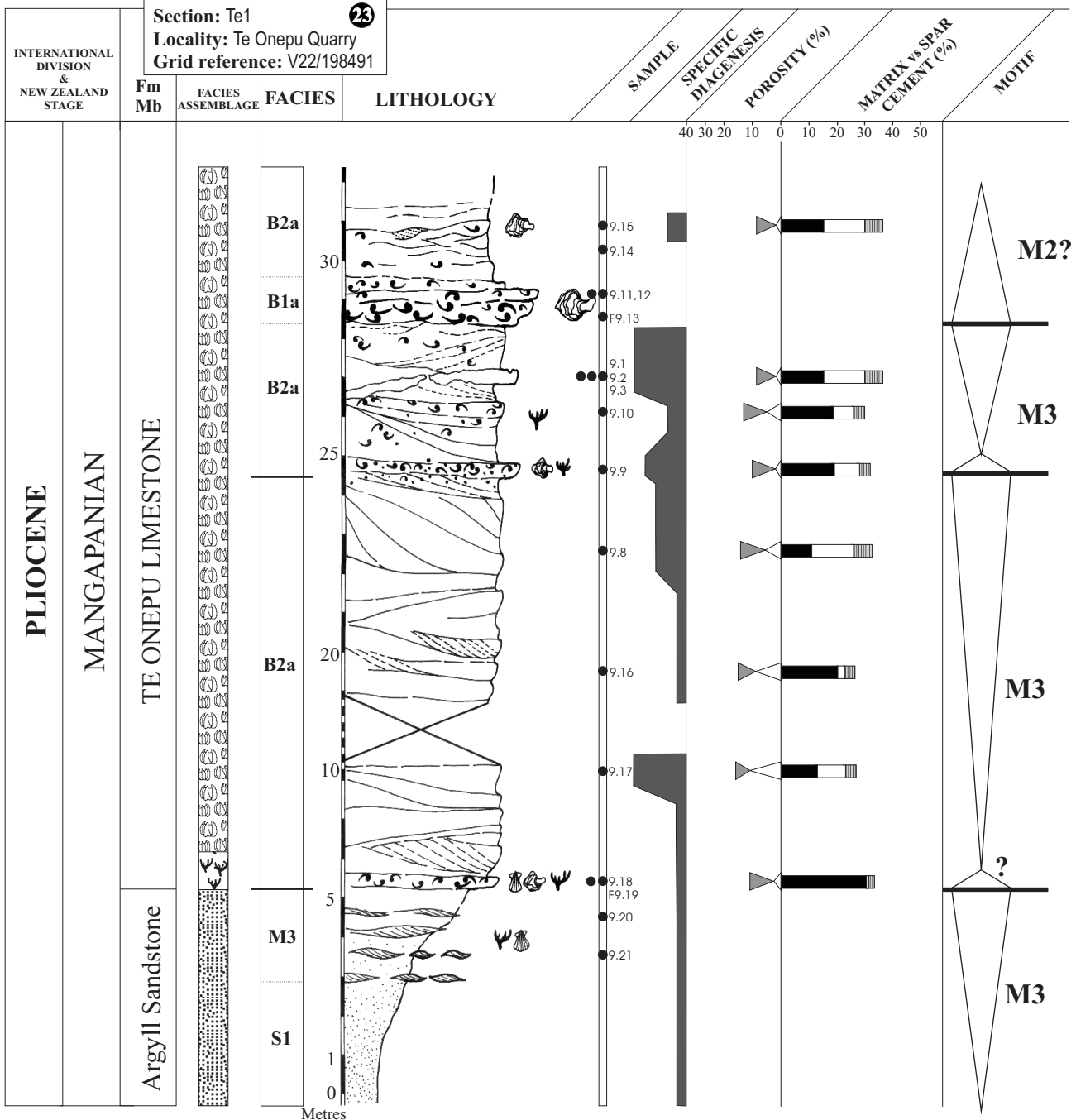
Location: Te Onepu Quarry

NZMS 260 Sheet: V22

Author: V. Caron

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Stratigraphic Column No: 245

Grid Reference: Top

Bottom

NZMS 260 V22

GPS Waypoint No(s): 216-219

E: 2820869

2819304

Region: Raukawa Range, Rotoma Station, Anaroa Rd. N: 6152243

6150981

Location: Composite column of outcrops on Raukawa Range from Te Onepu Road to Anaroa Road.

Altitude: 329 m

255 m

245

NZMS 260 Sheet: V22 Waipawa

Page 1 of 1

Author: S. Dyer

1 of 1

Stratigraphic Unit	Thick. (m)	Lithology	Structures	Dominant Fossils	Facies Code	WP No.	Description						
Te Onepu Limestone	38		=		C ₂	219	Creamy/white, massive to mm-bedded, differentially cemented, fossiliferous grainstone, composed of subangular and angular bryozoan, bivalve, echinoderm and barnacle fragments. With height, common mud stringers measuring approx. 50 cm long x 5 cm thick occur.						
	36												
	34												
	32												
	30												
	28												
	26							≠		S ₅	Interbedded siltstone and fossiliferous sandstone. Siltstone: Tan-coloured, calcareous, slightly pumiceous, friable, laminated siltstone with scattered angular shell fragments. Sandstone: Tan-coloured, horizontally bedded, calcareous, moderately-cemented, mouldic, skeletal sandstone. Siltstone thins out with height and outcrop dominated by sandstone. Sharply overlain by grainstone.		
	24												
	22								= mm		C ₂	217	Interbedded poorly-cemented, fine skeletal sandstone and well-cemented, coarse grainstone. Sandstone units thin with height and give way to grainstone units
	20												
18		= mm		S ₅	216	Tan-coloured, weakly cemented, poorly sorted, tabular crossbedded grainstone composed of subrounded bivalve, barnacle and bryozoan fragments. Overlain by red/brown, well sorted, calcareous, quartz-rich, massive to weakly bedded, friable sandstone.							
16													
14		= mm		C ₂	218	Coarse grainstone: Tan-coloured, poorly-sorted, well-cemented grainstone. First grainstone bed is tabular crossbedded, with <i>Phialopecten thomsoni</i> and juvenile sea urchins populating base of crossbeds.							
12													
10		= mm		S ₅	216	Tan-coloured, weakly cemented, poorly sorted, tabular crossbedded grainstone composed of subrounded bivalve, barnacle and bryozoan fragments. Overlain by red/brown, well sorted, calcareous, quartz-rich, massive to weakly bedded, friable sandstone.							
8													
6		= mm		C ₃	218	Coarse grainstone: Tan-coloured, poorly-sorted, well-cemented grainstone. First grainstone bed is tabular crossbedded, with <i>Phialopecten thomsoni</i> and juvenile sea urchins populating base of crossbeds.							
4													
2		=		S ₅	216	Tan-coloured, weakly cemented, poorly sorted, tabular crossbedded grainstone composed of subrounded bivalve, barnacle and bryozoan fragments. Overlain by red/brown, well sorted, calcareous, quartz-rich, massive to weakly bedded, friable sandstone.							
0													
		Mud fine med coarse Silt fine med coarse Sand Gravel											

Stratigraphic Column No: 246

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: R3

E: 2822800

-

GPS Waypoint No(s):

N: 6149500

-

Region: Central Hawkes Bay

Altitude:

-

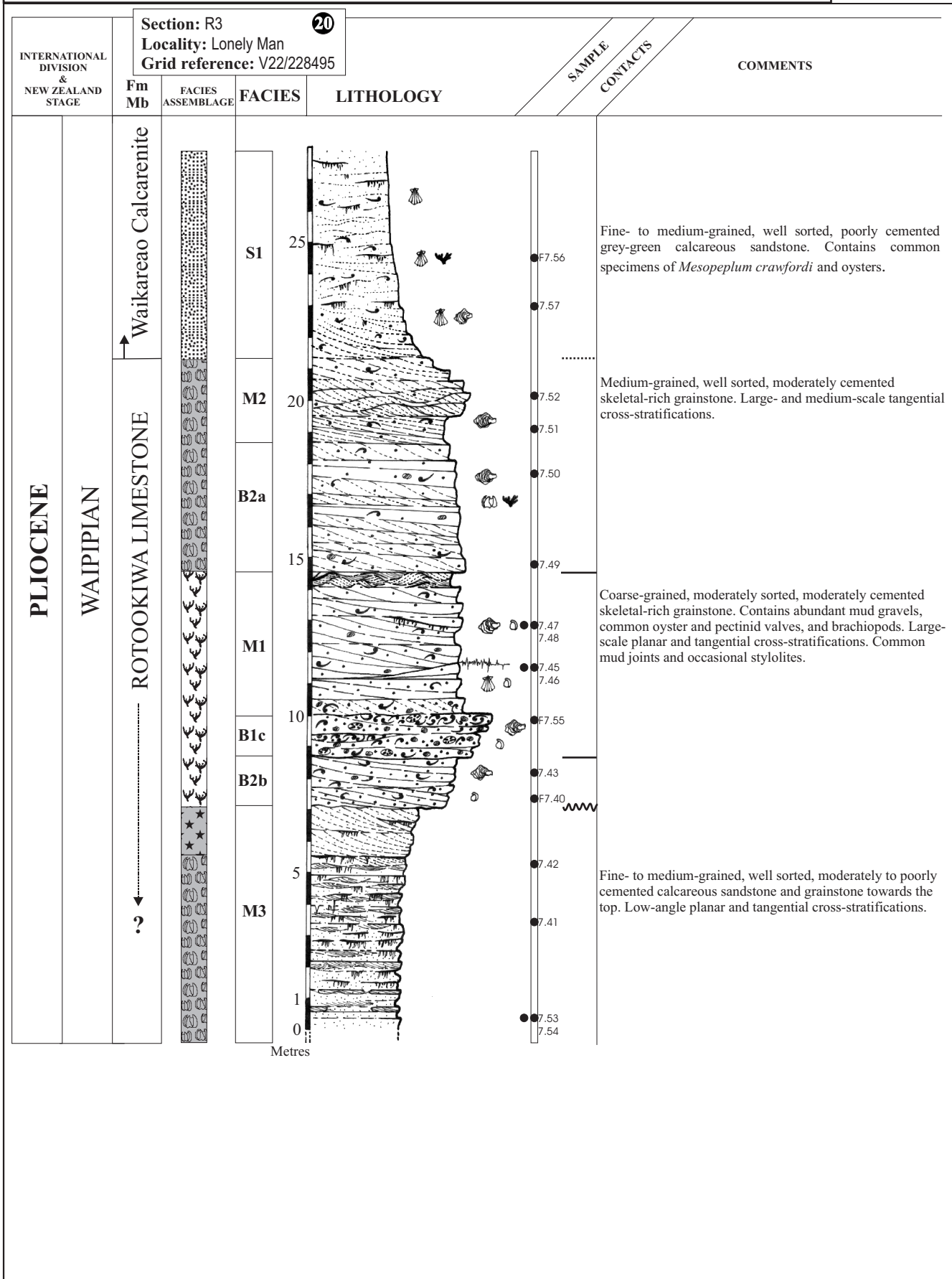
Location: Lonely Man

NZMS 260 Sheet: V22

Author: V. Caron

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1 of 2



Stratigraphic Column No: 246

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: R3

E: 2822800

-

GPS Waypoint No(s):

N: 6149500

-

Region: Central Hawkes Bay

Altitude:

