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APPENDIX A.

BRIEF LITHOLOGICAL DESCRIPTION OF THE SAMPLES AND AMOUNT USED FOR THE PALYNOLOGICAL PREPARATIONS.

- Zea Panamericana outcrop section (processed in July-August, 1992)

Sample ID	Description (and amount used in g)
AGUARDIENTE FORMATION	
13-04-01	Massive carbonaceous, silty and micaceous dark gray shale (10.34 g)
13-04-02	Massive silty and micaceous gray shale with coaly fragments (10.47 g)
13-04-05	Laminated dark gray shale with coaly fragments and slicked-slide (7.06 g)
13-04-06	Massive calcareous sandy-silty gray shale (10.65 g)
13-04-07	Massive calcareous dark gray shale (10.01 g)
13-04-08	Massive calcareous dark gray shale with coaly fragments (10.02 g)
13-04-10	Massive calcareous dark gray shale (10.27 g)
13-04-12	Massive calcareous brownish shale (10.72 g)
13-04-13	Massive calcareous brownish shale with coaly fragments (10.94 g)
13-04-14	Massive dark gray muddy limestone (55.52 g)
13-04-15	Massive dark gray muddy limestone (33.36 g)
13-04-16	Massive micaceous dark gray shale with slicken-slide (10.60 g)
13-04-17	Massive carbonaceous shale (7.42 g)
13-04-18	Massive micaceous black shale (7.76 g)
13-04-20	Massive micaceous black shale (7.40 g)
13-04-21	Massive micaceous black shale (7.20 g)
13-04-22	Massive micaceous black shale with slicken-slide (7.20 g)
13-04-24	Massive reddish silty shale (31.46 g)
13-04-25	Massive micaceous gray silty shale (19.67)
13-04-27	Silty micaceous dark-gray carbonaceous shale (10.62 g)
13-04-29	Slightly calcareous massive carbonaceous shale (21.34 g)
13-04-30	Massive carbonaceous shale with slicken-slide (7.80 g)
13-04-34	Laminated carbonaceous shale (7.56 g)
13-04-36	Massive micaceous carbonaceous shale (7.00 g)
13-04-38	Massive micaceous carbonaceous shale (7.48 g)

13-04-39 Massive gray silty shale (10.67 g)
13-04-41 Massive gray shale with carbonaceous material (20.11 g)
13-04-42 Massive black carbonaceous shale (7.85 g)
13-04-43 Massive black carbonaceous shale (7.29 g)
13-04-45 Massive black carbonaceous shale (7.20 g)
13-04-46 Massive black carbonaceous shale (7.10 g)
13-04-47 Massive black carbonaceous shale (7.23 g)
13-04-48 Massive black carbonaceous shale (7.64 g)
13-04-49 Massive black carbonaceous shale (7.95 g)
13-04-50 Finely laminated black carbonaceous shale (7.53 g)
13-04-51 Massive gray silty shale (10.30 g)
13-04-53 Massive micaceous black shale (6.56 g)
13-04-54 Massive micaceous black shale (7.07 g)
13-04-55 Massive micaceous black shale (7.47 g)
13-04-56 Massive micaceous black shale (7.66 g)
13-04-57 Massive black carbonaceous sandstone (43.73 g)
13-04-58 Massive bituminuos black shale (6.74 g)
13-04-59 Massive micaceous silty shale (7.43 g)

- La Grita-Seboruco outcrop section (processed in October, 1992)

Sample ID Description (and amount used in g)

AGUARDIENTE FORMATION:

09-04-04 Massive dark gray-black shale, with yellow stain of sulfur (7.02 g)
09-04-05 Massive dark-gray-black shale (7.43 g)
09-04-06 Massive black, almost carbonaceous shale (6.54 g)
09-04-07 Massive black, almost carbonaceous shale (6.21 g)
09-04-08 Massive micaceous black shale, with slicken-slide (7.54 g)
09-04-09 Massive micaceous black-dark gray shale (6.52 g)
09-04-10 Massive micaceous dark gray shale (7.38 g)
09-04-11 Massive carbonaceous and micaceous shale (7.37 g)
09-04-12 Dark gray-black, almost carbonaceous shale, with gypsum vein (7.13 g)
09-04-13 Massive dark gray-black shale (7.50 g)

- Well CR-5; cored subsurface section (processed in January-February, 1992)

RIO NEGRO FORMATION

15190' 6"	Microconglomeratic coarse-grained light gray sandstone (66.18 g)
15184'	Microconglomeratic coarse-grained light gray sandstone (64.30 g)

AGUARDIENTE FORMATION

14918'	Dark gray bioclastic wackestone (62.89 g)
14910'	Dark gray bioclastic wackestone (67.47 g)
14906'	Dark gray bioclastic mudstone (67.79 g)
14900'	Dark gray relatively massive wackestone (67.70 g)
14895'	Dark gray fossiliferous muddy limestone (61.78 g)
14891'	Light gray Massive wackestone (61.35 g)
14786'	Massive black shale (7.86g)
14781'	Massive light gray dolomite (69.42 g)
14770'	Light gray massive dolomite (30.62 g)
14755'	Light grey bioclastic dolomite (49.63 g)
14730'	Light gray bioturbated dolomite (79.95 g)
14700'	Light gray bioclastic limestone (57.53 g)
14632'	Light gray bioclastic limestone (68.84 g)
14625'	Dark gray massive wackestone (38.22g)
14591'	Dark gray massive wackestone (68.00 g)
14560'	Light gray massive wackestone (66.32 g)
14552'	Massive black shale (7.47 g)
14549'	Massive black shale (7.79 g)
14540'	Light gray calcareous fine-grained sandstone (66.21 g)
14501'3"	Light gray wackestone with shaly partings (66.95 g)
14480'	Light gray bioclastic wackestone (50.64 g.)
14460'	Black massive calcareous silty shale (10.48 g.)
14440'	Light gray bioturbated calcareous sandstone (83.60 g)
14410'	Dark gray laminated siltstone, slightly calcareous (23.31 g)
14401'	Dark gray massive arenaceous wackestone (73.87 g)
14386'	Light gray bioturbated silty shale (8.46 g)

14351'	Dark gray very fine-grained calcareous sandstone (78.81 g)
14337'	Dark gray to black massive shale (7.43 g)
14307'	Glauconitic calcareous fine-grained sandstone (27.63 g)
14285'	Dark gray shale with intercations of fine-grained sandstone (7.63 g)
14231'	Dark gray massive shale, slightly calcareous (7.59 g)
14210'	Dark gray laminated silty shale (12.32 g)
14196'	Light gray fine-grained massive sandstone (83.84 g)
14190'	Dark gray massive silty shale (7.06 g)
14186'	Dark gray massive shale (7.86 g)
14165'	Light gray very fine-grained glauconitic sandstone (52.70 g)
14068'	Glauconitic very fine-grained sandstone (53.62 g)
14027'	Glauconitic massive black shale (8.46 g)
14006'	Light gray massive very fine-grained sandstone (60.65 g)
13927' 3"	Massive black shale, calcareous (7.26 g)
13911'	Massive black shale, calcareous (7.15 g)

- Well ALT-19X; cored subsurface section (processed in September, 1992)

Sample ID	Description (and amount used in g)

APON FORMATION

17803' 3"	Massive black shaly limestone (30.00 g)
17802'	Dark gray massive muddy limestone (72.05 g)
17798'	Dark gray massive muddy limestone (72.14 g)
17795'	Dark gray massive muddy limestone (74.68 g)
17785'	Dark gray bioclastic packstone/wackestone (71.35 g)
17735'	Dark to medium gray mudstone (66.81 g)
17733'	Dark gray bioclastic packstone (66.81 g)
17723'10"	Dark gray bioclastic packstone (25.00 g)
17710'	Bioturbated dark gray wackestone (72.09 g)
17696'	Dark gray bioclastic packstone (72.17 g)
17679' 3"	Dark gray bioclastic limestone (30.00 g)
17639'	Dark gray massive shale, slightly calcareous (15.47 g)
17606'	Medium gray bioclastic wackestone (70.23 g)

17600'	Massive black shale, slightly calcareous (15.03 g)
17596'	Massive black shale, slightly calcareous (16.61 g)
17588'	Massive black shale, slightly calcareous (15.08 g)
17578'	Bioturbated dark gray packstone (71.34 g)

LISURE FORMATION

17555'	Massive black shale, slightly calcareous (15.06 g)
17530'	Dark gray fossiliferous grainstone (62.64 g)
17517'	Massive dark gray wackestone (48.00 g)
17504'	Dark gray fossiliferous mudstone (61.57 g)
17461'	Massive dark gray shale (13.00 g)
17450'	Massive black shale (7.67g)
17439'	Massive black shale (7.94 g)
17421'	Massive black shale (11.00 g)
17412'	Massive black shale (9.00 g)
17409'	Massive black shale (7.33 g)
17404'	Massive black shale (8.03 g)
17385'	Glauconitic dark gray siltstone (15.85 g)
17367'	Massive fossiliferous dark gray siltstone (7.22 g)
17339'	Black shale with fine laminations of fine-grained sandstone (12.00 g)
17338'	Micaceous massive black shale, slightly calcareous (14.59 g)
17294'	Massive black shale (7.70 g)
17291'	Massive black to dark gray shale (7.27 g)
17289'	Massive black shale (7.80 g)
17285'	Massive dark gray calcareous shale (16.06 g)
17258'	Bioturbated dark gray calcareous siltstone (30.06 g)
17253'8"	Bioturbated dark gray silty shale (17.96 g)
17247'	Massive dark gray shale (8.27 g)
17244'	Massive black calcareous shale (12.00 g)
17232'	Massive fossiliferous dark gray calcareous shale (8.00 g)
17230'	Massive dark gray shale, slightly calcareous (16.24 g)

MARACA FORMATION

17196'	Dark gray massive grainstone (61.58 g)

17175'	Light gray massive packstone (42.00 g)
17130'	Dark gray packstone with shale lenses (66.10 g)
17113'6"	Bioturbated dark gray wackestone (61.19 g)
17111'	Dark gray to black fossiliferous wackestone (23.50 g)

LA LUNA FORMATION

16966'	Finely laminated calcareous black shale (15.00 g)
16963'	Finely laminated calcareous black shale (10.00 g)
16951'	Finely laminated calcareous black shale (15.00 g)

- Well ALP-6; cored subsurface section (processed in March, 1992)

Sample ID	Description (and amount used in g)

RIO NEGRO FORMATION

16681'8"	Microconglomeratic sandtsone, slightly calcareous (49.34 g)

APON FORMATION: TIBU MEMBER

16831'	Dark gray calcareous shale with chonchoidal fracture (15.31 g)
16829'	Finely laminated black shale (17.17 g)
16814'	Calcareous massive black shale with chonchoidal fracture (10.09 g)
16810'	Finely laminated black shale with lenses of limestone (10.06 g)
16780'	Medium gray bioturbated wackestone (67.93 g)
16720'	Light gray massive wackestone (59.28 g)
16715'	Light gray massive wackestone (59.96 g)
16710'	Light gray bioturbated wackestone (59.72 g)
16695'	Light gray bioturbated wackestone (58.11 g)
16680'	Light to medium gray bioturbated wackestone (66.26 g)
16667'	Finely laminated calcareous dark gray shale (7.34 g)
16656'	Light gray massive limestone (64.25 g)
16601'	Medium gray muddy fossiliferous limestone (25.78 g)
16591'	Medium gray massive marl (7.31 g)

APON FORMATION: MACHIQUES MEMBER

16574'	Black massive calcareous shale (7.89 g)
16573'4"	Black massive calcareous shale (7.33 g)
16555'	Black massive calcareous shale (7.53 g)
16545'	Black massive calcareous shale (7.64 g)
16540'	Dark gray to black muddy limestone (24.97 g)
16525'	Massive dark gray limestone (55.29 g)

APON FORMATION: PICHE MEMBER

16500'	Massive light gray limestone (51.45 g)
16427'	Light gray bioclastic grainstone (18.40 g)
16394'	Light gray massive packstone (61.50 g)
16356'	Light gray massive mudstone (68.20 g)
16316'	Medium gray bioturbated bioclastic mudstone (68.20 g)
16221'	Dark gray to black massive packstone (56.79 g)
16165'	Light gray massive packstone (58.59 g)
16110'	Medium gray massive limestone (67.04 g)

LISURE FORMATION

16108'	Laminated black shale (9.86 g)
16101'	Laminated black shale (8.86 g)
16085'	Laminated black shale (8.97 g)
16060'	Laminated black shale (9.21 g)
16050'	Bioturbated silty black shale (7.86 g)
16034'	Dark gray shale with lenses of fine-grained sandstone (7.15 g)
16021'	Bioturbated light gray wackestone (72.02 g)
15973'6"	Light gray calcareous sandstone (31.10 g)
15995'	Light gray calcareous sandstone (33.69 g)
15947'	Massive dark gray shale (8.65 g)
15900'	Massive black shale (9.10 g)
15885'	Massive black shale, slightly bioturbated (7.49 g)

15881'9"	Dark gray shale with lenses of fine-grained glauconitic sandstone (15.76 g)
15777'6"	Massive light gray wackestone (74.03 g)
15761'6"	Light gray glauconitic wackestone (40.98 g)
15747'	Light gray glauconitic sandy grainstone (43.02 g)
15740'	Black shale with lenses of fine-grained sandstone (8.62 g)
15701'	Light gray sandy glauconitic packstone (43.07 g)
15664'	Light gray sandy glauconitic packstone/grainstone (73.68 g)
15652'	Light gray massive muddy limestone (60.53 g)

MARACA FORMATION:

15640'	Light gray bioclastic packstone (60.53 g)
15603'	Light gray bioclastic muddy limestone (71.81 g)
15597'	Medium gray muddy limestone (50.33 g)

LA LUNA FORMATION

15580'	Dark gray calcareous black shale (8.25 g)
15575'	Laminated calcareous black shale (7.14 g)
15550'	Laminated calcareous black shale (7.01 g)

- Catatumbo Quarry; outcrop section (processed in October, 1992)

Sample ID	Description (and amount used in g)
M-14	Light to medium gray massive limestone (68.08 g)
M-19	Massive black shale (12.45 g)
M-18	Finely laminated black shale, slightly calcareous (15.79 g)
M-20	Dark gray massive shale (15.68 g)
M-22	Dark gray massive shale, slightly calcareous (15.95 g)
M-23	Dark gray massive calcareous shale (15.73 g)
M-24	Medium gray massive shale (15.95 g)
M-25	Medium gray massive shale (15.06 g)
M-13	Beige calcareous nodule (105.67 g)

- Rosarito Quarry; outcrop section (processed in October, 1992)

Sample ID	Description (and amount used in g)
MARACA FORMATION:	
S2A	Dark gray massive bituminous shale lense (16.12 g)

- Well P-201; cored subsurface section (processed in June, 1992)

Sample ID	Description (and amount used in g)
APON FORMATION:	
11570'	Light gray bioclastic mudstone (73.94 g)
11550'	Dark gray bioclastic and bioturbated mudstone (71.99 g)
11518'	Light gray mudstone (47.03 g)
11514'	Light gray bioturbated packstone (72.94 g)
11504'	Light gray bioturbated wackestone (71.03 g)
11492'	Light gray bioturbated grainstone ((71.50 g)
11462'	Light to medium gray bioturbated grainstone (71.48 g)
11450'	Medium gray bioclastic grainstone (72.61 g)
11410'	Gray bioclastic bioclastic grainstone (74.53 g)
LISURE FORMATION:	
11403'	Massive black shale, slightly calcareous (7.11 g)
11402'	Massive black shale, slightly calcareous (8.60 g)
11399'	Massive black shale, slightly calcareous (7.30 g)
11398'	Massive black shale, slightly calcareous (7.80 g)
11396'	Massive black shale, slightly calcareous (7.84 g)
11395'	Black massive shale (7.97 g)
11394'	Black massive shale (7.42 g)
11393'	Black massive shale (7.50 g)
11392'7"	Medium gray bioclastic and bioturbated grainstone (74.42 g)
11369"	Medium gray shaly packstone (74.00 g)

11363'	Medium gray shale packstone (73.82 g)
11106'	Medium gray bioclastic wackestone (71.37 g)
11102'	Massive calcareous black shale (10.24 g)
11099'	Massive calcareous black shale (10.10 g)
11080'	Medium gray glauconitic wackestone (32.08 g)
11072'	Medium gray bioclastic and bioturbated grainstone (72.67 g)
11061'5"	Light gray bioclastic grainstone (75.85 g)
11059'2"	Medium gray oolitic bioclastic grainstone (74.85 g)
11003'7"	Dark gray bioclastic packstone (75.36 g)
10993'	Medium gray bioturbated packstone (73.67 g)
10970'	Light gray massive dolomite (71.96 g)
10925'	Light gray bioclastic wackestone (75.96 g)
10907'	Medium gray massive mudstone (76.98 g)
10900'	Light gray bioturbated grainstone (75.61 g)
10891'	Medium gray shaly packstone (75.61 g)
10867'	Medium gray bioturbated grainstone (72.88 g)
10854'	Medium gray bioclastic grainstone (73.73 g)

MARACA FORMATION:

