

MOBILE DRILL
LOG # 9



Ben Meadows

1-800-241-5401

LEVEL BOOK

#101596

17734
BURSF 7

17740
BURSF 6

17741
BURSF 3

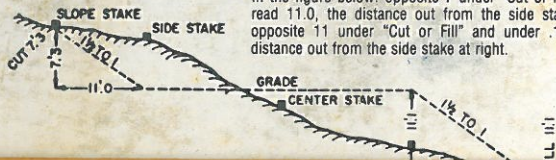
17743
BURSF 6

17744
BURSF 1

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

Roadway of any Width. Side Slopes $1\frac{1}{2}$ to 1.

In the figure below: opposite 7 under "Cut or Fill" and under .3 read 11.0, the distance out from the side stake at left. Also, opposite 11 under "Cut or Fill" and under .1 read 16.7, the distance out from the side stake at right.



Cut or Fill

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Cut or Fill

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page -
office

Robin H. 491 3739
(352) 955 2442

"CALL SUNSHINE" (800) 432-4770

The paper in this book is made of 50% high grade rag stock with a WATER RESISTING surface sizing.

17734
BulRF 7

17740
BulRF 6

17741

17743

17744

17745

[illegible]

800
Atlantic Drilling - Riv. Bch 535-7384
Mobile Drill (317) 781-6371
Toney Drilling (800) 432-6193
LARRY Atlantic Drilling (800) 752-9416
ENVIRONMENTAL MFG. (850) 624-0005
(800) 624 0005
FAX A LOCATE (800) 626-4097 phone
(407) 826-9063 Fax
Christensen - Boyles (800) 463-8418
Jim Thindell FGS cell (305) 815-7708
home (850) 926-8735
Tom Scott 580-4882
Jody Lee SURWMD (904) 329-4812
Don Boniol " (904) 329-4188
USGS Miami (1305) 526-2895
SRWMD (800) 226-1066
SUFWMD (800) 226 1066
Randy Chambers (352) 491-7445 Agr.
(352) 538 - 9463 mbl.
Lee Barth Dep. site inv. (850) 508 - 9897 mbl.
Carole Milliman SAUMD (561) 687-6764
Ken Campbell FGS cell (850) 933-2245
pers. cell (850) 545-8073
" " (850) 545-8125

Sonitrol, Urhse. 4631-56, enter, off.

Home #'s

Ken. 668-4437
 Jennifer 671-2659
 Craig 878-0123
 Harley 668-2361
 Rick Green 562-3780
 Frank 922-0981
 Spencer 422-3603

Tony Morrell (LK. Kissimmee St. Pl.)
 George Agrigg (941) 696-1112
 Riverwoods, SPUMD, Highlands Co.
 Barbara Welch (Sb) 624-6900
 Jgr. 885 3165

Jim Bridgeman (Sb) 625-5114
 Carlos De la Rosa (941) 467-3670

NWFWMD 4765 Pelt
 Marianna 482 9522

(999) 413

Contents

hole #	well depth	well name	County	page
234	17734/65	BURSE #7 18.5' MW	SR	1
235	17740/59.5'	BURSE site 6	SR	6
236	17741/49'	Pl. wash. site 3	WL	11
237	17743/61.5 ^{NO well}	Pl. wash. site 6	WL	16
238	17744/48 ^{31' MW}	Pl. wash. site 1	WL	20
239	17745/44	Pl. wash. site 4 28.2' MW	WL	24
240	17753/50	Austin Cary 26' MW	AL	29
241	17633	Joe Budd REPL well	GD	32
242	17804/53.5	Kirby site	AL	34
243	Tall Timber 17812/69	TT Aug 2 No well	LN	39
244	17813/73.5	TT North 73' MW	LN	43
245	17816/82	Pl. Estok ^{Pl.} Estok	Hi	49
246	17817/94	C-17 Fire Tower	Hi	52
247	17820/78.5	MARL Pit	Hi	56
248	17821/88.5'	Highlands Hamack	Hi	60
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17734
 BURSE 7
 17740
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 BURSE 1

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W 17734

Blackwater River Site No. 7

Tam start. JRS, DJ, M.P.

Lat. 30°55'15" 86°50'22"

T 5n R 26w S 21

- 0-2.5 push core. brown sand.
organic at top.
- 2.5-5. push core. lighter, orange
sand getting lighter at bottom.
- 5-6.75 hit water @ ~4' sample
is coarse tan sand.
- 6.75-9.0 NO sample. (coarse sand)
- 9.0-11.5 coarse clayey sand. orange.
- 11.5-13.0 Sp. Spn. Bad recov. coarse
sand. Go in again w/
core catcher
- 13.0-14.0 NO sample. pumped sample.
pinkish purple coarse sand.
- 14.0-16.5 no recov. pump. sample.
same.
- 16.5-18 no recov. pump sample.
pump to 20.5. ~~push~~
light orange coarse sand.
Some clay blebs.

17734
BulRF 7

17740
BulRF 6

17741
BulRF 3

17743
BulRF 6

17744
BulRF 1

~~20.5~~ 23 NO sample. NO recov.

23.0 - ~~25.5~~ very little recov. orange
coarse sand.

~~25.5~~ 28 good recov. into clay.
pinkish orange clay

28 - 29.0 sp. spn. same material.

29.0 - 31.0 clay yellowish tan clay,
good recov.

31.0 - 32.0 pink + grey mottled clay.

32. 34.0 sp. spn. same material.
lost top half.

34.0 - 36.0 lt grey + iron stained
mottled clay.

36.0 - 38.0 lt grey and lt. purple mottled
clay.

End Day @ 7 pm.

7:30 am start.

38 - 39.0 Originally sp. spn but
did not seal off well
to tubing. same material

39.0 41.5 sp. spn. poor less than
50% recov. (??)

17745
Pt. Wash. 4

17740
Bulwer 6

17741
Pt. Wash. 3

743
Wash. 6

17744
Pt. Wash. 1

- 41.5 - 43.5 lt grey + lt. purple mottled clay.
- 43.5 - 44.5 poor recn. Back into sand. med-coarse (orange)
- 44.5 - 47.0 good recn. back into mottled lt purple + lt grey. w/ some small sand lenses.
- 47.0 - 49.5 clayey sand. buff, orange and some pinkish purple.
- 49.5 - 51.0 sp. spn. buff - lt. orange clayey sand.
- 51.0 - 53.0 orange clayey sand.
- 53.0 - 55.0 orange clayey sand. clay content has inc'd.
- 55.0 - 56.5 sp. spn. Did not seal. same orange - lt. orange clayey sand w/ mica.
- 56.5 - 59.0 lt. orange + greyish buff mottled clayey sand. w/ mica.
- 59.0 - 61.5 lt. grey and iron stained clay w/ mica.
- 61.5 - 64.0 same only lighter.

Pl. Wash. 4 17745
BURST 6 17740
Pl. Wash. 3 17741
Wash. 6 17743
Pl. Wash. 1 17744

40-45.0 Same. T.T.

pull auger.

grout from 65-30 2 bags.

Cro in w/ 65/8 to 19'

Set well 5' screen, 15' casing
No tail pipe.

pull Augers. Sand collapses
to ~4'

Develop. Water is plum.
colored. pumps ~20 gpm.

- cleaned up within 20 minutes
close to clear only to cloud
right back up after surging.
pump and surge ... etc.

End Day @ 7pm.

Begin day at 7:30 am. JBS, DJ, MP.

Developing well and building up protective manhole cover.

pumping ~ 20 gpm.

puncture casing in screen intended drawing in sand.

set 2" inside 4".

Try and jet out sand infill to set 2", but filling in too fast.

filler pack sand to 7' w/ 1' bent. chip plug and remaining $\frac{1}{3}$ bag grout. Bring it up to within 3' of land surface. fill remainder w/ sand.

Well pumping a little slower now
gpm: - varies anywhere between
10 + 2.0 gpm.

Well depth -
water level

18' 18.5 to L.S.
3.5', 4.0 to L.S.

17740

30° 55.240"
86° 50.352"
Low pressure
GPS fix
use map #3

8-18-98 BWRSF #6

JBS, Bill Pollock

3:35 pm start from Tall.
arrive Milton ~ 7 pm.
End Day.

Location: T 5n R 27w S 14 SESW
Lat/Lon: (GPS reading does not match permit)

8-19-98 6:45 am start. Pick up rig,
trailer and arrive at site
8:15 am. Set up.

0-2.5 push core. black organic dirt
1st 6" then into clayey yellow
sand.

2.5-5.0 push core. dk. yellow and orange
mottled clay. Extremely tight.
* Could not get auger racks all the
way open because of tree → moved
back 1' and began on next
intervals.

5.0-7.5 dk. yellow and orange mottled
clay.

Sandy
zone.

- 7
- 7.5-9.0 Sp. Spn. Sample. dk. red-orange clayey dry sand.
- 9.0-11.5 dk yellow to orange clayey sand. Very tight-
- 11.5-14.0 lt. yellow to white med. grn. sand. w/clayey water.
- 14.0-16.5 white sand. - fine w/ clayey water. Have to pump bottom of hole clean.
- 16.5-19.0 tan-yellow med. grn sand. Plugs off in very clayey hard sand at bottom. (orange)
- 19.0-20.5 sp. spn. orange clayey sand.
- 20.5-23.0 orange clayey sand. getting back into pure clay at bottom.
- 23.0-24.5 gray + brick red mottled clay.
- 24.5-26.0 sp. spn. same material
- 26.0-28.0 grey + brick red mottled clay. some what expands in sampler.
- 28.0-29.5 brick red + grey mottled clay.

