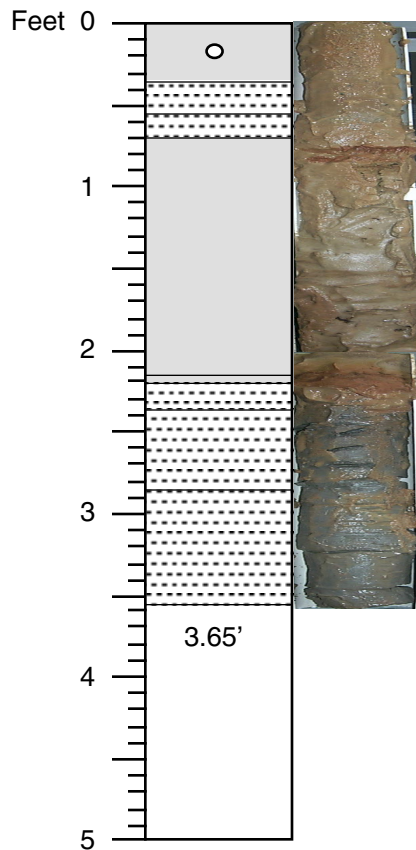


CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

1



Sand; medium; moderate sorting; subrounded; unconsolidated; wet; white tube (burrow); micaceous
Clay; silty; soft; brown (10YR5/3)
Clay; very soft; greenish gray (Gley 5GY5/1)

Sand; fine-very coarse; poor sorting; subrounded; very unconsolidated; wet (watery); light yellowish brown (10YR6/4)

Sand; as above but dark brown (7.5YR3/4)
Clay; silty (sandy at top); soft; brown (7.5YR4/4)
Clay; sandy, very fine, common mica; plant debris to ~3 mm size; common woody?; laminated up to 5 mm thick very dark green (Gley N3/)
Clay; silty; rare, finely dispersed plant debris; laminated up to ~5mm thick; very dark gray (Gley N3/); stickier toward bottom

174AX BB (Qj32-27)

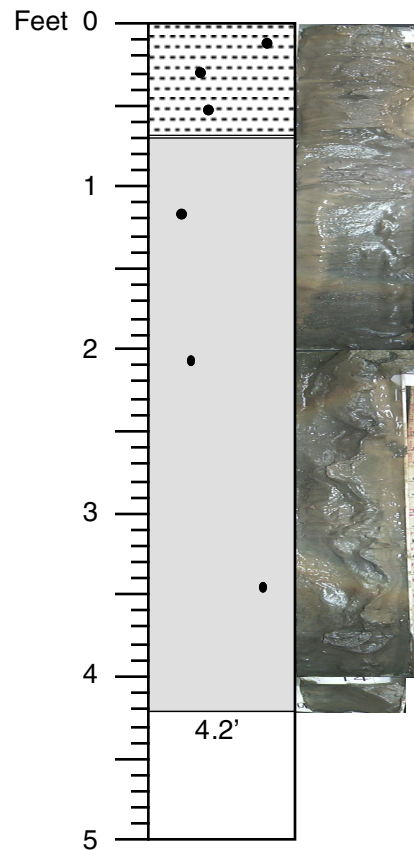
Core # 1
Date: 5/12/00
Described by: PPMcL

Start Depth: 5 ft
Stop Depth: 10 ft
Recovery = 3.6 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

2



CLAY; very silty and sandy (very fine); common plant fragments up to 3 mm; laminated; very dark gray (Gley N3/); common mica flakes

SAND; very fine-fine; moderate sorting; subrounded; very unconsolidated and watery; muddy; laminated (planar parallel??) with zones with dark stringers (fine plant debris); scattered plant debris and common to frequent mica

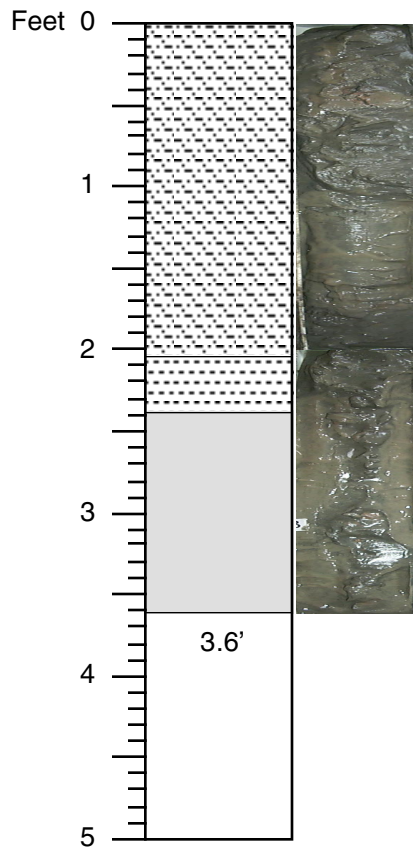
174AX BB (Qj32-27)

Core # 2
Date: 5/12/00
Described by: PPMcL

Start Depth: 10 ft
Stop Depth: 15 ft
Recovery = 4.2 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

3



SAND; very fine, some fine some silt; finely laminated, with <1 mm laminae of very fine plant debris interbedded; dark greenish gray (Gley 5GY4/1)

CLAY; slightly silty; sticky; very dark gray (Gley N3/)

SAND; very fine; some fine some silt, finely laminated; with <1 mm laminae of very fine plant debris interbedded; dark greenish gray (Gley 5GY4/1)

174AX BB (Qj32-27)

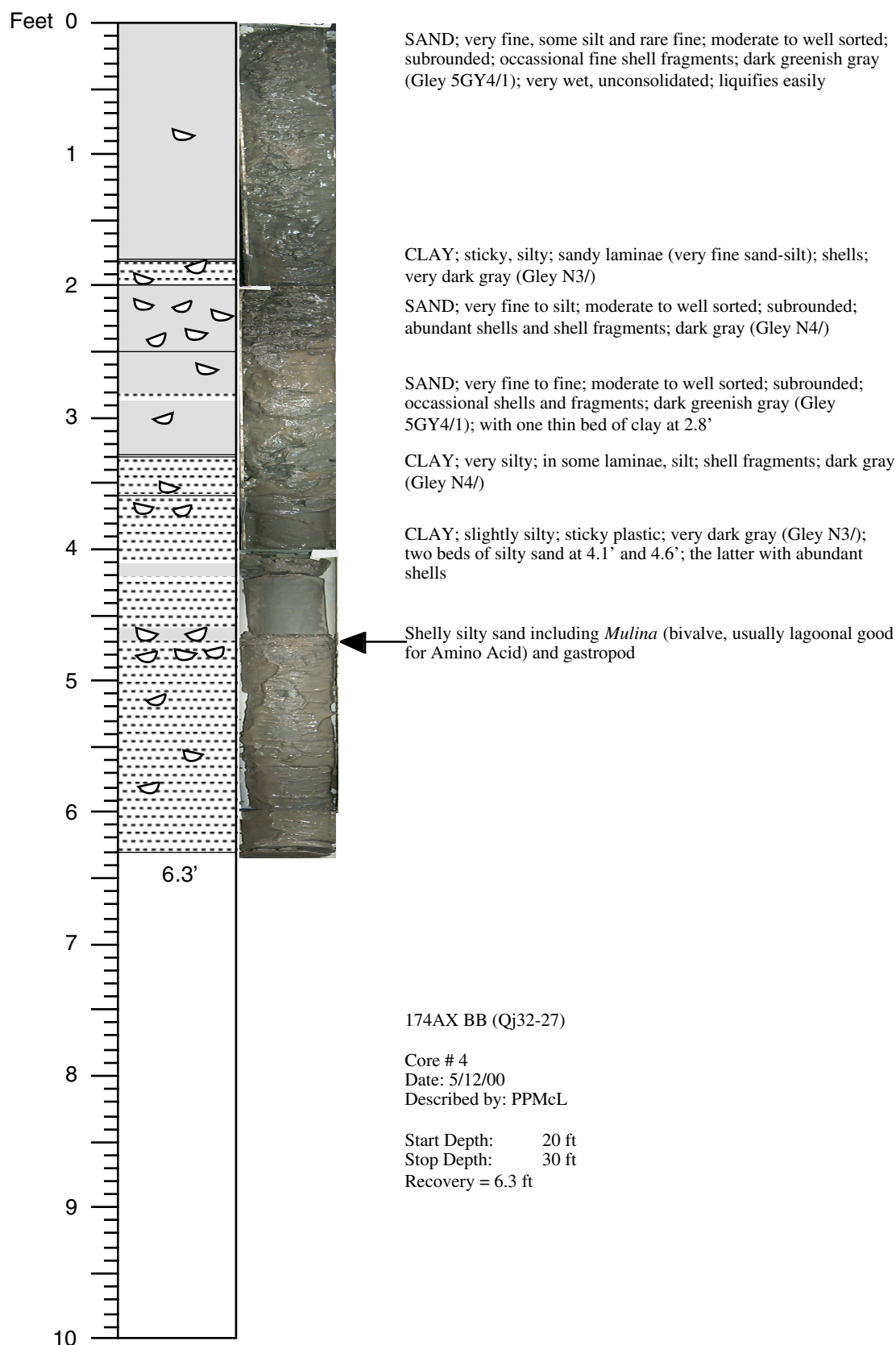
Core # 3
Date: 5/12/00
Described by: PPMcL

Start Depth: 15 ft
Stop Depth: 20 ft
Recovery = 3.6 ft

CORE DESCRIPTIONS

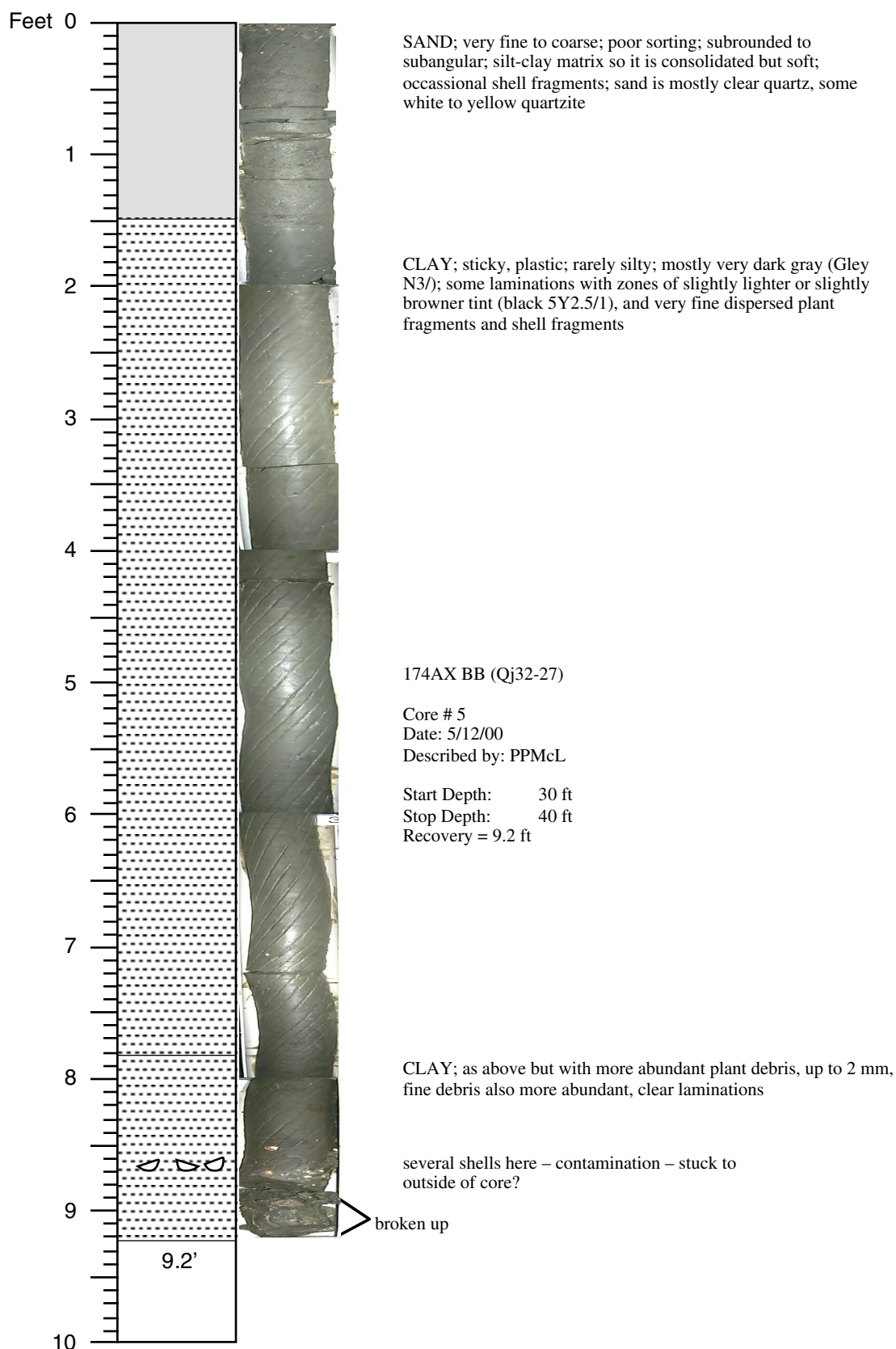
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

4



CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

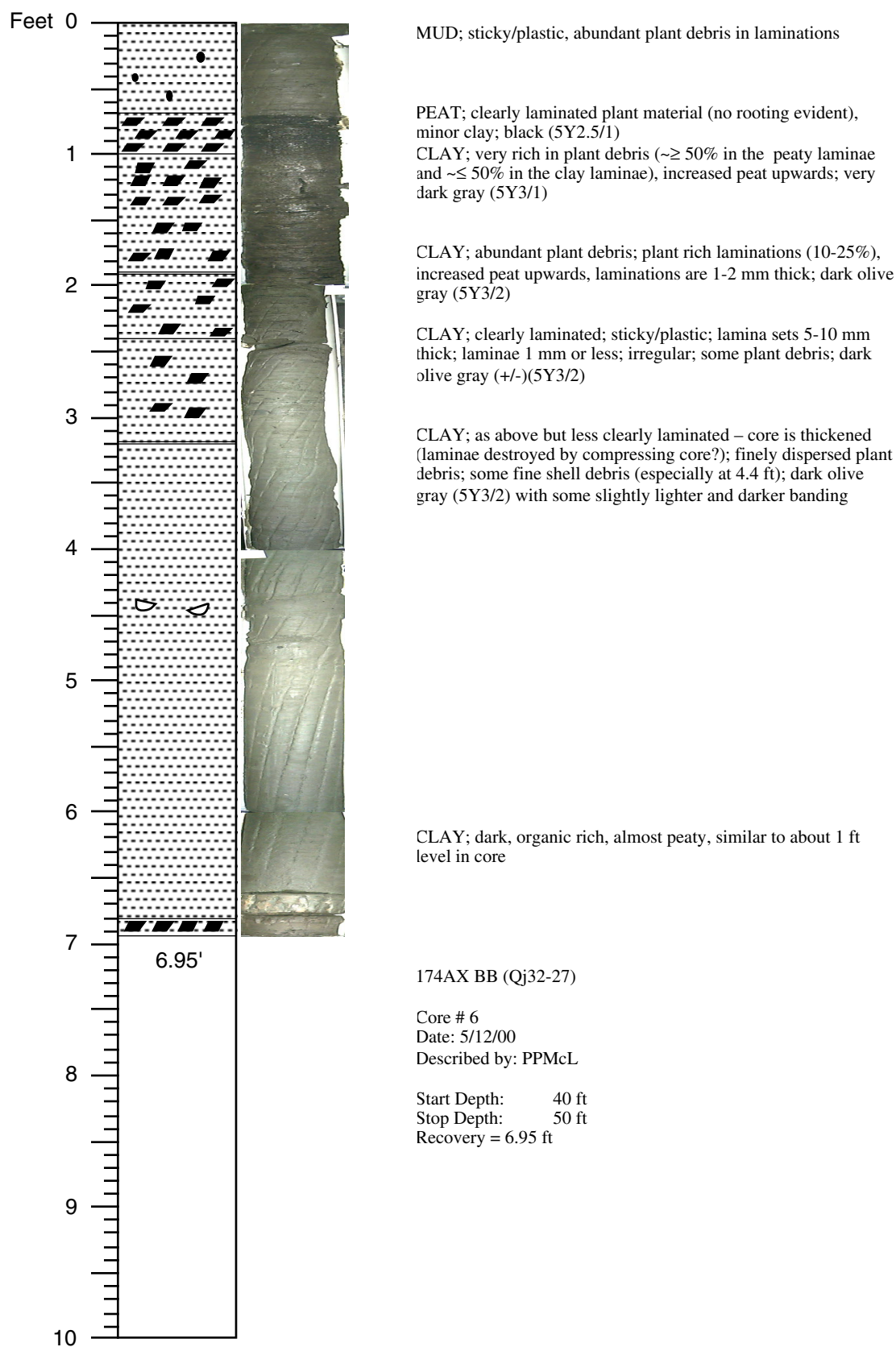
5



CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

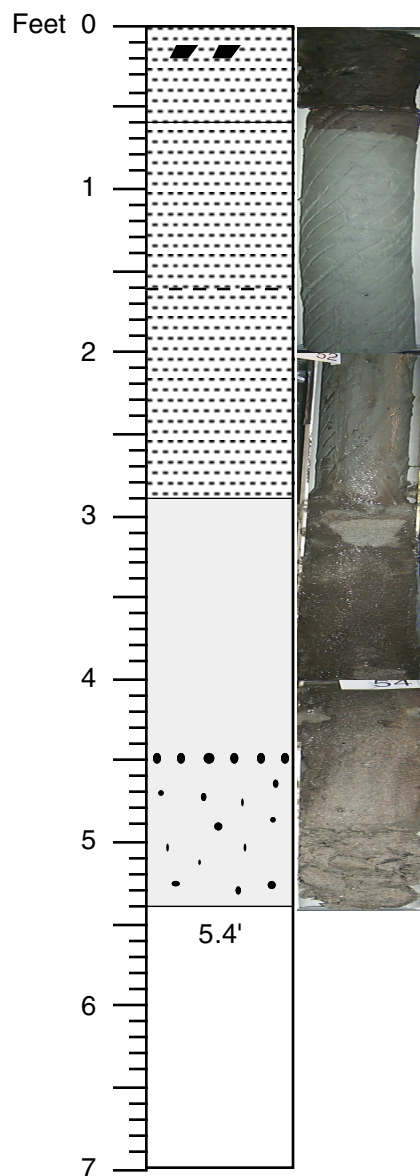
6



CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

7



CLAY; very rich in plant debris up to 7 mm, silty; black (5YR2.5/1); plant debris appears bedded with no rooting; soft

dramatic color change

CLAY; silty; finely dispersed plant debris; dark greenish gray (GLEYSGY4/1) with slightly darker and lighter banding; sandier/siltier downward; soft

Gradational

SAND; very fine to fine near bottom; clay matrix (same lithology as above); subrounded, some subangular; moderately sorted lower to good higher up (GLEYSGY4/1)

Not abrupt transition

SAND; medium near top to coarse near bottom; subrounded to subangular; moderate sorting at top to poor at bottom; clean, little clay; unconsolidated and porous, with coating of the organics from top of core accumulated on surface giving brownish tint; cutting into core color is light greenish gray (GLEYSGY7/1); in lower part some very coarse grains

Abundant granules at ~4.5'

TOP BEAVER DAM FORMATION HERE?

SAND; very coarse, some granules; subangular to subrounded, poor sorting; clean; includes organic grains (typical of Beaverdam Fm.A) light greenish gray (GLEYSGY7/1); unconsolidated

174AX BB (Qj32-27)

Core # 7

Date: 5/12/00

Described by: PPMcL

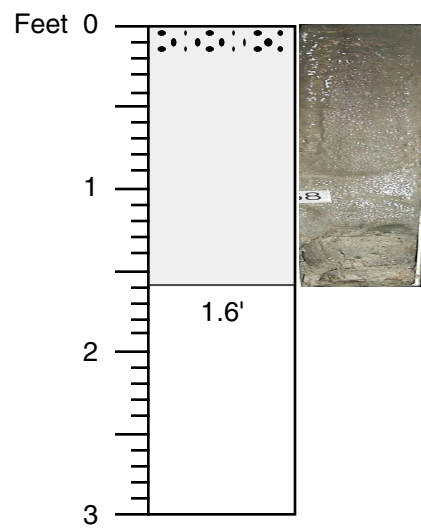
Start Depth: 50 ft

Stop Depth: 57 ft

Recovery = 5.4 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

8



SAND; coarse to very coarse, granuliferous at top which also includes a few <10 mm pebbles; clean, soft quartz, chert, orangish grains, greenish siltstone (?) grains, small mudclasts, poorly sorted (GLEY 5GY7/1)

174AX BB (Qj32-27)

Core # 8

Date: 5/13/00

Described by: PPMcL

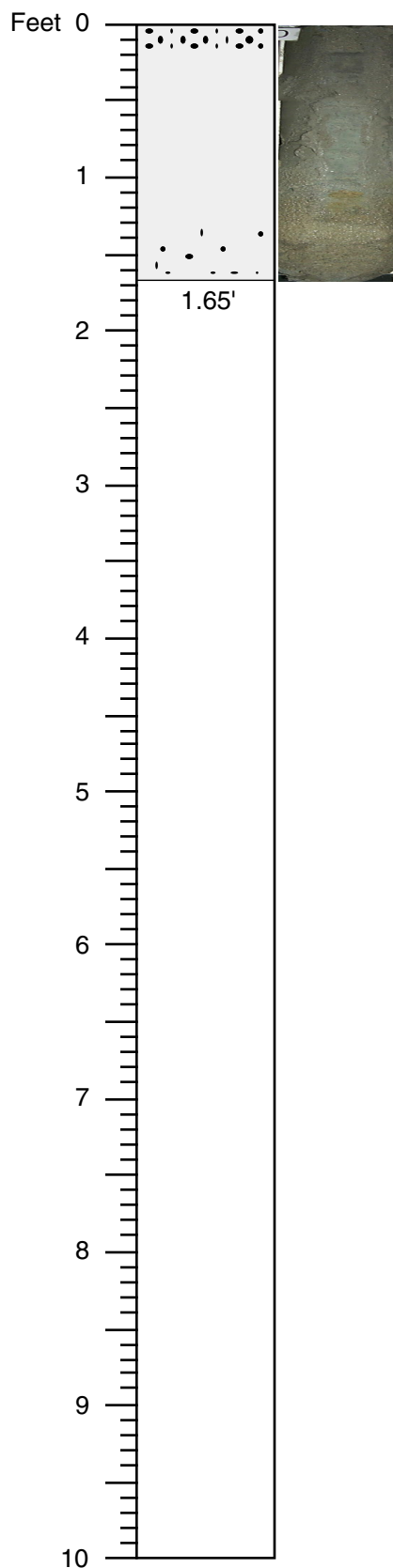
Start Depth: 57 ft

Stop Depth: 60 ft

Recovery = 1.6 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

9



SAND; fine to very coarse, very poorly sorted; fine to medium with abundant grains from coarse to very coarse near top plus pebbles to 10 mm; scattered coarse grains in fine to medium sand in middle; lower is medium to coarse with common very coarse grains; includes chert pebbles, orange-stained quartzite pebbles, and scattered orange sand grains; unconsolidated

174AX BB (Qj32-27)

Core # 9

Date: 5/13/00

Described by: PPMcL

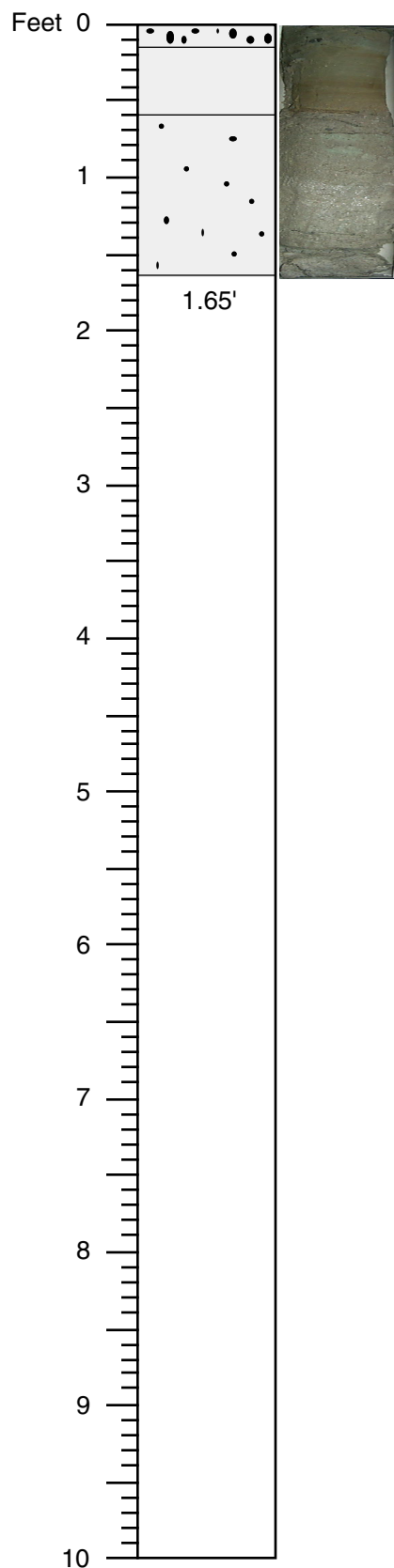
Start Depth: 60 ft

Stop Depth: 70 ft

Recovery = 1.65 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

10



SAND; medium to coarse; moderate sorting; subrounded, some subangular; including chert and quartzite pebbles up to ~10 mm; greenish-gray (GLY 5GY5/1)

CLAY; stiff; laminated, with color bands from olive gray (5Y5/2) to light olive brown (2.5Y5/6); sand coating on outside of lower part

SAND; fine to coarse, poor sorting, subrounded to subangular; includes granules (especially in upper part) and very coarse grains; greenish gray (5GY6/1)

174AX BB (Qj32-27)

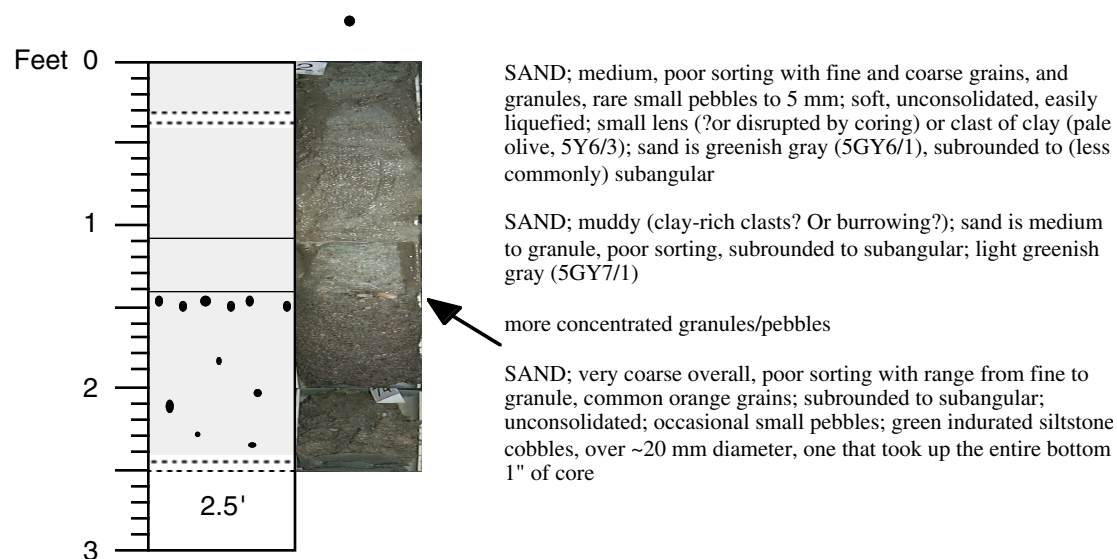
Core # 10
 Date: 5/13/00
 Described by: PPMcL

Start Depth: 70 ft
 Stop Depth: 80 ft
 Recovery = 1.65 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

11



174AX BB (Qj32-27)

Core # 11

Date: 5/13/00

Described by: PPMcL

Start Depth: 72 ft

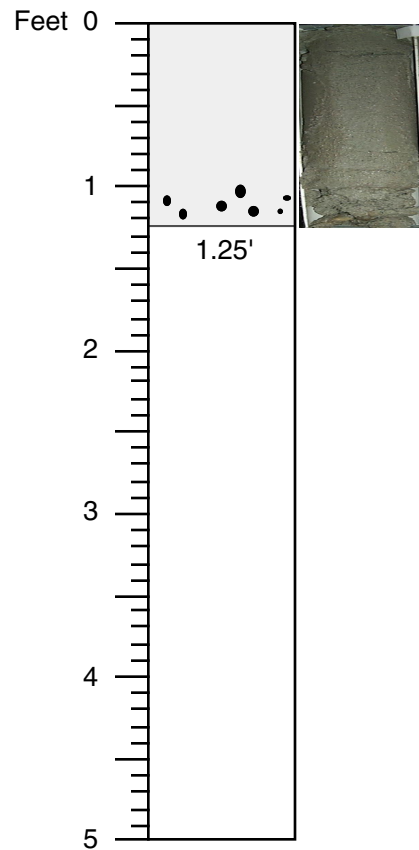
Stop Depth: 75 ft

Recovery = 2.5 ft

Core 12 (75-80 ft) NO RECOVERY

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

12



SAND; coarse; poorly sorted with medium to very coarse grains; subrounded to subangular; soft, unconsolidated, wet/watery; included in the lower 0.25' is a zone with granules and pebbles up to 30 mm (mostly quartzites); (5GY6/1) greenish gray

* This interval re-run and labeled Core 13A

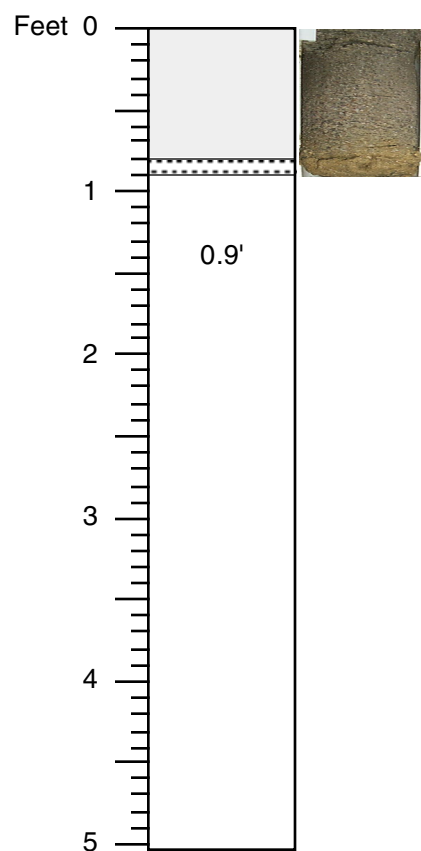
174AX BB (Qj32-27)

Core # 13
Date: 5/13/00
Described by: PPMcL

Start Depth: 80 ft
Stop Depth: 85 ft
Recovery = 1.25 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

13



SAND; very coarse to coarse, with grains down to fine grained; moderate sorting; subrounded, some rounded and subangular; 5YR6/1 gray; includes pink grains (K-spar?) and orange stained grains

CLAY; (does not appear so at first because of sand caked on outside): sticky, stiff, light olive brown (2.5Y5/6)

* Note – hang onto bottom of core #13 (81.25'; see ops notes)

174AX BB (Qj32-27)

Core # 13A
 Date: 5/13/00
 Described by: PPMcL

Start Depth: 80* ft
 Stop Depth: 85* ft
 Recovery = 0.9 ft

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

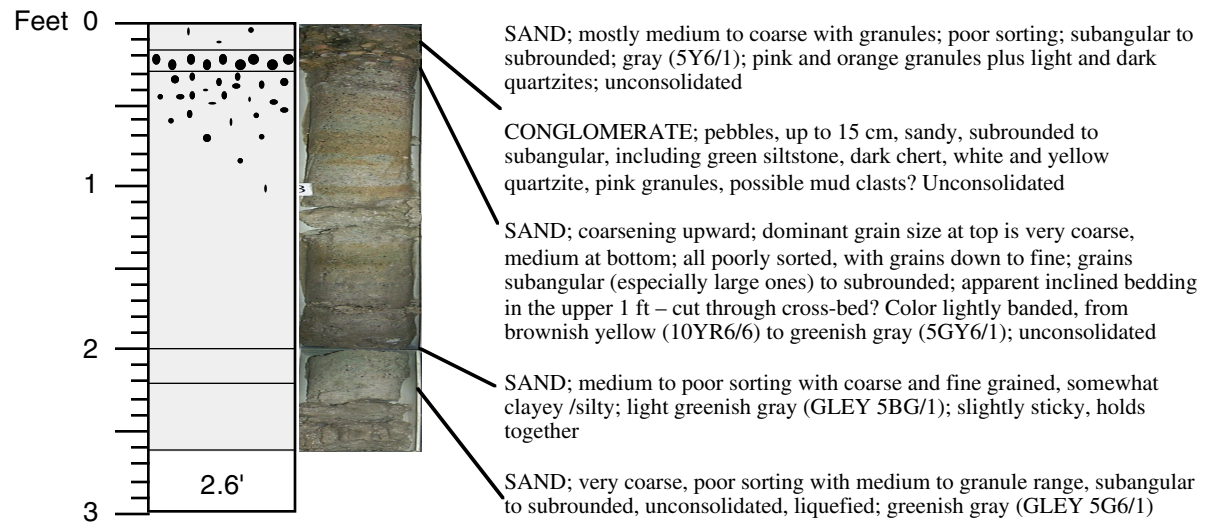
SAND; coarse with abundant very coarse and medium grains, including fine sand and granules also; poor sorting; subrounded to subangular; possible cross laminations in the upper part, planar in lower; distinct color change near top; from gray (GLE Y N5/) above to yellowish brown (10YR5/8) below, and downward to light yellowish brown (2.5Y6/3) and near base light gray (2.5Y7/1)

Start Depth: 85 ft
Stop Depth: 87 ft
Recovery = 1.85 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

15



174AX BB (Qj32-27)

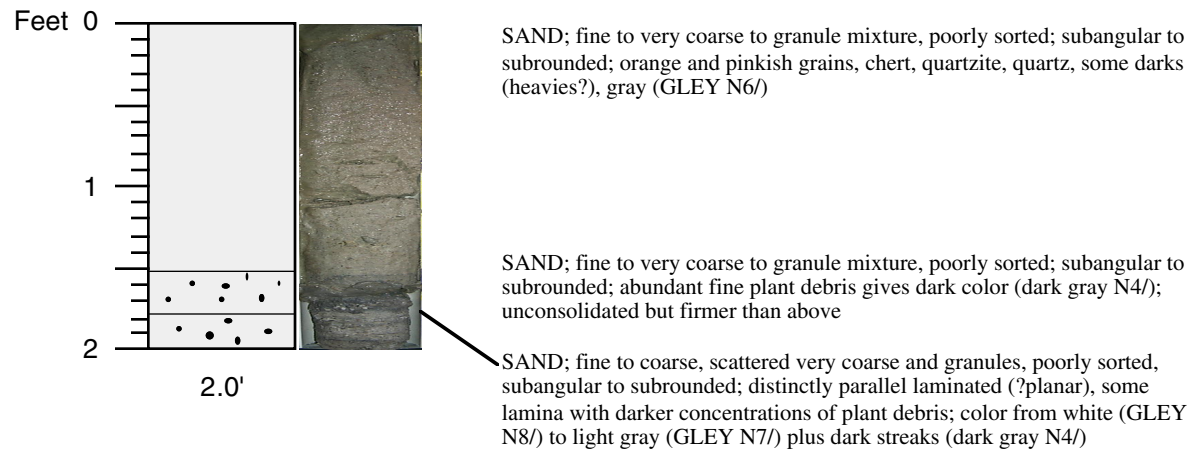
Core # 15
Date: 5/14/00
Described by: PPMcL

Start Depth: 87 ft
Stop Depth: 90 ft
Recovery = 2.6 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

16



174AX BB (Qj32-27)

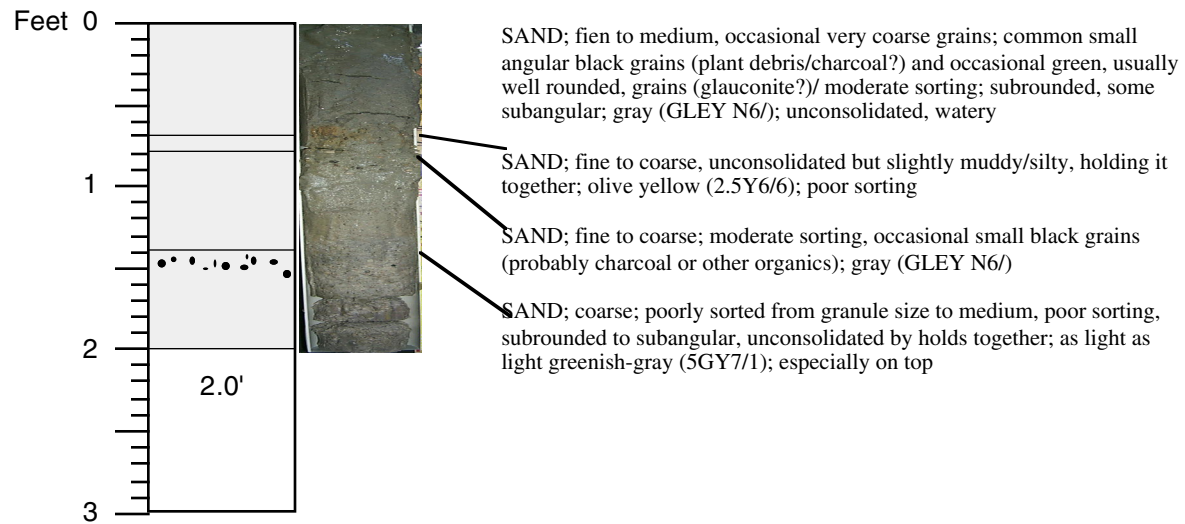
Core # 16
Date: 5/14/00
Described by: PPMcL

Start Depth: 90 ft
Stop Depth: 91 ft
Recovery = 2.0 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

17



174AX BB (Qj32-27)

Core # 17

Date: 5/14/00

Described by: PPMcL

Start Depth: 91 ft

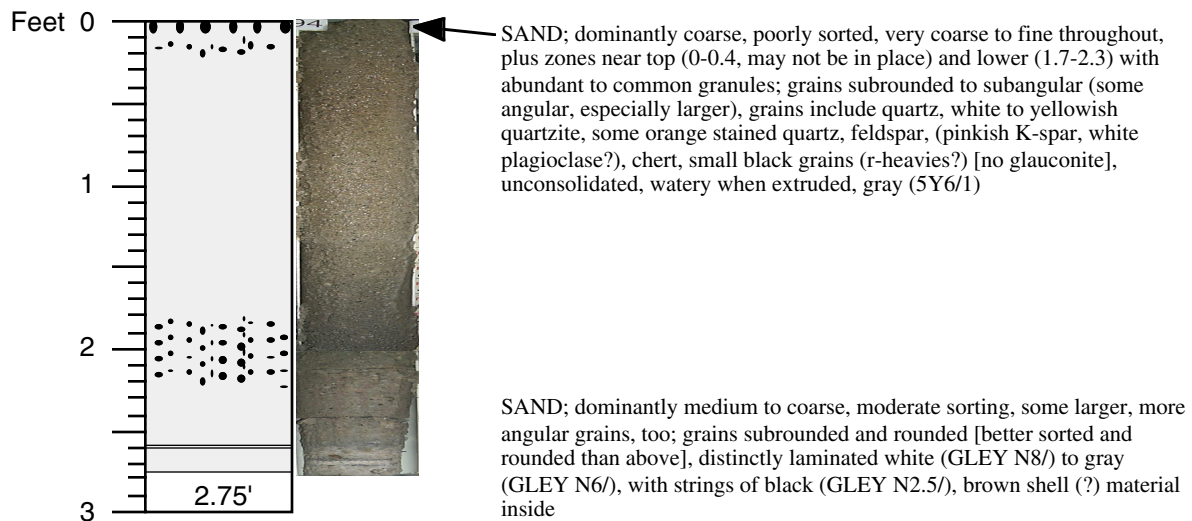
Stop Depth: 94 ft

Recovery = 2.0 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

18



174AX BB (Qj32-27)

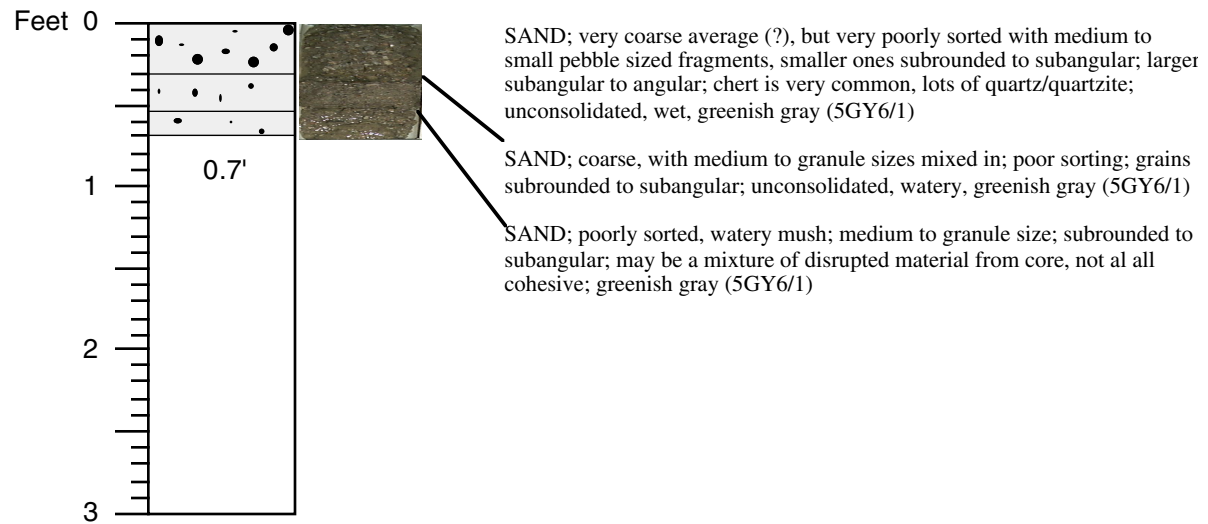
Core # 18
Date: 5/14/00
Described by: PPMcL

Start Depth: 94 ft
Stop Depth: 97 ft
Recovery = 2.75 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

19



174AX BB (Qj32-27)

Core # 19

Date: 5/14/00

Described by: PPMcL

Start Depth: 97 ft

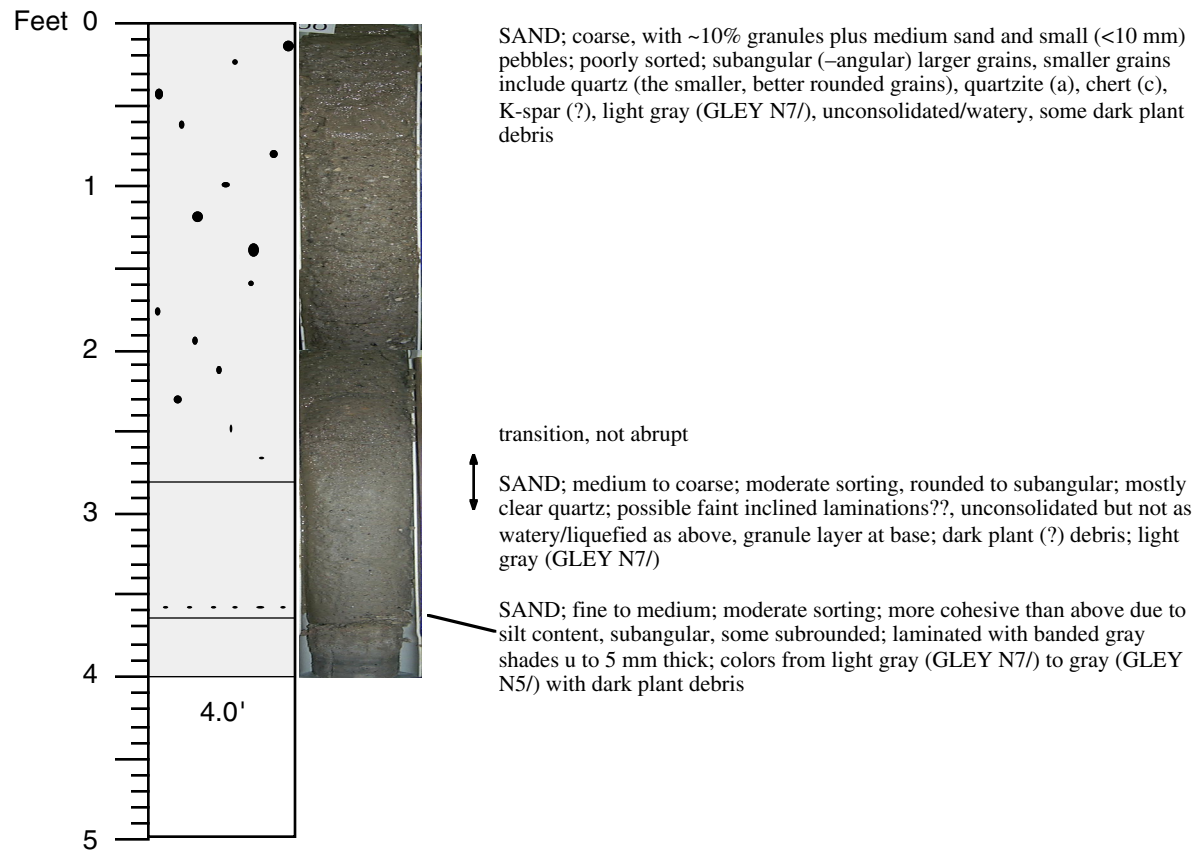
Stop Depth: 100 ft

Recovery = 0.7 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

20



174AX BB (Qj32-27)

Core # 20

Date: 5/14/00

Described by: PPMcL

Start Depth: 100 ft

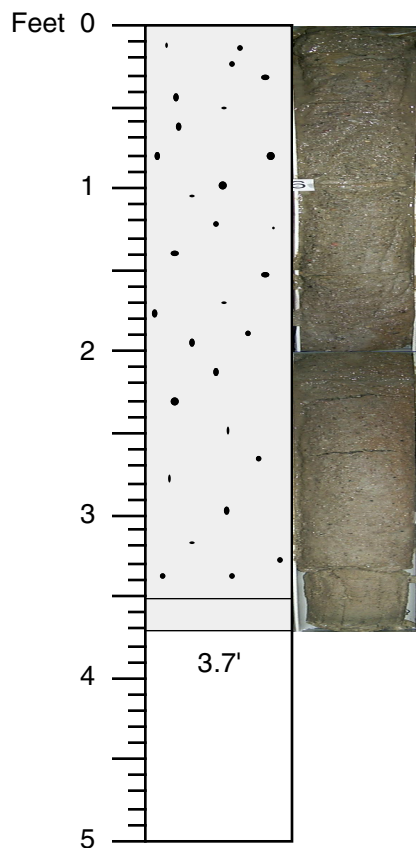
Stop Depth: 105 ft

Recovery = 4.0 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

21



SAND; coarse to very coarse, poorly sorted with common medium to granule sizes; slightly more granules at top; grains mostly subrounded to subangular, rounded grains common; most finer grains are clear quartz; coarse fraction includes quartz, quartzite, chert, some pink grains (potassium feldspar?), some orange stained quartz; unconsolidated; some light rusty look to outer part of core (iron stain? drilling mud/pipe coloration?).

SAND; medium to fine, silty, some coarse, moderately sorted; grains subrounded and rounded to subangular; slightly more consolidated than above due to silt content. Light brownish gray (2.5Y6/2) with some darker lamination, probably plant debris.

174AX BB (Qj32-27)

Core # 21

Date: 5/15/00

Described by: PPMcL

Start Depth: 105 ft

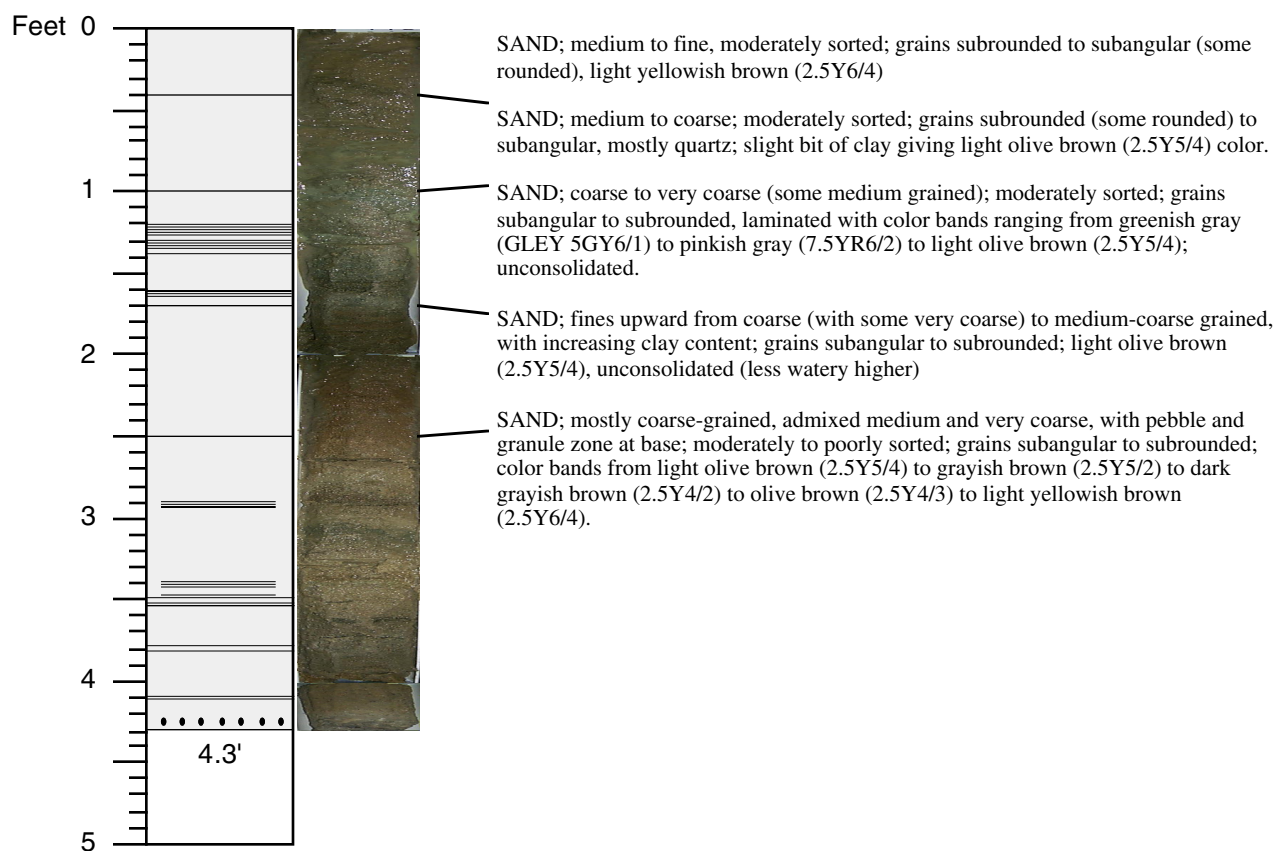
Stop Depth: 110 ft

Recovery = 3.7 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

22



174AX BB (Qj32-27)

Core # 22

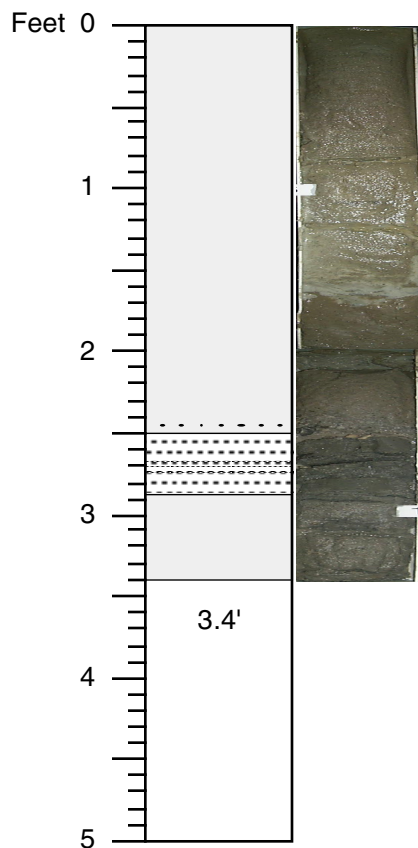
Date: 5/15/00

Described by: PPMcL

Start Depth: 110 ft

Stop Depth: 115 ft

Recovery = 4.3 ft



SAND; medium, moderately to well sorted, with granules and pebbles up to 15 mm at base; pebbles include chert, quartzite; clean, unconsolidated; grains subrounded to rounded, some subangular; OHM stringers, OHM $\geq 3\%$; light gray (2.5Y7/1).

Pebble lag

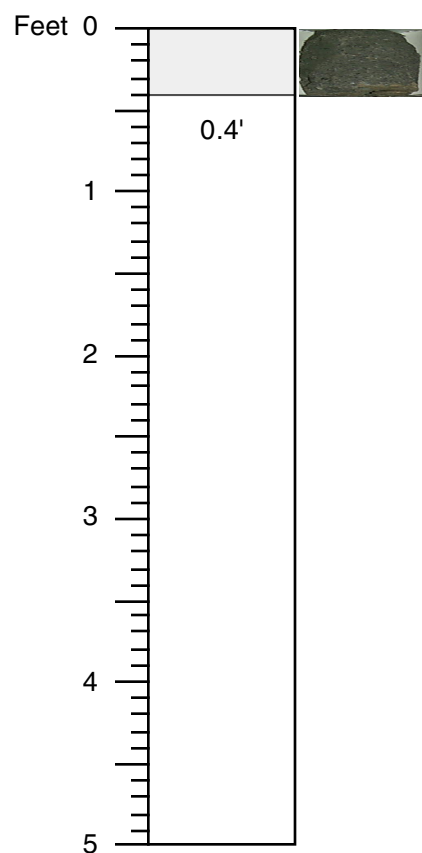
CLAY; firm but not plastic, finely laminated, olive gray (5Y4/2) with 2 thin sand laminae at 2.6 and 2.7 feet (sand as described for interval below), clay contains dark plant fragments/lignite up to 15 mm long.

SAND; medium to coarse, moderately to poorly sorted, some plant debris giving darker color (gray 5Y5/1); grains subrounded to subangular and some rounded.

174AX BB (Qj32-27)

Core # 23
 Date: 5/15/00
 Described by: PPMcL

Start Depth: 115 ft
 Stop Depth: 120 ft
 Recovery = 3.4 ft



SAND; fine to medium, some coarse; poorly sorted, silty, and somewhat consolidated; common dark grains (heavy minerals?) and silt/clay give dark greenish gray (5GY4/1) color; hard cemented zone in bottom few mm. Some very coarse sand is caked on outside of core but is not from this interval.

Note: Bottom of this core apparently slid out and appears to be (in part) in top of next core.

174AX BB (Qj32-27)

Core # 24

Date: 5/15/00

Described by: PPMcL

Start Depth: 120 ft

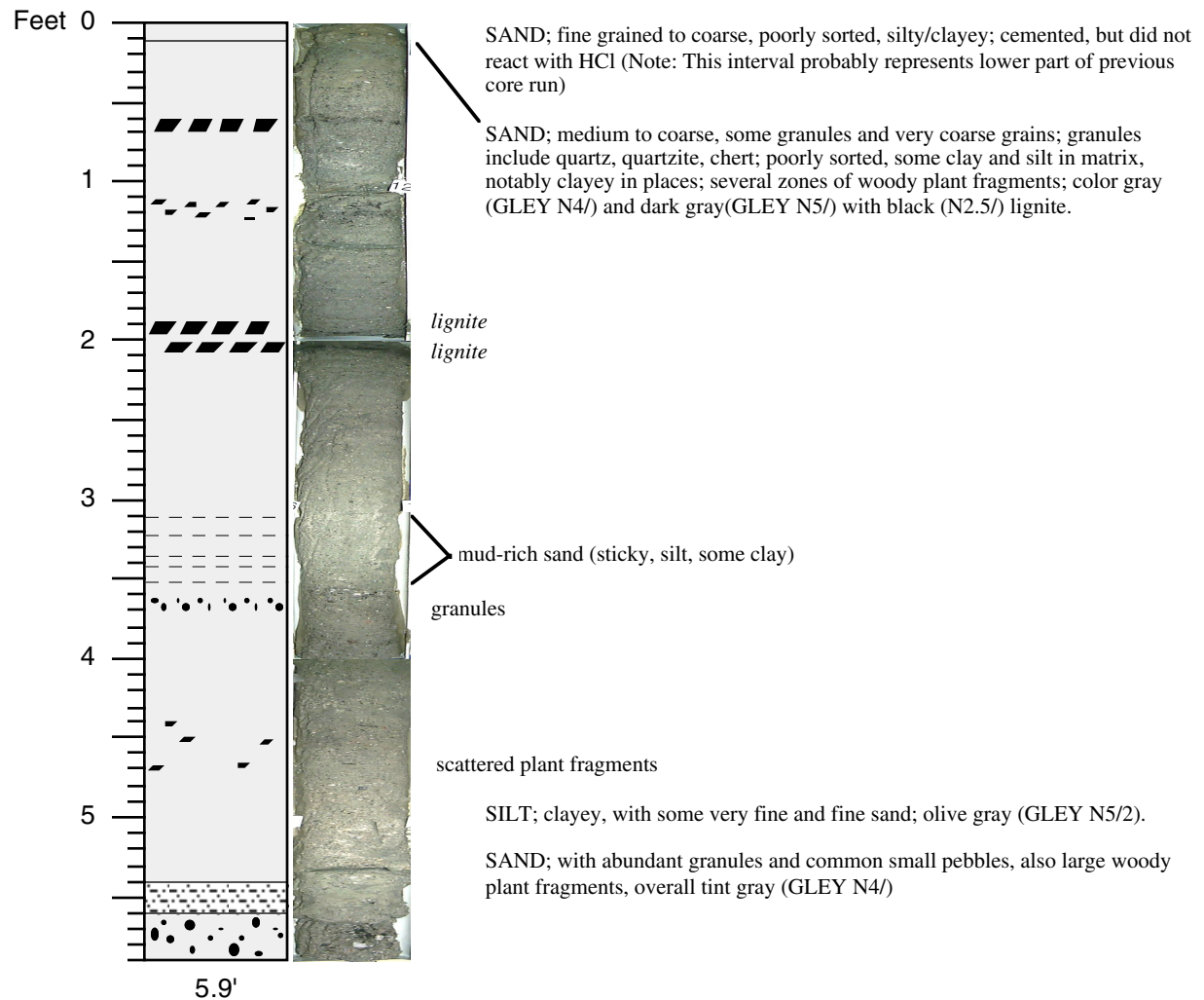
Stop Depth: 125 ft

Recovery = 0.4 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

25



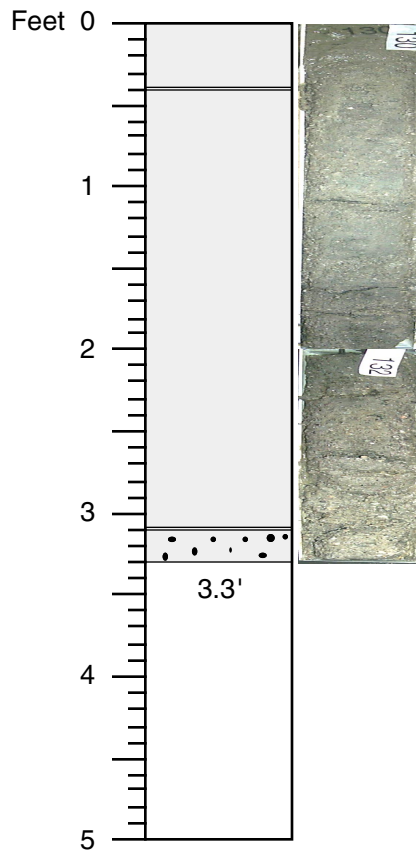
174AX BB (Qj32-27)

Core # 25
Date: 5/15/00
Described by: PPMcL

Start Depth: 125 ft
Stop Depth: 130 ft
Recovery = 5.9 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

26



SAND; medium, moderately sorted, subrounded; very wet and liquefied; uncommon silt/clay fragments.

SAND; medium, very poorly sorted with grain sizes from silt to granule size, muddy; subangular to subrounded; grains include abundant quartz and quartzite, chert, a few pink (potassium feldspar?) and orange-stained quartz; unconsolidated and wet but slightly sticky; dark gray 5Y4/1.

SAND; as above, but much richer in very coarse grains and granules, less consolidated.