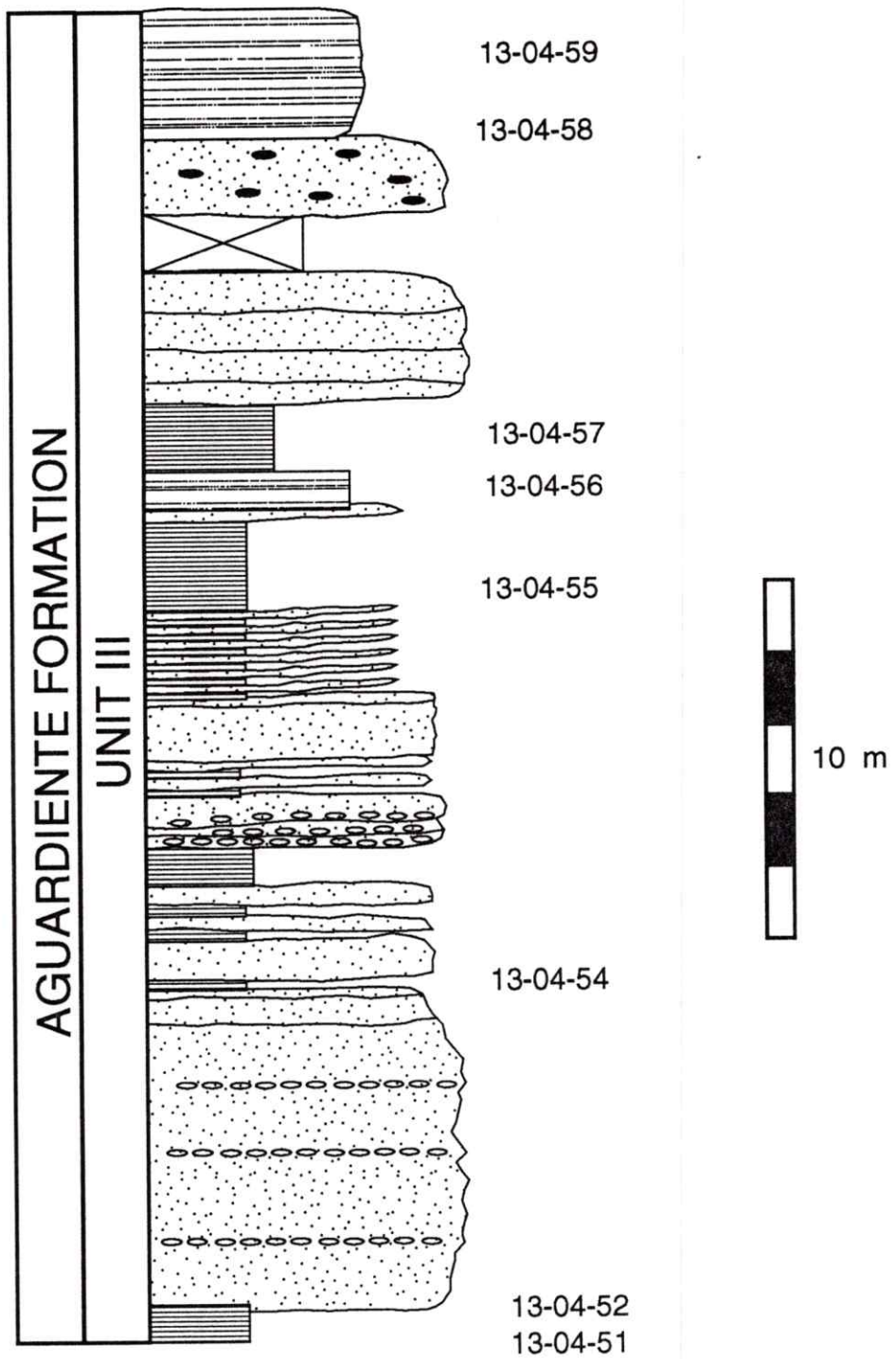
10823'8"	Black bioclastic mudstone (71.35 g)

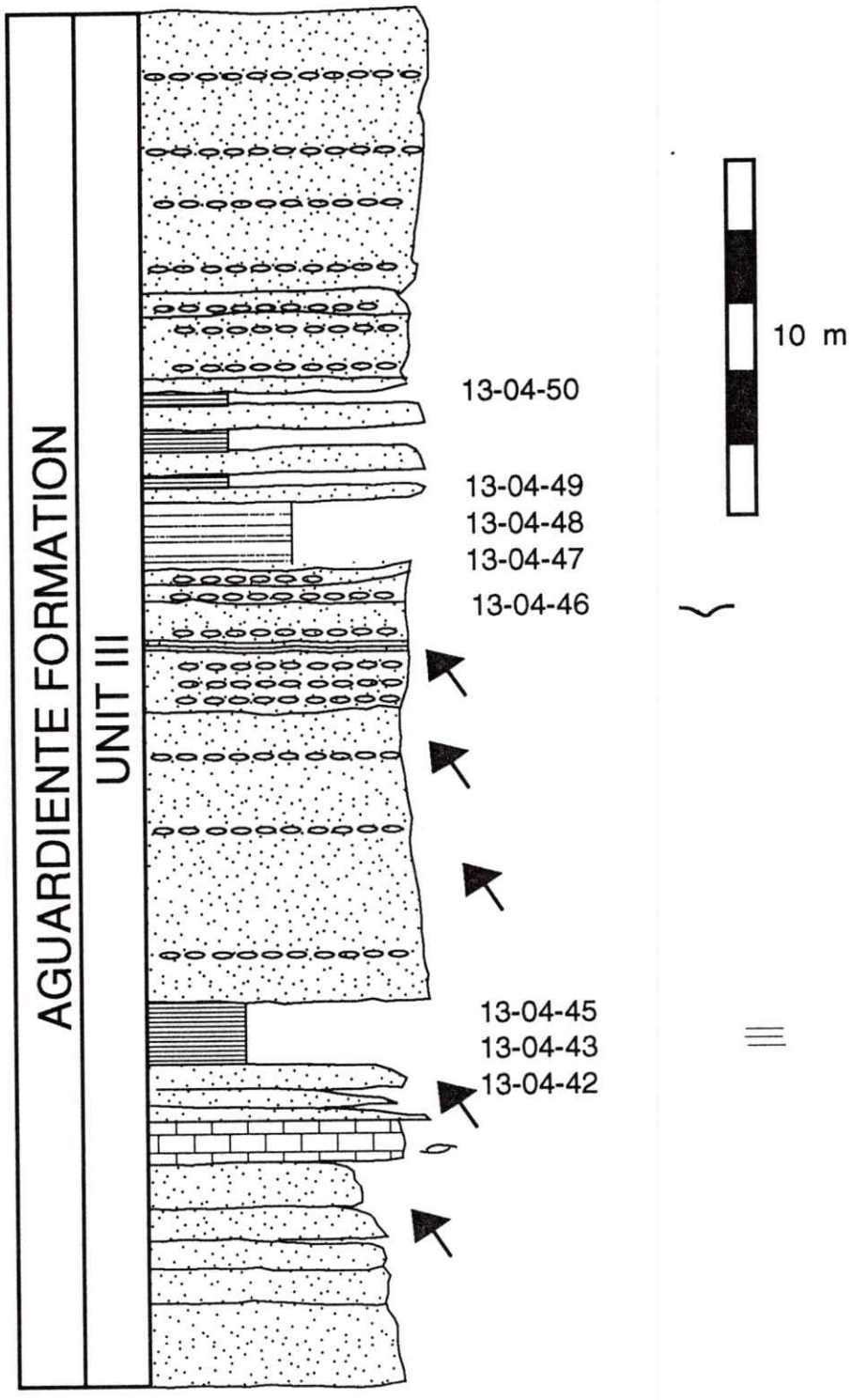
- Well VLB-704, cored section (processed in May-June, 1992)

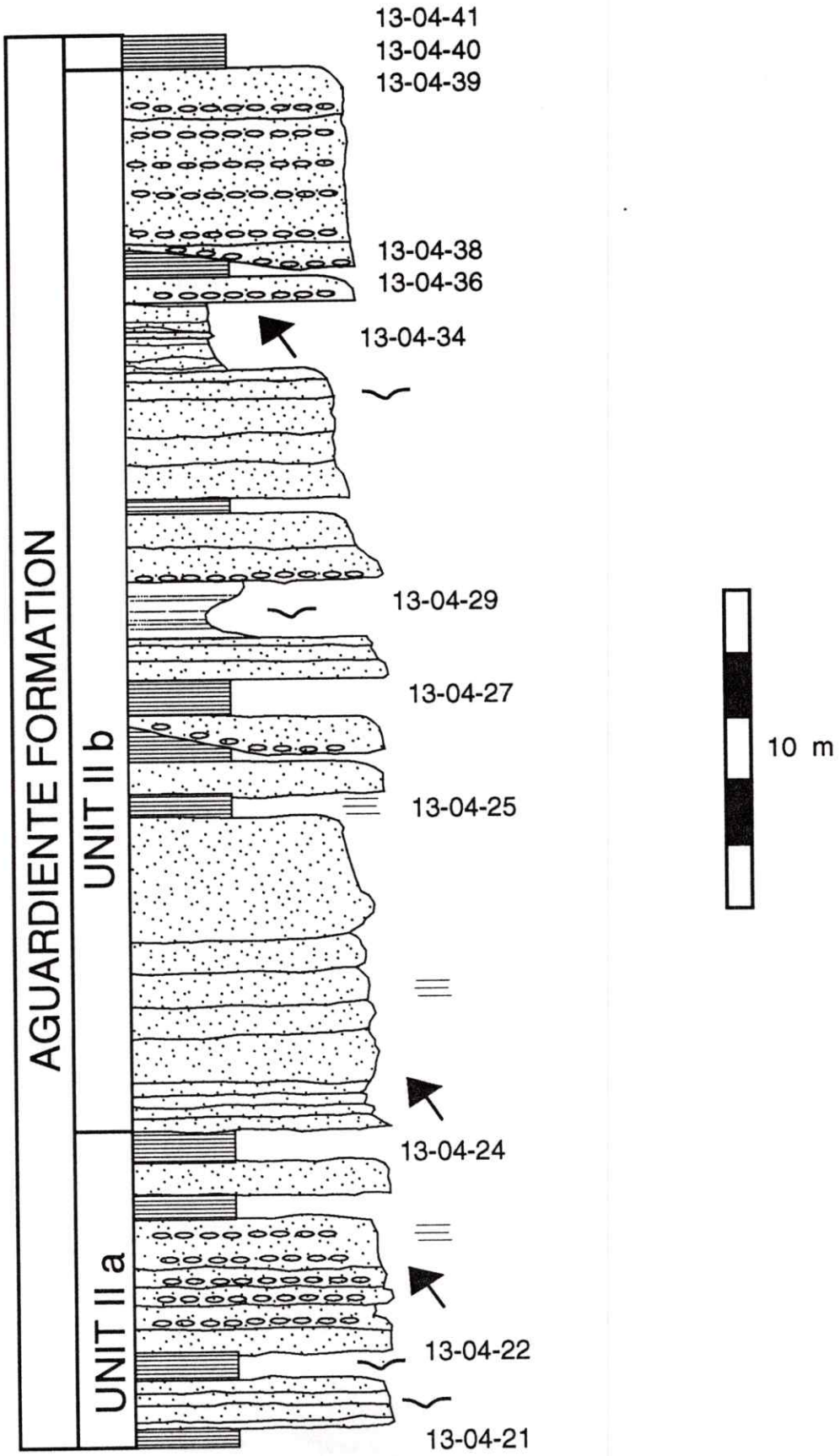
Sample ID	Description (and amount used in g)
14677'	Dark gray shale (7.05 g)
14646'8"	Dark gray bioclastic wackestone (71.70 g)
14639'2"	Dark gray bioclastic wackestone (72.80 g)
14625'	Dark gray bioclastic wackestone (71.52 g)
14611'6"	Light gray massive grainstone (71.83 g)
14584'10"	Light gray bioturbated packstone (70.93 g)
14526'	Light gray massive wackestone (70.71 g)
14509'	Light gray massive wackestone (69.26 g)
14484'	Dark gray bioturbated wackestone (69.04 g)
14470'	Light gray bioturbated wackestone (72.96 g)

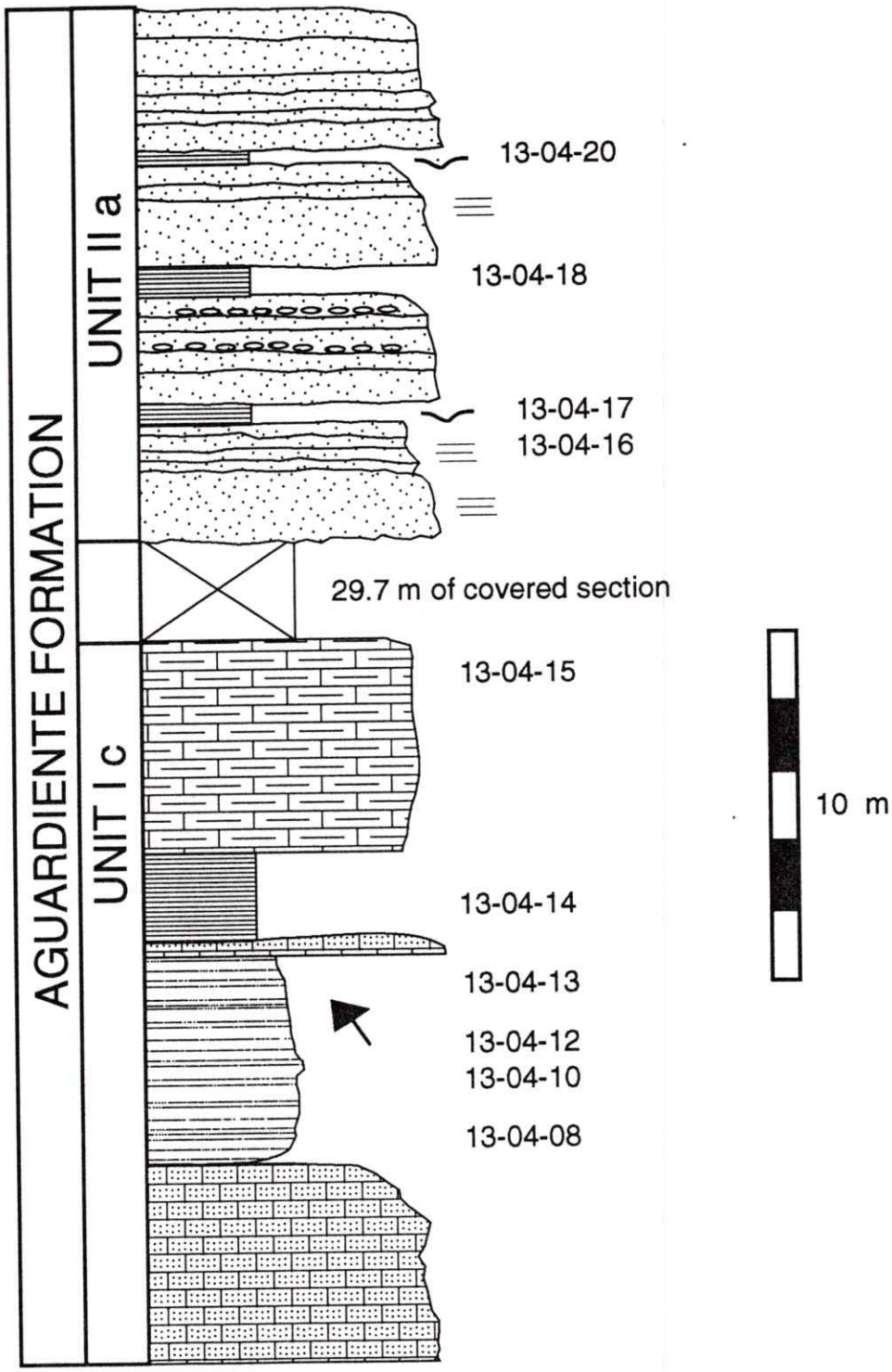
14450'	Light gray laminated wackestone (44.49 g)
14423'	Light gray massive wackestone (70.45 g)
14395'	Light gray bioclastic wackestone (60.89 g)
14378'	Light gray bioturbated wackestone (69.48 g)
14371'	Light gray bioclastic wackestone (57.51 g)
14366'	Light gray bioclastic wackestone (70.38 g)
14345'	Light gray wackestone with shale lenses (63.37 g)
14335'2"	Light gray bioturbated wackestone (72.86 g)
14326'7"	Light gray wackestone with sahle lenses (73.05 g)
14304'2"	Laminate light gray wackestone (71.26 g)
14289'4"	Dark gray massive shale, slightly calcareous (7. 43 g)
14275'	Light gray bioturbated wackestone (73.79 g)
14258'9"	Light gray bioclastic shaly packstone (72.85 g)
14233'	Light gray finely laminated shale (7. 41 g)
14203'	Light gray bioturbated wackestone (72.34 g)
14219'	Light gray bioturbated wackestone (74.10 g)
14188'	Light gray bioclastic wackestone (69.64 g)
14172'	Dark gray calcareous shale (7.30 g)
14158'	Dark gray bioturbated wackestone (51.62 g)
14154'	Dark gray bioturbated wackestone (70.76 g)
14150'	Dark gray slightly bioturbated wackestone (70.55 g)
14139'8"	Dark gray massive shale (7.14 g)
14133'	Dark gray shaly mudstone (7.56 g)
14119'	Light gray massive wackestone (69.95 g)
14092'7"	Light gray bioclastic wackestone (72.25 g)
14078'	Dark gray massive calcareous shale (8.00 g)
14077'4"	Light gray sandy limestone (7.62 g)
14045'	Dark gray mudstone (45.19 g)
14008'	Dark gray shaly mudstone (27.75 g)
13938'	Dark gray mudstone (33.71 g)
13877'5"	Dark gray massive wackestone (70.65 g)
13840'6"	Dark gray massive wackestone (71.60 g)
13832'9"	Dark gray laminated calcareous shale (15.91 g)
13805'	Dark gray laminated calcareous shale (15.01 g)