-

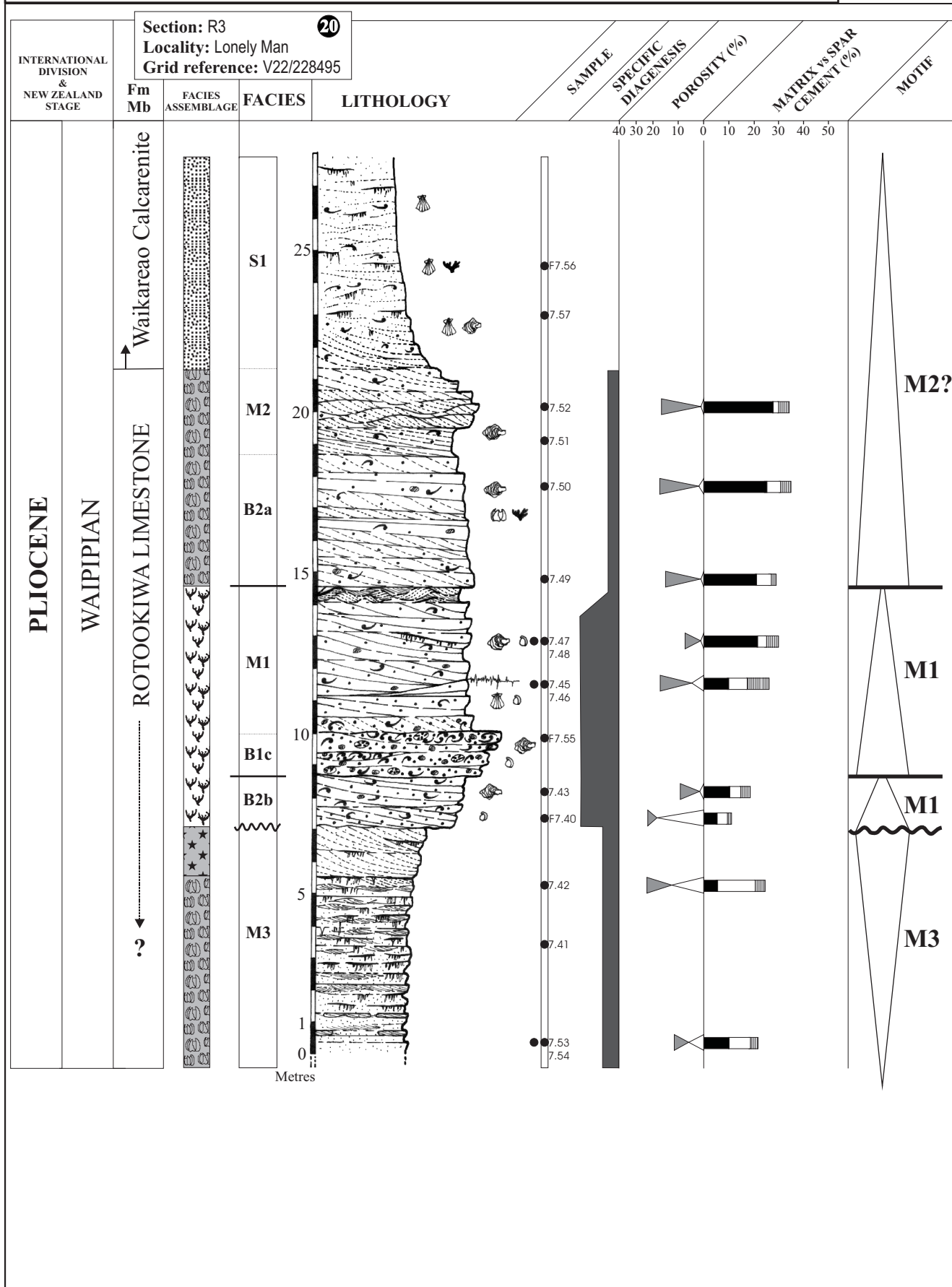
Location: Lonely Man

NZMS 260 Sheet: V22

Author: V. Caron

246

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Stratigraphic Column No: 247

Grid Reference: Top Bottom

NZMS 260 V22

Section: K11/A1

E: 2829200 -

GPS Waypoint No(s):

N: 6147500 -

Region: Central Hawkes Bay

Altitude: -

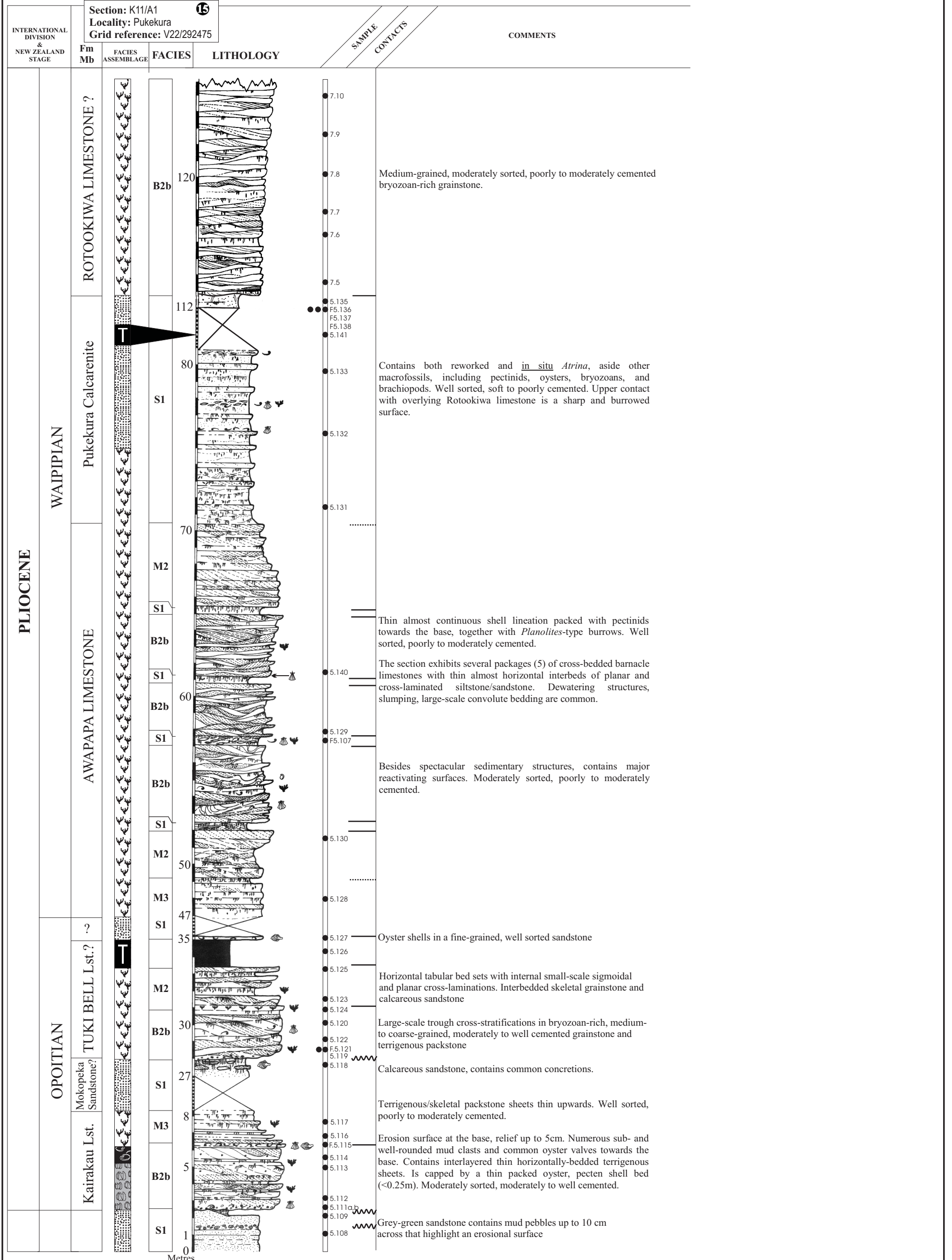
Location: Pukekura

Author: V. Caron

NZMS 260 Sheet: V22

247

1 of 2 A3



Stratigraphic Column No: 247

Grid Reference: Top Bottom

NZMS 260 V22

Section: K11/A1

E: 2829200

-

GPS Waypoint No(s):

N: 6147500

-

Region: Central Hawkes Bay

Altitude:

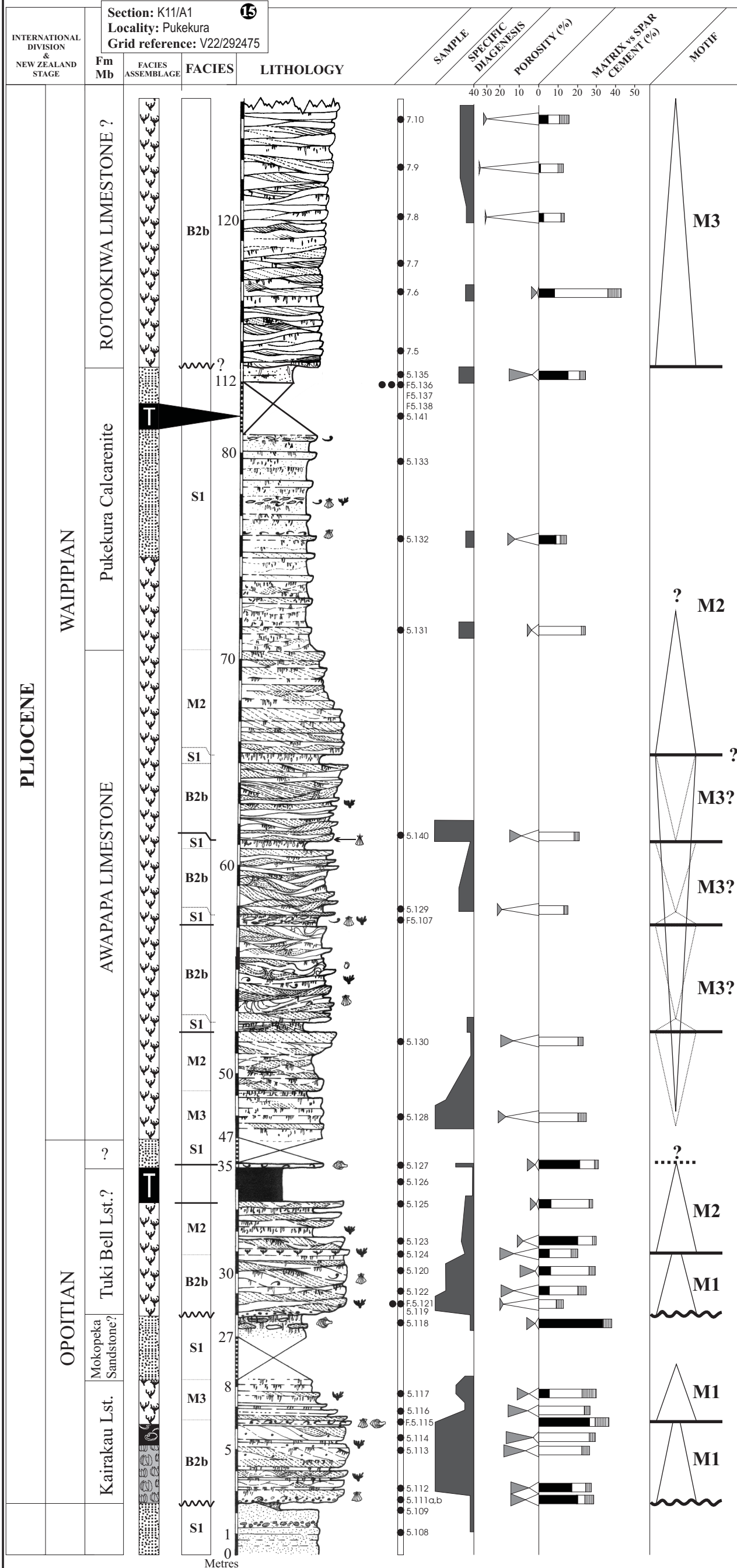
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Location: Pukekura

Author: V. Caron

247

2 of 2 A3



Stratigraphic Column No: 248

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: R2

E: 2831900-2831000 -

GPS Waypoint No(s):