174AX BB (Qj32-27)

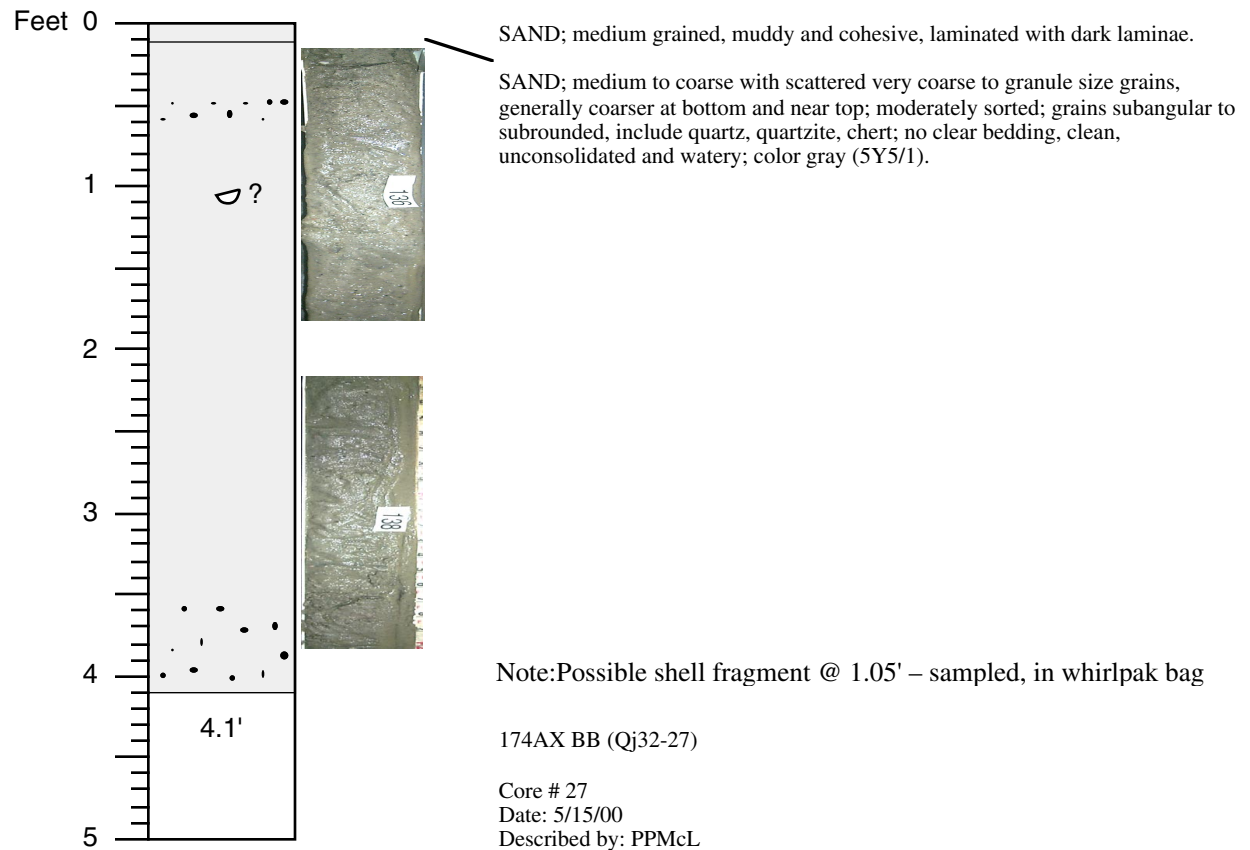
Core # 26
 Date: 5/15/00
 Described by: PPMcL

Start Depth: 130 ft
 Stop Depth: 135 ft
 Recovery = 3.3 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

27



174AX BB (Qj32-27)

Core # 27

Date: 5/15/00

Described by: PPMcL

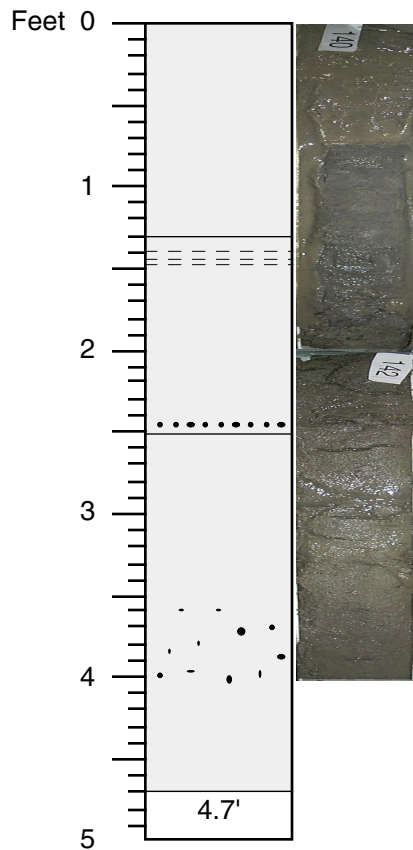
Start Depth: 135 ft

Stop Depth: 140 ft

Recovery = 4.1 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

28



SAND; medium to coarse, some very coarse, poorly sorted, subangular to subrounded, some rounded; watery, unconsolidated, color change at 140.7 ft from gray (5Y5/1) to lighter gray above.

SAND; fines from granule-rich coarse sand at base to silty medium to coarse sand in middle to silty, clayey, very fine to medium sand at top; increasingly sticky and consolidated upward with increasing clay content; finer intervals are dark gray (5Y4/1); sandier intervals are gray (5Y5/1).

SAND; medium to coarse, clean, moderately sorted, grains subrounded with some rounded and subangular, mostly quartz, some small dark grains, rare small pink grains; unconsolidated, slightly silty in upper 0.4 ft; gray (5Y6/1). Some compaction of the core at around 3 ft. Possible burrow with brown, organic clay at 142.7 ft

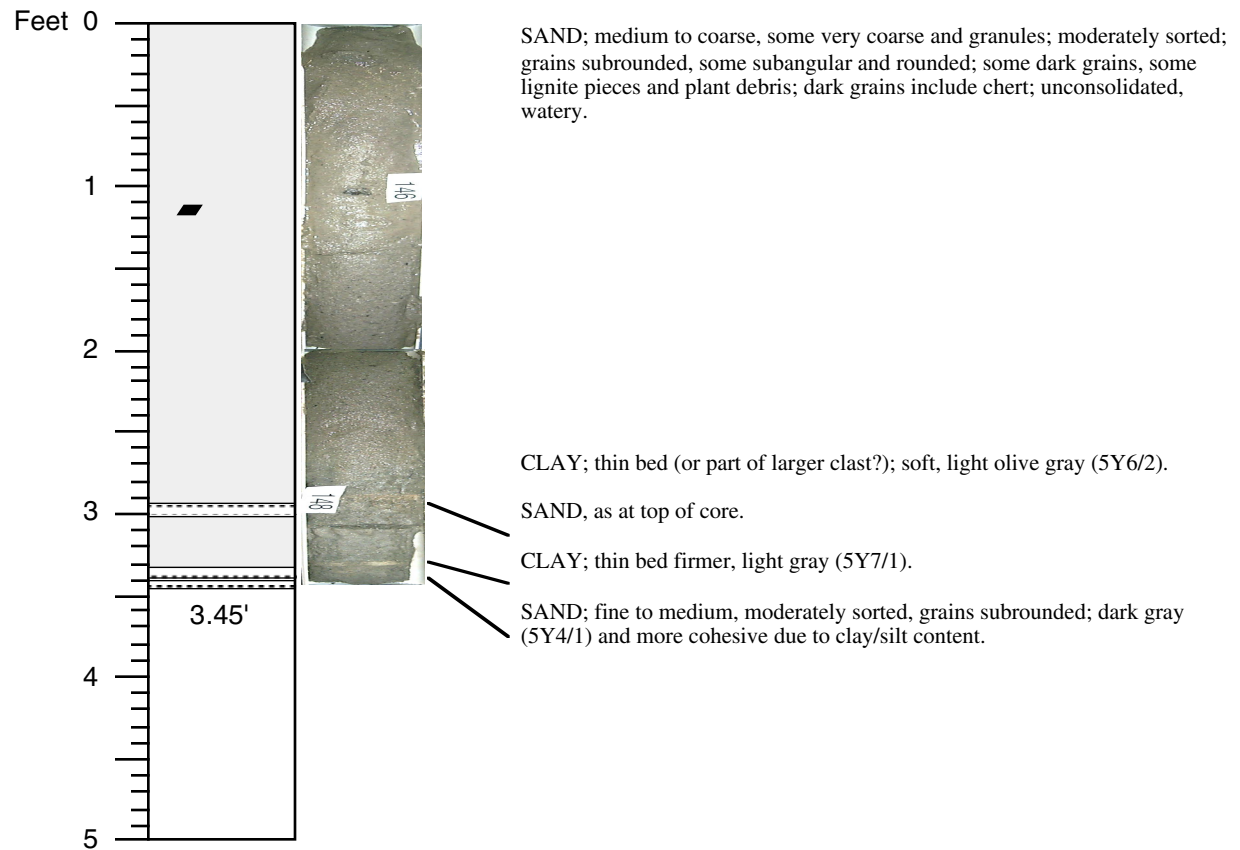
174AX BB (Qj32-27)

Core # 28
 Date: 5/15/00
 Described by: PPMcL

Start Depth: 140 ft
 Stop Depth: 145 ft
 Recovery = 4.7 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

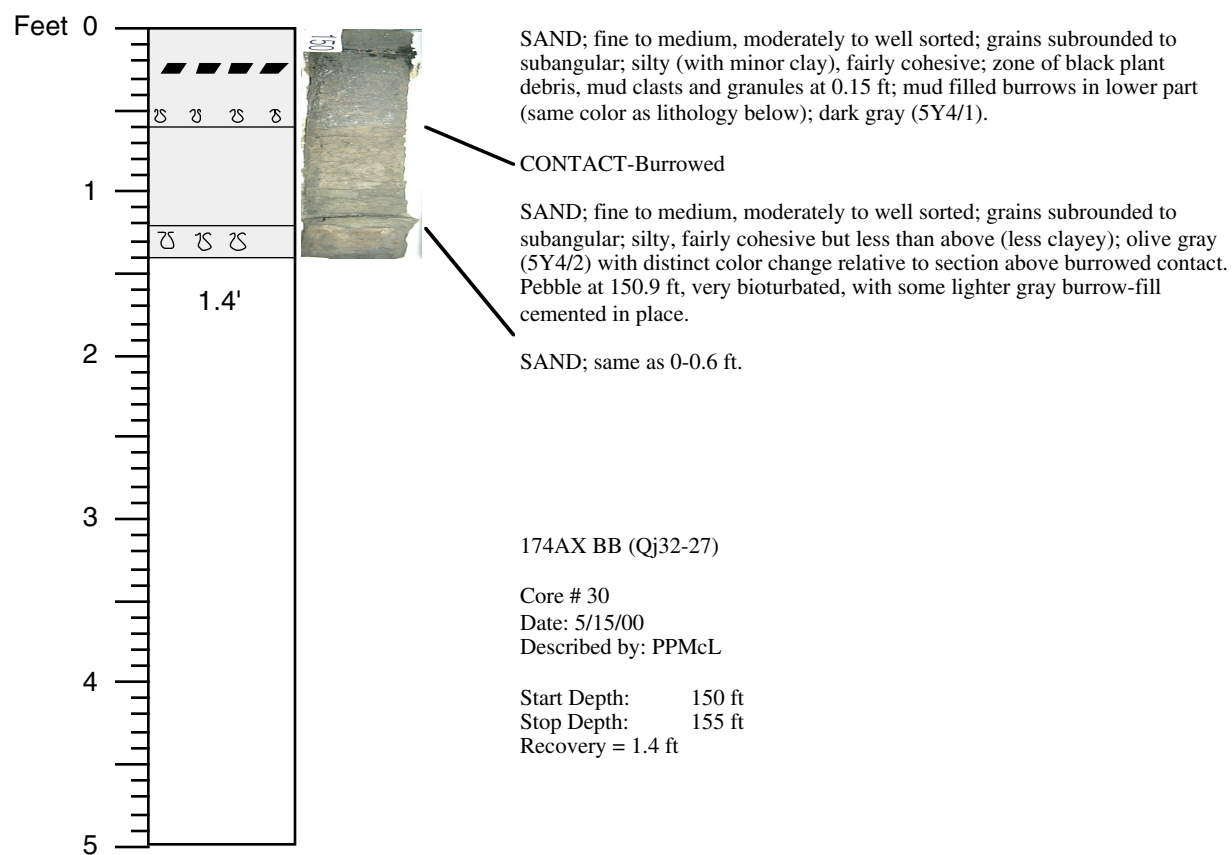
29



CORE DESCRIPTIONS

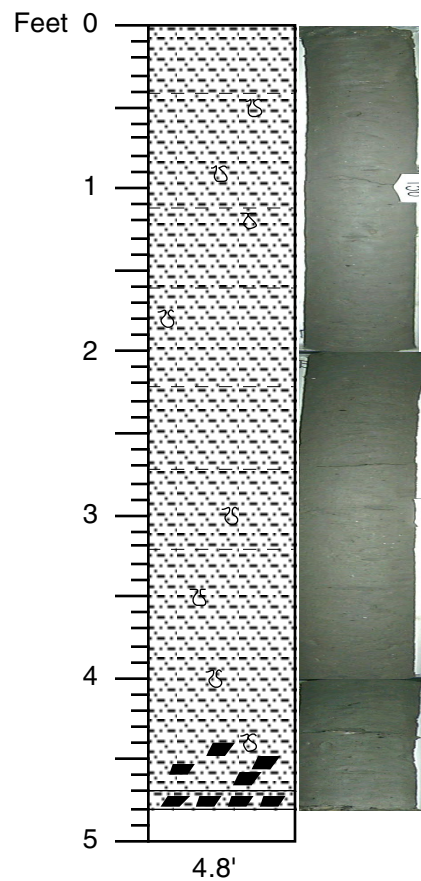
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

30



CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

31



SILT; sandy, very fine; to SAND; very fine, silty, slightly to moderately clayey; bioturbated and very uniform throughout, clay in disrupted laminations and as patches defining burrows; below 2.7' some fine sand; below 4.35' few organic fragments; dark gray (GLEY N4/).

SILT and SAND; as above with abundant woody organic fragments.

174AX BB (Qj32-27)

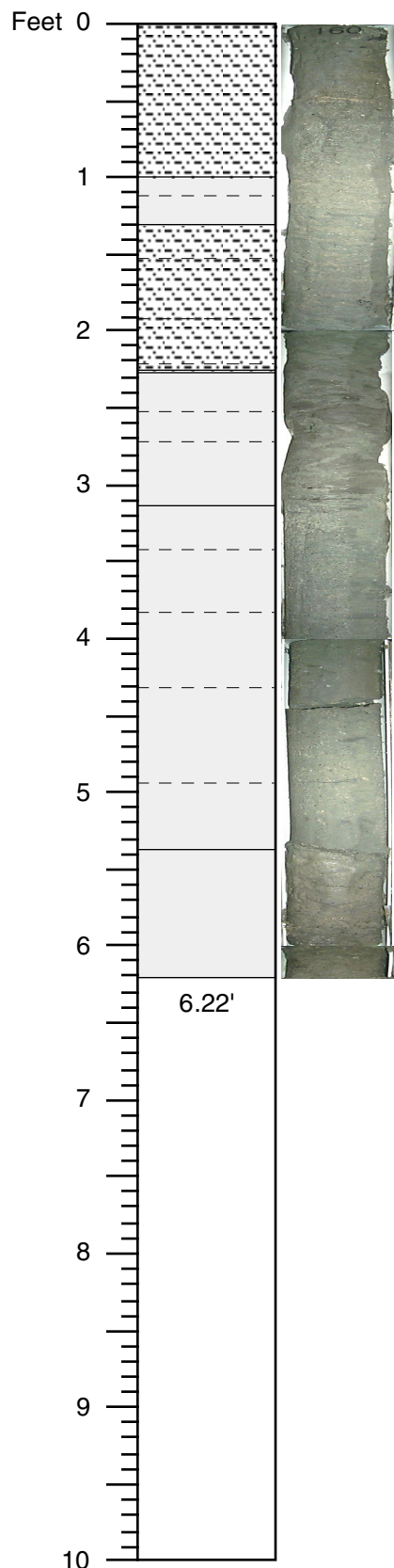
Core # 31
 Date: 5/16/00
 Described by: KWR

Start Depth: 155 ft
 Stop Depth: 160 ft
 Recovery = 1.4 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

32



SAND; very fine to fine, silty; heavily bioturbated but with some laminations evident; dark greenish gray (GLEY 5Y4/1).

SAND; as above with some silt, clay, laminated; heavily bioturbated; 1.0-1.1 ft is brown.

SAND; very fine, silty; interlaminated with SILT; clay laminations are 1.5 to 3 mm thick, heavily bioturbated but with some laminations evident; color as above.

SAND; very fine, silty; interlaminated with SILT; clayey, very heavily bioturbated, almost churned, laminations not evident; color as above interspersed with very dark gray (GLEY N3/).

SAND very fine to fine, few rare medium to coarse grains; interlaminated with SILT, clayey; more sand than above; silt laminated because few below 3.8 ft; heavily bioturbated, often obscuring laminations; dark greenish gray (GLEY 5Y4/1).

SAND; fine, moderate to slightly silty; few rare coarse grains; greenish gray (GLEY 5GY5/1); very silty zone from 5.9 to 6.0 ft.

174AX BB (Qj32-27)

Core # 32

Date: 5/16/00

Described by: KWR

Start Depth: 160 ft

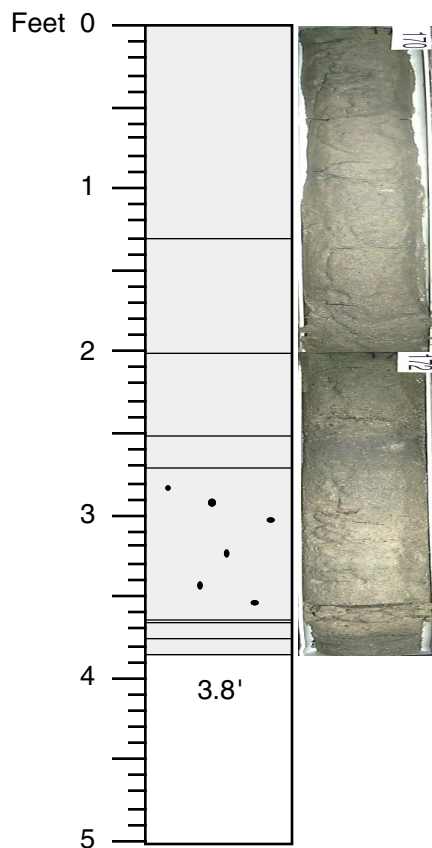
Stop Depth: 170 ft

Recovery = 6.22 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

33



SAND; fine, some very fine, slightly silty; gray (GLEY N5/); laminated organic fragment at 0.2 ft.

Gradational contact

SAND; fine, some medium, a few coarse grains; slightly silty, dark patches where fine plant debris is admixed; color as above.

Gradational contact

SAND; fine, some medium to coarse, a few granules; color as above.

SAND, as above but clayey; with SILT; clay laminated; dark gray (GLEY N4/).

SAND; fine to medium, some coarse, some granules; gray (GLEY N5/).

SAND; very fine to fine; GLEY N4/ (dark gray).

SAND; fine to medium, some coarse, some granules; gray (GLEY N5/).

174AX BB (Qj32-27)

Core # 33

Date: 5/16/00

Described by: KWR

Start Depth: 170 ft

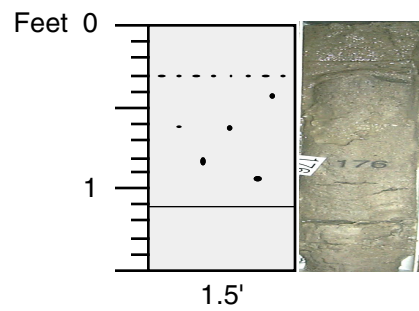
Stop Depth: 175 ft

Recovery = 3.8 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

34

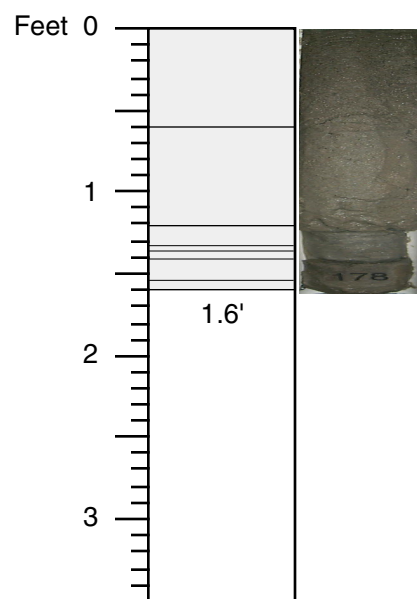


SAND; fine; abundant very fine to coarse; gray (GLEY N6/); few to some granules; dark gray silty zone (GLEY N4/) at 0.3 to 0.32 ft.

SAND; fine to very fine, few to some medium to coarse grains; gray (GLEY N6/).

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

35



SAND; fine to coarse, granules common, some very fine; gray (GLEY N6/).

SAND; fine; very fine and medium; gray (GLEY N6/).

SAND; as above with heavy mineral lamination.

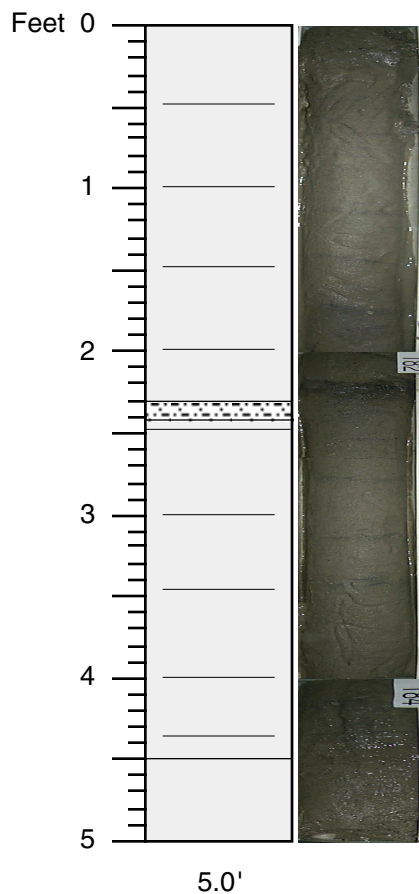
174AX BB (Qj32-27)

Core # 35
 Date: 5/16/00
 Described by: KWR

Start Depth: 176.5 ft
 Stop Depth: 180 ft
 Recovery = 1.6 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

36



SAND; very fine to fine, well sorted, heavy mineral lamination common; few to common medium to coarse grains from 2.2 to 2.3 ft; gray (GLEY N6/).

SILT; sandy; very fine, organic rich, dark gray (GLEY N/4).

SAND; very fine to fine, well sorted, heavy mineral lamination common; gray (GLEY N6/)

SAND; as above, with common to abundant medium to coarse grains.

174AX BB (Qj32-27)

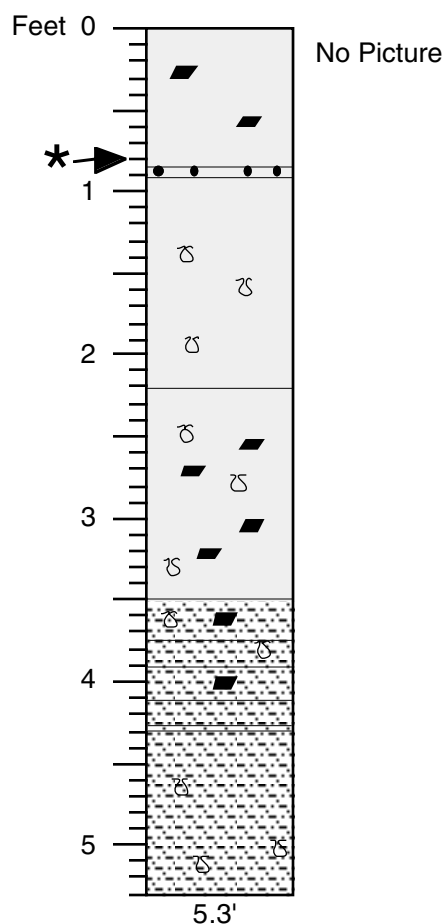
Core # 36
 Date: 5/16/00
 Described by: KWR

Start Depth: 180 ft
 Stop Depth: 185 ft
 Recovery = 5.0 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

37



SAND; very fine to fine; some medium; very soupy; moderately well sorted with a few large pieces of lignite; light greenish gray (5GY7/1); part of this may be redrill of bottom section of previous core.

SAND; very fine to fine, silty, slightly clayey, with abundant small pebbles (quartz, chert, Note: lower occurrences of pebbles are smeared on outside of core); very dark gray (GLEY N2.5/).

SAND; very fine to fine; silty, very dark gray (GLEY N2.5/); a few laminae of SILT, clayey, bioturbated.

SAND; very fine to fine, a few coarse grains; very dark gray (GLEY N2.5/); pieces of lignite and organic fragments common; few to some laminae of SILT, clayey, laminations partially obscured by heavy bioturbation.

SILT; clayey, with some to abundant laminations of very fine to fine sand; stiff; lignite common, micaceous; greenish gray (5GY6/1).

SILT; clayey, with few to some laminations of very fine to fine sand, a few coarse grains; no lignite; stiff; greenish gray (5GY6/1).

174AX BB (Qj32-27)

Core # 37

Date: 5/16/00

Described by: KWR

Start Depth: 185 ft

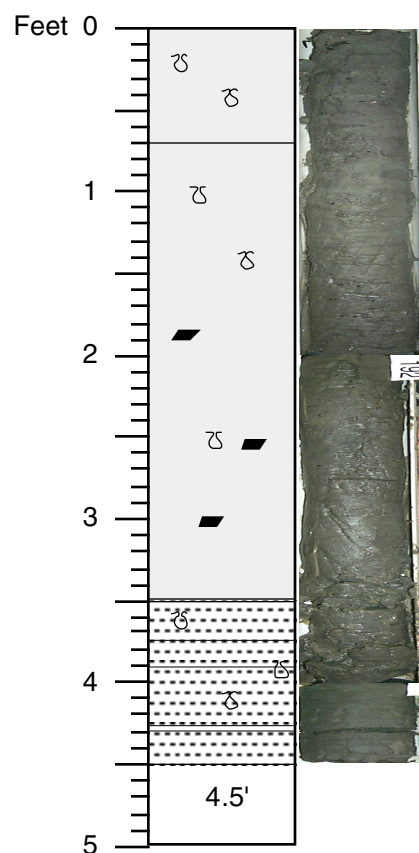
Stop Depth: 190 ft

Recovery = 5.3 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

38



SAND; very fine; to SILT; sandy, very fine; some to few lignite and few laminae of clayey SILT; dark greenish gray (5GY4/1).

SAND, very fine; to SILT; sandy; very finely interlaminated with CLAY, lignite fragments common, micaceous, bioturbated; clay laminations become thicker and more common downward, notably at 2.8 ft; silty, greenish gray (5GY6/1).

3.5 sharp contact

CLAY; silty, with thin laminae and lenses of silt, very occasional sand grains, micaceous, bioturbated, dark greenish gray (5GY4/1); very compacted and stiff.

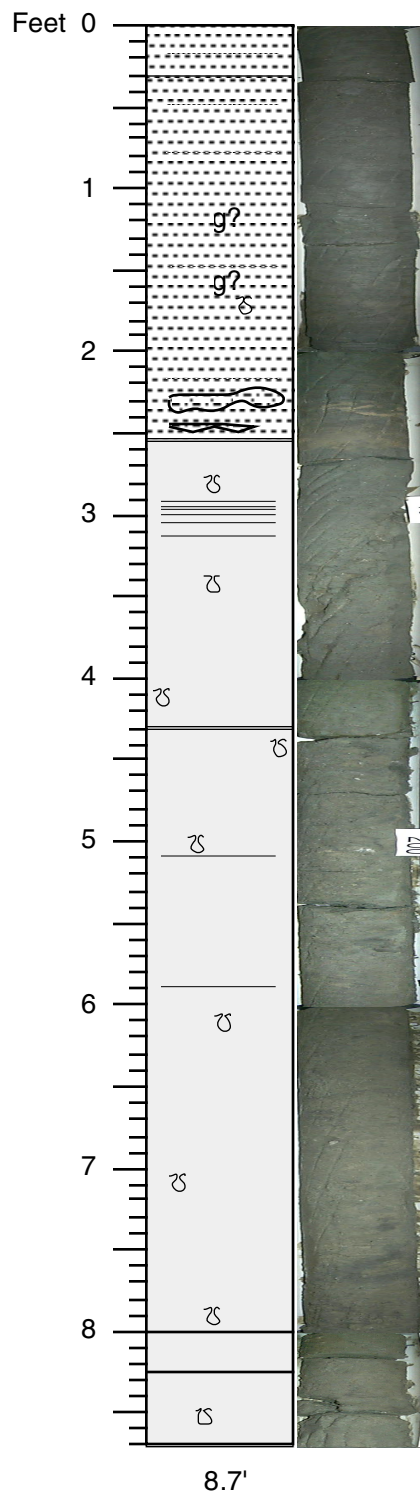
174AX BB (Qj32-27)

Core # 38
Date: 5/16/00
Described by: KWR

Start Depth: 190 ft
Stop Depth: 195 ft
Recovery = 4.5 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

39



CLAY; silty, with lenses of silt;

CLAY; silty, with lenses of silt and laminations and lenses of very fine sand with heavy minerals or glauconite; dark greenish gray (5GY4/1); from 2.25 to 2.4 ft, contains silty clay filled subhorizontal burrows, olive yellow (5Y6/6); from 2.48-2.55 is a zone or clast of silty clay (light greenish gray 5GY7/1).

SAND; fine to very fine, silty; stiff, bioturbated; with thin laminae of silty CLAY from 2.9-3.3; dark greenish gray (5GY4/1).

SAND; very fine to fine, silty; intermixed with CLAY, silty; some lamination and some burrowing evident; entire interval is probably bioturbated; color ranges from dark greenish gray (5GY4/1) to light greenish gray (5GY7/1).

SAND; very fine to fine, silty, clayey, brown

SAND; very fine, silty, greenish gray, similar to 4.3-8.0 ft interval

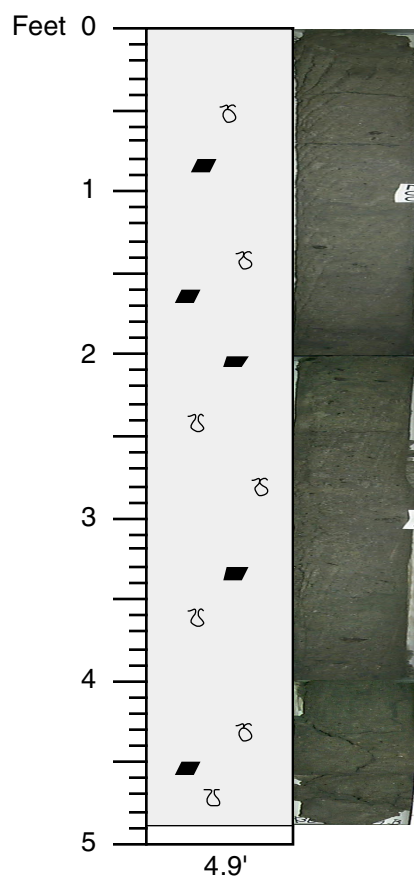
174AX BB (Qj32-27)

Core # 39
 Date: 5/16/00
 Described by: KWR

Start Depth: 195 ft
 Stop Depth: 205 ft
 Recovery = 8.7 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

40



SAND; very fine, silty, some fine sand; common fragments of organic material (lignite) ranging from coarse sand size to 3 cm diameter; uniform; abundant heavy minerals; bioturbated; dark greenish gray (5GY4/).

174AX BB (Qj32-27)

Core # 40
 Date: 5/17/00
 Described by: KWR

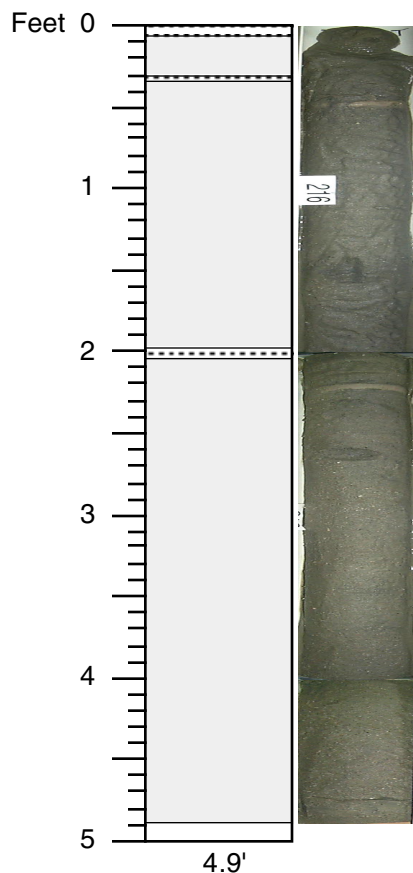
Start Depth: 205 ft
 Stop Depth: 210 ft
 Recovery = 4.9 ft

Core 41 (210-215 ft) NO RECOVERY

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

41



SANDSTONE (top 0.06 ft of core), indurated but not calcite cement; possible indurated clay with sand; two colors, dark olive gray (5Y3/2) and light yellowish brown (2.5Y6/3); penetrated by prominent 1 mm diameter vertical burrow.

SAND; fine to very fine sand, moderately sorted; subangular grains; trace of opaque heavy minerals throughout; very thin layers of clay intermittently; dark gray (2.5Y4/1); sand is massive below 2.2 ft; only a few clay and opaque heavy mineral layers above 2.2 ft; clay stringer at 0.3 ft, grayish brown (2.5Y5/2) with thin heavy mineral layers directly above and below the clay; clay stringer at 2.0 ft, color 2.5Y5/2.

174AX BB (Qj32-27)

Core # 42

Date: 5/19/00

Described by: SB, JU

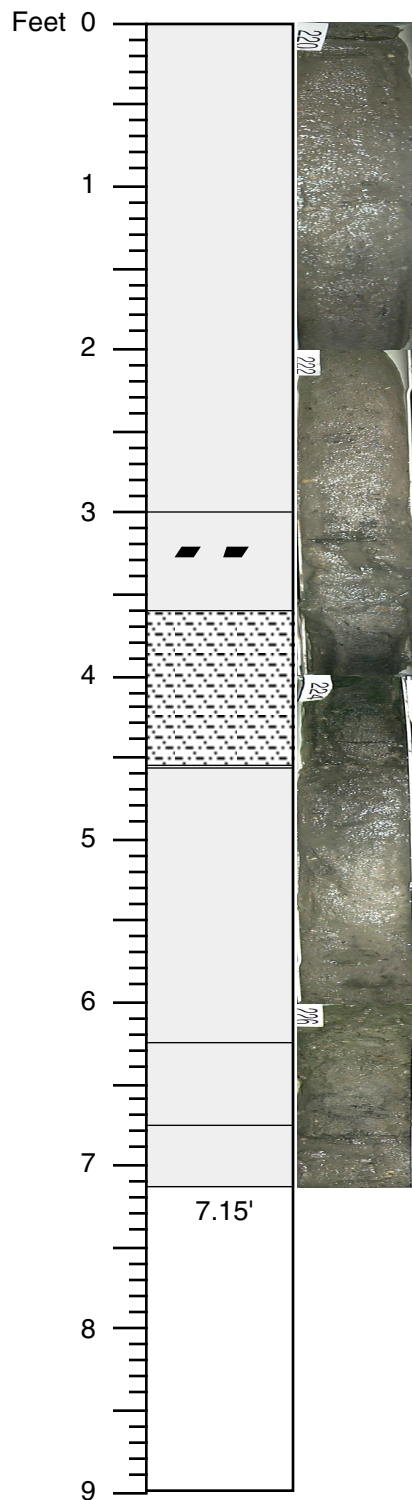
Start Depth: 215 ft

Stop Depth: 220 ft

Recovery = 4.9 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

42



SAND; poorly sorted, medium to very fine grained; grains, subangular; massive; gray (5Y5/1); some lignite, increasing with depth; large pebbles in the drilling mud coat the core).

SAND; fine to very fine, with lignite laminae, dark gray (2.5Y4/1); massive.

gradational contact

SAND; very fine, to SILT; lignitic, slightly clayey, slightly micaceous; black (2.5Y2.5/1); massive.

gradational contact

SAND; coarse to fine, moderately sorted; grains subangular, trace opaque heavy minerals throughout, trace lignite intermittently; massive; dark gray (2.5YH/1)

SAND; medium to fine; slightly more lignite than above, massive; moderately sorted; gray (2.5Y6/1).

SAND; coarse to fine, moderately sorted; less lignitic than above; dark grayish brown (2.5Y4/2); massive.

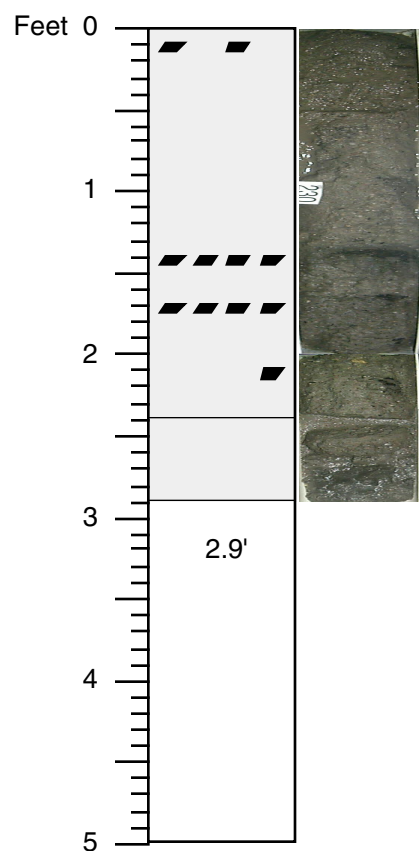
174AX BB (Qj32-27)

Core # 43
 Date: 5/19/00
 Described by: SB, JU

Start Depth: 220 ft
 Stop Depth: 229 ft
 Recovery = 7.15 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

43



SAND; very coarse to fine, poorly sorted, subangular grains, grayish brown (2.5Y5/2), no fossils seen; includes some clay or chert clasts, approximately 6 mm in diameter; some lignite at 0.05 ft, thin lignite beds at 1.4 and 1.7 ft, and a lignite fragment 1 cm diameter at 2.2 ft.

SAND; medium to fine, stained darker by disseminated lignite particles dark gray (2.5Y4/1).

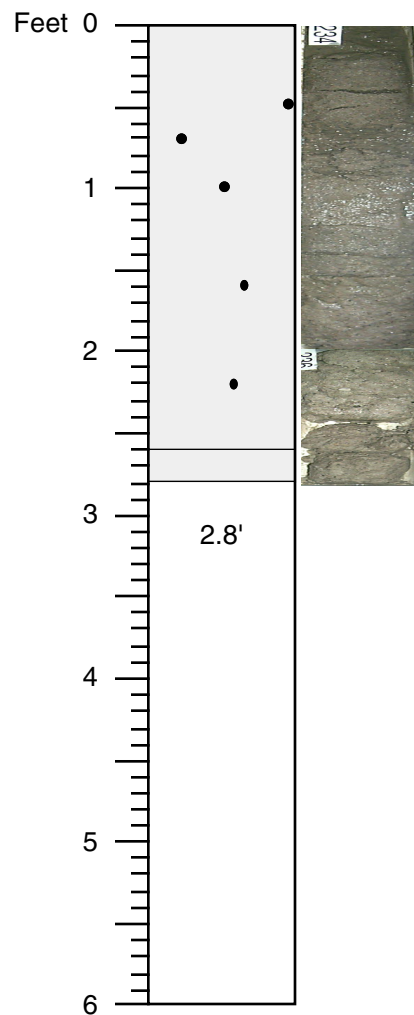
174AX BB (Qj32-27)

Core # 44
 Date: 5/19/00
 Described by: SB, JU

Start Depth: 229 ft
 Stop Depth: 234 ft
 Recovery = 2.9 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

44



SAND; very coarse to fine, poorly sorted; grains subangular, very few lithic fragments, a few pebbles of 3 to 6 mm diameter; gray (2.5Y5/1).

SAND; coarse to fine, same as above, just slightly fine grained 2.5Y5/1 (gray).

174AX BB (Qj32-27)

Core # 45

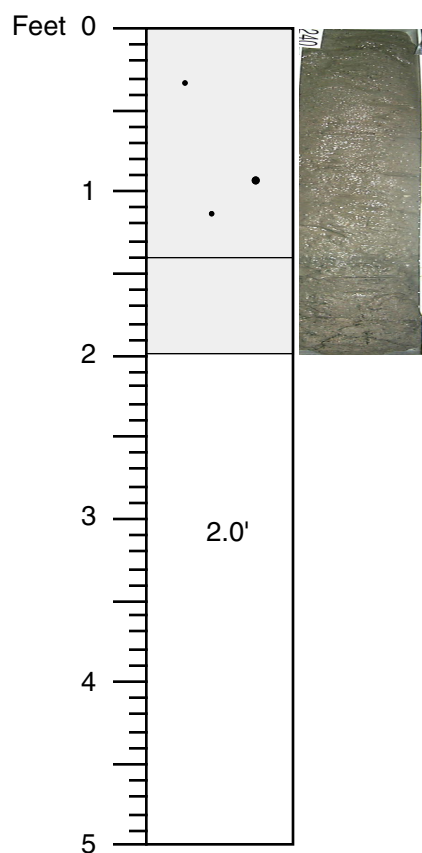
Date: 5/19/00

Described by: SB, JU

Start Depth: 234 ft

Stop Depth: 240 ft

Recovery = 2.8 ft



SAND; coarse to medium, fair sorting; grains subangular, <1% quartz granules approximately 2 mm diameter; massive; gray (10YR5/1).

SAND; coarse to medium, fair sorting, layers of opaque heavy minerals at 1.3 and 1.75 ft giving the section a darker color; dark gray (10YR4/1).

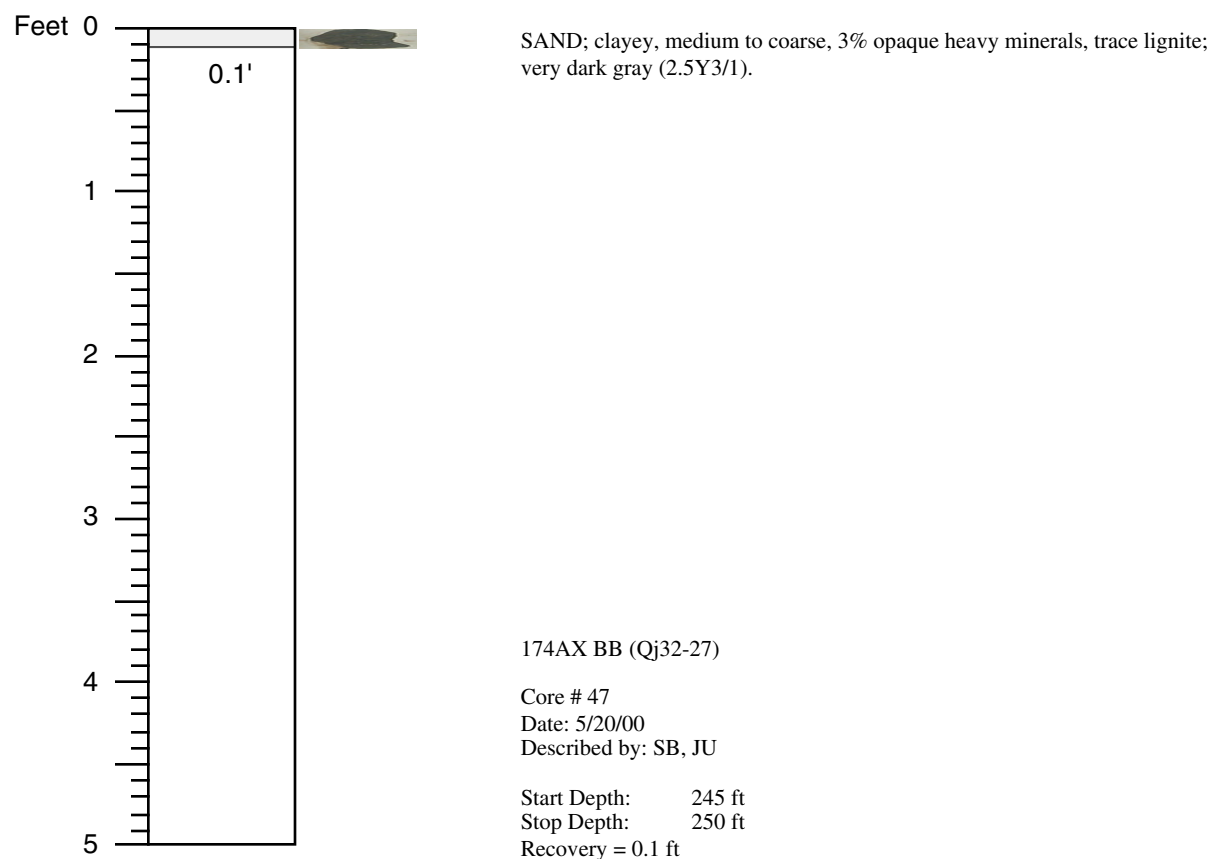
174AX BB (Qj32-27)

Core # 46
 Date: 5/20/00
 Described by: SB, JU

Start Depth: 240 ft
 Stop Depth: 245 ft
 Recovery = 2.0 ft

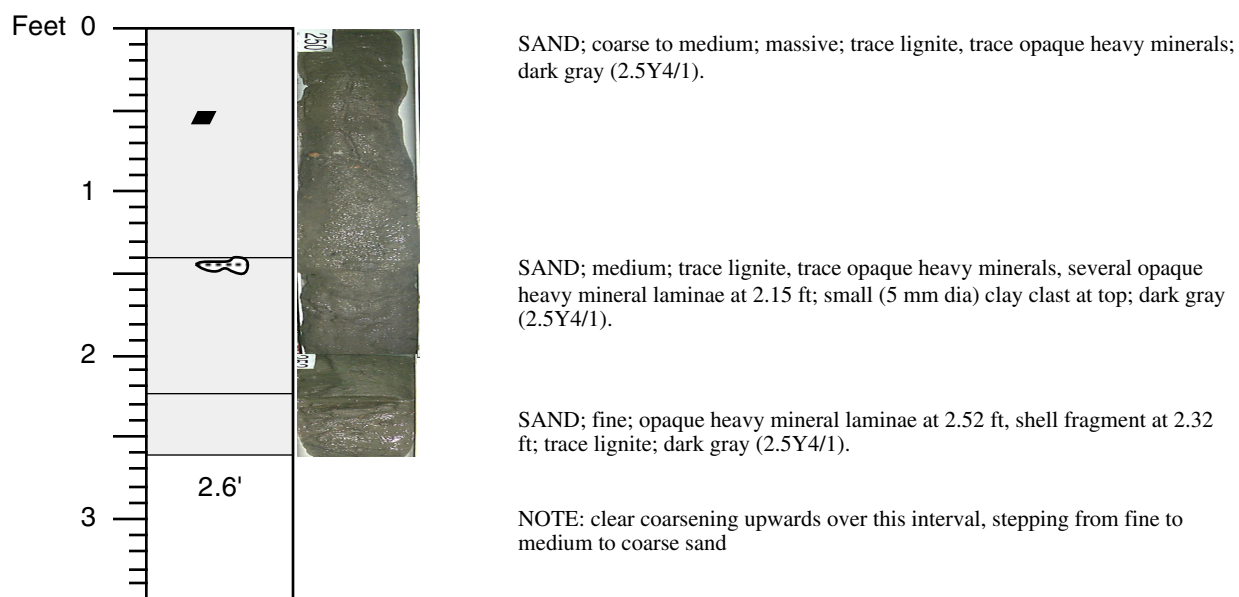
CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

46



CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

47



174AX BB (Qj32-27)

Core # 48

Date: 5/20/00

Described by: SB, JU

Start Depth: 250 ft

Stop Depth: 253.5 ft

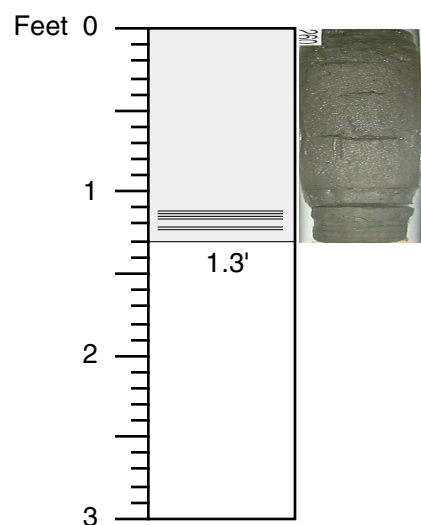
Recovery = 2.6 ft

Core 49 (253.5-260 ft) NO RECOVERY

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

48



SAND; coarsens upward from fine to medium; rhythmic opaque heavy mineral lamination at 1 cm intervals from 1.14 to 1.25 ft; possible burrow structures of millimeter size; some organic fragments (stem? about 7 mm long), trace lignite; very small amount of mica, some quartz granules (1%); gray (2.5Y5/1).

Note: When this core section was transferred to the PVC tubing, the upper end expanded, causing the whole section to register as 1.55 ft in the photograph as opposed to the length of 1.3 ft when described. The sand was significantly compacted and "fat" when extruded from the core barrel.

174AX BB (Qj32-27)

Core # 50

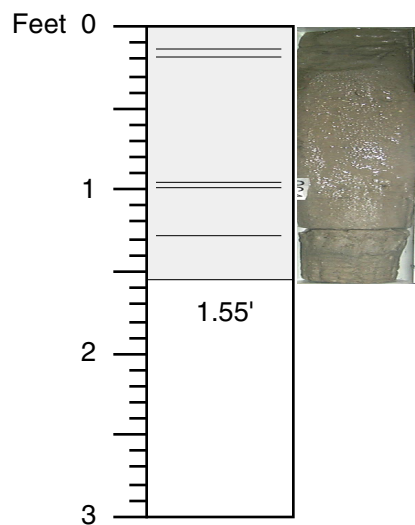
Date: 5/20/00

Described by: JU, SB

Start Depth: 260 ft

Stop Depth: 263 ft

Recovery = 1.3 ft



SAND; coarsening upward from fine to very fine; continuation of rhythmic bedding of opaque heavy mineral laminae at 1 cm intervals from section above, most prominently at 0.15 ft, 0.17 ft, 0.95 ft, 1.0 ft and 1.3 ft, some laminae are not parallel, but intersect suggesting possible draping on a cross bed structure; gray (5YR6/1).

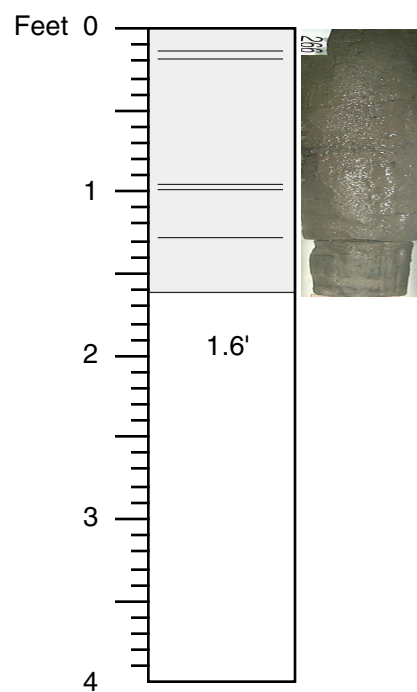
174AX BB (Qj32-27)

Core # 51
Date: 5/20/00
Described by: SB, JU
Start Depth: 263 ft
Stop Depth: 266 ft
Recovery = 1.55 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

50



SAND; coarsening upward from fine to medium; continuation of rhythmic bedding of opaque heavy mineral laminae at 1 cm intervals with laminae at around 0.7 to 0.8 ft, 1.1 ft, 1.25 to 1.32 ft, and 1.5 ft, spacing on several ohm laminae is approximately 1 cm; slightly micaceous, slightly lignitic; grayish brown (2.5Y5/2).

Note: We seem to be picking up parts of a coarsening upward sequence on each run. We may be losing the very fine fraction in the drilling process. The core in the shoe is less disturbed by drilling mud, so a better representation of the core section; color of core in shoe: 5Y6/1 (gray)

Also, in this material, we seem to be able to capture in the core about the same length of sample over several runs, i.e. @ 1.6-2.0 ft per run

174AX BB (Qj32-27)

Core # 52

Date: 5/20/00

Described by: JU, SB

Start Depth: 266 ft

Stop Depth: 270 ft

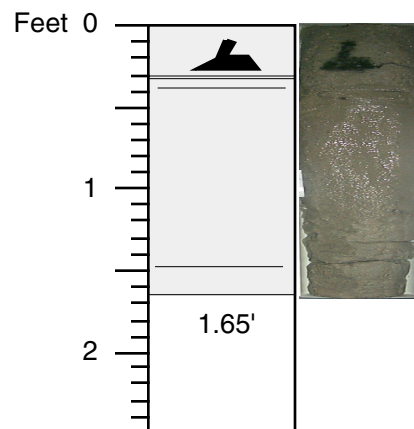
Recovery = 1.6 ft

Core 53 (270-275 ft) NO RECOVERY

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

51



SAND; coarse, fair sorting; slightly micaceous, greater than 1%, quartz granules; T-shaped, 3 by 45 cm, pyritized lignite nodule extends down to contact with lower sand; gray (2.5 Y 5/1).

SAND; medium, fair sorting; opaque heavy mineral laminae at 0.4 ft, 1.5 ft; trace lignite and opaques throughout; gray (2.5 Y 5/1).

174AX BB (Qj32-27)

Core # 54

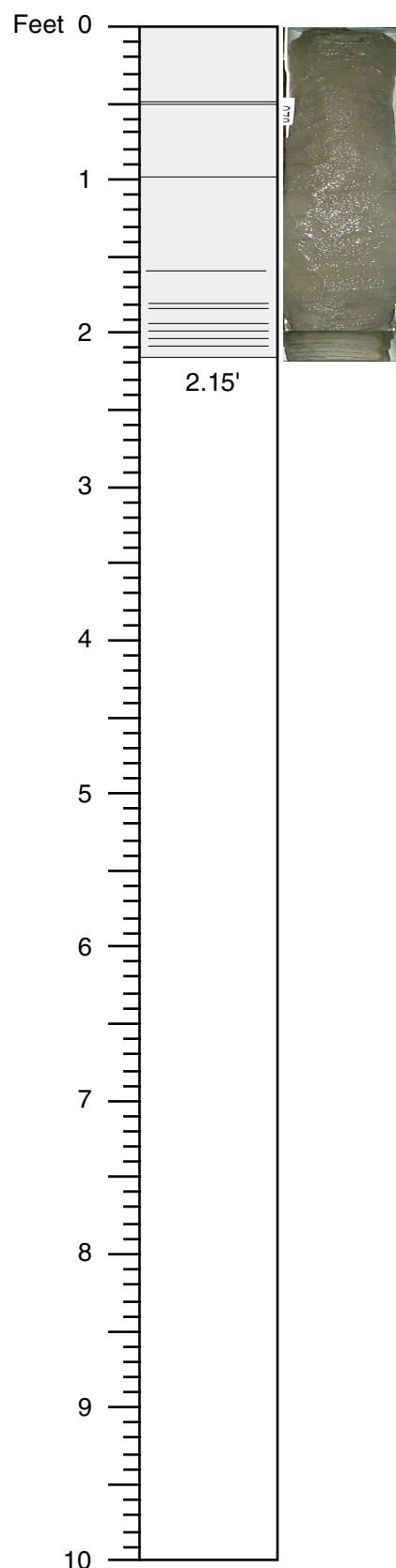
Date: 5/21/00

Described by: SB, JU

Start Depth: 275 ft

Stop Depth: 277.5 ft

Recovery = 1.65 ft



SAND; fine; grains subrounded; trace opaque heavy minerals; massive; gray (2.5 Y 5/1).

SAND; medium; trace opaque heavy minerals, trace lignite; gray (2.5 Y 5/1).

SAND; fine to medium; laminae of opaque heavy minerals at 1.6, 1.8, 1.85, 1.95, 2.05, and 2.10 ft; lignite laminae at 1.97 ft; gray (2.5 Y 5/1). On either side of opaque heavy mineral laminae, sand appears a lignite color (2.5 Y 6/1, gray).

174AX BB (Qj32-27)

Core # 55

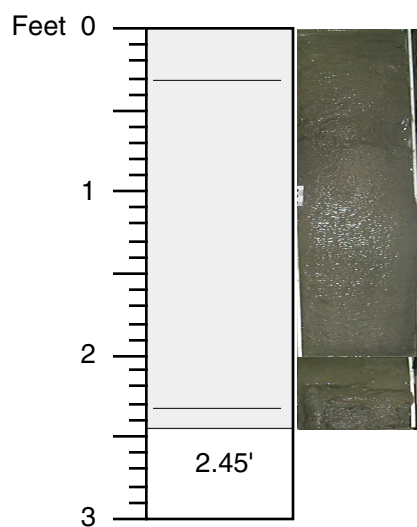
Date: 5/21/00

Described by: SB, JU

Start Depth: 277.5 ft

Stop Depth: 285 ft

Recovery = 2.15 ft



SAND; gradational change upward from medium to fine-medium to fine, sub-rounded to sub-angular grains; trace opaque heavy minerals and concentration in lamina at 0.36 and 2.30 ft; gray (2.5 Y 5/1).

174AX BB (Qj32-27)

Core # 56

Date: 5/21/00

Described by: SJB, JU

Start Depth: 285 ft

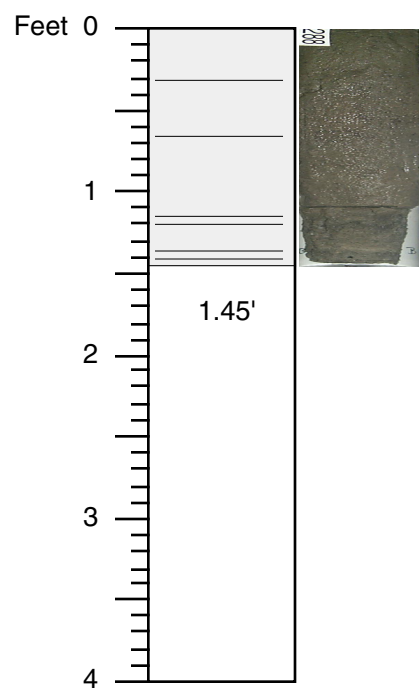
Stop Depth: 288 ft

Recovery = 2.45 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

54



SAND; gradational change upward from fine to medium; trace opaque heavy minerals and lignite; opaque heavy minerals concentrated in laminae at 0.3 ft (2 mm thick), 0.67 ft (2 mm thick), 1.16 ft (5 mm thick), 1.20 ft (1.5 cm thick), 1.32 ft (5 mm); 1.40 ft (2 mm thick); overall color gray (2.5 Y 5/1); opaque heavy minerals at 1.20 ft are dark gray (2.5 Y 6/1); diffuse band of lighter color gray (2.5Y6/1) directly above opaque heavy minerals at 1.40 ft.

174AX BB (Qj32-27)

Core # 57

Date: 5/21/00

Described by: SJB, JU

Start Depth: 288 ft

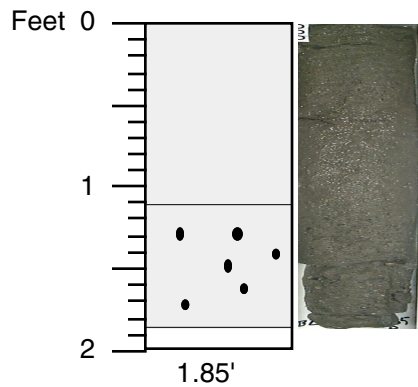
Stop Depth: 292 ft

Recovery = 1.45 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

55



SAND; coarse to medium, grains sub-rounded; trace opaque heavy minerals from 0.0 to 0.15 ft; gray (2.5 Y 5/1).

SAND; medium, sub-rounded, trace opaque heavy minerals, lignite or opaque heavy minerals stringers from 0.55 to 0.60 ft; gray (2.5 Y 5/1).

SAND; very coarse, 5-7 % granules; grains sub-angular, 3 % opaque heavy minerals, a pebble of iron cement at 1.42; massive; gray (2.5 Y 5/1).

