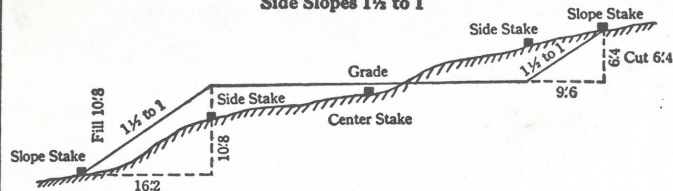


 **DIETZGEN**

**ENGINEERS'
FIELD BOOK
No. S400V**

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING
Roadway of any Width
Side Slopes 1½ to 1



In the figure above: Opposite 6 under "Cut or Fill" and under .4 read 9:6 the distance from the side stake to the slope stake at right. Opposite 10 under "Cut or Fill" and under .8 read 16:2, the distance from the side stake to the slope stake at the left.

Cut or Fill	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	Cut or Fill
Distance out from Side or Shoulder Stake											
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

DR. THOMAS M. SCOTT
 FLORIDA GEOLOGICAL SURVEY
 TALLAHASSEE, FLORIDA

Property of T. Scott
FGS

Address 903 W. Tennessee St

Tallahassee, FL 32304

Phone (904) 488-9380

This Field Book contains special paper which is impregnated with resin to make it substantially stronger as well as water resistant. Your field notes will come out sharp and clear even when the page is wet.

MADE IN U.S.A.

[illegible]

7/2/97 w/G-LB VA

Golightly Core Collier Monroe Co

TV 200

200-198.5 Silts of sand, yellow
clay? silt, phos, diatoms
biofurb, mica, unconsol - poor

195.7 - 196.3 v f sand, unconsol
yell gray, silt, dolosilt?
phos 18% boturb mica

196.3 - 170[±] Sand, w/ silt ^{with some coarse U} ~~if~~, ^{unconsolidated}
yell gray - light blue gray, much
phos 1% very few highly leached
moll. some highly overgrown
forams? clayey zone

grades into overlying lith
as clayey zones become laminar
w/ more clean #. of sand.

170± - 154 f/m Sand, f, f-vc, some pebbles
Discoid of $\frac{1}{2}$ at 166 cm, lgt gry
pink gry, unconsolidated, very little
clay phos to 2% some zones
bimodal f/c

few v. leached moll frags
more moll frags 160-60.7
grades into clayey shelly sand
≈ 157.5 same sand w/ more
shell, clay, lgt olv gry

156
155.8 - 142.4 Sand, vf, vf-f w/ scattered
c, vc silty micaceous, unconsol
very few very leached shell at base
plus 1-2% bioturb mica
PR 154
yell gry to lgt olive gry calc
becomes more grayish 142.8-142.4
more carb in mix. at 142.4 quickly
becomes next litho

142.4 - 129.8 Diatom-rich carb mud/clay
w/ sandy laminae, diatoms most
common in ~~beds~~ lam. low
in sand. ^{and sandy} propped to unconsol
PR 154
silty, more silty above 134/
grades into overlying ^{abundant} forams
by 129.8, plus 1-3% mica

129.8 - 126.3 Sand, yell gry to lgt olv
gry, silty, carb, clay, unconsol
plus 1-3% mica few diatoms
forams? Bioturb

[Sharp contact]

126.3 - 87 Sand m-c variable med,
f-vc w/ few discord pebbles.

lgt gry to yell gry & pink gry
unconsol to poor, carb in mix
few shell frags plus 1-3% foss frags
zones of med ls

LS, white to lgt gry, poor to med,
Sand (vf-f) abund - small molds
plus 1% gradational w/ sands
LS at 107.8, 104, 100, 98

103 Sand f vf-m more abund
foss frags forams etc

carb content increases near top

87-86.8 as 126.3-87 plus rock frags
(result of drilling?)

Contact seems gradational - increase
in carb and lithification

86.8-78.8 SS to LS, lgt gry to orangish gry
poor to good (some washed out
unconsol), very carb SS very sandy
LS, abund small molds & casts
in some zones. Sand is fine

predom ss
[sharp Break)

78.8 - 30 Ls, med gray to lt gray, pinkish
unconform to mal in zones,
sand generally very minor <10%
few zones of more sand,
plus 1% moll molds calc
and few frags, echinoids etc
forams (overgrown)?

Ochopee

Better lithified 35-30
poor recov 30-25

30-25 Ls, yell gray pinkish gray
hard, sandy, molds/casts (few)

25-16 Ls as above but very
moldic minor sand
softer 19-18

16-14 poor recov of rubble
due to dripping?

14-13 lost

13- Ls, lt gray to orange
gray (Fe stain), well ind,
abund large moll molds & well

Cliona galleries abundant
sand becomes more abund
above 4'

Probs lugworm or deeper than
unrecovered

PR

TD-170± grades into

UNNAMED 170± - 155.8 (156)

shelly zone 157.5 looks T. sandish

PRish 155.8 - 126.3

unnamed 126.3 - 86.8 has some affinity
to Ochopee sand

Tammi Ochopee 86.8 - 0

Some soil breccia 1m in
upper 10ft

7/24/97 Hot/Humid/Sweat
North Nobles Rd USGS
drilled by FAS

0 - .66 silt
.66 - 7 Ls ^{white - lgt gry} Soil breccia at top
soft, minor sand, fossil frags
good ind at top to poor/unconform at 7
7 - 12.25 sand, ^{lgt gry to lgt gray} carb matrix, clay??, m, f-c
minor phos grades in to
sandy ls, poor to unconform

12.25 - 22 ls, lgt gry to white, ^{unconform}
to v. poor sandy, fossil frags
and molds mollusks
abund oysters at 20
[grades into clay

22 - 32.6 clay, med gry to dk gry, poor conform
to unconform, sand & silt, abund
moll. forams, becomes more sandy
w/ depth

32.6 - 28.9 sand, ^{m, f-c} lgt grn' gry, very clayey
poor to unconform, clay/carb matrix
abund moll molds & frags forams.
[silty grades into v sandy ls

28.9 - 42 ^{to v. sandy} ls, lgt gry, unconform to poor
sandy fossil frags, moll molds casts frags
clayey in zones. lots of oysters
[grades into sand w/ carb matrix

42 - 59 sand, lgt yell gry, ^{yell. grn} unconform to poor
f, vf-m, minor phos carb matrix some clay
moll frags, forams?
more clayey in zones
[sharp contact

59 - 92.5 ls, dk gry to lgt gry, v. poor conform
to ^{good} conform, very moldic, sandy
Echinoderm ^{encrust} moll molds/casts and shell, minor phos
becomes very sandy towards base
[grades into ss Barnades

92.5 - 106 ss, ^{to good} lgt gry, med ind, very moldic
moll molds casts/frags.
fewer molds w/ depth
poor recovery below 97 to 111
lost 106 - 111

111 - 126
PR Sand, med gry, ^{vf vf-f silt} unconform to v poor
carb matrix very little clay, silty phos 5% - 7%
fossil frags (moll. Barnades) very leached
+ trace of mica forams 121 - 126

clay content increases below 121
color to olive gray

[Gradational contact

126 - $\approx$ 150 clay, olive gray, ^{to dk gray} unconsolidated to
poor, variably sandy, silty
forams sand lenses of v. silty
sand w/ clay, inter
scattered diatoms

below 128.5 silty clay w/ little
to no sand.