17745
Pt. Wash. 4
Austro. Lark
Pt. Wash. 3
17741
243
Pt. Wash. 6
17744
1

- 29.5-31.0 Sp. Spn. Same mottled
 31.0-33.0 Same brick red + grey
 mottled clay.
 33.0-34.5 brick red + grey mottled
 clay.
 34.5-36. Sp. Spn. same.
 36.0-38.0 lt. grey clay.
 38.0-39.5 same. Light grey.
 39.5-41.5 light grey clay, very
 dry.
 41.5-43.0 Sp. Spn. same.
 43.0-45 lt grey clayey sand.
 w/ some orange iron sm.
 45.0-47.5 same
 47.5-49.0 same.
 49.0-51.0 same
 51.0-52.5 buff - orange clayey sand
 52.5-53.0 same.
 53.0-54.5 ~~same~~ orange clayey
 sand, grey clay at
 bottom.
 54.5-57.0 same.
 57.0-59.5 grey clay w/
 iron
 stain.

(T.D.)

End Day 7:30 pm

17745
 Pt. Wash. 4

17753
 Austral. Lark

17741
 Pt. Wash. 3

743
 Wash. 6

17744
 Pt. Wash. 1

8" hole - 2.6 gal / ft

8-20-98 JBS, Bill Pollock. 6:45 st.
Clay cased in bottom of flights. To
pull augers to 35'. Pump bent.
grout in. (1 bag)
pull augers to 13'. Pump in 5 bags
neat cement to within .75' of
surface. Cover remaining .75' w/
cuttings.

Clean off augers → saturates
ground → rig gets stuck temp.
4wd working well but diff. to
get out of 4wd. (Hubs would
not unlock.) Drove truck down
dirt road several miles and
then was unable to disengage.

8-20-98 12:30 pm - drive to
site T to grout inner 2" to
surface.

Nashout filter pack + replace w/
neat cement.
Develop well some → well
is complete.

2:30 pm - drive and

load list.

split spn. tubing

box materials except dividers

cement (none left.)

3 bags bent. (3 remaining in truck.)

level. (level was lost?)

check oil in rig.

10
drop off rig at Grayton Beach
rec. area.

17741

PT WASHINGTON SE site #3
8-24-98 XL SM - 7AM start -
to spc the motorpool - went on
2943. brake controller repair. then
to WIND MARIANNA to pull
permits. to get to Boh River.
use you rig + trailer, fill
water tank, gas up + then
to site (3) set up

LAT 30°22'17" } 4 min avg.
LON 86°10'14" } (LWK002)
SEC 32 T 23 R 19W
WALTON CO
Elev ~ 17'

0-2.5' pink spl
2.5-4.0' ssp - SAND
drill in 1st auger + setup splr -
end day 8:15 pm

8-25-98 800A start
4.0-6.5' SAND
6.5-8.0 ssp - SAND. last ~ 3"
wet

17745
Pt. Wash. 4
17753
Austin River
Pt. Wash. 3
17741
1743
Wash. 6
17744
Pt. Wash. 1

need

safety latch for hook

Allen wrench

3/8 + 7/16" drill bit

Clorox

Rustolam primer

hd garbage bags

elec tape

tefl. tape

12

8-10.5' SAND - n 50% REC.

10.5-12.5' flap valve in place - n 50% REC

12.5-14' EXT splr 1" - sd, sl chy/org
matrix

14-15.5' ssp. NO recovery

15.5-18' bn sl cohesive sand -
organic matrix(?)

18-18.75' SAND - ssp. failed

18.75-20.5 bn sd or above - sucking
into HSA

20.5-22.5' drilled w/o splr - pumped
sample - SAND or above? w/o
organic matrix

22.5-24.5' H-bn sd - less org matrix
than previously

24.5-26' ssp. in core catcher
sample failed - only ~ 4" recovered

26'-28.5' pumped splr - 16 g bn sd
+ clayey sand - minor blebs clay

28.5-30.5 wa splr - softer penetr.
than previously sd than H.g.n
clayey sd

30.5-32' ssp dk bl. gn

chy sd - split spoon splr failed - poor REC

32-32.25' - pumped - btr of HSA

gn chy sd - coarse sd + clay blebs

17745
Pt. Wash. 4

17753
Austin Lake

17633
Los Buds Pt.

17743
Pt. Wash. 6

17744
Pt. Wash. 1

32.25 - 34' w/c spl dk gn dy sd¹³
34 - 36' hard slow penetration - easy
rotation 1st foot, then softer
- no recovery - bailed spl from
inside hsa - sand, w v dk
dk black matrix - almost black
water.

36 - 38 easy penetr + rot. no
recovery. 5' sed in hsa
sand - med - gran, w dk/gn soft clay
matrix - clay blebs are
push. litho in place

38 - 38.5' w/c sp - looks partially
washed

38.5 - 41.5 drilled w/o sampler -
pumped spl - cts sand w soft
clay matrix as above

41.5 - 44 SAME AS ABOVE

{ 44 - 46.75' ~~as above~~ less clay
{ 46.75 - 49.1' TD

finer + cleaner and more

Pull 3/4 hsa, looking - to
DESTIN to get supplies etc
8:30 end day

17745
Pt. Wash. 4

17753

17633

17743

17744

1

$$\begin{array}{r}
 28''6'' \\
 2''8'' \\
 \hline
 25.10
 \end{array}$$

$$\begin{array}{r}
 30.25 \\
 1.75 \\
 \hline
 28.5 \\
 2.67 \\
 \hline
 25.
 \end{array}$$

8-26-98

8 AM START - SCRUB WATER TANK,
load water + return to site

drillin 30' 6 3/8 ksa

well Assy

32" TAILPIPE + cap

5' SCN

22.5' CSG

30.25' Assy 1.75' stickup (tarp)

28.5' well depth from NAT grd

NATURAL fill to ~12'

3/4 bag bentonite chips washed
in 17-15' (bentonite bridged)

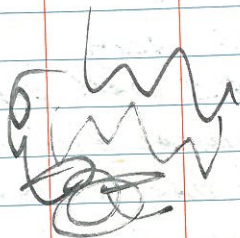
in ksa - pulled ksa's

NATURAL fill 15-7.5'

↑ pump 5 bags portland 7.5 -
still NOT to top

To DESTIN per move portland
end day 800 pm

pump + surge well ~ 4 hrs -
pumping ~ 6 gpm - NOT cleared
up yet.



8-27-98 8 AM START

STATIC W.L. 7.5' b.l.s

pump + add 1 bag portland
to surface + sackcrete for pad
set protective casing

pump + surge well - up to 90pm
now still cloudy - NE since
(didn't settle out quite)

2' 7" stickup (31")

left pump running - went to
2nd site then to GBSP

to install gimbal adapter

went back to site ~ 700pm

surged well + left pump running.

END day 800pm

8-28-98 8 AM start - return to
site 3 - water much improved
but still cloudy. ~~then~~
suction hose has collapsed
in csg opposite thick grout
section.

will need to cont. deep. later

Inventory on Rig

6.5 bags quick gravel
1 bag bentonite chips

8 2" x 10' CS9
1 2" x 10' SCN
1 2" x 5' CS9
3 2" x 2.5 CS9
1 2" x 2.5 SCN
4 2" 2" END CAPS
1 2" x 5' SCN
3 4" x 10 CS9
1 4" x 5 CS9
1 4" x 2.5 CS9
4 4" x 5' SCN
2M 4" END CAPS
1 4" x 10' SCN
1 6x6 prob CS9
1 manhole cover
1 4" x 2.5 SCN
1 4" washdown valve

First Hole with
Gumbo / Adaptor

B-28-98 W 17743

16

Pt. Wash. site 6 (Hwy 395)

SEC db 3 T 3S R 091 19W

LAT 30° 21.076 '091 19W

Lon 86° 08.182 '091 19W

Elev

0-2.5' push spl - sand

2.5-4.0 ssp push spl

4.0-6' w/spl

water table at ~ 5'

6-8' sand - NO recovery

8-8.5' bn clayey / organic sd

8.5-11' v soft - push easy

essentially no recovery

11-13.5' drilled w/o sampler

~ 6" sed in pipe - bailed to

14.5' - org rich clay, clay sand,

+ peat - abd. plant remains

14.5-17' sampler nose extended

max - early 750 + peat - full

recovery peat

17-19.5' ssp - peat / mud

19.5' - 21.25' - peat - v little

recovered - fibrous mat. push

plugged off splr nose

17745
Pt. Wash. 4

17753
Quinto Carr

17633
beBudd Rd

17743
Pt. Wash. 6

17744
Pt. Wash. 1

TO DO LIST

Rig tail/lift

remove str oil pump
fresh

service trailer brks + breg
miss cleanup/oz.