N: 6152400 -

Region: Central Hawkes Bay

Altitude: -

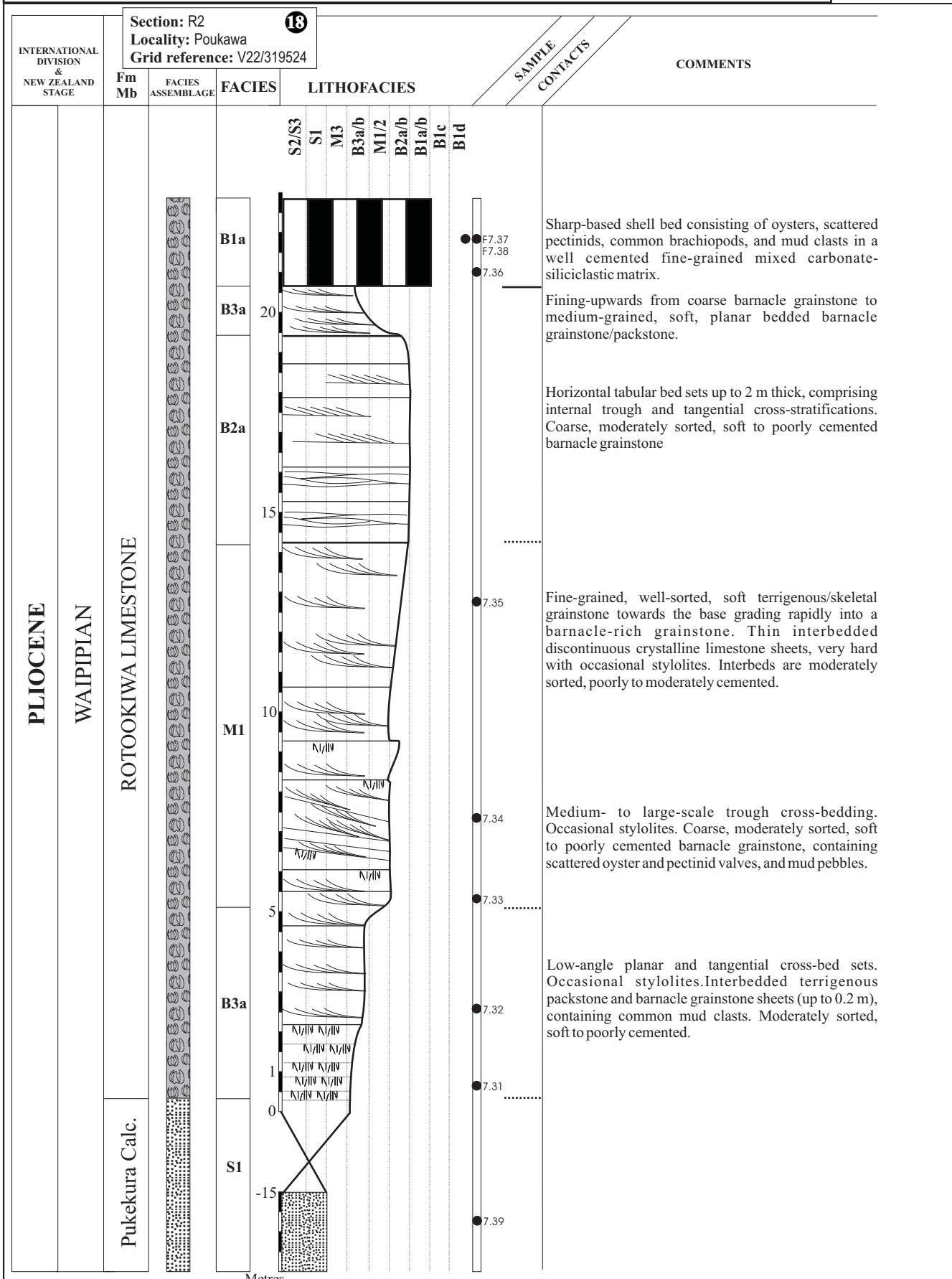
Location: Poukawa

NZMS 260 Sheet: V22

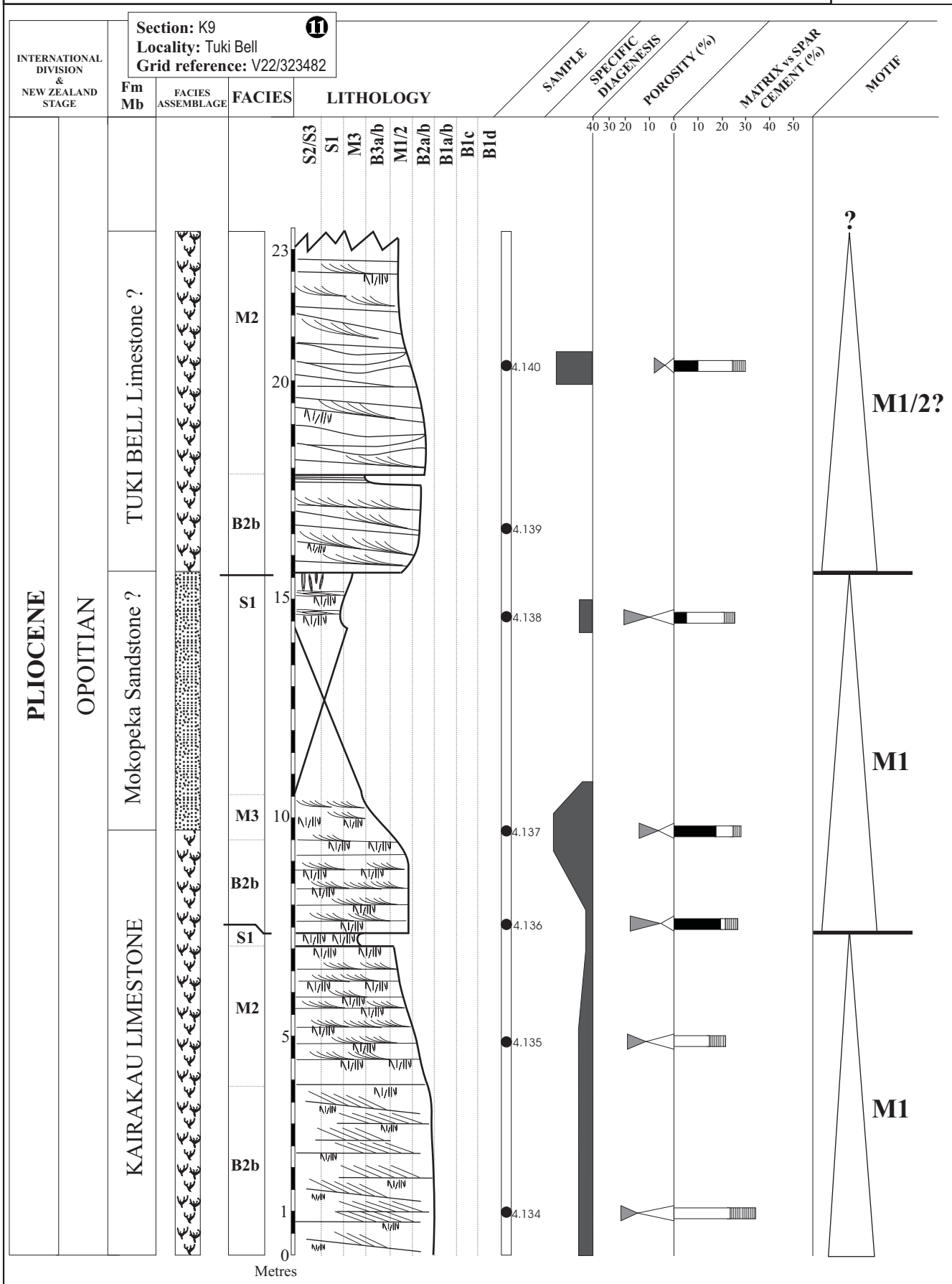
Author: V. Caron

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Stratigraphic Column No: 249	Grid Reference: Top	Bottom	NZMS 260 V22 249 2 of 2
Section: K9	E: 2832300	-	
GPS Waypoint No(s):	N: 6148200	-	
Region: Central Hawkes Bay	Altitude:	-	
Location: Tuki Bell	Author: V. Caron		
NZMS 260 Sheet: V22			



Stratigraphic Column No: 250

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: A6

E: 2833400

-

GPS Waypoint No(s):

N: 6148800

-

Region: Central Hawkes Bay

Altitude:

-

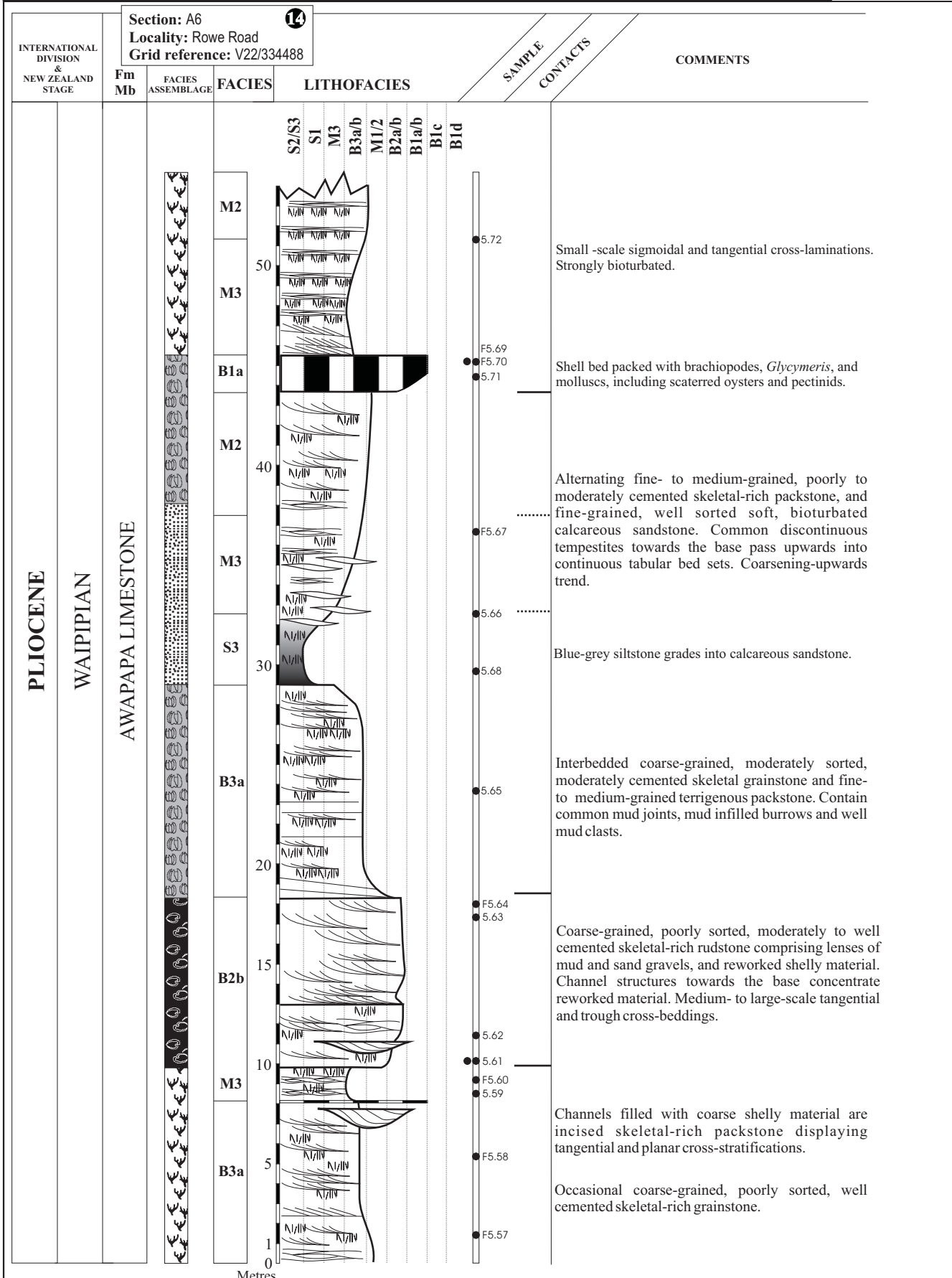
Location: Rowe Road

NZMS 260 Sheet: V22

Author: V. Caron

250

1 of 2



Stratigraphic Column No: 250

Grid Reference: Top

Bottom

NZMS 260 V22

Section: A6

E: 2833400

-

GPS Waypoint No(s):

N: 6148800

-

250

Region: Central Hawkes Bay

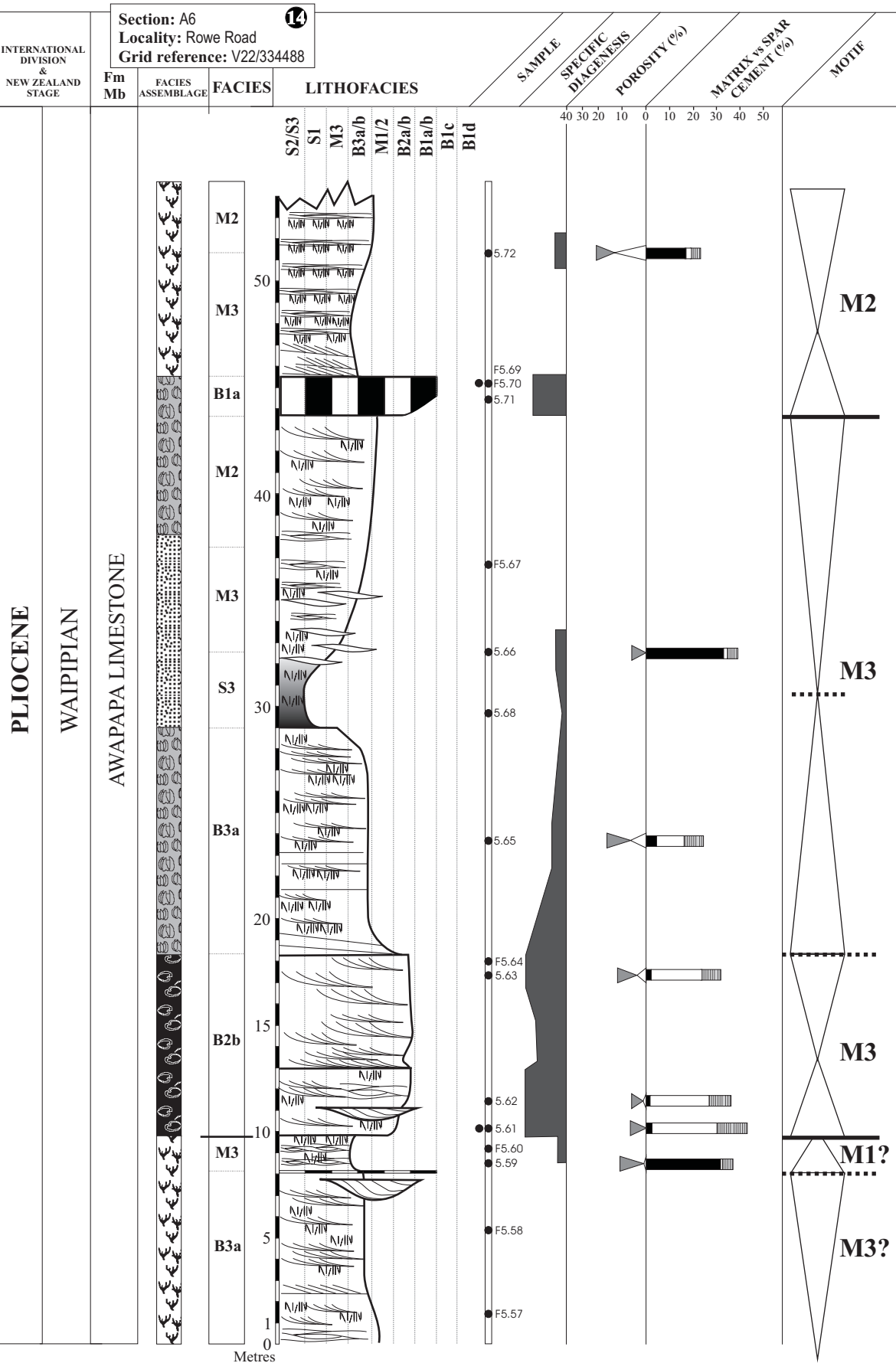
Altitude:

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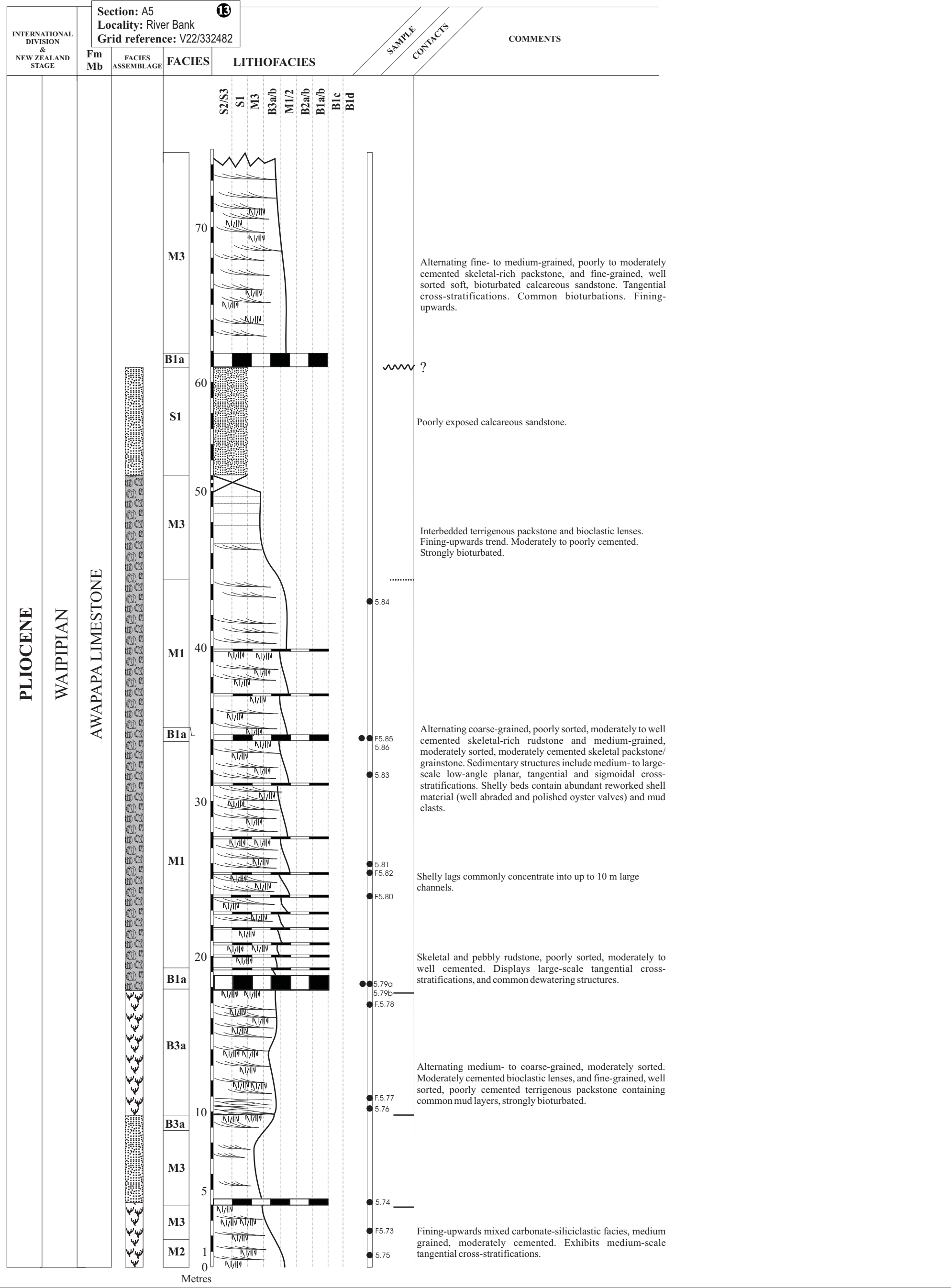
Location: Rowe Road

Author: V. Caron

2 of 2



Stratigraphic Column No: 251 Grid Reference: Top Bottom
 Section: A5 E: 2833200 -
 GPS Waypoint No(s): N: 6148200 -
 Region: Central Hawkes Bay Altitude: -
 Location: River Bank
 NZMS 260 Sheet: V22 Author: V. Caron



Stratigraphic Column No: 251

Grid Reference: Top Bottom

NZMS 260 V22

Section: A5

E: 2833200

-

GPS Waypoint No(s):

N: 6148200

-

Region: Central Hawkes Bay

Altitude:

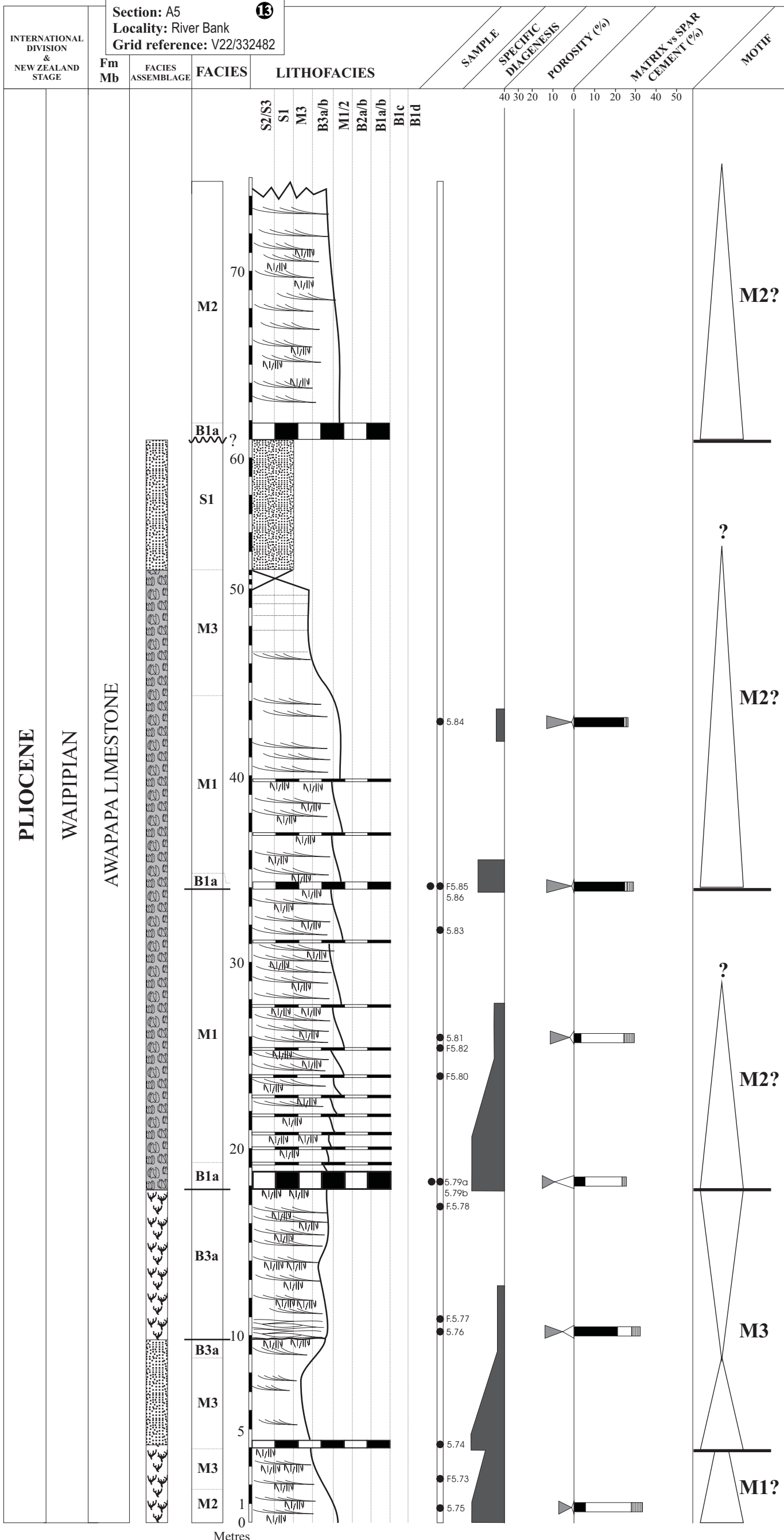
-

Location: River Bank

Author: V. Caron

251

2 of 2 A3



Stratigraphic Column No: 252

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: A4

E: 2834400

-

GPS Waypoint No(s):

N: 6146900

-

Region: Central Hawkes Bay

Altitude:

-

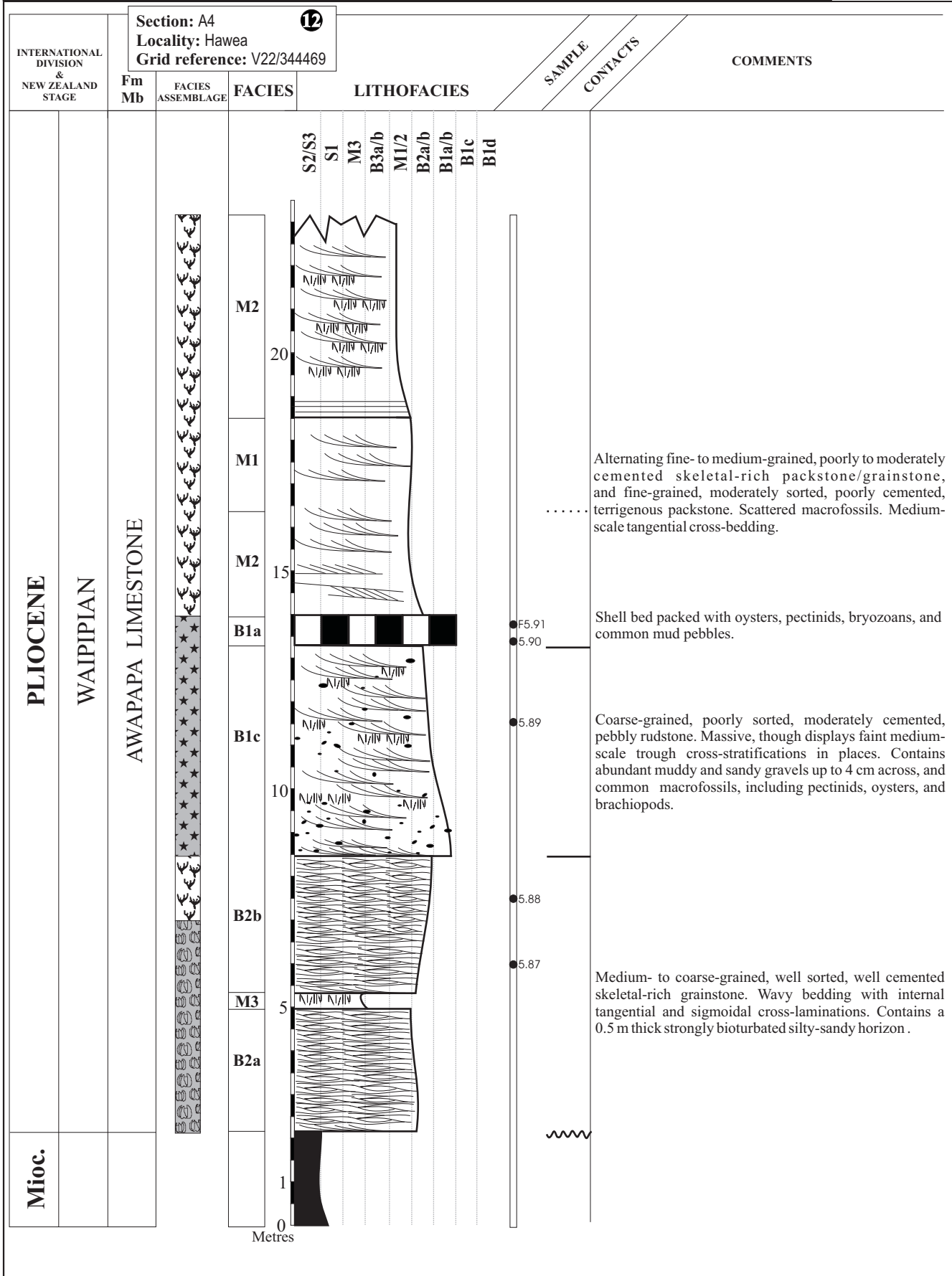
Location: Hawea

NZMS 260 Sheet: V22

Author: V. Caron

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1 of 2



Stratigraphic Column No: 253

Grid Reference: Top

Bottom

NZMS 260 V22

Section: K5

E: 2842300

-

GPS Waypoint No(s):