Thin layers of abundant forams
and diatoms

From 137 - 139 wispy zones
loaded w/ forams

141 - 144 (approx due to loc.) greasy clay
w/ scattered forams.

becomes sandier towards 150-1

[gradational contact

$\approx$ 150 - 200 sand, lgt grn gray to lgt oliv
gray, unconsolidated to poor, ^{silty} clay and
carb mtrix, vf, vf-f w/ coarse grains
occurring and becoming more common
below 156, much more clayey
below 160, mica forams
zones w/ very leached scattered moll
frags

zones of abundant very leached moll
abundant brachiopods

phos trace to 1% increasing below 158
as sand becomes coarser

sand becomes finer below $\approx$ 164.5
grades into v. clayey sand, silt
mica, minor phos few fossil frags
and forams

zones of high clay content (sandy clay)
interbedded w/ clayey sand and
cleaner sand lenses, some very
coarse grains, often abundant

[gradational contact

200 - 201 TD Clay, olive gray, poor
sandy particularly in thin zones
phos - minor

Notes

0 - 666 Fill

66 - 111 Tarni

66 - 22 Buckingham ??

22 - 59 ?? Pinecrest ??

?? 59 - 106 Ochapee

106 - 111 lost

111 - TD PR

Reston Stephen's 13th Birthday
9/3/97 cool front passed thru this AM ^{3:00 PM}

Nobles Rd core - USGS

TD 200'

200-186.5 Sand, ^{subang-subred} yell gry gry grn, vf
vf-f, silt, clay, few m-c grains
~~calc?~~ (antif HCl), unconsol - v poor
11% mica phos 1-2%, few very leached
moll frags, clay content variable
grades into clay - bioturb

186.5 - 179 clay, silt, med yell gry - yell grn
poor consol, scattered vf sand,
abund diatoms, trace phos
silt/clay contents variable
~~calc?~~ Bioturb

Grades into overlying clay

179 - 172.1 clay, med grn gry - med olv gry
poor consol, some silt, common to
abund diatoms but disappear by
177± some thin bedding

trace mica; vf sand, phos
sand content increases above 174
in bioturb zone, minor dol silt
gradational - due to bioturb

172.1 - ~170 sand, med olv gry becoming lighter
uphole, vf vf-f silt, clay,
phos to 10%, mica, sand subang-subred

clay content decreases uphole
~~data in mix?~~

gradational PR
to Tamu Sand?
~170-163.8 sand, yell gry - lgt gry, vf
vf-f silt, ^{calc} some clay clasts in
mix, unconsol to v poor, phos
to 20% (often concentrated in
burrow fill) zones w/ phos gravel
v. few moll frags at base, increasing
in amt up hole, leached
minor mica Bioturb

gradational

163.8-148.6 sand, lgt grn gry, vf, vf-f, silt,
calc, unconsol to v. poor, phos to
20%, common to abund moll frags
some whole shell - mostly leached
bioturb more calc at top
gradation of contact - Bioturb

148.6-144 Ls ^{packstone-grainstone}
lgt gry-white, unconsol to v. poor,
sand 10-50% (sand f w/ some well sorted
coarse grains), phos 1-2%, abund
moll, & disartic frags
becomes more sandy toward top
grades into overlying

144-122.5 Sand, ^{med grey zones} lgt grey to white, unconsolidated to v. poor, calc matrix, calc 10-50, phos 1%, abundant moll frags, calc. i. molds, echinoid frags, thin zones of v. sandy ls some is mod lith
Sand f-m some c

122.5-105.1 Ls ^{partly to green} lgt grey - white, ^{to med grey} unconsolidated to mod in thin zones, calc matrix sand 10-50, phos 1%, moll frags i. whole, molds i. casts, Few corals
Sander at top w/ phos to 2% gradational

105.1-103.5 Sand, lgt grey - med grey, unconsolidated to v. poor, calc matrix, calc 20-50+ phos to 5% sand f vf-f some med. fossil frags abundant variable to v. sandy ls

103.5-92.5 Ls, grainstone, lgt grey - med grey unconsolidated to v. poor, sand to 50%, phos to 5%, Foss. frags abundant moll frags molds, casts, Bryo
fairly sharp to grad contact

92.5-86.3 Ls, grainstone, yell grey, unconsolidated sand 30-50, phos to 2%, Foss frags, very leached mod finely fragmented as compared to more coarse below
sand vf-f few coarser grains clayey, clay clasts
clay content increases above 87'
grades into overlying

86.3 - ~84 Sand, lgt grey - yell grey unconsolidated to v. poor, clay matrix dol matrix? silt, clay, phos 2% no calc foss
grades into clay

~84-81 clay, grey - lgt grey, poor to unconsolidated, some dolosilt? sandy, phos silty
no calc fossils few diatoms
grades into overlying sand

81-68.4 Sand, grey grey, vf, vf-f, unconsolidated to v. poor, clay matrix, silt mica, phos 1% no calc foss
few moll molds

gradational as clay content increases

68.4 - 62.4 Clay, grn gry - yell gry, unconsolidated to v. poor, very silty, sandy phos 1%, mica no calc foss, sand v f sand filled burrows bioturb lenses of v f clayey silty sand gradational

62.4 - 36.4 Sand yell gry - lgt grn gry v f - f unconsolidated to v. poor, clay mtrix v. silty, few moll molds mica phos 1-2% becomes calc by 55.6 w/ scattered very leached shell frags forams above 55.6 Barnacles Bioturb gradational

36.4 - 31.7 Sand, lgt grn gry - lgt gry unconsolidated, f, v f - f calc mtrix phos 1% abund shell moll, worm tubes, often leached sand increases Gradational

31.7 - 25.5 Ls, wackestone, unconsolidated to v. poor sand 20-50 phos 1% moll molds casts and original material thin well like zones Barnacles grades into grainstone by 29' becomes very sandy and grades into ss

25.5 - 16 Sand, lgt gry, lgt org gry f, v f - f poor, calc, phos < 1% abund moll frags, worm tubes Barnacles forams gradational

16 - 15.2 Ls, grainstone, lgt gry - white unconsolidated to v. poor, sandy moll frags, Barnacles.