get bolts out of spreader
paint gimbal adapter
permits for Joe build
well

redo data valve bailer
safety latch on mast hoist hook
cable clamp on mast hoist
drill add hole for
driller platform

repl. feed bush

repl. wear plates

clean shoring rods

21.25 - 23.75' wu spe. - peat +
muck - 150 yd - poor recovery

23.75 -

End of day ~ 1:30 - mtn to
LH w rig + trailer

9-8-98 KC + Jim Trindell - leave full
~ 300 pm - waiting for truck to be
repaired - set up rig then
to motel ~ 7:30 pm
ending rig mileage 107260

9-9-98 7:30 AM start

23.75 - 25.25' ssp. - poor recovery
peat - fines at btm

25.25 - 27.75 - peat + sand

27.75 - 30.25' same - poor recovery

30.25 - 32.75 - soft - felt cohesive
when purging was clear - poor
recovery - felt like sand bucket
at btm - ~ 8" record - dk
br sd above more peat

32.75 - 33.5' pumped spe fine sd +
fibrous peat. cohesive when
in place

17745
Pt. Wash. 4

17753
Austin Cary

17633
Joe Budd Popl. Tedy

17744
Pt. Wash. 1

33.5-36' - no recovery - hsa clear¹⁸
36-38.5' - purged spc - hole is
stable dk bn sand w fibrous
organics -

38.5-41 sand w organics -
no sed in hsa when drilled w/o
sampler - pulled back &
bailed sample

41-43.5' same as above - uncured
+ bailed sample

43.5-46 - bailed sample - bn sd -
+ organics

46-48.5' purged spc - bn sd
w org. matrix - much crs
fibrous org.

48.5-51' run w/ splr -
dk bn cohesive organic rich
sand - clay content?

51-52.5' ssp. dk bn org rich sd
full recovery

52.5-55' bn black organic sand
sl. cohesive

55-57.5' black org. rich sd - cohesive

57.5-59' ssp. black org. rich sd

59-61.5' TD SAME

17745
Pt. Wash. 4

17753
Austro LAR

17633
6E Budd Popl. Treby

7804

17744
Pt. Wash. 1

TD' took after drive w 19
T. Countryman, called Sandra
Bennett verify her of abcl.

NATURAL fill to 20' pump
1 bag bent. grout (20%) to
10' NAT fill to 2'. 1 bag
bentonite chips to fill hole,
cuttings (packed) 2' to surface

move rig to site 1
ending mileage ~~107345~~ 107345
End day 7:30 pm

17745
Pt. Wash. 4
17753
Austin CAR
17633
66 Budd Popl. 1664
17804
17744
Pt. Wash. 1

Permit #
T 9801989

W 17744

20

Point Washington site 1

S 25 db T 25 R 26W
LAT 30° 23.088 5" 2 min Avg
Lon 86° 17.420 25" EPE ~ 40"
elev ~ 11'

9-10-98 KC, J. Trindell 7:30 A start

0-2.5' push static WL

2.5-4.0' push ~ 2.5 BLW

4.0-5.5' - WL spl sand

5.5-7.5' bailed spl - br gl. clay

7.5-8.5' bailed spl "

8.5-11. bailed - med bn sd

11-12.5 same

12.5-13.5 same

13.5-16' bailed med bn sd. dk
bn matrix

16-18.5' same - darker matrix

18.5-21' bailed above plus minor
organic fragments

21-23.5' bailed dk bn sd w org. frag.

23.5-26' bailed spl. dk or above
- sl. more organics

26-28.5' bailed spl dk bn sd w
organics as above

17745
Pt. Wash. 4
17753
Austro CAR
17633
66 Budd Popl. 166y
17804
17744
Pt. Wash. 1

28.5 - 31 - bailed spl. - dk bn
sd w organics - appear to be
increasing(?)

31 - 33.5' same

washed sed from btm (pulling in
- washed too far

33.5 - 36' bailed spl - same

36 - 38.5' b/same

38.5' - 41' spl hard to bail -

we splr wouldn't go in

- upper part of spl was bailed
the lower ~60% was pumped

41 - 44' pumped spl. bn sd w
organic content and blebs

44 - 48 - pumped spl - like stays open
blebs organic content and sand

48' TD

STATIC WL 34" BLS

Rig ending mileage 107458

end day 700 pm

17745
Pt. Wash. 4

17753
Austin Cary

17633
GeBudd Popl. Telly

7804

Brendwell Bay
REPAIR

9.11.98 KC-VT. 730 street²²
pn tenant - water,
drill in 33' 6 9/8 hsa
set 33' well casing -
~ 2' stickup
34" tp
5' scN
25' cs9

NATURAL fill td - 18'
1.5' bags bent to ground
18-45'
5 bags pollard 5'-pad
SET protective casing

STATIC WL 5.5' b-to-c
Well td 33' 4" f. to c,
30.5" stickup
well depth 30.9'
Ending rig mileage 107509
RTN to H 8:00 PM
SCREEN INT 23-28'

17745
Pt. Wash. 4
17753
Austro CARY
17633
66 Budd Popl. Treby
7804
Brackwell Bay
REPAIR

?

KEV -

WHEN WE MOVED THE RIG
IT WAS READING $\frac{1}{4}$ TANKS
WE PUT #22 IN IT & IT READ
FULL. IS THIS WORKING
PROPERLY?

9-14-98 CB-JT

23

LEFT TCH @ 3:30 AM. AERNE
PT. WASHINGTON 6:45 AM. GET
CAMP SITE. AND SCOUT OUT
NEW SITE.
END DAY 8:30 PM

9-15-98 CB-JT 7:15 START.

GO TO PT. WASHINGTON SITE #1
AND DEVELOP. STATIC WATER
LEVEL @ 3.0' BLS. DEVELOPED
ALL DAY. FILLED PUMP W/
FUEL AND LEFT TO RUN.
END DAY 7:00 PM

9-16-98 CB-JT 7:15 START

DROP TRAILER OFF AT PT.
WASHINGTON SITE #4. GO TO
PT. WASHINGTON SITE #1 TO P/U
PUMP & HOSES. PUMPING CLEAN
WATER. MOVE TO SITE #4. FILL
UP RIG ON WAY
SITE #7 PUMPING ~ 10 gpm

17745
Pt. Wash. 4

17753
Austro Cary

17633
66 Budd Popl. Treby

7804

Bracewell Bay
REPAIR

9-16-98 CB JT

24

POINT WASHINGTON SITE #4

S 55° NW T 3 S R 19W

Lat: 30° 21.178' N 11"

Lon: 126° 10.717' W 43"

ELEVATION: ~~1000~~ 39'

W17745

10:00 AM

0-2.5 PUSH 1.25' RECOVERY SAND

2.5-5.0 PUSH SAND-H₂O table @ 5'

5.0-7.5 SAND 1.5' of JUNK in hole
pump to 7.5'

7.5-9.0 SAMPLER - NO RECOVERY - PUMPED SAND

9.0-11.5 SAMPLER - NO RECOVERY

Bailed sample to 11.5' sucking
sand into hole.

11.5-12.0 NO SAMPLE

12.0-14.0 SAMPLER - sand - organic @
13.5'

14.0-16.5 - organic - 6" rec.

16.5-19.0 : Bailed organic rich sand

19.0-21.5 : Bailed - organic rich sand

Washed out to 21.5' settled back
OUT TO 21.5'

17745
Pt. Wash. 4

17753
Austro Cary

17633
66 Budd Popl. Tally

7804

Brandsell Bay
REPAIR

- 21.5-24.0 : bailed - sand-organic
- 24.0-26.5 : bailed - same
- 26.5-29.0 : bailed - same
- 29.0-31.5 : bailed - max
- 31.5-34.0 : bailed - same w/CLAY BLEBS
- 34.0-36.5 : bailed.

broken tape measure 2' off

36.5-39.0 : Bailed - ORGANIC SAND w/
OK SN CLAY BLEBS.

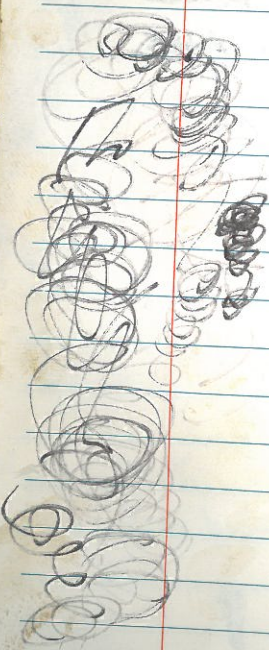
∴ MOVE PUMP & HOSES TO PT.
WASHINGTON #3 TO DEVELOP. FILLED
PUMP W/ GAS AND LEFT TO PUMP.
END DAY 6:45 PM

9:20:00 PM

17812
Tall Tim. Amb 2
17753
Austro Cary
17633
Loe Budd Popl. Tedy
17804
Brindwell Bay
REPAIR

NEED:

100' TAPE & WEIGHT.



26

9-17-98 OB-JT 7:15 AM START.

BACK TO PT. WASHINGTON SITE #3
TO PICK UP PUMP & HOSES. WATER
VERY DIRTY. DECIDED TO CONTINUE
TO DEVELOP SITE #3. PULLED A FAIR
AMT. OF SAND OUT OF WELL OVER
NIGHT.

12:00 pm

MOVE BACK TO SITE #4.