N: 6151500

-

Region: Central Hawkes Bay

Altitude:

-

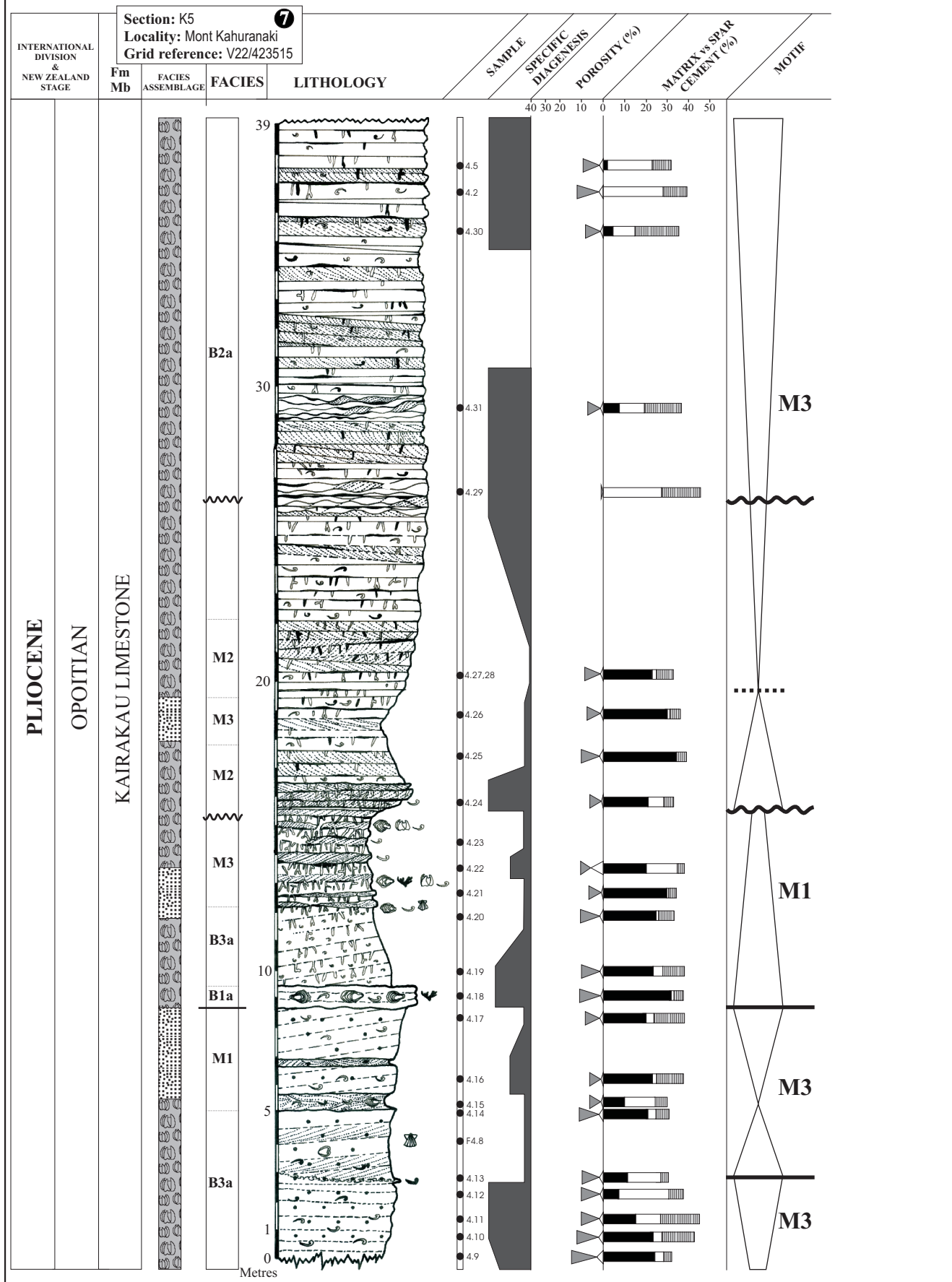
Location: Mount Kahuranaki/North Mount Kahuranaki

NZMS 260 Sheet: V22

Author: V. Caron

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Stratigraphic Column No: 254

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: K4

E: 2846000

-

GPS Waypoint No(s):

N: 6150400

-

Region: Central Hawkes Bay

Altitude:

-

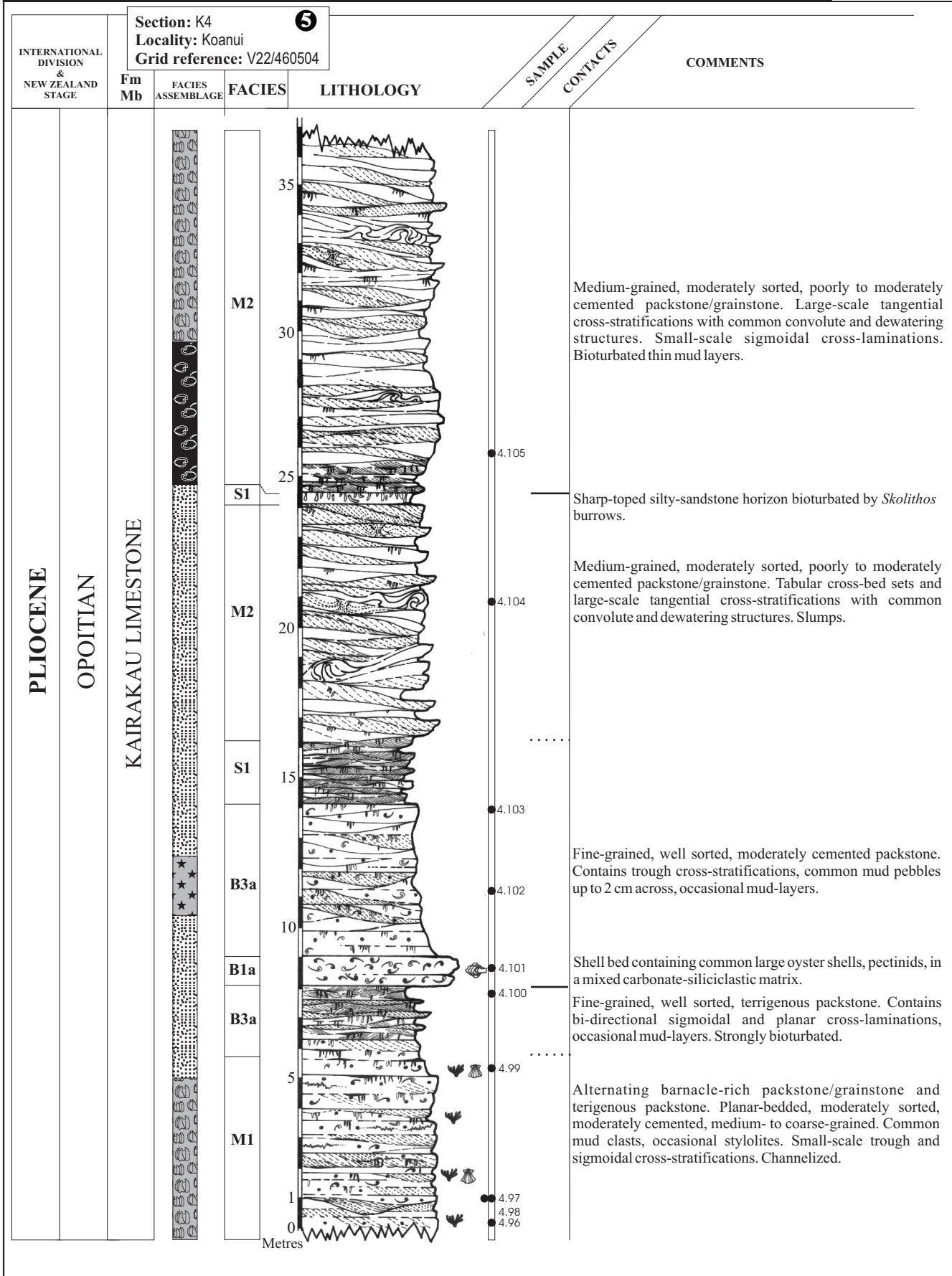
Location: Koanui

NZMS 260 Sheet: V22

Author: V. Caron

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1 of 2



Stratigraphic Column No: 254

Grid Reference: Top

Bottom

NZMS 260 V22

Section: K4

E: 2846000

-

GPS Waypoint No(s):

N: 6150400

-

Region: Central Hawkes Bay

Altitude:

-

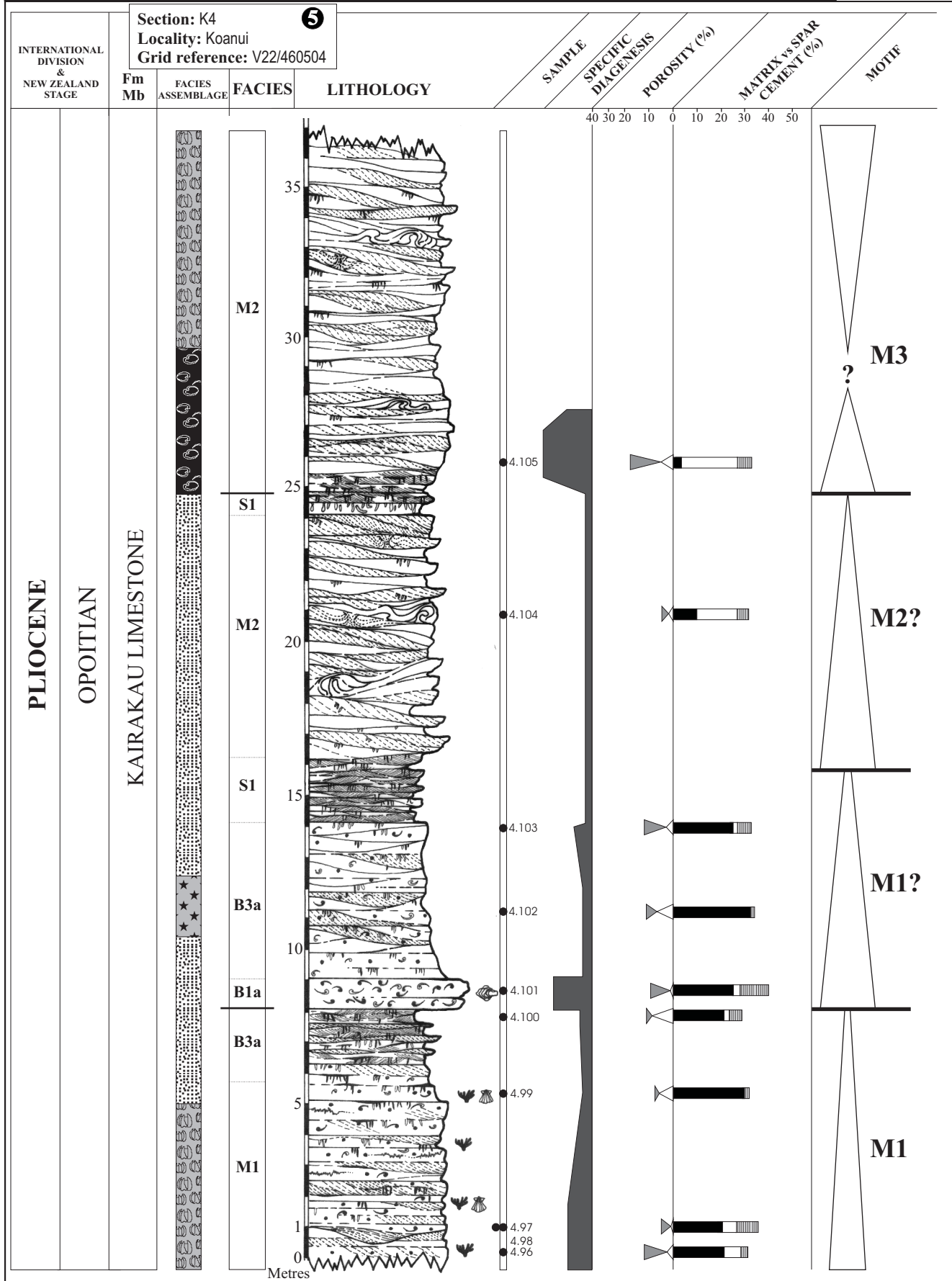
Location: Koanui

NZMS 260 Sheet: V22

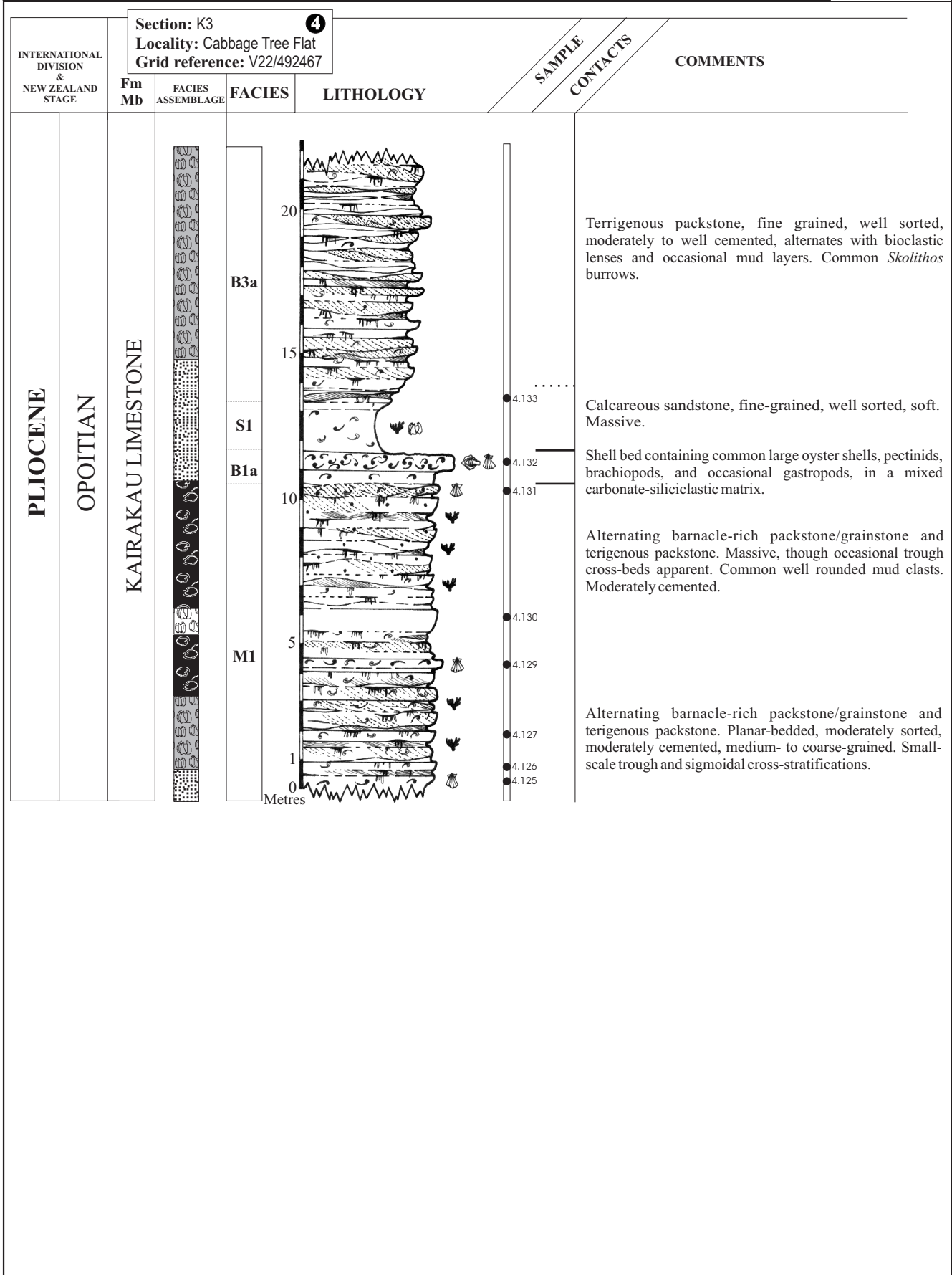
Author: V. Caron

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2 of 2



Stratigraphic Column No: 255	Grid Reference: Top	Bottom	NZMS 260 V22 255 1 of 2
Section: K3	E: 2849200	-	
GPS Waypoint No(s):	N: 6146700	-	
Region: Central Hawkes Bay	Altitude:	-	
Location: Cabbage Tree Flat	Author: V. Caron		
NZMS 260 Sheet: V22			



Stratigraphic Column No: 255

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: K3

E: 2849200

-

GPS Waypoint No(s):

N: 6146700

-

Region: Central Hawkes Bay

Altitude:

-

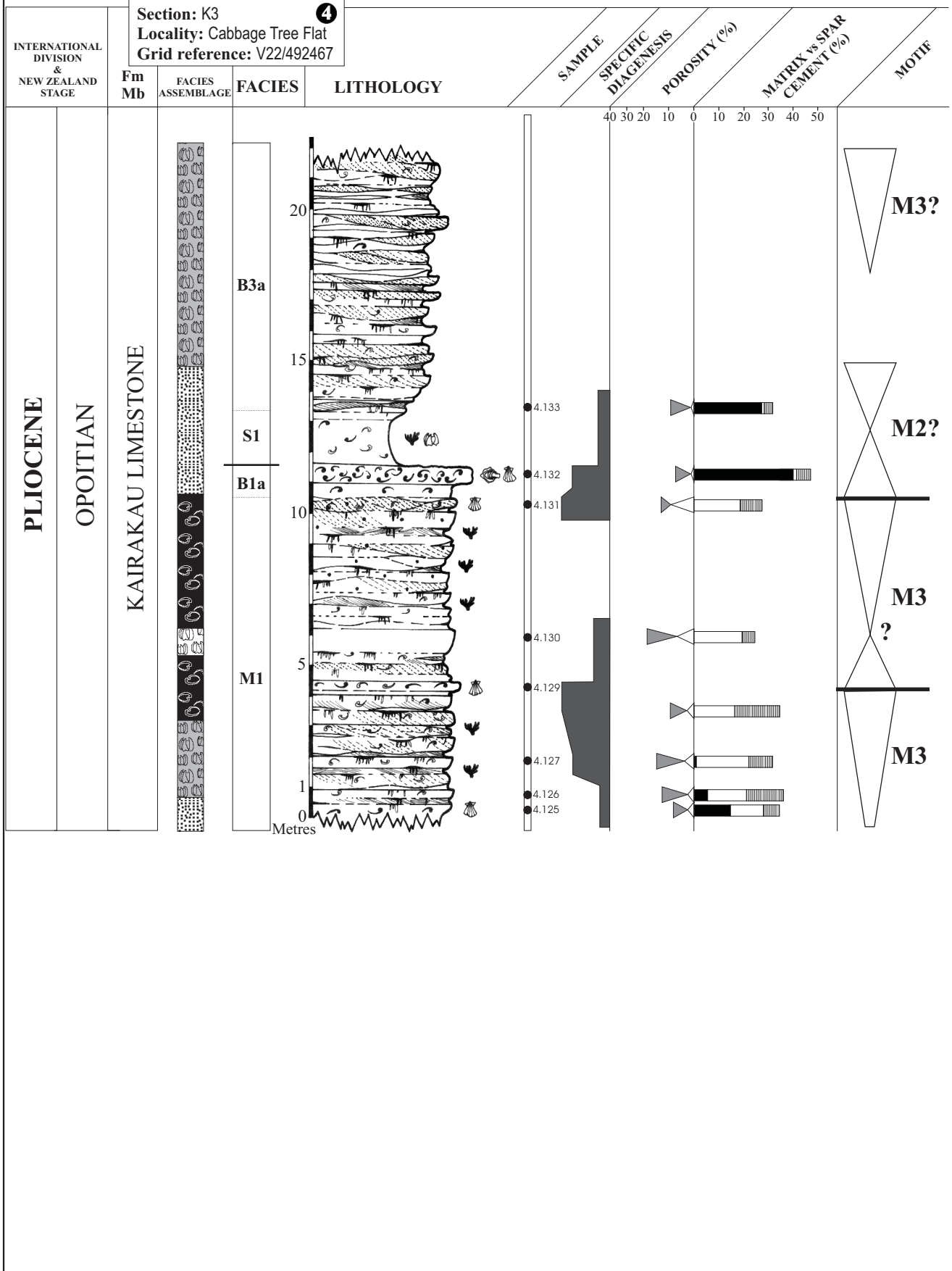
Location: Cabbage Tree Flat

NZMS 260 Sheet: V22

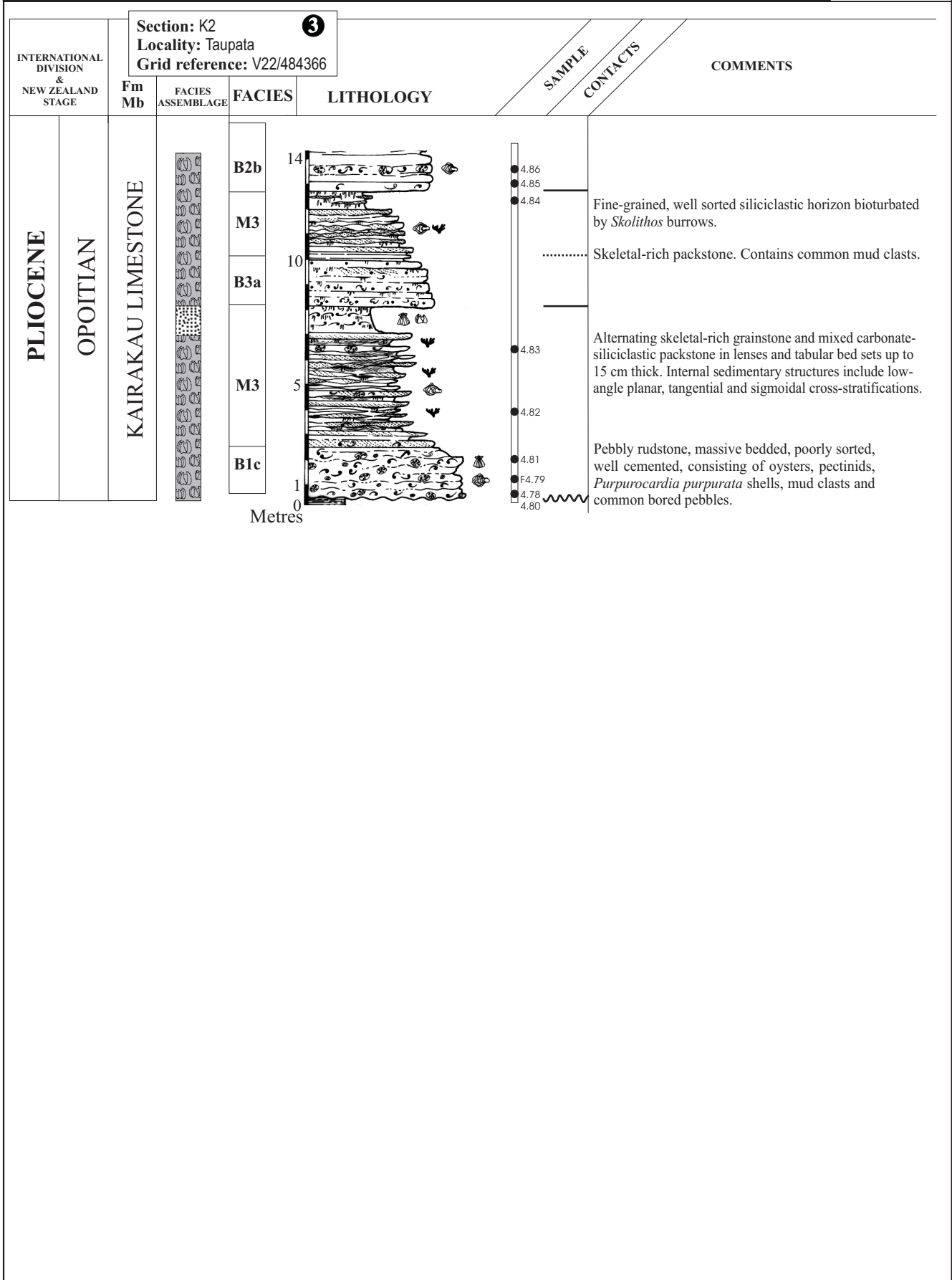
Author: V. Caron

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Stratigraphic Column No: 256	Grid Reference: Top	Bottom	NZMS 260 V22 256 1 of 2
Section: K2	E: 2848400	-	
GPS Waypoint No(s):	N: 6136600	-	
Region: Central Hawkes Bay	Altitude:	-	
Location: Taupata	Author: V. Caron		
NZMS 260 Sheet: V22			