Note: At the bottom of run driller noted "chatter" indicating the drill bit encountered gravel, but no gravel was recovered in the core barrel; see description and photo for core 59 for gravel pieces

174AX BB (Qj32-27)

Core # 58

Date: 5/21/00

Described by: SJB, JU

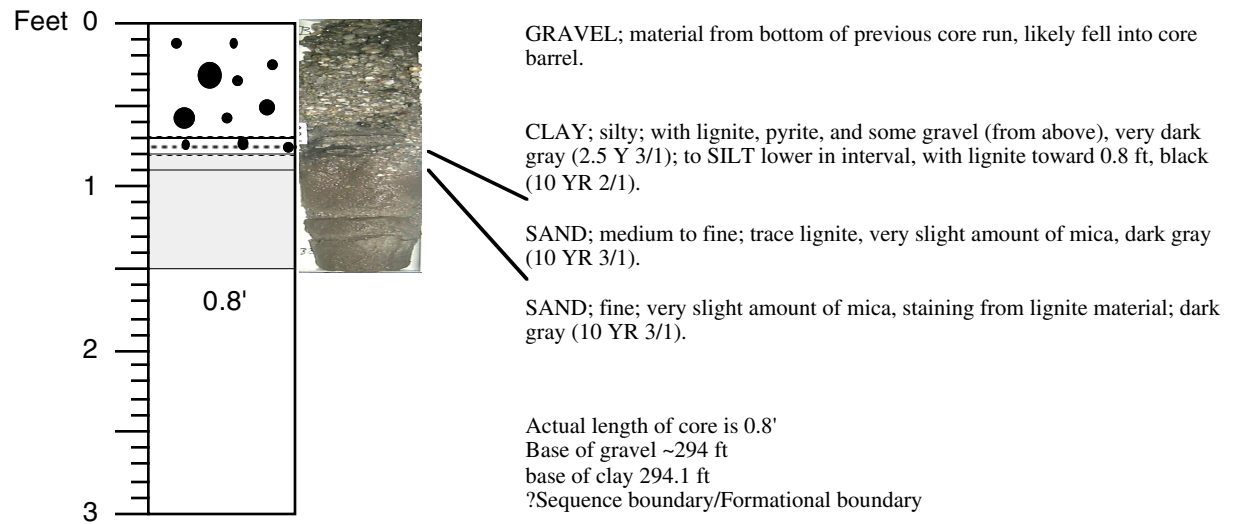
Start Depth: 292 ft

Stop Depth: 294 ft

Recovery = 1.85 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

56



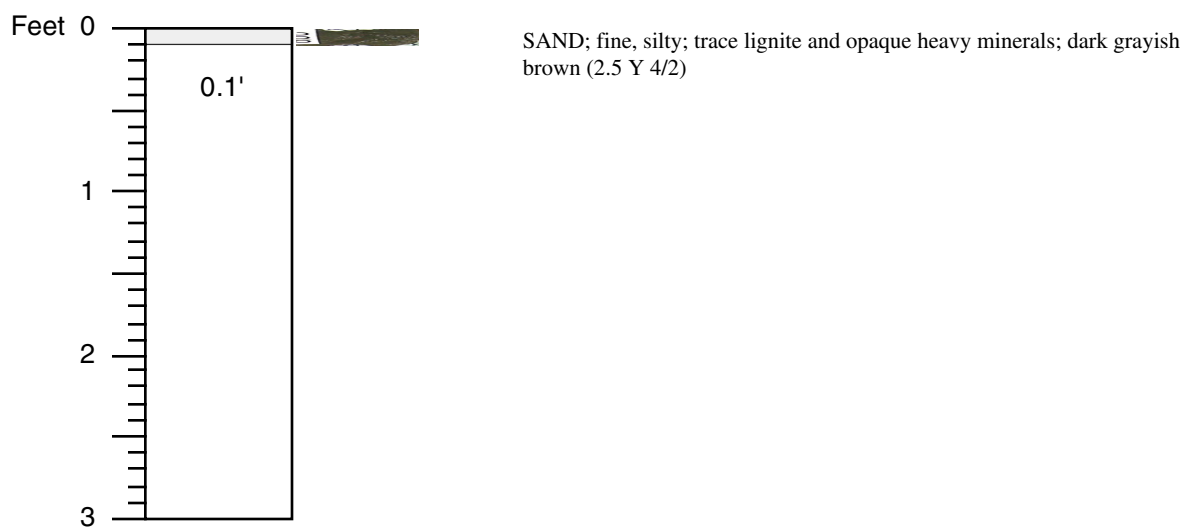
174AX BB (Qj32-27)

Core # 59
 Date: 5/21/00
 Described by: SJB, JU

Start Depth: 294 ft
 Stop Depth: 297 ft
 Recovery = 0.8 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

57



174AX BB (Qj32-27)

Core # 60

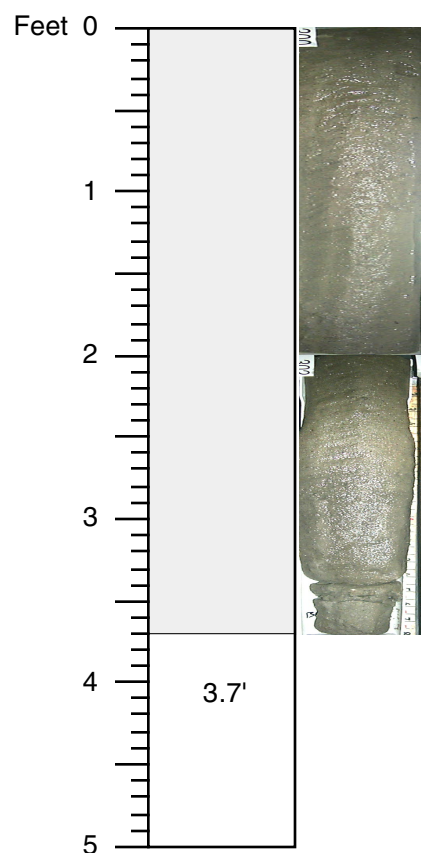
Date: 5/21/00

Described by: SJB, JU

Start Depth: 297 ft

Stop Depth: 300 ft

Recovery = 0.1 ft

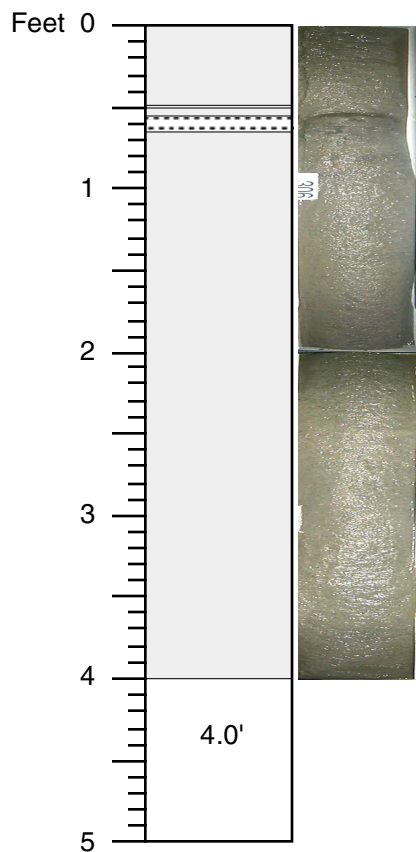


SAND; fine coarsening upward to medium with 1% coarse and granules, well sorted; grains sub-rounded, trace lignite, trace mica, trace opaque heavy minerals, disseminated throughout; massive, unconsolidated.

174AX BB (Qj32-27)

Core # 61
Date: 5/22/00
Described by: JU, SAS

Start Depth: 300 ft
Stop Depth: 305 ft
Recovery = 3.7 ft



SAND; medium to fine, well sorted; sub-rounded grains, trace opaque heavy minerals, trace lignite; massive, dark gray (5 Y 4/1).

SAND; medium to fine, dark stained from organics, black (5 Y 2.5/1)

CLAY; silty, with organics as flecks and small fragments (5 mm size) giving the clay a dark color; very dark gray (2.5 Y 3/1).

SAND; medium to fine; trace opaque heavy minerals throughout, trace lignite, trace mica; massive; dark gray (5 Y 4/1)

174AX BB (Qj32-27)

Core # 62

Date: 5/22/00

Described by: JU, SAS

Start Depth: 305 ft

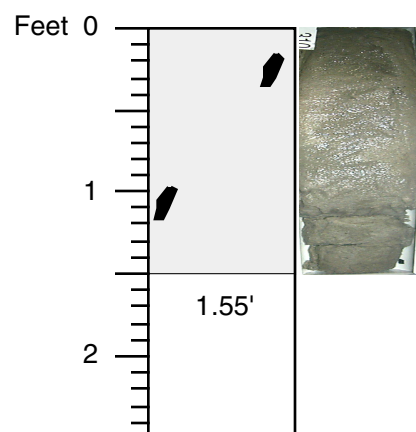
Stop Depth: 310 ft

Recovery = 4.0 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

60



SAND; coarsens upward from medium-fine to fine; 2% opaque heavy minerals; massive, evidence of burrowing, with darker clay-filled burrows at 0.27 and 1.04 feet, no lignite, no mica; gray (2.5 Y 5/1)

174AX BB (Qj32-27)

Core # 63

Date: 5/22/00

Described by: JU, SAS

Start Depth: 310 ft

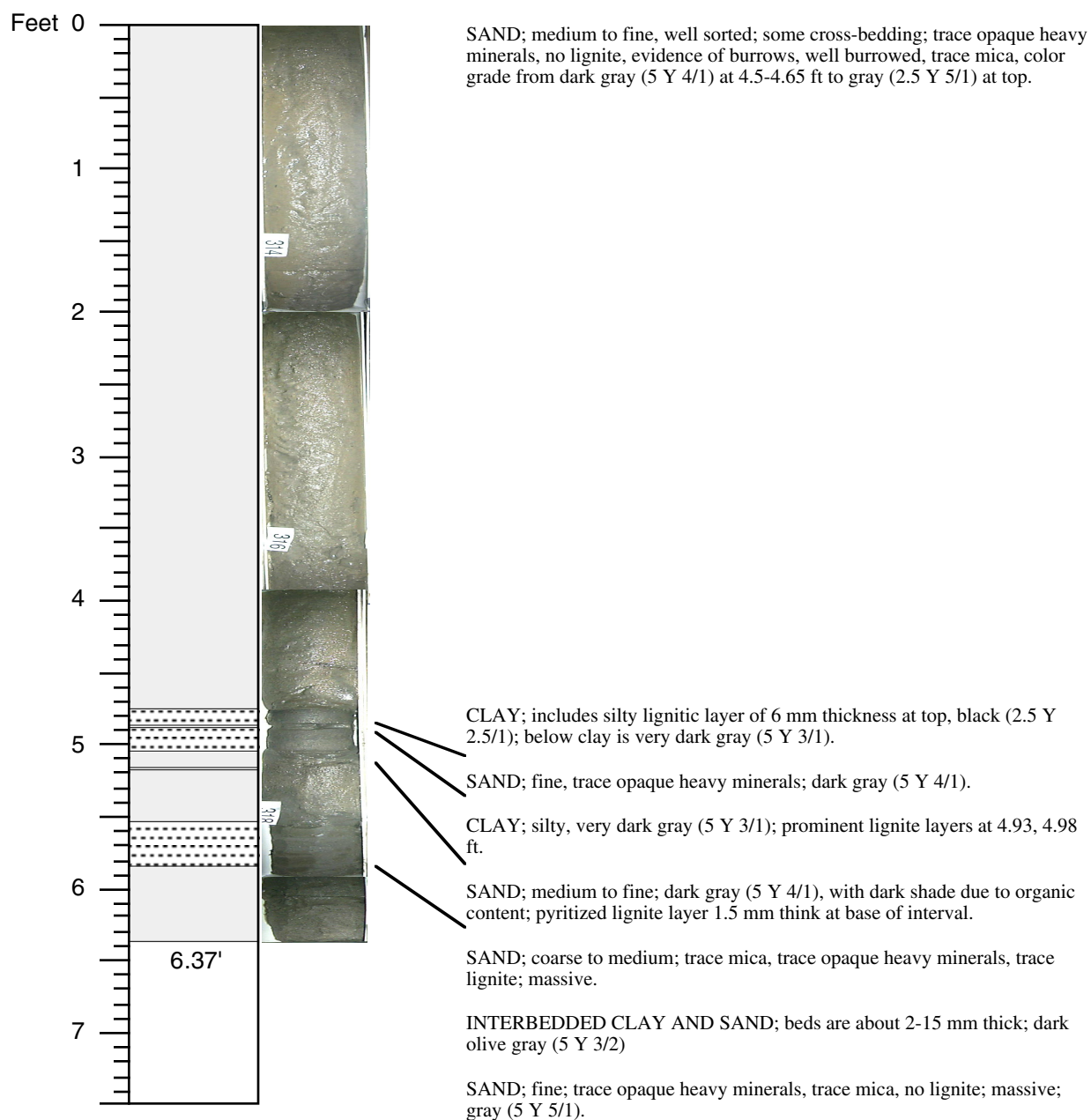
Stop Depth: 312.5 ft

Recovery = 4.0 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

61



174AX BB (Qj32-27)

Core # 64

Date: 5/22/00

Described by: JU, KGM, SAS

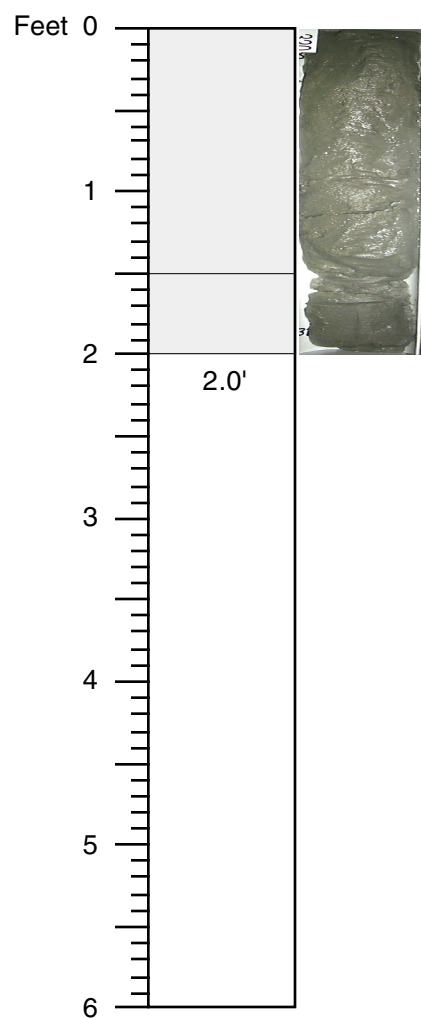
Start Depth: 312.5 ft

Stop Depth: 320 ft

Recovery = 6.37 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

62



SAND; fine to medium, well sorted, 2 % coarse sand; trace mica, trace opaque heavy minerals, trace lignite; massive; gray (5 Y 5/1).

SAND; fine, very well sorted; trace lignite, trace opaque heavy minerals; gray (5 Y 5/1).

174AX BB (Qj32-27)

Core # 65

Date: 5/22/00

Described by: JU, KGM, SAS

Start Depth: 320 ft

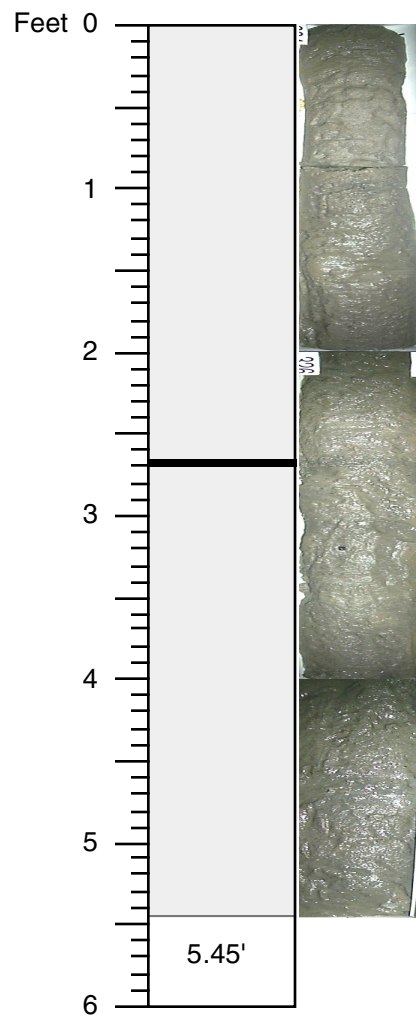
Stop Depth: 324 ft

Recovery = 2.0 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

63



SAND; fine to medium; slightly clayey, increasing cohesiveness; trace lignite, trace mica, trace opaque heavy minerals; massive; gray (2.5 Y 5/1); contains abundant burrow structures; lignite is less abundant in the upper 1.0 ft; lignite layer of 1 cm thickness at 2.65-2.68 ft.

174AX BB (Qj32-27)

Core # 66

Date: 5/22/00

Described by: JU, KGM, SAS

Start Depth: 324 ft

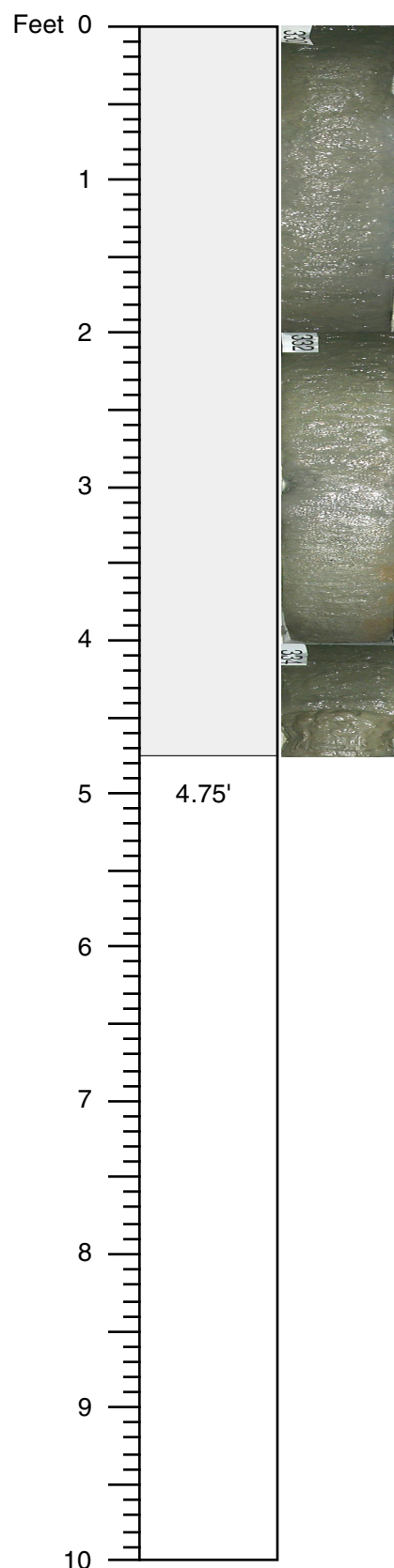
Stop Depth: 330 ft

Recovery = 5.45 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

64



SAND; coarsens from fine to medium-fine; trace phosphate nodules (greater than 1 mm to 1.55 mm in diameter) throughout, prominent submillimeter-scale lighter colored clay layers at 1.85 to 2.5 ft and 3.0 to 4.2 ft, spaced at about 1 cm intervals, trace opaque heavy minerals, trace lignite; dark gray (2.5 Y 4/1).

174AX BB (Qj32-27)

Core # 67

Date: 5/22/00

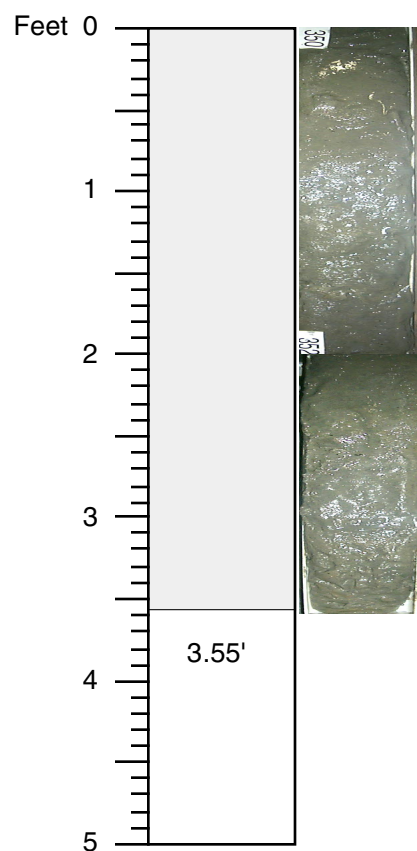
Described by: JU, KGM, SAS

Start Depth: 330 ft

Stop Depth: 340 ft

Recovery = 4.75 ft

Core 68 (340-350 ft) NO RECOVERY



SAND; "soupy" fine-medium quartz sand with common coarse grains including purple grains (amethyst); trace to 1% opaque heavy minerals; structure massive due to drilling disturbance, trace lignite; dark gray (5 Y 4/1).

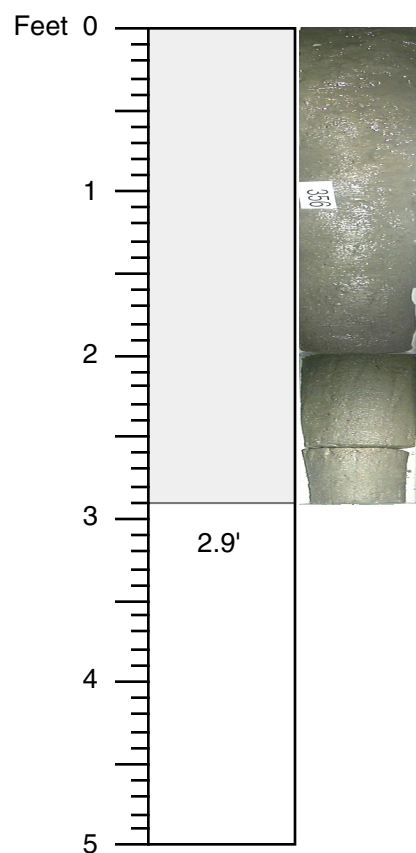
174AX BB (Qj32-27)

Core # 69
 Date: 5/23/00
 Described by: KM

Start Depth: 350 ft
 Stop Depth: 355 ft
 Recovery = 3.55 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

66



SAND; fine to medium, well sorted; unconsolidated, "soupy" in top 1.5 ft, firmer in lower part; trace to 1% opaque heavy minerals, trace lignite, some amethyst grains; unbedded; gray (5 Y 4/1).

174AX BB (Qj32-27)

Core # 70

Date: 5/23/00

Described by: SAS

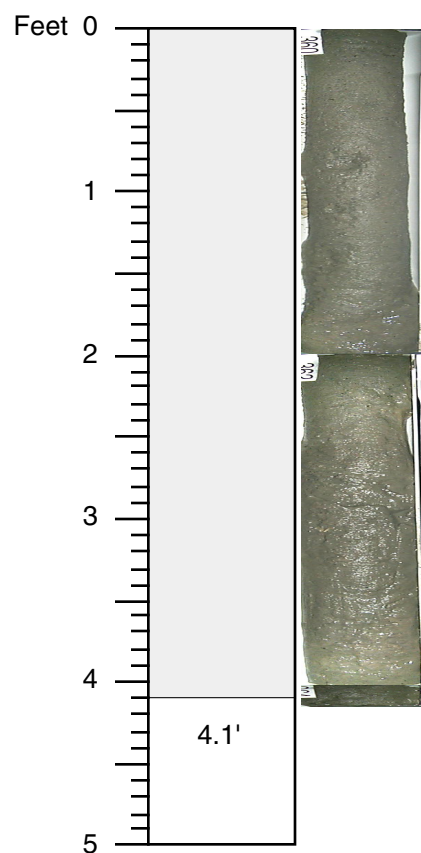
Start Depth: 355 ft

Stop Depth: 360 ft

Recovery = 2.9 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

67



SAND; fine to medium, well sorted; trace lignite, trace-1% opaque heavy minerals, trace mica, more cohesive than previous core; massive; dark gray (5 Y 4/1).

174AX BB (Qj32-27)

Core # 71

Date: 5/23/00

Described by: SAS

Start Depth: 360 ft

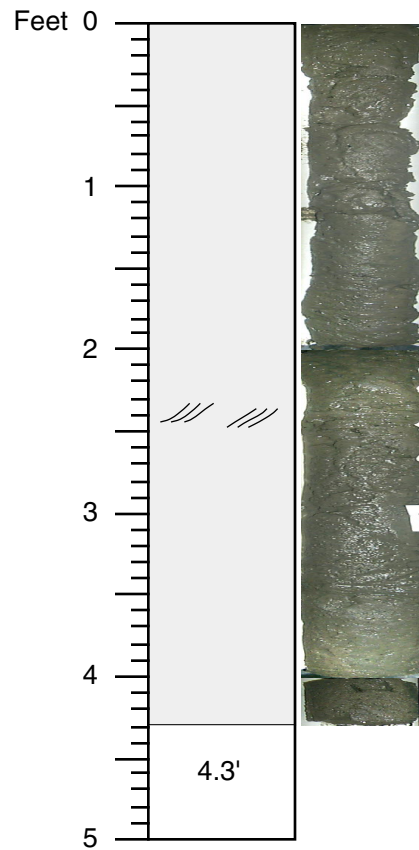
Stop Depth: 365 ft

Recovery = 4.1 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

68



SAND; fine to medium, with coarse to medium from 4.1-4.3 ft; generally well sorted though coarse quartz grains of various colors still occur, lignite in trace quantities, trace opaque heavy minerals, trace mica; generally massive, though distinct cross-bedding from 2.4-2.6 ft, with hints of cross-bedding from 2.6-4.1 ft; slightly more clay makes more cohesive; dark gray (5 Y 4/1).

174AX BB (Qj32-27)

Core # 72

Date: 5/23/00

Described by: KM

Start Depth: 365 ft

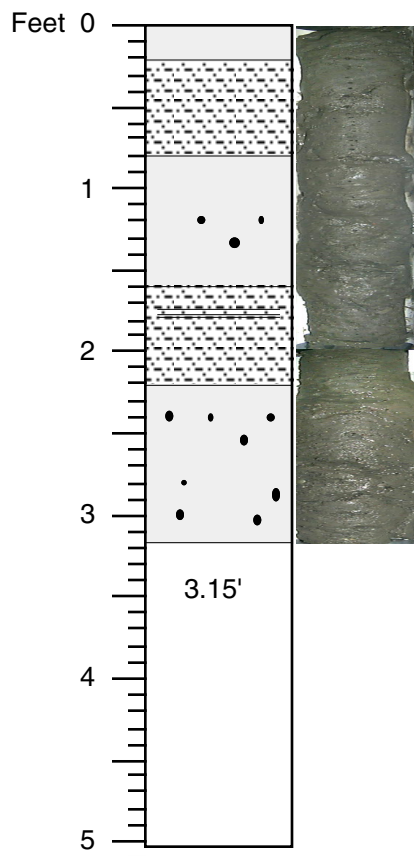
Stop Depth: 370 ft

Recovery = 4.3 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

69



SAND; fine to medium, well sorted, clayey; common very coarse sand, granules, and pebbles on outside, decreasing upsection; these are present (though less common) in clean core; includes phosphate pebbles; trace shell and shell fragments occur at base of core; unconsolidated; massive bedding due to bioturbation, with hints of cross-lamination in clayey sections; clay content varies, very slightly clayey from 0.0- 0.2 ft, slightly from 0.2-0.8 ft, very slightly from 0.8-1.6 ft, clayey from 1.6 –2.2 ft, clay laminae from 1.77-1.79 ft, and very slightly clayey from 2.2-3.1 ft; dark gray (5 Y 4/1).

174AX BB (Qj32-27)

Core # 73

Date: 5/23/00

Described by: KM

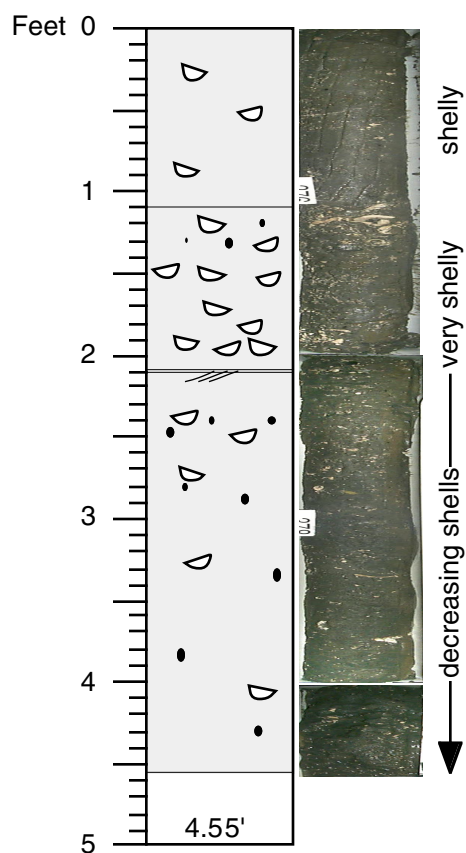
Start Depth: 370 ft

Stop Depth: 375 ft

Recovery = 3.15 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

70



SAND; fine to medium; slightly clayey, shelly with coarse quartz phosphate grains and granules and pebbles, increasing shelliness from bottom of core to 2.1 ft, very shelly from 1.1 to 2.1 ft; shells mostly broken, few whole turrillid gastropods (large gastropod at 3.0 ft), clams (*Mercenaria*), large shell at 3.7 ft; less than 1 % opaque heavy minerals, large phosphate pebbles (1.5 mm at 1.3 ft, 5 mm at 2.4 ft); massive bedding, possible small channel and cross bed at 2.1 ft; dark gray (5 Y 4/1).

174AX BB (Qj32-27)

Core # 74

Date: 5/23/00

Described by: KM

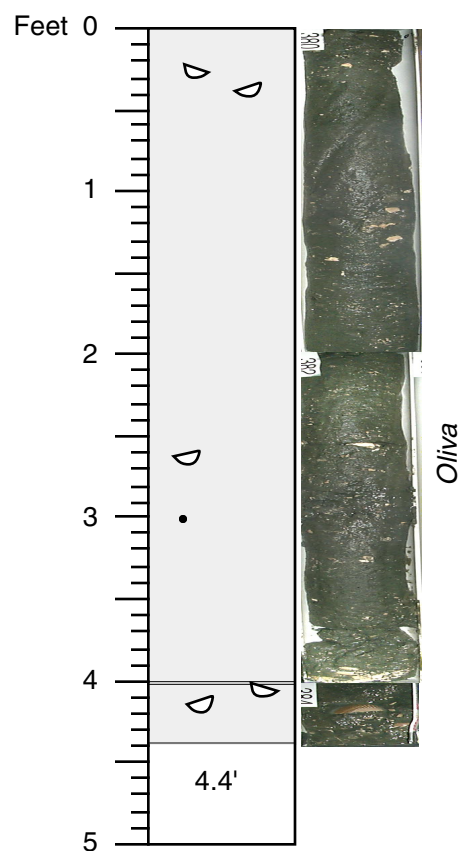
Start Depth: 375 ft

Stop Depth: 380 ft

Recovery = 4.55 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

71



SAND; fine to medium, well sorted, clayey; 2-3 % opaque heavy minerals, shelly, shells mostly broken; large shells from 4.0-4.4 ft, more abundant towards bottom; 10 mm phosphate pebble at 3.0 ft; massive; darker gray (5 Y 4/1).

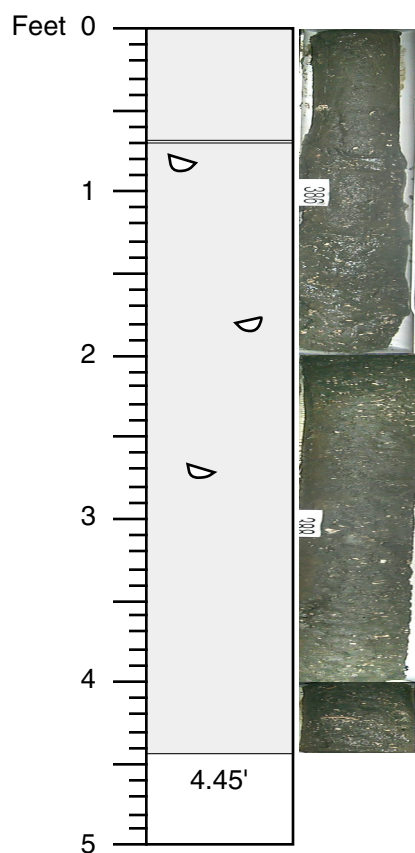
174AX BB (Qj32-27)

Core # 75
 Date: 5/23/00
 Described by: SAS, JVB

Start Depth: 380 ft
 Stop Depth: 385 ft
 Recovery = 4.4 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

72



SAND; fine to medium, clayey, with few shells, firm.

SAND; medium; bivalve and gastropod shells more abundant than above, including juvenile shells and broken adult shell; ~3mm phosphate grains throughout; massive; very dark gray (2.5 Y 3/1).

174AX BB (Qj32-27)

Core # 76

Date: 5/23/00

Described by: SAS, JVB

Start Depth: 385 ft

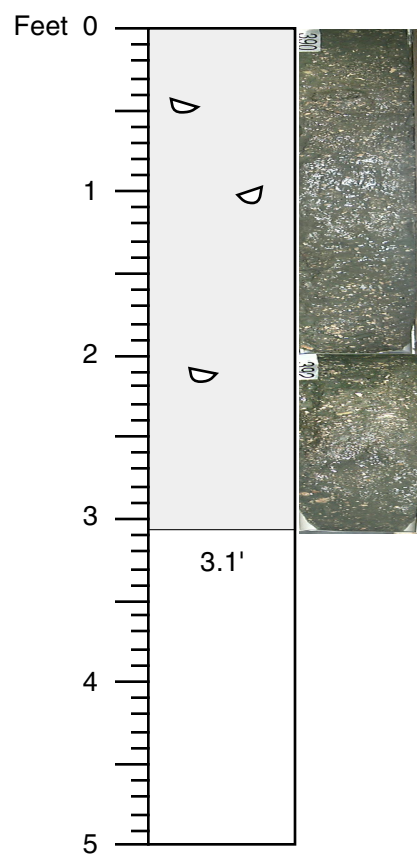
Stop Depth: 390 ft

Recovery = 4.45 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

73



SAND; fine to medium, with granules (quartz) and pebbles; shells very abundant, more numerous than in previous cores, abundant shell fragments, 5% opaque heavy minerals; massive, unconsolidated and "soupy"; dark gray(5 Y 4/1).

174AX BB (Qj32-27)

Core # 77

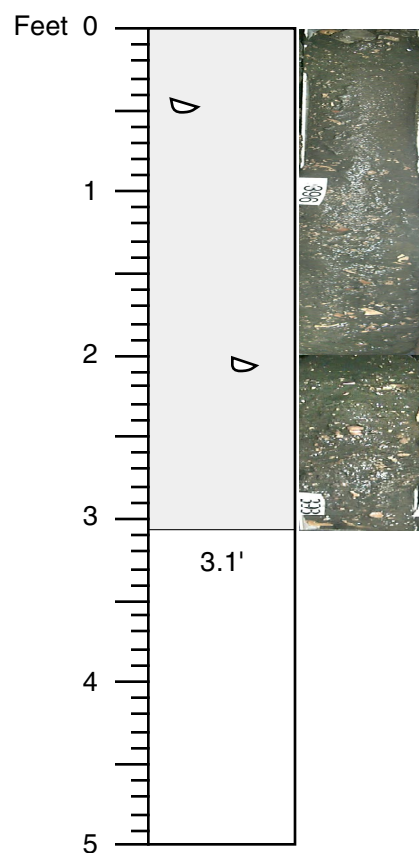
Date: 5/23/00

Described by: SAS, JVB

Start Depth: 390 ft

Stop Depth: 395 ft

Recovery = 3.1 ft



SAND; fine to medium, well sorted, clayey; abundant shells throughout, shells larger than above; trace lignite, ~5% opaque heavy minerals; massive; dark gray (5 Y 4/1).

174AX BB (Qj32-27)

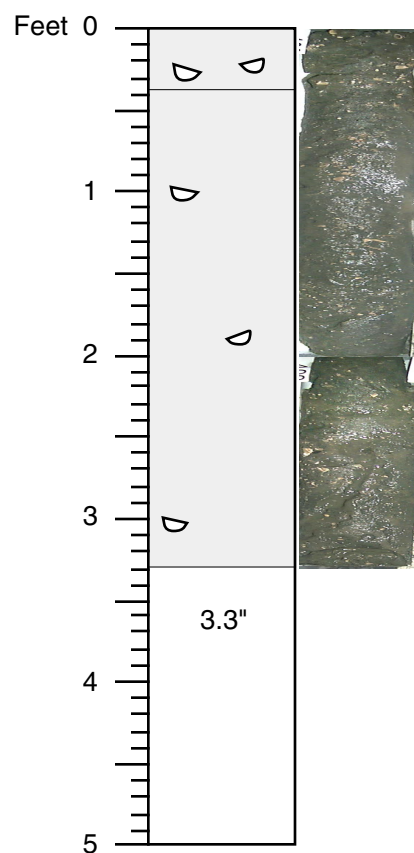
Core # 78
Date: 5/23/00
Described by: SAS, JVB

Start Depth: 395 ft
Stop Depth: 400 ft
Recovery = 3.1 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

75



SAND; fine to medium, well sorted, very clayey; includes quartz granules up to 4 mm and fragmented shells, 5-7% opaque heavy minerals; massive; dark olive gray (5 Y 3/2).

SAND; fine to medium, well sorted, very clayey; includes quartz granules up to 4 mm and fragmented shells; all shells appear to be fresh; 5-7% opaque heavy minerals; massive; dark olive gray (5 Y 3/2).

174AX BB (Qj32-27)

Core # 79

Date: 5/24/00

Described by: SAS, JVB

Start Depth: 400 ft

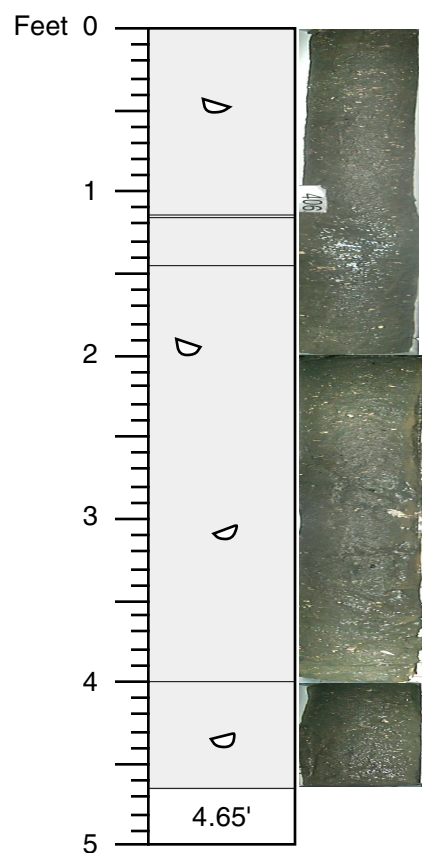
Stop Depth: 405 ft

Recovery = 3.3 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

76



SAND; fine to medium sand; 5 % opaque heavy minerals, trace lignite in the upper half of the core; some quartz granules, massive flakes of mica; fewer and smaller shells; possible faint evidence for a mottled (bioturbated) texture; firmer intervals from 0.0 to 1.1 ft and 1.45 to 4.65 ft; soupy and unconsolidated from 1.1 to 1.45, soft from 4.0 to 4.65 ft; dark olive gray (5 Y 3/2).

174AX BB (Qj32-27)

Core # 80

Date: 5/24/00

Described by: SAS, JVB

Start Depth: 405 ft

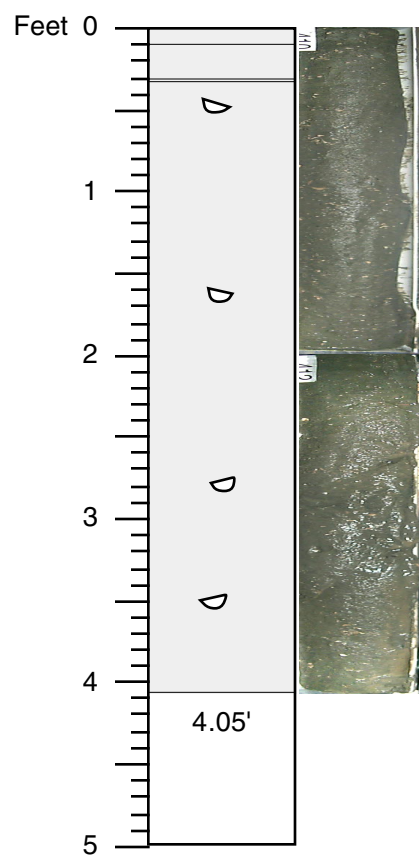
Stop Depth: 410 ft

Recovery = 4.65 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

77



SAND; fine, some medium, well sorted; grains sub-rounded; abundant shells/shell fragments, no large shells; 5-7% opaque heavy minerals, trace mica, trace lignite, massive-no burrows/mottles; very firm zone from 0.1 to 0.3 ft; dark olive gray (5Y 3/2).

174AX BB (Qj32-27)

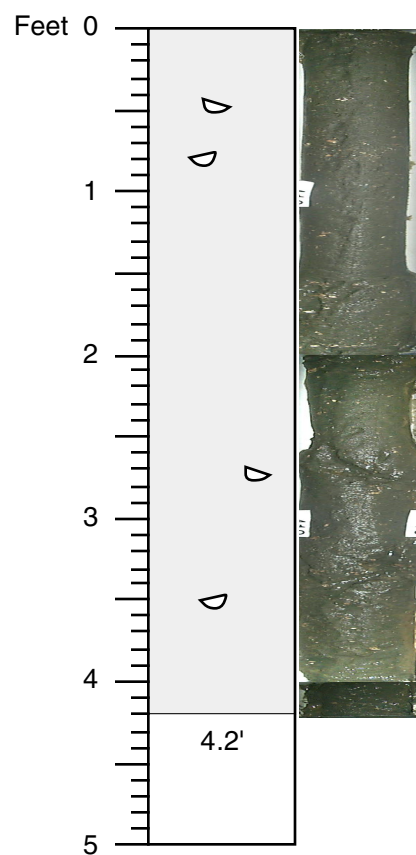
Core # 81
Date: 5/24/00
Described by: SAS, JVB

Start Depth: 410 ft
Stop Depth: 415 ft
Recovery = 4.05 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

78



SAND; fine, well sorted; grains sub-rounded; 5% opaque heavy minerals, trace mica, trace lignite but more noticeable than above; shelly, all shells are fine or small, some whole gastropods; massive; dark greenish gray (GLEY 1 5GY4/1).

174AX BB (Qj32-27)

Core # 82

Date: 5/24/00

Described by: SAS, JVB

Start Depth: 415 ft

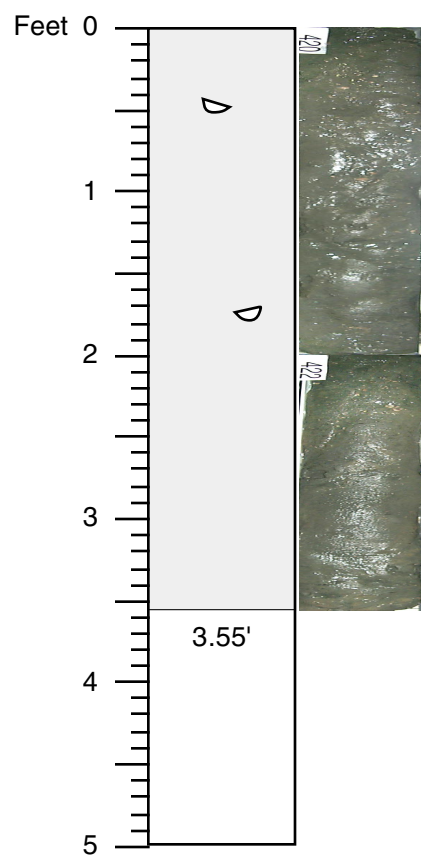
Stop Depth: 420 ft

Recovery = 4.2 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

79



SAND; fine, very few granules, well sorted; grains well rounded, quartzose with 5% opaque heavy minerals, trace mica, trace lignite includes larger pieces; very soft, little clay matrix holding it together; lower part of core characterized by finer and better sorting and rounding; fine shells, dewier than above, some have original (?) color pattern; dark greenish gray (GLEY 10 GY4/1).

174AX BB (Qj32-27)

Core # 83

Date: 5/24/00

Described by: JVB, SAS

Start Depth: 420 ft

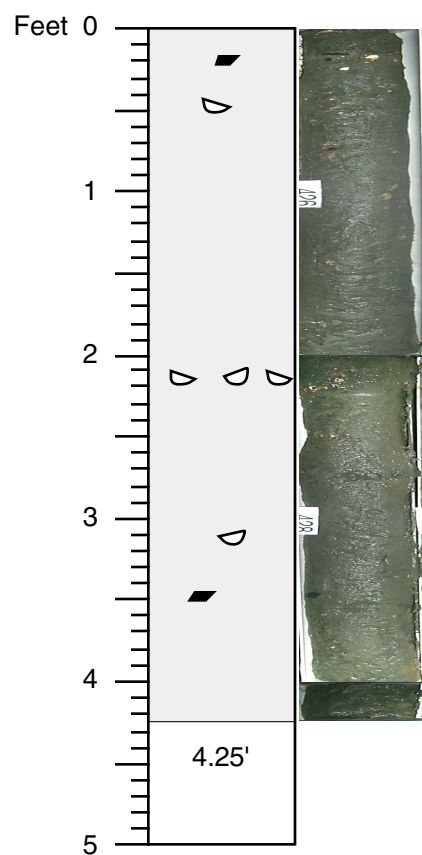
Stop Depth: 425 ft

Recovery = 3.55 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

80



SAND; fine to very fine, clayey; trace mica, trace lignite with more and larger pieces than above; Small shells and shell fragments, thin walled, fewer than above; lignite pieces at 0.2 and 3.5 ft, 1.5 cm long; wet and unconsolidated, mottled texture due to bioturbation; dark greenish gray (10GY4/1).

174AX BB (Qj32-27)

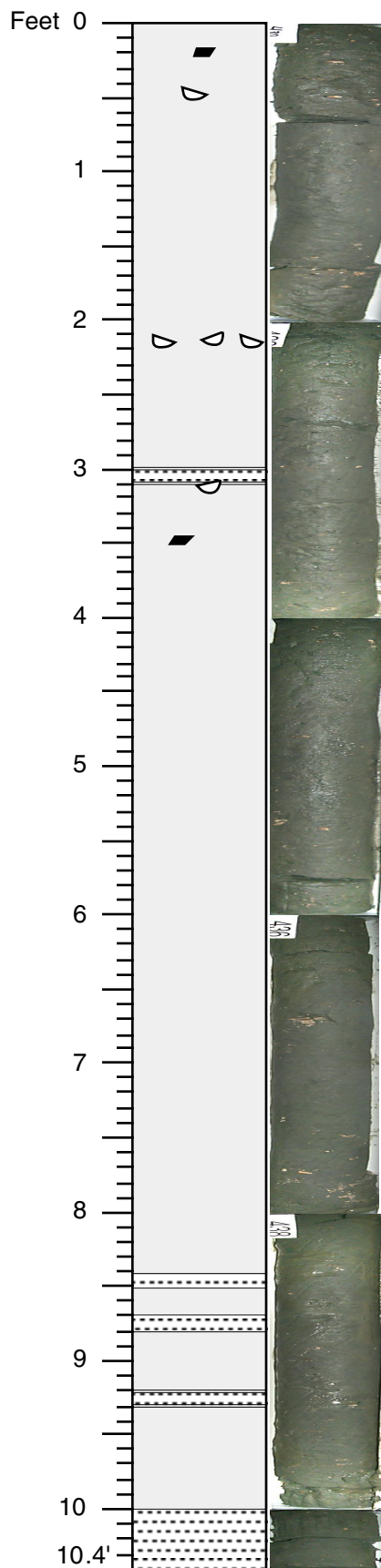
Core # 84
Date: 5/24/00
Described by: SAS, JVB

Start Depth: 425 ft
Stop Depth: 430 ft
Recovery = 4.25 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

81



SAND; fine to very fine, well sorted; abundant silt, trace mica but more common than above; trace lignite; phosphate granules, 5-7% opaque heavy minerals; overall coarsens upward, with clayey interval at very bottom, and greater silt content in lower 2 feet than in upper part; shells are common, fine debris and thin walled; mottled texture, dark greenish gray (10GY 4/1).

174AX BB (Qj32-27)

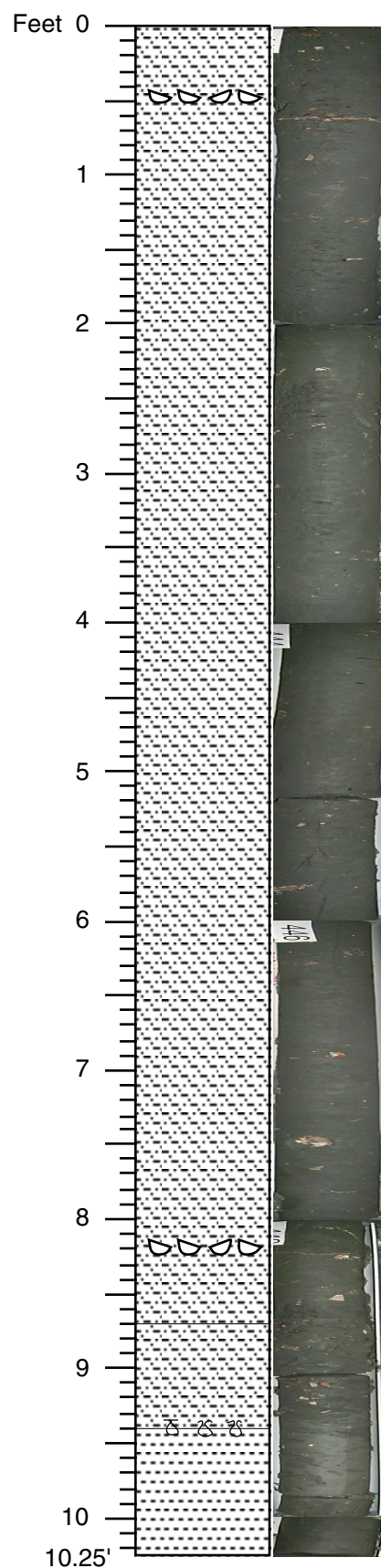
Core # 85
Date: 5/24/00
Described by: JVB, SAS

Start Depth: 430 ft
Stop Depth: 440 ft
Recovery = 10.4 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

82



SILT; sandy, very fine; trace of mica, small shells and fine shell fragments throughout, 5-7% opaque heavy minerals, heavy bioturbation, some clay layers throughout, more common in bottom half; abundant burrows from 9.1 ft to the contact at 9.4 ft, 1 cm diameter, filled with clay from the underlying unit; from top to 2.6 feet core surface is washed out, obscuring possible laminations and burrows; dark greenish gray (5GY4/1).

174AX BB (Qj32-27)

Core # 86
Date: 5/24/00
Described by: JVB, SAS

Start Depth: 440 ft
Stop Depth: 450 ft
Recovery = 10.25 ft

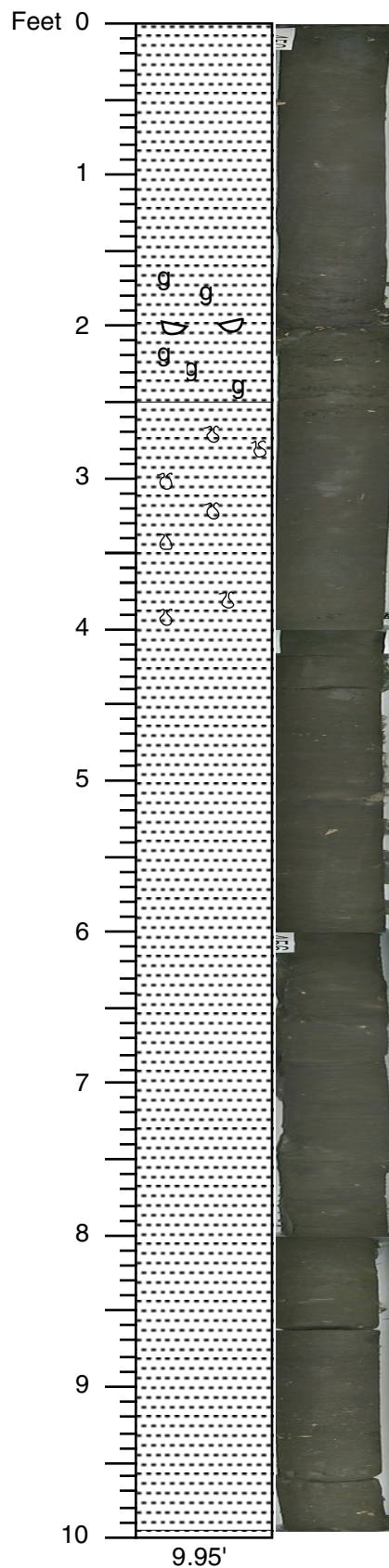
SILT; veeery fine snad with common small shells and shell debris; sandier than above and with veryfine to silt sized glauconite

burrowed contact with overlying silt
CLAY; silty; burrowed contact with overlying silt, includes silt-filled burrows 1 cm diameter; dark gray (2.5Y 4/1).

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

83



CLAY; slightly silty; slightly micaceous; laminated and bioturbated, heavier bioturbation with small clay-filled burrows common below 2 ft, glauconite filled, glauconite is especially common between 1.5 and 2.6 ft; up to medium grain size and coarser than above; laminations throughout core; scattered thin shells, shell layer at 2.0 ft; dark greenish gray (5GY 4/1).

CLAY; slightly silty with some very fine mica and glauconite grains, around 8 ft there is more glauconite with scattered medium glauconite grains mixed in; laminations throughout but bioturbated to about 4 ft, larger burrows are filled with clay and medium glauconite, smaller burrows are filled with darker clay; scattered thin shells; dark greenish gray (5GY 4/1).

174AX BB (Qj32-27)

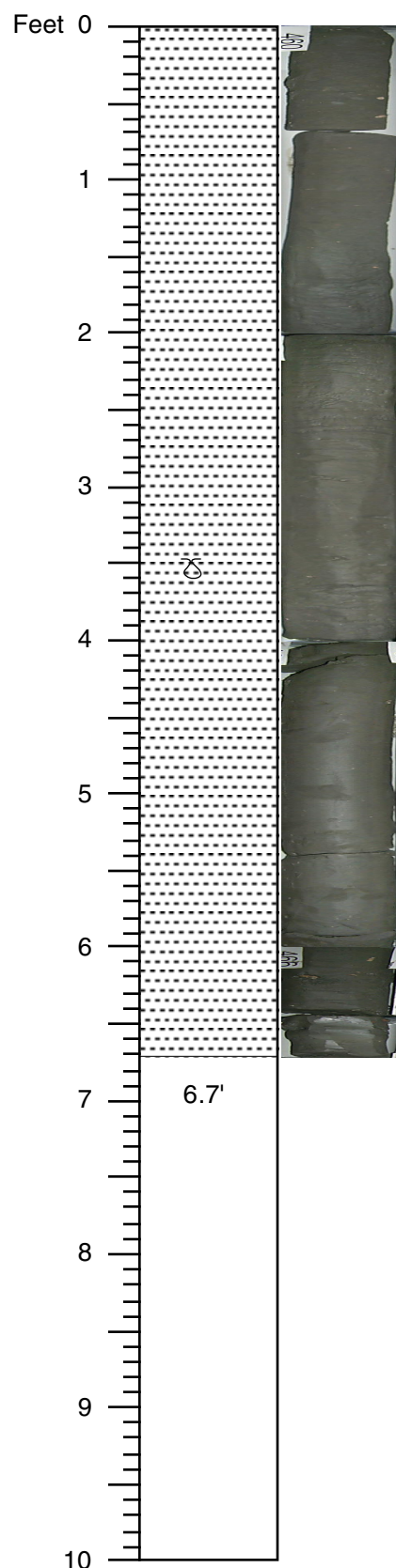
Core # 87
Date: 5/24/00
Described by: SAS, JVB

Start Depth: 450 ft
Stop Depth: 460 ft
Recovery = 9.95 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

84



CLAY; slightly silty; hard, burrows throughout (especially at 3.5 ft), laminations in upper part; trace mica, trace opaque heavy minerals; few shells, mainly high-spired gastropods; dark greenish gray (10YG4/1).

174AX BB (Qj32-27)

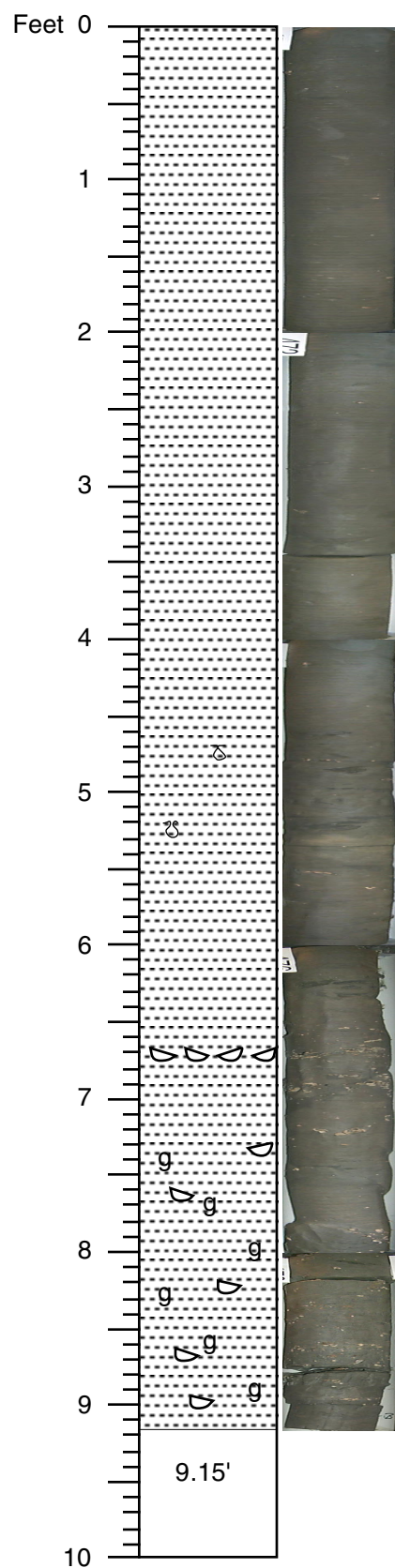
Core # 88
Date: 5/24/00
Described by: JVB, SAS

Start Depth: 460 ft
Stop Depth: 470 ft
Recovery = 6.7 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

85



CLAY; slightly silty; hard and dry, laminated, burrowed, burrows form concretions at 474.85 and 475.25 ft; trace glauconite below 7.25 ft; shell layers from 6.7-6.9 ft, mainly high-spined snails, scattered shells from 8.0-9.15 ft; dark green-gray (10Y4/1) and green-gray (10Y5/1).

174AX BB (Qj32-27)

Core # 89

Date: 5/24/00

Described by: JVB, SAS

Start Depth: 470 ft

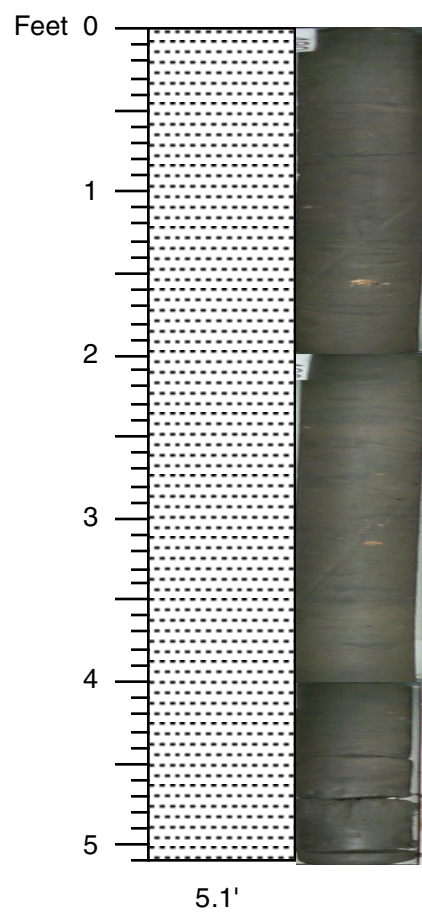
Stop Depth: 480 ft

Recovery = 9.15 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

86



CLAY; slightly silty and laminated, burrowed, hard; few small shells, mainly gastropods especially at 1.5 ft; traces of lignite and glauconite; greenish gray (10Y5/1); burrows darker colored, dark gray (5Y4/1).

174AX BB (Qj32-27)

Core # 90

Date: 5/25/00

Described by: SAS, JVB

Start Depth: 480 ft

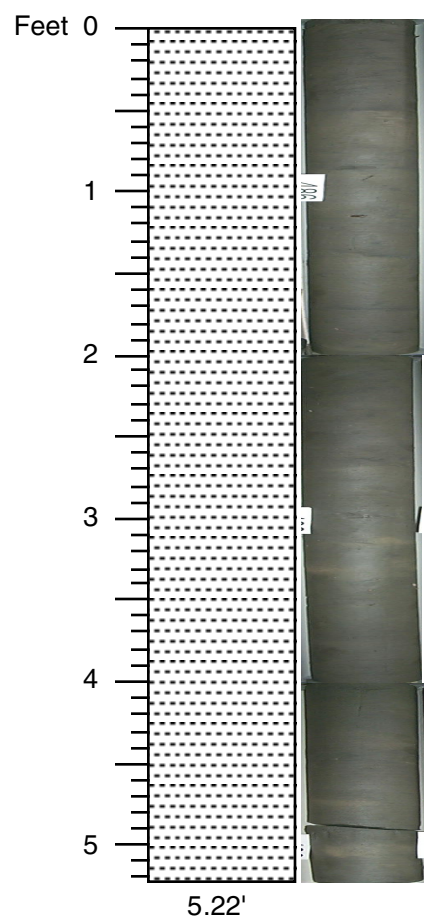
Stop Depth: 485 ft

Recovery = 5.1 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

87



CLAY; silty, slightly laminated, with burrows and trace amounts of shells; gastropod shell at 1 ft and laminations are not as prominent; some fine sand in burrow fills, and trace amounts of mica and lignite within the clay; dark greenish gray (10Y 4/1) with greenish black (10Y 2.5/1) burrow at 5.22 ft.