PUMP BACK DOWN TO 39.0

39.0-41.5: BAILED - POOR RECOVERY

PUMPED SAND & SAND W/ 10% WOOD FRAGS
41.5-44.0: BAILED - POOR RECOVERY

TRIED TO PUMP REMAINING SAMPLE.

LOST CIRCULATION. LOSING A₂O
THROUGH FORMATION.

44.0-46.0 GOT SAMPLER TO 50 IN.

DRILLED 2'. LOST SAMPLE AND
SUCKED 6' INTO HOLE, LOSING CIRCULATION
WHILE PUMPING AND GETTING NO
RECOVERY WITH SAKER. T.D.

17812
Tall Tim. Amb 2
17753
Austro Cary
17633
Loe Budd Popl. 125y
7804
Brundwell Bay
REPAIR

21
DRILLED IN 29' of 6 7/8" here.
END DAY 5:00 PM. EARLY DAY
DUE TO BAD WEATHER. HAD BEEN
RAINING ALL DAY.

9-18-98 CB-JT 7:45 AM START

SET 30.5' WELL ASSEMBLY

~ 2.5' STICKUP

3' TP

5' SCREEN

20' CASING

NATURAL FILL TO 15'

SCREEN INT. 21-26'

DEVELOP WELL. PUMPING ~12 gpm

FORMATION FILL TO 15'. 2 BAGS OF

PORTLAND CEMENT TO 5'. 5 BAGS OF CEMENT

FILL 5' TO GROUND AND PAD.

RIN TO T4H 6:00 PM

9-23-98 - CB back to complet. development
well depth 30' 7" - dr top of csg?

SWL 3' 10" GLW

csg stickup 29"

yield 149 gpm

30.5'
2.5'
28.0'
27.6

17812
Tall Tim. Aug 2
17753
Austro Cary
17633
66 Budd Popl. Treby
17804
Brendwell Bay
REPAIR

C-41A N O-~SB WDSC ?

NSB QSH

C-41A-S

28

43.5 TAP good QSH

Labelle new NO QSH
10545 ck sid Auger hole for pks:

9-90 O-~~~24~~23.5 WDSC
23.5 68' TMIN - Buckingham
68- TO "UNNAMED" SAND

17812
TJ/Tm. Aug 2
17753
Austro CAR
17633
6E Budd Repd. Tedy
17804
Brendwell Bay
REPAIR

17753

fix brass spacers

Lat 29° 44' 34.91082" N
 Lon 82° 12' 22.2865017" W
 T 9 S R 21 E SEC 4 IRR
 ELEV ~ 147'

17754

W

17753

29

9-29-98 AUSTIN CARY FOREST

CB & HM 7:00 AM Start

LEAVE TAL & ARENE IN @ FOREST

1:00 PM. PICK SITE, SET UP &
 START @ 2:00 PM

0-2.5 PUSH SAND w/ ORGANICS
 2.5-4.0 push SAND WATER @ 2.5
 4.0-6.5 push SAND
 6.5-8.0 push sand w/ some clay
 8.0-9.5 sampler - gray - br clayey sand
 9.5-11.0 sp. V.f. Sand yg.
 11.0-12.5 - V.f. gray sand
 12.5-14.5 V.f. gray sand
 14.5-16.0 SSP. same
 16.0-18.5 SAME - LAST 6"
 CLAYEY SAND. 3.5" or
 Sand in hole - bail -
 PUMP.
 18.5-21.0 CUTTER SAND BY
 1" REC.

21.0 -

17812
 Tall Tim. Amb 2
 17753
 Austin Cary
 17633
 Joe Budd Popl. Treby
 7804
 Brandwell Bay
 REPAIR

21.0-22.5 - SSP. SAME
 22.5-24.5 - SAME 8" REC
 24.5-27.0 - SAME MORE CLAY -
 SAME BLEBS

end day 7:45 pm

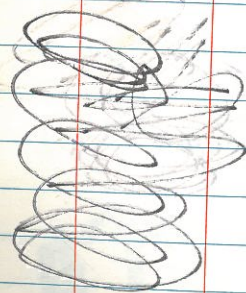
9:30-98 Hm - CB 7:30 am start
 RAIN - RAIN - RAIN

pump hole clear

27.0-29.0 - pump same - w/clay/blebs
 29.0-31.5 - NO sample - mushy
 31.5-34.5 - NO sample - mushy
 34.5-37.0 - sandy clay w/ phosphate
 37.0-38.5 - SSP. sandy clay w/ phosphate
 poor REC.
 38.5-40.0 - same - w/LS cobbles

40-41.25 - same w/ shell
 41.25-42.75 50% REC same but
 smaller

42.75-45.25 SP same
 45.25-47.25 SANDY CLAY w/ phosphate
 47.25-49.0 SAND w/ phos.
 49-50. same w/ LS



17812
 Tall Tim. Aug 2 Tall Timber N. Vot Budd Popl. Treby
 17813
 17633
 7804
 Brendwell Bay
 REPAIR

INSTALL 28' OF CASING

3' TP

5' SEN

20' CASING

FORMATION FILL TO 7'. BENTONITE
PLUG AND CEMENT.

END DAY @ 4:00 PM.

THUNDERSTORMS & HIGH WINDS.

10-1-98 7:30 AM Start

WATER LEVEL: 1.5' BELOW GS.

STICK UP: 24"

GPM: 2

3 BAGS of cement. put in
protective casing & develop
well. RTN TO TLT @ 6:30 PM

10-21-98 CB LEAVE TLT @ 7:00 AM

ARRIVING AT SITE @ 10:15 AM. WELL

PUMPING 2 gpm. SURGE & PUMP ...

17812
Tall Tim. Aug 2 Tall Timber N
17813
17633
Voe Budd Popl. 1264
7804
BRANDWELL Bay
REPAIR

10-13-92

Joe Budd well #2

32

replace well w low yield &
broken screen

static WC in old well 11' bcs
plan to set screen 23-28'

KC, CB, JBS 7AM start

set 33' well Assy - 5' sen,

3' tailpipe 25' csg

- set up w ~ 3' stickup

nat drill to 18' bcs

1 bag quick grout to ~ 11' bcs

pumped + surged ~ 1 hr - yield

~ 10 spm + clearing up

pump 6 bags portland ~ 1 to 11'

pump 2.5 bags portland to pad

original well - pump 1 bag quick
grout to 11'

pump 1 bag portland to ~ 6"
- cut csg 2 1/2' 1' bcs

17812

17813

17633

17804

Brandwell Bay
REPAIR

Tall Tim. Aug 2 Tall Timber N Joe Budd Pop. Treby

$$\begin{array}{r} 32' 8'' \\ 2' 10'' \\ \hline 29' 10'' \end{array}$$

$$\begin{array}{r} 32' 8'' \\ 2' 10'' \\ \hline 29' 10'' \end{array}$$

well to 32' 8" (toc) 29' 10"
 stickup 2' 10"
 SWL 13' 8" (TOC)
 210
 10.8

33

17812
 17813
 17816
 17804
 Kieby
 Brendwell Bay
 REPAIR

12-14-98

34

KL - VBS, CB to Alachua
Co - Kirby site

N# 17804

SEC 4 T 8S R 19E NW, NW, NE

LAT 29° 49.42' N 25" NE, NW, NE

LONG 82° 24.57' W 34"

Elev ~170'

0-2.5' push - greenish gray to br sd

2.5-4' ssp gn + Hbn sd

4-6 wL ssp bn sand

6-8.5 wL ssp sWL ~ 7.75' GLS

8.5-10' ssp dk bn clayey sd

10-11.75' blk, dk bn sd thin

from Hbn clay sd

11.75-13.5' SAME

13.5-15.0 ssp.

15.0-17.5' - wL SAME - test 3-4'
softer

17.5-20.0 ~~same~~ CREAM clayey sd.

20-21.5' ssp - HARD penetrative SAME
- test 3-4" softer

21.5-24 - SAME as Above to 23.5'

23.5-24 - Hbn sl. clay sd - phosphatic?

24-26.5' top slushy as above

17812
Tall Tim. Aug 2 Tall Timber N to pond Rk

17813
Kirby

17816
Brendwell Bay
REPAIR

Pu

Silicone sealant
magic markers
5/16 bolts
saw
PVC saw blades

44.5'
2.5'
42.0'

expanded sample
section

thin fine - blue 6" dk gy
phosphatic sd, sl. clay,
sucked into hsa

- pump (and) of water -
the pump won't run - setting
3.5 hrs pump to pump hsa clear
26.5-28' ssp red gy phos
clayey sd

28-29.5' - we are 76" - 6" - 6" of
hole should 28.5-29'
END day - clear up site
6:00 pm

12-15-98 800 A start

29-31' 2' Run bn + orange plastic clay

31-32.5' ssp - grey + bn clay

32.5-34' ssp

34-35.25

35.25-37' 1' gy + yl. or sdy
phosphatic clay

37-38.5' ssp

38.5-40.25'

40.25-42' as above until blue 6"
rubby then redural

42-43' grey gy rubby - phos? dolo?
pbw etc clay

17812
Toll Free, Amb 2 Toll Free N to 10000 Rk
17813
17816
17817
117 Fire Taxi.
REPAIR
Brandsell Bay

43-44' several runs - hard rubble
 clay - extended opt. section
 would feed up splr.