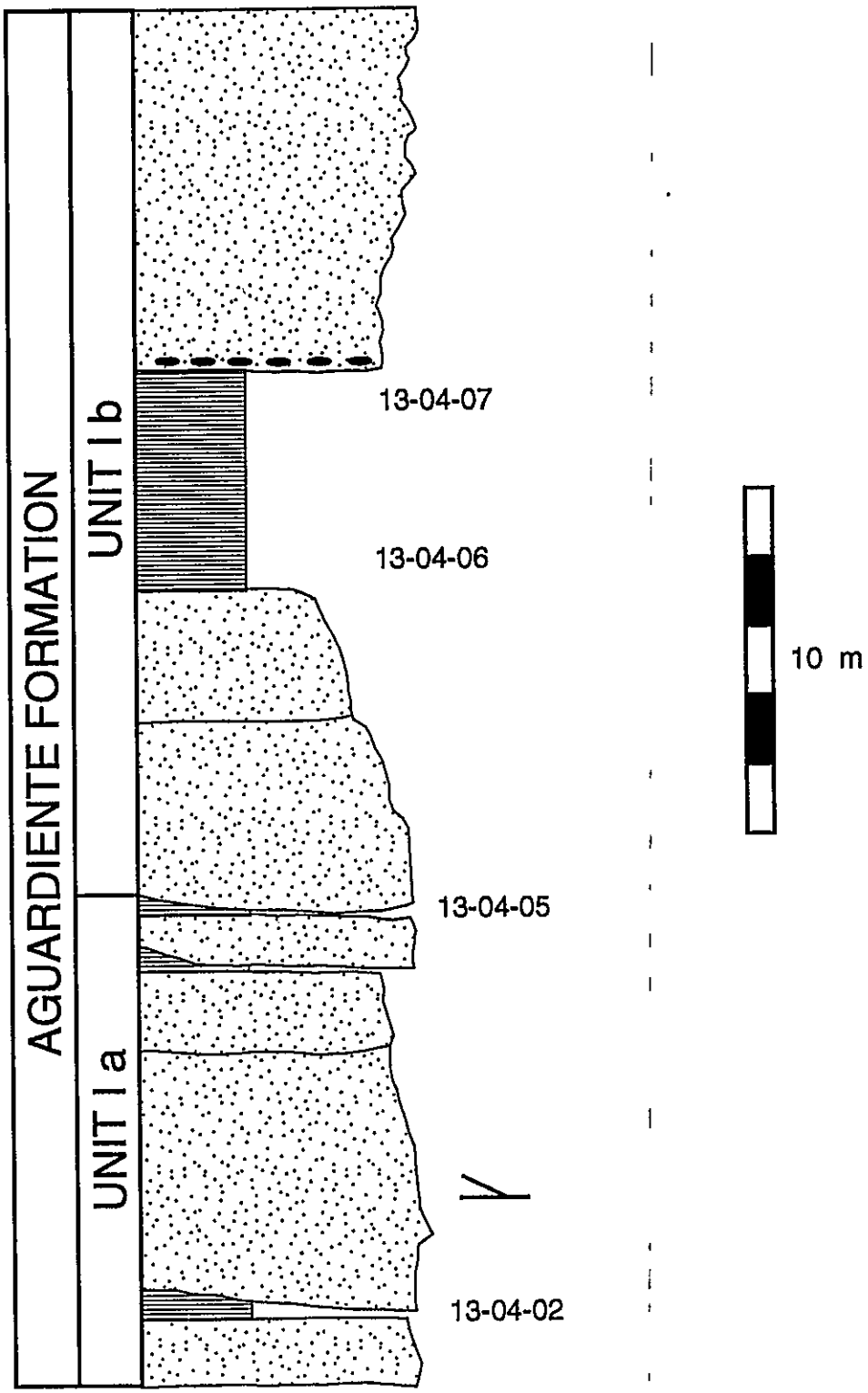
Appendix B-1. Lithological column of the Zea-Panamericana outcrop section, with location of samples processed for this study (Scale 1:200). Modified from field work notes of Ms. Xiomara Marquez and Selena Mederos.

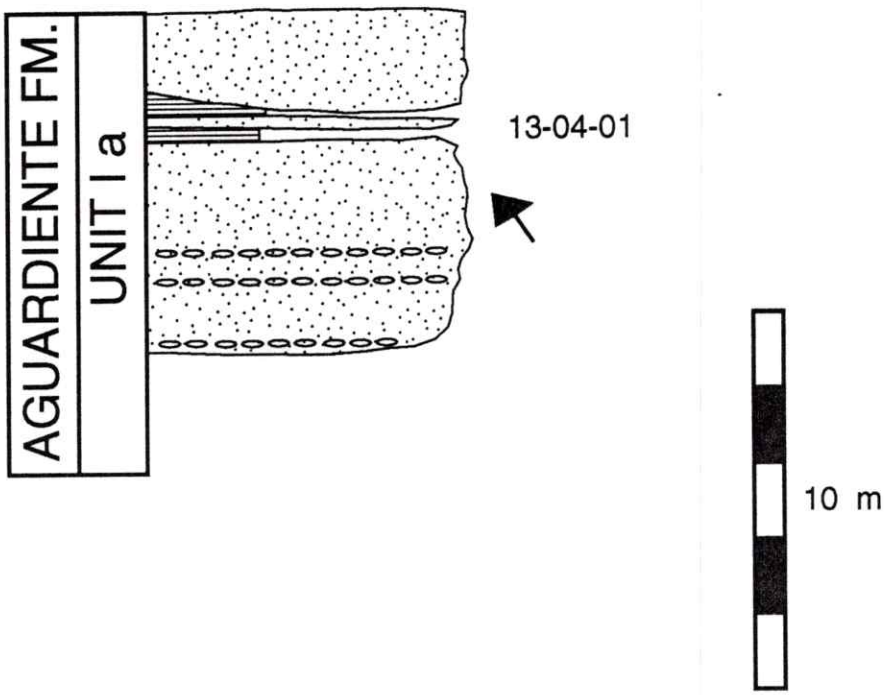

AGUARDIENTE FORMATION
UNIT III
13-04-59
13-04-58
13-04-57
13-04-56
13-04-55
13-04-54
13-04-52
13-04-51
10 m


AGUARDIENTE FORMATION
UNIT III
13-04-50
13-04-49
13-04-48
13-04-47
13-04-46
13-04-45
13-04-43
13-04-42
10 m


AGUARDIENTE FORMATION
UNIT II b
UNIT II a
13-04-41
13-04-40
13-04-39
13-04-38
13-04-36
13-04-34
13-04-29
13-04-27
13-04-25
13-04-24
13-04-22
13-04-21
10 m


AGUARDIENTE FORMATION
UNIT II a
UNIT I c
13-04-20
13-04-18
13-04-17
13-04-16
29.7 m of covered section
13-04-15
13-04-14
13-04-13
13-04-12
13-04-10
13-04-08
10 m


AGUARDIENTE FORMATION
UNIT I b
UNIT I a
13-04-07
13-04-06
13-04-05
13-04-02
10 m



LIMESTONE

BITUMINOUS LIMESTONE

SANDY LIMESTONE

SANDSTONE

CALCAREOUS SANDSTONE

SILTSTONE

SHALE

BIOTURBATION

PARALLEL LAMINATION

CROSS-BEDDING

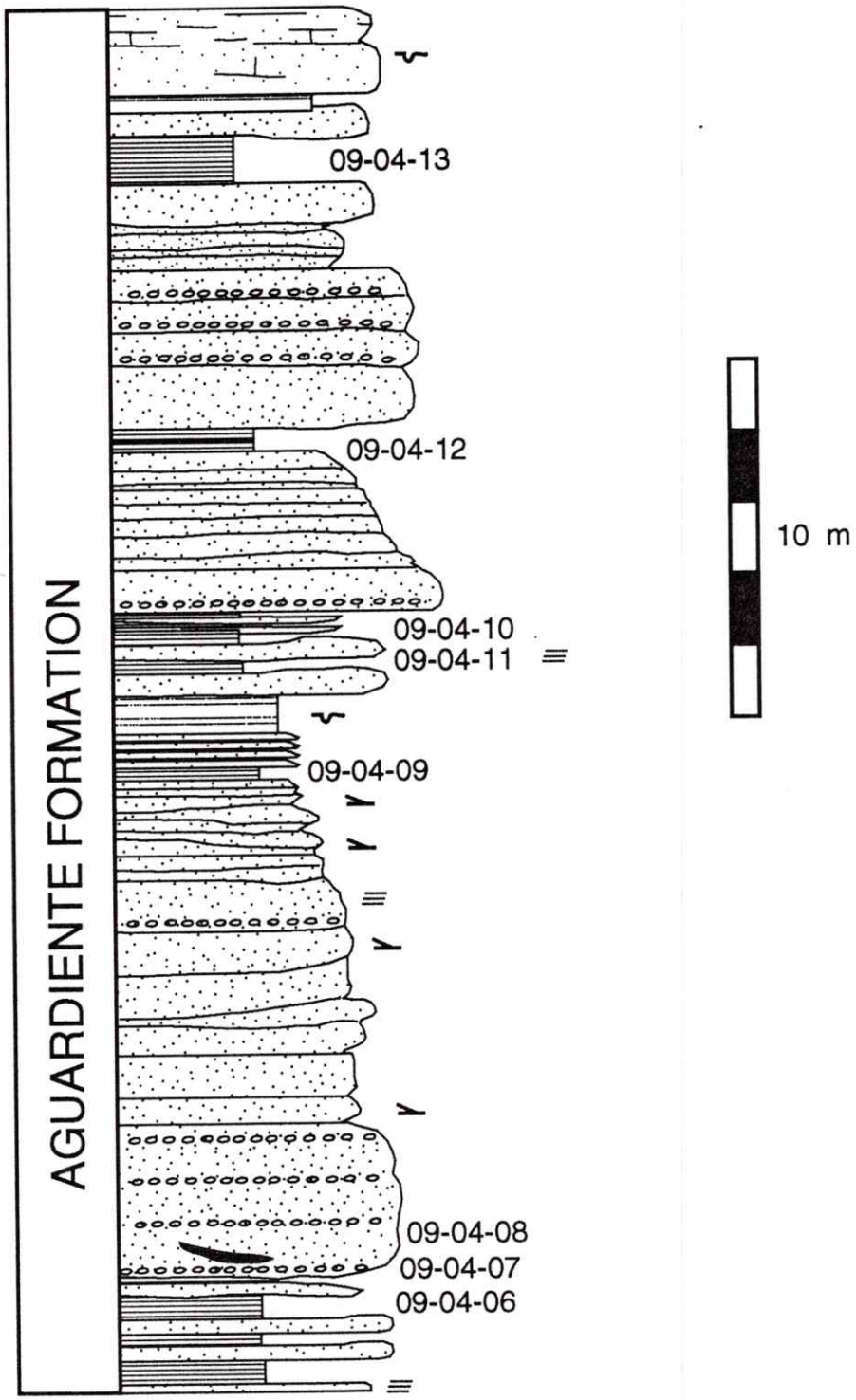
FINING-UPWARD

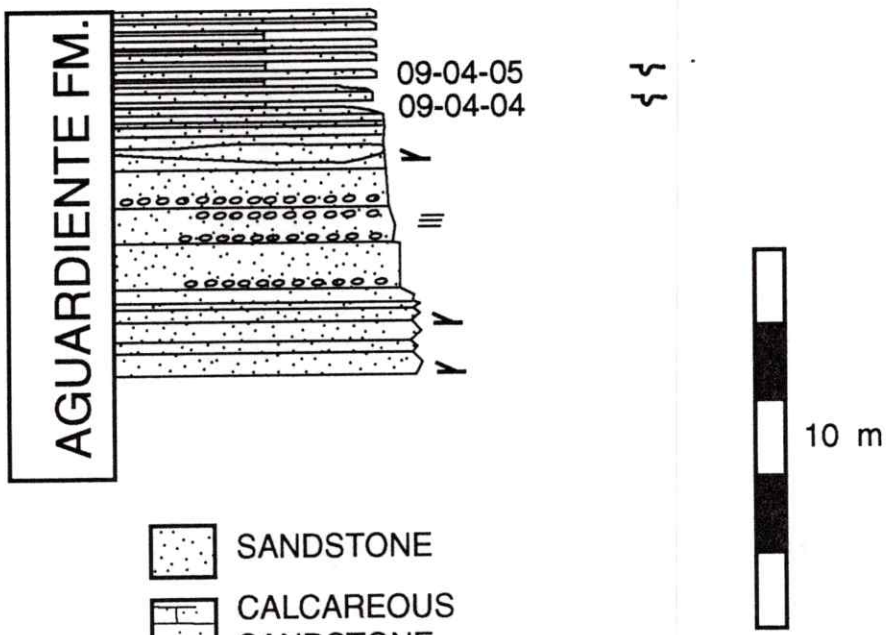
13-04-00 PALYNOLOGICAL SAMPLE

CARBONACEOUS NODULES

MICROCONGLOMERATE

Appendix B-2. Lithological column of La Grita outcrop section, with location of samples processed for this study (Scale 1:200). Modified from field work notes of Ms. Xiomara Marquez and Selena Mederos.