174AX BB (Qj32-27)

Core # 91

Date: 5/25/00

Described by: SAS, JVB

Start Depth: 485 ft

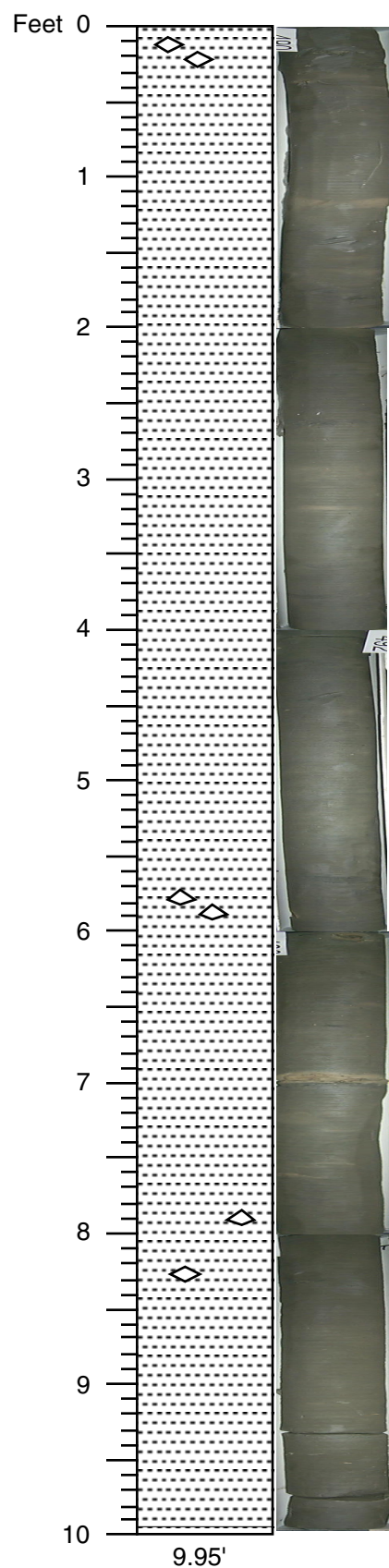
Stop Depth: 490 ft

Recovery = 5.22 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

88



CLAY, silty, to clayey SILT; contains discontinuous calcium carbonate cemented nodules (in burrows?) at depths of 0.17 ft, 0.27 ft, and 2.6 ft; some color lamination throughout, but unclear if any related textural change; some black laminae, more organic rich laminae; a few small thin-walled shell fragments, with lamination of shell fragments at 9.45 ft; color dark greenish gray (5GY 4/1) to dark olive gray (5Y 3/2) with pale olive (5Y 6/3) 1.5 mm diameter carbonate nodules 5.85 ft, 6.0 ft, and 7.9 ft.

174AX BB (Qj32-27)

Core # 92

Date: 5/25/00

Described by: SAS, JVB. KWR

Start Depth: 490 ft

Stop Depth: 500 ft

Recovery = 9.95 ft

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

Feet 0

1

2

3

4

5

6

7

8

9

10

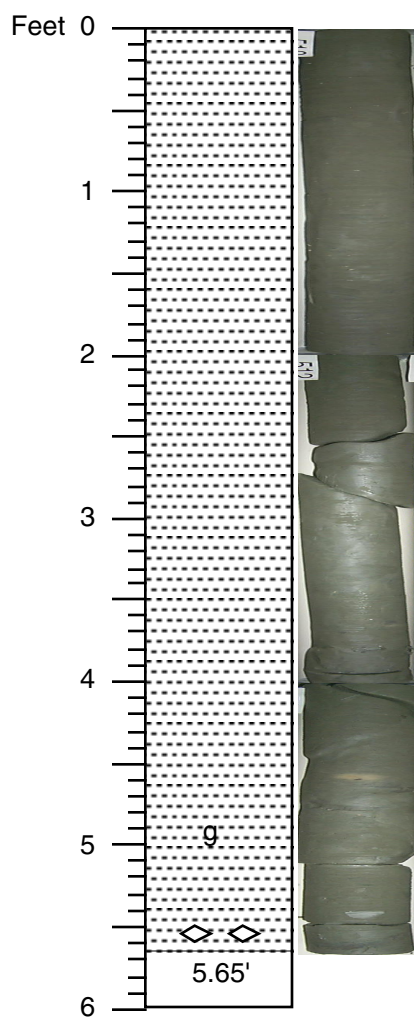
10.15'

Start Depth: 500 ft
Stop Depth: 510 ft
Recovery = 10.15 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

90



CLAY, silty, to clayey SILT; very stiff; scattered shell fragments and a few black organic rich clay laminae; below 4.5 ft, greenish black grains (glauconite?) become common; color dark greenish gray (5GY 4/1); calcium carbonate cemented zone at base of core and cemented nodules at 5.55 ft.

174AX BB (Qj32-27)

Core # 94

Date: 5/25/00

Described by: KWR

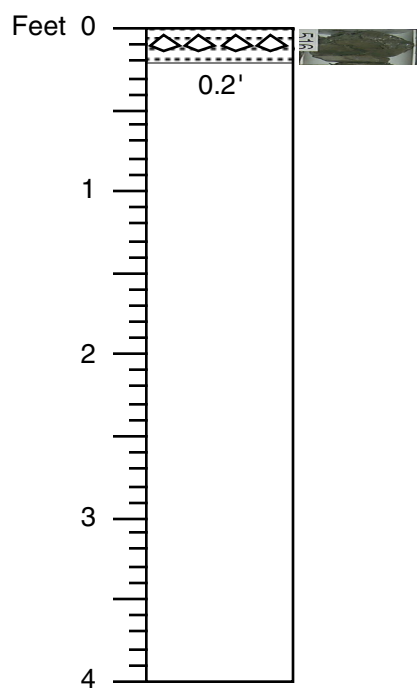
Start Depth: 510 ft

Stop Depth: 516 ft

Recovery = 5.65 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

91



Micrite; indurated carbonate-cemented claystone, very fine grained, with glauconite and possibly phosphate grains.

174AX BB (Qj32-27)

Core # 95

Date: 5/25/00

Described by: JVB

Start Depth: 516 ft

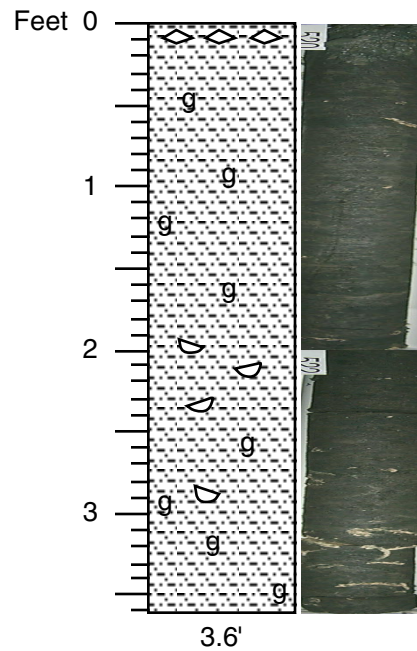
Stop Depth: 520 ft

Recovery = 0.2 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

92



SILT to SAND, very fine to fine grained, slightly clayey, with very fine to fine glauconite grains, glauconite is 80% of sand fraction is glauconite; carbonate nodules at top (0.0-0.15 ft); coarse grained to granular quartz sand below 2 and 3 ft; lenses and laminae of greenish gray silty clay are common; shells fragments and a few whole shells (both valves), often chalky, with larger shells common between 1.85 ft and 2.8 ft, shells are larger and thicker walled than above; color overall grayish green (5G 4/2).

174AX BB (Qj32-27)

Core # 96

Date: 5/25/00

Described by: KWR

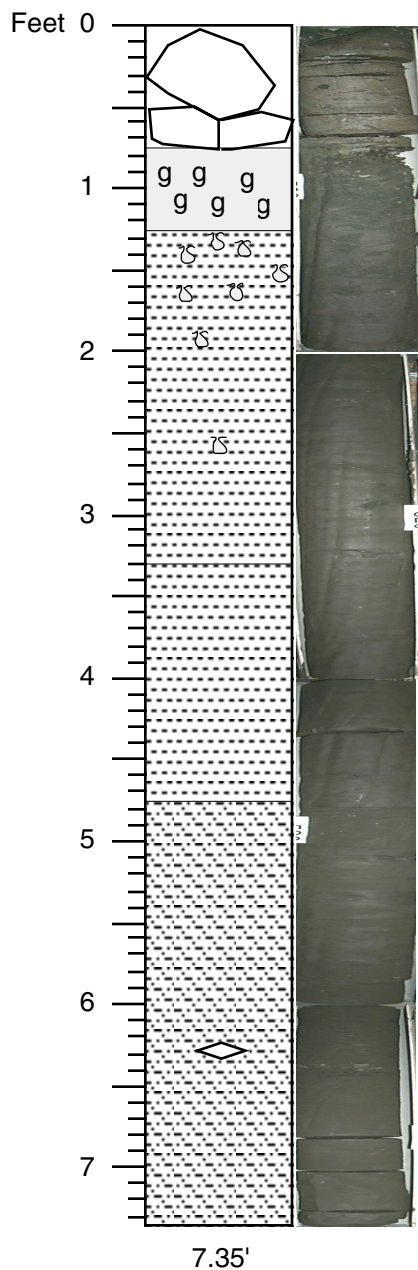
Start Depth: 520 ft

Stop Depth: 523 ft

Recovery = 3.6 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

93



SILTSTONE; massive concretions of carbonate cemented silt, cracked and filled with glauconitic silt and or sand from above or below; greenish gray (5GY 6/1).

SAND, very fine, silty, to SILT, sandy, very fine; sand is predominantly glauconite; slightly clayey.

CLAY, sticky, slightly sandy (vf quartz, trace mica), laminated, bioturbated; with sand-filled burrows, glauconitic and very fine to fine grained; sand-filled burrows less abundant below 524.75 ft.

CLAY, as above, with a few very thin sand/silt laminae.

SILT, clayey, with clayey silt laminae about 0.5 mm apart; rare shell fragments and trace amounts of mica; includes calcareous concretion, with some glauconite sand, at 6.35-6.4 ft; color is greenish gray (5GY 6/1).

174AX BB (Qj32-27)

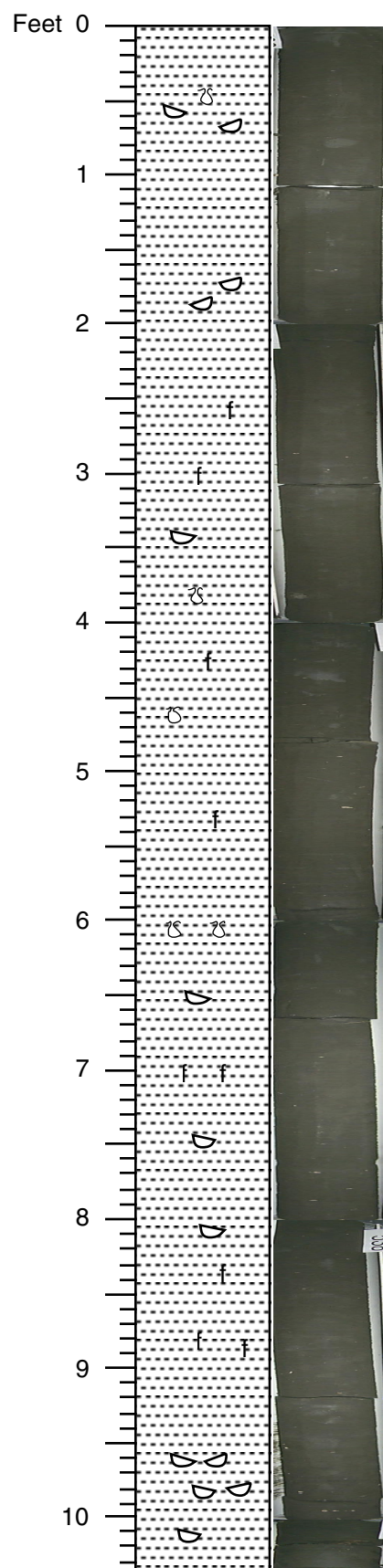
Core # 97
 Date: 5/25/00
 Described by: KWR

Start Depth: 523 ft
 Stop Depth: 530 ft
 Recovery = 7.35 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

94



CLAY; slightly silty, slightly micaceous; finely laminated (less than 1mm thick), with ~ 5 mm lamina sets; very stiff with a slightly conchoidal fracture, but pliable; some scattered thin shells, including Turritella-like gastropods; better laminated and more shelly around 9.5 ft; some dark small scattered specks, possibly organics or minerals; scattered silt-filled, burrows with pyrite at 3.75, 4.7, 6 and 9.8 ft; scattered foraminifera evident on the surface of the core; color is dark olive gray (5Y 3/2).

174AX BB (Qj32-27)

Core # 98

Date: 5/26/00

Described by: PPMcL

Start Depth: 530 ft

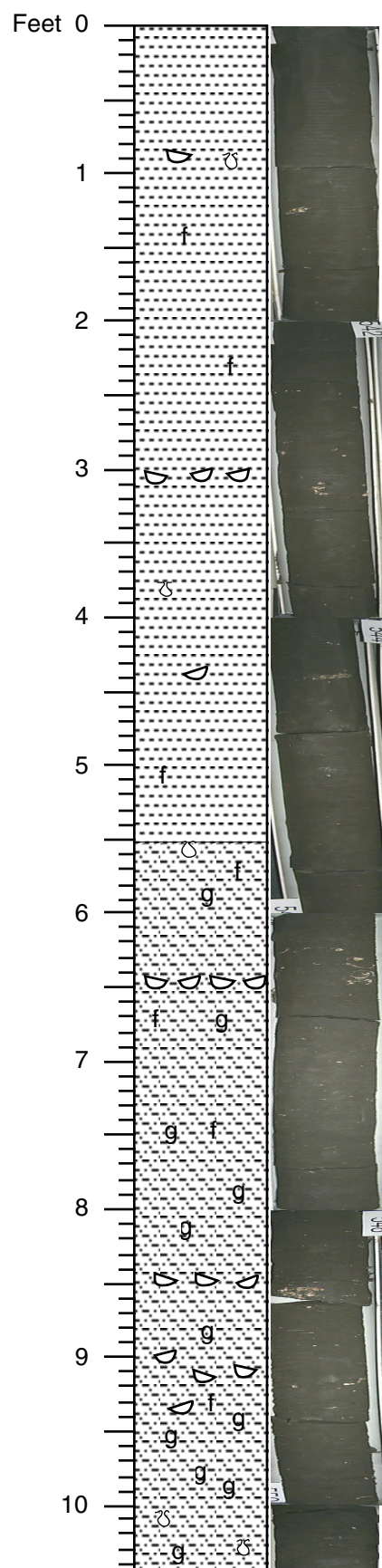
Stop Depth: 540 ft

Recovery = 10.35 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

95



CLAY; slightly silty, micaceous, finely laminated (less than 1 mm) packaged into 3-5 mm thick lamina sets, giving appearance of banding between more clay-rich and more silt-rich layers (less distinct between 3.8 and 4.5 ft); foraminifera evident on surface of core; scattered shells and shell fragments present, more abundant around 3.1 ft; burrows, some silt-filled with pyrite (0.9 and 3.8 ft).

CLAY, silty, passing to SILT, clayey, downward; clay is as above, but with less distinct banding and increasing amount of silt and glauconite downward (about 2-3% at the bottom); scattered foraminifera evident; shelly zone at 6.4 ft; one 5 mm dia quartz pebble, possible contaminant; silt-filled burrow at 10 ft and glauconite filled burrow at 10.45 ft.

174AX BB (Qj32-27)

Core # 99

Date: 5/26/00

Described by: PPMcL & JVB

Start Depth: 540 ft

Stop Depth: 550 ft

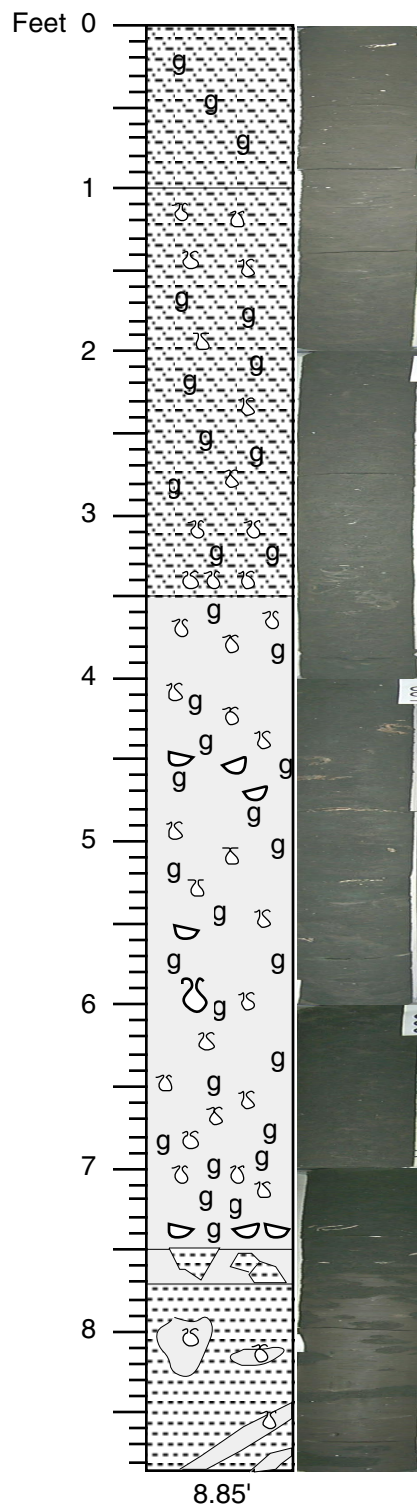
Recovery = 10.45 ft

10.45'

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

96



SILT; clayey, finely but indistinctly laminated, organized into lamina sets producing banding of slightly clayey versus siltier zones; 2-3% glauconite, micaceous, small shells and shell fragments, foraminifera; color dark olive gray (5Y3/2); base transitional with underlying unit.

SILT; clayey, transitioning downward to SAND, silty; very glauconitic; relative to overlying unit, notable increase in burrowing (some mud-filled, some mud-lined); scattered small shell fragments; quartz grains from fine sand to 4 mm granules, the coarser of these apparently contaminants pressed into surface of core, micaceous; color black (5Y2.5/1); base transitional with underlying unit, marked by zone of well preserved mud-lined horizontal burrows, 10-15 mm diameter.

SAND; fine to very fine to medium near base of interval; silty, very glauconitic, with increasing glauconite downward that coarsens to medium-grained; micaceous; extensively burrowed, burrows 10-30 mm diameter, often mud-lined, no laminations preserved, with a large mud-lined burrow at 6.0 ft; shells and shell fragments, often large (10-50 mm), which become more weathered towards lower end of interval; as above, quartz granules occur on outside of core and are likely contaminants; zones of bright green clay; forams evident; dark grayish green (GLE1 5G2.5/2).

SAND and CLAY, mixed; likely a contact zone with a mixture of sand from above and clay from below, possibly due to mud burrowed up ward from below or deposition of mud rip-up clasts at the contact.

CLAY; silty, micaceous, some dark (organic?) specks, small shells and forams; large, glauconite filled burrows, horizontal, up to 30 mm diameter, similar in lithology to the glauconite sand unit above; local zones of silt-size pyrite, possibly burrow fill; lithology is stiff, fairly dry, breaks with conchoidal fracture; unlaminated; dark gray (2.5Y4/1).

174AX BB (Qj32-27)

Core # 100

Date: 5/26/00

Described by: PPMcL & JVB

Start Depth: 550 ft

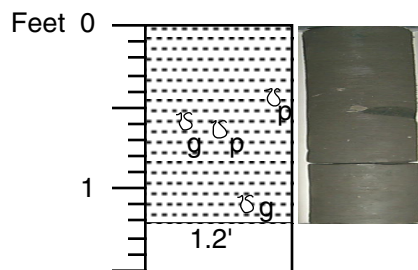
Stop Depth: 558.5 ft

Recovery = 8.85 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

97



CLAY; very slightly silty, micaceous; finely laminated in lamina sets that give faint banding; small shells, shell fragments, and foraminifera; dark spots (organic?); two large subhorizontal burrows, 15-20 mm diameter, glauconite filled; one smaller silt-filled burrow (with pyrite); glauconite in burrows is mostly fine grained, includes very dark green grains, some brighter green grains; foraminifera; very dark gray (2.5Y3/1).

174AX BB (Qj32-27)

Core # 101

Date: 5/26/00

Described by: PPMcL & JVB

Start Depth: 558.5 ft

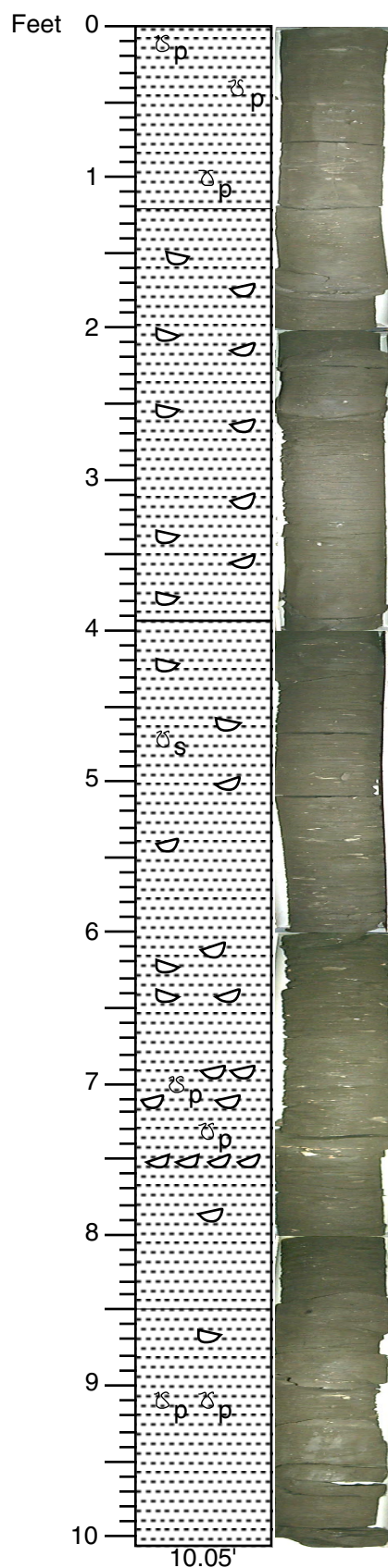
Stop Depth: 560 ft

Recovery = 1.2 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

98



CLAY; very silty; mica, but less than above; small shell fragments and forams; finely laminated in lamina sets that give faint banding; pyrite-silt filled burrows; stiff, hard; very dark gray (2.5Y3/1).

CLAY; silty; small shells, foraminifera, some mica; stiff, but softer and "flakier" than above; finely laminated, but significant differences in induration between alternating clay and silty laminae; clear groupings in lamina sets; from 1.4-1.75 ft and 2.2-2.6 ft core is more uniform, slightly harder, fractured at top and bottom during coring.

CLAY; as above, but more abundant and slightly larger shells (with shelly zone at 7.5 ft); slightly more burrowed, some sand-filled (at 4.8 ft, with rounded to subrounded quartz up to medium grained finer glauconite), some pyritic silt-filled (at 7.1 and 7.3 ft).

174AX BB (Qj32-27)

Core # 102

Date: 5/26/00

Described by: PPMcL & JVB

Start Depth: 580 ft

Stop Depth: 581 ft

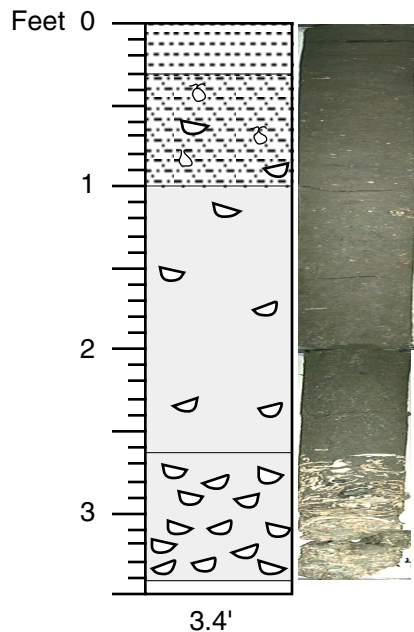
Recovery = 1.0 ft

CLAY; very silty, in some places sand grains up to medium grained, occasional very coarse grains; finely micaceous; finely dispersed shell fragments and common forams; clearly laminated in fine lamina sets that give faint banding; dark olive gray (5Y3/2).

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

99



CLAY; silty, finely micaceous, finely laminated with lamina sets giving faint banding; olive gray (5Y3/2).

SAND; medium to fine, very muddy, cohesive but soft; common shells and shell fragments; sand moderately sorted, grains rounded to subrounded, with subangular more common in scattered coarse and coarser grains; some possible glauconite and very rare garnet; faint possible burrows; dark greenish gray (GLE Y1 10Y3/1).

SHELL BED; shells and shell fragments ~70% volume; shells up to 40-50 mm across; matrix extremely poorly sorted mix of sand, fine to very coarse sand to granules, including quartz and occasional glauconite, plus subangular to subrounded pebbles up to 20 cm across; well cemented; shells mostly bivalves with possible barnacles, somewhat weathered; pebbles a gray, fine-grained lithology, no reaction to HCl.

174AX BB (Qj32-27)

Core # 103

Date: 5/26/00

Described by: PPMcL & JVB

Start Depth: 570 ft

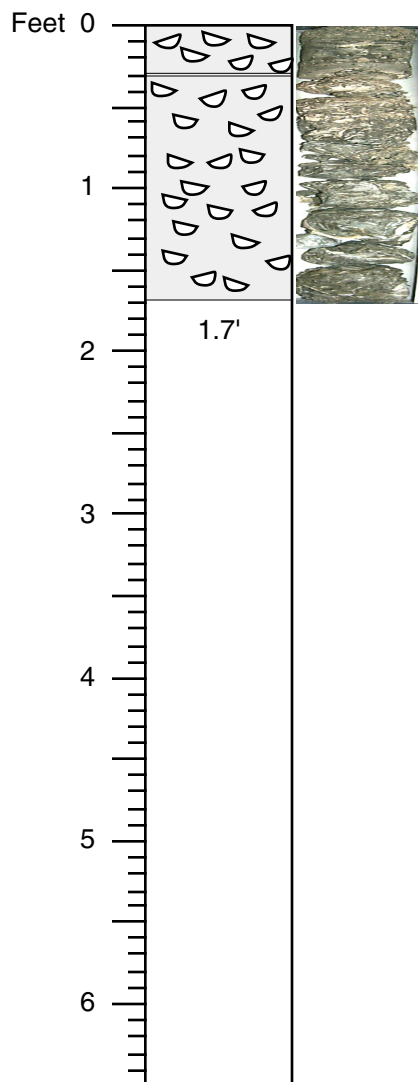
Stop Depth: 573.5 ft

Recovery = 3.4 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

100



SHELL BED; as in above core.

LIMESTONE; strongly cemented shell bed (sandy molluscan skeletal packstone); shell material weathered/partially removed, leaving some shells punky and steinkerns; shells include bivalves (pectinids), small gastropods (as steinkerns), abundant fragments; shells not in life position, layered in beds, "nested" in upper 0.2 ft. Matrix is poor to moderately sorted sand, with fine to coarse grained quartz sand and some glauconite; calcite cement; highly indurated; greenish gray (GEY1 10Y6/1).

174AX BB (Qj32-27)

Core # 104

Date: 5/26/00

Described by: PPMcL & JVB

Start Depth: 573.5 ft

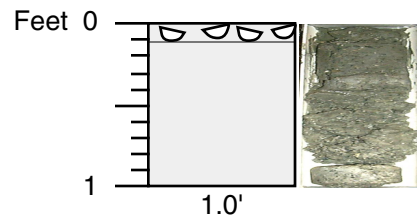
Stop Depth: 580 ft

Recovery = 1.7 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

101



LIMESTONE; sandy molluscan packstone (as above); unclear if fallen from above or in place.

SAND; fine to medium, some grains up to granule size; slightly clayey/silty and cohesive; granule-size shell fragments common; few dark plant debris/lignite fragments; most sand is quartz, subrounded to rounded, with larger ones subangular; some dark gray, very fine grains, possibly opaque heavy minerals; from 0.5-0.9 ft, core is a jumble from coring/washing.

174AX BB (Qj32-27)

Core # 105

Date: 5/26/00

Described by: PPMcL & JVB

Start Depth: 580 ft

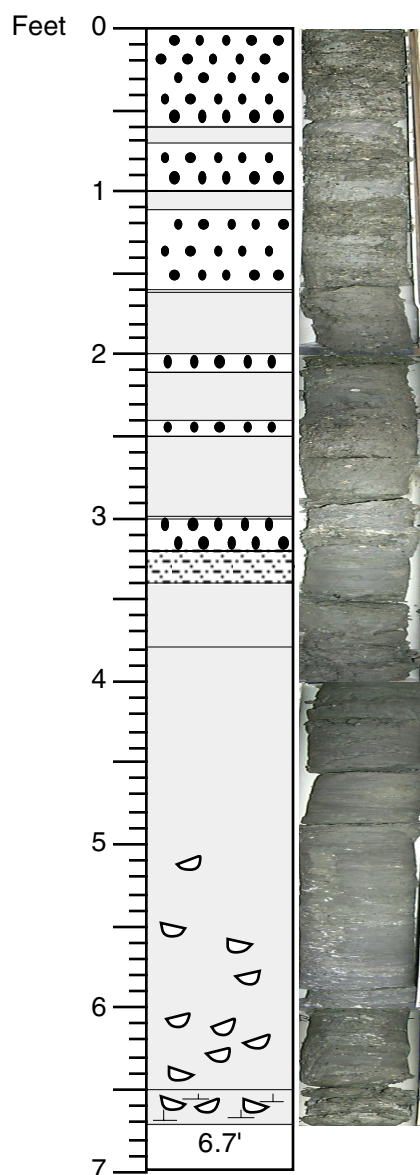
Stop Depth: 581 ft

Recovery = 1.0 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

102



SAND, gravelly and silty; gravel with interbedded shell fragments up to 20 cm, white and black; pebbles include quartz and quartzite, lithic clasts of calcite-cemented quartz sandstone; includes dark grains, possibly phosphate, in muddy sand matrix, which is poorly sorted with fine to very coarse to granule sized grains; the larger grains are angular to subangular and the smaller ones are subrounded to rounded; color is gray (GLEY1 N6/); the sand beds are composed of medium to fine, moderately sorted, subround to rounded, sand which is very muddy and sticky; the lower beds include a component of very coarse grains.

SILT, muddy with some fine sand, laminated near the top, dark gray (N4/), transitions downward into underlying silty sand.

SAND; the upper part (3.4-3.8 ft) is soft, muddy, fine grained sand, passing downward into silty very fine sand; laminated/banded; micaceous; from 5.0 ft downward, number of shells and coarseness of sand increase, with scattered very coarse and granule size grains; shells are all weathered and whitish; includes dark grains, possibly phosphate; dark greenish gray (GLEY1 10Y3/1).

SAND; calcite cemented, indurated; fine to medium with some is coarse to very coarse grains, poorly sorted, includes some shell fragments.

174AX BB (Qj32-27)

Core # 106

Date: 5/26/00

Described by: PPMcL & JVB

Start Depth: 581 ft

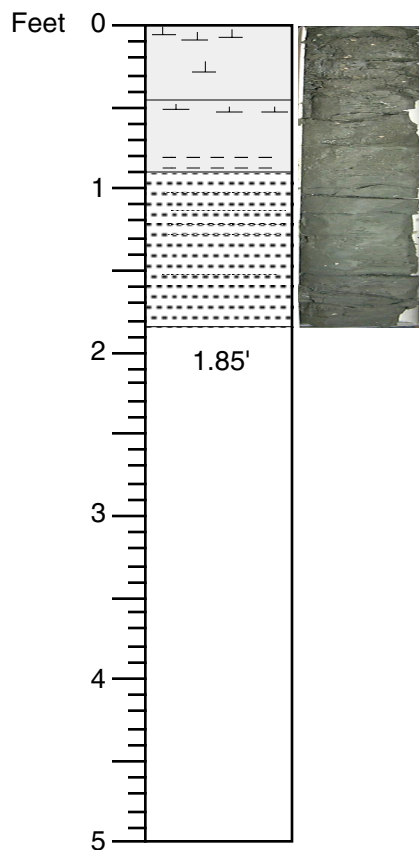
Stop Depth: 588 ft

Recovery = 6.7 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

103



SAND; uncertain if in-place or drilling debris; a mix of soft material composed of very poorly sorted, mostly medium-grained sand (but up to granule sized) and harder cemented zones and/or clasts of medium grained sand with granule size shell fragments; dark greenish gray (GEY1 5GY4/1).

SAND; medium to fine grained, well sorted, mostly quartz, about 1% opaque heavy minerals; slightly clayey; cemented at the top; thin 1 to 2 mm clay/silt laminae spaced about 15 mm apart, soft and sticky.

CLAY with interbedded SAND; at top, clay laminae are 3 to 4 mm thick in couplets with 1 to 2 mm thick sand laminae; clay laminae are thicker lower in interval; clay-sand couplets total up to 40 mm; some of the clay-sand contacts are irregular due to burrowing; sand is fine to medium, well-sorted, subangular to subrounded (less so in upper part); scattered shell fragments.

174AX BB (Qj32-27)

Core # 107

Date: 5/27/00

Described by: PPMcL & JVB

Start Depth: 588 ft

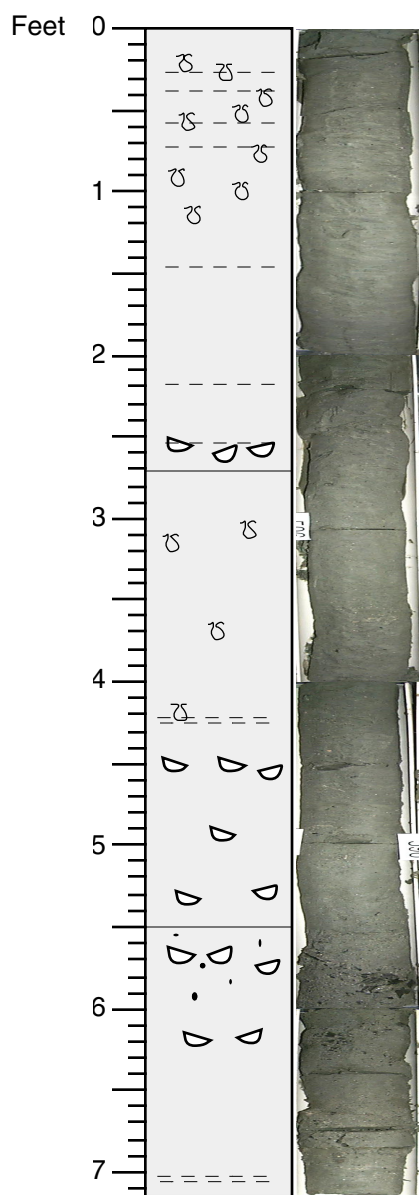
Stop Depth: 593 ft

Recovery = 1.85 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

104



7.15'

SAND; fine grained with some medium to coarse grains, subangular to subrounded; moderately well sorted; silty/clayey, mottled by extensive burrowing, especially in upper half; clay mixed into burrowed intervals by disruption of clay laminae, particularly from 0.3-0.95 ft; black shell fragments at 2.6 ft.

SAND; fine with more coarse grains than above, subangular to subrounded; moderately well sorted; silty/clayey matrix; laminated and burrowed, but less than the above interval; black shell fragments at about 4.5 ft, clay rich zone at 4.75 ft, and a zone of thinner weathered shells at 5.0 ft.

SAND; medium grained with coarse grains in some zones, moderately sorted; abundant shell fragments, including larger fragments up to 40 mm (pectinid?); most shell material is dark; becomes progressively muddier, finer, and less shelly below 6.2 ft.

174AX BB (Qj32-27)

Core # 108

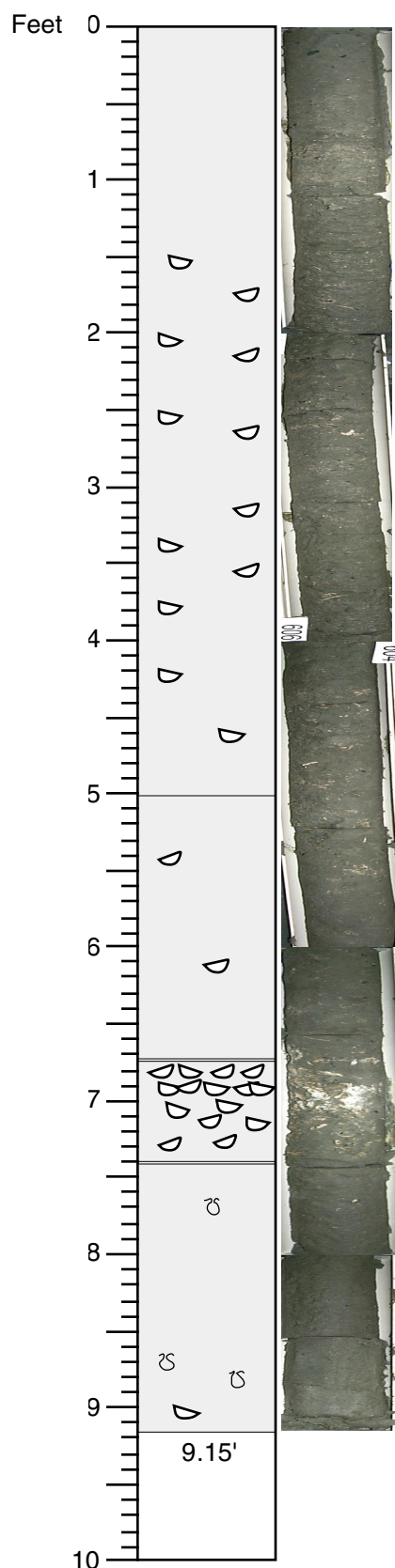
Date: 5/26/00

Described by: PPMcL & JVB

Start Depth: 593 ft

Stop Depth: 600 ft

Recovery = 7.15 ft



SAND; fine to medium, with occasional coarse grains, some stained pinkish orange; moderately sorted; subangular to subrounded; matrix is silty, very slightly clayey, and cohesive in upper 0.5 ft, less so below; below 0.5 ft, common to abundant shells and shell fragments, concentrated at 1.9 and 2.7 ft, mostly bivalves, mostly white and partially weathered, some dark to black (phosphatized?); sand is soft and muddy, with heavy bioturbation yielding an uneven mud distribution; mud-filled burrows (some indistinct) are present, as are a few intervals of laminated clay disrupted by burrows; color greenish gray.

SAND; fine to medium grained, moderately well sorted, slightly silty; subrounded to subangular grains; homogeneous with no clear sedimentary structures or burrows; some scattered light and dark shell fragments, the light ones generally very weathered and chalky; some mica; greenish gray.

SAND; contains abundant shells; the upper part is shell supported; sand is medium to fine grained, moderately sorted, some coarse to very coarse grains; grains subrounded to subangular; shell fragments thick (up to 3 mm), closely packed together but broken, some weathered and chalky but most indurated and hard.

SAND, medium to fine grained, moderately well sorted; grains subrounded to subangular; scattered sand size shell fragments with a shell at the bottom; fairly homogeneous with faint evidence of bioturbation; greenish gray.

174AX BB (Qj32-27)

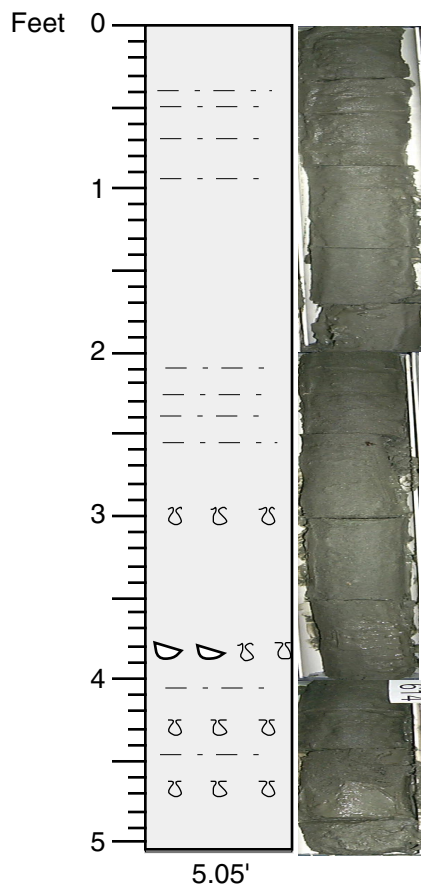
Core # 109
Date: 5/27/00
Described by: PPMcL

Start Depth: 600 ft
Stop Depth: 610 ft
Recovery = 9.15 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

106



SAND; medium grained, well sorted; grains subrounded to subangular; mostly quartz, about 1% opaque heavy minerals, rare glauconite and garnet; core is soft, clean, and porous; medium sand sized thin shell fragments dispersed through the sand (2-3%); scattered thin (1-2 mm), cohesive, silty, fine-grained sand laminae occur from 0.6-1.0 ft, 2.1-2.6 ft, and below 4.0 ft; vertical and horizontal mud-lined burrows at around 3.0 ft; color greenish gray (GLEY1 5GY5/1).

174AX BB (Qj32-27)

Core # 110

Date: 5/27/00

Described by: PPMcL & JVB

Start Depth: 610 ft

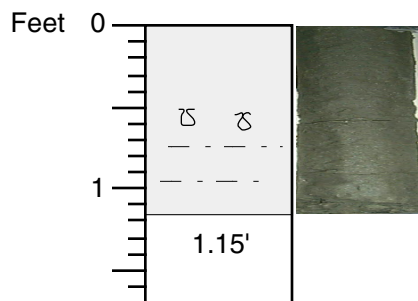
Stop Depth: 615 ft

Recovery = 5.05 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

107



SAND; medium grained, well-sorted; grains subrounded to subangular, mostly quartz, about 1% opaque heavy minerals; soft, clean, and porous; medium sand sized thin shell fragments; thin (1-2 mm), cohesive, silty, fine-grained sand laminae at several points; greenish gray (GLEY1 5GY5/1).

174AX BB (Qj32-27)

Core # 111

Date: 5/27/00

Described by: PPMcL & JVB

Start Depth: 615 ft

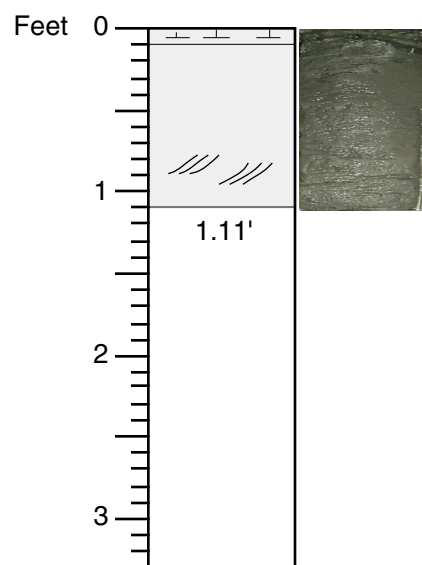
Stop Depth: 616.7 ft

Recovery = 1.15 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

108



SANDSTONE; medium grained, moderately well sorted; grains subrounded to subangular, about 1% opaque heavy minerals, some shell fragments; calcite cemented, indurated.

SAND; medium to fine grained with some coarse near the top; about 1% opaque heavy minerals; unconsolidated, soft, wet, with lamination evident due to slight variation in silt content; several zones, especially at 0.75 ft, suggestive of cross lamination; greenish gray (GLE Y1 5GY5/1).

174AX BB (Qj32-27)

Core # 112

Date: 5/27/00

Described by: PPMcL & JVB

Start Depth: 616.7 ft

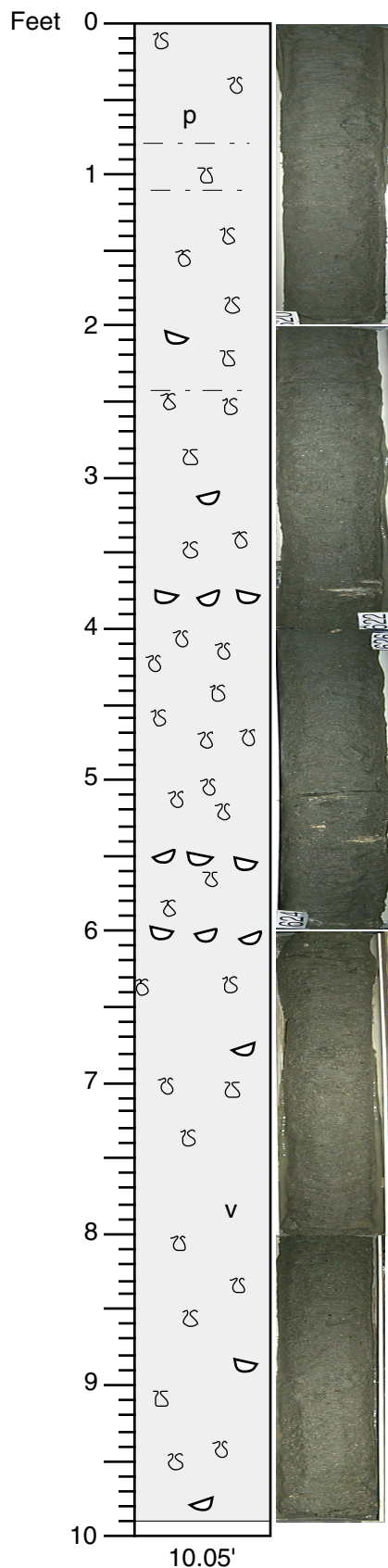
Stop Depth: 620 ft

Recovery = 1.1 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

109



174AX BB (Qj32-27)

Core # 113

Date: 5/27/00

Described by: PPMcL & JVB

Start Depth: 620 ft

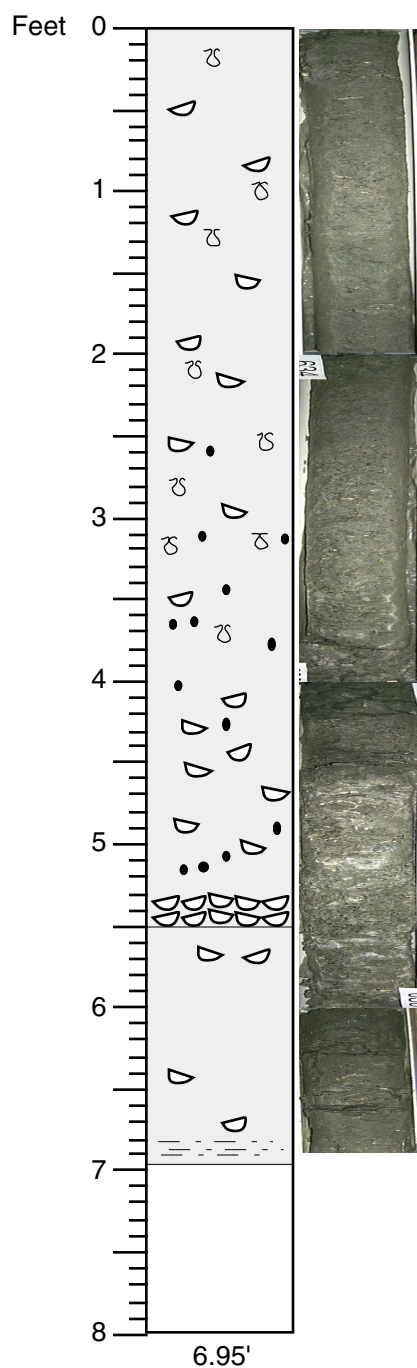
Stop Depth: 630 ft

Recovery = 9.9 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

110



SAND; medium grained, moderately well sorted; grains subrounded to subangular, mostly quartz, with some smaller dark grains, possibly opaque heavy minerals, and larger subangular dark grains (probably phosphatized shell fragments); shell fragments common from sand size up to 10 mm down; larger fragments of thick shells more abundant in lower part, giving interval from 4.0 to 5.5 ft a rubbly texture, with 5.3 to 5.5 ft dominated by shell debris on an abrupt contact with the underlying unit; 10 to 30 mm clasts/concretions of calcite-cemented sand also common in rubbly interval; extensive bioturbation evident from irregular/discontinuous lamination in siltier zones; dark greenish gray (GLEY1 5GY4/1)

SAND; medium to fine grained, moderately well sorted, increasingly siltier downward; grains subrounded to subangular, some dark grains (likely opaque heavy minerals), thin shells (in contrast with any of the thick ones above) and shell fragments, both often chalky; bioturbated; dark greenish gray (GLEY1 5GY3/1).

174AX BB (Qj32-27)

Core # 114

Date: 5/27/00

Described by: PPMcL & JVB

Start Depth: 630 ft

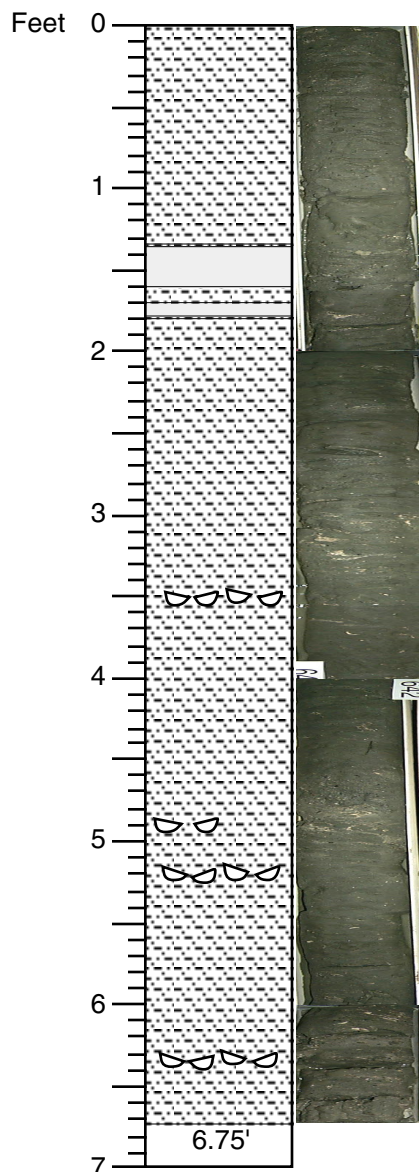
Stop Depth: 638 ft

Recovery = 6.95 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

111



SILT and interbedded SAND; in the upper part (0-1.5 ft), silt and sand beds/laminae are approximately equal and generally thinly interlaminated; below that, the silt is more abundant, approximately 75% of the thickness; silt is very clayey and soft; two notable sand beds, at 1.35-1.6 ft and 1.7-1.85 ft, otherwise sand occurs generally in 1 to 5 mm thick laminae; sand is generally fine, medium in places, moderately well sorted, especially where fine, soft and unconsolidated; mostly quartz, subrounded to subangular; sands includes shell debris ranging from sand size to 10 mm, several zones where more concentrated; shells are mostly light in color, some darker (probably phosphatized); dark greenish gray (GLE Y1 5GY4/1).

174AX BB (Qj32-27)

Core # 115

Date: 5/27/00

Described by: PPMcL & JVB

Start Depth: 638 ft

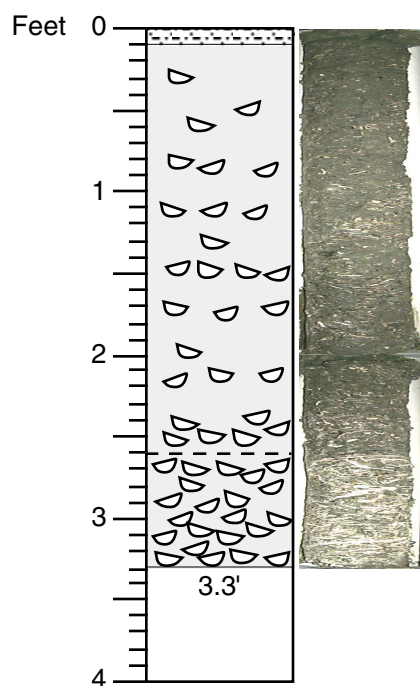
Stop Depth: 645 ft

Recovery = 6.75 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

112



SILT; upper part (0-0.07 ft) chaotic, some admixed sand and shell debris, possibly coring debris; clearly laminated silt from 0.07-0.1 ft.

SAND; medium with some coarse grains in lower part; very shelly and silty, uncemented; shell content and grain size increase downward, from 10-20% shell content near the top to 50% near the bottom; quartz grains are subangular, some subrounded; larger grains include abundant shell fragments, lithified siltstone pebbles (up to 7 mm), pink and white quartz granules (up to 4 mm), and well rounded, deep black, very coarse grains (possibly phosphate); also includes subrounded to rounded dark brown to black grains, possibly broken phosphatized shells; shells include one with mother-of-pearl sheen at 0.95 ft, mostly bivalves, thin-shelled forms are mostly broken up and often aligned with trend of faint lamination; fragments of thick-shelled forms also present; some of the shells are fairly weathered; the base of the unit is transitional into the underlying shell bed.

SHELLBED; unconsolidated, very sandy and silty, about 75% shells; shells are weathered and crumbly; black granule- to small pebble-size grains common, possibly phosphate; includes other grains and pebbles as in above interval; matrix predominantly medium quartz sand as above.

174AX BB (Qj32-27)

Core # 116

Date: 5/28/00

Described by: PPMcL & JVB

Start Depth: 645 ft

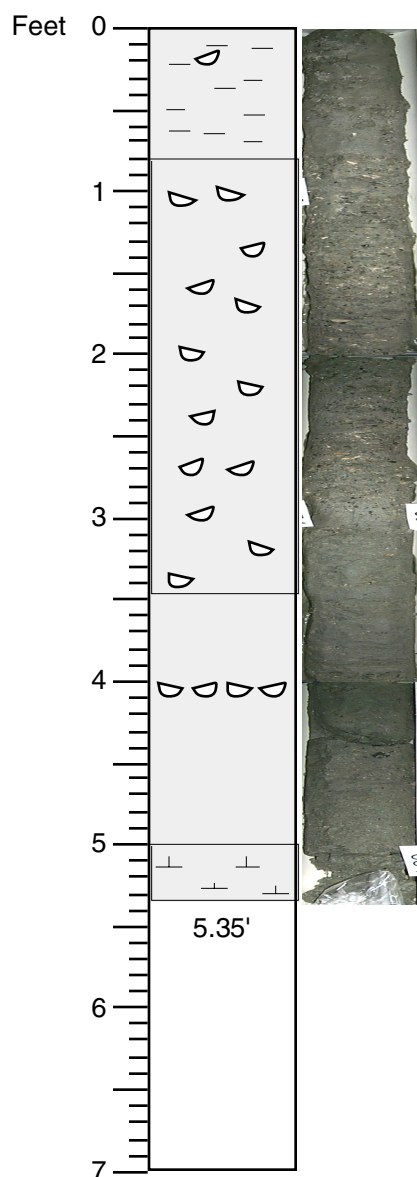
Stop Depth: 649 ft

Recovery = 3.3 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

113



SAND, very clayey and silty, fine to medium, subangular to subrounded; mostly quartz, some small fine very dark grains (possibly opaque heavy minerals); many thin, chalky shells, some dark shells (possibly phosphatized), shells more abundant in upper part, includes bivalves and echinoderm fragments; clay/silt content makes very soft and sticky; dark greenish gray (GLE Y1 10Y4/1).

SAND; medium, with common coarse grains, some granules; subangular to subrounded; abundant shell debris, about 20-30% in volume, approximately equal volumes of light and dark shell debris; fragments are angular to subangular, includes bivalves (thick-shelled, the lighter ones are thicker), and echinoderm plates; note a 2 mm dia shiny black phosphate nodule/grain; dark greenish gray (GLE Y1 10Y4/1).

SAND; medium to fine; moderately sorted; grains subangular to subrounded (some well rounded); variably silty, giving some banding of slightly contrasting cohesiveness; contains coarse to granule size shell fragments, with a concentration of weathered thin shells at about 4 ft and more disseminated fine thin shell debris below; soft and uncemented; dark greenish gray (GLE Y1 10Y4/1).

SANDSTONE; calcite cemented but crumbly (especially near top); medium; grains subangular to subrounded; very shelly and silty; dark greenish gray (GLE Y1 10Y4/1).

174AX BB (Qj32-27)

Core # 117

Date: 5/28/00

Described by: PPMcL & JVB

Start Depth: 649 ft

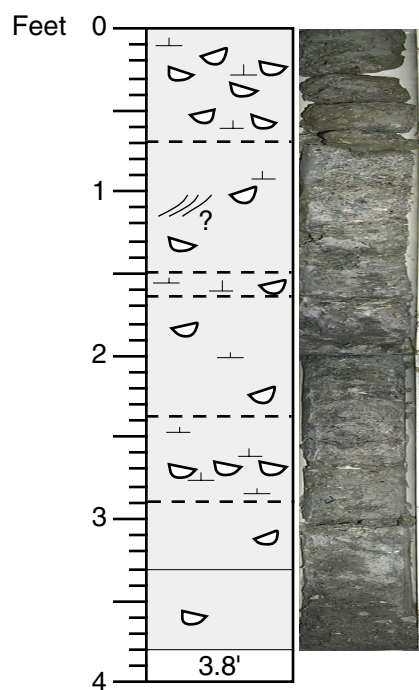
Stop Depth: 656 ft

Recovery = 5.35 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

114



SAND; medium, some very coarse grains; ranges from hard, firmly calcite-cemented (at 0-0.7 ft, 1.5-1.65 ft, and 2.4-2.9 ft), to loosely cemented and crumbly; cement clear to milky white; areas with hard cement do not react strongly when HCl applied to surface but do when the cement is crushed; very shelly, with shells up to about 75% in top of interval and including some thick (greater than 1 mm) shells and some steinkerns; black/dark (phosphatized) grains (probably shell fragments); possibly cross-stratified at 1.2-1.4 ft; local clayey zones (possibly laminae or clay clasts); mottled light (light gray GLEY1 N7/) to olive (olive green 5Y5/2) to dark (dark gray GLEY1 N4/); at around 2.0 ft, the core smells like oil or swamp gas, even like gasoline at first; the smell comes out strongest from the cracks in the sample and dissipates some with time; likely reflects high sulfide content.