15.2 - 10 Back to Sand as 25

10 - 8.5 lost

8.5 - 23' Ls, wackestone, pale orange - lgt grn med ind, little sand, root casts & molds, abundant micro moll w/ hard cap rock

3-1.5 clayey sand filling cavity
in cap rock to 1.6'
then hard cap rock

15-0 fill

notes

PR to 170'

transitional PR 170-163.8

Tami Sand? 163.8-148.6

Ochapee 148.6-86.3 92.5

Tami Sand: Clay 92.5-31.7

Sand: ls - Tami Colours? 31.7-15.2 or 10

ls indistinct 10-1.3 possibly

Fresh H₂O

9/8/97 Reston

Ball core USGS

200 TD

200-196.2 Sand, lt grey, vf, vf-f
unconsol, silty, clay (minor)
phos 1%, slightly dolo, few
restal fossil frags. Biofurb.
gradational scattered mica

196.2-171.5 Sand as 200-196.2 but w/
more dolo mtr, small molds?
casts. poor lth.

grades back to sand as 200
w/ little dolo mtr by 193.5
variable dolo mtr minor clay
becomes f vf-f by 175 w/ m-c
grains very scattered.

small frags become more common
at toward 171.5

gradational contact

171.5-167.9 Sand, grey, gritty, unconsol
m m-vc fgn granules, phos sand
and gravel, abundant small frags
Bawacks. very leached.
gradational - Biofurb

167.9-163.8 sand, olv gry, lgt grgy
unconsol, f vf-f few med
silt, clay in wisps; little mtr
few small frags forams?
phas 1%
grades into overlying

163.8-148.8 Sand lgt gry c; c-vc
granule, unconsol very little
to no mtr, phas 1%
few fossil frags - small
finer upward m-f-c mica
more mtr clay, calc, ^{small} discoid
pebbles, small frags more common

160 - f, fm few vc to granule
more coarse in zone

160-155 finer

155-152.6 coarser fining up

152.6-150.2 " " "

abund shell frags 150ish
gradational

1
148.8-146.8 Sand, lgt grgy unconsol
c, m-gravel, abund. flatbed
pebbles, med frag phas 1-2% ^{sand} gravel
clay zone 0.05' at top
sharp contact

146.8-128 Sand, lgt brn gry to lgt gr
gry, vf vf-f few coarse
grains, mica, phas 1%
less silt
few zones of vc sand
coarse component increases
above 128
gradational

128-95 Sand, lgt brn gry to gry
unconsol, bimodal f, vf-f
and c, c-vc/granule, mica
phas 1-2 (zones of as much as 5%)
zones of abund gravel some
discoid. few zones of kaolinite mtr
Becomes more coarse above
95'
gradational

95-80+ Sand/gravel, yell brn gry to lgt
brn, unconsol, c, m-vc/gravel
mica, phas 1% few lenses of
kaolinite mtr
few larger discoid pebbles
above 90' fewer to no large pebbles
and only little granule
gradational

20-61 Sand lgt brn gry lgt ag gry
unconsol c, m-c, silt clay
(very minor) becomes finer up
to m, m-c, hardly any phos
fairly sharp break

grainstone to packstone
61-50 Ls, lgt gry to med gry, unconsol
to poor, sand to 50%, phos 1%
small molds, cast, frags
very rubbly, interspersed harder
zones
Barbados,

Amiami
Ochope
45-50 lost

45-38.4 Ls, grainstone/packstone, med
gry, unconsol to mod., sand
to 25%, small molds, casts
frags phos < 1%
echinoids, rubbly
sharp to grad Break

38.4-9.5 Ls, grain-pack, unconsol to
mod, sand 10%, echinoids
small molds, casts, frags, Barbados
Dryozoans
sharp Break

undiff sc
9.5-5.8 Clay, dk gry brn gry, unconsol
to poor, sand to 20%, silty, rock
frags, fossil frags, phos 1%

5.8-0 Sand, med brn gry, f, v f-m
clay matrix, rock frags, fossil frags
phos 1%

no PR observed

very coarse zones in unnamed
slices w/ phos sand and gravel
Tamiami is not typical Ochopee
from 61-39

39-9.5 Ochopee

9/8/97 Reston

Monroe Station Core USGS
201 TD

201 - 200 Cement

200 - ~189 Sand, lgt gr^{lyt gr/lt gr} unconsol.

m-m-c becomes c m-vc

wp, phos 1-3%

scattered shell frags

thin zones w/ disrupted clay

sand grain size vary.

but overall m-c

Gradational

PR

189 - 184 Sand lgt gr^{lyt gr} to lgt gr^{lyt gr}

unconsol, m, f-m, phos 1%

few small frags

gradational

184 - 180.6 Sand, med olv gr^{lyt gr} to lgt

gr^{lyt gr}, unconsol, clay mtr^{lyt gr}

(variable but < 10%) m, f-m phos

1%. Small frags moll

gradational with increasing

Carbonate to a calc. clayey

sand w/ vc sand, silt

gradational contact

180.6 - 145 Sand, med gr^{lyt gr} to lgt gr^{lyt gr}, unconsol, vf vf-f few coarse grains, clay mtr^{lyt gr} Bioturb

→ dolosilt 177.5 - 176

few zones of f, vf-f sand

phos 1-2%, mica

clay content variable

gradational - Bioturb

PR

145 - 130.2 Clay, olv gr^{lyt gr}, yellow

unconsol, sandy, silty phos 1%

mica, variable to a very

clayey silt, Bioturb

sandy/silty laminae

interbedded sand and clay

135 - 130.2 Sand vf, vf-f silt

Gradational

130.2 - 110.0 Sand, brn gr^{lyt gr} to lgt gr^{lyt gr}, unconsol, clayey, phos < 1%

mica, quite variable clay/silt

grades into overlying

TRANSITION

110.0 - 101.8 Sand, lgt gr^{lyt gr} - med gr^{lyt gr}, unconsol

vf-f, vf-f sand coarse grains

phos 1%, mica few small frags

unconsolidated silt

101.8 - 100 Sand, org gry to lgt gry,
unconsol to poor, fine v.f-m, scattered
coarse to granule, phos 1-2
moll frags very calc
sharp contact

100 - 60 Sand, yell gry to lgt gry
unconsol, m, f-m, few coarse
foss. frags phos 1% minor
calc in mtrx to 90' then
more calc mtrx

becomes more coarse to 90

90 - 87.5 very calc

87.5 - 85 very coarse w/
quite a bit of shell debris

85 - 83.7 finer

83.7 - 80 coarser

80 - 78.5 finer w/ more calc
mtrx and leached shell
poor to mod lith 80-79

78.5 - 66.5 coarser w/ zones of
poor to mod lith, calc mtrx

66.5 - 60 fine

Driller says sand started at
58'

contact lost

60 - 55 lost

Amami - Chapel

55 - 40 Sand, org gry to white
well ind to v. poor, calc mtrx
moll frags, molds, casts phos 1%
v. poor recovery m, f-m scattered
coarse grains calc mtrx to
> 50% (Ls, packstone)

40 - 31.5 Ls, packstone-grainstone,
yell gry, unconsol to well,
sand to 50% phos 1%
moll molds casts frags
echinoids
v. poor recovery

31.5 - 9 ls, grain-pack, white-lgt gry
unconsol - poor, sand 20-30
phos 1%, moll molds, casts
frags rubby few hard
retical zones. foss frags, forams?