AGUARDIENTE FORMATION
09-04-13
09-04-12
09-04-10
09-04-11
09-04-09
09-04-08
09-04-07
09-04-06
10 m



SANDSTONE

CALCAREOUS SANDSTONE

SILTSTONE

SHALE

BIOTURBATION

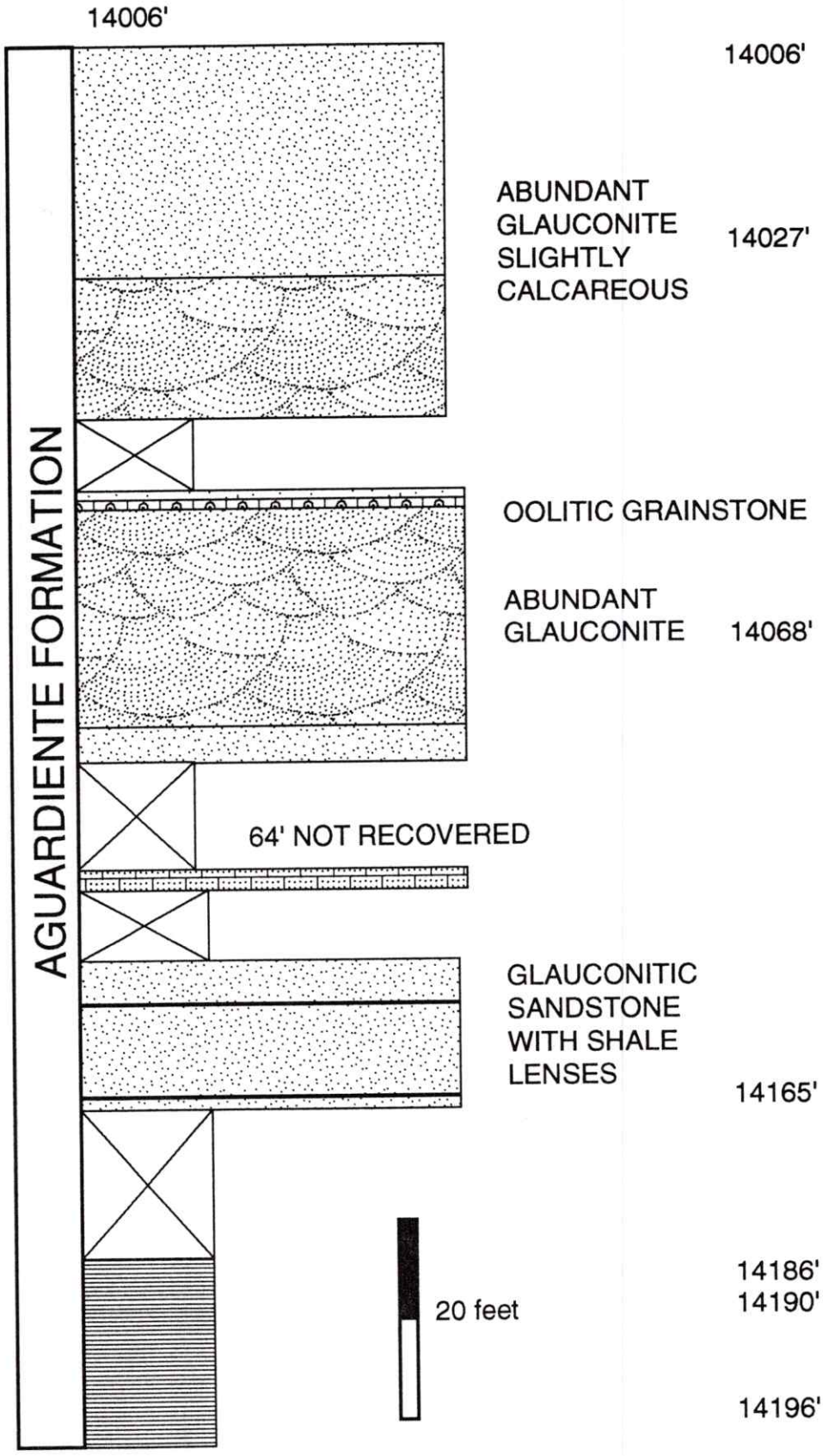
PARALLEL LAMINATION

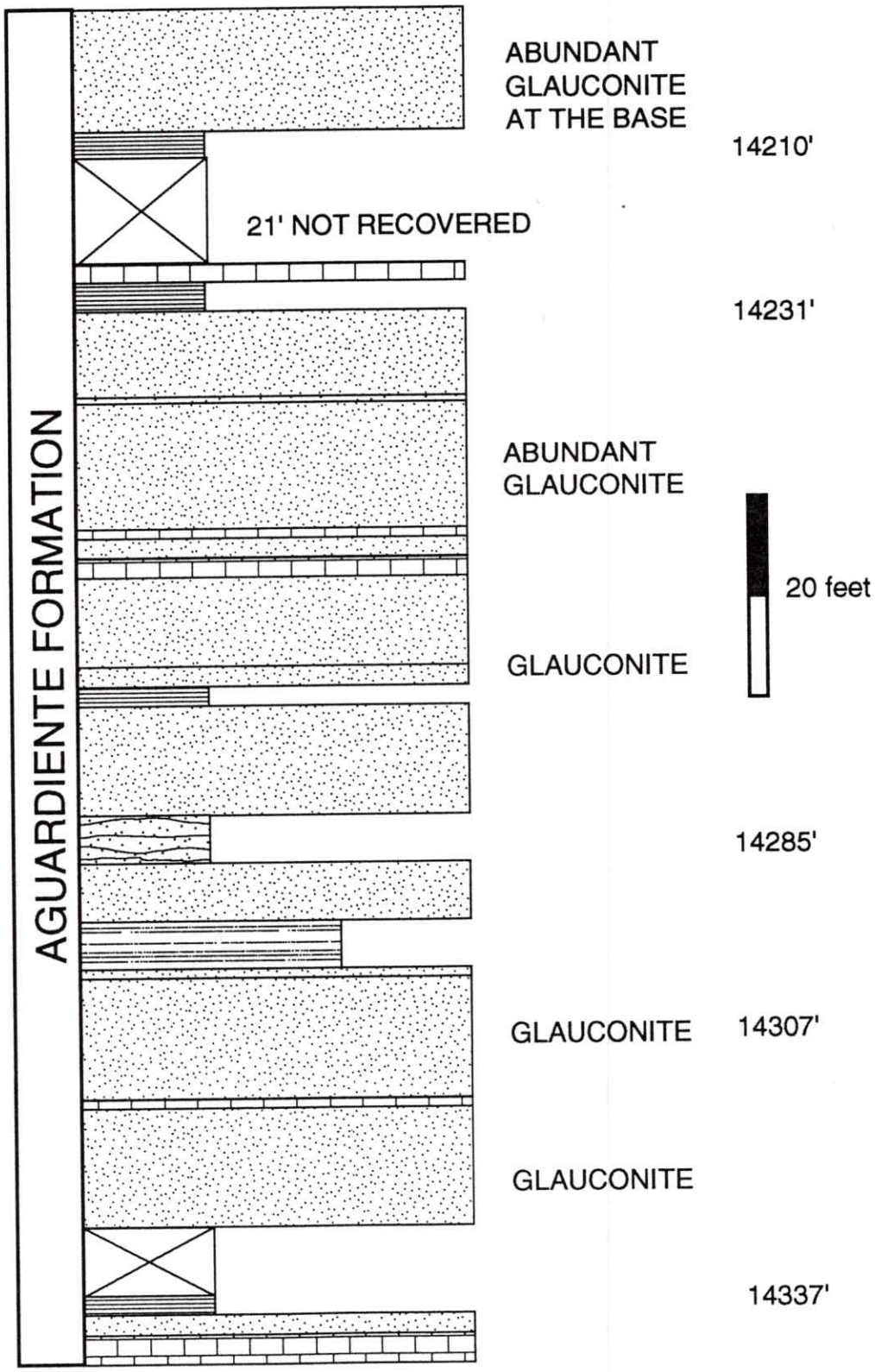
CROSS-BEDDING

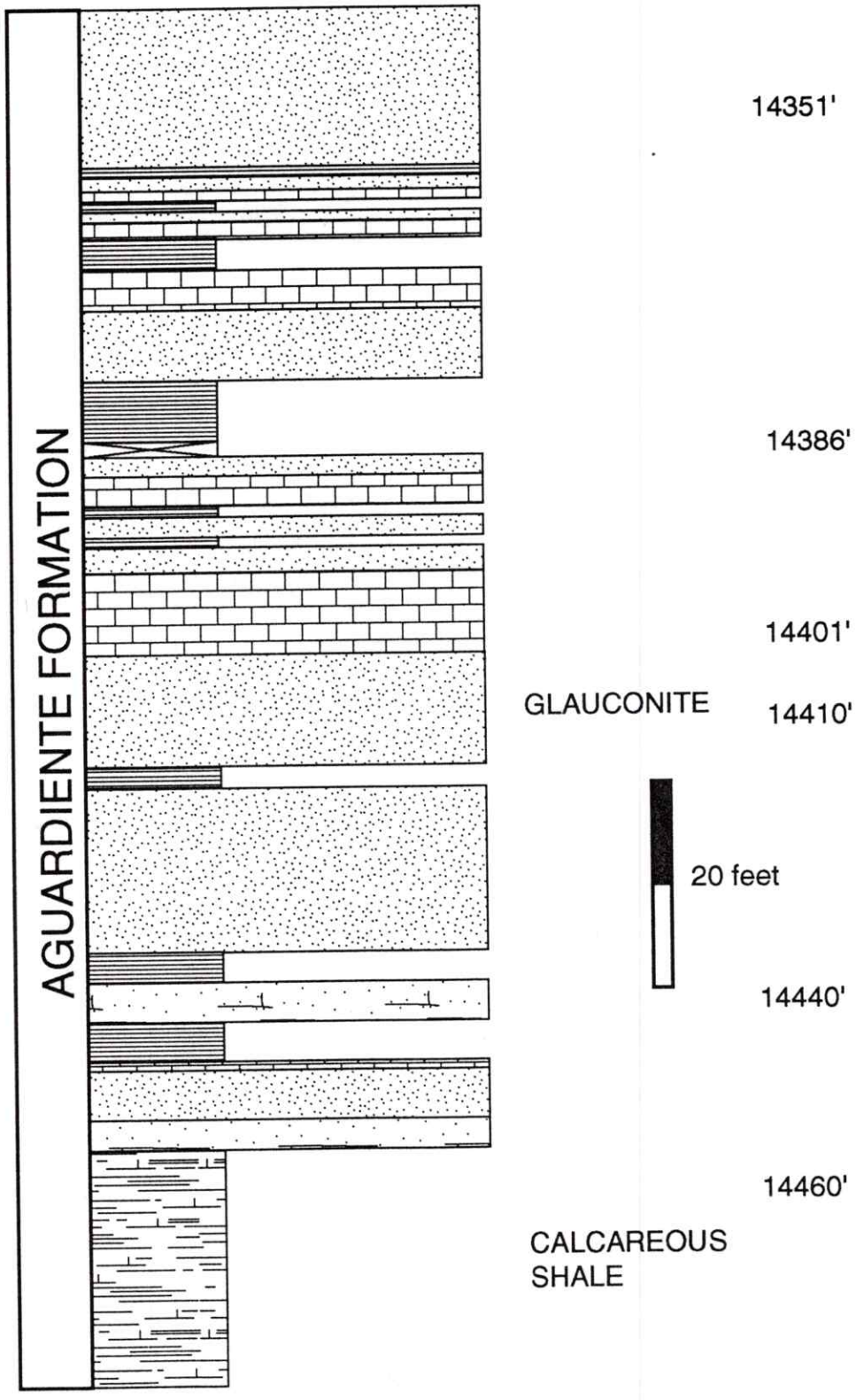
09-04-00 PALYNOLOGICAL SAMPLE

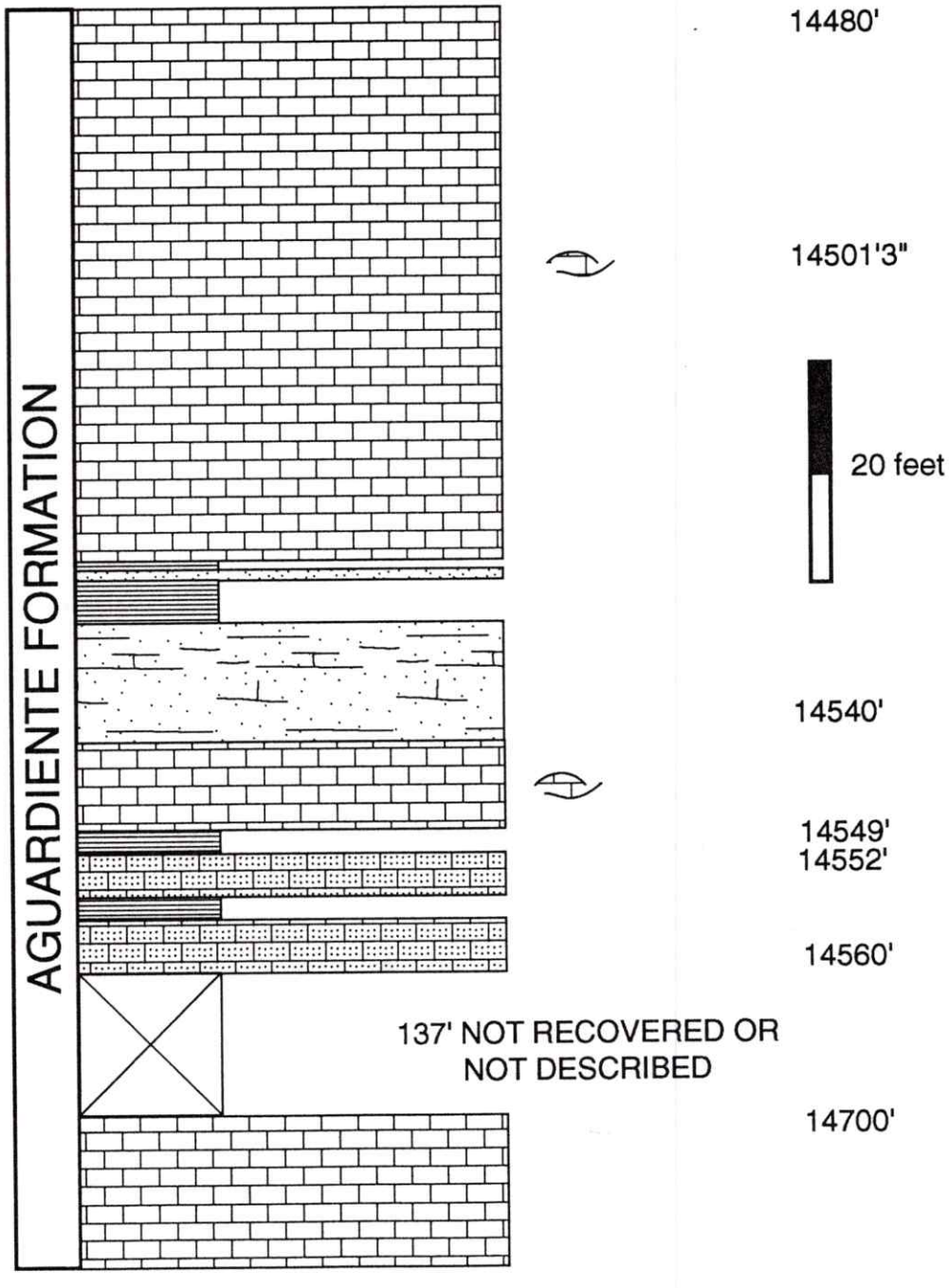
MICROCONGLOMERATE

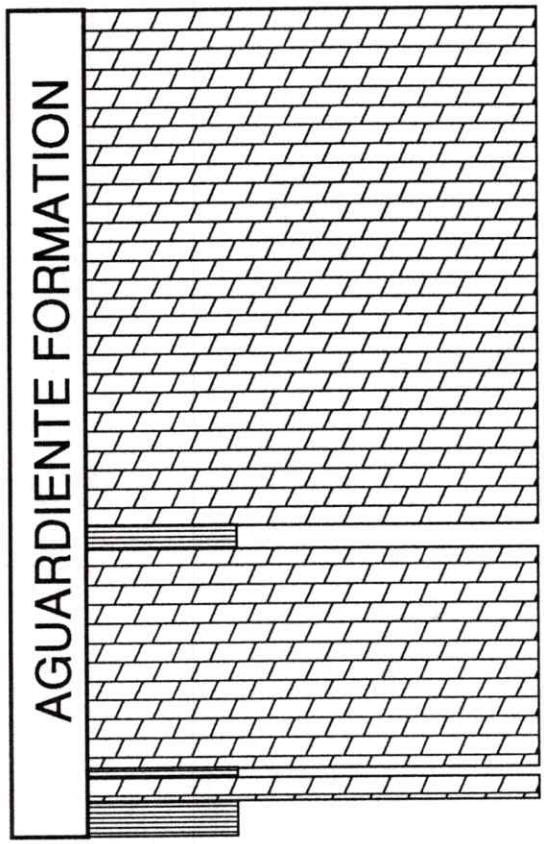
Appendix B-3. Lithological column of the cored section of well CR-5, with location of samples processed for this study (Scale 1:200). Modified after Mederos (1992).


14006'
14006'
AGUARDIENTE FORMATION
ABUNDANT
GLAUCONITE
SLIGHTLY
CALCAREOUS
14027'
OOLITIC GRAINSTONE
ABUNDANT
GLAUCONITE
14068'
64' NOT RECOVERED
GLAUCONITIC
SANDSTONE
WITH SHALE
LENSES
14165'
20 feet
14186'
14190'
14196'


AGUARDIENTE FORMATION
ABUNDANT
GLAUCONITE
AT THE BASE
14210'
21' NOT RECOVERED
14231'
ABUNDANT
GLAUCONITE
GLAUCONITE
20 feet
14285'
GLAUCONITE
14307'
GLAUCONITE
14337'


AGUARDIENTE FORMATION
14351'
14386'
14401'
GLAUCONITE
14410'
20 feet
14440'
14460'
CALCAREOUS
SHALE


AGUARDIENTE FORMATION
14480'
14501'3"
20 feet
14540'
14549'
14552'
14560'
137' NOT RECOVERED OR
NOT DESCRIBED
14700'



14730'

20 feet

14755'

14770'

14781'

14786'