SAND; medium to coarse, clean; grains subangular (especially the coarse grains) to subrounded; abundant dark grains (probably sand-sized phosphatized shell fragments and phosphatized grains); shell fragments up to 10 mm dia, generally thick; dark, ranging from dark gray GLEY1 N4/ to very dark gray GLEY1 N3/

174AX BB (Qj32-27)

Core # 118

Date: 5/28/00

Described by: PPMcL & JVB

Start Depth: 656 ft

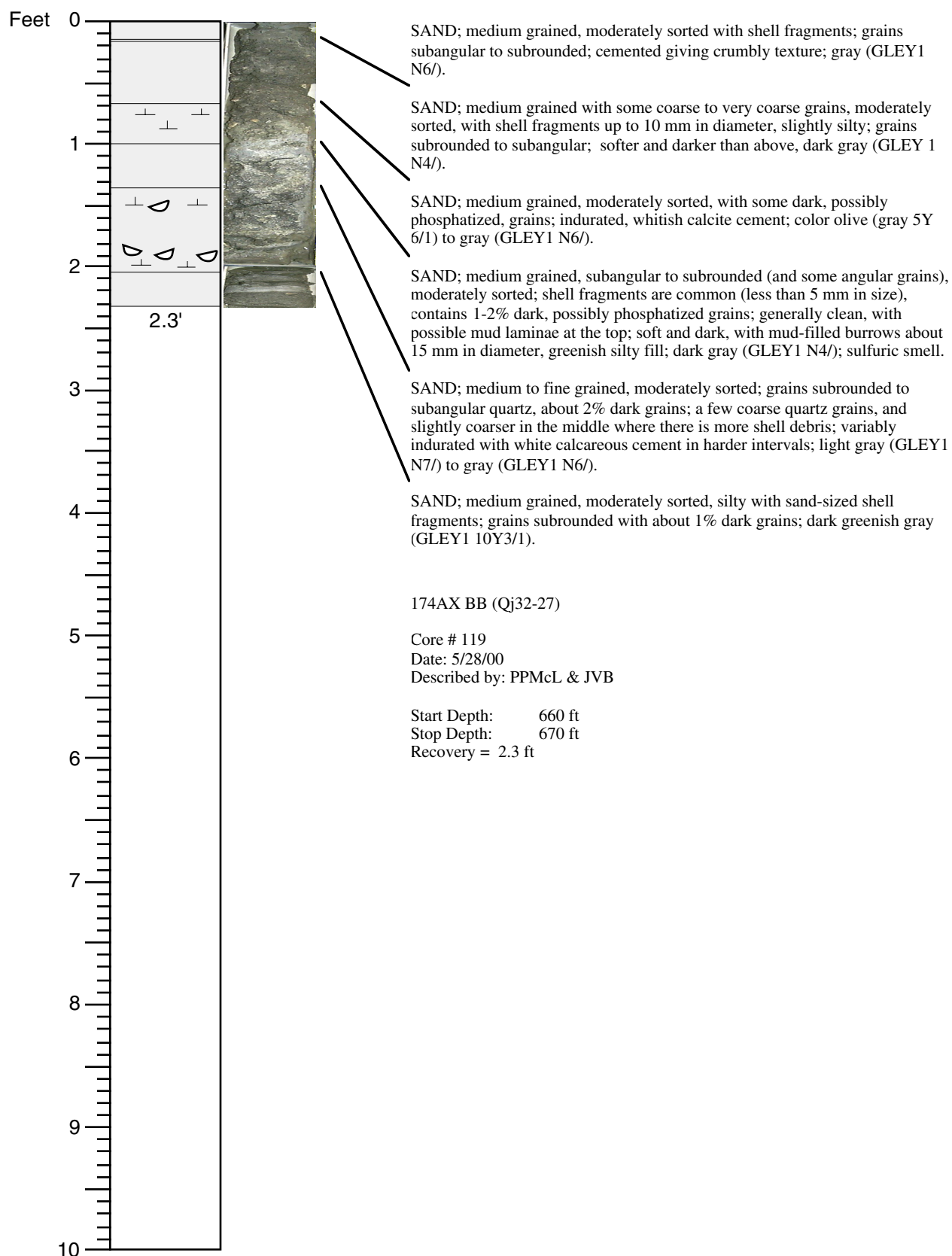
Stop Depth: 660 ft

Recovery = 3.8 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

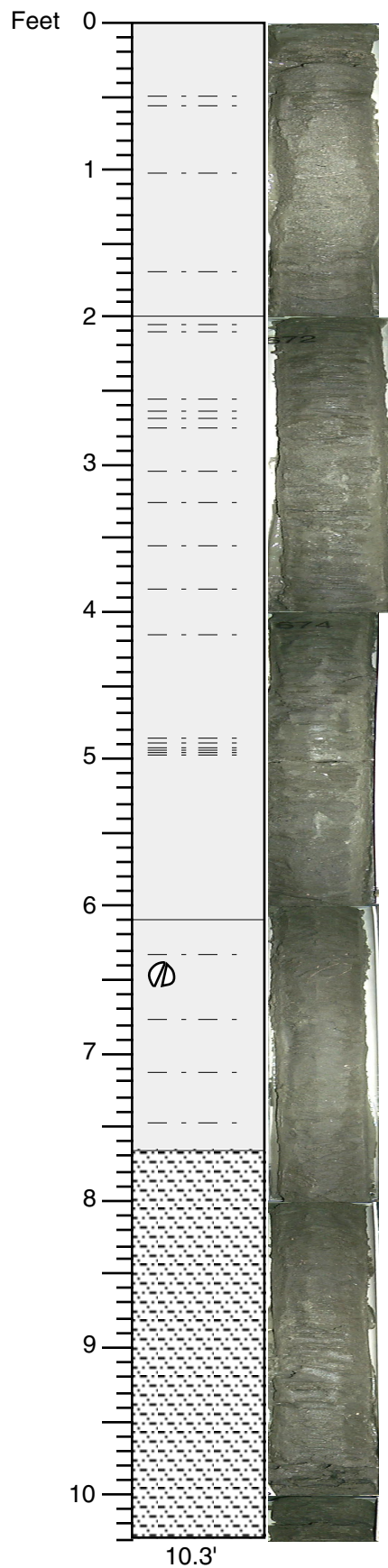
115



CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

116



SAND with thin SILT laminae in places; sand is medium grained, containing small, very thin-walled shells and dispersed sand-sized shell fragments (especially in the upper 1.5 ft and concentrated at 0.3-0.4 ft); silt is less than 10% of the interval thickness, soft and sticky, laminae 1-2 mm thick or less, inclined laminae at around 0.5 ft; dark greenish gray (GLEY1 10Y3/1).

SAND with thin to thick SILT laminae; sand is fine with some medium grains, scattered sand-size very thin shell fragments/flakes; silt is about 50% of the interval thickness, soft and sticky, laminae 3-4 mm thick or less, with gently inclined laminae and flaser bedding at 2.3 ft, 3.15 ft, and 5.0 ft; different orientations of inclined laminae noted throughout the interval; dark greenish gray (GLEY1 10Y 3/1).

SAND with thin SILT laminae in places; description as for the 0.0-2.0 ft interval.

SAND with thin to thick SILT laminae and a silt bed at the base; description as for the 2.0-6.1 ft interval.

174AX BB (Qj32-27)

Core # 120

Date: 5/28/00

Described by: PPMcL & JVB

Start Depth: 670 ft

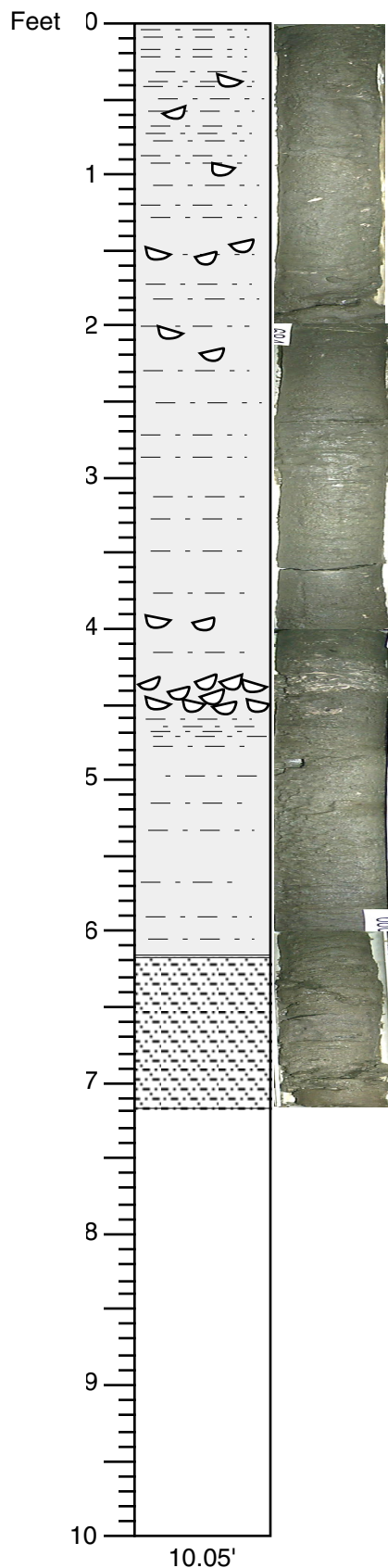
Stop Depth: 680 ft

Recovery = 10.3 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

117



SAND with SILT laminae; sand is fine, well sorted, soft; grains subangular to subrounded, include quartz and fine shell debris, and a few dark shell fragments, color dark greenish gray (GLEY1 10Y4/1); silt is mostly thinly laminated, about 40% of the thickness, some thick, soft but not as sticky in core #120; contains thin-shelled bivalves up to 30 mm in diameter), color olive gray (GLEY1 5Y5/2).

SILT; thinly laminated to thin-bedded, soft and sticky, somewhat clayey, from 7.0 to 7.15 ft it is hard and stiff but cut-able; some interlaminated and interbedded fine sand with a few dark (phosphatized) shell fragments, color olive gray (GLEY1 5Y5/2).

174AX BB (Qj32-27)

Core # 121

Date: 5/28/00

Described by: PPMcL & JVB

Start Depth: 680 ft

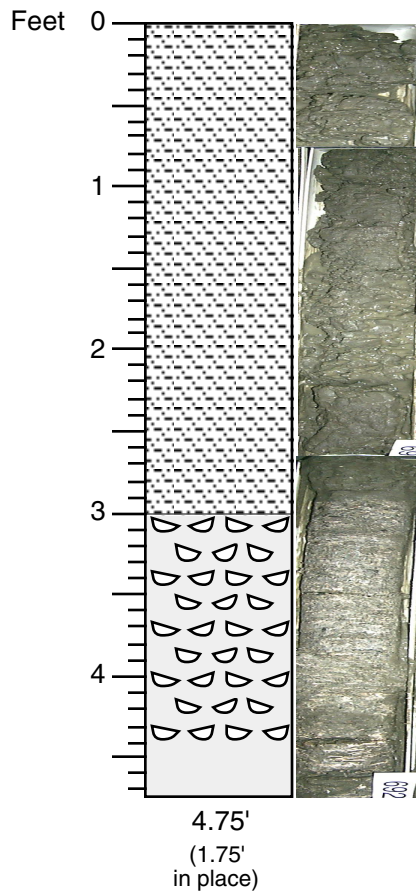
Stop Depth: 690 ft

Recovery = 7.15 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

118



SILT, clayey, and SAND, fine; slightly jumbled but basically coherent core that represents the lower 3 ft of the previous coring run that was not recovered; silt very clayey, sticky, soft; sand is fine, well sorted, grains subangular to subrounded; core contains dispersed fine shell debris throughout, with a scallop fragment near top of core.

SAND; medium, moderately sorted; sand mostly quartz, subangular to subrounded; well rounded fine black grains, possibly phosphate; abundant shell fragments, making up 2/3 of volume in the upper part and 1/3 in the lower part, mostly aligned flat, more broken in upper part of interval, 2/3 light colored and 1/3 dark (phosphatized?); partially indurated, crumbly texture, with whitish cement that reacts mildly to HCl; silty from 4.6-4.75 ft.

174AX BB (Qj32-27)

Core # 122

Date: 5/28/00

Described by: PPMcL & JVB

Start Depth: 690 ft

Stop Depth: 692 ft

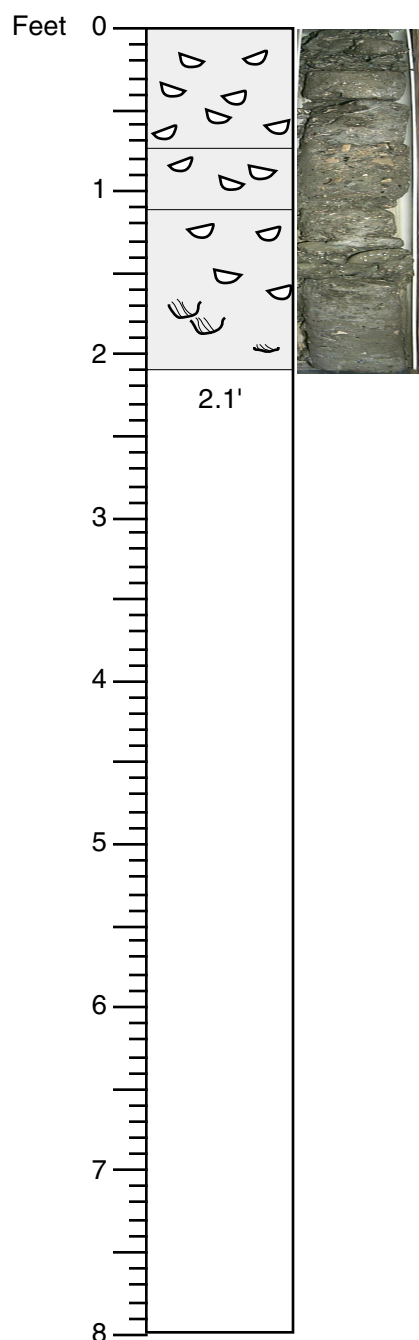
Recovery = 4.75 ft

*Note: upper 3 ft of this core is the lower 3 ft of the previous core

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

119



SAND; fine to medium, moderately sorted; grains subrounded to subangular; abundant shells (20-30% of the volume), mostly bivalves, fairly thin shelled, mostly whitish, some dark, some dissolved; hard, indurated, whitish cement with strong reaction to HCl when crushed to powder; dark greenish gray (GLEY1 10Y3/1).

SAND; fine to medium, moderately sorted; grains subrounded to subangular; abundant shell fragments (including pectinid), about $\frac{1}{2}$ of the shell fragments are light and the other $\frac{1}{2}$ are dark; soft, unconsolidated; very dark gray (GLEY1 5Y3/1).

SAND; fine to medium, moderately sorted; grains subrounded to subangular, some dark likely phosphate grains; abundant shells (10-15% of the volume), mostly bivalves, fairly thin shelled, mostly whitish, some dark, some dissolved; hard, indurated, whitish cement with strong reaction to HCl when crushed to powder; bedding inclined in the lower part, with lamination increasing in inclination upward suggestive of trough cross-bedding; dark greenish gray (GLEY1 10Y3/1).

174AX BB (Qj32-27)

Core # 123

Date: 5/28/00

Described by: PPMcL & JVB

Start Depth: 692 ft

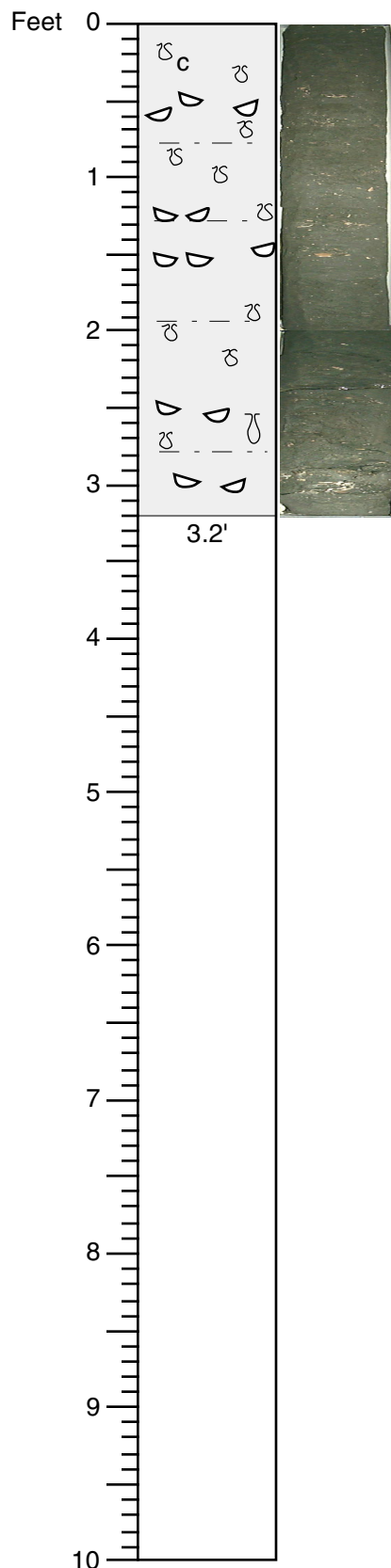
Stop Depth: 700 ft

Recovery = 2.1 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

120



SAND; very fine to fine, moderately sorted, silty and slightly clayey in places; grains subangular to subrounded mainly quartz, some glauconite in very fine fraction; upper part is browner and more crumbly; interbedded silt laminae are heavily bioturbated, burrow fill is muddier; faint lamination, with siltier, clayier intervals standing out (1.2-1.3 ft is a good example); shell fragments are light colored types only, no darker possibly phosphatized fragments, includes *Turritella*, bivalves; burrows are 7 to 20 mm in diameter, subhorizontal to subvertical, filled with different materials, some lined; upper 1 ft of core is more sand-dominated, 1-2.2 ft has more clay, and 2.2-3.2 ft is sandier; very dark gray (5Y 3/1) at the top and dark greenish gray (GLE Y1 10Y3/1) at the base, with very dark grayish brown (2.5Y3/2) and dark greenish gray (GLE Y1 10GY4/1) burrow fill.

174AX BB (Qj32-27)

Core # 124

Date: 5/28/00

Described by: PPMcL & JVB

Start Depth: 700 ft

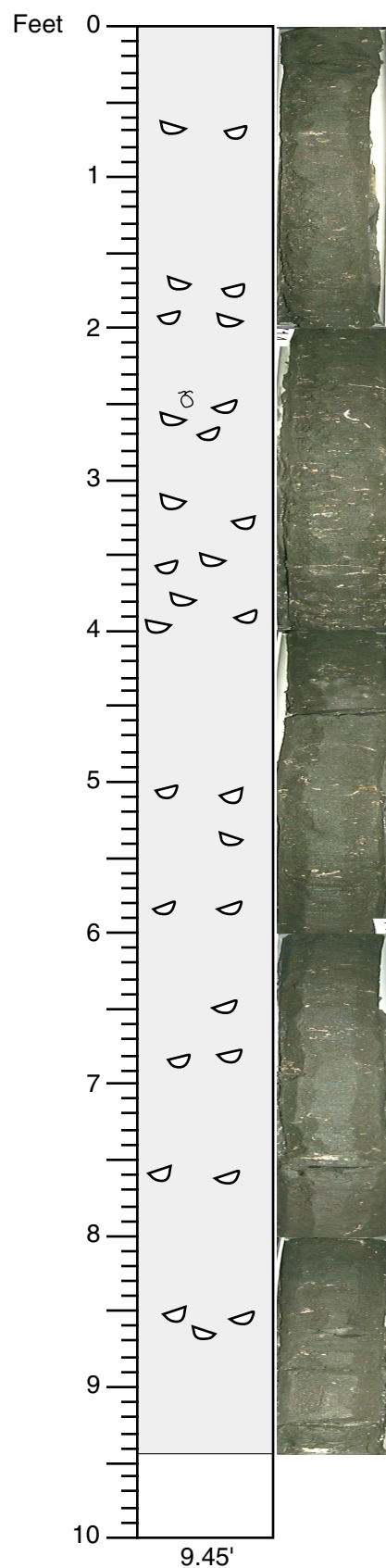
Stop Depth: 710 ft

Recovery = 3.2 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

121



SAND; fine, moderately sorted, silty, soft but somewhat cohesive; mostly quartz, subangular (or angular) to subrounded, but includes very fine glauconite; has indistinct silt laminae, which are disrupted by burrowing (inclined at the U-shaped burrow at 2.4'); includes lighter-colored shell fragments and shells, includes thin and thick bivalves, turritellid gastropods, echinoderm plate fragments, scaphopods, sand, with several zones richer in complete shells, including large (>50 mm) shell at 3.6 ft; less shelly lower in core, slightly more homogeneous and a bit siltier near the top; dark greenish gray (GLEY1 5GY3/1) with slightly browner silt.

174AX BB (Qj32-27)

Core # 125

Date: 5/28/00

Described by: PPMcL & JVB

Start Depth: 710 ft

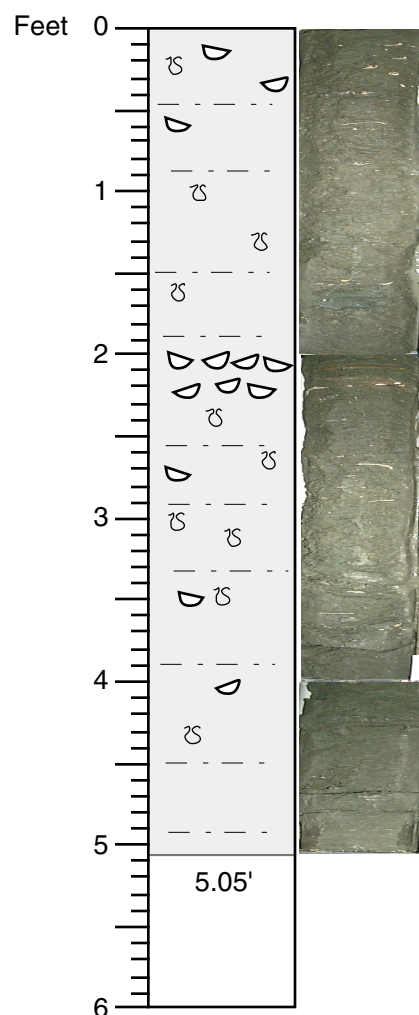
Stop Depth: 721 ft

Recovery = 9.45 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

122



SAND; very fine to fine, silty, moderately sorted; grains subangular (some subrounded to angular), mostly quartz, with 1-2% very fine to silt-size glauconite and possibly trace mica; laminated and heavily disrupted due to bioturbation, with slight variations in the silt content showing the lamination; inclined laminae in places indicate cross bedding, includes silts lenses which may represent flaser bedding; from 3.8 ft downward the core is less bioturbated, and the silt laminations are thus better preserved; includes scattered shells and fragments, primarily thin, light colored bivalves, and some gastropods; at 2.1 ft, a 3 mm thick, 40 mm long, very fibrous, very flat shell; at 2.2 ft, a thin flat bivalve with mother-of-pearl luster; shells mostly aligned flat and some amber colored; dark greenish gray (GLEY1 5GY4/1).

174AX BB (Qj32-27)

Core # 126

Date: 5/29/00

Described by: PPMcL & JVB

Start Depth: 720 ft

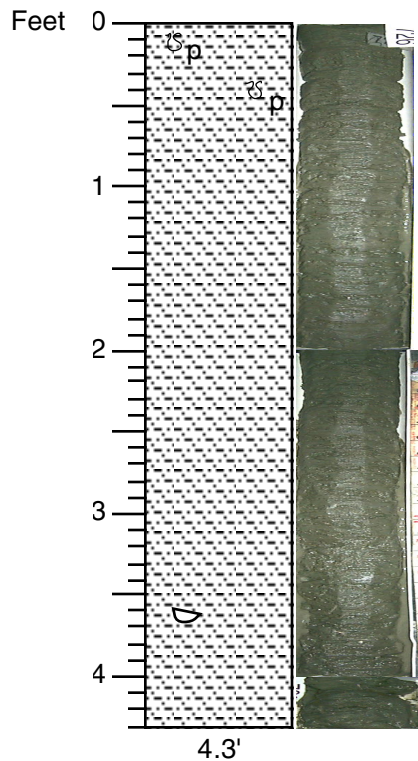
Stop Depth: 726 ft

Recovery = 5.05 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

123



SAND with interlaminated SILT; sand:silt ratio about 1:1; sand is very fine to fine, silty matrix, well sorted; subangular quartz with 1-2% glauconite and trace mica; silts have some admixed very fine sand, slightly clayey and sticky; interval irregularly laminated due to significant bioturbation, with burrows more evident in sands, mostly subhorizontal; silt beds being more predominant from 1-3 ft, and the sandier above and below that; in the sandier zones, sands are thickly laminated to very thinly bedded (10-15 mm); in the siltier zones the sands are thin to thickly laminated (up to 10 mm) arranged in apparent sets up to 25 mm; rare shells at 3.7 ft; dark greenish gray (GLE Y1 10Y4/1).

174AX BB (Qj32-27)

Core # 127

Date: 5/29/00

Described by: PPMcL & JVB

Start Depth: 726 ft

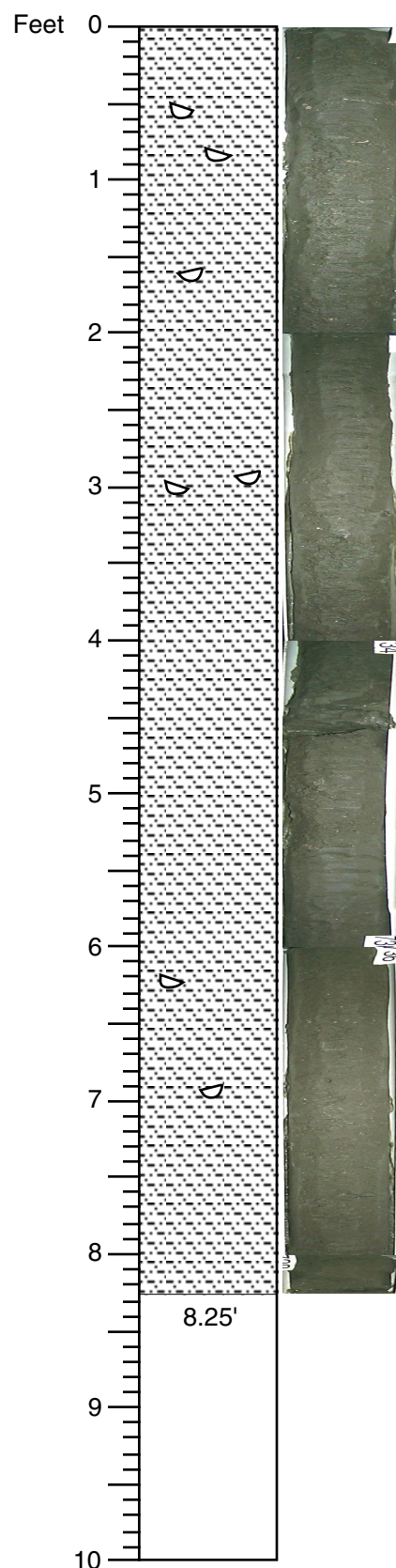
Stop Depth: 730 ft

Recovery = 4.3 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

124



SAND and SILT interlaminated; sand is very fine to fine, well sorted, subangular, mostly quartz, with very fine glauconite (1-2%), trace amounts of mica (more than above interval), and slightly silty; the silt is clayey, sticky, soft, and sandy (very fine); lamination characterized by lamina sets of silt and sand up to 10 to 15 mm thick; more sand than silt with some siltier intervals (0.25 to 0.65, 5.35 to 5.8 ft); some cross bedding; bioturbation, mostly subhorizontal; scattered to occasional shells include bivalves, gastropods, scaphopods, and shell fragments; dark greenish gray (5 GY 3/1 GLEY)

174AX BB (Qj32-27)

Core # 128

Date: 5/29/00

Described by: PPMcL & JVB

Start Depth: 730 ft

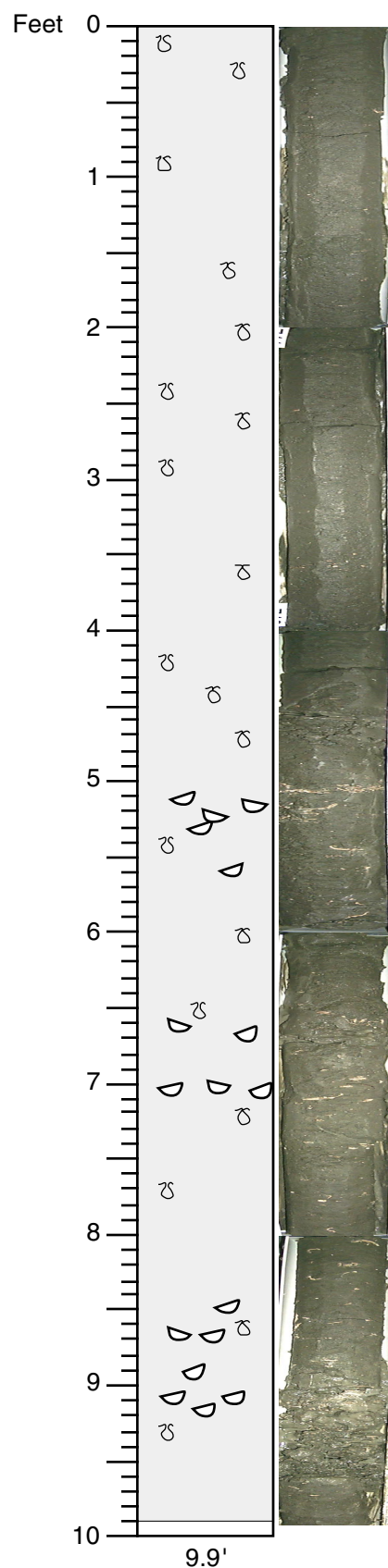
Stop Depth: 740 ft

Recovery = 8.25 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

125



SAND with some interlaminated SILT; sand is very fine, moderately well sorted, subangular, mostly quartz, with 1-2% very fine glauconite, mica, and some silt; silt is clayey and sandy; due to extensive burrowing, the sand and silt laminae are indistinct; from 9.5 to 9.9 ft, the core has more clay content and is slightly more consolidated; from 8.9 to 9.9 ft, the glauconite is coarsens to fine-grained; shells overall more abundant below 5 ft and include bivalves, echinoderms, gastropods; extensive bioturbation, with churning in the upper part but more distinct burrows below 7.5 ft; dark greenish gray (GLEY 1 10Y 3/1).

174AX BB (Qj32-27)

Core # 129

Date: 5/29/00

Described by: PPMcL & JVB

Start Depth: 740 ft

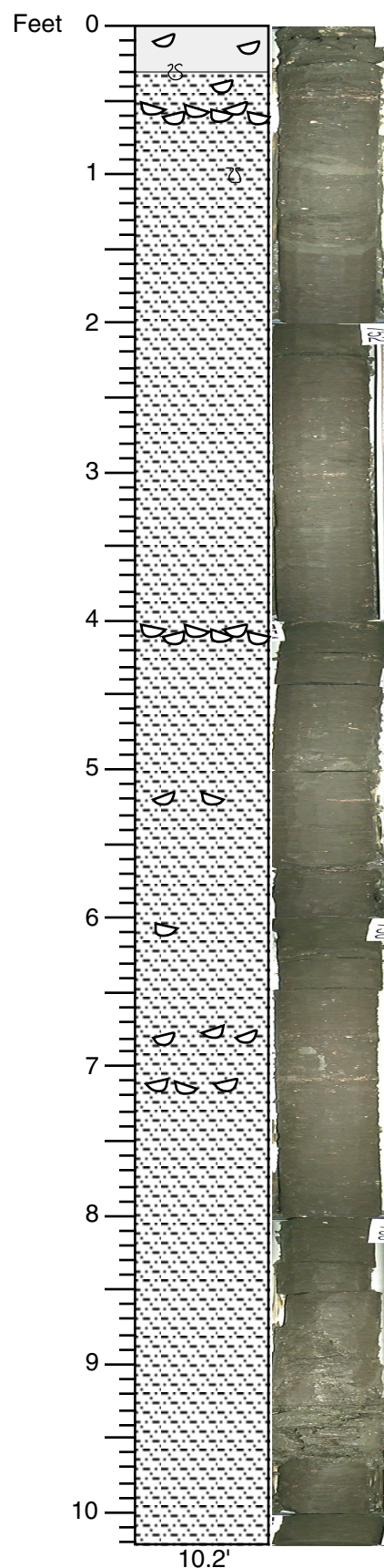
Stop Depth: 750 ft

Recovery = 9.9 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

126



SAND; very fine, silty and clayey, subangular, well sorted; mainly quartz, but notable fractions of very fine to silt-sized glauconite and mica; sand-filled burrows; shells from 0.0 to 0.3 ft and 0.5 to 0.6 ft, includes bivalves and scaphopods; above and below the shells section is mottled due to burrowing; greenish black (GLEY 1 10Y 2.5/1).

SILT; very clayey, with some very fine sand; stiff and somewhat dry; laminated and heavily bioturbated, with large and small burrows, sand is burrowed down into the silt, the smaller ones possibly *Planolites*, less than 1 mm by 3 mm, bedding parallel; sand includes some quartz, mica, very fine to silt-sized glauconite, and shell fragments; lamination is mostly thin (less than 3 mm), and sometimes the shells are concentrated on the laminae; shells are mostly nested bivalves, more abundant but dispersed at certain intervals (4.15, 6.85, and 7.15 ft); very dark gray (5Y 3/1).

174AX BB (Qj32-27)

Core # 130

Date: 5/29/00

Described by: PPMcL & JVB

Start Depth: 750 ft

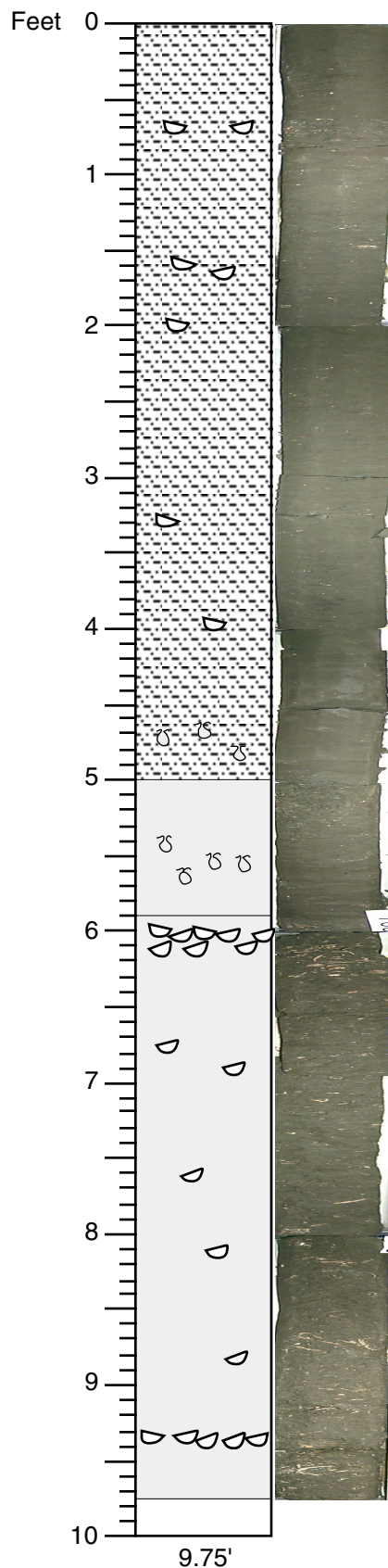
Stop Depth: 760 ft

Recovery = 10.2 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

127



SILT; slightly clayey with some very fine mostly quartz sand; some silt-sized to very fine sand-sized glauconite; micaceous; finely laminated; lower part is clayier and has a more banded color, but less relief, with laminations probably reflecting variations in clay content; bioturbated with small mostly subhorizontal burrows, more abundant burrows from 4.5 to 5.0 ft; shelly with bivalve fragments, layer of shells with sand at 0.65 ft; very dark olive gray (5Y 3/1).

SAND and interlaminated SILT; coarsening upward unit; sand is very fine to fine, moderately sorted, subangular, silty, micaceous, with shell fragments and small shells making up 10% of the sand; heavily bioturbated.

SAND; fine to very fine, moderately sorted, subangular, silty, micaceous, shelly, with about a 1% glauconite; shells concentrated from 0.0 to 0.3 ft and 9.5 to 9.6 ft where they make up about 30% of the volume; other wise shell content is around 10% of the volume; shells are mostly bivalves, a few dark shell fragments, possibly phosphatized; dark olive gray (5Y 4/1).

174AX BB (Qj32-27)

Core # 131

Date: 5/29/00

Described by: PPMcL & JVB

Start Depth: 760 ft

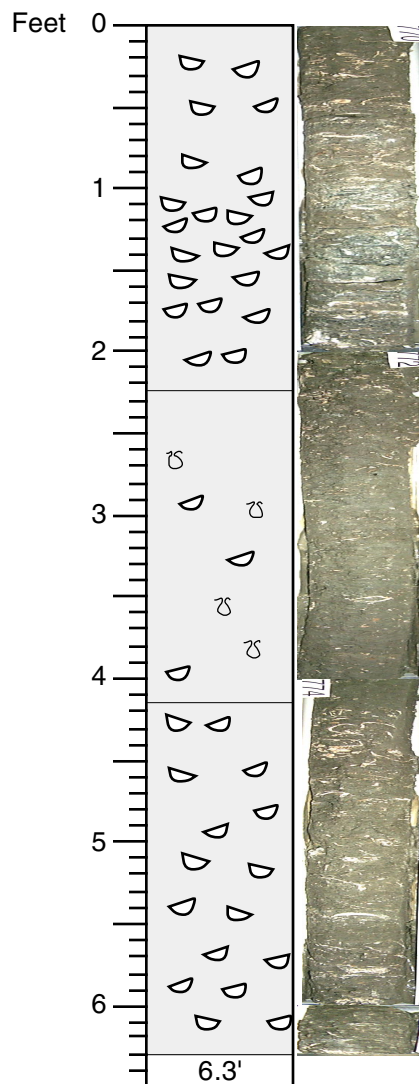
Stop Depth: 770 ft

Recovery = 9.75 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

128



SAND; very fine to fine, subangular, moderately sorted, mostly quartz, 25-40% shells, with very fine glauconite sometimes concentrated on or near shells; shells include bivalves (including possible very thick-shelled oysters) and turritellid gastropods; from 1.0 to 2.0 ft concentrated dark (phosphatized?) shell debris form hard zones; very dark gray (5Y 3/1) matrix; contact gradational with underlying interval.

SAND; as above but less shelly, less than 10% volume; variable siltiness gives contrast in the lamination; burrowed; shells include bivalves, gastropods, and fibrous shell debris, with occasional phosphatized grains; very dark gray (5Y 3/1); contact gradational with underlying interval.

SAND; as above but more abundant shells, 15-25% volume, shelliest near the top; includes a very fibrous shells and a large pecten shell at 6.0 ft; very dark gray (5Y 3/1).

174AX BB (Qj32-27)

Core # 132

Date: 5/29/00

Described by: PPMcL & JVB

Start Depth: 770 ft

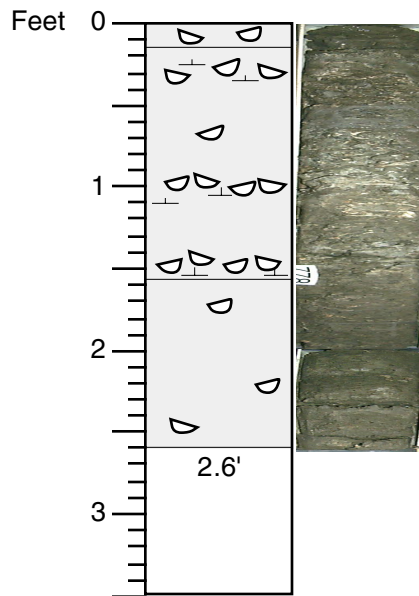
Stop Depth: 776.5 ft

Recovery = 6.3 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

129



SAND; shelly, fine to medium, subangular, moderately sorted, includes small bivalve shells.

SAND; shelly, fine to medium, subangular, moderately sorted (double-check sand texture – not in notes but assumed as above), with alternating cemented very shelly zones at 0.15-0.35 ft, 0.9-1.05 ft, and 1.35-1.55 ft, and unconsolidated less shelly zones in between; contains a few thick shell fragments, thin shells and fragments, fibrous shell fragments, phosphatized shell fragments, and some glauconite.

SAND with interlaminated SILT; sand is very fine to fine, subangular, moderately sorted, with 1-2% darker grains, possibly glauconite, scattered shell fragments (including a barnacle at 2.2 ft), and a few coarser grains; silt is slightly more cohesive; dark gray (5Y 4/1).

174AX BB (Qj32-27)

Core # 133

Date: 5/29/00

Described by: PPMcL & JVB

Start Depth: 776.5 ft

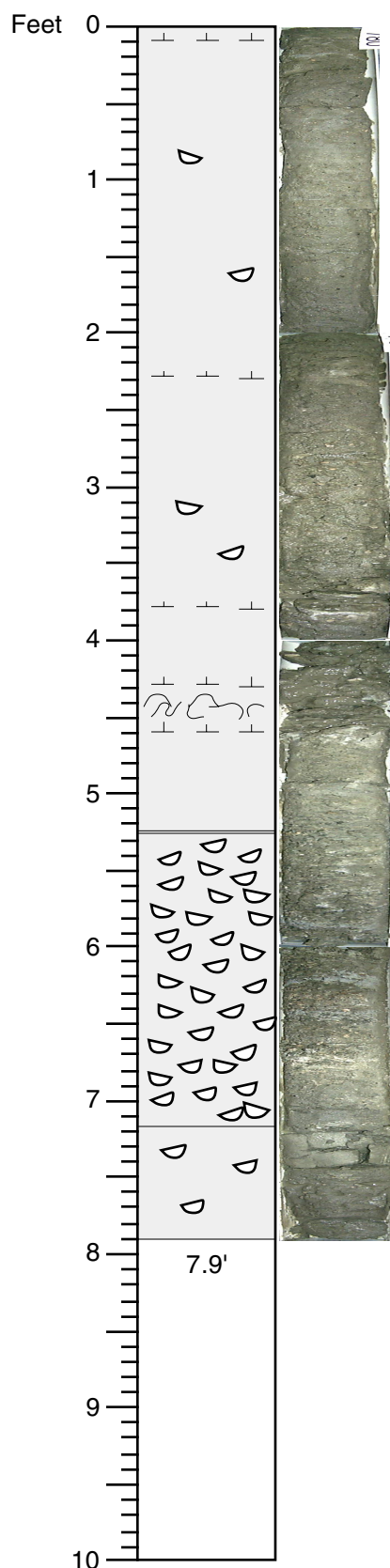
Stop Depth: 780 ft

Recovery = 2.6 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

130



SAND; fine to medium grain near the top, and medium near the middle, mostly quartz, less than 1% dark grains (glauconite or phosphate), subangular, moderately well sorted, slightly silty; some small shell fragments, from sand-sized to less than 5 mm, some still pearly; hard calcite-cemented nodule zones at 0.05-0.1 ft, 2.2-2.3 ft, 3.75-3.95 ft (very hard), 4.2-4.8 ft (with broken zone in middle).

SAND; very shelly, with shell fragments 75% volume, giving rubbly appearance; shell fragments mostly less than 5 mm, gray to dark gray with some tan to whitish or chalky, smaller shells towards the bottom; also numerous cemented sand steinkerns of shell fragments; in some places the sand matrix is cemented hard (more so in upper part), in other places crumbly.

SAND; fine to medium grain near the top, and medium near the middle, mostly quartz, less than 1% dark grains (glauconite or phosphate), subangular, moderately well sorted, slightly silty; similar lithology as top interval but no hard zones and slightly less shelly and silty.

174AX BB (Qj32-27)

Core # 134

Date: 5/30/00

Described by: PPMcL

Start Depth: 780 ft

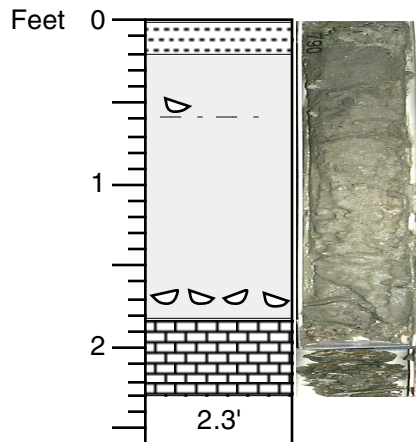
Stop Depth: 790 ft

Recovery = 7.9 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

131



Clayey coring junk, 0.0-0.2 ft.

SAND; medium, subangular, and well sorted; mostly quartz, common sand-sized shell debris and occasional shells and fragments including bivalves and barnacles; interbedded with very thin bed of sandy, clayey silt at 0.6 ft; contains some clasts of lithified silt at 0.5 ft; ground up cemented shells and sand from 1.75 to 1.8 ft.

LIMESTONE; sandy molluscan skeletal packstone; shells at least 75% of the volume, mostly bivalve, some shells with pearly luster; hard calcite-cemented sand matrix.

174AX BB (Qj32-27)

Core # 135/136

Date: 5/30/00

Described by: PPMcL

Core 135

Start Depth: 790 ft

Stop Depth: 792 ft

Recovery = 1.8 ft

Core 136

Start Depth: 792 ft

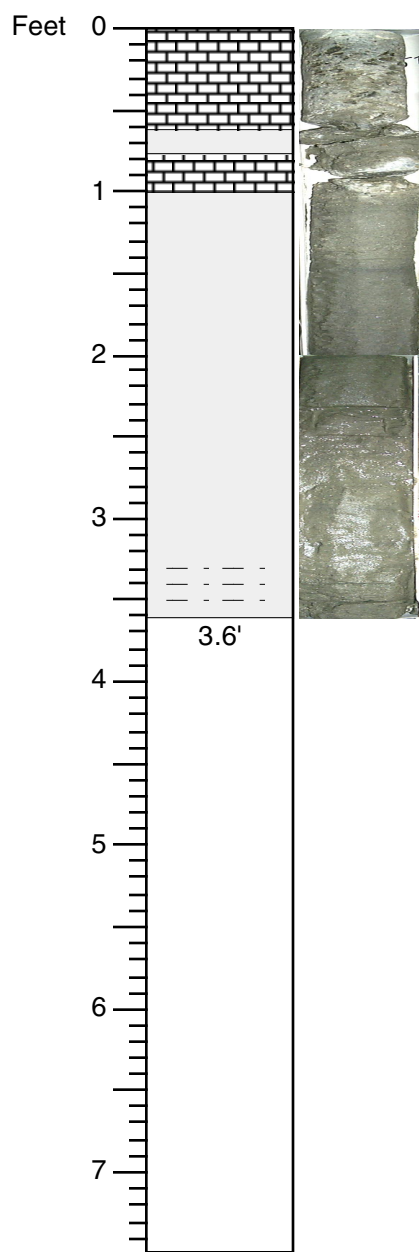
Stop Depth: 792.6 ft

Recovery = 0.5 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

132



LIMESTONE; sandy molluscan skeletal packstone; sand quartzose, with common dark grains; the smaller dark grains are possibly opaque heavy minerals, larger ones are better rounded and possibly phosphate; hard white calcareous-cemented sandy matrix.

SAND; fine, subangular, moderately well sorted, composed of mostly quartz, but contains about 1-2% dark grains, possibly opaque heavy minerals.

LIMESTONE; same as the top of the core but does not extend across the entire core so may be a fragment of that interval.

SAND; fine to medium, subangular to subrounded to rounded, well sorted, clean; the only larger grains are shell fragments ranging from medium to very coarse sand-sized, some are dark, but most are light; faint lamination, slightly darker opaque heavy minerals zones at 1.4, 1.9, 3.1, and 3.2 ft; shelly sand concentrations in places; several sticky, silty laminae in the lower part ; greenish gray (GLE Y 5GY 5/1) .

174AX BB (Qj32-27)

Core # 137

Date: 5/30/00

Described by: PPMcL

Start Depth: 792.5 ft

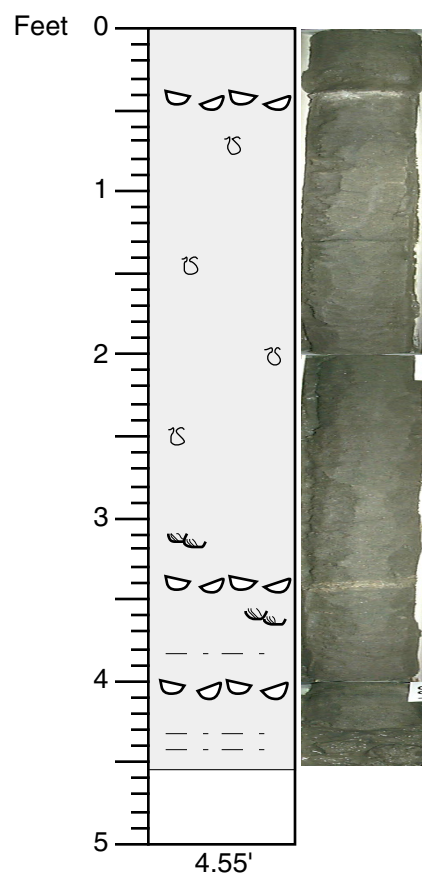
Stop Depth: 800 ft

Recovery = 3.6 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

133



SAND; fine to medium, clean, well sorted, subrounded to subangular; faint lamination and faint burrowing, with better lamination lower in interval; zones of shell enrichment at 0.3, 3.35, and 4.0 ft, with shell debris weathered to chalky white; apparent cross bedding between 2.9 and 4.0 ft; opaque heavy mineral concentrations at 3.9 and 4.1 ft; siltier zones at 3.8 ft and from 4.35 to 4.55 ft; greenish gray (GLEY 1 5GY 5/1).

174AX BB (Qj32-27)

Core # 138

Date: 5/30/00

Described by: PPMcL

Start Depth: 800 ft

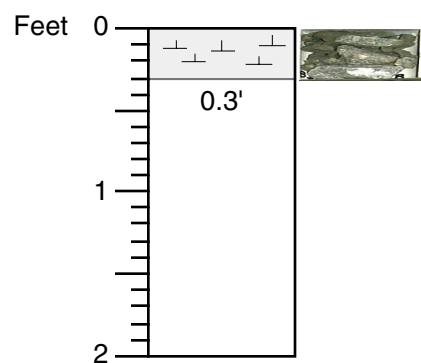
Stop Depth: 805 ft

Recovery = 4.55 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

134



SANDSTONE; hard, calcite cemented; fine, mainly quartz, 1-2% dark grains, possibly opaque heavy minerals, some shells.

174AX BB (Qj32-27)

Core # 139

Date: 5/30/00

Described by: PPMcL

Start Depth: 805 ft

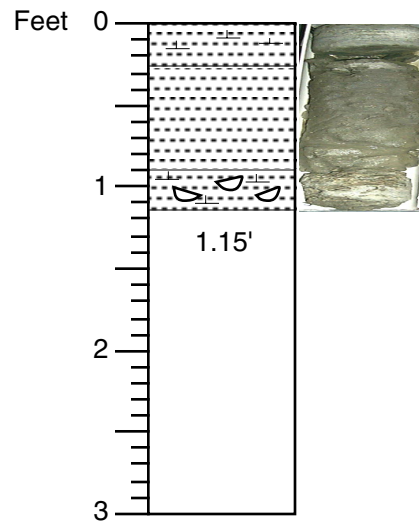
Stop Depth: 807 ft

Recovery = 0.3 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

135



SANDSTONE; hard and calcite cemented; fine, subangular to subrounded, moderately well sorted; mostly quartz, less than 1% dark grains; skeletal moldic porosity; greenish gray (GLY 10Y 5/1).

SAND; soft, unconsolidated; fine, moderately well sorted, subangular to subrounded; common (2-3%) fine/thin sand-sized shell fragments and 1-3% opaque heavy minerals.

SANDSTONE; hard and calcite cemented; fine; similar to the top sandstone, but more shells and shell voids, about 1/3 of the total volume.

174AX BB (Qj32-27)

Core # 140

Date: 5/30/00

Described by: PPMcL

Start Depth: 807 ft

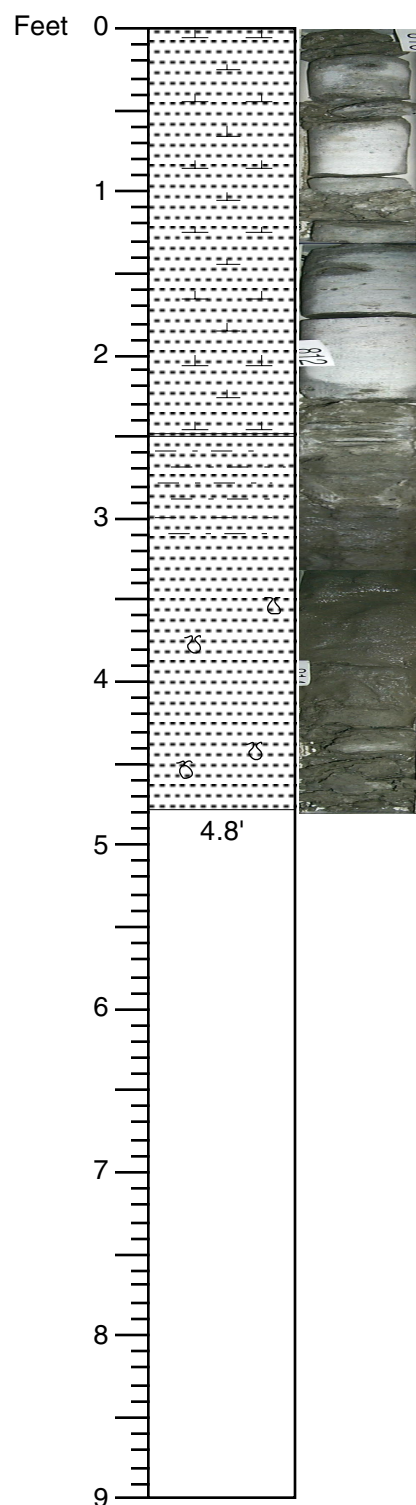
Stop Depth: 810 ft

Recovery = 1.15 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

136



SANDSTONE; hard, calcite cemented; fine to very fine, moderately well sorted, subround to subangular to round; mostly quartz, 2-3% opaque heavy minerals, and 2-3% fine shell debris, with the shell debris more concentrated in some intervals; a few larger shells and/or fragments; common voids from dissolved shells below 0.3 ft, where less cemented.

SAND, fine to medium, moderately sorted, subrounded to subangular; very slightly silty, soft, unconsolidated to slightly cohesive near the base; mostly quartz, 1-2% dark grains, 2-3% sand-sized shell debris ranging from fine to very coarse; lamination evident in zones of enriched silt or shell debris, especially in the upper part; burrowed with darker siltier fill; greenish gray (GEY1 5GY 4/1).

174AX BB (Qj32-27)

Core # 141

Date: 5/30/00

Described by: PPMcL

Start Depth: 810 ft

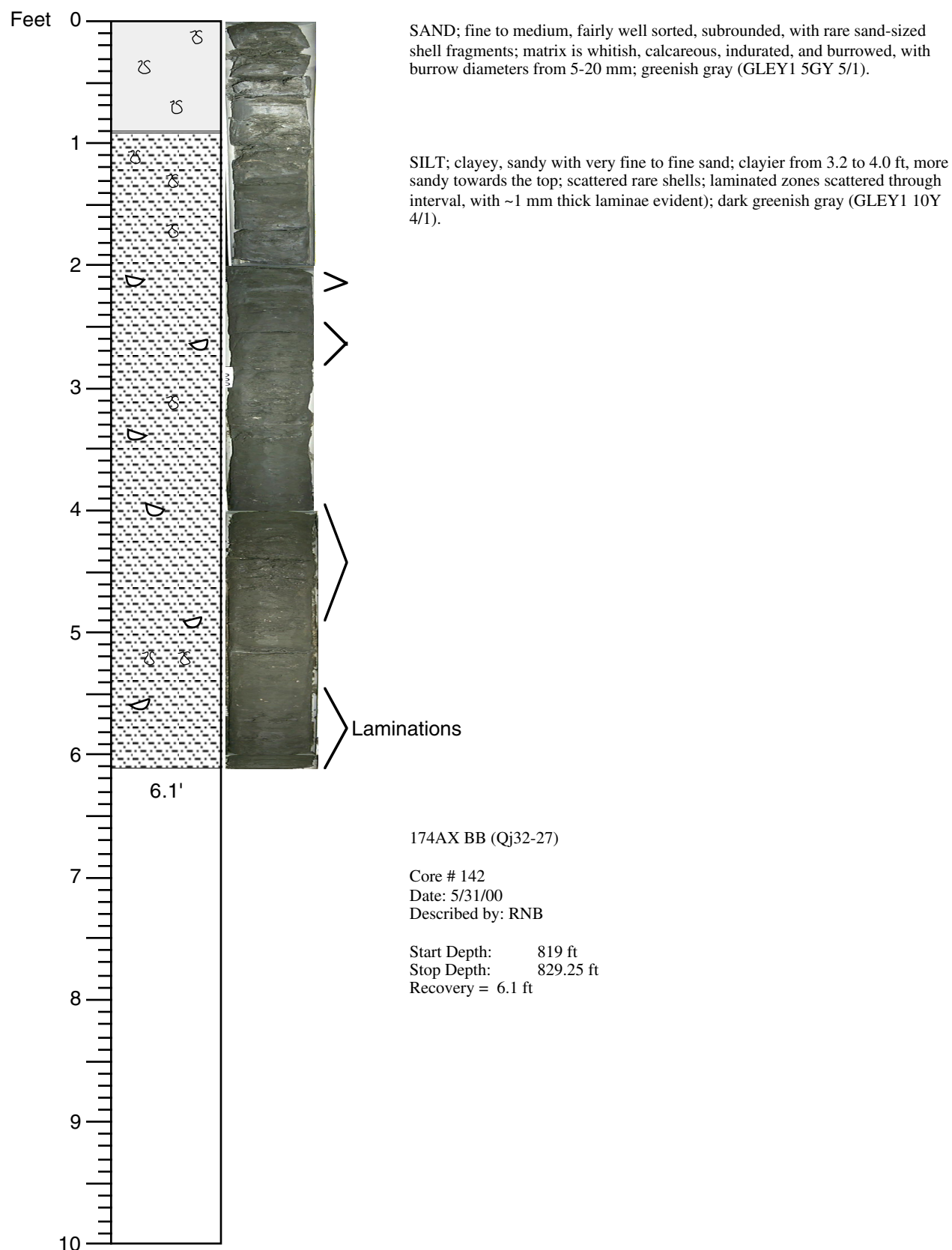
Stop Depth: 819 ft

Recovery = 4.8 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

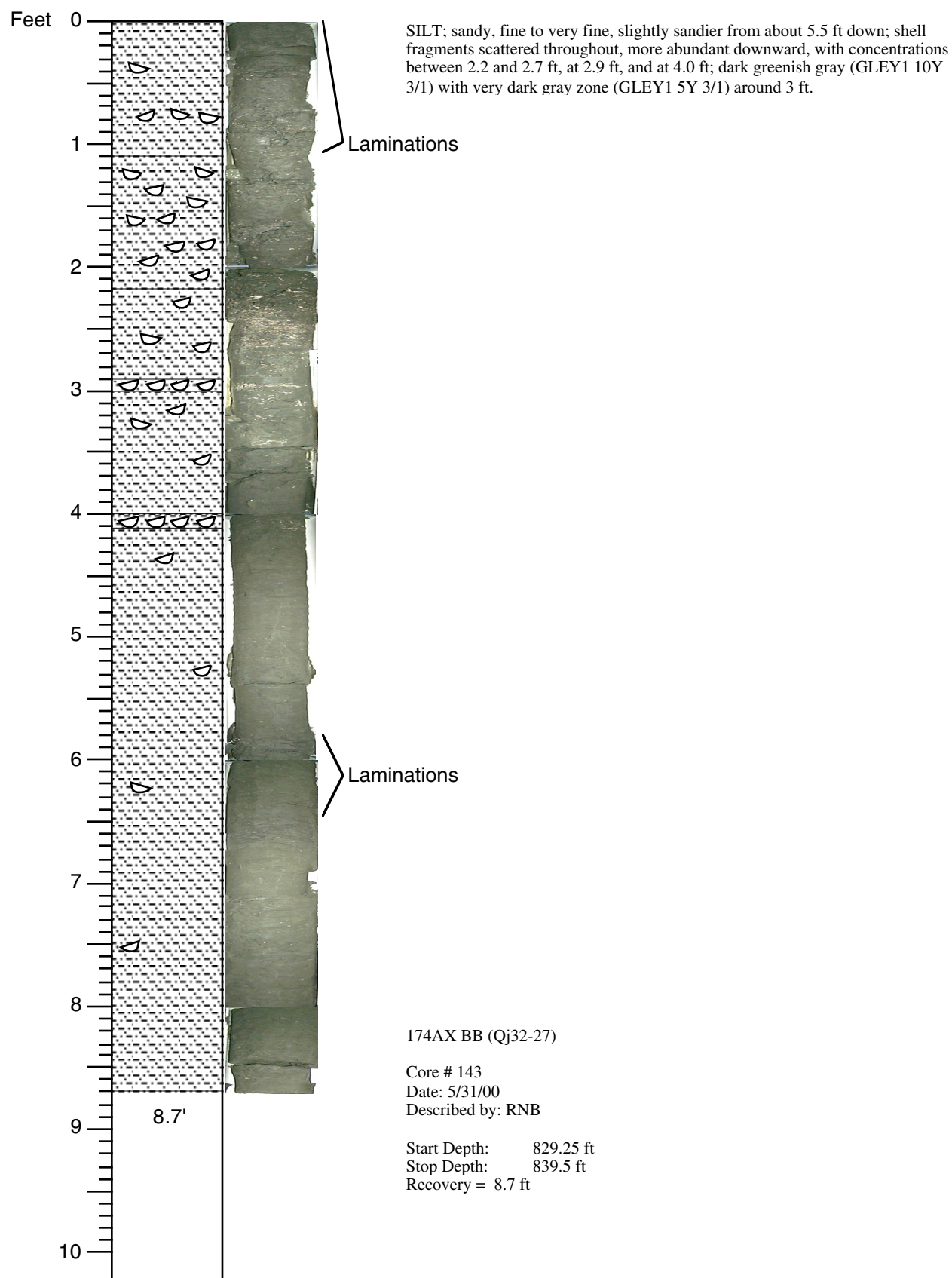
137



CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

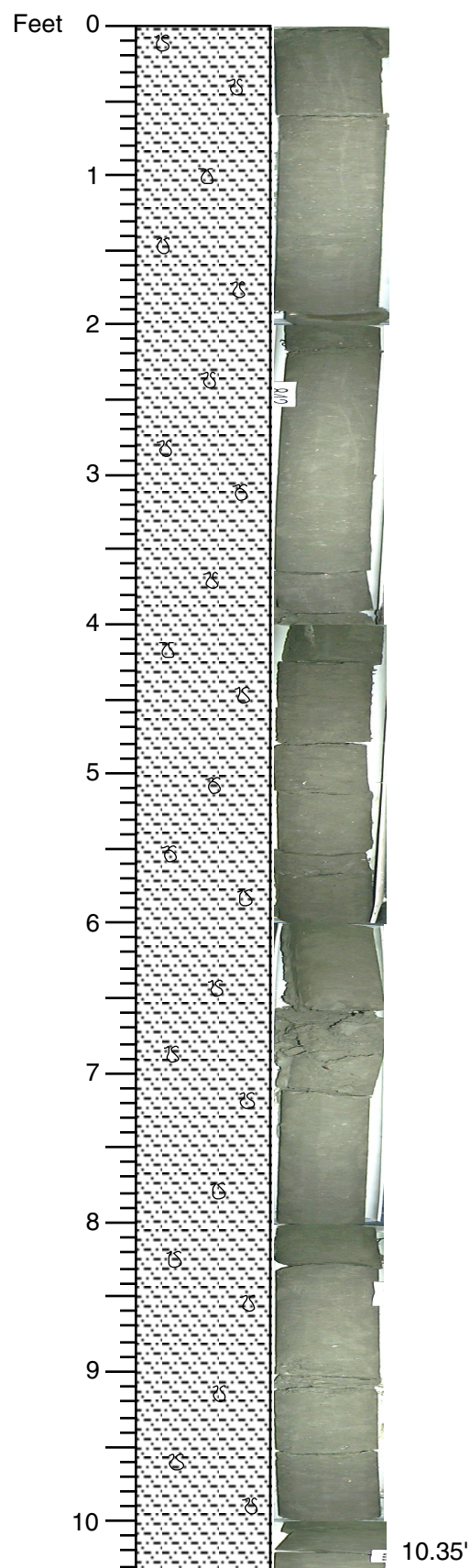
138



CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

139



SILT; slightly clayey; variably sandy, with very fine sand; extensively bioturbated, burrows generally slightly siltier or muddier; occasional shells and shell fragments that range from sand-sized to 5 mm; soft zones that are sandier and clayier with some preserved lamination at 2.1, 6.3, 6.7, and 8.9 ft.