Stratigraphic Column No: 257

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: K1

E: 2845700

-

GPS Waypoint No(s):

N: 6133300

-

Region: Central Hawkes Bay

Altitude:

-

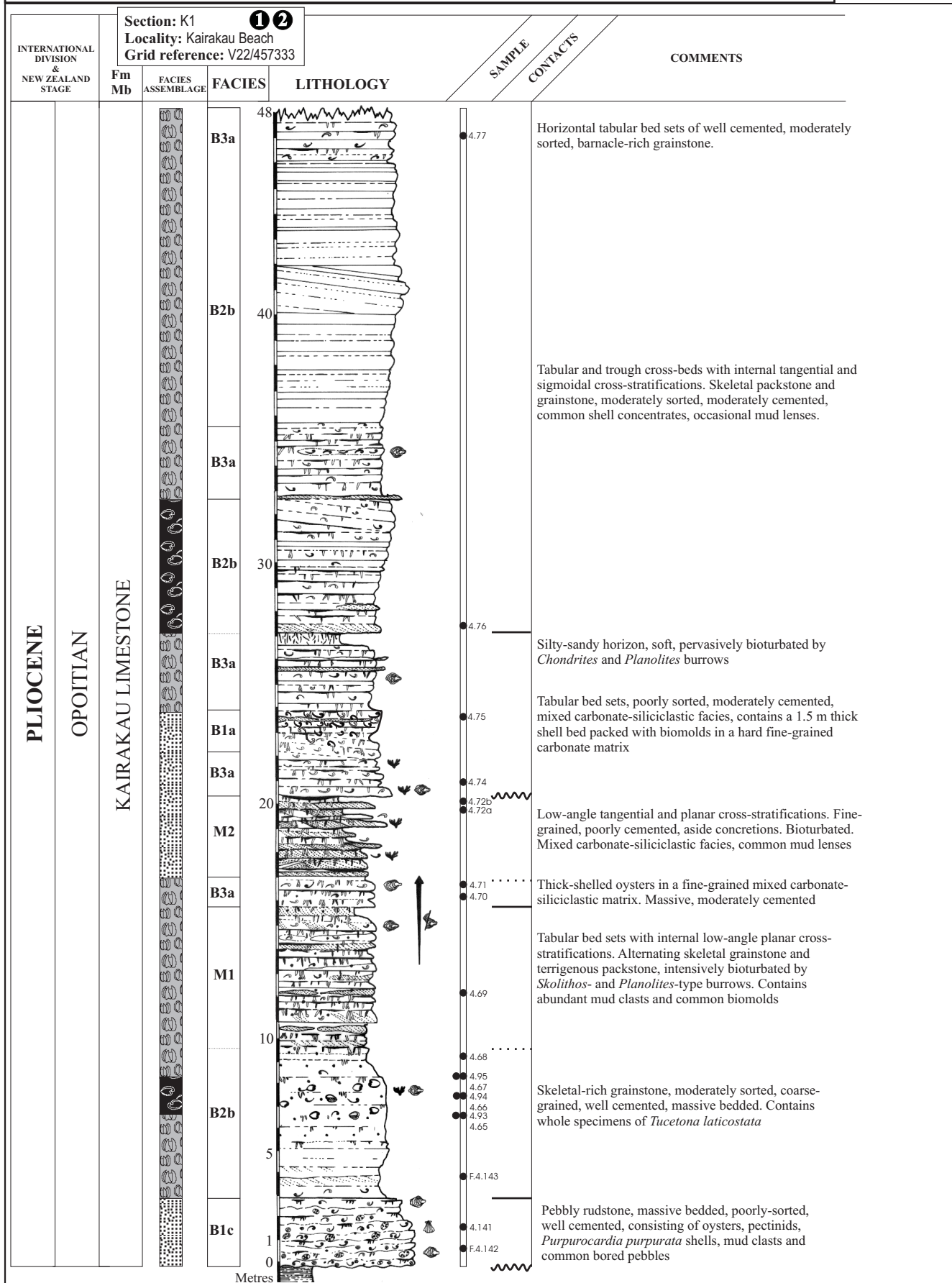
Location: Kairakau Beach

NZMS 260 Sheet: V22

Author: V. Caron

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Stratigraphic Column No: 257

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: K1

E: 2845700

-

GPS Waypoint No(s):

N: 6133300

-

Region: Central Hawkes Bay

Altitude:

-

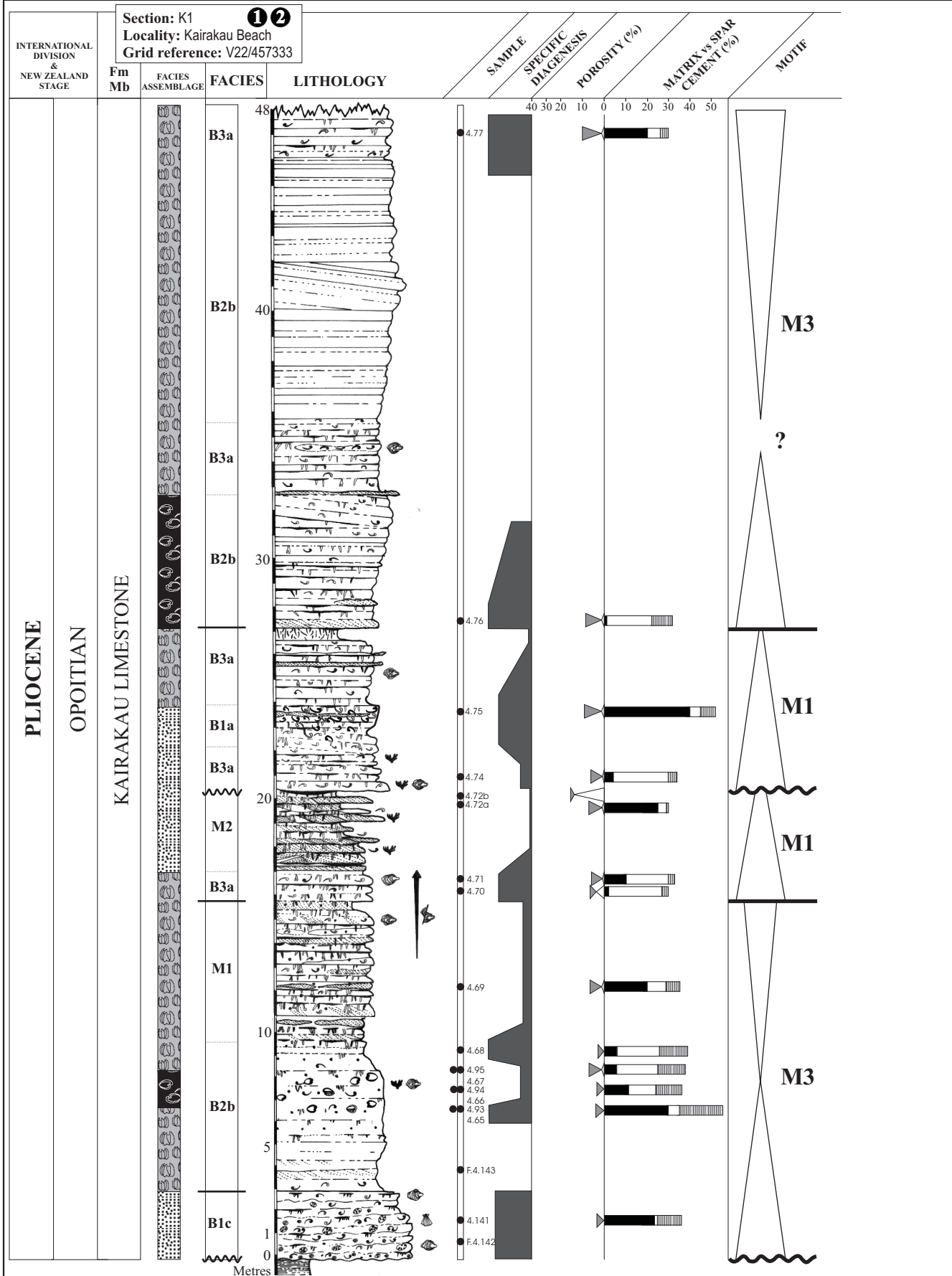
Location: Kairakau Beach

NZMS 260 Sheet: V22

Author: V. Caron

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Stratigraphic Column No: 258

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: A3

E: 2831800

-

GPS Waypoint No(s):

N: 6140500

-

Region: Central Hawkes Bay

Altitude:

-

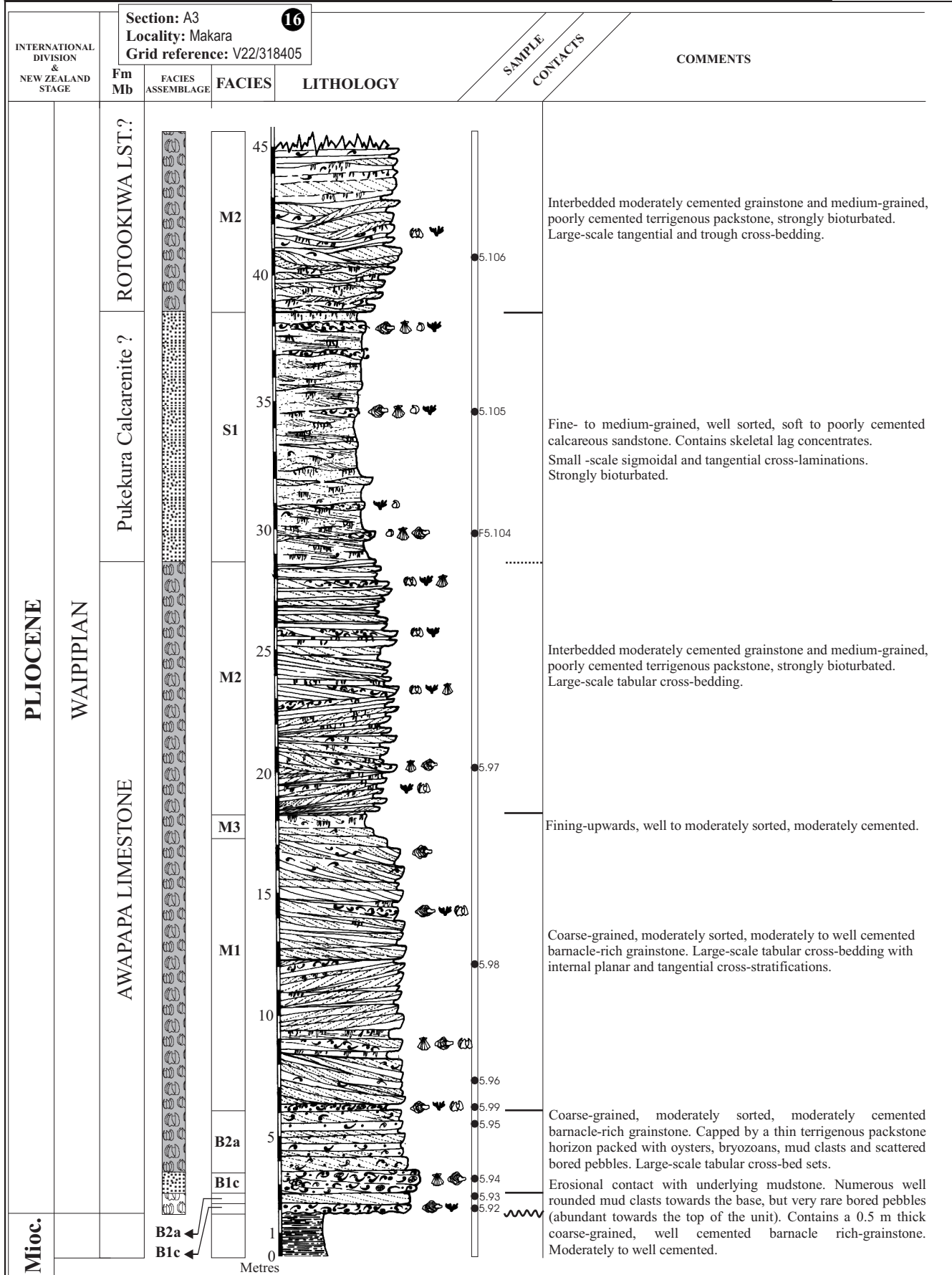
Location: Makara

NZMS 260 Sheet: V22

Author: V. Caron

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Stratigraphic Column No: 258