SANDSTONE

CALCAREOUS SANDSTONE

CROSS-BEDDED SANDSTONE

SILTSTONE

SHALE WITH SANDSTONE LENSES

SHALE

DOLOMITE

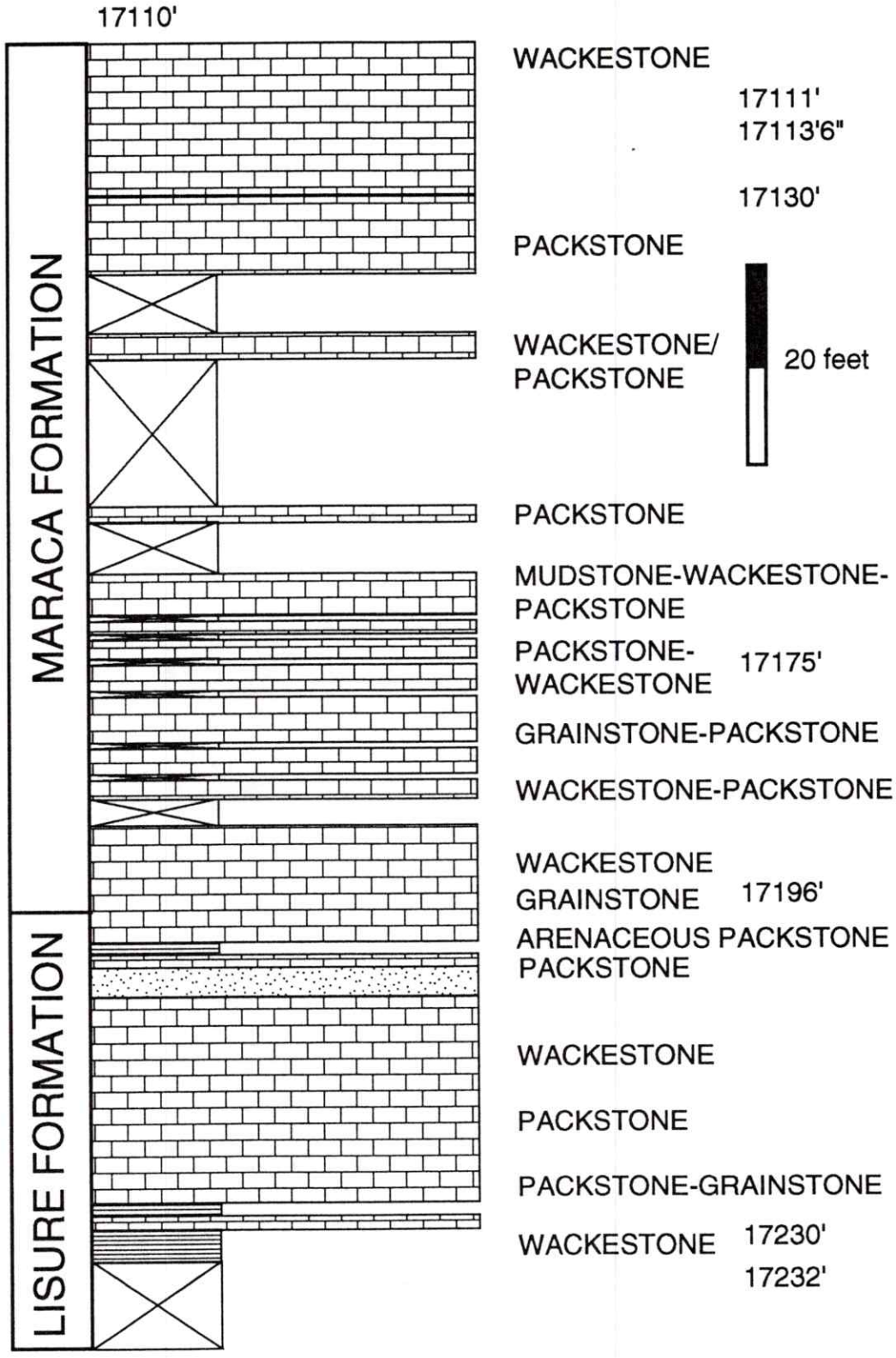
WACKESTONE

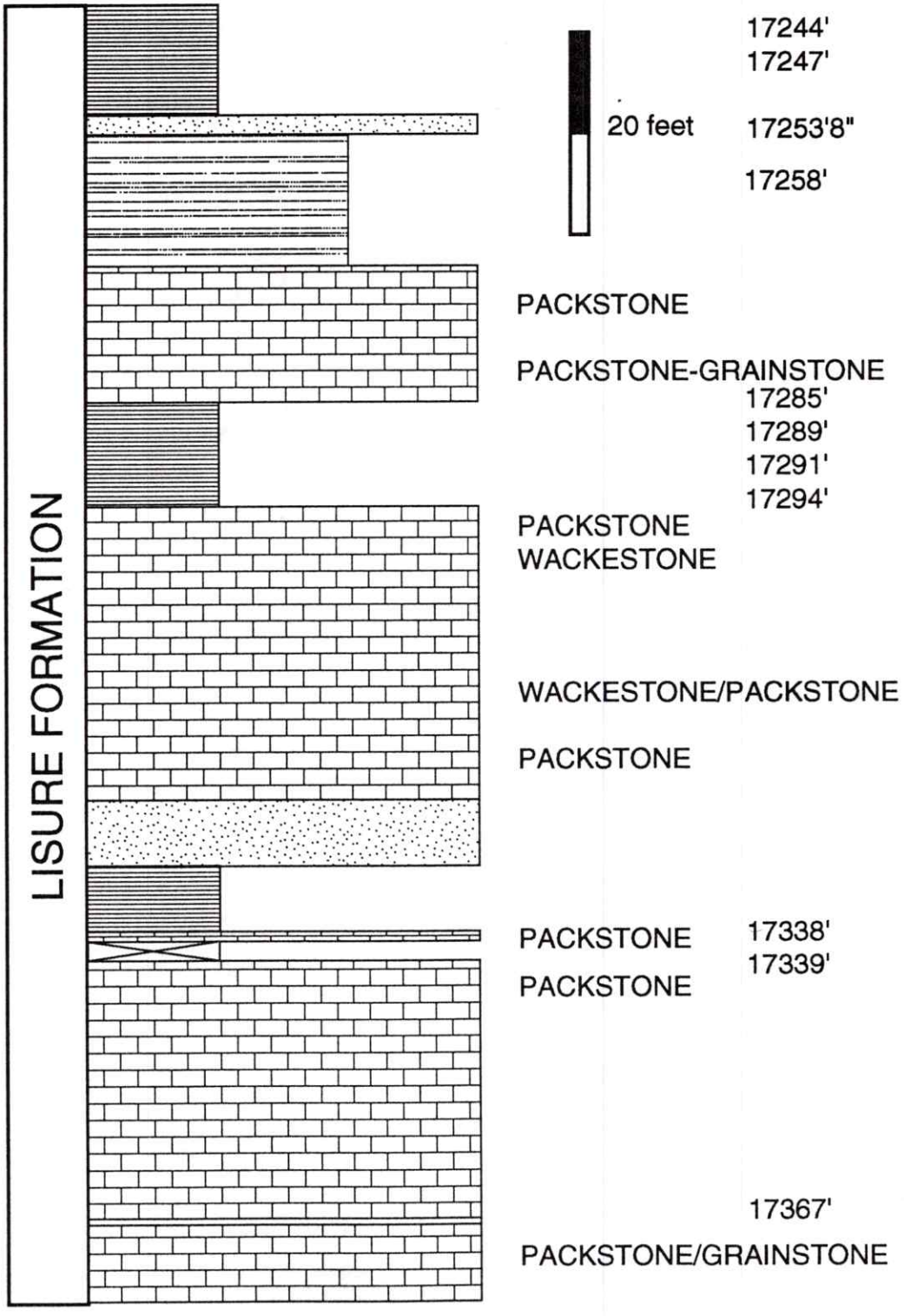
SANDY LIMESTONE

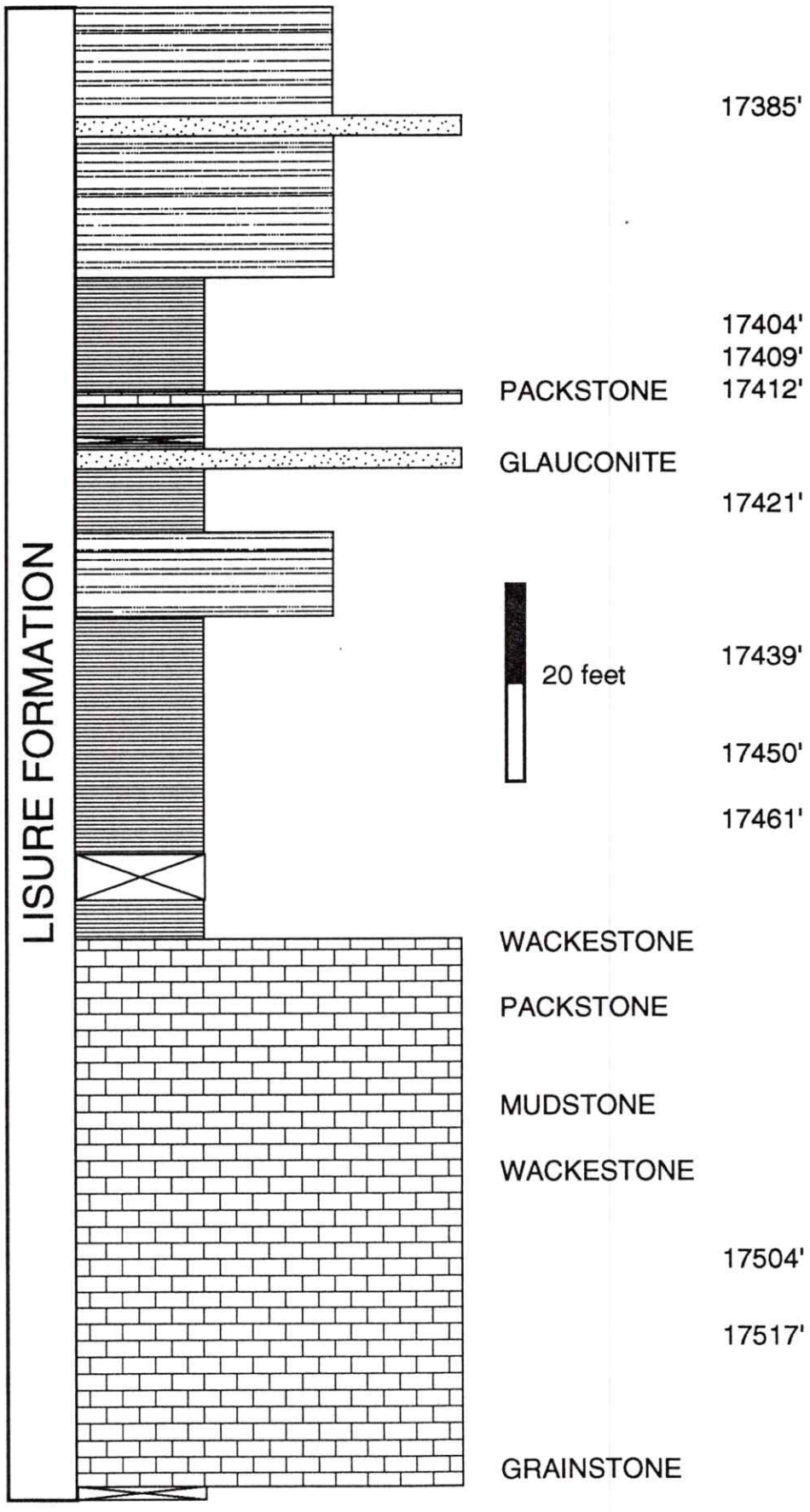
SHELL FRAGMENTS

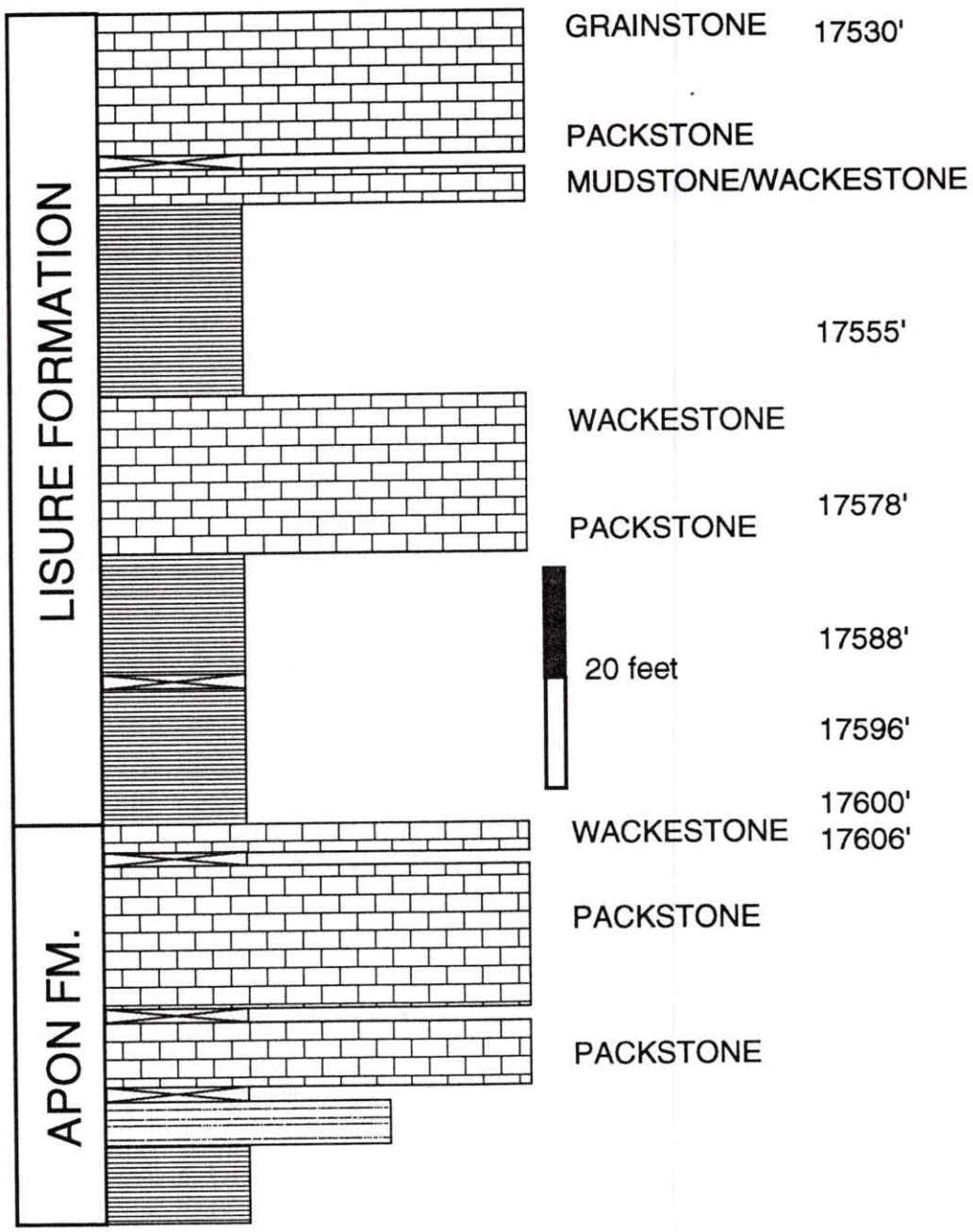
11111' PALYNOLOGICAL SAMPLE

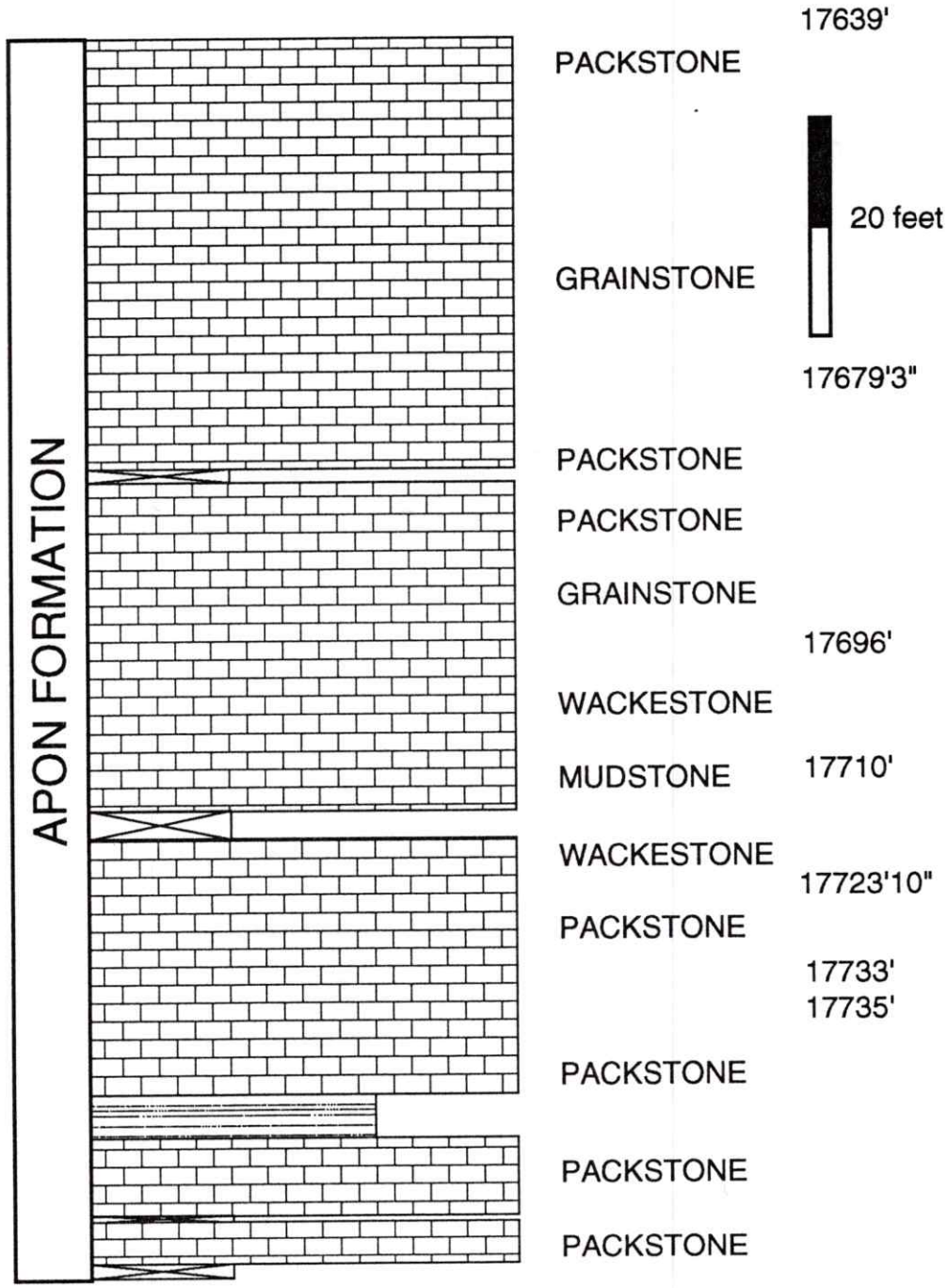
Appendix B-4. Lithological column of the cored section of well ALT-19X, with location of samples processed for this study (Scale 1:200). Modified Moldovanyi and Pinto-Auso (1987).

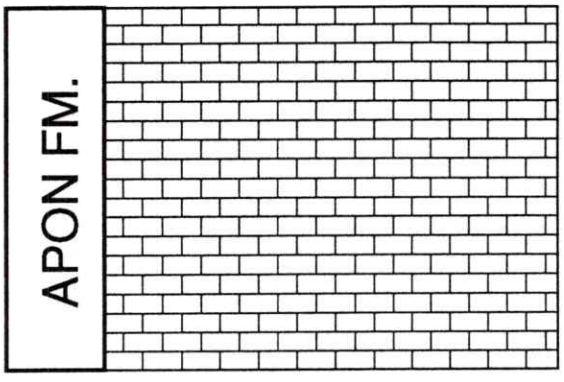

17110'
MARACA FORMATION
LISURE FORMATION
WACKESTONE
17111'
17113'6"
17130'
PACKSTONE
WACKESTONE/
PACKSTONE
20 feet
PACKSTONE
MUDSTONE-WACKESTONE-
PACKSTONE
PACKSTONE-
WACKESTONE
17175'
GRAINSTONE-PACKSTONE
WACKESTONE-PACKSTONE
WACKESTONE
GRAINSTONE
17196'
ARENACEOUS PACKSTONE
PACKSTONE
WACKESTONE
PACKSTONE
PACKSTONE-GRAINSTONE
WACKESTONE
17230'
17232'


LISURE FORMATION
20 feet
17244'
17247'
17253'8"
17258'
PACKSTONE
PACKSTONE-GRAINSTONE
17285'
17289'
17291'
17294'
PACKSTONE
WACKESTONE
WACKESTONE/PACKSTONE
PACKSTONE
PACKSTONE
17338'
17339'
PACKSTONE
17367'
PACKSTONE/GRAINSTONE


LISURE FORMATION
17385'
17404'
17409'
PACKSTONE
17412'
GLAUCONITE
17421'
20 feet
17439'
17450'
17461'
WACKESTONE
PACKSTONE
MUDSTONE
WACKESTONE
17504'
17517'
GRAINSTONE


LISURE FORMATION
APON FM.
GRAINSTONE
17530'
PACKSTONE
MUDSTONE/WACKESTONE
17555'
WACKESTONE
17578'
PACKSTONE
20 feet
17588'
17596'
17600'
WACKESTONE
17606'
PACKSTONE
PACKSTONE


APON FORMATION
17639'
PACKSTONE
20 feet
GRAINSTONE
17679'3"
PACKSTONE
PACKSTONE
GRAINSTONE
17696'
WACKESTONE
MUDSTONE
17710'
WACKESTONE
17723'10"
PACKSTONE
17733'
17735'
PACKSTONE
PACKSTONE
PACKSTONE



PACKSTONE

MUDSTONE

17785'