174AX BB (Qj32-27)

Core # 144

Date: 5/31/00

Described by: RNB

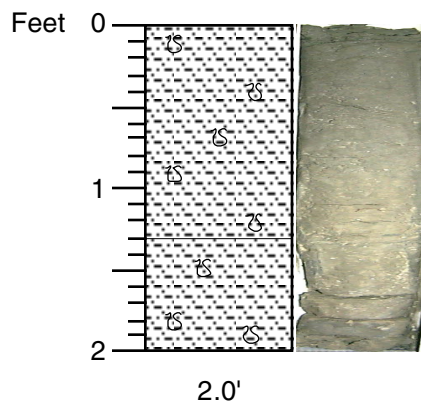
Start Depth: 839.5 ft

Stop Depth: 849.75 ft

Recovery = 10.35 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

140



SILT; sandy, sand is very fine; greenish gray (GLEY1 5GY 5/1).

SILT; sandy, sand is very fine; indurated; is less sandy towards the bottom.

174AX BB (Qj32-27)

Core # 145

Date: 5/31/00

Described by: RNB

Start Depth: 894.75 ft

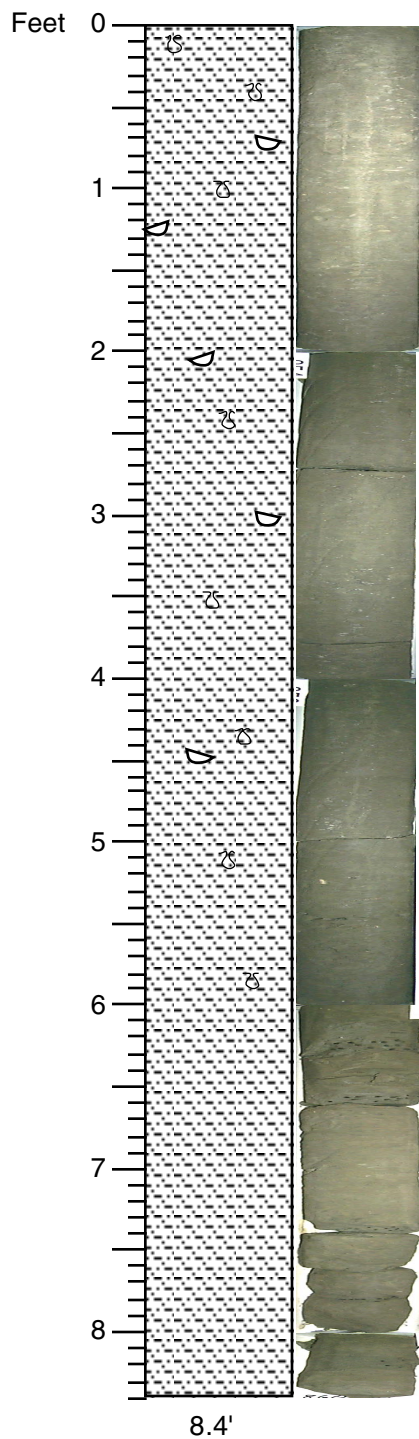
Stop Depth: 851.75 ft

Recovery = 2.0 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

141



SILT; sandy, clayey; top 2 feet indurated; sand fine to very fine, top 5 ft slightly sandier; heavily bioturbated, with sand-filled burrows; trace amounts of opaque heavy minerals throughout; homogenous bedding due to bioturbation, with some cross laminations at depths of 6-6.4 ft and 7.4-8.4 ft; barnacle fragment at 5.2 ft; top 2 ft is light olive gray (5Y 6/2 to 5/2), rest of the core is olive gray (5Y 4/2).

174AX BB (Qj32-27)

Core # 146

Date: 5/31/00

Described by: MEK, RNB, & KGM

Start Depth: 851.75 ft

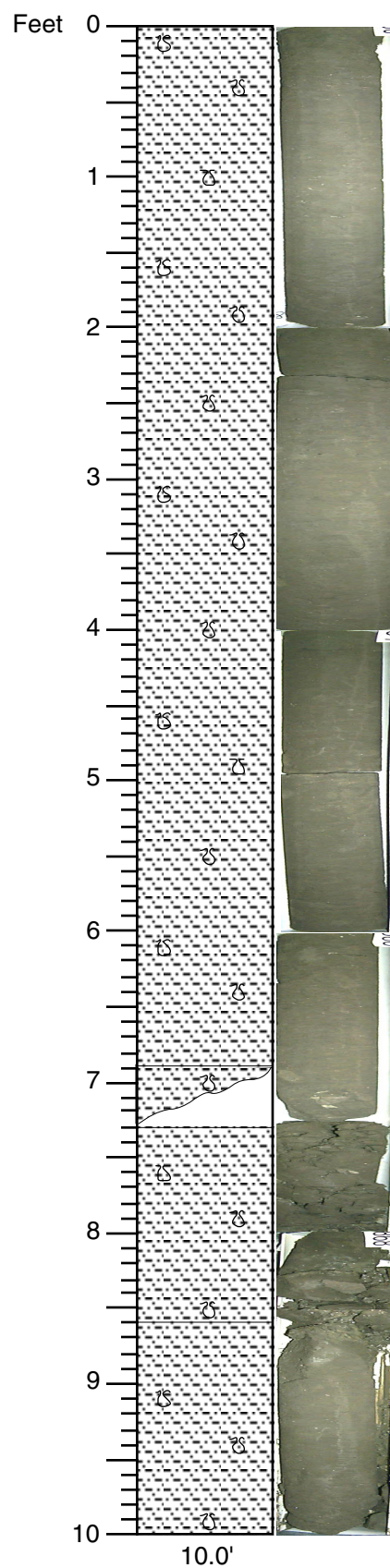
Stop Depth: 860 ft

Recovery = 8.4 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

142



SILT; sandy, sand very fine and slightly micaceous; rare, sand-sized shell fragments and scattered rare foraminifera; core is broken and brecciated from around 7 to 8.5 ft due to drilling disturbances; dark greenish gray (GLE Y1 10Y 4/1), with very dark gray (GLE Y1 5Y 3/1) broken zone.

174AX BB (Qj32-27)

Core # 147

Date: 5/31/00

Described by: RNB

Start Depth: 860 ft

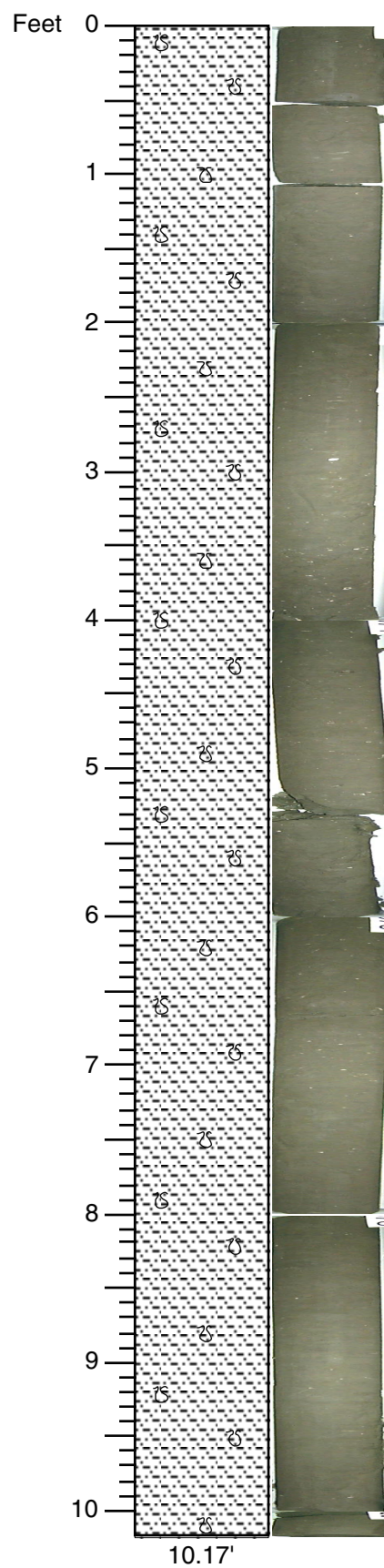
Stop Depth: 870 ft

Recovery = 10.0 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

143



SILT; very slightly sandy, with little or no clay; rare shell fragments scattered throughout the core; faint lamination (clearest from 5.8 to 6.6 ft) but difficult to see due to the bioturbation; dark greenish gray (GLE Y1 10Y 4/1).

174AX BB (Qj32-27)

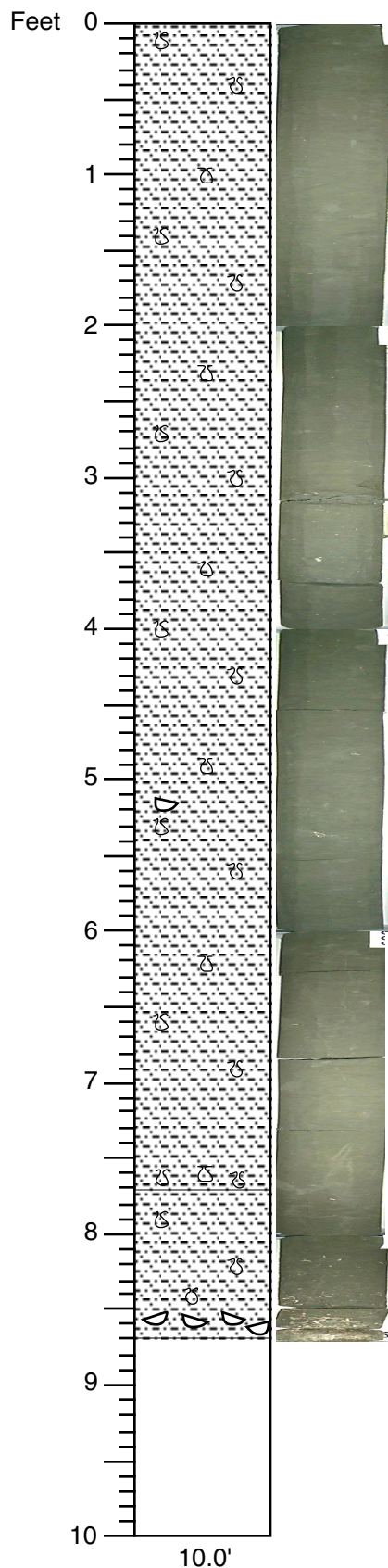
Core # 148
Date: 5/31/00
Described by: RNB

Start Depth: 870 ft
Stop Depth: 880 ft
Recovery = 10.17 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

144



SILT; rare shells scattered throughout, increasing slightly at 8.1 ft with a concentration between 8.6-8.7 ft and a turritellid at 5.2 ft; faint laminations (clearest from 3.0-3.1 ft) but bioturbated throughout; burrowed contact ranging over about 1 foot at 7.7 ft below which silts grades downward into sandy silt; dark greenish gray (GLEY1 5GY 4/1) with dark greenish gray (GLEY1 10Y 4/1) from 0-7.7 ft.

174AX BB (Qj32-27)

Core # 149

Date: 6/1/00

Described by: RNB & MEK

Start Depth: 880 ft

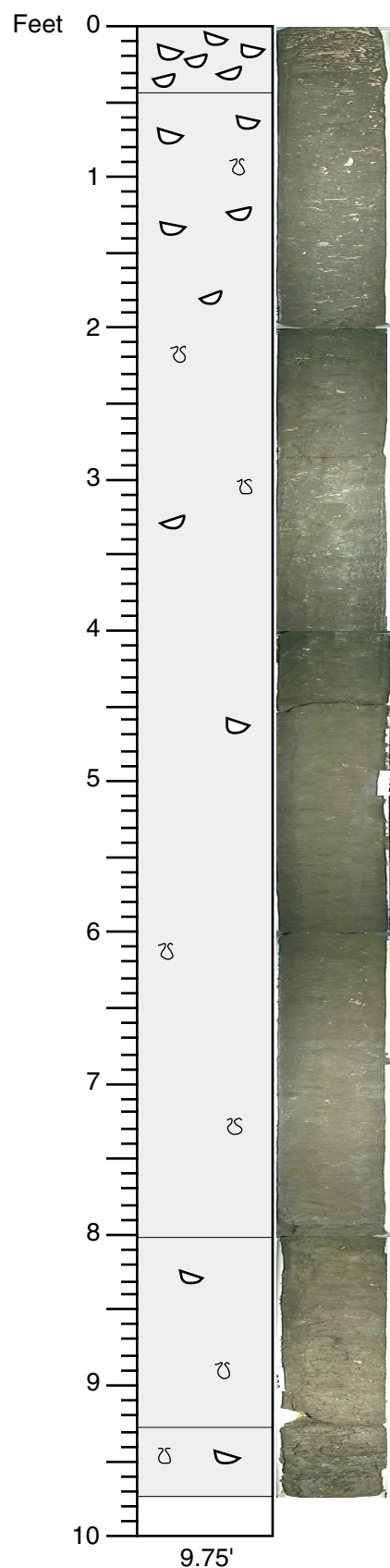
Stop Depth: 889 ft

Recovery = 8.7 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

145



SAND; medium to fine, silty, with a few quartz granules; concentration of dark shells.

SAND; fine grain, silty; subrounded; shells scattered throughout the interval, decreasing gradually downward to 1.8 ft and less abundant below; layer of finer, harder sand between 7.5 and 8.0 ft; dark olive gray (5Y 3/2).

174AX BB (Qj32-27)

Core # 150

Date: 6/1/00

Described by: RNB

Start Depth: 889 ft

Stop Depth: 899 ft

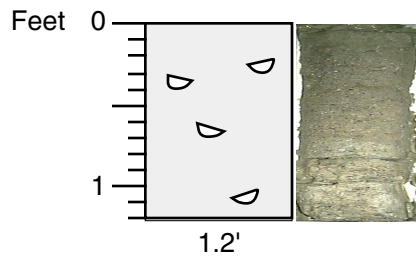
Recovery = 9.75 ft

SAND; fine, slightly silty; coarsens to medium below 9.3 ft with some coarse sand and shell fragments; dark greenish brown (2.5Y 4/2).

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

146



SAND, medium to coarse, subrounded, quartzose, grain-supported, moderately well sorted; shelly with scattered detrital fragments; unbedded; 10Y 4/1

Note: the top 0.3 ft is siltier (burrowed from above)

174AX BB (Qj32-27)

Core # 151

Date: 6/1/00

Described by: RNB

Start Depth: 899 ft

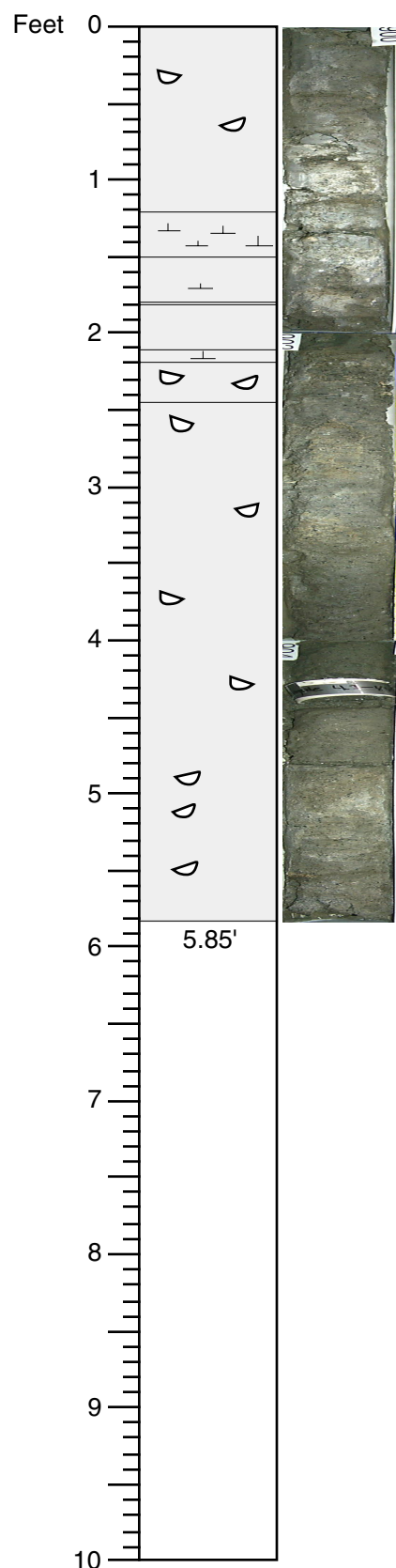
Stop Depth: 900 ft

Recovery = 1.2 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

147



SAND; medium, clean, moderate to well sorted, subrounded; grains quartz with detrital shell fragments that are up to granule size, trace phosphatic grains; unconsolidated, but with variably calcite-cemented intervals of SANDSTONE from 0.8 to 1.5 and loosely cemented zones from 1.5 to 1.8 ft and 2.0-2.1 ft; greenish gray (5GY 6/1).

SAND; coarse, moderately sorted, subrounded, with granule plus sized shell fragments.

SAND; medium, clean, fairly well sorted; contains quartz grains and common shell fragments, which range from all sizes but are primarily 2 mm or less; includes phosphatized grains, possibly vertebrate bone fragments, barnacles, and other shell types; gray to olive gray (5Y 5/1 to 5Y 5/2).

174AX BB (Qj32-27)

Core # 152

Date: 6/1/00

Described by: RNB

Start Depth: 900 ft

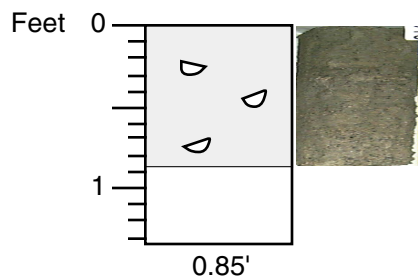
Stop Depth: 910 ft

Recovery = 5.85 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

148



SAND; medium, moderately well sorted, subrounded, clean; includes scattered detrital shell fragments, the larger of which are likely barnacles; gray (5Y 5/1).

174AX BB (Qj32-27)

Core # 153

Date: 6/1/00

Described by: RNB

Start Depth: 910 ft

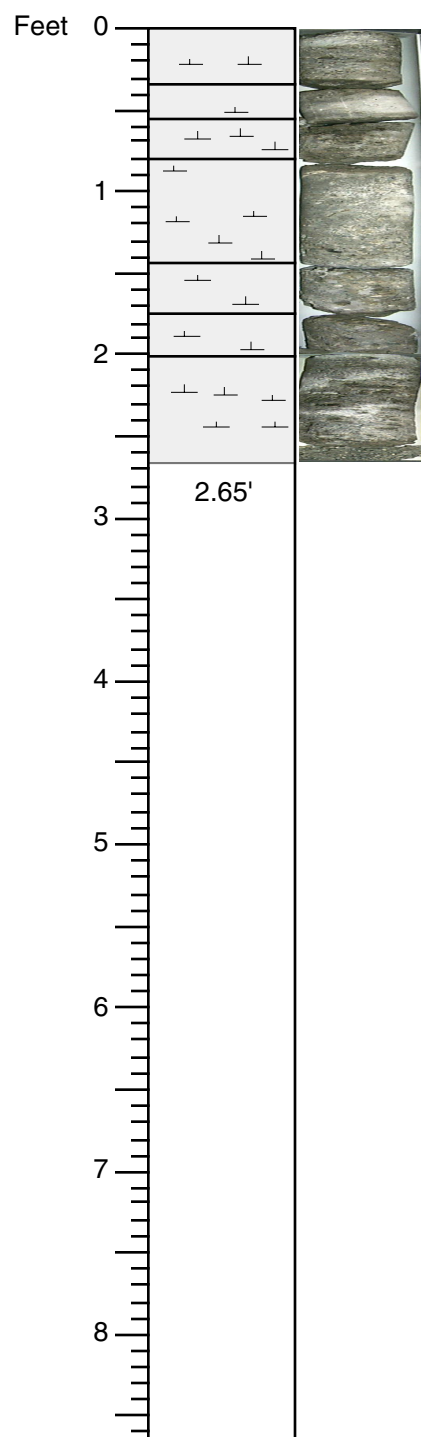
Stop Depth: 911.35 ft

Recovery = 0.85 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

149



SANDSTONE; hard, calcite cemented; grains medium, subrounded, well sorted, "floating" in the calcite cement; cement rims less than 1 mm thick around the grains; shell fragments present, including large ones; large areas of uncemented sandstone that are probably represent areas where shells were dissolved; sandstone occurs as seven different pieces, which were probably all separated in the subsurface by uncemented sand; light to dark gray (N 8/ to N 4/6).

174AX BB (Qj32-27)

Core # 154

Date: 6/1/00

Described by: RNB

Start Depth: 911.35 ft

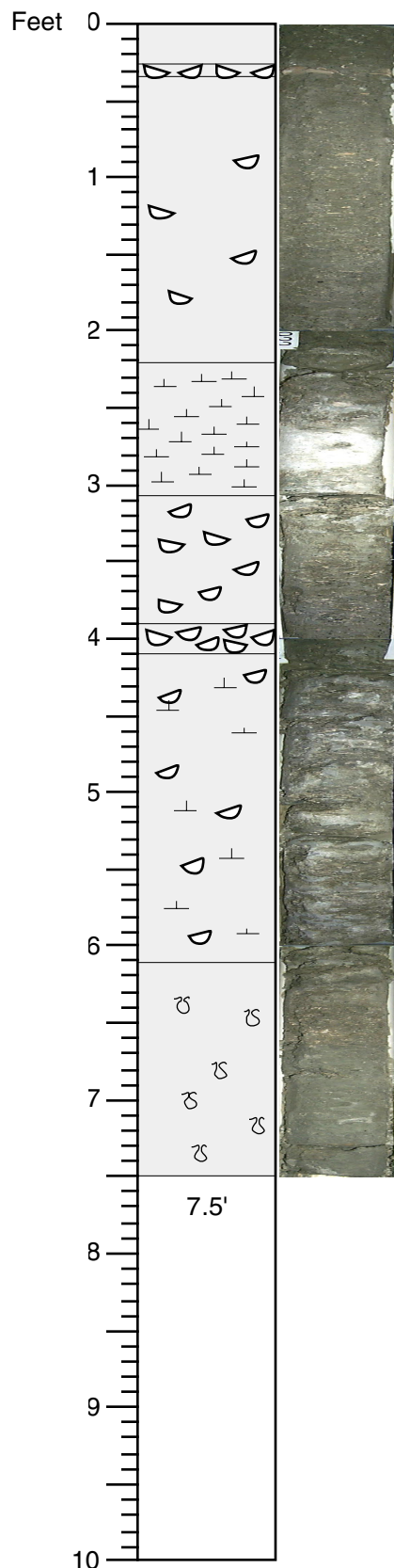
Stop Depth: 920 ft

Recovery = 2.65 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

150



SAND; slightly silty, medium, subrounded; mostly quartz, some shell fragments; at 0.28 ft there is a concentration of shells, including one encrusted with bryozoa

SAND; coarse grading downward to medium, fairly well sorted, slightly silty; mostly quartz, scattered sand to granule-size shell fragments; olive gray 5Y 4/2.

SANDSTONE; hard, calcite cemented; medium, well sorted; grains quartz; common shells.

SAND; coarse grading downward to medium, fairly well sorted, slightly silty; mostly quartz, concentration of shells between 3.3 and 3.8 ft, coarse shell fragments from 3.9 to 4.1 ft; olive gray (5Y 4/2).

SAND; medium, with some coarse grains from 6.3 to 6.6 ft; fairly well sorted, silty; grains quartz, subrounded, irregularly cemented; shells common from 4.1 to 4.9 ft.

SAND; medium grained, subround, and fairly well sorted; silty to clayey; grains mostly quartz; clay filled burrows; top of unit at 6.6 ft may represent significant contact.

174AX BB (Qj32-27)

Core # 155

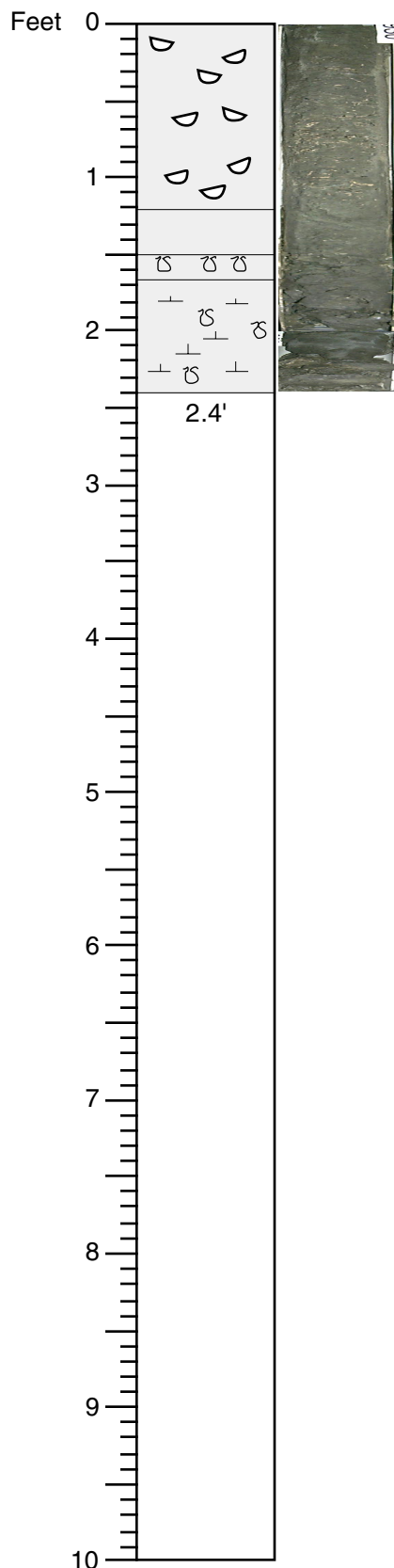
Date: 6/2/00

Described by: RNB

Start Depth: 920 ft

Stop Depth: 930 ft

Recovery = 7.5 ft



SAND; medium, moderately well sorted, and subangular to subrounded, silty; mostly quartz, with opaque heavy minerals and phosphatized shell fragments horizontally layered; very shelly, shells nearly whole; olive gray (5Y 5/1-4/1).

SAND; medium to fine, silty; mostly quartz, with some rare shell fragments.

SAND; fine, silty; contains clay filled burrows.

SAND; fine to very fine, silty, no shells; from 1.9 to 2.4 feet, calcite cemented with distinct laminations; dark greenish gray (10Y 3/1).

174AX BB (Qj32-27)

Core # 156

Date: 6/2/00

Described by: RNB

Start Depth: 930 ft

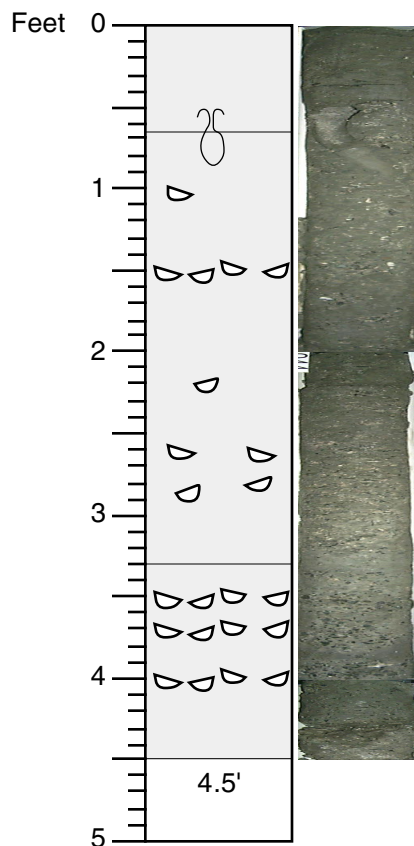
Stop Depth: 940 ft

Recovery = 2.4 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

152



SAND; medium, some coarse, subrounded to subangular, very clayey; mostly quartz; large clay filled burrow at 0.65 ft, 20 mm diameter.

SAND; medium, some coarse, subrounded to subangular; clayey to silty; quartz sand, fragments of thick shells, with shells tending to be layered horizontally, including mollusks, barnacles, and some bone fragments; shell concentrations from 1.4 to 1.5 ft (which includes trace glauconite and phosphate) and 2.1 to 2.5 ft.

SAND; medium to coarse; silty to clayey; quartz grains with 20-30% matrix; concentrations of shell material around 3.5, 3.7, and 3.9 ft that include barnacle fragments, some bone phosphate, and quartz granules.

174AX BB (Qj32-27)

Core # 157

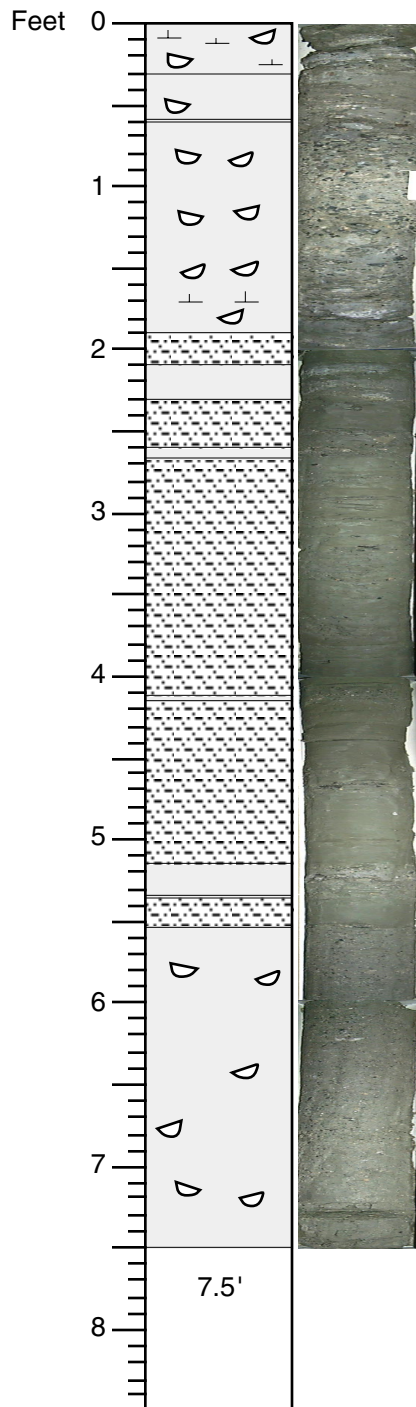
Date: 6/1200

Described by: RNB

Start Depth: 940 ft

Stop Depth: 945 ft

Recovery = 4.5 ft



SANDSTONE; fine to very fine; calcite cemented quartz; coarse shell fragments from 0.2 ft-0.3 ft.

SAND; very fine to fine, silty and clayey.

SAND; medium to fine, moderately sorted, subrounded to subangular; mostly quartz; shelly, barnacle fragment concentrations at 0.6-0.9 ft, 1.15-1.3 ft, and 1.45-1.55 ft; hard layer at 1.7 ft; possible mammal tooth at 0.65 ft.

SILT; with laminated and sandy intervals in the upper part, and cross-laminated appearance in lower part; thin medium to coarse SAND horizons at 2.6-2.65 ft, 4.1-4.15 ft, and 5.15-5.35 ft; sands include barnacle fragments; very rare scattered shell fragments in silt; dark greenish gray (10Y 4/1).

SAND; medium to coarse, fining downward; silty; contains shell fragments; unbedded.

SAND; medium, silty, no shells.

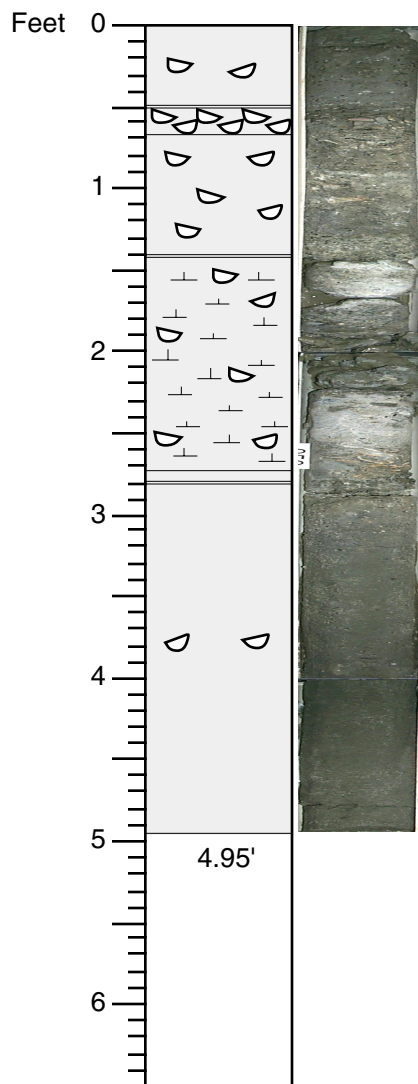
174AX BB (Qj32-27)

Core # 158
 Date: 6/2/00
 Described by: RNB

Start Depth: 945 ft
 Stop Depth: 953.5 ft
 Recovery = 8.5 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

154



SAND; fine to coarse, poorly sorted, quartz; clayey, giving muddy matrix; scattered barnacle fragments; 10Y 4/1.

SHELL BED; concentration of barnacle fragments up to 10-15 mm; sandy.

SAND, very shelly, medium to coarse, coarser at the base.

SANDSTONE; shelly quartz sand with calcite cement; shell hash includes a mix of bivalves, barnacles, and bone fragments; from 1.9-2.2 ft and 2.75-2.8 ft the core is broken into rubble by the drilling.

SAND; medium very silty; calcareous, quartz sand; scattered shell fragments from 3.7-3.9 ft; 10GY 4/1.

174AX BB (Qj32-27)

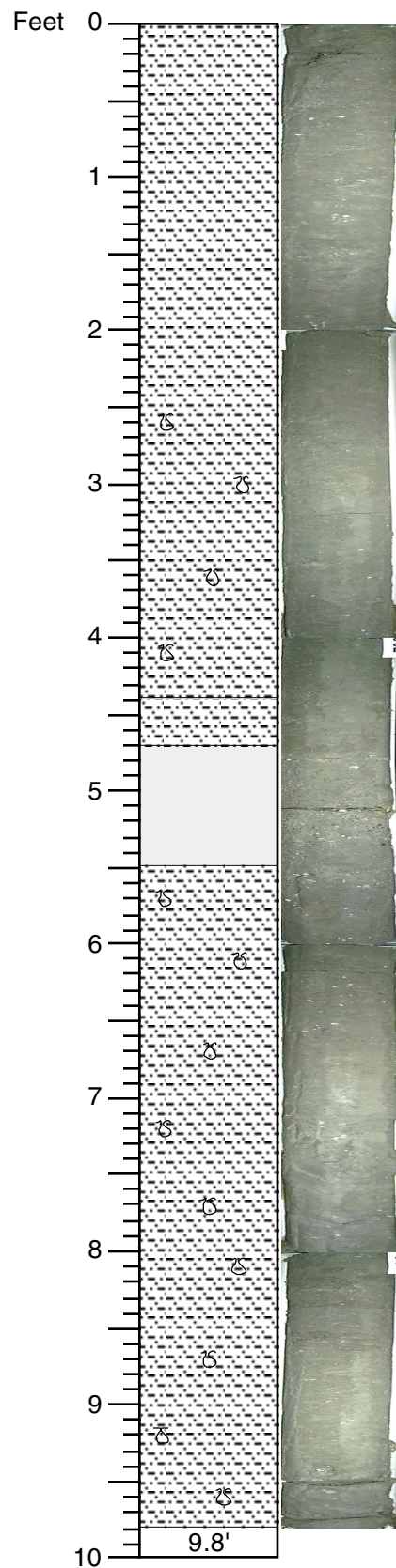
Core # 159
 Date: 6/2/00
 Described by: RNB

Start Depth: 953.5 ft
 Stop Depth: 960 ft
 Recovery = 4.95 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

155



SILT; very sandy (sandiest from 0-0.3 ft), clayey; appears cross-laminated from around 2.0-2.3 ft, below which laminae appears to be disrupted; a few clay filled burrows from 2.5-4.4 ft; little sand from 4.4 ft-4.7 ft.

SAND; medium to coarse, moderately sorted, subangular to subrounded, silty; quartz with rare shell fragments; sand grades downward to sandy silt from 5.5 ft-5.7 ft.

SILT; some very sandy; bioturbated.

Note: after storage, bottom 2 ft of core develops yellow sulfur coating on exterior

174AX BB (Qj32-27)

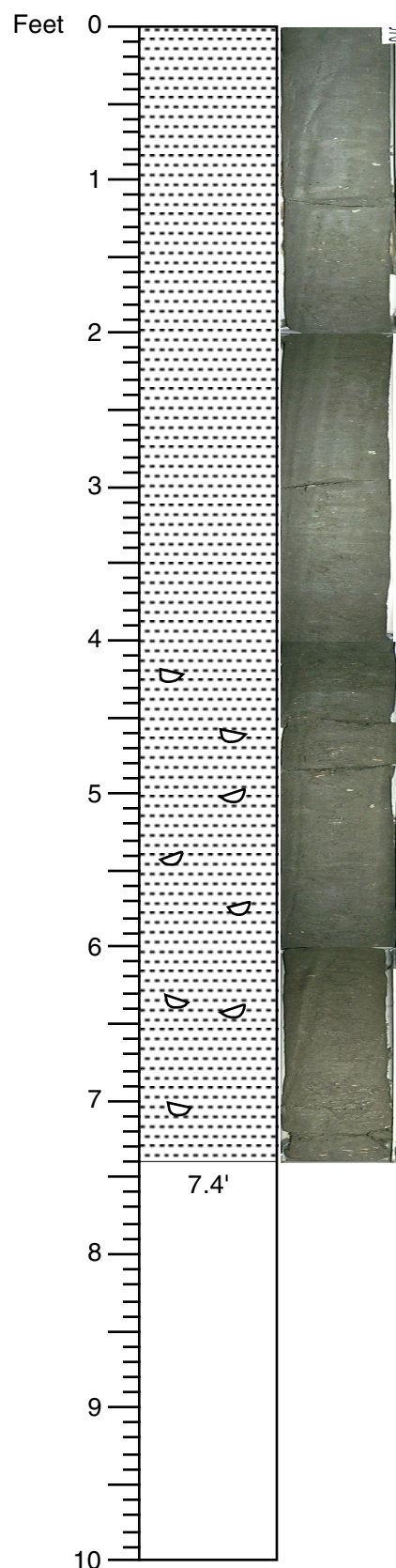
Core # 160
Date: 6/2/00
Described by: RNB

Start Depth: 960 ft
Stop Depth: 970 ft
Recovery = 9.8 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

156



SAND; fine to very fine, well-sorted; clayey and silty from 0-1.1 ft, silty below that; sand is quartz with some scattered shell fragments, more in bottom 0.9 ft; fairly homogeneous but faintly laminated; very dark to dark olive gray (5Y 2.5/1 to 5Y 3/1).

174AX BB (Qj32-27)

Core # 161

Date: 6/2/00

Described by: RNB

Start Depth: 970 ft

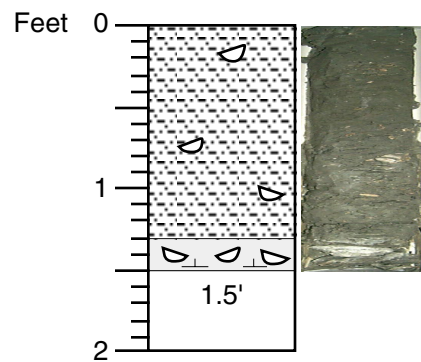
Stop Depth: 980 ft

Recovery = 7.4 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

157



SAND; fine to medium, slightly silty; mostly quartz sand with shells and fragments distributed throughout; no visible bedding; dark olive gray (5Y 3/2).

SANDSTONE; calcite cemented, shelly.

174AX BB (Qj32-27)

Core # 162

Date: 6/3/00

Described by: MEK

Start Depth: 980 ft

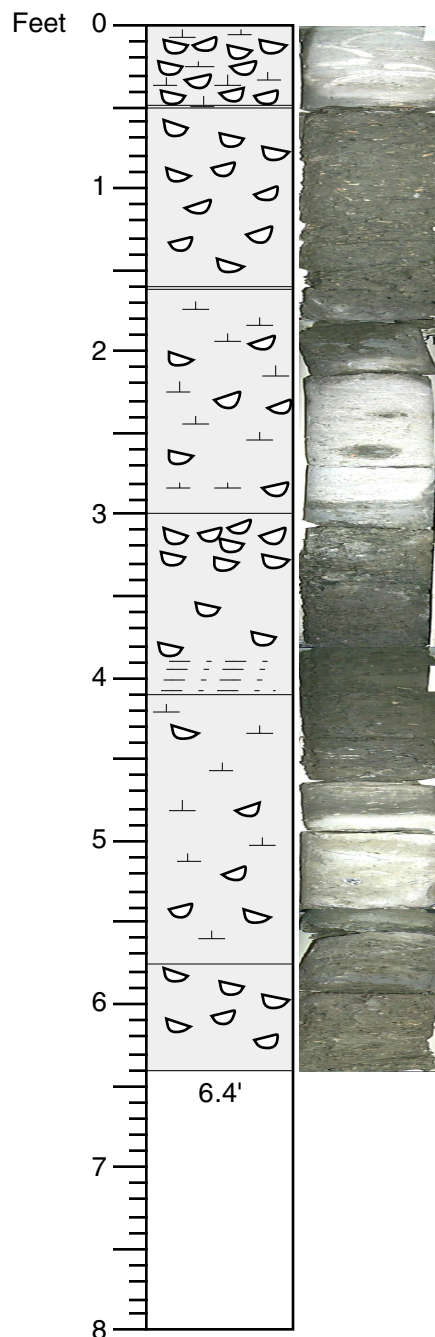
Stop Depth: 982 ft

Recovery = 1.5 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

158



SANDSTONE; calcite cemented, hard, fine, well sorted quartz sand; <1% dark grains (opaque heavy minerals); < 25% of volume is shells and shell fragments, often including both valves, some very thick (1-7 mm); greenish gray (GEY 10GY 6/1).

SAND; soft, fine, some medium, subrounded to subangular, moderately sorted quartz sand; silty, includes about 1% dark grains; light and dark shell debris is abundant, <25% volume, dark shells possibly phosphatized; some shells are nearly whole; fragments range from sand sized to greater than 50 mm but mostly about 1 mm thick, fragments are aligned subvertical to subhorizontal; base is gradational into underlying unit; dark greenish gray (GEY 1 5GY 4/1).

SANDSTONE; hard, calcite cemented, subround to subangular, fine to medium grained; abundant shell fragments, <25% volume, from sand-sized to 10 mm and up to 2 mm thick; whole shells occur near the bottom; shells occur at various angles; greenish gray (GEY 1 10GY 5/1).

SAND and interbedded SILT; soft; top is very shelly sand, bottom is sandy silt; sand is fine grained, subrounded, and well sorted; silts are shelly; shell debris about 50% volume near top, but near the bottom volume is >50% sandy, shelly silt; dark greenish gray (GEY 1 10Y 4/1).

SANDSTONE; calcite cemented, hard, fine, well sorted quartz sand; <1% dark grains (opaque heavy minerals); < 25% of volume is shells and shell fragments, often including both valves; some parallel laminations near the top; greenish gray (GEY 10GY 6/1).

SAND; soft, fine, some medium, subrounded to subangular, moderately sorted quartz sand; silty, includes about 1% dark grains; shell debris is abundant, <25% volume, range from sand sized to greater than 50 mm but mostly about 1 mm thick; dark greenish gray (GEY 1 5GY 4/1).

174AX BB (Qj32-27)

Core # 163

Date: 6/3/00

Described by: PPMcL & MEK

Start Depth: 982 ft

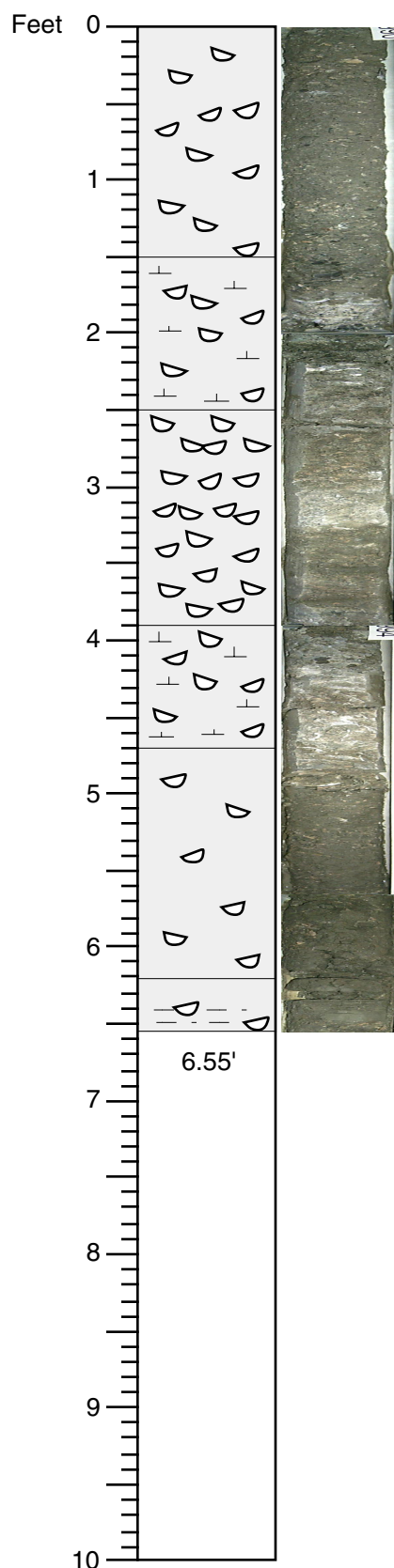
Stop Depth: 990 ft

Recovery = 6.4 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

159



SAND; soft, medium to fine, subrounded, moderately sorted, silty; abundant shell fragments, about 25% of the volume, up to 10 mm, light and dark (some possibly phosphatized); rare, well-rounded larger (up to 4 mm) dark grains, possibly phosphate; dark greenish gray (GLEY1 10Y 4/1).

SANDSTONE; hard, calcite cemented, more crumbly lower in interval; medium to fine sand as above; a few larger shells; greenish gray (GLEY1 10Y 6/1).

SAND; soft, medium to fine sand as above; very abundant shell fragments similar to top of core but nearly 50% of the volume; dark greenish gray (GLEY1 10Y 4/1).

SANDSTONE; calcite cemented, somewhat crumbly, medium to fine sand as above; abundant shell material, includes shell fragments and large shells, mostly bivalves; greenish gray (GLEY1 10Y 6/1).

SAND; soft, silty, medium to fine, moderately to moderately well sorted subround quartz; abundant shells, up to 25% volume, includes fragments and nearly complete specimens, size as large as 50 mm to as small as sand size; smells like **hydrogen sulfide**; dark greenish gray (GLEY1 10Y 4/1).

SAND; soft, silty, medium to fine, as above but with fewer shells and more silt.

174AX BB (Qj32-27)

Core # 164

Date: 6/3/00

Described by: PPMcL & MEK

Start Depth: 990 ft

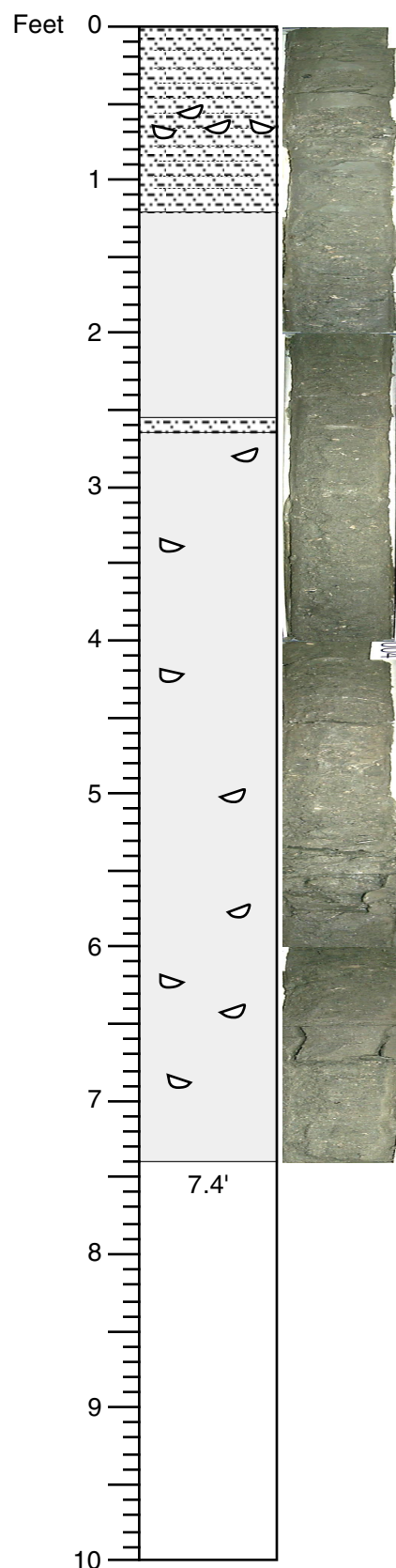
Stop Depth: 1000 ft

Recovery = 6.55 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

160



SAND and interbedded SILT; sand is fine to medium, subrounded to subangular, silty, about 1% opaque heavy minerals; scattered shell fragments, some dark; silt is laminated, some appears cross-laminated or discontinuous (flaser bedding), little to no sand; greenish gray (5GY 5/1).

SAND: fine to medium, subrounded to subangular, silty; ~1% opaque heavy minerals; faint to clear lamination; shells, more intact than above, aligned in places; scattered zones of silt; sand becomes cleaner and contains more water below 5.3 ft; dark greenish gray (10Y 4/1).

174AX BB (Qj32-27)

Core # 165

Date: 6/3/00

Described by: PPMcL & MEK

Start Depth: 1000 ft

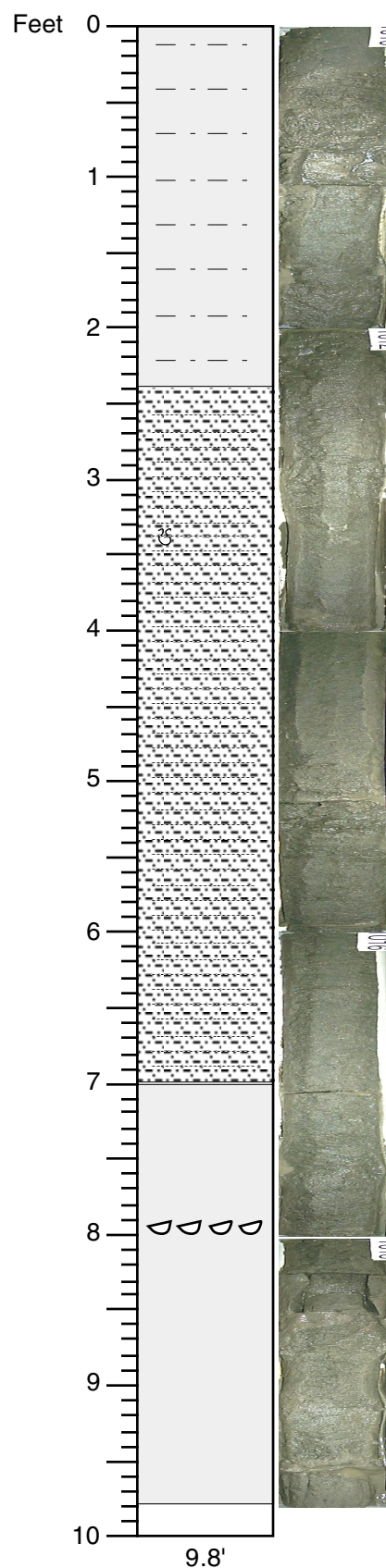
Stop Depth: 1010 ft

Recovery = 7.4 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

161



SAND; medium, subrounded to subangular, well sorted; mostly clean, slightly silty in places; ~ 1% opaque heavy minerals; small scattered shells throughout with a shell hash laminae from 7.9-8.0 ft; faintly laminated, with siltier sands and more pronounced lamination in places between 2.4-7 ft; silt-filled burrow at 3.35 ft; dark greenish gray (10Y 4/1).

174AX BB (Qj32-27)

Core # 166

Date: 6/3/00

Described by: PPMcL & MEK

Start Depth: 1010 ft

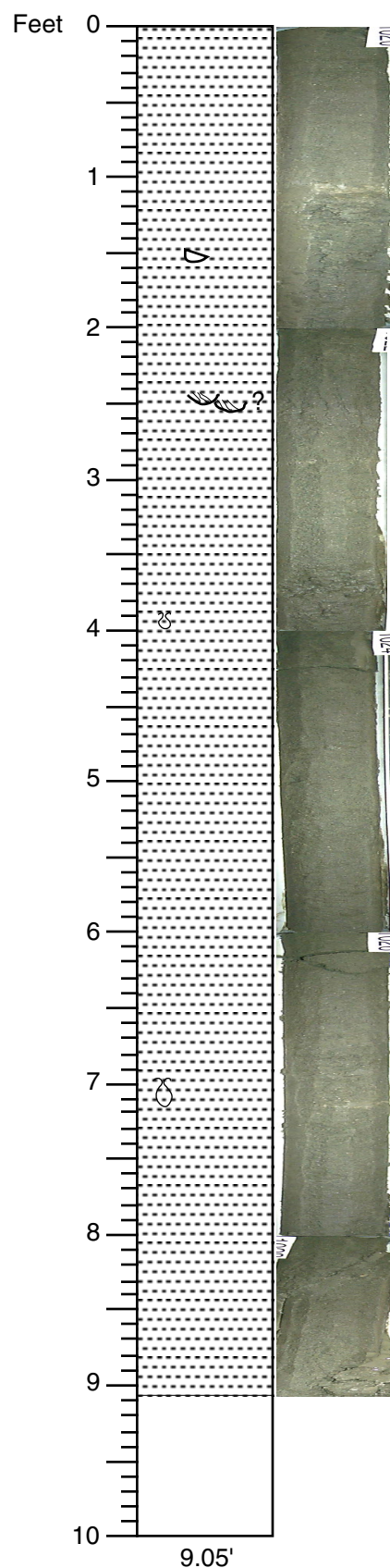
Stop Depth: 1020 ft

Recovery = 9.8 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

162



SAND, soft, fine, well sorted, and subrounded; ~1% dark grains, possibly opaque heavy minerals; dispersed sand-sized shell debris, occasionally concentrated in laminae, with larger shell fragments at 1.6 ft; slightly silty, giving slight cohesiveness, variability showing lamination in places; burrowed, with inclined slightly silty U-shaped burrow at 2.9 ft and a subhorizontal silt filled burrow at 7.05 ft; inclined laminae at 2.55 ft, possibly cross bedding.

174AX BB (Qj32-27)

Core # 167

Date: 6/3/00

Described by: PPMcL & MEK

Start Depth: 1020 ft

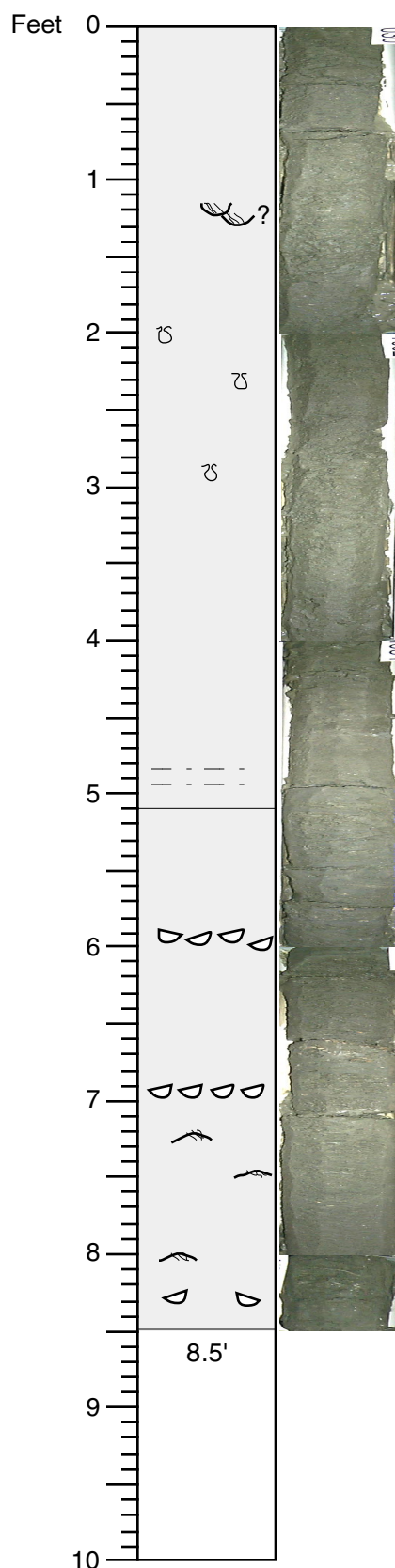
Stop Depth: 1030 ft

Recovery = 9.05 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

163



SAND; fine, subrounded, well sorted; mostly quartz, 1-2% opaque heavy minerals, dispersed sand-sized to 2-3 mm very thin shell debris; scattered lamination, some very inclined laminations, possibly cross beds; slightly silty, especially towards the bottom; dark greenish gray (GLEY 10Y 4/1)

SAND; interlaminated very thin fine sand and silty very fine sand; the silty very fine sands are slightly more cohesive, subrounded, well sorted, 3-4 mm in thickness; the fine sands are slightly silty, moderately well sorted, subrounded; layers that are greater than 3 mm thick show cross lamination or ripples; concentrations of shell fragments at 5.95 ft, 6.85-6.95 ft, and 8.3 ft; minor bioturbation; sandier lower in interval, with very fine sand laminations less abundant and thinner/more discontinuous; more common fine scale cross laminations in lower part, especially from 7.0-8.0 ft; the fine sands are dark greenish gray (GLEY 1 10Y 4/1) and the very fine silty sands are dark greenish gray (GLEY 1 10Y 3/1).