9 - 2 hard cap rock w/ soil/sand-clay
filled voids,

2 - Soil/Fill

PR - TD (200) to 105.5
w/ transition 101.8
unnamed silty 101.8 - 55
Tamiami-Ochapee 55 - 2
Silt 2 - 0

Sand is overall finer than
in Bars

PR appears to be a
lagoonal deposit (or further
off shore) portion of unnamed

Miller Property
Collier Co

2/5/98 cool ~~st~~
5+dy to GLB

TD 195

195-169 Silty clay to clayey silt w/minor
sand ^{calc} fin gr to olvgry, abundant
forams below 187.5, abundant
diatoms above 187.5 $\pm$ 179
thin forams and diatoms

Pena River Fm

169-146.5 Sand vf, vf-f, unconsol to
v. poor, gray to lgt gry, ^{calc mtr} phos 10-25%
some shell frags (more abundant
in some zones) Matrix becomes
more calc toward 146.5
more clayey 160-169

Sharp Break??

146.5-140.8 lost

packstone

140.8-129.5 Calc SS to sandy ls, med-good
ind, white to lgt gry, very
moll moldic, phos to 5%
some original shell

Tamiami Ochapee

129.5-103 Rubbly, ^{Brngry to lgt gry} grainstone to packstone
ls, to calc ss, moll moldic, poor
ind, some original shell

123.5-103 unconsol. w/few poor ind zones

Forams & moll molds and original

103-74.25 Ls, grainstone - packstone, ^{widest} sandy
mod grey to white, poor to med ind
very moll moldic
varies to quite rubbly, almost
unconformal.

fairly sharp break
74.25 - 10 Sand, v.f-f ^{below 71 m, f.c. unconformal to above}
v. poor, yellow grey, forams, moll
mtrix - clay & carb, carb content
increases upwards to 65' then
varies.

Quite clayey above 52'
sand becomes finer above
48' v.f-f.
clay content decreases 48-44
then carb mtrix sands (tan)
w/ little shell

16-1.0 carb mtrix sand grading
into sandy carb mud, yellow grey
to white, unconformal to v. poor
very shelly 10-7.5
very rubbly 5-1.75

11.0 - surf Soil

2/9/98
Sunni Land Core (FGS) at U.M.

815 TD K Cunningham put ^{warehouse}
Os at 738± ^{U.M. did not}
~~FD~~ ^{have HCl for}
^{me to use.}

TD-738 Ls to dol? and ss grainstone to wacke
sandy (qtz) w/ sand beds poor to
good ind, orangink grey to white
forams moll - moldic
zones of breccia & debris crusts
807-7.5, 783-3.5, 767.5
741.5-42 738.0-740.5
phos < 1% - 2%

738-671 Ls, packstone - grainstone, white
to pale orange, less sand than
below, mod to good ind
Dol zones 721-716
more sandy above 716 to 671
moll molds very abund above
726. forams throughout

Bryozoan 680-688
breaks at 726, 721, 716, 676, 671
excellent handground $\approx$ 676
phosphatized.

Package 3
671-654.9 Dolo, grngy, med-good ind
variable clay content
Anc
bioturb
phos clasts 656.7-654.9

Package 4
654.7-596 Ls & Dolo, lgt grngy to
grngy. mtrix often appears
dolomitized w/ algae unusual
few small frags or molds
Bryozoan 634± and above
few good breaks $\approx$ 618'
good break at 596

596-592.5± Phosphorite dk gry
to brngy, poor ind
carb/clay mtrix phos to 80%
sand sized to gravel
very little to no qtz sand.

592.5-588?? Clay med gry silt to v.f. sand
breaks into poker chips
grades into sandier, silty carb
& clay 591.3

6
Zone 591-588 looks very
unusual - due to drilling??

588-585 very interesting carb clasts, clayey
sand

588?? - 478 Carb (Dolo/Ls?)
w/ varying sand % and clay
phos varies from 1-2% to >20%
white to med grngy, med-good ind
X Bryozoans, algae small frags
in zones, all bioturb
grades into clay zone
v.f. sand & silt w/ phos $\rightarrow$ silty clay
then good clay
clay clasts upper 1.5'

478'-363' Carb (Dolo & Ls)
lgt gry to grngy, poor to good
ind, generally sandy, zones
of ss. phos to >15%
8
Top Anc
small molds & frags, forams
algae, Bryoz. canals
no diacrusts

363-60 poor recovery

Clayey, sandy silt to clay
w/ carb in mtrix??
lgt to med gry poor ind to
unconsol

Very phos zone 354.5-4.2

363-247

clayey sands (uf) to silt to
sandy silty clays, poor to unconsol
mica

generally becomes sandier up
section with occasional thin
clays sand become coarser (to f-m)
up section coarse grains
appear around 292-3

unnamed
1

becomes more carb mtrix around
273

very coarse sand to pea gravel
273-247 some discoid gt;
pebbles in moll moldie
ss (beach rx?)
poor to unconsol

247-140 Ls to ss, brngy to lgt gry
poor to mod ind,
moll moldie to 242

sand content increases up section
sand f-m becoming more
coarse up section

discoid pebbles common above
232

cuttings 220-207 gravel
and sand - abnd discoid pebbles

unnamed
2

Sand contains abnd moll
fm $\approx 154-143$

moll moldie sandy Ls to ss
143-140 (Poor recov)

140- $\approx 52'$ Sand, lgt gry to brngy
unconsol to v. poor thund mica
f-m w/ coarse grains

few forams, minor moll frags
very poor recov 56-41
appears to grade into moll-moldie
calc mtrix ss at about 52'
varies to v sandy Ls

52-27 ss to Ls, lgt brngy
poor to mod, trace phos
very moll moldie
corals nodal

unnamed
Chapra

poor to unconsol 30-27
thin clayey carb

27-12.5 clayey carb, sandy
brngy to tan, poor to unconsol

12.5- ≈ 4 Ls cap rock, moll moldie
and oyster frags.

4 - Surf sail

Notes

Arcadia Fm / Haw Gp
T10 to 363

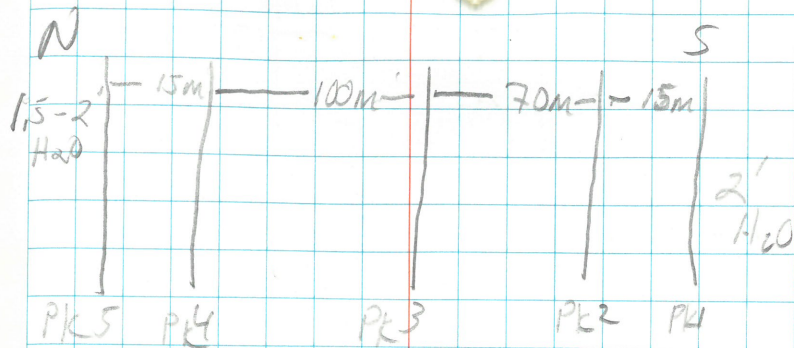
unnamed
363-52

Tamiami / Ochupex
52-27

Tamiami / Bucking Ham?
27-12.5

Tamiami cap rock
12.5-4
Sail 4-surf.