MUDSTONE

PACKSTONE

SANDSTONE

SILTSTONE

SHALE

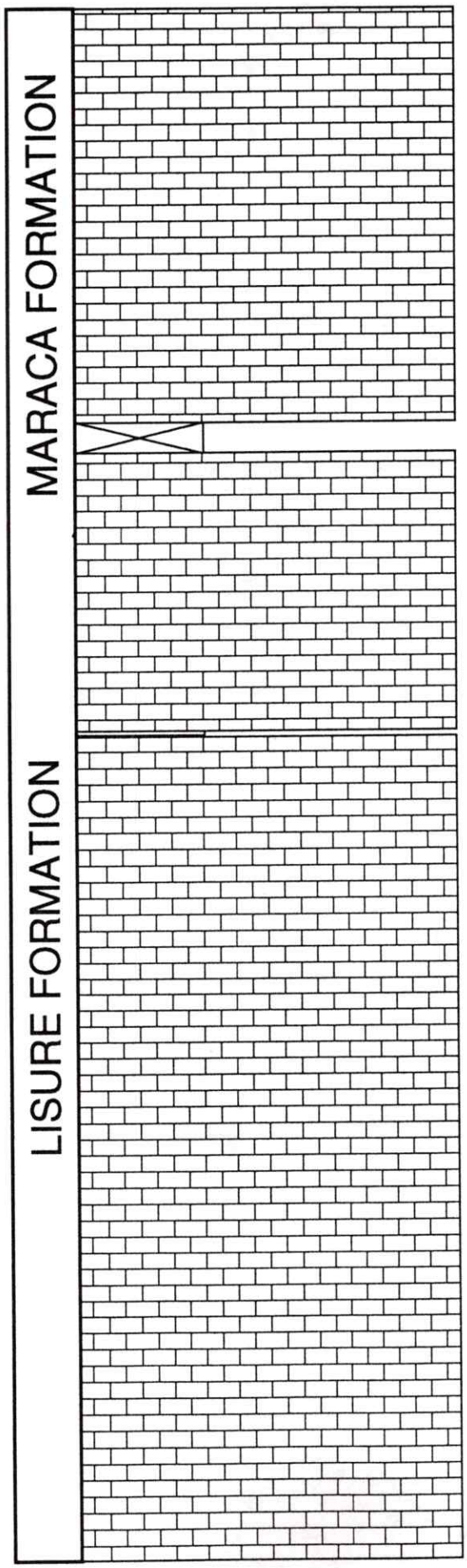
LIMESTONE

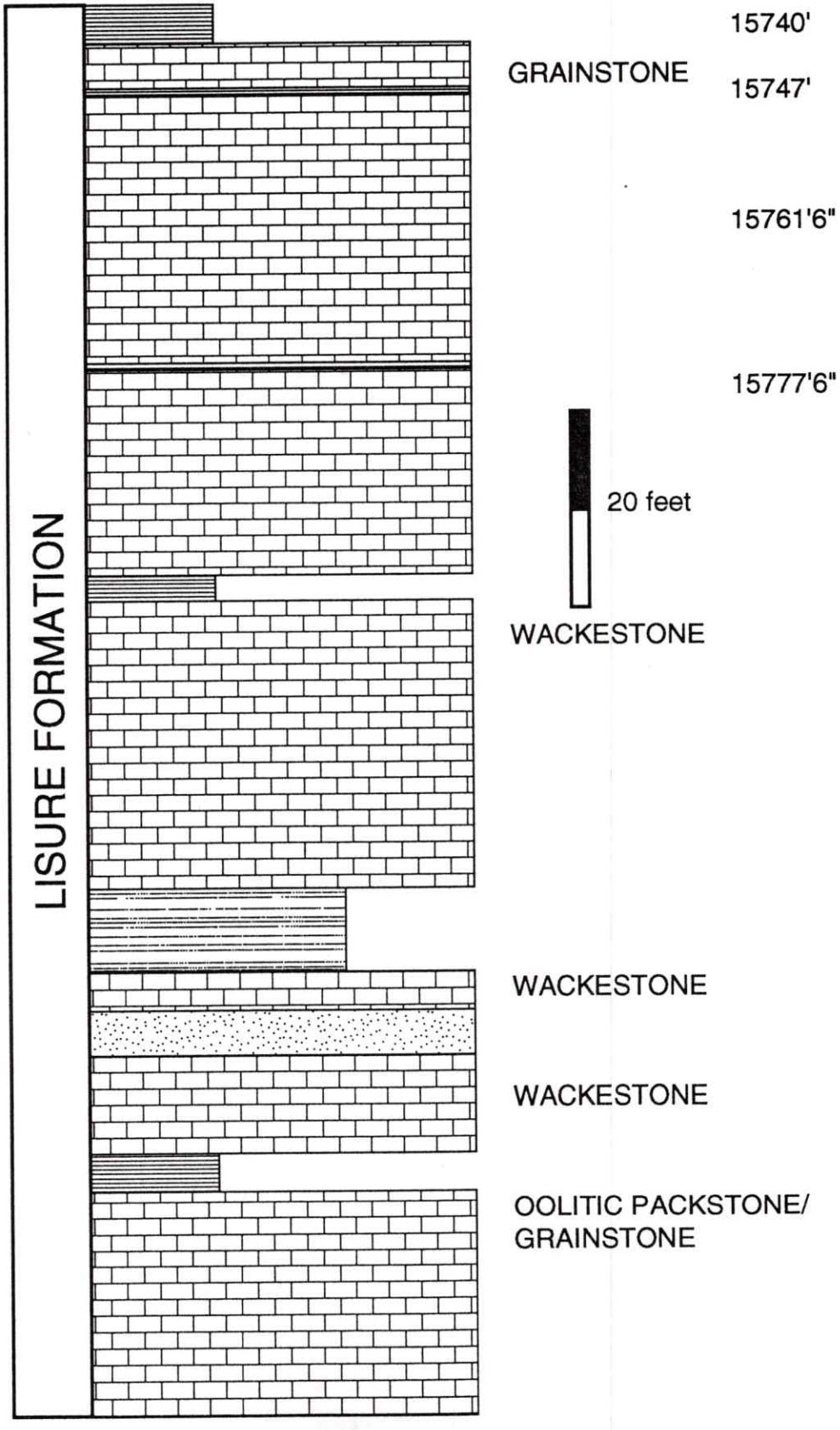
20 feet

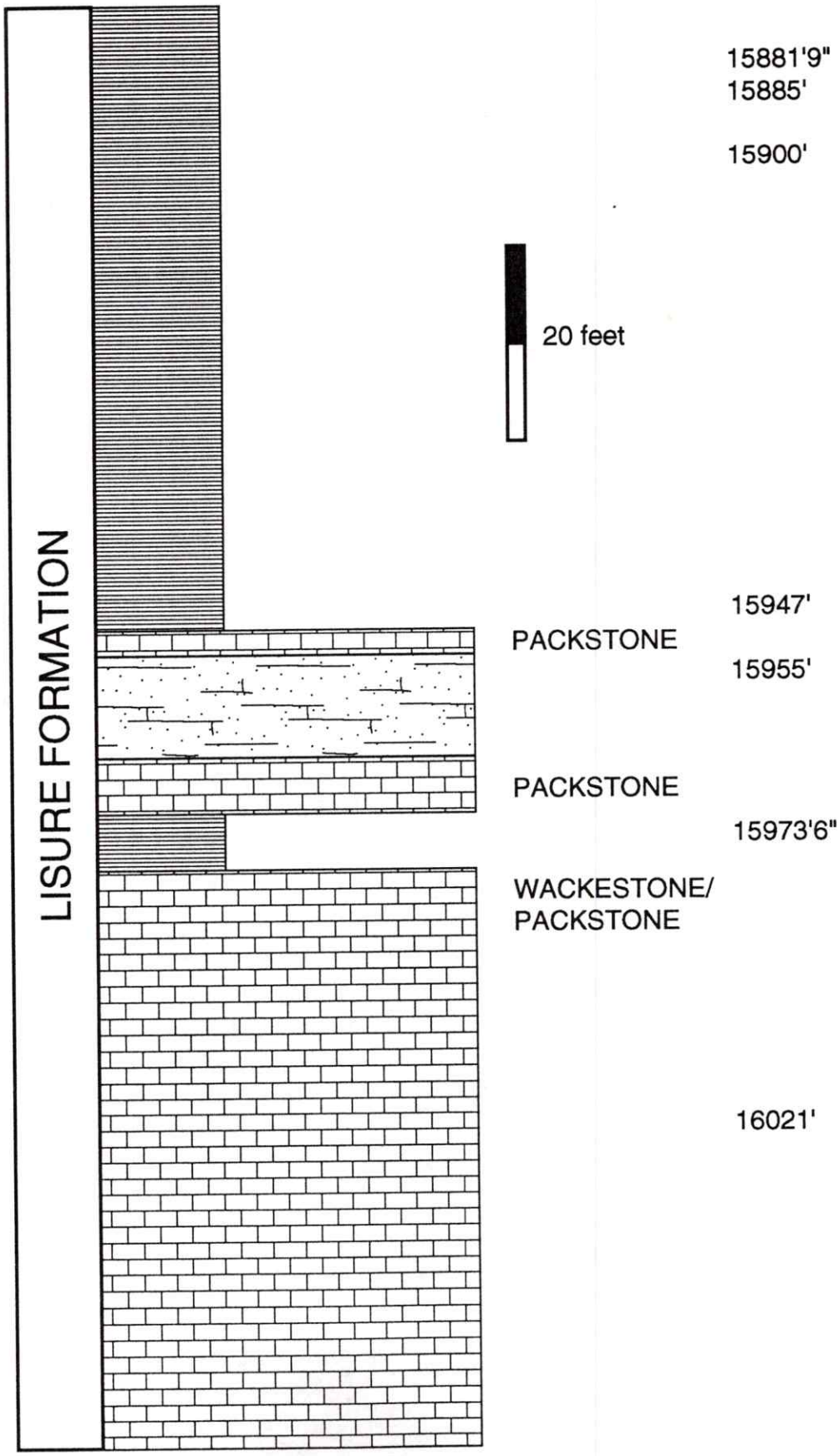
17777' PALYNOLOGICAL SAMPLE

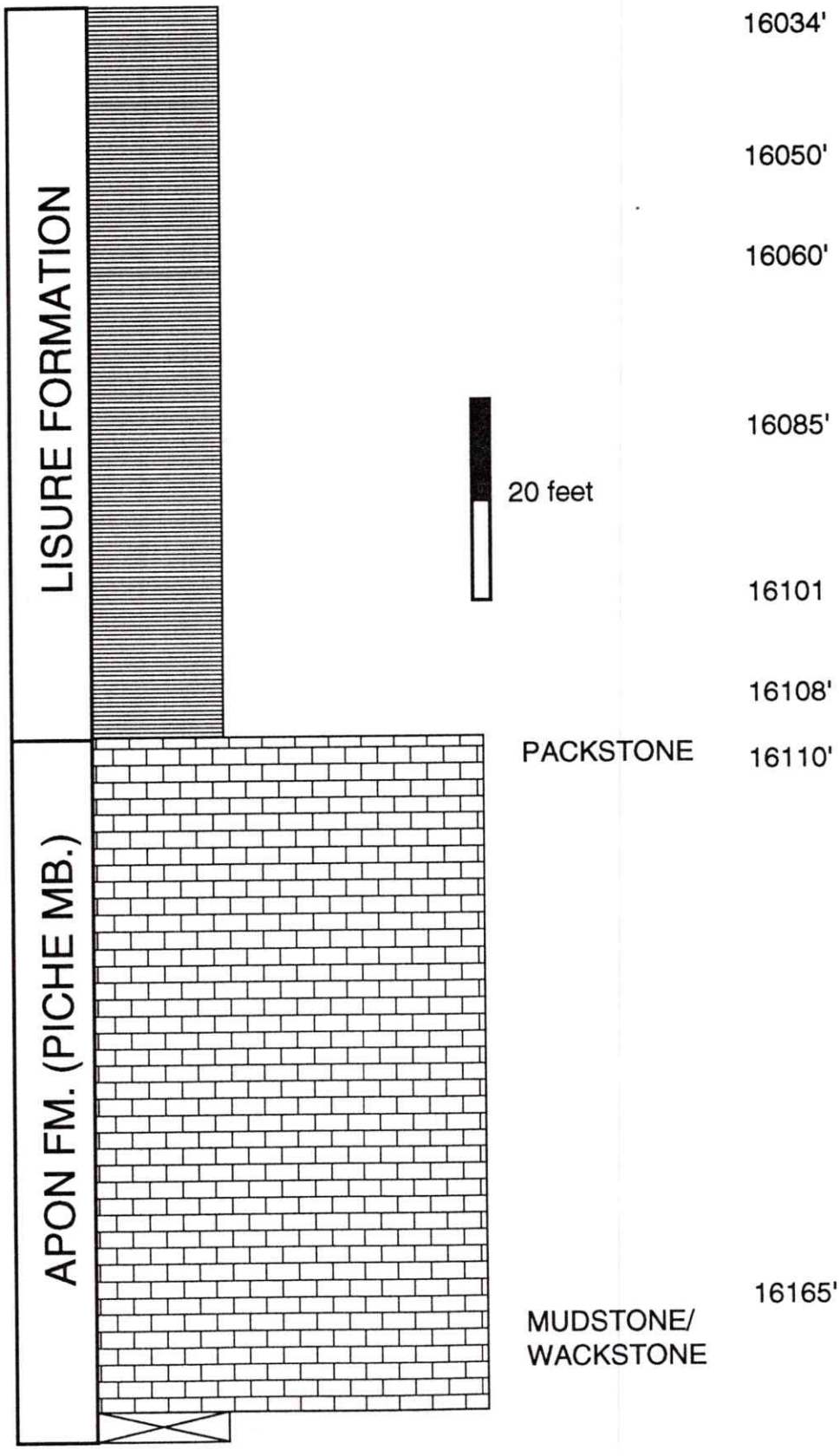
CORE NOT RECOVERED

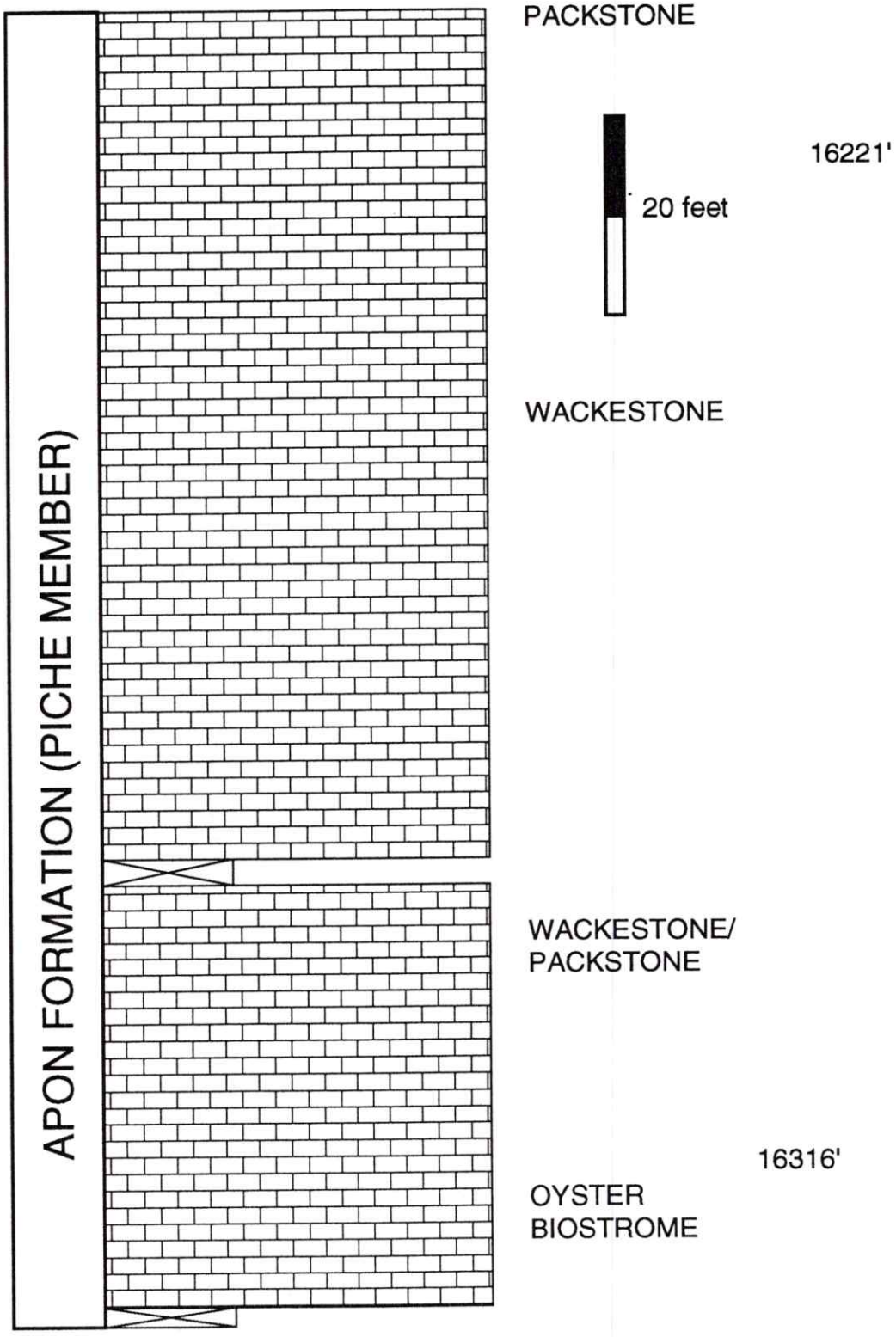
Appendix B-5. Lithological column of the cored section of well ALP-6, with location of samples processed for this study (Scale 1:200). Modified after umpublished work by Dr. Bruno Murat.