174AX BB (Qj32-27)

Core # 168

Date: 6/3/00

Described by: PPMcL & MEK

Start Depth: 1030 ft

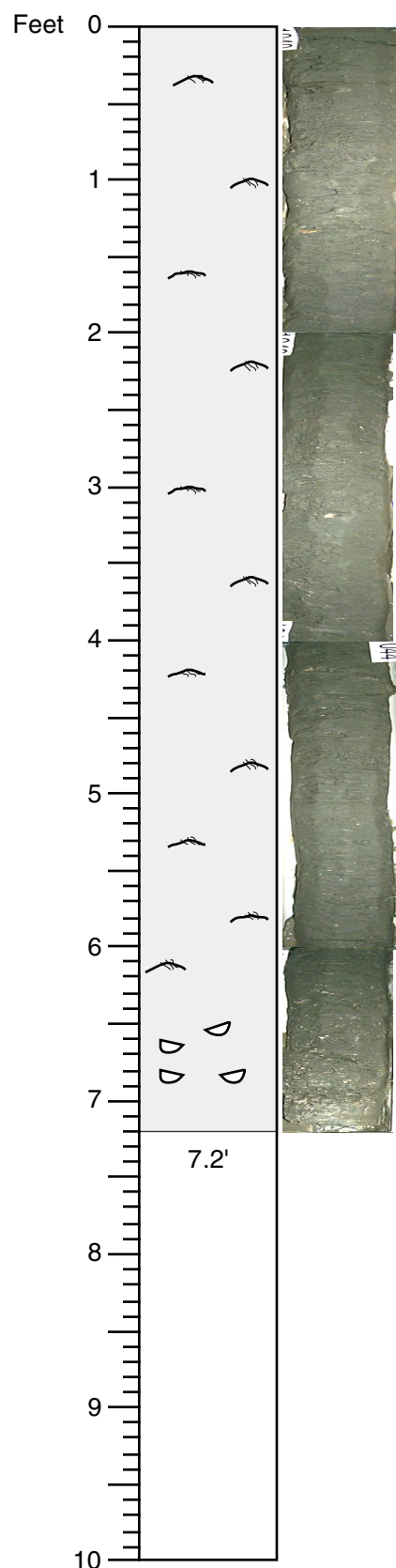
Stop Depth: 1040 ft

Recovery = 8.5 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

164



SAND; fine, well sorted, subrounded; very slightly silty, soft, laminated to thinly bedded, more homogeneous and less laminated below 6.4 ft; scattered shells throughout, but more concentrated below 6.4 ft, parallel aligned; dark greenish gray (GLE Y 10Y 4/1)

174AX BB (Qj32-27)

Core # 169

Date: 6/4/00

Described by: PPMcL & MEK

Start Depth: 1040 ft

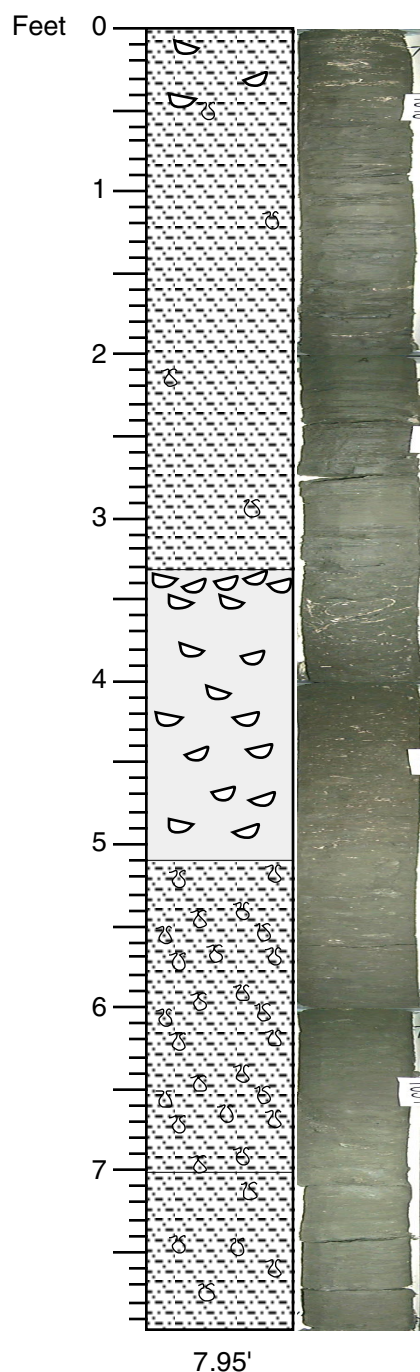
Stop Depth: 1047.5 ft

Recovery = 7.2 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

165



SILT and interlaminated SAND; silt is 2/3 to 1/2 of the interval, soft, very clayey, stiff, laminated, and in some places thinly laminated up to 30 mm; sand is very fine-grained, silty, well sorted, subrounded, and slightly silty; laminae range from thin to thick, some inclined, may represent cross lamination; scattered shells, most abundant 0-0.5 ft is shellier; burrow present; dark greenish gray GLEY 1 10Y 4/1

SAND; harder than above, fine to very fine, subrounded to subangular, moderately sorted, somewhat silty; abundant shells, including articulated bivalves at the top, up to 40 mm in size, comprising ~10% of volume; bioturbation gives a mottled appearance; dark olive gray (5Y 3/2)

SILT; hard; extensively burrowed, vertical and horizontal burrows up to 15 cm in diameter, including Thalassinoides-type, sandy fill; scattered shells; variable slight clayeyness in the interval; extensive burrowing gives mottled appearance; dark olive gray (5Y 4/1) with mottling being slightly lighter and darker.

SILT; generally clayey; some layers are soft and sticky, but mostly hard; faint lamination but notable burrowing, all horizontal; dark olive gray (5Y 4/1).

174AX BB (Qj32-27)

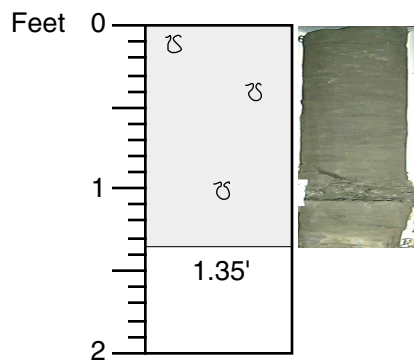
Core # 170
Date: 6/4/00
Described by: PPMcL

Start Depth: 1047.5 ft
Stop Depth: 1055 ft
Recovery = 7.95 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

166



SAND, very fine, subrounded, well sorted; hard; silty, more so from 1.1 ft to the bottom; includes horizontal burrows up to 10 mm in diameter; finely laminated; dark gray to very dark olive gray (5Y 4/1-5Y 3/1).

174AX BB (Qj32-27)

Core # 171

Date: 6/4/00

Described by: PPMcL & MEK

Start Depth: 1055 ft

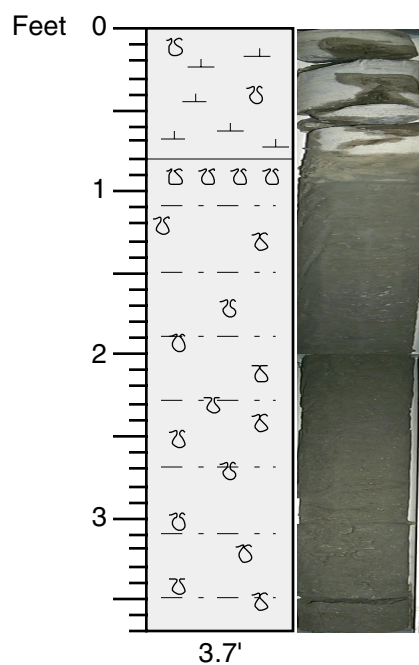
Stop Depth: 1057 ft

Recovery = 1.35 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

167



SANDSTONE; hard, dolomite cemented; very fine, silty, subrounded, well sorted, with 1-2% opaque heavy minerals, with conchoidal fracture; includes burrows, which are slightly softer; cement looks more micritic than sparry; olive gray (5Y 4/2).

SAND, interlaminated fine and very fine sand; both are silty but the very fine sand is siltier; 1-2% opaque heavy minerals, and trace amounts of very fine glauconite; faint lamination obscured by common bioturbation; top 0.1 ft is mottled, with burrowing mixing this and the overlying layer; burrows are horizontal, subvertical and U-shaped; dark greenish gray (GLEY 1 10Y 4/1 and GLEY 1 10Y 3/1).

*Note: the top of the core had a wear ring on it from the drilling of the previous run. Thus, the top 0.7 ft of this core is probably the bottom of the previous core.

174AX BB (Qj32-27)

Core # 172

Date: 6/4/00

Described by: PPMcL

Start Depth: 1057 ft

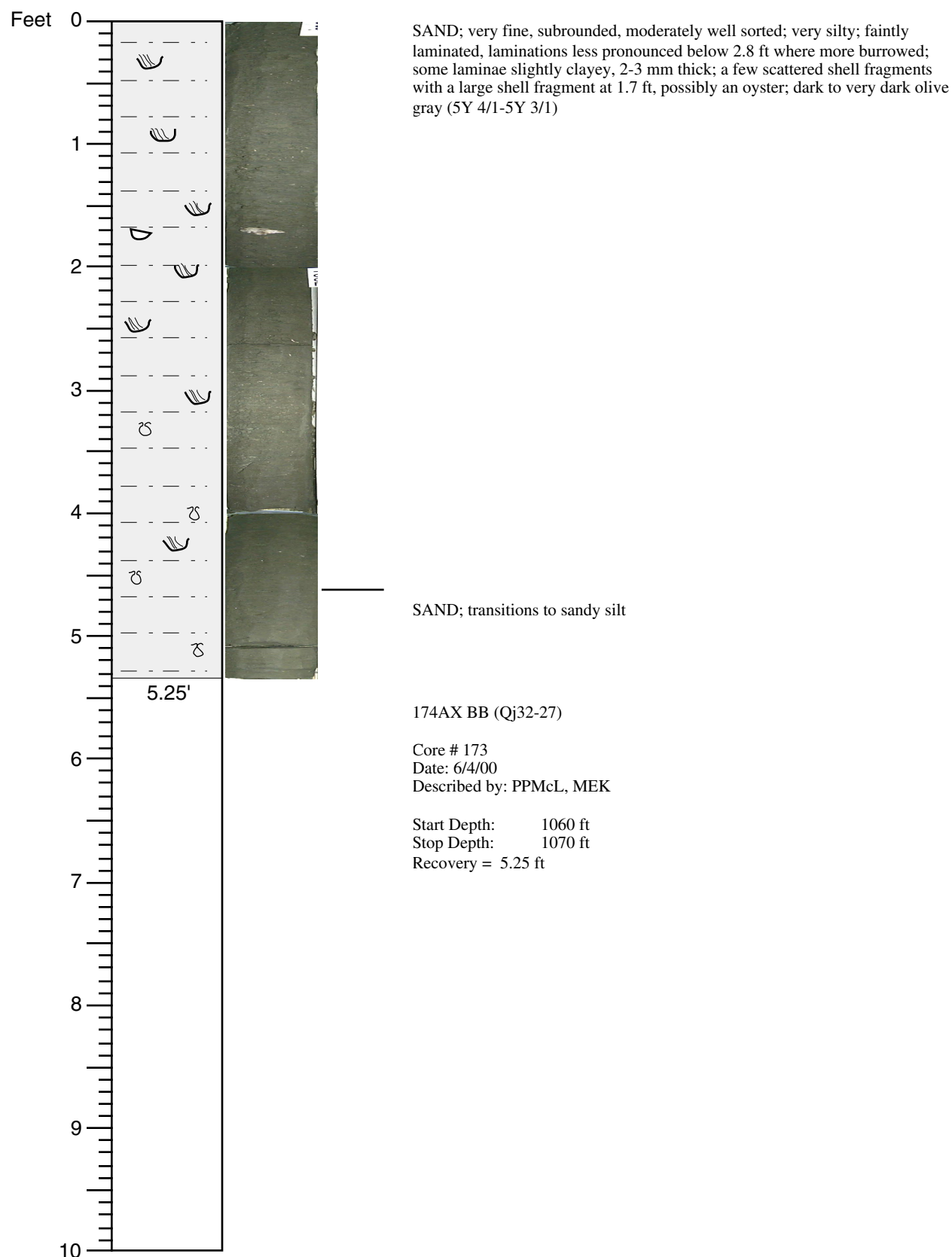
Stop Depth: 1060 ft

Recovery = 3.7 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

168



CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

169



SAND; very fine, well sorted, subangular to subrounded, about 1% dark grains (opaque heavy minerals and/or glauconite); very silty, a bit dry inside the core; extensively bioturbated with good horizontal and vertical burrows; 15 mm diameter burrow at 3.0 ft with fill layered parallel to the wall; faint lamination/color banding throughout the most of the core; clear distinct lamination between the stickier (siltier) zones and the less sticky zones from 4.5-5.0 ft.

174AX BB (Qj32-27)

Core # 174

Date: 6/4/00

Described by: PPMcL

Start Depth: 1070 ft

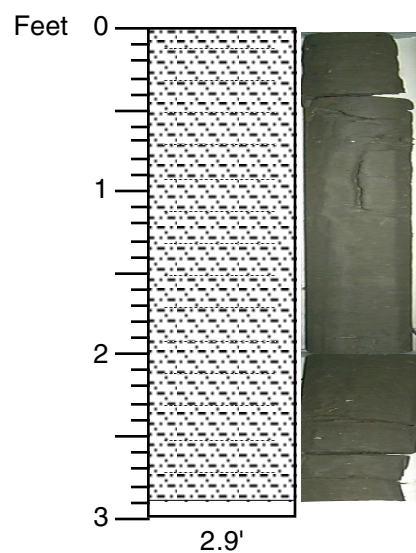
Stop Depth: 1077 ft

Recovery = 6.7 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

170



SILT; sandy (very fine), clayey, laminated throughout; scattered burrows; scattered shell fragments less than 1 cm in size, includes barnacles and possibly mollusks; dark gray (5Y 4/1).

174AX BB (Qj32-27)

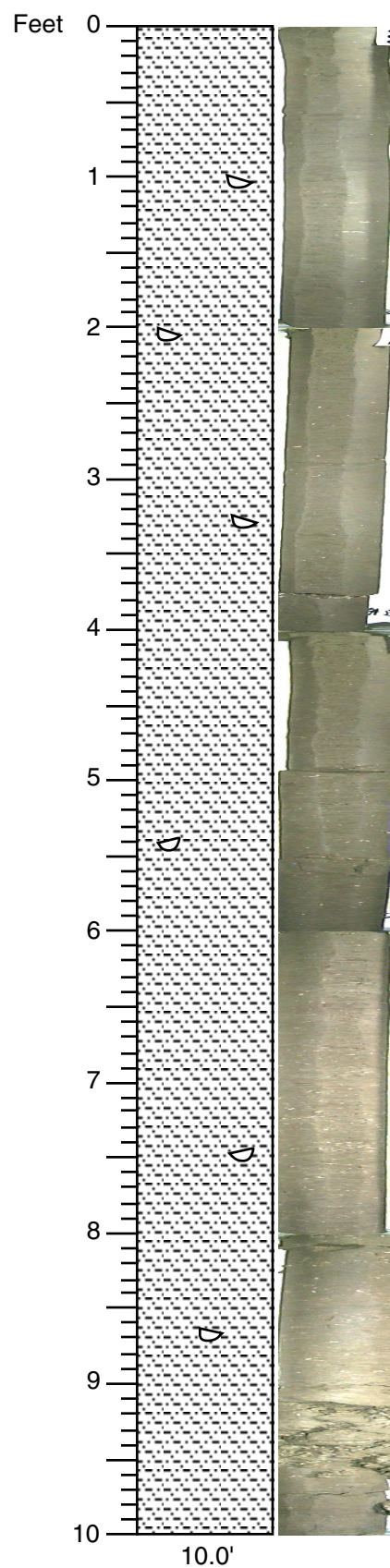
Core # 175
Date: 6/12/00
Described by: RNB

Start Depth: 1077 ft
Stop Depth: 1080 ft
Recovery = 2.9 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

171



SILT; sandy (very fine), somewhat clayey, laminated throughout; slightly less sandy below 7 ft; 1-2% glauconite; small (<1 cm) scattered shell fragments, very rare from 0-6 ft, rare from 6-10 ft; large thin shell at 3.75 ft; dark gray (5Y 4/1).

174AX BB (Qj32-27)

Core # 176

Date: 6/12/00

Described by: RNB

Start Depth: 1080 ft

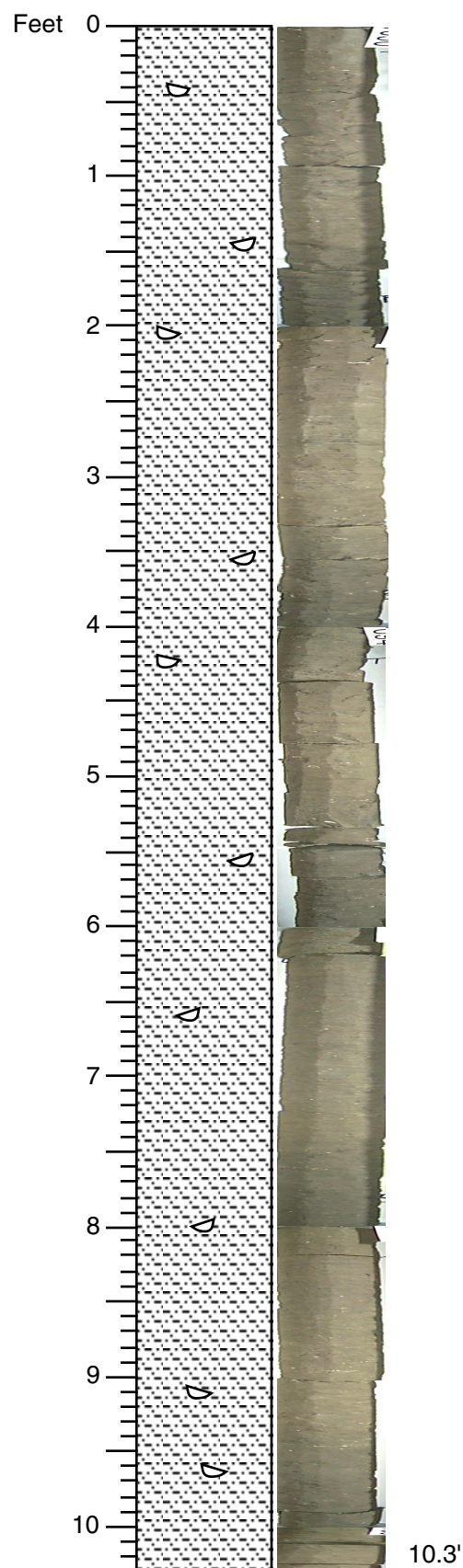
Stop Depth: 1090 ft

Recovery = 10.0 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

172



SILT; sandy (very fine) but less than overlying core, somewhat clayey; laminated throughout, although it is less apparent from 7.5 ft-9.0 ft; 1-2% glauconite; shells rare and scattered throughout, but more abundant than in the previous core; dark gray (5Y 4/1).

174AX BB (Qj32-27)

Core # 177

Date: 6/12/00

Described by: RNB

Start Depth: 1090 ft

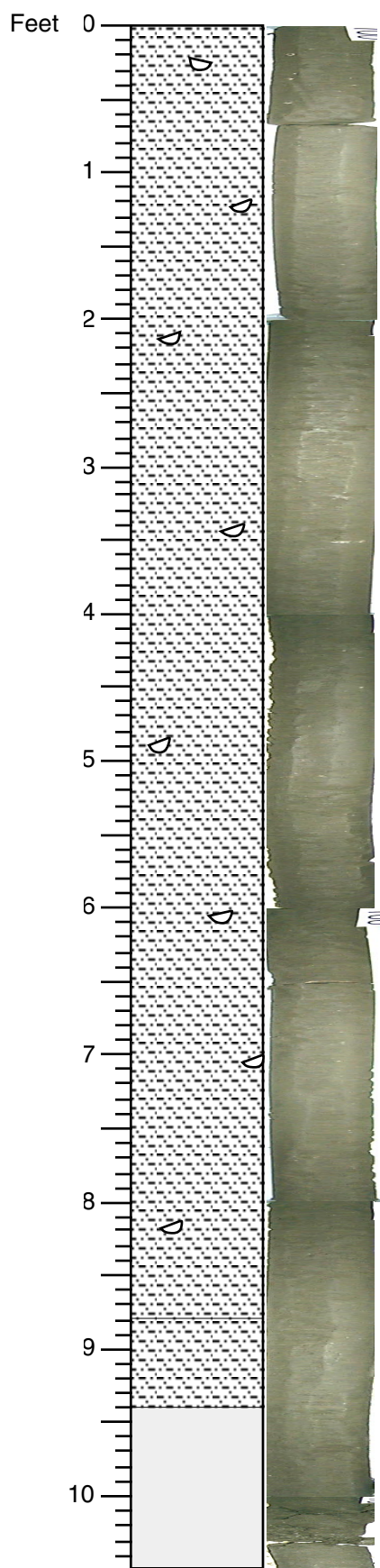
Stop Depth: 1100 ft

Recovery = 10.3 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

173



SILT; sandy (very fine), slightly clayey; contains fine shell fragments, less than in overlying core; thin, nearly complete shells at depths of 0.2, 3.4, 6.4 ft; dark gray (5Y 4/1).

174AX BB (Qj32-27)

Core # 178

Date: 6/12/00

Described by: RNB

Start Depth: 1100 ft

Stop Depth: 1110 ft

Recovery = 10.5 ft

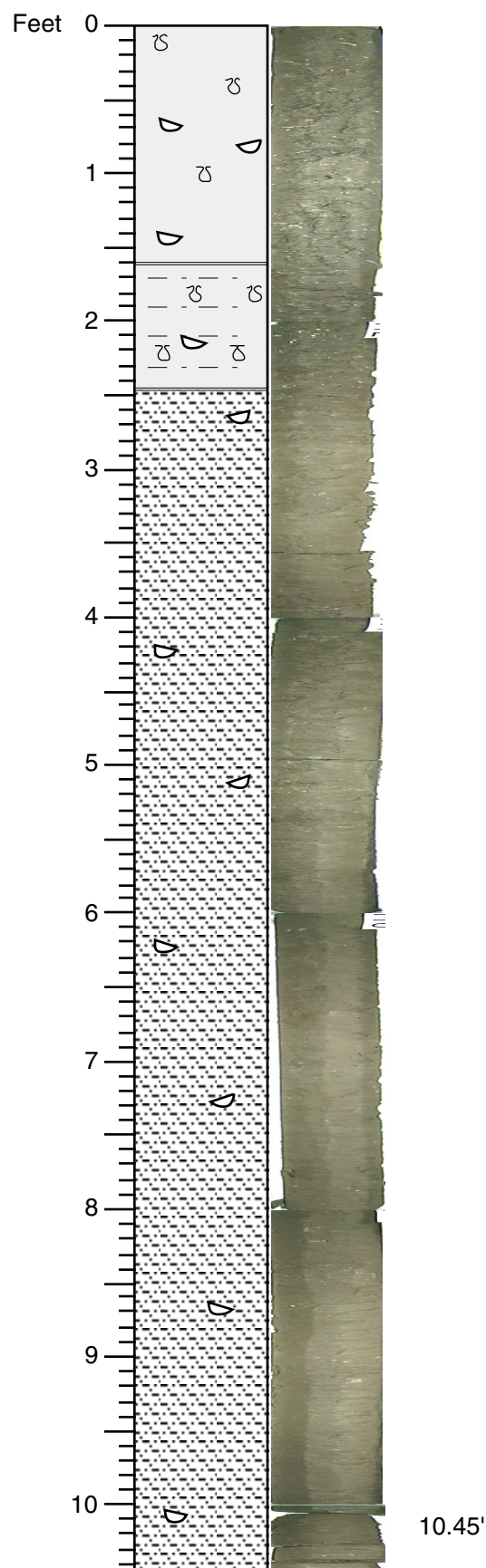
SILT, sandy, changing gradually downward to SAND; sand is fine to very fine, very silty.

SAND; very fine to fine, very silty; dark grains fine to medium, 1-2% of the volume, possibly phosphate (bone?) and/or glauconite.

CORE DESCRIPTIONS

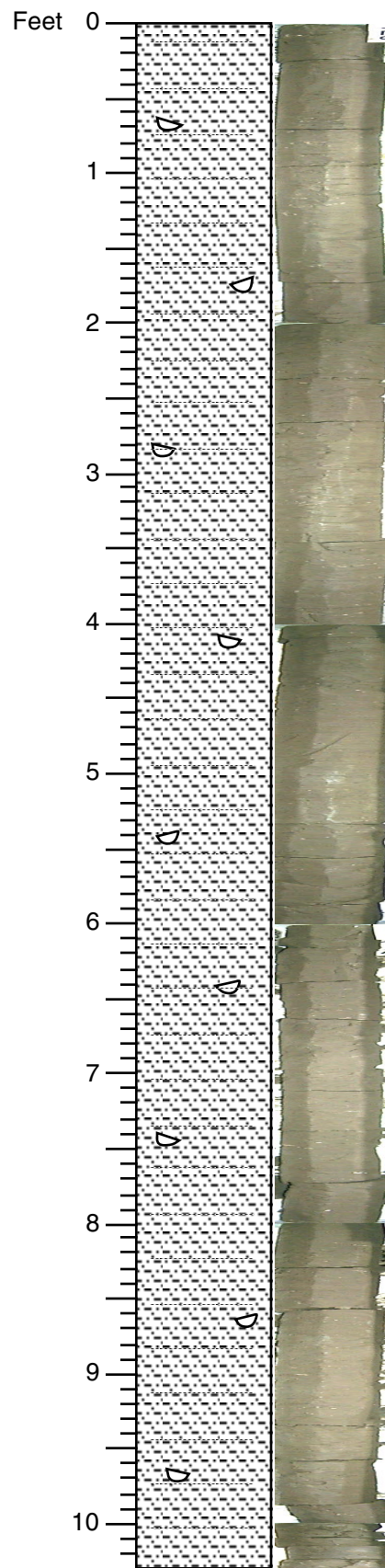
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

174



CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

175



SILT; sandy (very fine grained); small, scattered shell fragments; laminated throughout.

174AX BB (Qj32-27)

Core # 180

Date: 6/13/00

Described by: RNB & SFP

Start Depth: 1120 ft

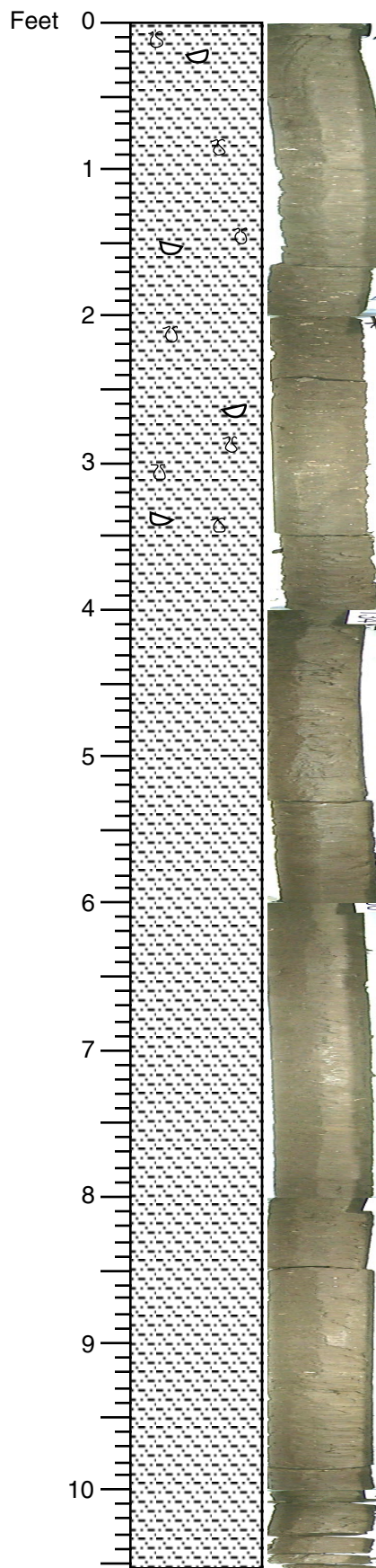
Stop Depth: 1130 ft

Recovery = 10.3 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

176



SILT; sandy (very fine), sandier in the upper 3.5 ft; thin shells and fragments are scattered in the upper 3.5 ft, very rare below, generally horizontal and parallel to lamination; laminated throughout; faint burrows in the upper 3.5 ft

174AX BB (Qj32-27)

Core # 181

Date: 6/13/00

Described by: RNB & SFP

Start Depth: 1130 ft

Stop Depth: 1140 ft

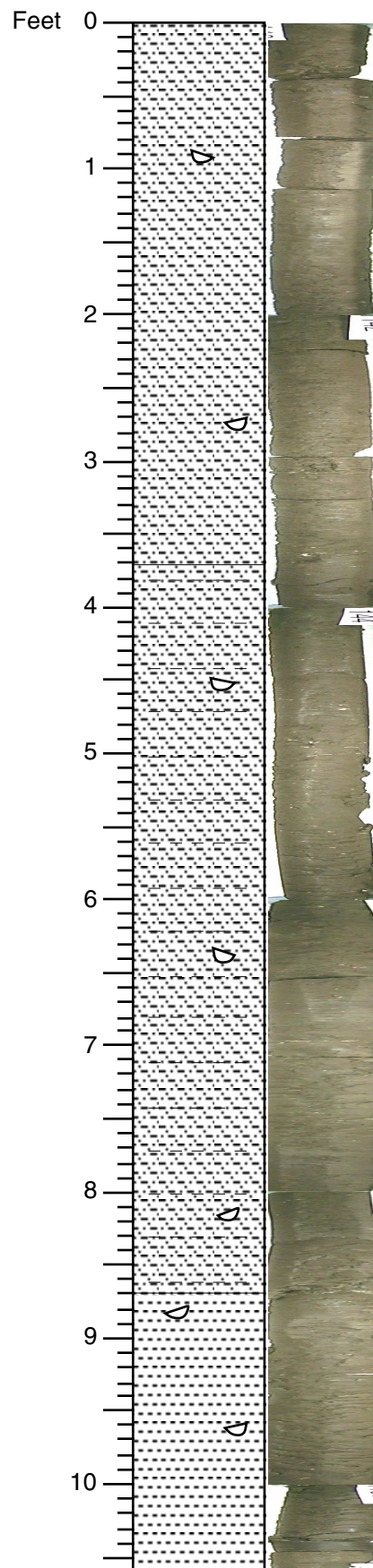
Recovery = 10.55 ft

10.55'

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

177



SILT; clayey; sparse sand; very rare and scattered shell fragments and foraminifera, shell fragments are small and thin; laminated throughout with thickening of clay laminae from 3.7 to 8.7 ft; clay dark olive gray (5Y 3/2), silt olive gray (5Y 4/2).

174AX BB (Qj32-27)

Core # 182

Date: 6/13/00

Described by: RNB & SFP

Start Depth: 1140 ft

Stop Depth: 1150 ft

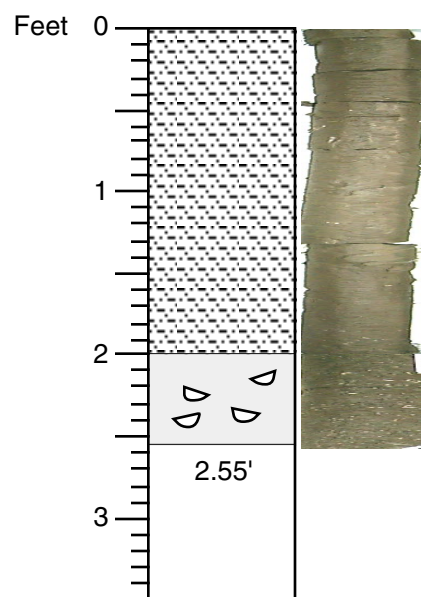
Recovery = 10.6 ft

10.6

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

178



SILT; laminated; rare, scattered shell fragments, less common below 1.75 ft; olive gray (5Y 4/2).

SAND; medium to coarse with a few granules, subrounded to subangular; ~5% glauconite; rare shells fragments; discontinuous "pods" of laminated silt, possibly burrow-fill.

174AX BB (Qj32-27)

Core # 183

Date: 6/13/00

Described by: RNB & PPS

Start Depth: 1150 ft

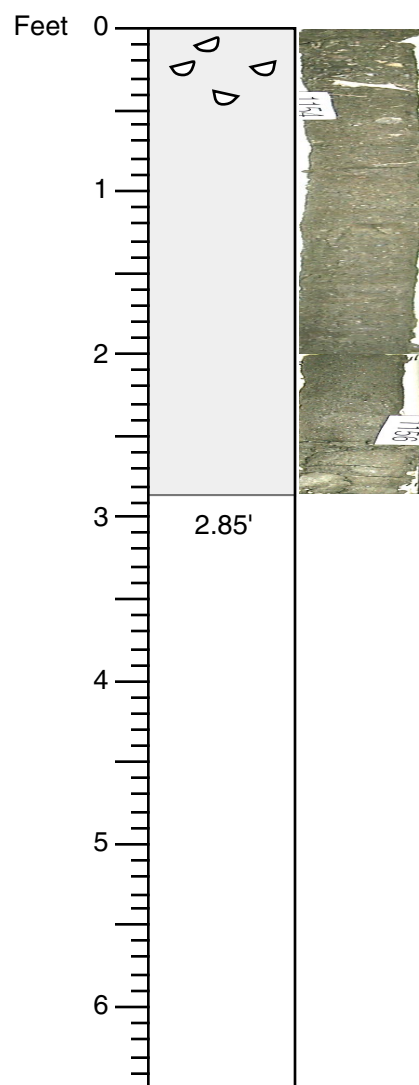
Stop Depth: 1153.5 ft

Recovery = 2.55 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

179



SAND; quartz, medium to coarse with some granules, subrounded, slightly silty, but relatively clean; 1-5% glauconite, decreasing in abundance downward; coarse shell fragments (up to 10mm) and some nearly whole shells-barnacles and some mollusks from 0 to 0.5 ft, little to none below; very dark gray (5Y 3/1).

174AX BB (Qj32-27)

Core # 184

Date: 6/13/00

Described by: RNB & PPS

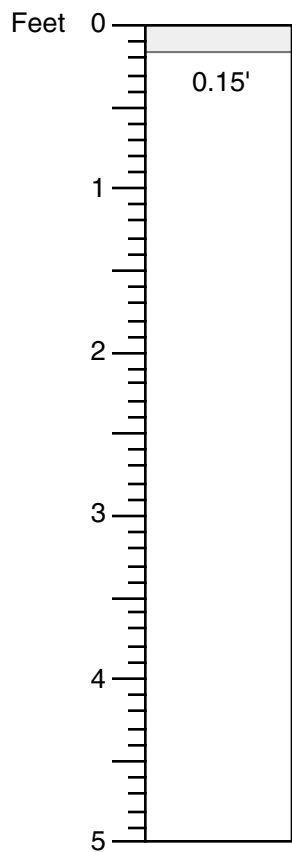
Start Depth: 1153.5 ft

Stop Depth: 1160 ft

Recovery = 2.85 ft

CORE DESCRIPTIONS
VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

180



No picture

SAND; medium to coarse, moderately sorted, and subrounded, in a silty and clayey matrix; olive black (5Y2 5/2).

174AX BB (Qj32-27)

Core # 185

Date: 6/14/00

Described by: PPMcL

Start Depth: 1160 ft

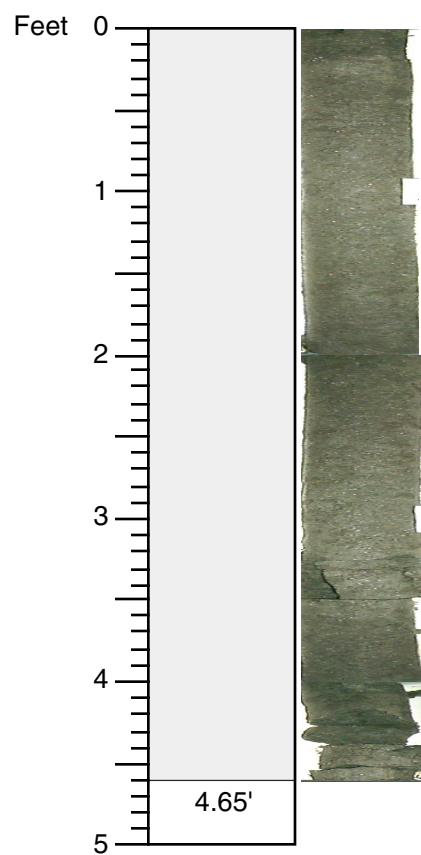
Stop Depth: 1165 ft

Recovery = 0.15 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

181



SAND; coarse to medium, moderately sorted, subrounded to subangular; less than 1% dark minerals (glauconite?); silty, more silt from 0.15 to 0.25 ft; bedding homogenized by bioturbation; dark greenish gray (5 GY 4/1-5 GY 5/1).

174AX BB (Qj32-27)

Core # 186

Date: 6/14/00

Described by: PPMcL & KGM & JCH

Start Depth: 1165 ft

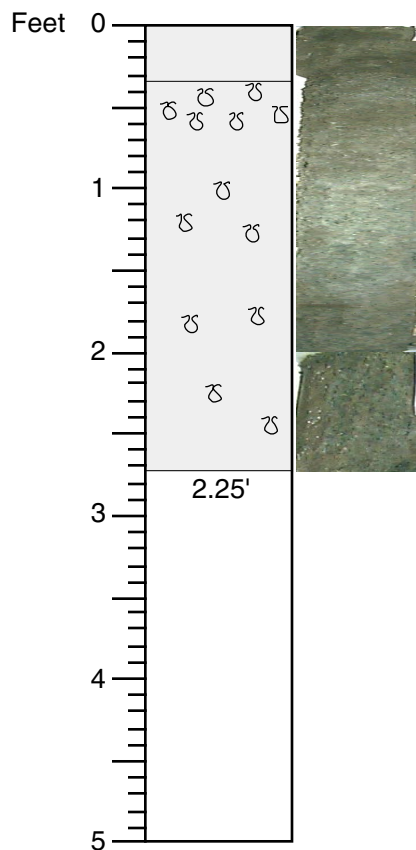
Stop Depth: 1170 ft

Recovery = 4.65 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

182



SAND; medium to coarse, some fine, moderately to poorly sorted, subrounded to subangular; silty and clayey, giving some cohesiveness; churned, no lamination preserved; dark olive gray (5Y 3/2).

SAND; fine to coarse grained, poorly sorted, angular to subangular to subrounded; mostly clean except for silt-sized green grains that smear, possibly glauconite or chlorite; fairly dry; interspersed zones of brown, clayier material, similar to lithology above, horizontal and mostly 10 mm or less in diameter; these zones are more common towards the top and likely due to burrowing; greenish gray to dark greenish gray (GLEY1 5G5/1 to GLEY1 5G4/1).

174AX BB (Qj32-27)

Core # 187

Date: 6/14/00

Described by: PPMcL & JCH

Start Depth: 1170 ft

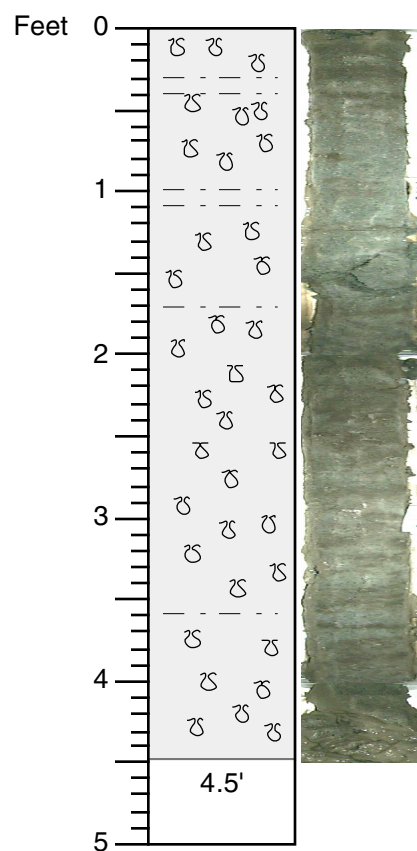
Stop Depth: 1175 ft

Recovery = 2.25 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

183



SAND; fine to coarse, poorly sorted, angular to subrounded; clean except for very fine sand to silt-sized green grains and interspersed brown zones; extensive bioturbation; some of the brown zones are silty sand beds, some are muddy filled burrows; burrows up to 10 cm in diameter; sand is fairly dry, while the silty sands and burrows are slightly sticky; clean sands are greenish gray (GLE Y1 5G 5/1), silty sand zones and burrows are dark olive gray (5Y 3/2).

174AX BB (Qj32-27)

Core # 188

Date: 6/14/00

Described by: PPMcL & JCH

Start Depth: 1175 ft

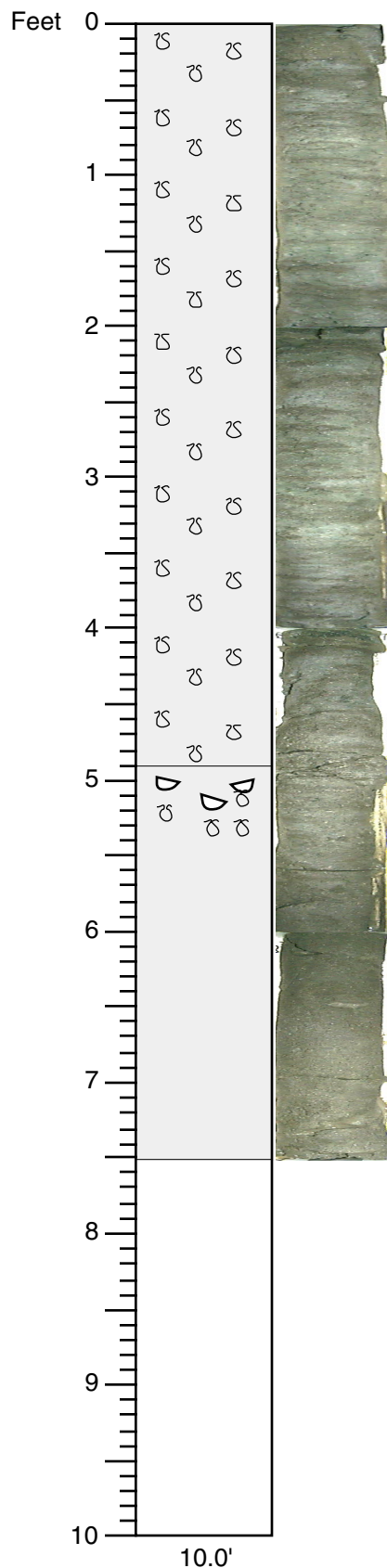
Stop Depth: 1180 ft

Recovery = 4.5 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

184



SAND; fine to medium with some coarse grains but much less than the above section, poorly sorted, subangular to subrounded; sand loose but not wet; extensively burrowed, up to 25% volume; burrows lined with brown, sticky silty sand and filled with a clean sand, 5-15 mm in diameter, mostly horizontal to subhorizontal; 4.7-4.9 ft is muddier and stickier; sand is greenish gray (GLEY 1 5G 5/1) and silty burrow linings are dark olive gray (5Y 3/2).

SAND; fine to medium, poorly sorted, subangular to subrounded; very silty, making sticky; burrows abundant from 4.9-5.8 ft, decreasing below, filled with a lighter colored silt/sand; a few weathered shells in upper part; dark olive gray (5Y 3/2) with greenish gray (GLEY 1 5G 5/1) burrow fill.

174AX BB (Qj32-27)

Core # 189

Date: 6/14/00

Described by: PPMcL & JCH

Start Depth: 1180 ft

Stop Depth: 1190 ft

Recovery = 7.5 ft

Core 190 (1190-1200 ft) NO RECOVERY



SAND, medium with some fine to coarse, poorly sorted, subrounded to subangular; silty; contains fine weathered thin and chalky shell material; fairly solid, some mud invasion; dark olive gray (5Y 3/2).

SAND, same as the above, except softer with more mud invasion.

SAND, same as the above but firmer towards the bottom.

*1200 ft- Actual point of 1200 ft depth, probably from present run interval-fairly solid and drier.

SAND; medium with some fine and a rare coarse; silty, firm, and fairly dry; some slightly stickier, wetter zones create a mottled appearance (possibly drill mud invasion or burrows; dark gray (5Y 4/1) for the dry material, and dark olive gray (5Y 3/2) for the wetter material.

Note: Upper 3.3 ft of core belong to previous run.

174AX BB (Qj32-27)

Core # 191
 Date: 6/15/00
 Described by: PPMcL

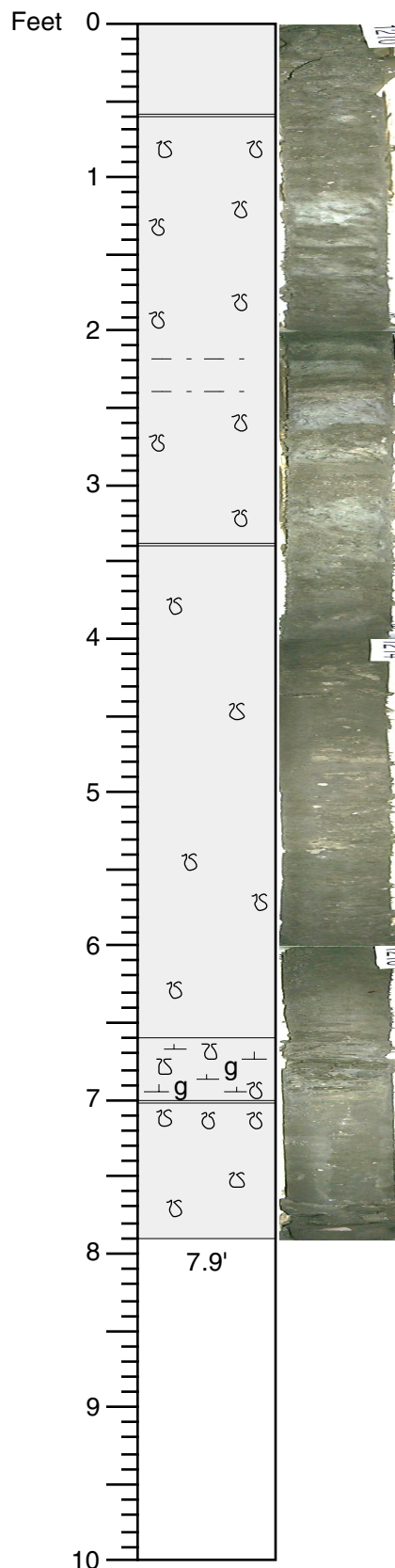
Start Depth: 1200 ft
 Stop Depth: 1201 ft
 Recovery = 4.3 ft

Core 192 (1201-1210 ft) NO RECOVERY

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

186



SAND; medium, moderately sorted, subrounded to subangular; very silty (clayey?); some very small thin shell fragments; very soft and mushy, so possibly from the bottom of the last core run.

SAND; mottled by burrowing; silty brownish sand zones mixed with whitish gray silty sand zones; brownish zones are silty, medium-grained, moderately sorted, subangular to subrounded, and dark olive gray (5Y 3/2); the whitish-gray zones are very silty (almost silt supported), fine to medium grained, and light gray (GLEY 1 N6/) to gray (GLEY 1 N7/); some chalky weathered shell material is also present.

SAND; fine to medium moderately sorted; siltier than the above, some clay present; silt/clay layers as thick as 10 mm, make up about 25% of the section, more abundant than overlying interval but less sticky and drier, especially in the lower part; burrowed; plant material at around 5.5 ft; a 5 mm by 25 mm rip up clast of underlying hard ground at 6.55 ft; color is dark olive gray (5Y 3/2), slightly lighter/grayer near bottom.

SANDSTONE under a distinct contact; hard, calcite-cemented, silty sand; mostly quartz, but about 10% is glauconite; abundant burrows filled with lighter, soft, silty quartz sand and some zones of very light gray clay/silt.

SAND; fine, moderately sorted; trace glauconite; chalky thin shell debris dispersed throughout; very silty and clayey; the upper 0.1 ft is bioturbated causing mixing with bed above; fairly homogeneous, with some slightly clayier zones (possibly burrows).

174AX BB (Qj32-27)

Core # 193

Date: 6/1/00

Described by: PPMcL & BSC

Start Depth: 1210 ft

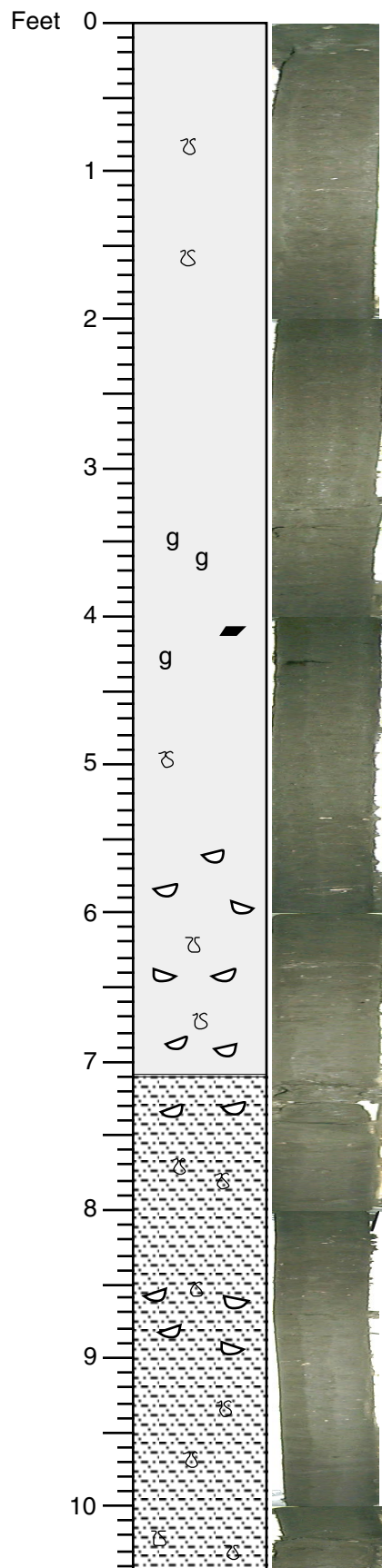
Stop Depth: 1220 ft

Recovery = 7.9 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

187



SAND; medium to coarse, moderately sorted; very clayey and silty sand, almost clay supported in places; homogeneous, bioturbated, and contains a few shells; clay-filled burrows at 0.4, 0.6, 1.3, and 3.4 ft; gradational contact with underlying interval; olive gray to dark olive gray (5Y 3/2 to 5Y 4/2).

SAND; fine to medium; trace glauconite (less than 1%) in very fine fraction; very silty with minor amounts of clay; homogeneous and bioturbated; scattered lignitic material from 4.1 ft to the bottom of the core with a large fragment at 4.25 ft; somewhat shelly, concentrated between 5.3 and 6.65 ft, sizes from 5-20 mm in length; sand decreases and silt increases between 6.9 ft and 7.1 ft.

SILT; shelly throughout, with shells concentrated between 8.45 ft and 9 ft and a layer of shell fragments at 7.2 ft; contains trace glauconite, a fleck or two of plant debris; frequent burrows mostly obscure the faint thin lamination; at least two of the burrows have a silty, sandy fill; olive gray (5Y 4/2).

174AX BB (Qj32-27)

Core # 194

Date: 6/15/00

Described by: PPMcL & BSC

Start Depth: 1220 ft

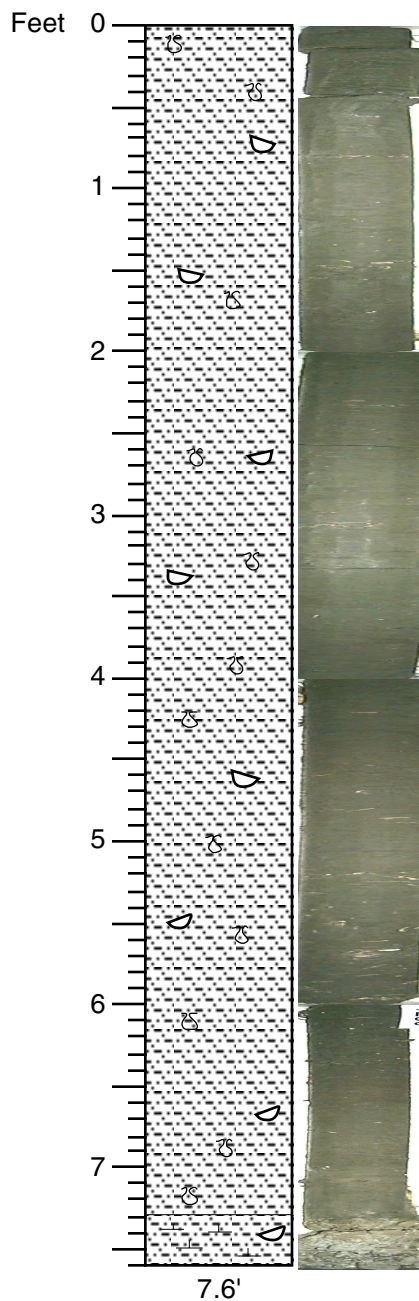
Stop Depth: 1230 ft

Recovery = 10.45 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

188



SILT; thinly laminated with some thin interlaminae of very fine to fine sand; very shelly with scattered thin walled, less than 1 mm thick, bivalve shells throughout, most occurring horizontally; abundant burrows, some lined and sand filled and up to 10 mm in diameter, others are silt filled and less than 5 mm in diameter; sandier zone from 5.8 to 6.55 ft is silty and clayey with fine to very fine (and some medium) sand, mostly quartz, and subround to subangular.

SILTSTONE; hard, calcite cemented, some shell material, rare sand; core broken, and mixed with it is a light gray, very sticky, runny, silty clay with forams (relationship uncertain due to the broken nature); smelled like hydrogen sulfide; from core catcher.

174AX BB (Qj32-27)

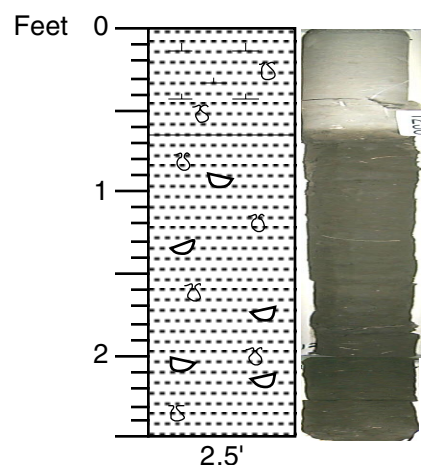
Core # 195
Date: 6/15/00
Described by: PPMcL

Start Depth: 1230 ft
Stop Depth: 1237.5 ft
Recovery = 7.6 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

189



SILT; indurated, calcite-cemented; about 25-40% very fine sand; includes possible organic debris, and shells as large as 10 mm in diameter; somewhat bioturbated; calcite-filled fractures; light gray to white (5Y 7/1 to 5Y 8/1).

SILT; less than 15% very fine sand; slightly clayey, softer than above but stiff, and fairly dry; some organic debris; numerous thin bivalve shells are numerous and up to 50 mm in size; somewhat bioturbated, yet laminae are still evident in places; thin siltier/less sandy layer of siltier/less sandy material at 1.25 ft; olive gray to dark olive gray (5Y4/2-5Y3/2).

174AX BB (Qj32-27)

Core # 196

Date: 6/16/00

Described by: BSC & PPMcL

Start Depth: 1237.5 ft

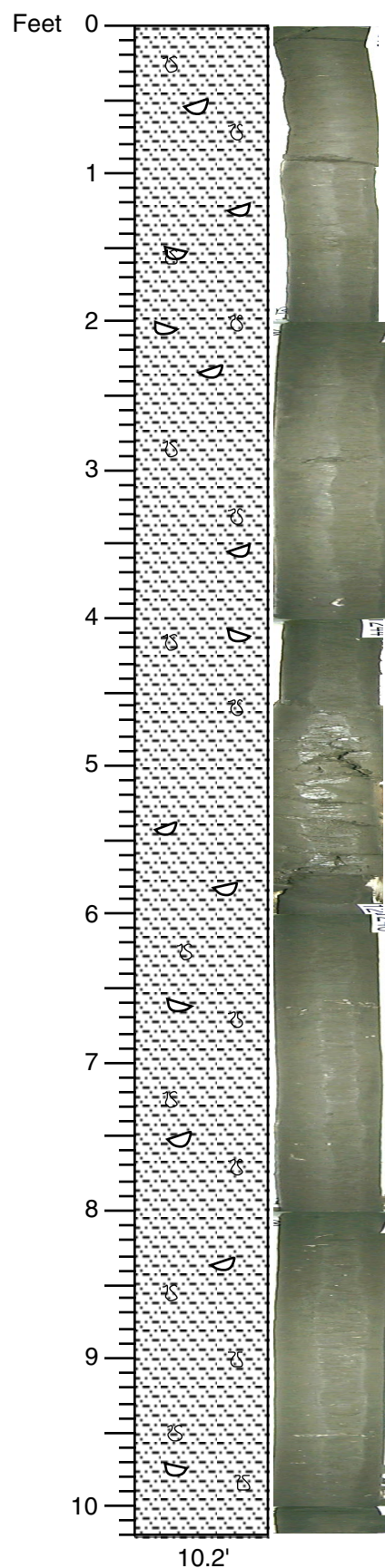
Stop Depth: 1240 ft

Recovery = 2.5 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

190



SILT; thinly laminated, soft but stiff, somewhat clayey; approximately 5% sand (very fine to fine), 2-3% very fine to silt-sized dark grains (possibly glauconite); abundant burrows, mostly subhorizontal; scattered thin shells up to 30-40 mm diameter, oriented subhorizontal to subvertical; rare very small plant fragments; disturbed section from twisting during coring, 4.5 to 5.8 ft; dark olive gray (5Y 3/2).

174AX BB (Qj32-27)

Core # 197

Date: 6/16/00

Described by: PPMcL & BSC

Start Depth: 1240 ft

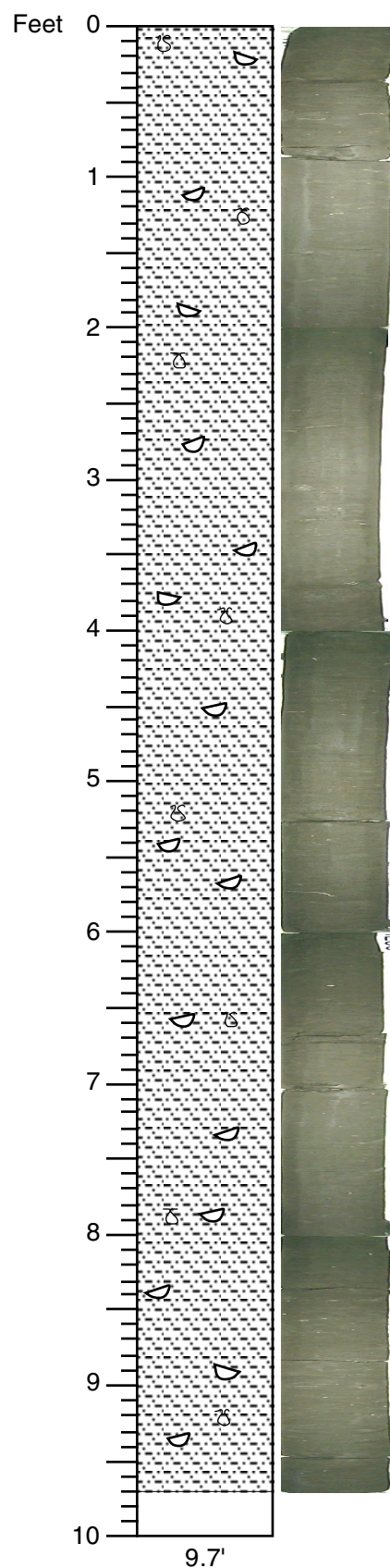
Stop Depth: 1250 ft

Recovery = 10.2 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

191



SILT; clayey; sandy (very fine), sand up to 40% volume; very fine sand to silt-sized dark grains (possibly glauconite) ~2-3% volume; some thin laminations with more clay; burrowed, with burrow fill either clay or very fine-grained sand; common thin-walled bivalve shells, 30-40 mm in diameter; stiff but easily cut.

174AX BB (Qj32-27)

Core # 198

Date: 6/16/00

Described by: PPMcL & BSC

Start Depth: 1250 ft

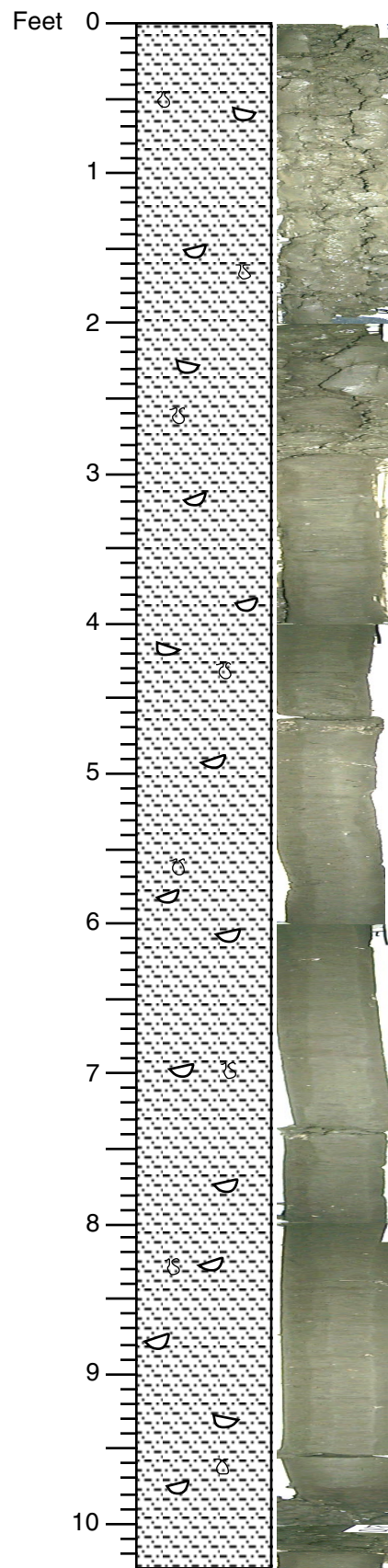
Stop Depth: 1260 ft

Recovery = 9.7 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

192



SILT; sandy (very fine), sand up to 40% volume, with more sand from 0.0-3.0 ft and below 9.0 ft; very fine sand to silt-sized dark grains (possibly glauconite) ~1-3% volume; some thin laminations with more clay; common thin-walled bivalve shells, up to 15 mm in diameter, some in shell hash layers, some as discrete individuals.