44 - 44.75' - several runs -
 rubble - phos sdy ls, + much
 carbonate mud in clay - + slow
 drilling + high feed pressure
 ? how much of mud did we
 make drilling?

44.75 - 45' - the "hard" -
~~change over to 45'~~

45-45.8'

45-47' W2 core - soft stuff on
 above + fd ls.

47

soft - plugged off

W2 core to 535' TD in blue
 sdy clay

prop 3 bags quick grant to
12' bws

Natural fill 17-12'

cuttings to 15.

37

17812
17813
17814
17817
Tall Tim. Aug 2 Tall Timber N Tokpaga Rk
17 Fire Tow.
Brendwell Bay
REPAIR

1-13-99

800AM start 38

KC + CB retu to Bradwell Bay
to repair damaged well

- FOREST SERVICE HAS ADDED ~2'
fill + damaged prot. csq,
pad + casing. - well csq.
punctured at bottom of protective
casing.

- Dug down to pad level, removed
damaged pad, cut off casing
below damage.

Added long coupling (glued)
(Above WL + grt water level)
and new casing (~6')

back filled + compacted fill in
dug hole - used 8" PVC on
prod temp. csq.

Pumped 3.5 bags portland
to grout upper segment of csq,
+ set prot. csq + pad.

constructed 3'x3'x6" pad
Pumped well to remove sediment

NEW TD 42'05" (TOC)

stickup 30.5"

SWL 8.5' 6 TOC

retu TLH 600 PM

17812
Tall Tim. Amb 2 Tall Timber N Tokpaga Pt
17813
7816
17817
17 Fire Tow.
Bradwell Bay
REPAIR

W-17812 —

39

1-25-99 KL+CB to
Tall Timbers Ambient
site - 130 pm start
load up, gas up etc then
to site

change over rig to girnal

Tall Timbers Shallow Ambient #2

SEC 10 IR, T3N, R 1E

LAT 30°40'22" Lon

Elev ~~125~~ 125 84°13'01"

0-2.5' push spl - dk brn/blk sand
~ 2' recovery

2.5-5.0' push spl - upper 6"
or above remainder grd to brn
clayey sand

5.0-7.5' push ssp - 2 1/2" tube
full recovery but loose in tube -
retained as normal spl - ^{had core} _{catching}

7.5-8.3.75 ssp - tan clayey sand
full recovery

8.75-11.25' tan clayey sand with
blebs of carb. ss

end day

17812
Tall Tim. Amb 2 Tall Timbers N to page 17
17813
17816
17817
17820
17 Fire Tool. MAR PJT

1-26-99 JBS, CB 8.00am

11.25-13.75 white sand. tight.

13.75-16.25 Split spoon. white sand. good recov.

16.25-18.75 Top is white sand w/ clay increasing down, some iron-staining.

18.75-21.25 ~~Split spoon~~ Dry white-gray clayey sand some iron stain. Tight.

21.25-23.75 Split spoon. greyish white + orange mottled clayey sand. 50% recov.

23.75-26.25 Lt. greyish white sand. spots of iron stain.

26.25-28.75 Lt. gray very fine sand

28.75-31.25 Split spoon Lt. gray very fine (silty) sand water @ 29'. Good recov.

17821 Hillbuck Hwy. Tall Timber N Tokpaga Pt
17813
17816
17817
17820
177 Fire Tower. IAL Pt

31.25-33.75 2' of recovery grey + red
mottled silty-clayey sand

33.75-36.25 2' of recovery AS ABOVE

36.25-39.75 split spoon good recover.
as above

38.75-41.5 good recovery - grey/RO
UF-silty sand

41.5-44.0 AS ABOVE w/ some clay

44.0-46.5 sp. spoon AS ABOVE good
recovery

46.5-48.75 light gray sandy clay ~~etc~~
mottled w/ orange.

48.75-51.5 Dry lt. gray sandy clay
w/ some iron-staining
Sampler stuck - bowed?

51.5-54.0 SSP. grey mottled clay
sand 2' of Rec.

54.0-56.5 - AS ABOVE

56.5-59.0 UF sand gray w/ clay blebs
mottled

59-61.5 light gray very fine sand.
split spoon.

61.5-64 light gray to green clay.
(plastic towards bottom of int.)

64-66.5 clay sand light gray-green

17821
17813
17816
17817
17820
Hobart Hwy. Tall Timber N to p.p. Rk 17 Fire Tower. Marl P, T

66.5- 69. V. lt. green + white + orange
mottled clay. Good recovery

69' TD

Abandon hole

pull HSA's - NATURAL
fill to -12'

1 ~~bag~~ bag bentonite grout 84-12'

1 bag portland to ~ -1'

cuttings on top of that

move to Tall timber ^{North} ~~Arctic~~ ₃
site

17821
17813
17816
17817
17820
Hickory Run
Tall Timber N Tokpaq Pt
17 Fire Tower. 1961 P. 1

1-27-99

43

Tall timbers North (Aurb #3)

SW # 17813

Sec 265 T 3N R 1E

LAT 30°40'42"

Lon 80°13'23"

Elev 180'

0-2.5' push-mottled clay sd

2.5-5.0 push same

5.0-6.5' ssp pushed - 2.5' new
same - ssp failed -
base in tube

6.5-8.5' ssp spl mottled red or +
cream clayey sd

8.5-11' brk red clay sd - mottled orange
+ cream

11-13.5 same

13.5-16' ssp spl brk red, cream + orange clay

16-18.5' brk red, cream + or clay, oxidized
sand layer at ~ 17.5-18'

18.5-21' or + cream clay + clay sd

21-23.5' ssp - org clay sd +
red + cream mottled clay

23.5-26' or + red clay sd

17821
Willard Hwy
Tall Timbers N
17813
7816
17817
17 Fire Tower, N. 1781 P, 17
7820

2" well matl.
core divider
core box liners
large blocks
6 $\frac{5}{8}$ T plug
1 2.5x 6 $\frac{5}{8}$ Tailoc

* part of hydraulic
pump

26-28.5' reddish orange clay sd ⁴⁴
28.5-31 ssp or lt or sd +
clay sd

31-33.5' v lt orange sand +
clay sd

33.5-36' cream + lt or mottled
sand + clay sd - water table
in this sample

36-38.5' ssp sand or above +
clay sd
END day

1/28/99 CB JS OH KC
START 7:00 AM

28.5-41.0 cream/REO mottled sandy
clay

41.0-43.5 grey/REO mottled sandy
clay

43.5-46' ssp

46-48.5' lt greenish grey silty clay? (lost
6" oxidized orange-mottled)

48.5-51.5' lt or sand - unconsolidated

51-53.5' ssp

53.5-56' orange sl clay sd

56-58.5 orange sd or above (at 6"
thru lt gy clay sd (does it?))
orange again at base

Rig Maint.

oil leak - 1 side engine

exh. leak - LS manifold/t.p.

58.5-61' ssp SAME

61-63.5 grey sh. ch. sand, ^{some} mottled

63.5-66 lt. grey sd. sl. phosphatic?

66-68.5' ssp

68.5-71 lt. y. gy. & sand

71-73.5' TD sand or above - ^{bailed} ~~put~~ sample.

SET 2" well arm

3' TP

5' SEN

CSG to surface

to see if can make viable well in 63.5-70' range

As per Thompson instr.

15' to top of well csg (temp.) - 2' sticking

screen 65-70'

develop using 1 1/4" bailer -

putting & fine sand. water clears up when purged with whale 5 (~19pm)

- tried to flush out well. ^{litter} ~~then~~ sediment around sen instead
worked in 3 bags 20-30 sand

46
Along w/ the sand to 58'
continued surging & pumping
w/ bailer - draws down ~ 12'
even w/ 1'4" x 6" bailer

end day 6:30 pm

1-29-99 Kc, CB
Kc 730 start

STATIC WL 35.6' BLS
.8' sediment in well
surf outside CSG 34.6'
sediment filled in to 53'6" tot HSA

pumped & surged - cyclis/proser
foot valve

pulled 15' HSA
pulled HSA's. NATURAL
fill to 32'
1 bag Quik graft 32-23'
9 bags neat cement 23' to
surface

2/1/99

KC CB

LEAVE FGS ~ 11:00 AM FOR
TALL TIMBERS, STATIC H₂O
LEVEL @ 35.5' BGS CEMENT
3.5' BGS. WELL PUMPING 2.5
GPM.

Flushed well w/ makeup water
to remove fines + remove csq
walls.

CONTINUE pumping + surging well
still pulling sand and fines

3.25" from top of csq to
slange on manhole cover

48

Well TD 73.0'

SCREEN 65-70'

STATIC WL 35.5' bgs

filter sand + formation sand

32 - TD

Bentonite Grout 23 - 32

NEAT CEMENT grout -1 - 23

2" diameter

manhole cover

top of csg ~ 65

~ .25' below top of manhole cover

17821
Hobbs Ave. Ranch
17823
Back Island
17816
Isleport Rd
17817
177 Fire Tower. Marl Pt
7820

LAKE ISTAPOGA

T 35S R 30E S 12
 LAT 27° 26.509' (31")
 LON 81° 17.293' (178")
 Elev ~40'

BRING PRESSURE WASHER
 RAGS
 STAPLES

W17816 LAKE ISTAPOGA

49

2-8-99

CB-MP 6:45 AM START

LEAVE TLH @ 6:45 AM. MEET
 VICKI AT ISTAPOGA PARK AT
 3:30 PM. GET SET UP, GET 1/2 O
 AND HEAD TO RIVERWOODS.
 END DAY @ 6:15 PM.