2/12/98 Pass Key Tranche
Hanley & me



PK 1, 2, 4, 5 pushed to refusal
at approx 4.5'

PK 3 push all the way into
sediment 6'

PK5 shell lag

PK4 firm mud w/ some shell

PK3 about transition b/w firmer mud
and gelatinous mud

PK2 gelatinous mud

PK1 firmer mud

Russell Key

Tuesday 2/14/98

NE

SW

1 - 50m - 2 - 50m - 3 - 50m - 4 - 75m - 5

1 shell lag/grass 1-1.5' 1/20

2 - mud/grass

3 - gelatinous mud

4 - very gelatinous mud

5 - shell lag in grass/mud 1.5' 40

all cores pushed 6'
no refusal

Slides taken 2/15/98

Keys Marine Lab w/ Lynn

Fujichrome 400 most of Roll shot on FB
1st photo

#29-31 ✓ Ruppia w/ root structure
Site 2

#32-37 ✓ Site 2 Ruppia - long piece

Kodak Elite 100 36 exp

#1-3 ✓ Syringodium, collected behind
KML

#4-6 ✓ unidentified dicot plant
from Trout Ck.

7-8 ✓ Site 20, floating, jagged
red textured algae, Sargassum sp

9-11 ✓ Pass Key Ruppia

12-13 ✓ Nest Key bottle brush algae (Green)
Batophora oerstedii

14-17 ✓ Polysiphonia sp. Nest Key

18-19 ✓ Sargassum sp. Nest Key
w/ berries

Date: 3/2/98 1:34:29 PM
From: Thomas Scott TAL
Subject: Mudbank transects
To: Lynn Brewster-Wingard

Afternoon, Dr. Brewster,

Here are the specifics on the transects of the mudbanks at Pass, Park and Russell Keys and at Shell Creek.

Pass Key (PK)

Transect runs approximately north to south. Two push cores were taken at each station. Number 5 is the northern end of transect, 1 is on the southern end.

core 1 taken in 2 ft of water. 15 m to #2 core
core 2 taken in less than 1 ft of water. 70 m to #3 core
core 3 taken in less than 1 ft of water. 100 m to #4 core
core 4 taken in less than 1 ft of water. 15 m to core #5.
core 5 taken in 1.5 to 2 ft of water.

200 m transect

cores 1, 2, 4, 5 pushed to refusal at approx. 4.5 ft. possibly to rock, felt hard.

core 3 pushed 6 ft into sediment.

core 1 taken in firmer mud
core 2 in gelatinous mud
core 3 at transition between gelatinous mud and firmer mud
core 4 in firmer mud with some shell
core 5 in a shell lag over firmer mud.

Park Key (PKK)

North to south transect with core 1 at the southern end and core 5 at the northern end. One core taken at each site.

core 1 taken in 1.5 ft of water. 54 m to core 2.
core 2 taken in less than 1 ft of water. 125 m to core 3.
core 3 taken in less than 1 ft of water. 80 m to core 4.
core 4 taken in less than 1 ft of water. 15 m to core 5
core 5 taken in 2 ft of water.

none of the cores hit hard bottom.

core 1 in grass with shelly mud
core 2 mud with some grass
core 3 soupy mud
core 4 shell lag on mud
core 5 at erosional cut on edge of bank with grass roots, mud with shell

transect 275 m.

Shell Creek (SC)

Cores taken in a roughly square pattern. One core at each site

1 _____ 18 m _____ 4

3

2 _____ 16 m _____ 5

m between 1-2, 4-5, 1-3, 2-3, 4-3, 5-3

core 3 taken in the middle of the channel, cores 1-2 taken west of the channel, cores 4-5 taken east of the channel. Line between 1-4 and

2-5 is oriented approximately SW-NE.

All cores pushed to refusal on hard substrate. Cores 1,2,4,5 pushed in mud with a fair amount of shell. Core 3 push in channell lag of shell with little to no mud.

Water depths

Cores 1 and 4 in 2.5 ft

Cores 2 and 5 in 3.0 ft

Core 3 in 4-4.5 ft

Russell Transect (RK)

Transect oriented NE-SW with core 1 at northeastern end and 5 at the southwestern end.

2 cores taken at each site.

Core 1 taken in 1-1.5 ft of water. 50 m to core 2.

core 2 taken in less than 1 ft of water. 50 m to core 3

core 3 taken in less than 1 ft of water. 50 m to core 4

core 4 taken in less than 1 ft of water. 75 m to core 5

core 5 taken in 1.5 ft of water

no cores hit refusal

Core 1 taken in shell lag and grass with mud

core 2 taken in mud with grass

core 3 taken in gelatinous mud

core 4 taken in soupy (very gelatinous) mud

core 5 taken in shell lag in grass with mud

Transect 225 m

Well, I hope things are going ok for you today and that you're getting time to work on the paper. I'll get the pictures and slides in the mail ASAP. I'm part way through the slides. Looking at the slides and pics brings back memories of a very enjoyable time with my FPFLIL&BB2.

Let me know when you get a proposal from Christie and Dr.J.

Take care M'Lady,

T

FPFLIL&BB2

thks4cnslnnglstnght

20-22 Laurencia Nest Key

22-24 Chondria sp Nest Key

Kodak 200° 24exp

Wendley Key toll

12-18 Laurencia 5 ✓

Kodak 200° 24exp

1-5 ✓ Halodule Site 12 #4

Fuji 800 18?-23 Strombus sp

23-28 Feathery "algae" FB 24

29-32 ~~by~~ Bryozoa FB 24

- 32 LYNN Jeff

Ektachrome 100

1-5 Bryozoa FB 24 ✓

6-8 Caulerpa Ashmeadii FB 23 ✓

9-11 Syringodium FB 23 ✓

12-15 Udotea FB 23 ✓

16-17 Caulerpa prolifera Bar off channels

18-20 Caulerpa lanuginosa " " 5

21-24 Hypnea? FB 24 ✓

Ektachrome 100 36exp

1-7 Syringodium FB 18 near shore

8-10 " roots etc " "

11-16 Nassarius "Fred" FB 26 RIP

17-20 Thalassia blades w/ stone mold
& Spinorbis FB 26

21-26 Halodule FB 26

27-30 unident algae FB 24

31-32 " " Bar off channels 5

33-37 Laurencia papillosa? Bar off channels

Fuji 400 24exp

1-3 Dictyota FB 23

4- Ulva FB 26

- 17 Halimeda opuntia FB 23

12-14 " incrassata FB 23

15-

3/27/98

W - 1753-4 ~~Collier Co~~
G-200 Palm Beach Co

TD 221-217.5 silty clay, abn grn, abnd
clatoms, interesting decalcified
filled w/ clay
sand increases upward grades into
vf silty clayey sand to very sandy
silty clay by 217.5

217.5-215.5 silty clayey sand to v. sandy silty
clay, vf-f sand, yell. grn.
upto 25% phos. phos gravel
around 217-216.5

215.5-212.5 clay, silty, abn grn to yell grn
some rectal forams
abnd phos sand w/ phos gravel
in clay mtrix around 214
thin sand strings, dolomitic?
from 214-212.5 clay w/ banous
filled with vf sand, phos.