174AX BB (Qj32-27)

Core # 199

Date: 6/16/00

Described by: PPMcL & BSC

Start Depth: 1260 ft

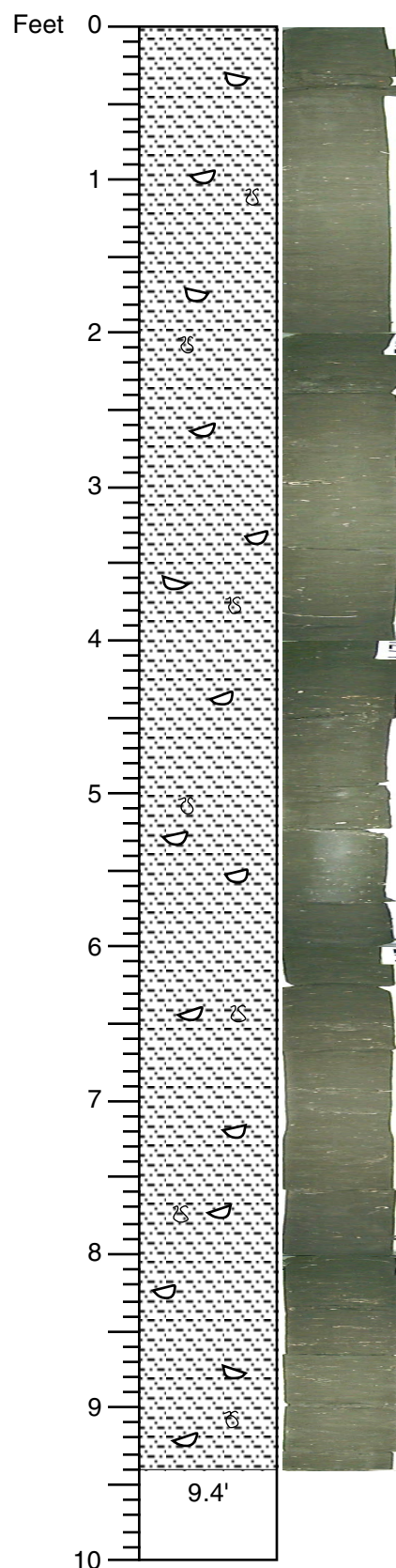
Stop Depth: 1270 ft

Recovery = 10.3 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

193



SILT; sandy (very fine), with sandier interbed from 2.3 ft-2.4 ft; 25-40% silt to very fine sand size dark grains (glauconite); shells throughout, mostly thin bivalves, more abundant downward, with concentrations of shell debris at 4.4, 7.3, and 8.3 ft; dark olive gray (5Y 3/2).

174AX BB (Qj32-27)

Core # 200

Date: 6/16/00

Described by: BSC & PPMcL

Start Depth: 1270 ft

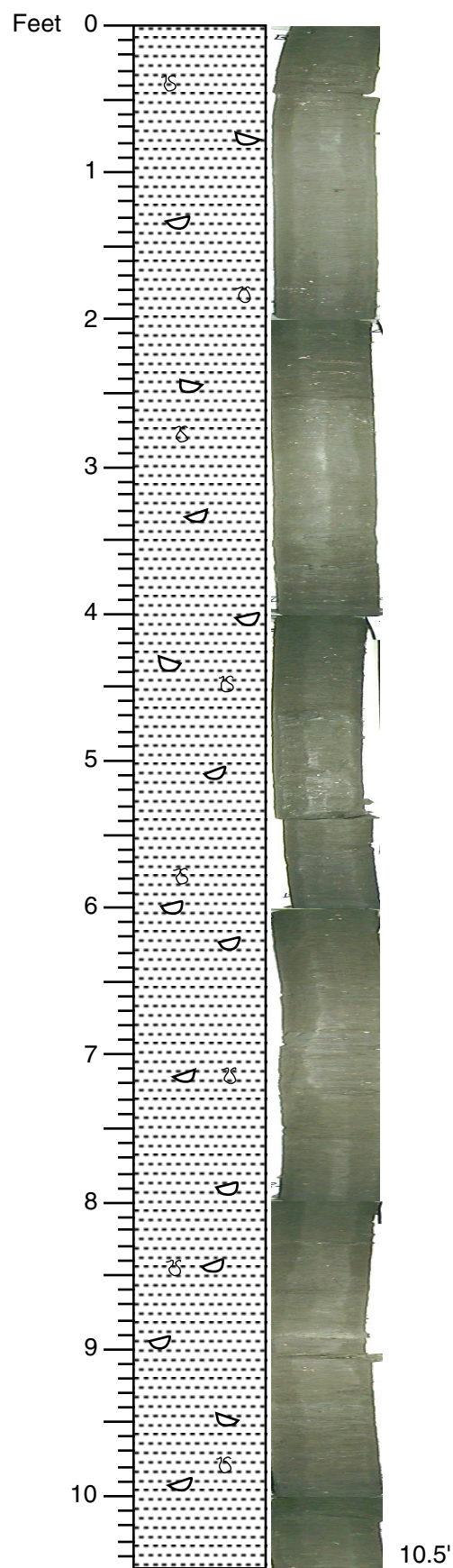
Stop Depth: 1280 ft

Recovery = 9.4 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

194



SILT; sandy (about 40% very fine sand), slightly clayey in places; shelly throughout, mostly thin bivalves, some very rare plant fragments (woody); thinly laminated, some sandier (such as 5 mm thick sand at 6.9 ft), some clayier; abundant burrows disrupting the laminations, some filled with clean sand (such as 8.9 ft), others with silt or clay; stiff but cut-able and fairly dry.

174AX BB (Qj32-27)

Core # 201

Date: 6/16/00

Described by: PPMcL & BSC

Start Depth: 1280 ft

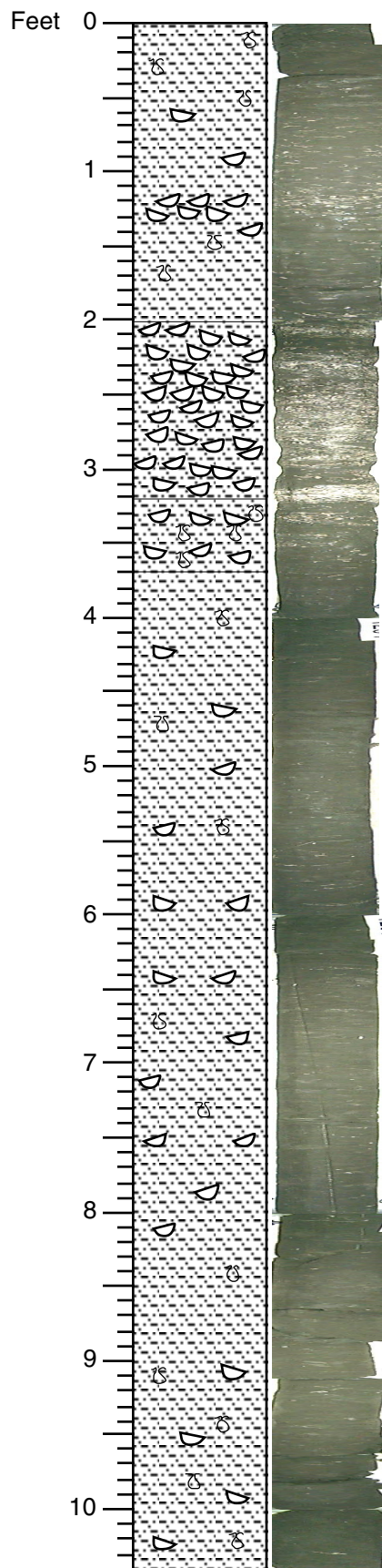
Stop Depth: 1290 ft

Recovery = 10.5 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

195



SILT; sandy (10-40%, very fine); 2-3% dark grains, possibly glauconite; includes thin shells from 5-10 mm diameter, richest around 1.3 ft; faint lamination; common burrows; dark olive gray (5Y 3/2).

SILT; very clayey; very slightly sandy; very abundant shells, 50-75% volume, thin, 2-10 mm in diameter, mostly disarticulated, soft and crumbly but many with pearly luster; a few porous yellow-brown grains from 1-3 mm in diameter, possibly recrystallized old shells.

SILT; sandy (10-40%, very fine); 2-3% dark grains, possibly glauconite; includes thin shells from 5-10 mm diameter; faint lamination; common burrows; dark olive gray (5Y 3/2).

SILT; clayey, variably sandy (0-50%); 2-3% dark grains; thin, 2-50 mm diameter shells scattered throughout; faint thin laminations disrupted by abundant bioturbation; dark olive gray (5Y 3/2).

174AX BB (Qj32-27)

Core # 202

Date: 6/17/00

Described by: PPMcL & BSC & JU

Start Depth: 1290 ft

Stop Depth: 1300 ft

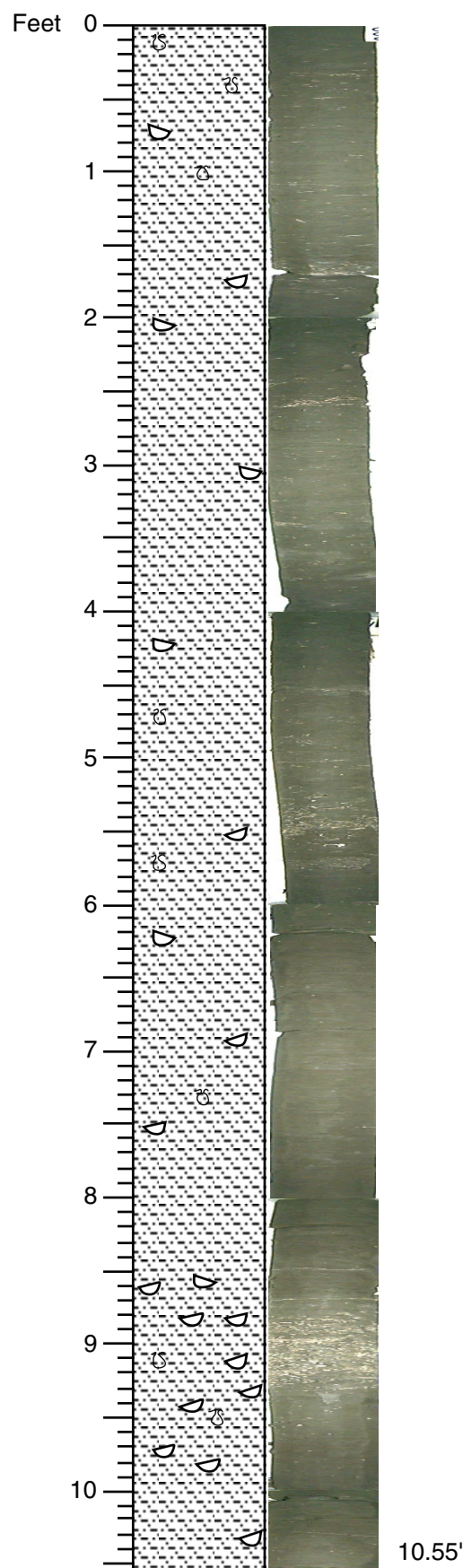
Recovery = 10.4 ft

10.4'

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

196



SILT; slightly sandy (less than 25%); 1-2% dark grains; scattered shells from 0.0-6.2 ft, but very few shells from 6.2 ft-8 ft; shell hash between 8.7 and 9.3 feet, mostly fragments, very few are articulated, 1-3 mm in diameter, some thicker than 1 mm, some with pearly luster preserved; plant debris in places; more laminated than above with 1-2 mm thick laminae; very little clay except for silty clay laminations; common burrows burrows; dark olive gray (5Y 3/2), but slightly lighter than above.

174AX BB (Qj32-27)

Core # 203

Date: 6/17/00

Described by: BSC & PPMcL

Start Depth: 1300 ft

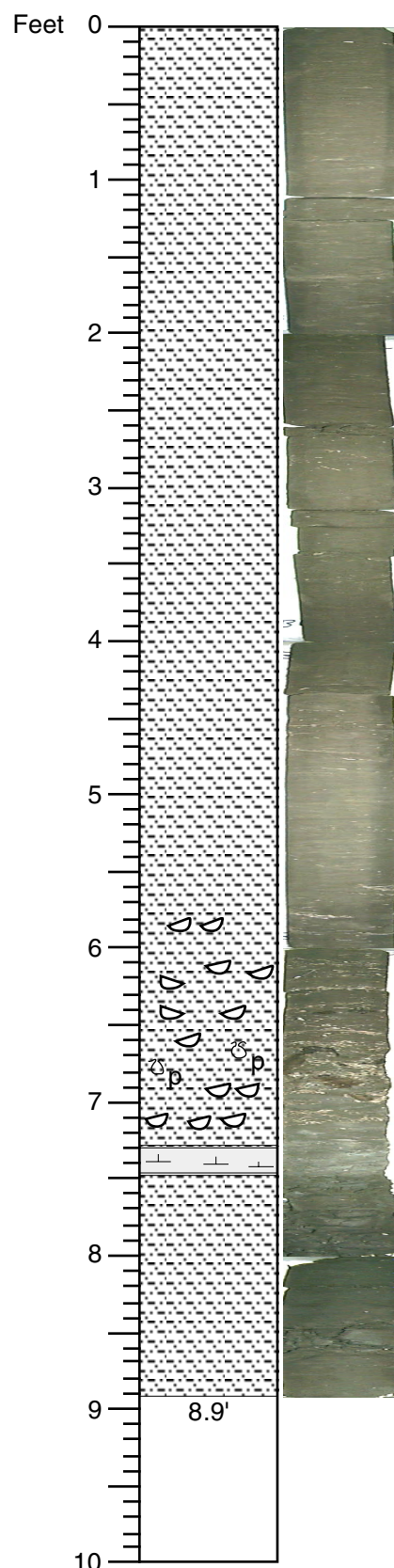
Stop Depth: 1310 ft

Recovery = 10.55 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

197



SILT; sandy (very fine grained), slightly clayey; scattered thin shells and debris throughout; faint thin laminations, bioturbated; a few clayier zones; stiff but still cut-able.

SILT; sandy (very fine grained), slightly clayey; abundant shells; includes large dark brown (black when fresh) phosphate-filled burrows, diagonal to subvertical, up to 10 mm in diameter and 40 mm long from 6.4 ft to 7.0 ft; also includes slighter smaller lighter gray green, very fine to fine sand-filled calcite cemented horizontal burrows from near the bottom of the phosphate zone (about 6.8 ft) to the bottom of the interval; stiff, dark olive gray (5Y 3/2).

SANDSTONE; hard, calcite cemented, under distinctive burrowed contact; very fine to fine, silty, about 3-5% dark grains (silt to very fine sand, glauconite?); light gray green (same as overlying burrow fill).

SILT; sandy (very fine grained), slightly clayey; scattered thin shells and debris throughout; faint thin laminations, bioturbated; a few clayier zones; hard, calcite-cemented, in some places crumbled from the coring; some small brown streaks/platelets, possibly plant debris or phosphatized shells.

174AX BB (Qj32-27)

Core # 204

Date: 6/17/00

Described by: PPMcL & BSC

Start Depth: 1310 ft

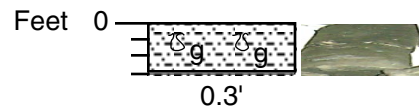
Stop Depth: 1320 ft

Recovery = 8.9 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

198



SILT; hard, lithified; sandy (40%-50%, very fine); 3-5% silt to sand sized dark grains (glauconite), somewhat coarser grains than above; shells layer at 0.2 ft composed of 10 mm long thin bivalves; burrowed, fill is glauconitic sand (about 10% glauconite).

174AX BB (Qj32-27)

Core # 205

Date: 6/17/00

Described by: BSC & PPMcL

Start Depth: 1320 ft

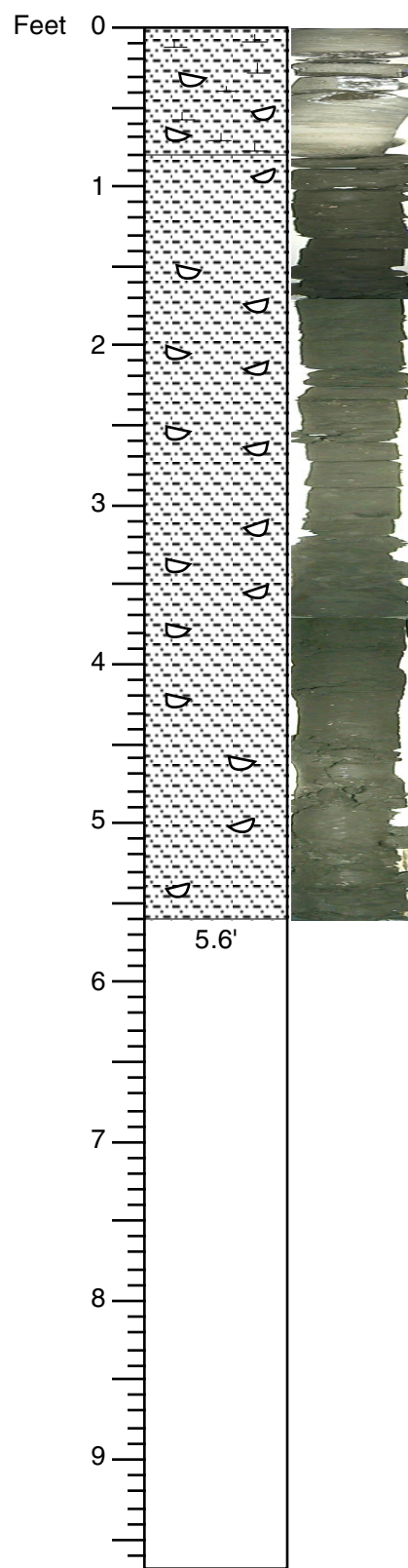
Stop Depth: 1320.3 ft

Recovery = 0.3 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

199



SILTSTONE; dolomite-cemented; sandy; shelly; contains fractures, possibly former bivalves, filled with calcite and fine to silt-sized dark grains (glauconite).

SILT; hard to very hard in places; 30-40% very fine sand; about 5% silt-sized dark grains, possibly glauconite; a few fragments of phosphatized shells, also scattered shells and shell fragments; thinly laminated; moderately bioturbated, burrows filled with slightly sandier material; more laminated above 2.6 ft (1322.9').

174AX BB (Qj32-27)

Core # 206

Date: 6/17/00

Described by: BSC & PPMcL

Start Depth: 1320.3 ft

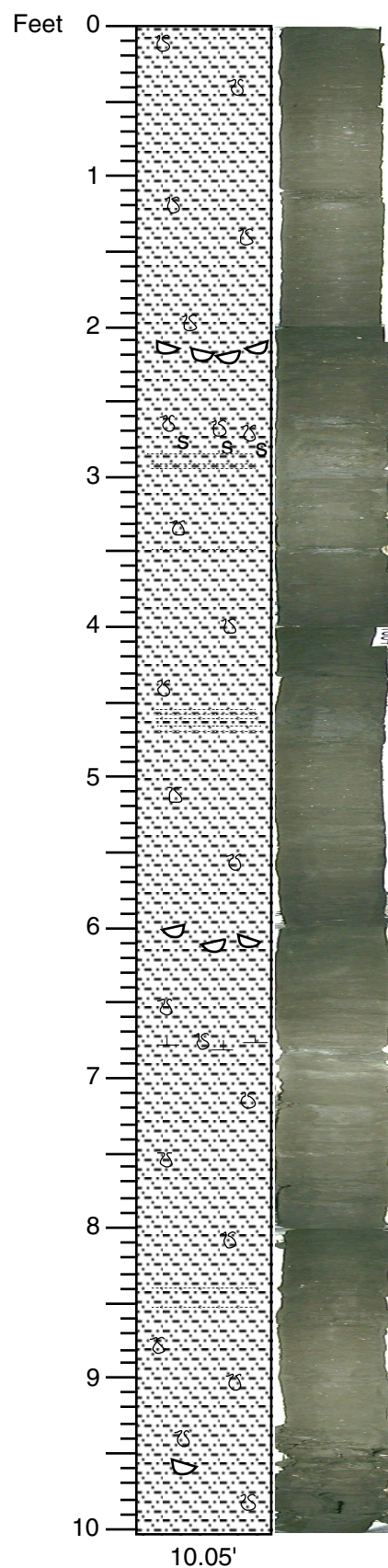
Stop Depth: 1330 ft

Recovery = 5.6 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

200



SILT; mostly clayey, with a few thin clay laminae; slightly sandy (very fine, 10%), slightly micaceous; some interlaminated very fine sand up to 25 mm in thickness, but most are 2-10 mm, with sand-rich laminae at 2.9, 3.05, 3.5, 8.35, and 8.55 ft, and a thin bed from 4.5 ft and 4.7 ft; scattered shells and shell fragments throughout, with richer zones at 2.2 ft and 2.3 ft; abundant burrows are abundant, including a sand-filled burrow at 2.6 ft and a sand and shell filled burrow at 7.5 ft; includes a partially cemented sandy zone is between 6.7 ft and 6.9 ft, which is surrounded by two thin clay laminae.

174AX BB (Qj32-27)

Core # 207

Date: 6/18/00

Described by: PPMcL & BSC

Start Depth: 1330 ft

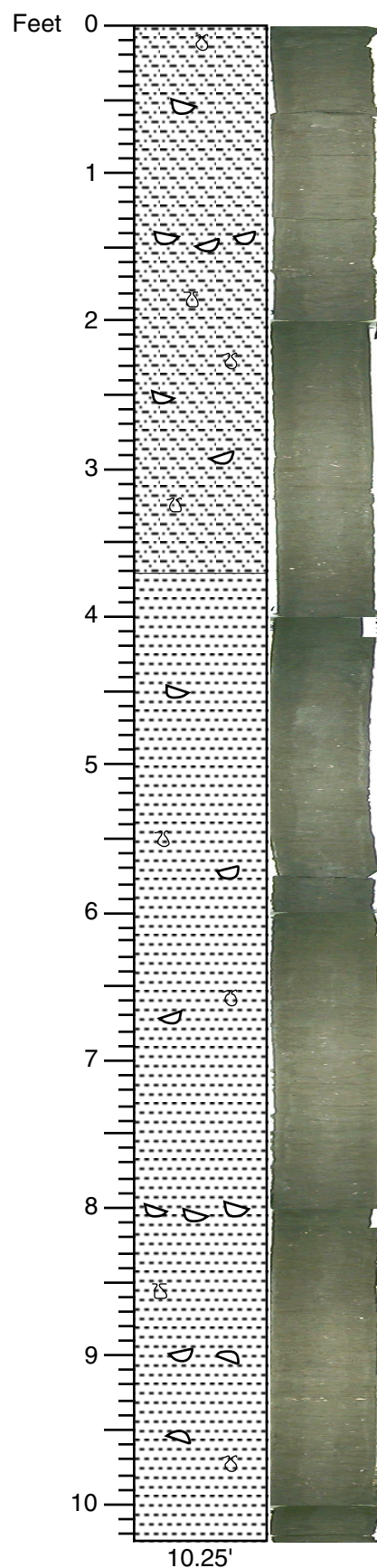
Stop Depth: 1340 ft

Recovery = 10.05 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

201



SILT; sandy (30-40%), with interlaminated silty very fine sand composing 25% of thickness; becomes sandier downward; shiny grains (5-10% of volume), probably shell fragments, in very fine sand fraction; scattered shells; 3-5% dark grains, probably glauconite; burrows filled with sand and silt; heavily bioturbated; dark olive gray (5Y) 3/2; transitional contact with underlying interval.

SAND: very fine grained, very silty with silty burrows. Dark grains make up 3-5% of the volume, which are probably glauconite, and some dark brown flecks, possibly phosphatized shell fragments. Also articulated shells are common. The sand-filled burrows contain about 10% glauconite. Just like above the sand is heavily bioturbated.; bioturbation homogenizes most of the interval

174AX BB (Qj32-27)

Core # 208

Date: 6/18/00

Described by: PPMcL & BSC

Start Depth: 1340 ft

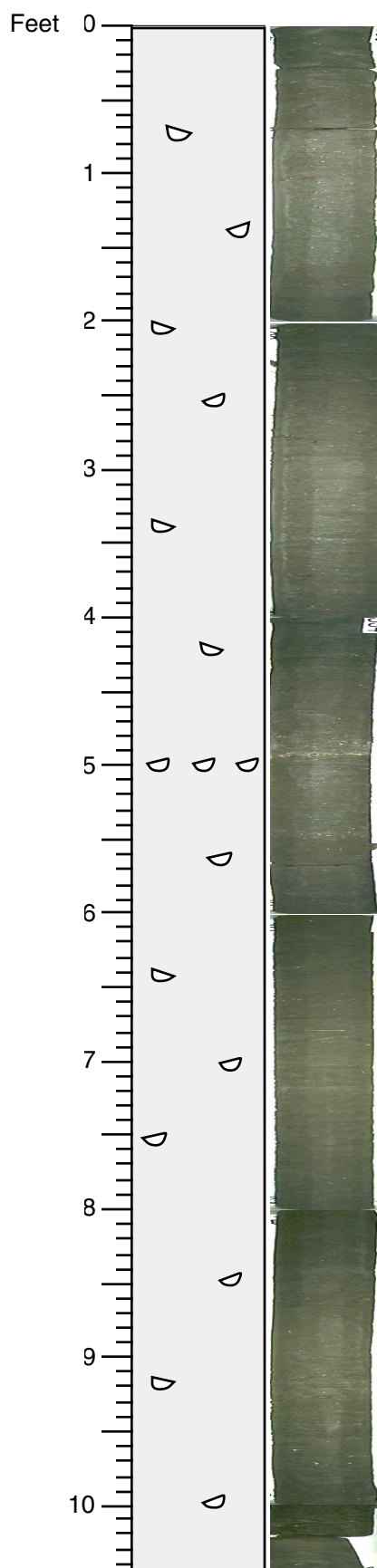
Stop Depth: 1350 ft

Recovery = 10.25 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

202



SAND; very fine; very silty; 5-10% glauconite; scattered shells, very fine shell fragments; laminated in places, some thin sandy silt laminae; around 4.0 ft, laminae are <1 mm, stacked into ~5 mm sets, which are stacked into 75-mm-thick beds; sand and silt filled burrows, bioturbation homogenizes upper part of core; shell hash between 4.9 and 5.0 ft.

Shell zone - 1354.5-1355 ft

SAND; more abundant cleaner sand zones below 1355; thin laminated very fine sand zone, clean parallel and slightly inclined laminae, in 2-5 cm thick sets, laminations better preserved from here down

174AX BB (Qj32-27)

Core # 209

Date: 6/18/00

Described by: PPMcL & BSC

Start Depth: 1350 ft

Stop Depth: 1360 ft

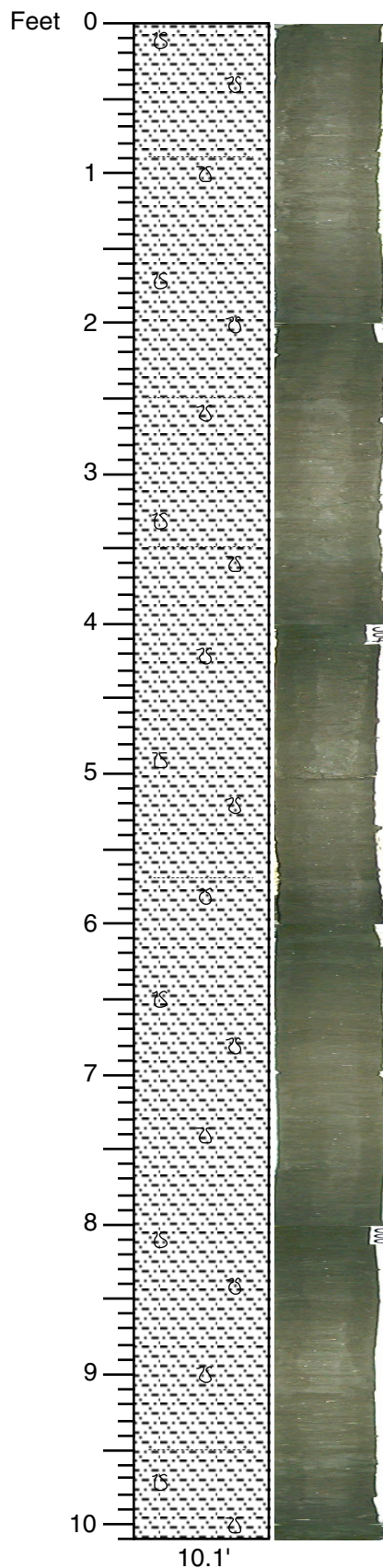
Recovery = 10.45 ft

10.45'

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

203



SILT, sandy, and SAND, silty; interlaminated; sandy silt is slightly clayey in places, includes up to 50% very fine sand with up to 5-10% dark grains; silty sand is very fine, very silty to slightly silty, with 5-10% dark grains; scattered shell fragments of thin-shelled bivalves; very fine shell fragments in sand filled burrows; clearly laminated places, very disrupted due to abundant burrowing in others; laminae range from less than 1 mm to 2 mm in thickness; low angle cross laminations in very fine sands with small-scale erosive scoops; dark olive gray (5Y 3/2).

174AX BB (Qj32-27)

Core # 210

Date: 6/18/00

Described by: PPMcL & BSC

Start Depth: 1360 ft

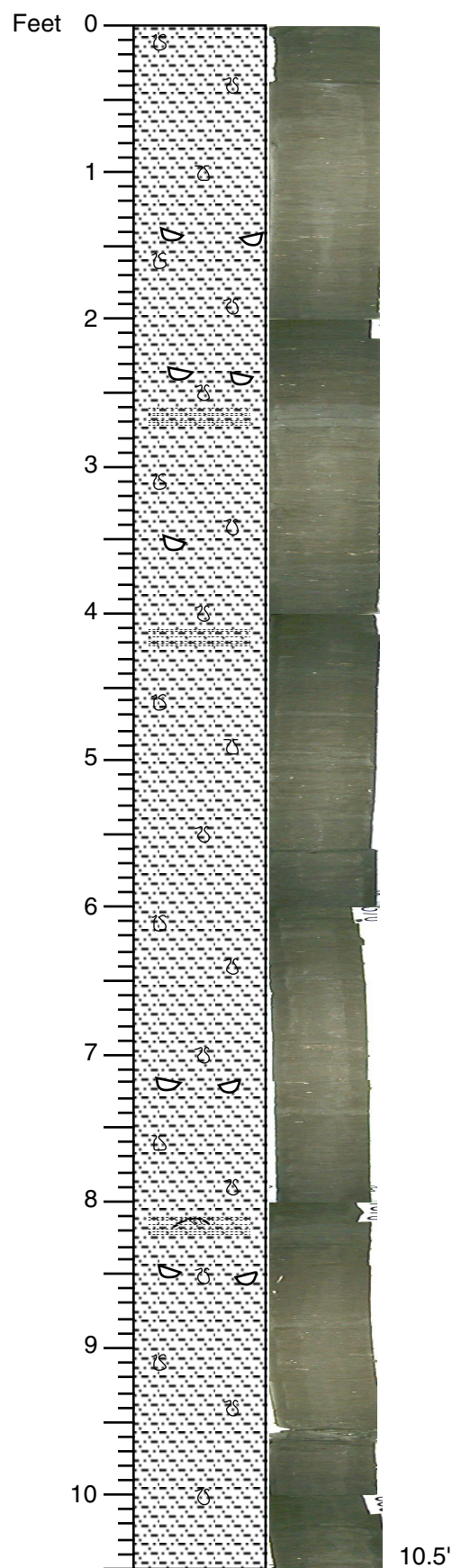
Stop Depth: 1370 ft

Recovery = 10.1 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

204



SILT, sandy, interlaminated with silty, very fine SAND; silt is ~50% of thickness in interval and composed of up to 50% very fine sand, very slightly clayey; sand is very silty to slightly silty; intervals of cleaner sand very soft, contain <10% shell fragments, and are cross-laminated in places (8.1-8.2 ft); laminae mostly < 1-2 mm thick, in places laminated sand forms thin beds to 10-25 mm thick; scattered shells and shell fragments of disarticulated, very thin bivalves; moderate bioturbation, some zones heavily burrowed and other zones with little; some burrows filled with very fine sand with 5-10% dark grains, probably glauconite; some burrows filled with clayey silt; dark olive gray (5Y 3/2).

174AX BB (Qj32-27)

Core # 211

Date: 6/18/00

Described by: PPMcL & BSC

Start Depth: 1370 ft

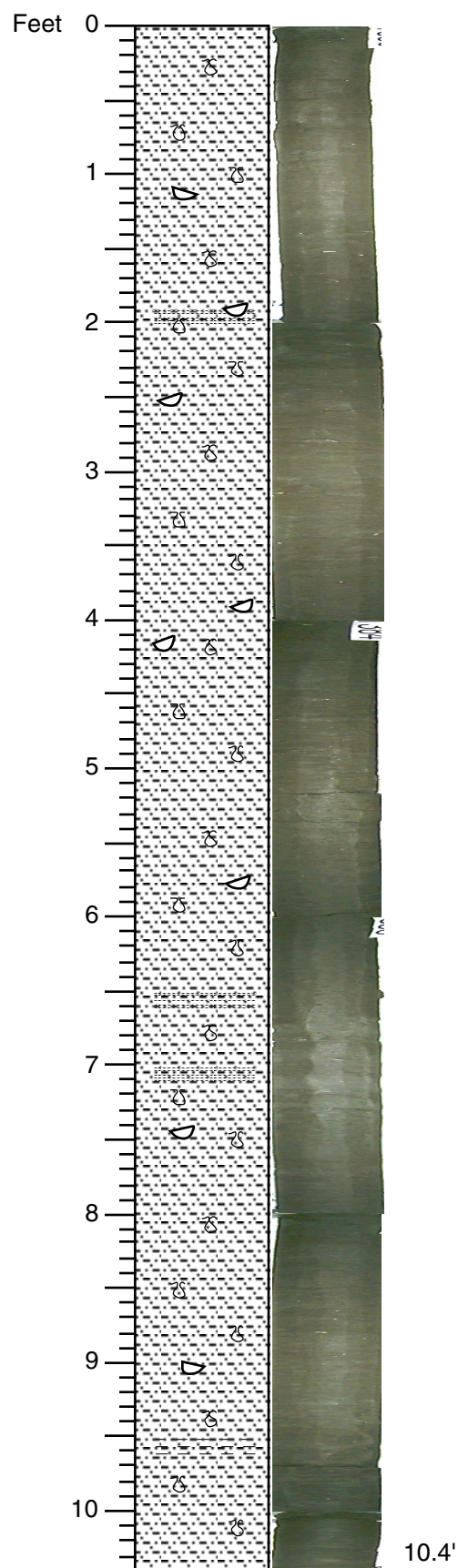
Stop Depth: 1380 ft

Recovery = 10.5 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

205



SILT, sandy, interlaminated with lesser (~40%) silty, very fine SAND; silt is clayey in most places; sand is very fine, very silty to slightly silty; intervals of cleaner sand (2.0, 6.6, and 7.1 ft) are very soft with fine shell debris; laminae are < 1-2 mm thick, with sand laminae stacking into beds up to 20-30 mm thick; occasional shells, but less than the above core; moderately bioturbated, burrows filled with clayey silt or with sand containing up to 10% dark grains; several thin clay laminae near the bottom of the core (9.55 ft); dark olive gray 5Y 3/2.

174AX BB (Qj32-27)

Core # 212

Date: 6/18/00

Described by: PPMcL & BSC

Start Depth: 1380 ft

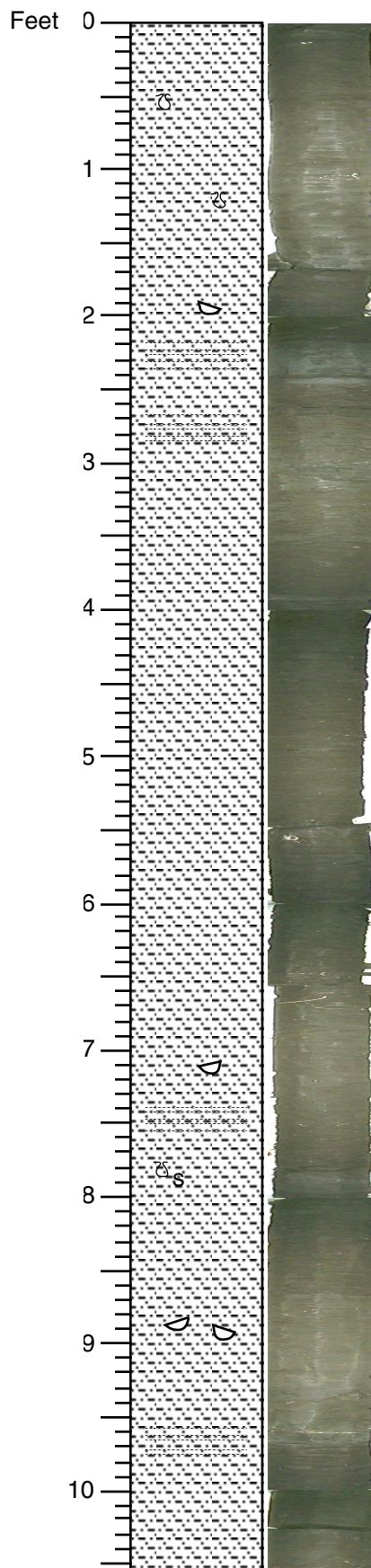
Stop Depth: 1390 ft

Recovery = 10.4 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

206



SILT, very slightly sandy (very fine); approximately 3-5% dark silt or very fine grained sand, probably glauconite; shell fragments 10% of the volume; laminated (good examples at 2.3 ft), in places disturbed by burrowing; laminae about 1 mm thick, in some places appearing cross-laminated; some clay laminae in the upper 1.5 ft, rare mica; burrows filled with either silty sand containing ~10% glauconite (such as at 7.8 ft) or silt; 5Y 3/2.

174AX BB (Qj32-27)

Core # 213

Date: 6/19/00

Described by: BSC & DHM & TEMcK

Start Depth: 1390 ft

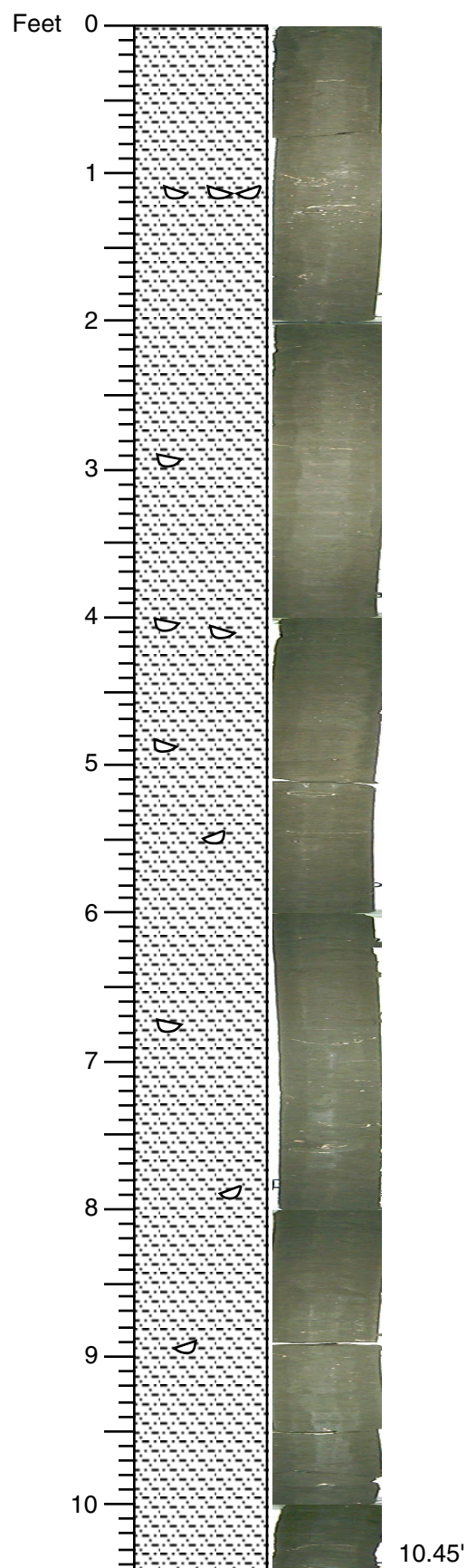
Stop Depth: 1400 ft

Recovery = 10.55 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

207



SILT; very slightly sandy (10%, very fine) to slightly clayey; sand fraction mostly glauconite (increasing abundance downward) with minor mica and some shell fragments; scattered shells, more than in the overlying core; burrowed throughout, but laminated with a few clay laminae below 4.1 ft.

174AX BB (Qj32-27)

Core # 214

Date: 6/19/00

Described by: BSC & DHM & THMcK

Start Depth: 1400 ft

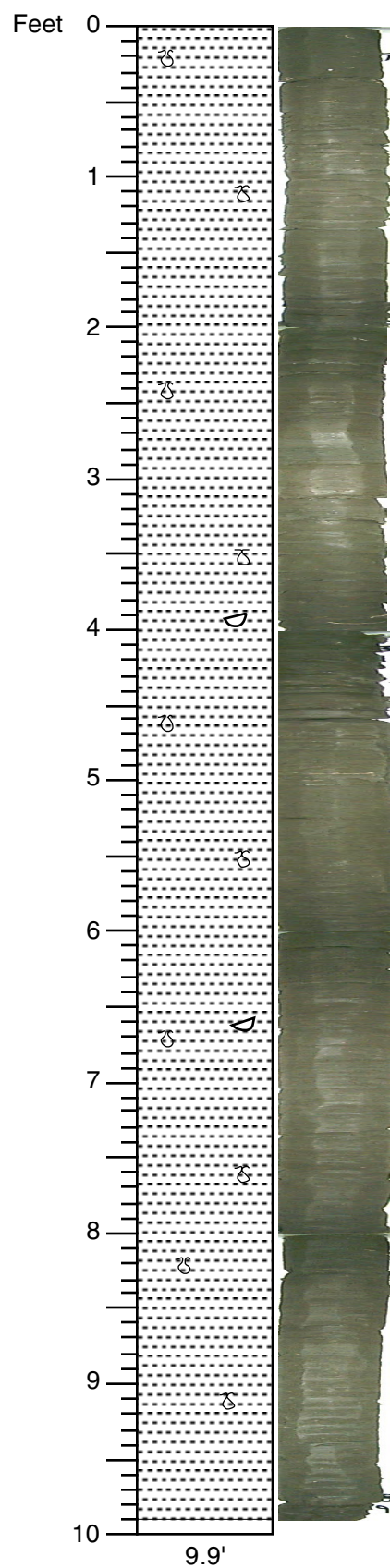
Stop Depth: 1410 ft

Recovery = 10.45 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

208



SILT; sandy (5-10% glauconite), with common laminae of silty clay and some of silty sand; clay laminae every 0.5 ft to 1.5 ft; silty sand is very fine, laminae occur at 2.8-2.9 ft, 3.2-3.3 ft, 4.8-4.9 ft, 8.9 ft); a few shells and shell fragments; common burrows filled with glauconitic sand (up to 20%); harder than the above silt.

174AX BB (Qj32-27)

Core # 215

Date: 6/19/00

Described by: BSC & DHM

Start Depth: 1410 ft

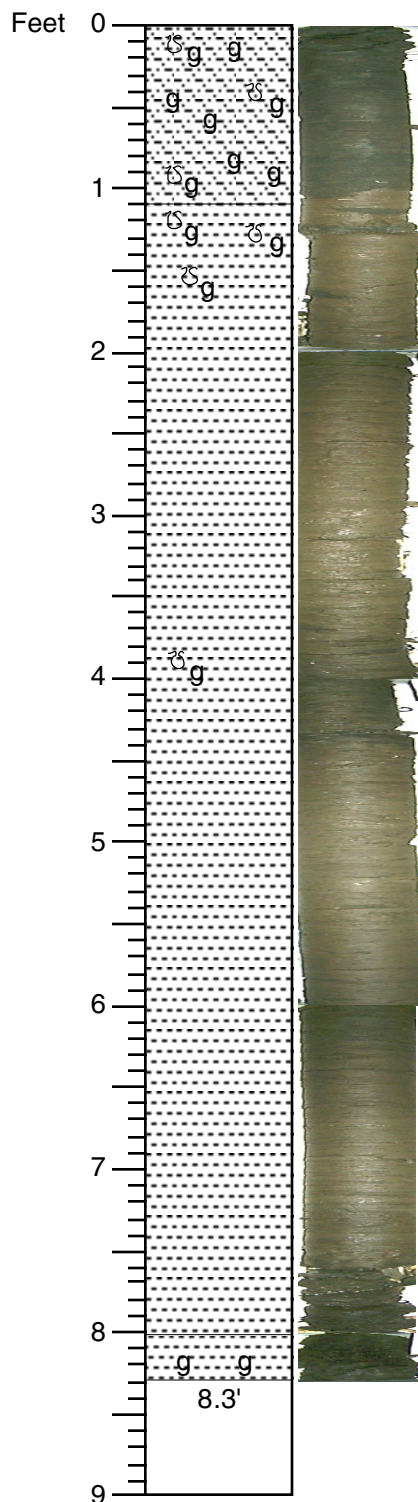
Stop Depth: 1420 ft

Recovery = 9.9 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

209



SILT; clayey; ~ 40% fine glauconitic sand, changing from 10-20% at the top to 40-5% at the base; rare mica; less clay and more silt down section; heavily bioturbated; olive gray (5Y 4/2).

CONTACT is non planar, possibly due to burrowing or erosion. The contact is bioturbated and the.

CLAY; underlies irregular, bioturbated contact with burrows extending up to 0.8 feet below the contact; calcareous, but no visible shells; faint lamination, some intervals of darker clay; a few scattered burrows, some are filled with glauconitic material; clay becomes denser and drier lower in interval; bottom 0.3 ft is probably glauconitic clay but may be mixture of core material with drilling mud; olive (5Y 4/3-5Y 5/3), darkening down section.

174AX BB (Qj32-27)

Core # 216

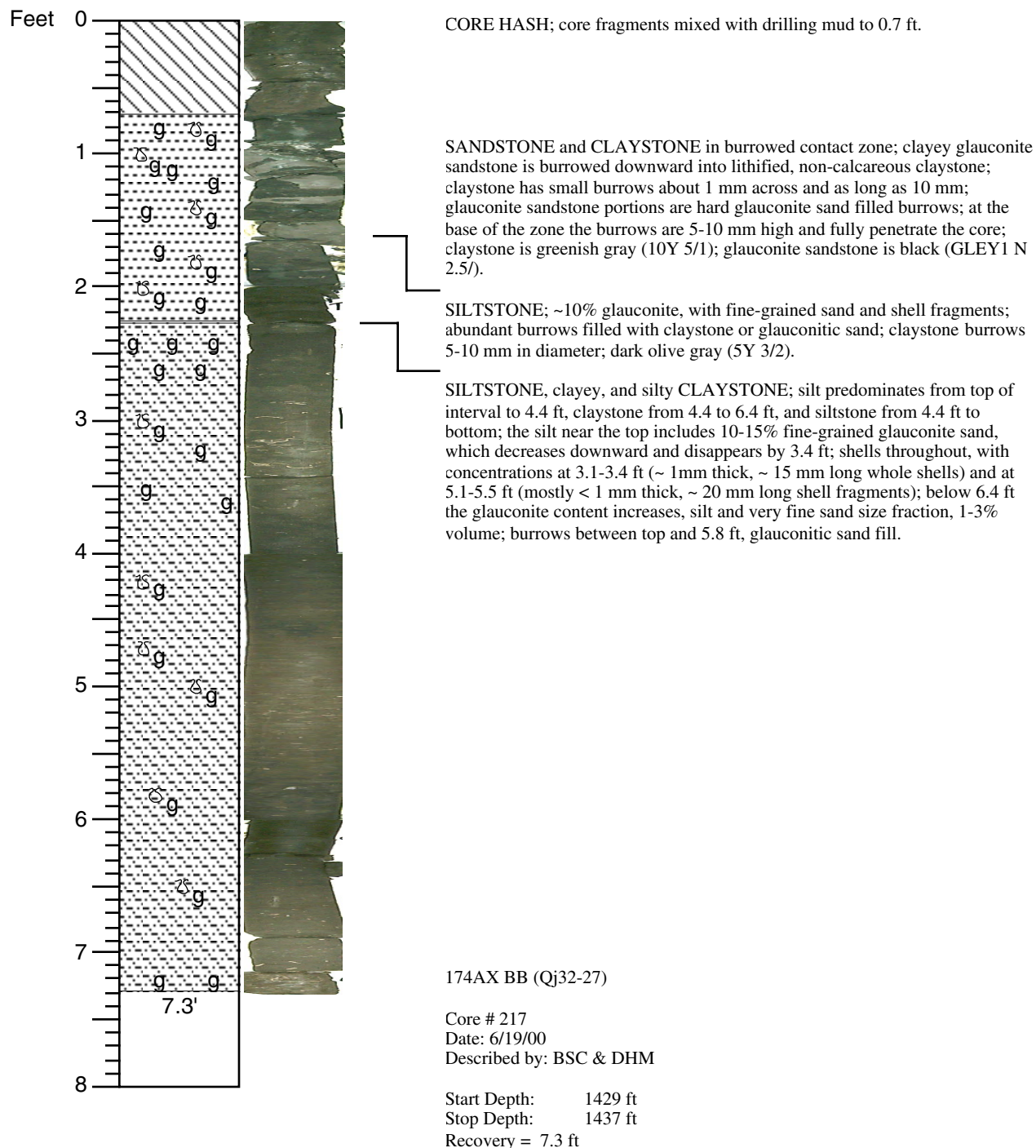
Date: 6/19/00

Described by: BSC & DHM

Start Depth: 1420 ft

Stop Depth: 1429 ft

Recovery = 8.3 ft

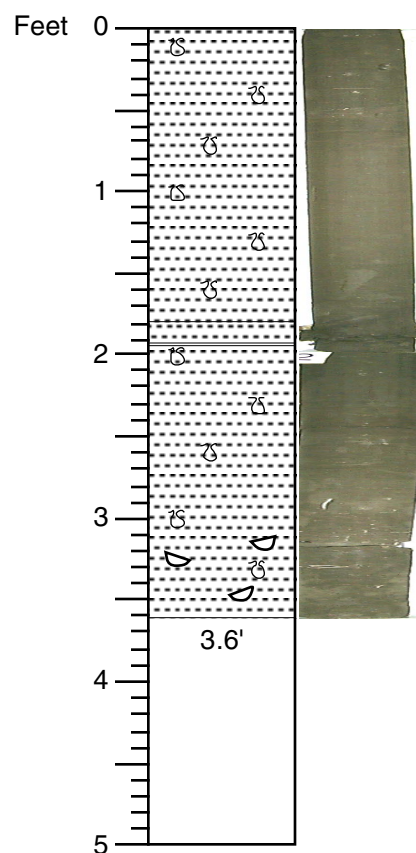


Core 218 (1437-1440 ft) NO RECOVERY

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

211



CLAY; hard; ~ 10% silt, rare mica; highly burrowed; burrows 2 mm by 10 mm; rare very fine shell hash throughout but more common in the upper 0.6 ft; very fine glauconite sand at base of unit; dark olive gray (5Y 3/2).

CLAY; dark olive gray (5Y 3/2).

CLAY; hard, slightly silty, very small (< 1 mm) shell fragments throughout, larger shells more common below 2.9 ft; highly bioturbated; dark olive gray (5Y 3/2).

174AX BB (Qj32-27)

Core # 219

Date: 6/20/00

Described by: DHM & TEMcK

Start Depth: 1440 ft

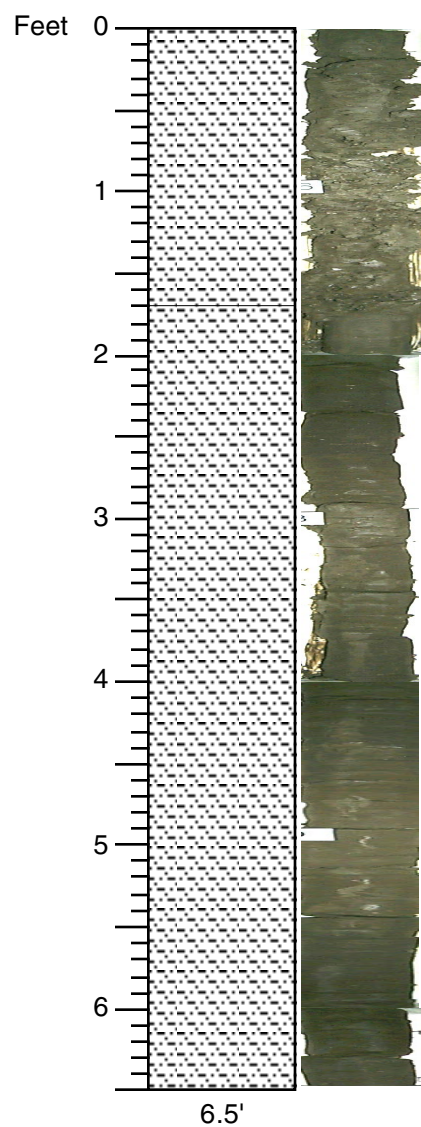
Stop Depth: 1445 ft

Recovery = 3.6 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

212



SILT, clayey, and silty CLAY; mixed; core fragmented and broken during drilling.

SILT, clayey, and silty CLAY; very fine (< 1 mm) shell fragments throughout; trace very fine-grained quartz sand; rare glauconite; silty CLAY predominates from 1.7-2.35 ft, Clayey SILT with a slightly higher concentration of shells from 2.35-2.9 ft, Silty CLAY from 2.9-3.1 ft, and Clayey SILT with subordinate silty CLAY from 3.1-6.5 ft; very fine laminae evident in the clayey silts; apparent partings within core are probably a resulting of high drilling pressure (800 psi); dark olive gray (5Y 3/2).

174AX BB (Qj32-27)

Core # 220

Date: 6/20/00

Described by: DHM & KGM

Start Depth: 1445 ft

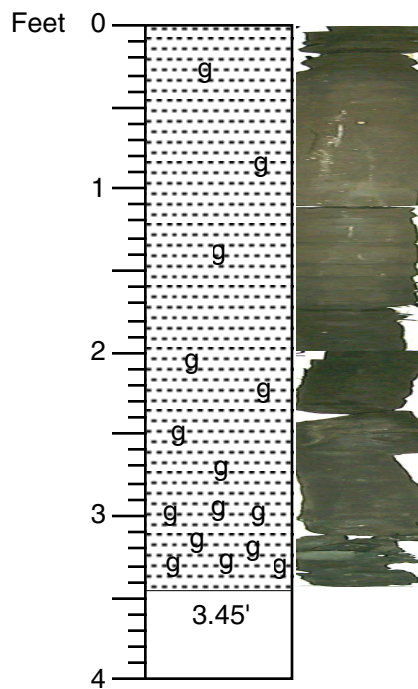
Stop Depth: 1450 ft

Recovery = 6.5 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

213



CLAY, glauconitic, grading down to glauconitic and clayey SAND; most of the sand is glauconite, medium-grained, mixture of brown and green; trace quartz sand, particularly at the base; glauconite content increases down section from 1% near top, 5% at 1.5 ft, 7% at 2.6 ft, 10% at 2.7 ft, and 80% at 3.2 ft; highly laminated throughout; disseminated shell fragments throughout; olive gray (5Y 4/2).

174AX BB (Qj32-27)

Core # 221

Date: 6/20/00

Described by: DHM & KGM

Start Depth: 1450 ft

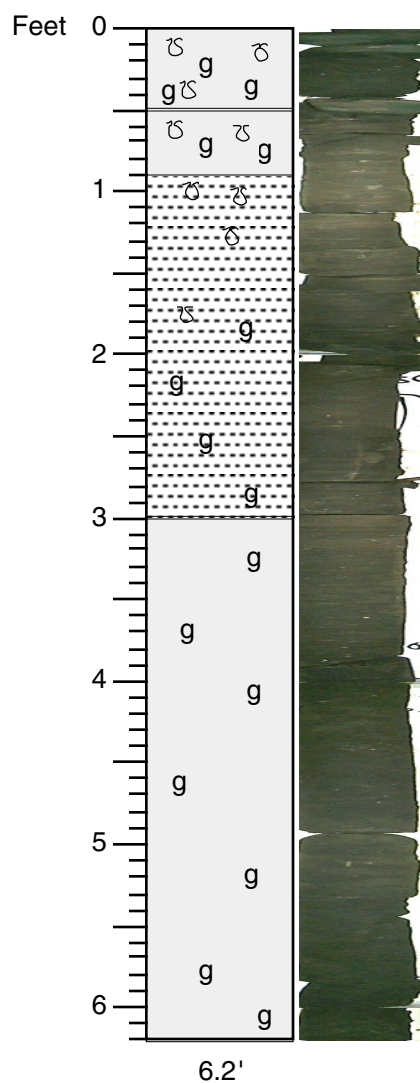
Stop Depth: 1454 ft

Recovery = 3.45 ft

CORE DESCRIPTIONS

VISUAL CORE DESCRIPTIONS, BETHANY BEACH SITE

214



SAND; fine, clayey; most of sand fraction is glauconite, including common brown weathered glauconite, with trace amounts of quartz sand; heavily bioturbated.

CLAY; extensively burrowed under a significant contact; clay is glauconitic, very dark grayish brown (2.5Y 3/2); cut by numerous burrows filled with glauconite sand.

CLAY; glauconite-rich; glauconite sand filled burrows are common in the upper part of this interval (0.9-1.5 ft); trace mica; small, less than 1 mm, shell fragments throughout; very dark grayish brown (2.5Y 3/2).

SAND; clayey and glauconitic; most glauconite is green, some is weathered brown type; includes microfossils and trace quartz; black (5Y 2.5/1).

174AX BB (Qj32-27)

Core # 222

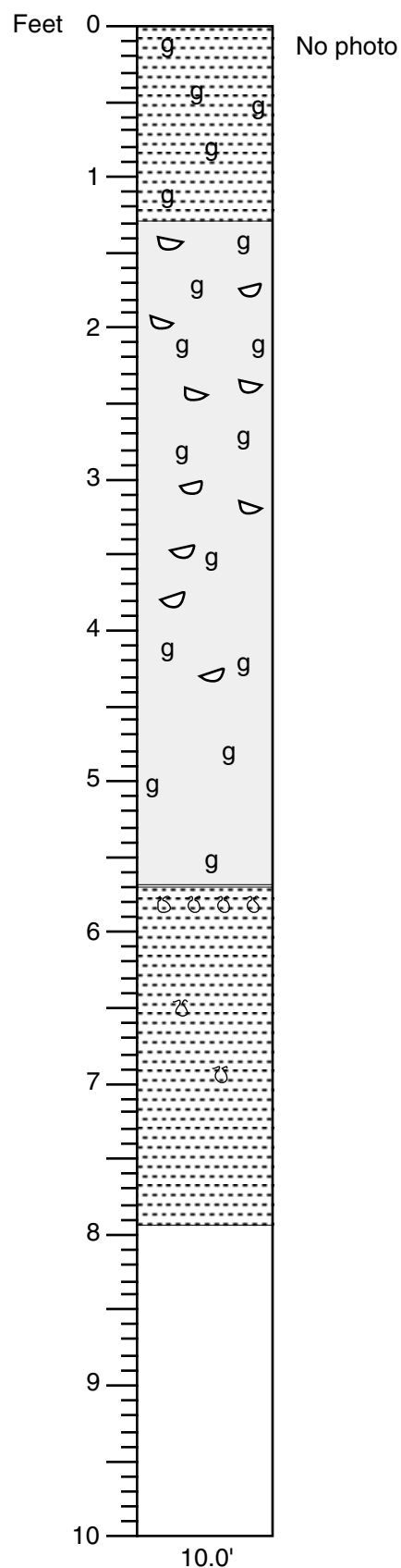
Date: 6/20/00

Described by: KGM & DHM

Start Depth: 1454 ft

Stop Depth: 1460 ft

Recovery = 6.2 ft



CLAY; glauconitic; fragments mixed with drilling mud, probably due to high-pressure drilling and core barrel extraction.

SAND, clayey, to glauconitic CLAY; sand is fine to medium; glauconite is black and green; shelly from 1.3 to 4.4 ft; microfossils apparent, abundant burrows, with clay from underlying interval filling burrows as high as 5.1 ft; black (2.5Y 2.5/1).

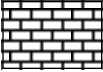
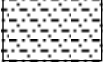

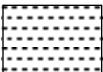






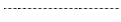



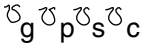







CLAY; laminated, very slightly micaceous, slightly glauconitic, and rich in foraminifera; upper part (5.7 to 6.0 ft) is highly burrowed; burrows are less abundant from 6.0 to 6.9 ft; burrows are filled in with glauconitic sand; dark olive gray (5Y 3/2).

174AX BB (Qj32-27)

Core # 223
 Date: 6/20/00
 Described by: DHM & KGM

Start Depth: 1460 ft
 Stop Depth: 1470 ft
 Recovery = 7.95 ft

Key

	limestone
	silty sand
	sand
	clay
	peat
	pebbles
	granules
	shells
	cross beds
	laminations
	sand laminae
	clay laminae
	silt laminae
	burrows
	burrows filled with glauconite, pyrite, sand or clay
	nodule
	foraminifers
	glauconite
	mica
	calcite cemented
	fining upward
	coarsening upward