2-9-99

CD-MP 6:45 AM START

0-2.25 PUSH CORE - HEAVY ORG
 TO GREY SAND

2.25-3.0 PUSH CORE GREY SAND

3.0-4.5 NO SAMPLE WATER TABLE
 AT 3.5'

4.5-7.0 TAN TO BROWN ORG. RICH SAND

7.0-9.5 BROWN ORG. RICH SAND

9.5-12.0 BROWN SAND W/ SOME CLAY

12.0-14.5 AS ABOVE

14.5-17.0 AS ABOVE. - 1/2 oz JUNIOR
 IN HOLE - PUMP CLEAN - SAMPLER
 IN.

17.0-19.5 - 9" IC SAMPLE - BROWN
 SAND - PUMP HOLE CLEAN.

17.5-22.6 SAMPLER BACK IN - "SANDLOCKED"

GOOD SAMPLE - DEWAL SAND

10' of JUNK IN PIPE - PUMP
CLEAN. WILL PUMP NEXT
COUPLE OF SAMPLES.

22.0-25.5 TAN-BROWN SAND -
PUMPED SAMPLE

25.5-27.5 AS ABOVE - PUMPED

27.5-29.0 - 27.5-28.5 OLIVE-GREEN
CLAY. 28.5-29.0 TAN SAND

29.0-31.5 TAN-BROWN SAND - 3.5'
OF JUNK IN PIPE. PUMP
CLEAN.

31.5-34.0 BROWN SAND POORLY SORTED

34.0-36.5 AS ABOVE clay stringers

36.5-39.0 ~~sample~~ - AS ABOVE

SUCKING JUNK IN THE PIPE

39.0-41.5 pumped - poorly sorted
brown sand w/ clay blocks.

~~28.0-34.5~~
41.5-44.0 pumped - AS ABOVE

44.0-46.5 - NO SAMPLE. DRILLED DOWN

2. NO SAMPLE IN THE PIPE

46.5-49.0 NO SAMPLE - PLUGGED OFF.

DRILLED SMALL AMT. SAND AS
ABOVE. BUT NOT PLUGGED BUT
NO SAMPLE IN PIPE.

17821

17823
Back Island
Hobbs Creek17824
Fisherman's
Creek17817
17820
C17 Fire Tower, Marl Pit

PUT SAMPLER BACK INTO ICE
IF WE COULD CAPTURE SAMPLE
W/OUT GETTING SANDLOCKED.

49.0-51.5 BLOWN POWER SUITS AND 2" REEL
SANDLOCKED. - CABLE BROKE.
START PULLING AUGER FLIGHTS.
"FUN-FUN-FUN TIL DADDY
TAKES YOUR SAMPLER AWAY"
PULLED FLIGHTS. GOT FLIGHT ABOVE
LOCKING MECH. FREE & BIT FREE.
SAMPLING UNIT & LOCKING MECH.
STILL SANDLOCKED. LEFT HANG
OVERNIGHT.

END DAY 7:00 PM

2-10-99 START DAY 6:30 AM

OB-MP

GET SAMPLER OUT OF LOCKING MECH.

MICKY TO REFILL H₂O TANK -

START TURNING FLIGHTS BACK IN.

TURN IN TO 48.5' PUMP CLEAN.

51.5-54.0 SAMPLE TO 54.75 - PUMPED.

BLOWN TO TANK AND 4" WOOD CHUCKS.

54.0-59.0 PUMPED AS ABOVE.

59.0-64.5 TAN-BROWN COARSE SAND
PUMPED SAMPLE

64.5-68.0 PUMPED - OLIVE CLAYED SAND

68.0-74.0 PUMPED - OLIVE CLAY SAND

74.0-82.0 DRILLED TO 79.0'. PUMPED
3' BELOW PIPE SAMPLING TO
82.0'. COARSE CLEAR SAND.
TO.

PULL HOLE TO 35'. APO 2

WAG. BENTONITE TO 26'.

NATURAL FILL TO SURFACE AFTER
REMOVING REST OF HSA. MOUND
CUTTING ON TOP OF BULK HOLE.

POLICE AREA + MOVE TO
FIRE TOWER ON C-17. MAKE
ARRANGEMENT TO LEAVE EQUIPMENT
@ FIRE TOWER OVER WEEKEND.

END AM 6:00 PM.

2-11-99 CS-MP START AM 6:45 AM.

C-17 FIRE TOWER

T	35S	R	29E	S	23
LAT	27° 25.258'	(15")			
CON	81° 23.972'	58"			

ELEV ~115'

W 17817

17821

17823
Back Island
Kauai

17824
Fishermen's
Cave

17817

17820
C17 Fire Tower. MARI P. 7

C-17 FIRE TOWER

53

0-2.5 PUSH CORE. BROWN-TAN SAND

2.5-5.0 PUSH CORE. TAN SAND

3 FOR SAMPLING UNIT & RUN AUGER
FLIGHTS IN TO 5.0'

5.0-7.5 SAMPLER. ORANGE-TAN
SAND

7.5-9.0 WORKER ORANGE-TAN SAND

9.0-11.5 AS ABOVE

11.5-14.0 AS ABOVE

14.0-16.5 AS ABOVE

16.5-19.0 AS ABOVE

19.0-21.5 RED-ORANGE SAND

21.5-24.0 LT. ORANGE SAND

24.0-26.5 AS ABOVE W/SOME MOTTLED WHITE SAND

26.5-29.0 LT. ORANGE SAND W/SOME WHITE
MOTTLED SAND

29.0-31.5 AS ABOVE

31.5-34.0 AS ABOVE

34.0-36.5 AS ABOVE

36.5-39.0 AS ABOVE

39.0-41.5 LT. ORANGE-TAN SAND
WATER @ 40.5'

17821

17823
Back Island

17824
Fisherman's
Creek

17817
C17 Fire Tower, 1946 P.T.

7820

HIGHLANDS HANNOCK
PETER ANDERSON

NEED:
CHISEL

54

41.5-44.0 NET LT. ORANGE-TAN SAND
1.0' OF RECOVERY

44.0-46.5 TAN SAND 6" RECOVERY

46.5-49.0 JUNK IN PIPE. PUMP CLEARED
DRILL TO 49.6'. PUMP SAMPLE.
TAN FINE SAND.

49.0-54.0 NO SAMPLE. TRIED TO PUMP
BUT FORMATION TOOK WATER AND
BECAM SAMPLE CAVED. BACK INTO
FORMATION.

54.0-56.5 BAILED. TAN FINE SAND.
SOME FINE GETTING WASHED OUT.

56.5-59.0 BAYED TAN FINE SAND

59.0-61.5 PUMPED. TAN FINE SAND

61.5-64.0 NO SAMPLE. PUMPED,
FORMATION TOOK H_2O &
SAMPLE.

64.0-69.0 BAILED. TAN FINE SAND

69.0-74.0 BAILED. TAN-GRAY

~~2000~~ FINE SAND

74.0-79.0 BAILED. AS ABOVE

79.0-84.0 BAILED. AS ABOVE

17821
Highland Ham.
Back Island
Kauai

17823
Fishermen's
Creek

17824
621/1041A

17820
MARE P. f

84.0-89.0 BAILED AS ABOVE
 89.0-94.0 BAILED AS ABOVE
 TO

PULL HSA'S. NATURAL FILL TO
 GROUND SURFACE. DO NOT GO
 THROUGH ANY CONTINUED.
 CLEAN UP - PACK UP.
 END DAY 6:15 pm

17821
 Highlands Mon. Ranch
 17823
 Back Island
 17824
 Fisherman's
 Creek
 1784C
 621/CH1A
 1782D
 MARL P, 7

MARL
Pit Core

W# 17820

56

2-15-99 KC + Sm Tan sand
to Hightlands hamock st. pk. on Big dune
→ Hi Co. next pit

SEC 23T 36S R 28E SW NW

LAT $27^{\circ} 35' 20''$ 04" 9 min

Lon $81^{\circ} 24' 52''$

ELW ~ 88'

AVG
EPE 85'

0-2.5' push

2.5-4' push

4-6' push

6-8.5' calc spe - grey clay sd calc?

8.5-11' same

11-13.5' same top 3/4 foot -
bluish green clay w calc
nodules

13.5-16' bluish green clay sd.

END day 6:45p

Riz mikoy 109933

NOTE
Auger 19.7-24.7
has bad threads

2-1699 7:30 start

57

repair spl latch Assy

SWL 4.5' bLS

~ 2' of sludge in hole

16-18.5' blue grey clayey phosph.
sand

18.5-21 sand on shore first
1.5' thin grey clay or calc.
mud.

21-23' TAN phosph. sandy mud

23-25 same - with minor
indurated clasts/lenses

25. firmer - hard lens at

26 1/4 stopped penetration
pull back sampler nose 2"

26.25 - 28.75 hard + rubble top

half thin clayey sand

28.75 - 31.25' ^{as above upper} 1.25' thin
greenish grey
dolomite?