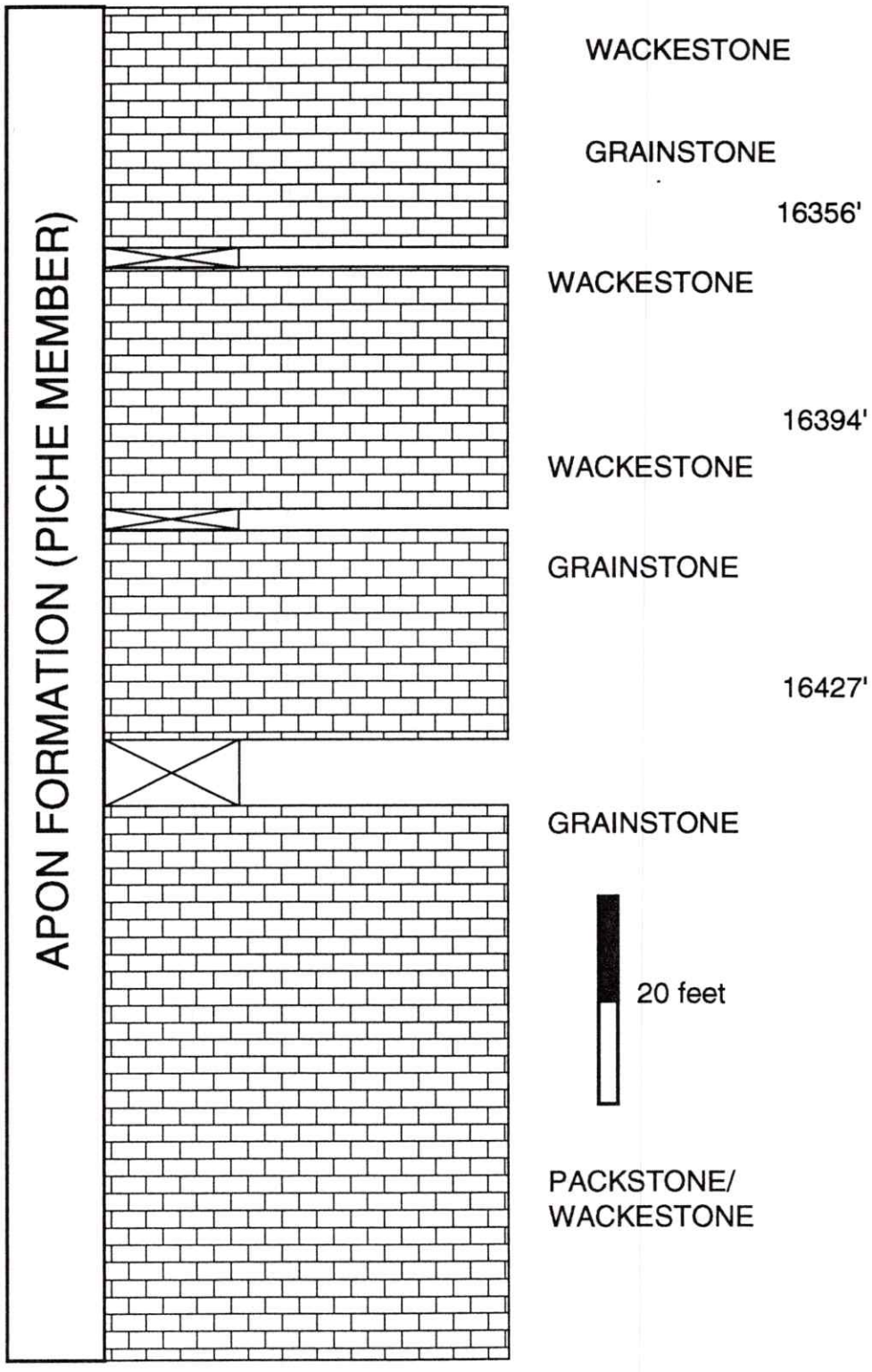

MARACA FORMATION
LISURE FORMATION
15580'
PACKSTONE
15597'
15603'
20 feet
PACKSTONE
15640'
15652'
15664'
WACKESTONE
GLAUCONITE
15701'

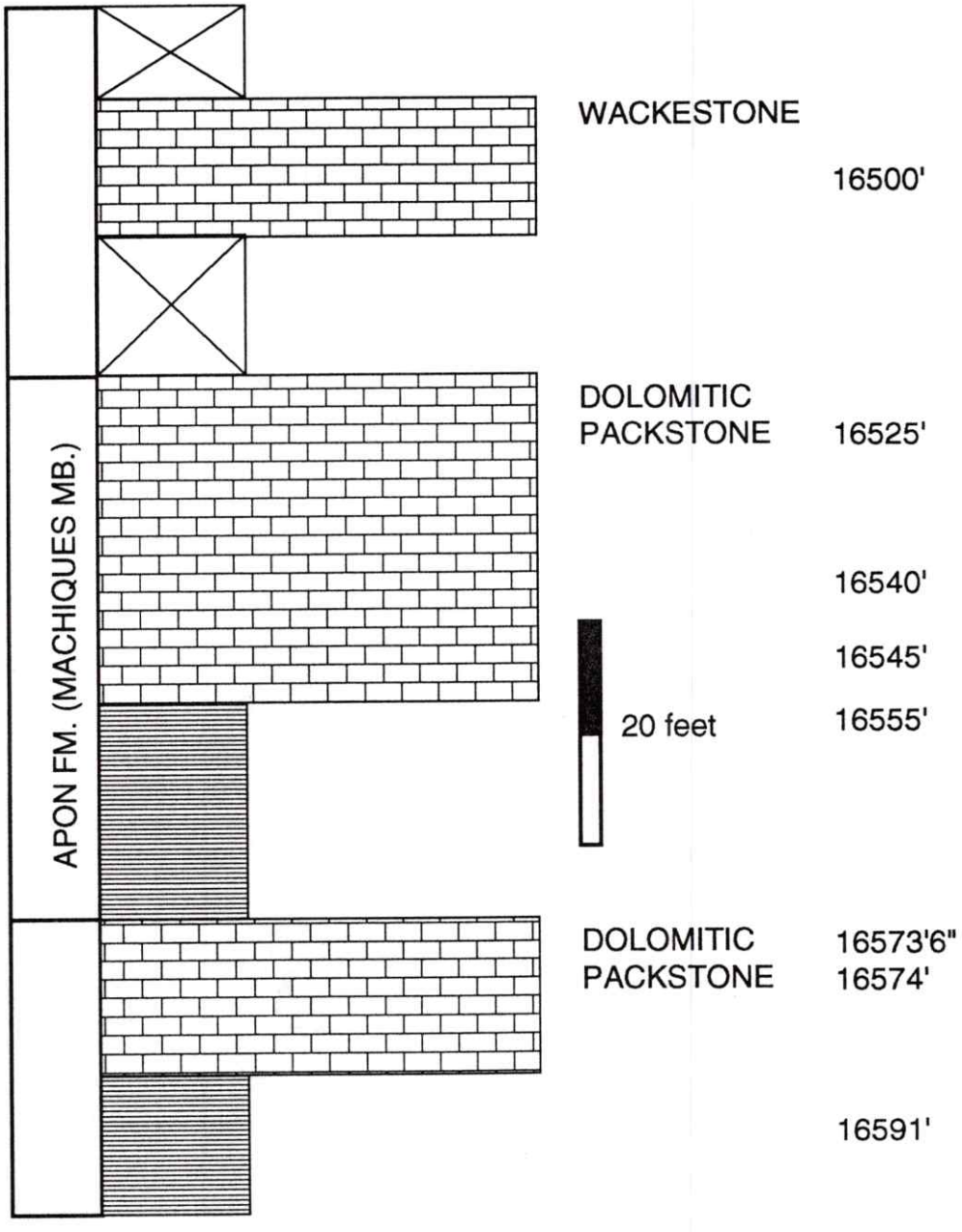

LISURE FORMATION
15740'
GRAINSTONE
15747'
15761'6"
15777'6"
20 feet
WACKESTONE
WACKESTONE
WACKESTONE
OOLITIC PACKSTONE/
GRAINSTONE

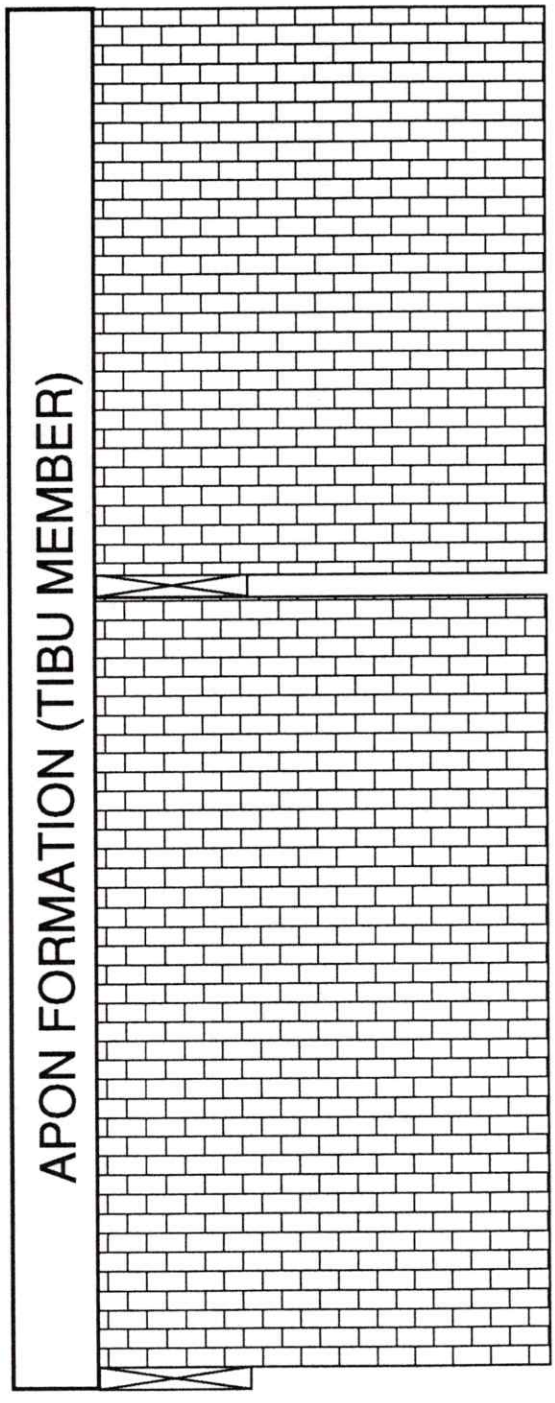

LISURE FORMATION
15881'9"
15885'
15900'
20 feet
15947'
PACKSTONE
15955'
PACKSTONE
15973'6"
WACKESTONE/
PACKSTONE
16021'

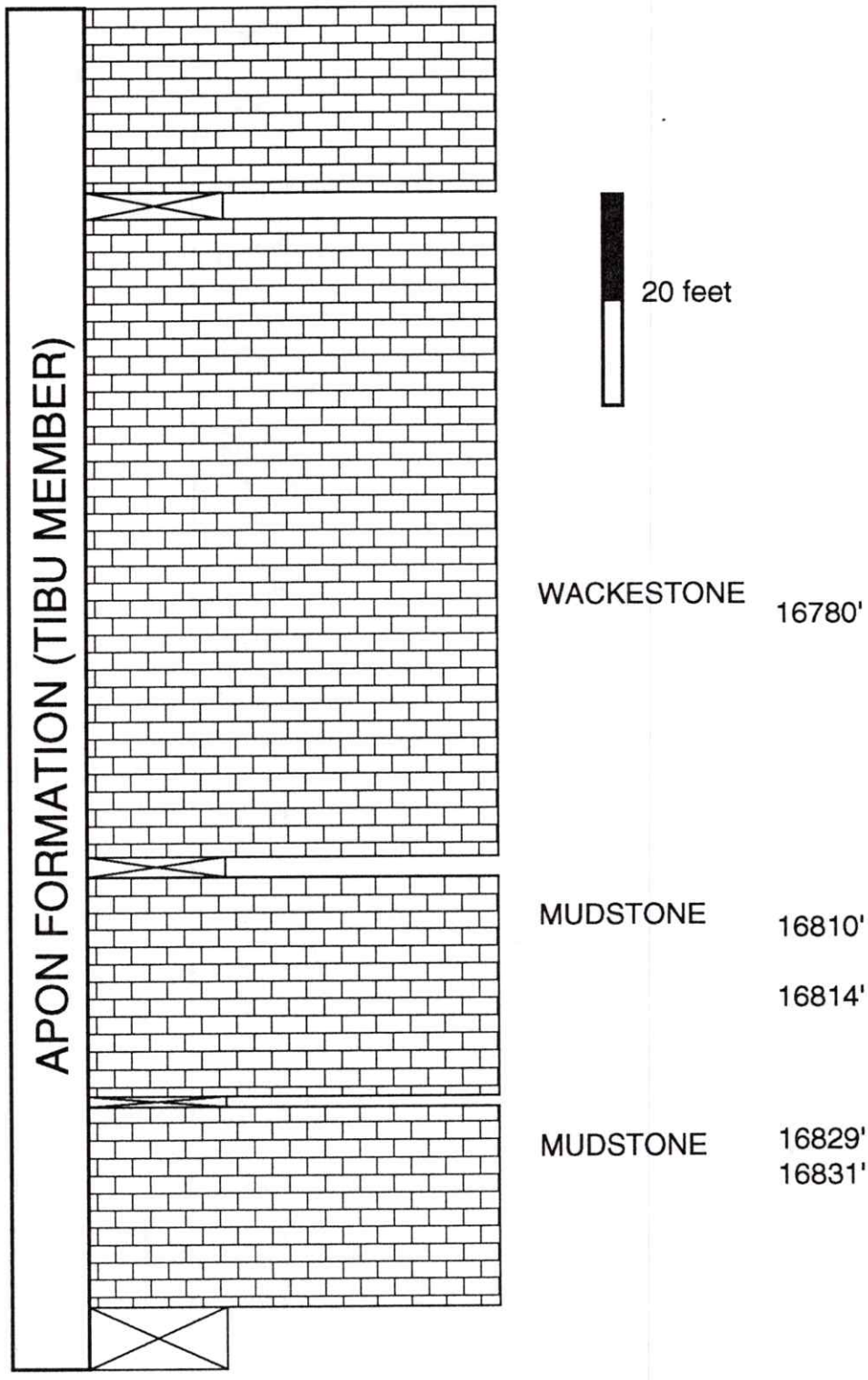

LISURE FORMATION
APON FM. (PICHE MB.)
20 feet
PACKSTONE
MUDSTONE/
WACKSTONE
16034'
16050'
16060'
16085'
16101
16108'
16110'
16165'

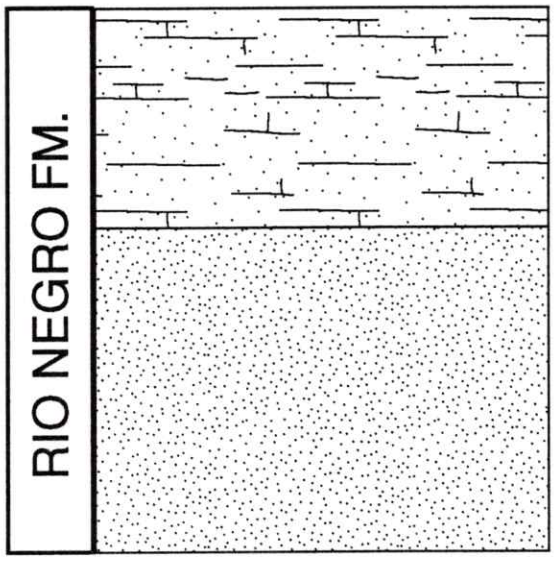

APON FORMATION (PICHE MEMBER)
PACKSTONE
16221'
20 feet
WACKESTONE
WACKESTONE/
PACKSTONE
16316'
OYSTER
BIOSTROME


APON FORMATION (PICHE MEMBER)
WACKESTONE
GRAINSTONE
16356'
WACKESTONE
16394'
WACKESTONE
GRAINSTONE
16427'
GRAINSTONE
20 feet
PACKSTONE/
WACKESTONE


APON FM. (MACHIQUES MB.)
WACKESTONE
16500'
DOLOMITIC
PACKSTONE
16525'
16540'
16545'
20 feet
16555'
DOLOMITIC
PACKSTONE
16573'6"
16574'
16591'


APON FORMATION (TIBU MEMBER)
DOLOMITIC MUDSTONE
16601'
20 feet
WACKESTONE/ PACKSTONE
16656'
16667'
16680'
16695'
16710'
16715'
16720'


APON FORMATION (TIBU MEMBER)
20 feet
WACKESTONE
16780'
MUDSTONE
16810'
16814'
MUDSTONE
16829'
16831'



16881'8"