212.5-175.5 sand, clayey silty, phos (to 15%)
vf-f sand, lgt gry to med gry unconsol
clay decreases upward to v. poor
Bio turb. few scattered forams
slight calc/dolo in mtrix

above 193 gets more coarse
to f w/ some vf
more calc/dolo lgt grn gry
% mtrix variable

Peace River Fm TD to 175.5
good PR. to 197.5 transitional
197.-175.5

175.5-136.66 sand, f vf-m, lgt gry
minor phos, unconsol to v. poor
moll frags. variable calc mtrix
thin zones of unconsol carb
w/ shell i sand moll mtrix
few coarser sand grains

1
136.66-101 sand, m, f-m, few coarse
unconsol, lgt gry phos 3-5
no shell. minor calc mtrix in
some zones
shell increases about 117
echinoid spines, barnacles, moll.

101-96 lost

96-78 ss to v. sandy ls, sand
m-c lgt gry mod ind
ls med gry mod ind
moll moldic w/ few foss frags
phos - 2-5%
grades upward into m-c
v. poorly consol to unconsol
sand

finer upward
78-71.2 sand, m-c, lgt gry
unconsol, carb mtr
foss frags phos 2-5%
sand becomes finer above
69-70. to f-m. w/ zones of
consol rx - ex. 74
- minor clay in burrows at top

71.2-68 sand, f-m, lgt gry, unconsol
clay/carb mtr, hard zones
or rextal clasts, many moll frags
<1% phos

68-59 sand, f-m, lgt gry, unconsol
to mod. ind, carb mtr, abund
moll frag, trace phos
piece of pecten that
suggests Pinecrest

f-m
59-46.5 sand, fine, unconsol
lgt gry, ~~fine~~ small moll frags
trace phos, minor carb mtr
shell content variable
hard ground 46.5

46.5-29.5 carb sand to gty sand, v. lgt gry,
unconsol - poor, f-vc carb grains
qty f-m
abund moll frags
mostly a carb sand

29.5-26.5 rubble of hard sandy
ls. w/ zone at 29-28.5 of
carb w/ sand & shell

26.5-20, sand, lgt gry, vf-f,
carb mtr, unconsol to poor
abund moll frags trace phos
rock frags near 20 (drilling
artifacts?)

20-7 ls, variably sandy brngry to
med gry very hard rextal, moll
moldic, fresh H₂O zone at 17.5

7-0 fill

PR TD - 175.5 ?

sand 175.5 96 ? ? unnamed ?

sand 175.5 96 - 59 Pinecrest ? *Teniamia*

sand 59 - 20 Caloos ?

LS 20.0 - 7 maybe Caloos / Bermat
i FT at top

Holey Sand Is 20 - 7??

Alligator Alley East

7/28/98

TD 201

201 - 170.5 Sand ^{mudgy to green grey} of of-f, silty
phos 1-5%, slightly clayer
unind, thin zone of
more carb mix, trace mica
barnacle frags and moll frags
above 191.5 scattered forams
few coarse well rounded grains
of gfs which become more
abund up hole
more coarse up hole of → f
Coarsening up hole sequence

PR
170.5 - 147 Clay, lgt grn grey, ^{to yellow grey} silty.
very minor sand, carbonate abund
in zones, more clay in others
unind to poor, minor mica
zones of abund diatoms
other zones w/ abund forams
minor foss. frags
grades up ward into less
carb clay to good clay
above approx 157
sand filled burrows near top

147-128 sand, med gry, vf, vf-f
clay mtrx, calc phos 10-20%
(sand and gravel), foss frags
few in clayey part becoming
more abund uphole as clay
decreases & carb increases
Barnacles, moll.
zones of unconsl vf sand
appears to grade into Oolite

upper PR

128-79 very sandy ls to calc cont qtz
sandstone, white to v. lgt gry
Ls, poor to med ind, sand to 50%
SS w/ 40% mtrx
<1% phos, abund moll molds
SS poor to med ind calc mtrx to 50%
<1% phos, abund moll molds
very poor recovery

Oolite

79-69 Ls, lgt gry, unconsl
sand, trace phos, abund moll
frags, minor clay content

laminar clay

69-57 Clay, lgt gm gry, unconsl
silty, sandy. few foss. frags
calc in mtrx

57-55 Sand lgt brn gry unconsl
vf-f mica minor carb

55-52 very sandy clay to claygy sand
w/ calc in mtrx

52-47 vf sand very poor recovery

47-7 sand lgt gry ^{to yell. brn} unconsl
vf-f, calc mtrx, some moll frags
other unident. foss frags. and forams
zone at 39' w/ abund moll w/
Barnacles
some phos present

7-3.5 Sand, poor coal, cream
to white w/ ke stain abund
moll frags more ind. upward
carb mtrx increases upward.

3.5-0 Caprock, Ls, med gry to
orangish brn, good ind., sandy
moll frags.

Baker's Grade

TD 179

179-176 Sand lgt gry f-f-m
unconsol, trace phos

176-157 Sand as above w/ clay
mtx, scattered coarse g/f grains.
sand becomes finer above 170

157-144 Sand vP med grn gry, unconsol
3% to trace phos, clay mtrix
scattered very weathered
shell some carb in mtrix
silty, variable clay mtrix

144-120 Sand lgt gry to lgt grn gry
unconsol, vP-f 5% phos
becomes clayey upward
scattered coarse grains
Some zones very clayey

120-112.5 Clay dk gry to dk grn gry
thin sand/silt stringers
10+% phos in sand stringers
sand stringers thicker 116-114

112.5-101.5 Sand, vP, vP-f, silty
clayey, phos to 10%, carb in mtrix
above 108
shell frags appear around 106.5
scattered forams

101.5-87 Sand, white to lgt gry, vP, vP-f
to mod., carb mtrix, moll frags
forams phos to 3%
becomes moldic around 91±
than

poor
recov.