31.25 33.25 H grey sand as above

33.25 - 34.75 H grey sand - unconsolidate
poreable - sucked in ~ 8"

pumped clear + drilled 2.5

34.75 - 37.25 sand - bailed spl

37.25 - 38.25 sand - bailed spl

17821

17823

17824

17846

Highlands Man. Ranch

Back Island

Fisherman's Creek

621/1241A

RETAINER BACRED
 liftw springs (4)
 cap screws for barrel
 cap screws for legs
 6 bushings - 3/4 HSA
 bolts

38.5 - 41' SAND - pumped ⁵⁸ spl
 - hit carbon at 6' m
 41 - 43' WL spl - 17 olive chyd
 phosphatic
 43 - 45.5' WL spl
 49.5 - 47.75' Slgy chyd - some mottling
 47.75 - 50' Hgy chyd - dk olive
 last 6"
 50 - 52.25 sl. gn/gy chyd
 52.25 - 53.5' "
 53.5 - 54.25 - sandier -
 54.25 - 56.5' slgy chyd
 56.5 - 57.5' sl. gn sd + clumpy sand
 57.5 - 59.5' sl. gn chyd
 59.5 - 61.75' same
 61.75 - 63.5 same - some lighter
 63.5 - 66' lt slgy sl. chyd
 66 - 66.5 - washed onto
 66.5 - 68.5 lt slgy sand
 68.5 - 70.75' gy sand
 70.75 - 74.5' SAND, phosphatic
 sl. gn clay blebs - pumped spl
 74.5 - 76.25 - SAND - pumped

END day 7:00 pm
 Rig mileage 110,034

17821
Highlands Man.

17822
Back Island
Kauai

17824
Fishermans
CREEK

17872
621/1241A

2-17-99 730 start - Went w ⁵⁹
Highlands hammock (Robert Ford)
select core site

• STATIC WL 6.8' bws

76.25-78.5' WL spl - sand -
sand locked, broke cable
tipped out - NO sample recovered
78.5' TD

17821
Highlands Hamm.

17823
Back Island
KNUCH

17824
Fisherman's
CREEK

17846
621/C411A

W# 17821

60

Highlands Hammock st. pk

2-17-99

NE, SE, NE SEC 31 T 34S R 28E 6 min avg

Lat 27° 28' 53" 41° 47'

Long 81° 33' 05"

Elev 79'

0-2.5' push org rich sd + clay sd

2.5-5.0 push - or + gy mottles

clay then gy + white sd

5-7 1/4 gy clay then lt gy sd

7.25-9.0 - fine sand - uncovs.

9.0-11.5' fine sand - bailed

11.5-14' fine sand pumped

14-15' pumped spc - coarse

in green clay blebs

~15-16.5' bailed spc - sd w green

clay matrix

End day 6:45 pm

Rig and mileage 110116

2-18 7:30 start

SWL 2.9' bLS

3' sludge in TSA - pps out

16.5 - 19' bailed: sand slight green clay

19 - 21.5' SAME } - matrix now

21.5 - 24' SAME } 41.9W

24 - 26.5' sand - same - bailed

26.5 - 29' sand or above - bailed

29 - 31.5' " " " "

31.5 - 33.5' sand or above - bailed

33.5 - 36.5' or above

36.5 - 38.5' pumped sand - more clay
blebs, more phosphate. lost 15"
from cohesion - doesn't pump.~ 37.25 - 38.0 - tan clay/sand w
shell - cohesive

~ 38.0 - 38.75 shell bed

38.75 - 39.75 w/ spec - shell bed +
shelly ds sd39.75 - 41.75' poor recovery
clayey shelly sand41.75 - 43.75 - same - poor recovery -
adj sampler out 2"43.75 - 45.75 first 6" grey clayey
shelly sd - transition dk grn clay
w oriented brn shell frag.17823
Back Island
Ranch17824
Fisherman's
Creek17846
621/1241A

125' $\frac{1}{4}$ " GALV wire rope
 100' tape
 1" x $\frac{1}{8}$ " bar stock for
 weights
 1" x 3/4"

★ Hydraulic pump
 Rotates clockwise
 (when looking
 shaft)

45.75-47.75 dk grey. gn shelly
 clayey sd

47.75-49.75 same

49.75-51.25 same

51.25-53.0 same

53-55' same sl softer

55-57.5' ~50% recovery - same

~~57.5~~ - lower half rubbery drilling
 shell?

57.5-58.5' green phosphatic
 clayey sd.

58.5-60.75' - to 50% recovery
 dk sl. gy clay + clay sd

60.75-63.25 dk. gn clay sd

63.25-65.75' dk. gy clay sd then
 dk. gn blight clay.

65.75-68.50 dk. gn clay sd.

68.50-71 same

71-73.5' same - lower $\frac{1}{2}$ shelly

73.5-76 dk. gy clay sd - shelly -
 lower part more shelly - larger
 frag.

76-78.5' same as latter.

78.5-81 dk. gy shelly, plus clay sd
 thin frag.

81-85.1' less clay, more permeable

end day - out of cable
trip to sebring pm more
Rig mileage 110221

2-19-99

7:30 start - to Triangle
Hardware (Sebring) pm
twist cable, re rig.
+ wash hole clean

83-84 no sm washed out

84-86 sl. gn phosphatic shelly
clayey sand

86-87

AT 87' hard bed encountered
87-88.5' Rock - vz spl retained in
WL - blocked - picked up +
pumped spl. web sieved a
coarse + fine fraction
TD 88.5'

pull HSA's place 1 bag
gunk growth 60-70'
nat fill above + below
place bentonite chips
8-10' back fill to 5'
place 1 bag bentonite

17823
Back Island
Kauai

17824
Fishermans
Creek

17846
621/1241A

Rig needs
hubs unlocked

64
chips to 3' remainder in
cuttings then bottom chips
at surface joined others
cuttings

17823
Back Island
KNUD

17824
Fisherman's
CREEK

17825
621/1241A

17823

2-22-99

CBS MP

65

7:00 AM START

BUCK ISLAND RANCH

T 385 R 315 S NOT DELIVERED

Lat 27° 11.463' 28"

Lon 81° 13.438' 26"

MEET @ WAREHOUSE @ 7:00 AM LOAN
UP & FUEL UP. PICK UP RIG
& TRAILOR @ HIGHLANDS HAMMOCK
& FAIRIE TO B.I.R. MEET W/
GENE COLLIN & FILL UP THE
TANK. SET UP:

END DAY 7:00 PM

2-23-99 CAMP 6:30 AM START

0-2.5 PUSH GREY SAND

2.5-5.0 PUSH GREY SAND TO BROWN ORG RICH
SAND

5.0-6.5 SAMPLER BROWN ORG RICH SAND
WATER ~ 5.5' BES

6.5-8.5 AS ABOVE

8.5-11.0 BROWN SAND

11.0-13.5 BROWN FINE SAND

17823

17823
Back Island
Knock

17824
Fishermen's
Creek

17842
621/CH1A

3' OF JUNK IN HOLE. PUMP CLEAN

13.5-16.0 AS ABOVE

16.0-18.5 AS ABOVE

18.5-21.0 AS ABOVE. DIFFICULT TIME

RETRIEVING SAMPLER. SAMPLING UNIT
GETTING HUNG UP IN AUGER FLIGHT.
CHECK SAMPLING SYSTEM. CHANGE
AUGER FLIGHT. TIGHTEN HEX BOLTS
ON SANKER. THIS WORKED. NOT
AUGER FLIGHT.

21.0-23.5 TOP 6" BROWN SAND

21.5-22.5 GREY/GREEN SANDY CLAY

22.5-23.5 GREY/GREEN PLASTIC CLAY
W/ SHELLS.

23.5-26.0 GREY/GREEN SANDY CLAY W/
SHELL. SHELL $\frac{1}{4}$ T DOWN

INTERNAL. JUNK IN HOLE. PUMP CLEAN

26.0-27.5 4" OF REG. SHELL. SMALL $\frac{1}{4}$
SAND. NO MATRIX. JUNK IN HOLE
PUMP CLEAN. CATCH MATERIAL &
USE AS SAMPLE. SAMPLER WILL
NOT GO IN. DRILL TO 28.5'

27.5-28.5 PUMPED SHELL W/ SAND

17824
FISHBENTON
CREEK

17824
621/C411A

28.5-31.0 2" REC. SHELL w/ SAND

PUMP REMAINING SAMPLES.

SHELL w/ SAND & CLAY BUBBS

@ END OF RUN STALLS TEETH

31.0-33.5 SAND w/ SHELL, CLAY BEDS &
PHOSPHATE 1' OF REC.

33.5-36.0 TOP 1' CLAYEY SAND w/ SHELL
& PHOSPHATE. BOTTOM 1.5'

SANDY CLAY w/ SHELL (PECTIN)

36.0-38.5 GRAY/GREEN CLAYEY SAND w/
SHELL. PHOSPHATE 90% IN DRILL
OFF TO T%.