20 feet

SANDSTONE

CALCAREOUS SANDSTONE

SILTSTONE

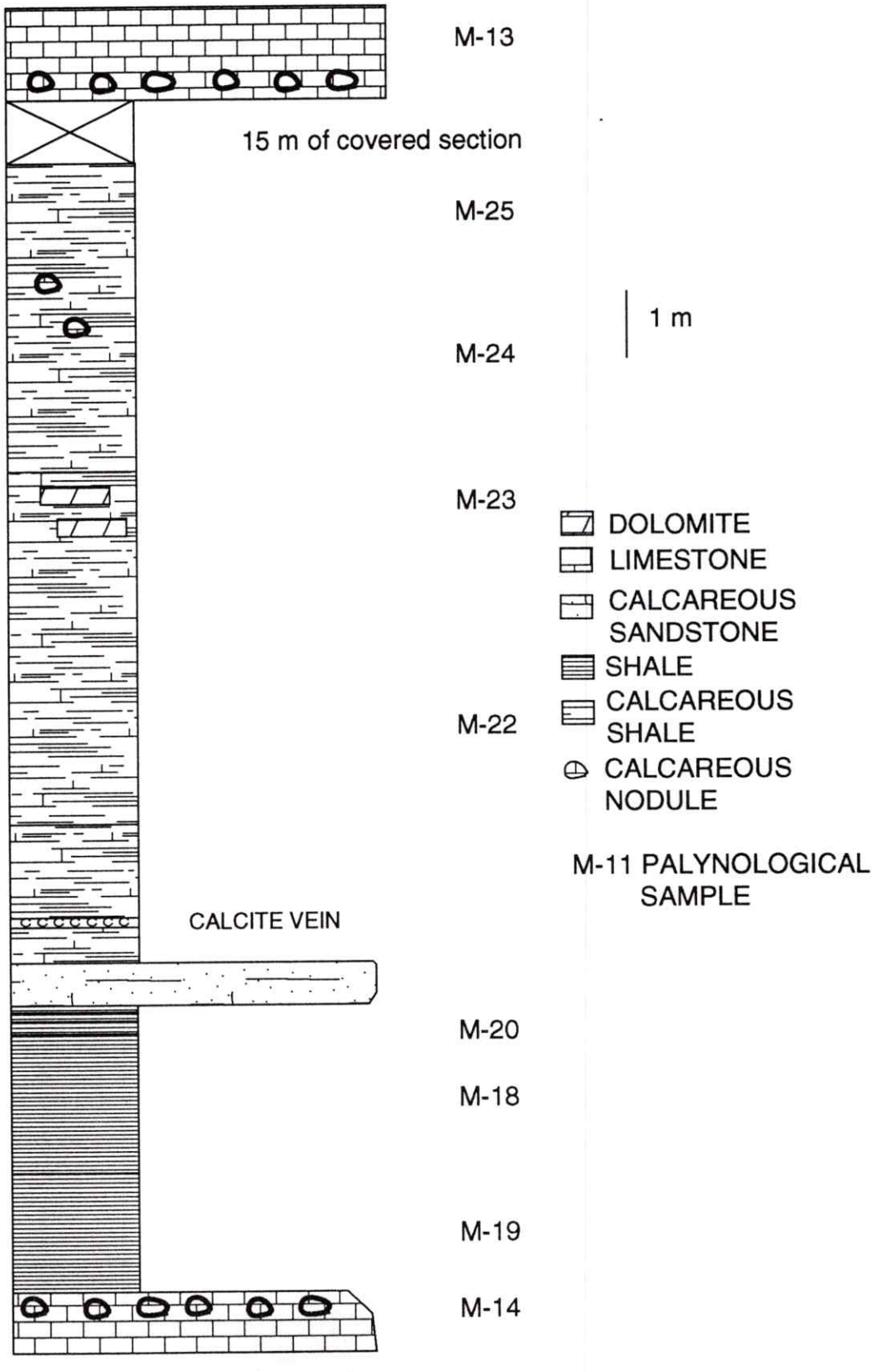
SHALE

LIMESTONE

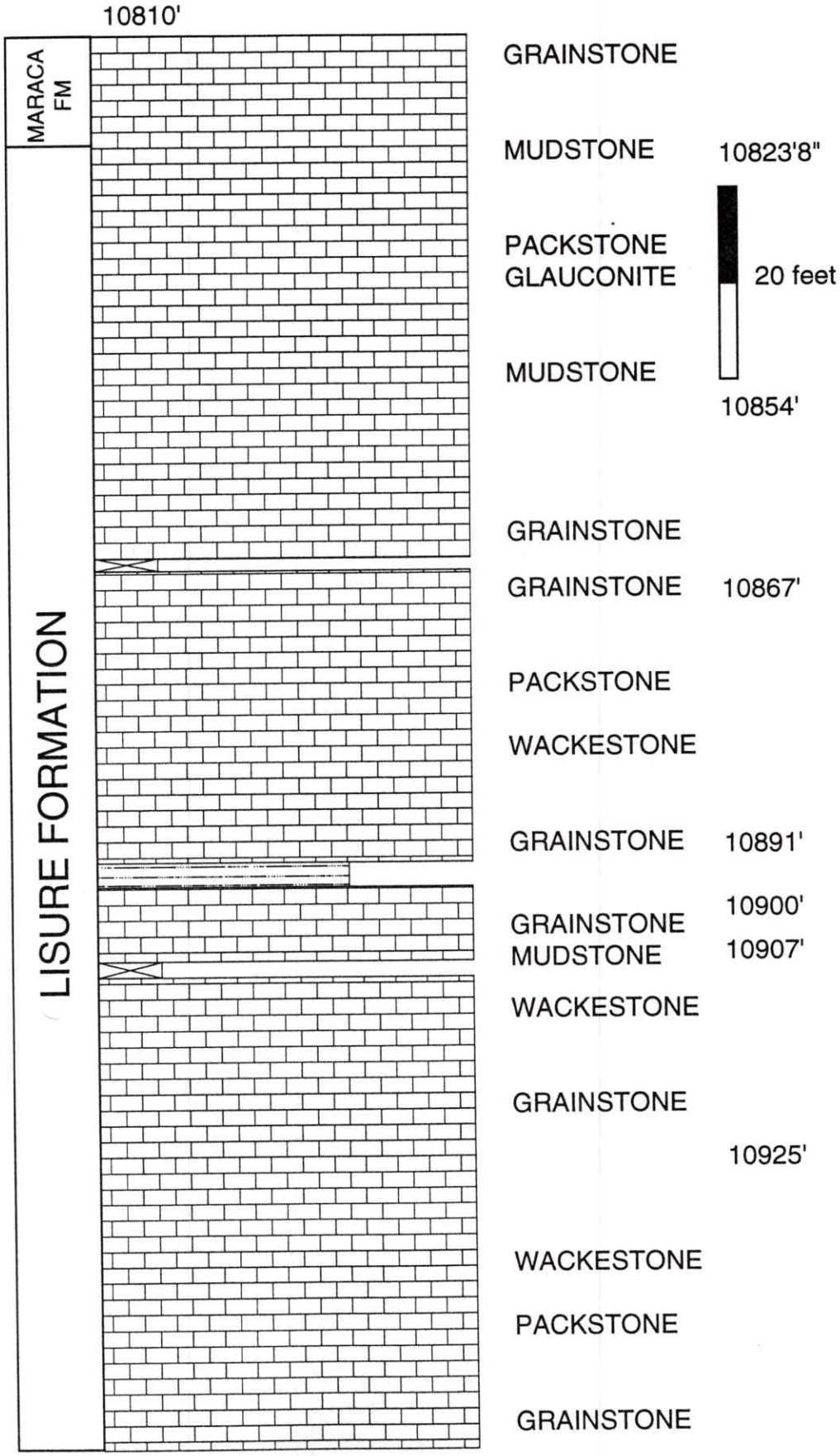
CORE NOT RECOVERED

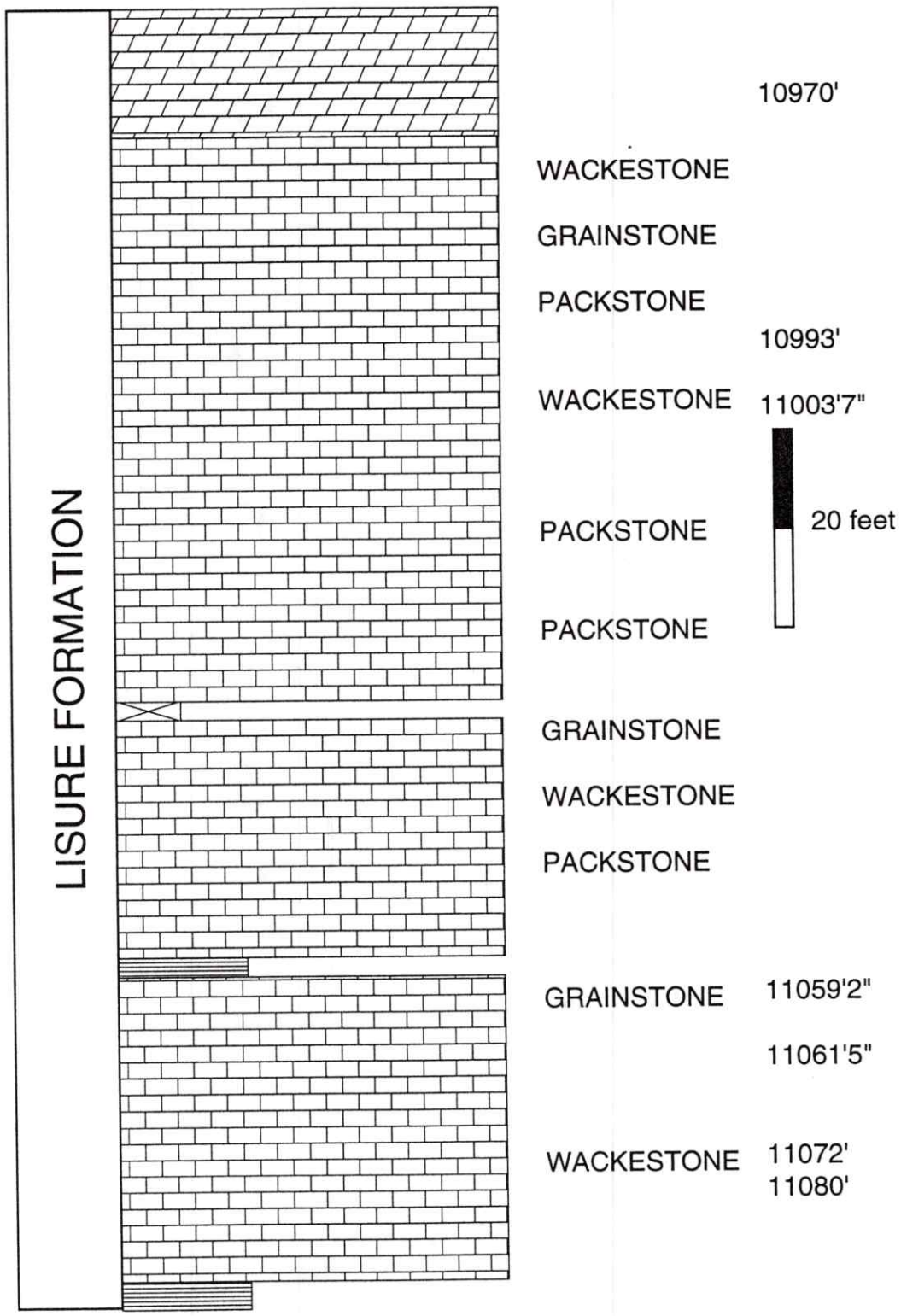
16666' PALYNOLOGICAL SAMPLE

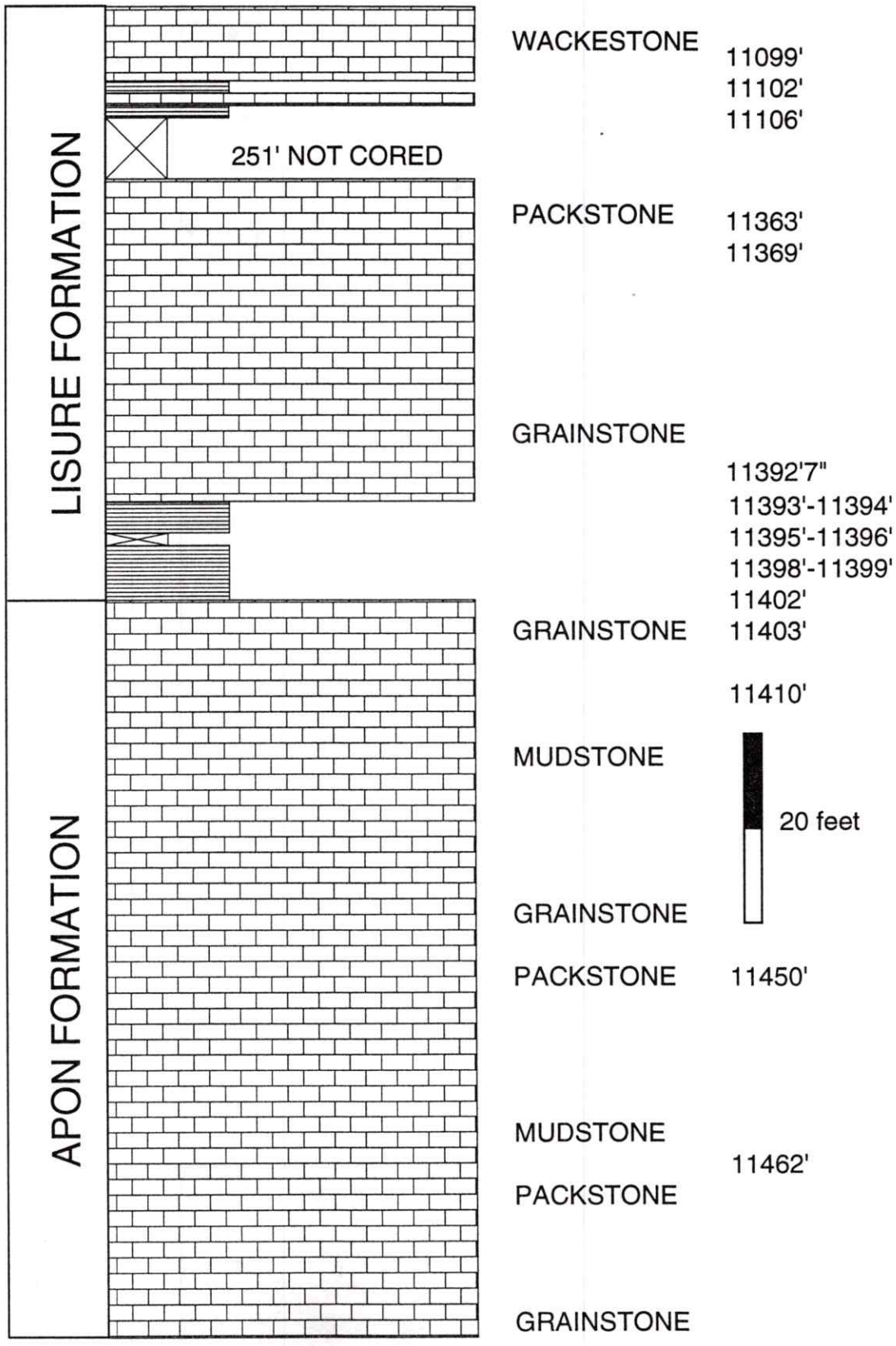
Appendix B-6. Lithological column of the Catatumbo outcrop section, with location of samples processed for this study (Scale 1:100).

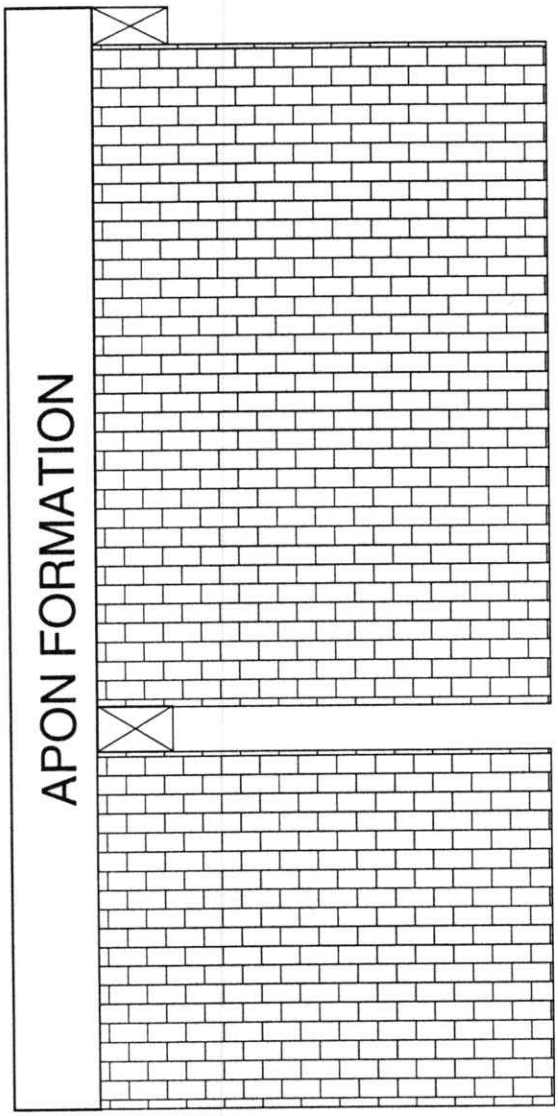

M-13
15 m of covered section
M-25
1 m
M-24
M-23
DOLOMITE
LIMESTONE
CALCAREOUS SANDSTONE
SHALE
CALCAREOUS SHALE
CALCAREOUS NODULE
M-22
M-11 PALYNOLOGICAL SAMPLE
CALCITE VEIN
M-20
M-18
M-19
M-14

Appendix B-7. Lithological column of the cored section of well P-201, with location of samples processed for this study (Scale 1:200). Modified after Chacartegui (1984).


10810'
MARACA FM
LISURE FORMATION
GRAINSTONE
MUDSTONE
10823'8"
PACKSTONE
GLAUCONITE
20 feet
MUDSTONE
10854'
GRAINSTONE
GRAINSTONE
10867'
PACKSTONE
WACKESTONE
GRAINSTONE
10891'
10900'
GRAINSTONE
MUDSTONE
10907'
WACKESTONE
GRAINSTONE
10925'
WACKESTONE
PACKSTONE
GRAINSTONE


LISURE FORMATION
10970'
WACKESTONE
GRAINSTONE
PACKSTONE
10993'
WACKESTONE
11003'7"
PACKSTONE
PACKSTONE
20 feet
GRAINSTONE
WACKESTONE
PACKSTONE
GRAINSTONE
11059'2"
11061'5"
WACKESTONE
11072'
11080'


LISURE FORMATION
APON FORMATION
251' NOT CORED
WACKESTONE
11099'
11102'
11106'
PACKSTONE
11363'
11369'
GRAINSTONE
11392'7"
11393'-11394'
11395'-11396'
11398'-11399'
11402'
GRAINSTONE
11403'
11410'
MUDSTONE
20 feet
GRAINSTONE
PACKSTONE
11450'
MUDSTONE
11462'
PACKSTONE
GRAINSTONE



11492'

WACKESTONE

PACKSTONE

11504'

MUDSTONE

11514'
11518'

WACKESTONE

MUDSTONE

11550'

GRAINSTONE

PACKSTONE

11570'

MUDSTONE

SILTSTONE

SHALE

LIMESTONE

DOLOMITE

11111' PALYNOLOGICAL SAMPLE

CORE NOT RECOVERED

20 feet