87-54± Sand, white-lgt gry, f-vP-m
unconsol to moderate, very
moldic (mod) scattered phos
~~thin~~ zones of sandy l/c

Ochre

54-40.75 LS, white to med gry,
unconsol to mod, sandy to
very sandy, moll moldic
more gray toward top

40.75-26± Silt, grn gry, unconsol
clayey, calc, sandy, forams
varies to silty calc clay
thin zones of vP sand &
" " " calc clay
few moll frags

26± - 2 Sand, lt gray to white, unconsolidated
to poor, vf, vf-f, calc mtrix
few small frags
near to few beds of sandy
ls v. poor consol.
rubbly zones at 13.5 & 11

10/30/98
Windmill Rd W 17 764

TD 151

151 - 116.5 Sand, f, vf-f, grn gray to lt olv
gray, unconsolidated, silt, clay mtrix, phos 1-7
weathered shell common below 143'
thin laminae disrupted by bioturb
variable clay content
few scattered well rounded coarse
grains

PR 2 undisturbed?
116.5 - 108.25 clay, olv. gray, unconsolidated to poor
silt, sand & phos in sand 1-3, thin
layers of vf sand/silt. some bioturb

PR 2
108.25 - 101 Sand, f, vf-f, unconsolidated
med gray to olv gray, phos to 10%
clay zones becoming less common
upward

101 - 81.5 Sand, f, vf-f, med gray
unconsolidated to
poor, phos 10-15, weathered
shell, carb mtrix, bioturb
carb content increases up.

Tentative
81.5 - 79? Sand, f, vf-f, lt gray, poor
to unconsolidated, phos 5-7, mill molds
poor recovery

Ochopee

79? - 46.5 Ls, lgt gry, unconsol to
good ind, soft zones (sand?)
washed out, moll-moldic
echinoid frags
sand content highly variable
varies to calc cont sandstone
poorly ind above 60'
very weathered top of Ls
46.5

46.5 - 21.5 Sand, m, m-c, unconsol
lgt gry to gry, minor clay
in thin layers below 38'
shell frags, phos - 1-2%

21.5 - 0 Sand, f, f-m, unconsol
lgt gry to med brown gry
organic above 14'

151 - 81.5 PR 101 - 81.5 maybe unconsol

81.5 - 46.5 Tami Ochopee

46.5 - 0 undif sand

11/17/98 w/ Hawley

Prison #1

TD 151

151 - 97.5 Sand, med olive gry,
vf, vf-f, clayey, unconsol,
phos 3%, mica 1%, moll frags
weathered shell,
bioturb. w/ some coarser sand
in burrows. clay content variable

97.5 - 83.5 Clay, gungry, unconsol
silty, phos trace, diatoms
variable vf sand. becomes
sander upward, bioturb.

Peace River Fm

83.5 - 80.5 Sand, med gry gungry, vf-f
unconsol, foss. frags, clayey, phos 10%
few moll frags, clay decreases upward
carb content increases upward
grades into oolitic

80.5 - 55.5 Sand, lgt gry med gry,
unconsol, carb mtrx, phos 10%
forams, moll,

Ochopee

55.5 - 35 Ls, grainstone, lgt gry to white, good ind, sand 40% phos 1% moll molds, echinoids, sand is med to coarse in many zones.

35 - 32 Ls, brn gry; lgt gry, unconsol to v. poor ind., very little sand, abund moll frags.

32 - 24 Sand, lgt brn gry, brn gry unconsol, clay & carb mtrix sand varies from fine to med

24 - 22 Sand as ~~above~~ 32-24 but coarse

22 - 17 lat

17 - 14 sand, lgt brn gry to lgt gry unconsol to v. poor, calc mtrix clayey, sand f to c, phos 1% some shell frags

14 - 12 Clay, lgt grn gry, unconsol thin sand zones, shell frags carb rich zones.

12 - 0 Sand lgt brn to tan unconsol f- f-m, organics

Peace Rv 151 - 55.5

Ochopee 55.5 - 32

Undip 32 - 0

Prison #2 3/11/99

Q cool

TD 181

181-119 Sand, med grn gry to lgt
yell gry, vf vf-f, poor med to
unind, 1-3% phos, no fossils
bioturb, clay variable, silty
trace-1% mica, few scattered
coarse well rounded qtz grains
some burrows filled w/ relatively
clean qtz sand. Clay content
varies from 25% to 50%
Few zones of sandy clay
gradational contact

119-91 Sand, lgt grn gry to
lgt yell gry, vf, vf-f, unconsol.
to v. poor med, phos 1-5%,
much less clay, carb appears in
mtrx scattered moll frags
increasing upward, trace mica
bioturb. more carb mtrx up

91-64 Sand, lgt gry to white
f, vf-m med ind to poor, carb mtrx
abund moll molds, coral
phos 1-4%, poor recovery Trace
mica

few zones of sandy ls
sharp contact

64-48.25 Clay, olv. grn, poor consol
sand to >50% in zones, phos to 10%
silty, forams, few shell frags
ls chunks at top maybe cavings
zones of silty clay interbedded
w/ silty sandy clay and clayey silty
sand. trace mica

48.25-34 Sand, grn gry to lgt gry
poor med to unind, vf, vf-f,
minor clay mtrx, carb mtrx
less clay up, phos 1-3% trace mica
shell frags appear around 43'
forams carb mtrx increases
around 36' w/ few zones of
very sandy, unconsol ls w/
abund moll frags
gradational

34-

34-16 Ls, lgt gry, white, poor med
sand 30% (variable) phos trace-1%
moll molds abund.
some more indurated zones

sand at 28' prob. cavings
some large oysters
sharp contact

16-0 sand, lgt gray to brn blk
f, vf-f, unconsol, zones of
organics & org rich sand.

TD-91 PP 119-91 questionable

91-34 Tamiami
good " Carb sand 91-64
T. clay? 64-48.25
T. sand? 48.25-34
Calcs 34-16
Undil 16-0

Mustang Grade 3/11/99 ^{or warm} spring!!

TD 221'

221-201 Sand, lgt gray lgt brn gray
f, vf-f, unconsol, phos 1-3%
sharp contact

201-173 Sand, med olv gray
f, vf-f, unconsol to poor
clay mtrix (~~phos~~) phos 1-3% silty
clay content quite variable
becomes calc w/ very weathered
shell around 173

scattered
coarse
sand

Disturb

gradational

173-128.5 Sand, lgt olv gray to olv gray
vf, vf-f, scattered coarse sand
unconsol to poor, clay and carb
mtrix, phos to 5% weathered
well ~~fragmented~~ shell, quite
variable carb and clay content
Sample at 171 may be ~~the~~ cavings
(m-c sand w/ abundant frags.)
fines upward, shell content
variable Forams
sharp contact

Pearl River

128.5-106 Sand, white to lgt grn gry
mod ind to unconsol, small molds
worm tubes, echinoid frags
m, f-c sand, carb mtrix
phos 1-3% poor recovery.
Zones of very sandy ls

106-56.5 Sand, lgt gry to lgt grn gry
unconsol f, f-m, phos 1-3%
minor carb mtrix
coarse zone around 73.5
thin zone of coarse sand w/ fossil frags
66' very poor recovery

56.5-20 Sand, lgt grn gry to med
gry, f, f-m w/ scattered coarse
unconsol, minor mtrix (carb?)
fine fossil frags - moll
forams, slightly clayey phos 5%
few very clayey zones - clays
are very sandy to slightly sandy
w/ blue grn to reddish brn color
some oyster shell

20-12 Sand, org gry to lgt dv gry
f, v f-f, poor consol to unconsol
carb and clay mtrix, moll frags
few forams phos 1-2%

zone of abund oysters (*Hyolosa*?)
barnacles (large) 14-16'
gradational contact

12-4.5 Lime mud w/ upto 50% sand.
few sand beds. fine fossil debris
white to org gry, poor to unconsol
sand is f-vf
upper part has hard ls clasts

4.5-0 Sand, brn gry to med gry
f, v f-f, poor to unconsol, clay mtrix
Org mtrix, roots, oxidized zones

PR TD - 128.5

Tamiami 128.5 - 12(?)