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: A3

E: 2831800

-

GPS Waypoint No(s):

N: 6140500

-

Region: Central Hawkes Bay

Altitude:

-

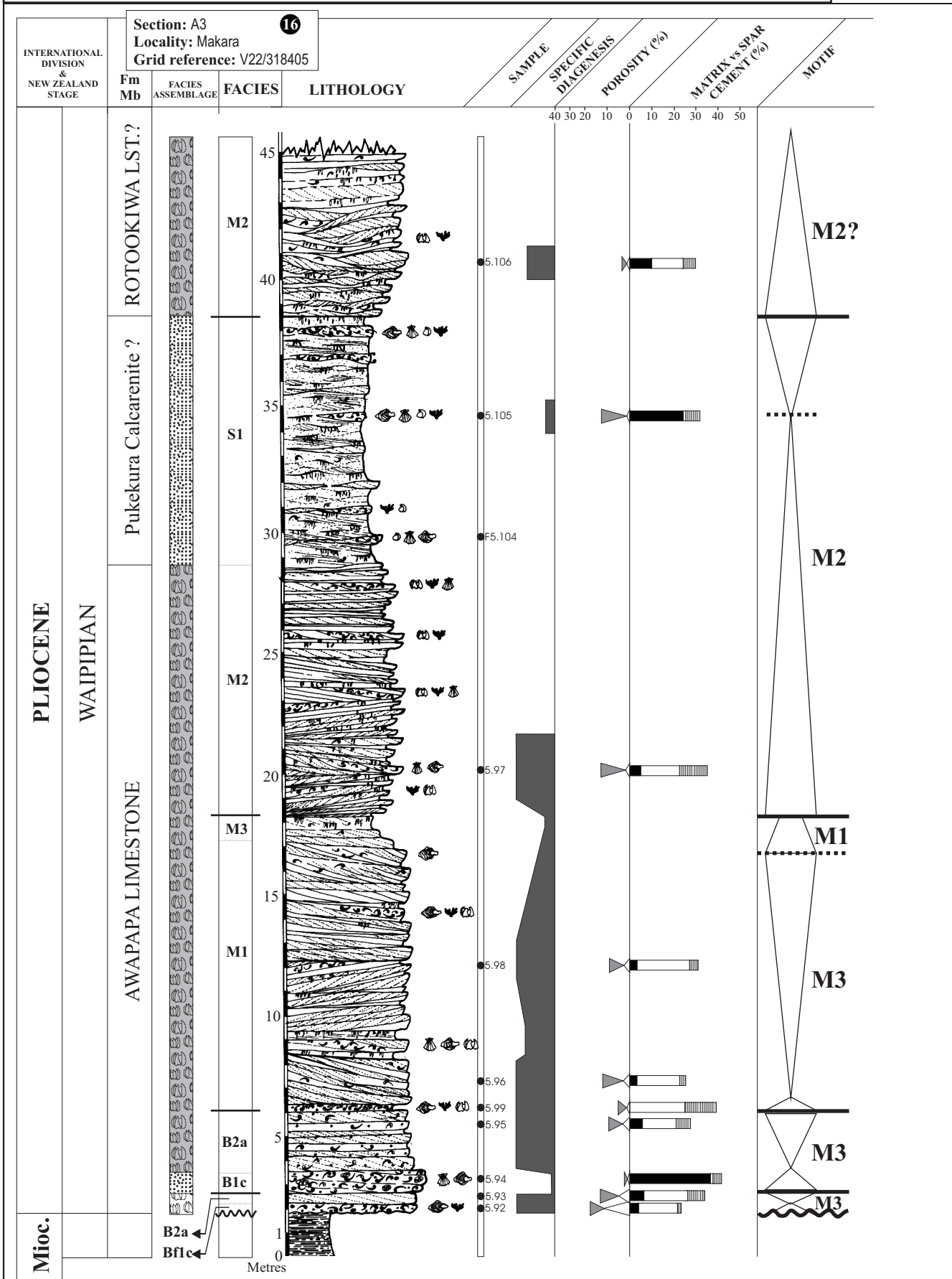
Location: Makara

NZMS 260 Sheet: V22

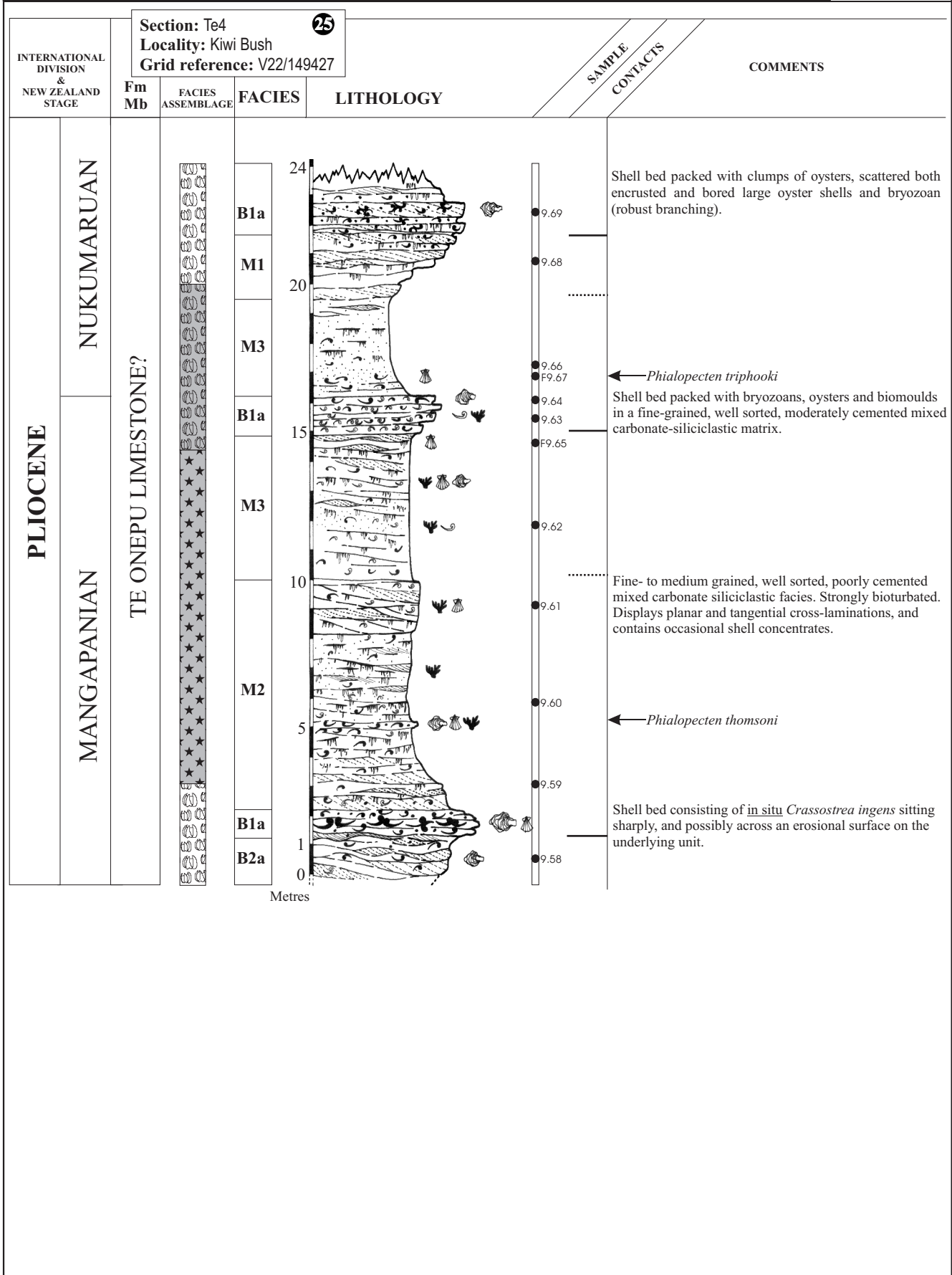
Author: V. Caron

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Stratigraphic Column No: 259	Grid Reference: Top	Bottom	NZMS 260 V22 259 1 of 2
Section: Te4	E: 2814900	-	
GPS Waypoint No(s):	N: 6142700	-	
Region: Central Hawkes Bay	Altitude:	-	
Location: Kiwi Bush	Author: V. Caron		
NZMS 260 Sheet: V22			



Stratigraphic Column No: 260

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: Te3

E: 2814800

-

GPS Waypoint No(s):

N: 6142200

-

Region: Central Hawkes Bay

Altitude:

-

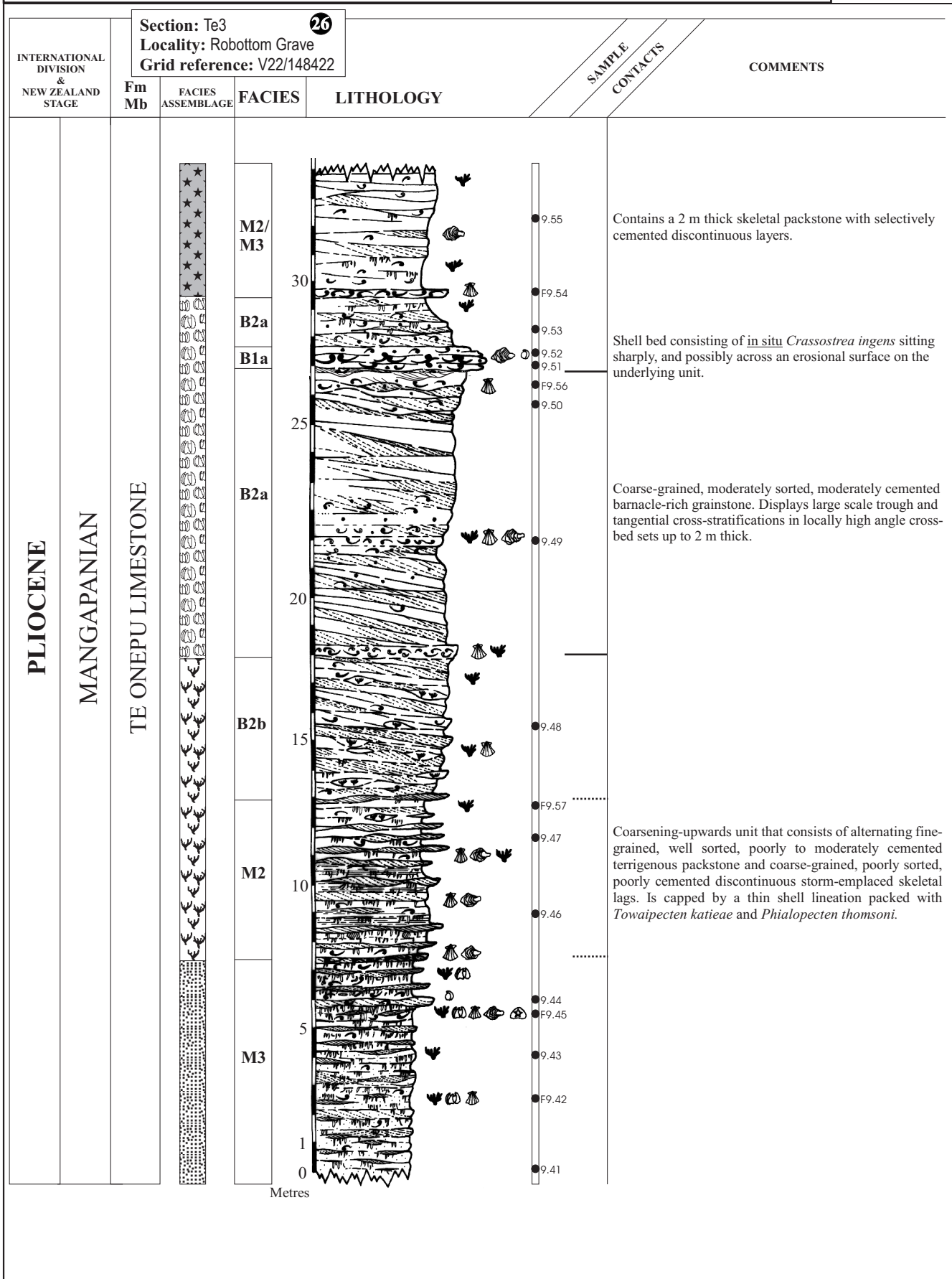
Location: Robottom Grave

NZMS 260 Sheet: V22

Author: V. Caron

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Stratigraphic Column No: 260

Grid Reference:

Top

Bottom

NZMS 260 V22

Section: Te3

E: 2814800

-

GPS Waypoint No(s):

N: 6142200

-

Region: Central Hawkes Bay

Altitude:

-

Location: Rottom Grave

NZMS 260 Sheet: V22

Author: V. Caron

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Section: Te3
Locality: Rottom Grave
Grid reference: V22/148422

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