Ochopee 128.5 - 106

Tamiami 106 - 56.5

Buckingham 56.5 - 20

Pinecrest? 20 - 12

undif 12 - 0

Alaska Photos 6/5-20, 1989

Roll 1 Fujifilm Superia 400

1 Flight into Anchorage over
2 Kenai Pen w/ glaciers

9-10 pm

19 Flight to Fairbanks

11:30 12 am
pm

Roll 2 Fujifilm 800

Over Denali

Chena Rv Trip

Roll 3 Fuji 400

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20
- 21
- 22
- 23
- 24
- 25

Chana Rv

TANANA Rv

Paddlewheel boat



Roll 4 Fuji 400

- 1
- 2
- 3
- 4
- 5
- 6
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- 13
- 14
- 15
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- 17
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- 19
- 20
- 21
- 22
- 23
- 24
- 25

Ester Gold Champ

Way to Ft Knox

recovered

Train trip



~~Roll 4 Fuji 400~~

Roll 1 slides Fuji 400
all at FT Knox

Roll 2 Seely Fuji 400
all at FT Knox

Roll 3 Seely Fuji 400
Train

Roll 4 Antelope

Roll 5 chena : ~~Antelope~~

Roll 6 Penak

Roll 7 Exit Glacier

8 Moose

Roll ^{Real} 5 Fuji 400

1
2 FT Knox

3

4

5

6

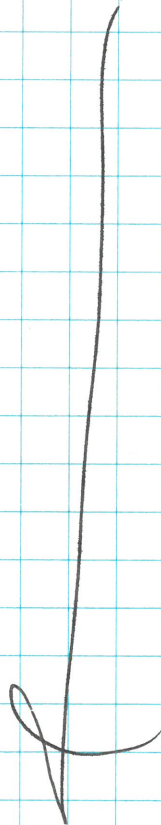
7

8

9

10

~~Antelope~~ chena



I
Chena
&
Antar

6) Denali & vtr 1340

7 " " "

8 " " "
880

1-14

15-24 Denali Hwy

9- Denali Hwy

10- " "

11 Kenai to Anchorage then
to Portage Glacier

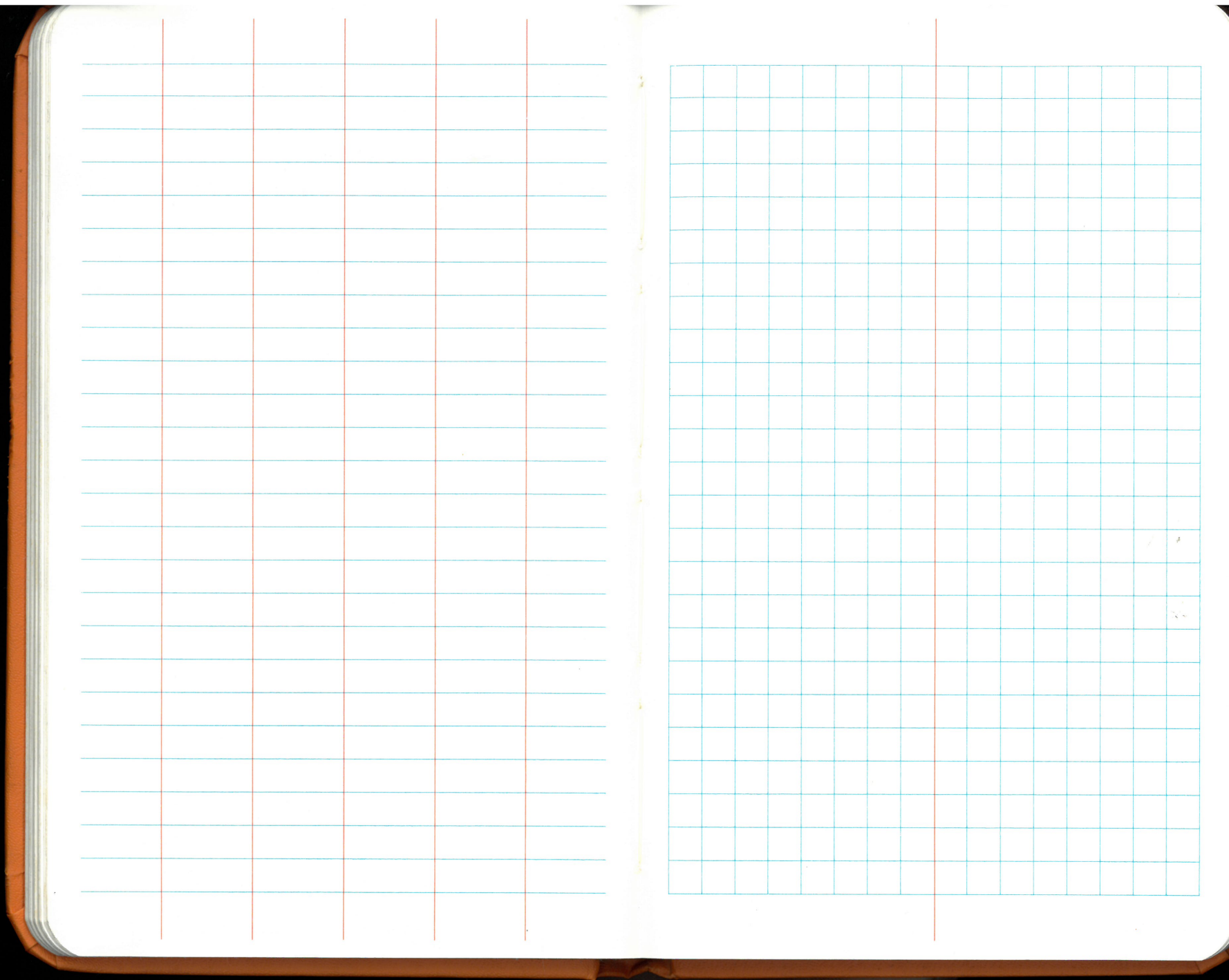
12 Portage to Seward

13 Seward Cruise

14-17/Chena Fjords Trip

18 Kenai & Seward

19-21 Seward, Exit Glacier &
trip to Anchorage





**ENGINEERS'
FIELD BOOK
No. S400V**