38.5-41.0 GRAY/GREEN CLAYEY SAND

41.0-43.5 GRAY/GREEN SANDY CLAY

43.5-46.0 GRAY/GREEN RUBBY CLAYEY SAND
PHOSPHATE & SHELL PRESENT

46.0-48.5 AS ABOVE

48.5-51.0 AS ABOVE.

51.0-53.5 OLIVE GREEN CLAYEY SAND
w/ LEACHED SHELL & PHOSPHATE

53.5-56.0 AS ABOVE

56.0-58.5 AS ABOVE

17824
FISHCATCHING
CREEK

17846
621/CH1A

58.5-61.0 AS ABOVE

61.0-62.5 AS ABOVE

62.5-66.0 AS ABOVE

66.0-68.5 AS ABOVE, LESS CLAY.

68.5-69.25 2 1/2' OF SAMPLE: GREY PHOSPHATIC
CLAYEY SAND W/ SHELL FRAGS.
FILLED THE SAMPLER. JUNK IN
HOLE. PUMP CLEAN

69.25-71.0 AS ABOVE.

71.0-73.5 AS ABOVE DRILLING HARD

73.5-76.0 AS ABOVE. DRILLING HARD. PUMP
NOISE IN ONE SPOT.

76.0-78.5 SANDLOCKED. GOT IT BUT
LUCKY. AS ABOVE. 6" REC.
6' JUNK IN HOLE. CALL RICK.

MICKI IS SICK. WENT TO GO
LAY DOWN.

END DAY 8:00 PM

2-24-99 START DAY 7:00 AM
8' OF JUNK IN HOLE.

PUMP CLEAN. SAMPLER IN

24.5-31.0 204/600N CLAYEY SAND W/
SHELL & PHOSPHATE

81.0-83.5 AS ABOVE w/ LESS SHEAR &
HIGHER CLAY CONTENT

83.5-86.0 AS ABOVE, SANDIER

86.0-88.5 AS ABOVE

88.5-91.0 AS ABOVE

91.0-92.5 DUNE CLAYEY SANDS
TO

PULL HSA'S TO 32'. NATURAL FILL
TO 32'. PUMA / BAG BENTONITE
GROUT IN. 32'-22'. NATURAL FILL
TO GROUND SURFACE. CLEAN UP &
MOVE TO CARLTON RANCH.

17824
FISHCREEK
CREEK

17846
621/10411

FISH EATING CREEK

70

2-24-99

T 375 R 29E S 31

Lat 27°12.660' 40"

Lon 81°27.670' 40"

17824

0-2.5 PUSH BROWN/TAN SAND

2.5-5.0 PUSH TAN/BROWN ORG. RICH SAND

5.0-6.5 SAMPLER BROWN SAND

6.5-8.5 BROWN SAND

8.5-11.0 BROWN SAND

11.0-13.5 AS ABOVE

13.5-16.0 AS ABOVE. SOME HAS HIGHER
CLAY CONTENT

16.0-18.5 BROWN/TAN CLAYEY SAND

18.5-21.0 AS ABOVE W/ S.S. COBBLES

21.0-23.5 DRILLED EASY BROWN/TAN CLAYEY SAND

23.5-26.0 DRILLED EASY AS ABOVE

26.0-28.5 TAN CLAYEY CLAYEY SAND

28.5-31.0 AS ABOVE. 2' JUDICIAL HOLE

END DAY 6:30 PM

2-25

17824
FISH EATING
CREEK

17824
621/12411

2-25-99

START DAY

2:45 AM

12' OF JUMP IN HOLE. PUMP
CLEAN.

31.0-33.5 TAN. FINE SAND.

~~33.5-36.0~~ SANDLOCKED. CASING BROKE
PULL HSA'N TO GET TO
SAMPLING SYSTEM. RUN HSA'N
BACK IN

33.5-36.0 BLOW CLEAN. PUMP CLEAN

~~36.0-38.5~~ SANDLOCKED. OUT CASE

GET UNLOCKED. PUT IN NEW
CASING. RUN HSA'S BACK IN TO
36.0'. PUMP CLEAN. DRILL
TO 38.5'.

36.0-38.5 NO SAMPLE.

38.5-41.0 ^{CASING AND} ~~CASED~~ REGRIND UNIT

WENT GET SAMPLER. PUMP RO
FOR NEW SANDLOCKED. CASING
BROKE PULL HSA'N AGAIN.

41.0-43.5 GREY CLAY SAND w/ 6" CLAY LENS @ end of run

1784C
621/1041A

43.5-46.0 DRILL TO 46.0. pump.

OLIVE CLAY PLASTIC

46.0-48.5 sampler. OLIVE ~~sandy~~ CLAY

48.5-51.0 OLIVE SANDY CLAY

51.0-53.5 OLIVE CLAY

53.5-56.0 AS ABOVE

56.0-58.5 OLIVE SANDY CLAY

58.5-61.0 AS ABOVE

61.0-63.5 AS ABOVE

63.5-66.0 AS ABOVE

66.0-68.5 AS ABOVE

68.5-71.0 OLIVE CLAY & SAND

71.0-73.5 AS ABOVE

73.5-76.0 AS ABOVE, JUNK IN HOLE.
PUMP CLEAN.

76.0-78.5 6" REC. AS ABOVE

78.5-81.0 AS ABOVE, JUNK IN HOLE
PUMP CLEAN.

81.0-83.5 AS ABOVE w/ PHOS.

end day 8:00 pm

2-26-99 START DAY 700 AM

PUMP HOLE CLEAN 14'

OF JUNK IN HOLE. SAMPLES

GETTING RINSE. WILL NOT

PUR SAMPLER BACK IN HOLE

83.5-88.5 GLEY FINE SAND

PHOS. & STEEL KEYS

88.5-93.5 GLEY FINE SAND /
PHOS. & STEEL KEYS

TD

PULL HSA'S TO 53'. BENTONITE

ABOUT 53.0 - 420. PULL REST

OF HSA'S. BACK FILL TO 6'

HOLE PLUS & NATURAL FILL IN

TOP TO LAND IN PLACE. PILE

CUTTINGS OF HOLE CLEAN UP

& MOVE EQUIP TO HOTHAM'S

HAMMOCK STATE PARK.

RUN TO T.H.

621/C-41A

Lat 27° 19' 47.5" 285°

Lon 81° 14' 78.6" 47"

T 36S S29 center A R 31E

17813

17846

621/C-41A 7:00 AM START 74

3-8-99

COJA

LEAVE TRH FOR HIGHLANDS Co

@ 8:00 AM AFTER GOING TO OFFICE

P/U RIG & TRAILER @ HIGHLANDS

HAMMOND STATE PARK & MORE TO

C-41A @ 621.

END DAY 6:00 PM

3-9-99

COJA

7:00 AM START

0-2.5 PUSH - GREY SAND

2.5-4.0 PUSH ORGANIC RICH CLAY TO

PEAT TO 3.5. 3.5-4.0

GREY SAND

4.0-5.5 SAMPLER GREY FINE SAND

5.5-8.0 LT. BROWN FINE SAND. H₂O

TABLE @ ~5.0'

8.0-10.5 LT. BROWN CLAYEY SAND

10.5-12.0 LT. BROWN FINE SAND DRILLING SW

12.0-16.0 LT. BROWN CLAYEY SAND

16.0-18.5 AS ABOVE

18.5-21.0 AS ABOVE

21.0-23.5 AS ABOVE

17846
621/C-41A

23.5-26.0 AS ABOVE

26.0-28.5 DK. BROWN CLAYEY SAND.

SOME ORGANICS

28.5-31.0 DK BROWN CLAYEY SAND W/ ORG

31.0-33.5 AS ABOVE

33.5-36.0 AS ABOVE

36.0-38.5 AS ABOVE, CLAYER & HIGHER
ORG. CONTENT.

38.5-41.0 39.5-40.0 - AS ABOVE. 40-41.0

DK GREY SANDY CLAY

41.0-43.5 DK GREY SANDY CLAY

43.5-46.0 TAN FINE SAND W/ CLAY BLOSS
W/ POSS. PROTUS.

46.0-48.5 AS ABOVE. 6' JUNK IN HOLE.

PUMP CLEAN

48.5-51.0. LOST SAMPLE. 1.3' JUNK IN
HOLE. PUMP & KEEP FOR SAMPLE

51.0-53.5 DK BRN. CLAYEY SAND

53.5-56.0 AS ABOVE

12' JUNK IN HOLE. PUMP CLEAN

56.0-58.5 GRAY FINE SAND

58.5-61.0 GRAY FINE SAND. 10' IN HOLE.
PUMP CLEAN

PUMPED CLEAN. RECOVERY SAND
~~61.0~~ & ORG. RICH. SAND w/ WOOD
 FRAGMENTS. NOT WHAT RECOVERING
 IN SAMPLER. SAMPLER BACK IN.
 61.0-63.5 TAN FINE SAND

SANDLOCKED PUTTING SAMPLER
 BACK IN HOLE. WARD! START
 PULLING HSA. RUN CABLE THROUGH
 FLIGHTS TO SAVE CABLE. TANG
 FLIGHTS & SAMPLING EQUIP.
 FROM MAST. CLEAN UP &
 LOCK UP.

END DAY 7:30 PM

3-10-99

START DAY 6:45 AM

CB JA

GET SAMPLER UNSTUCK. RUN.
 HSA IN BACK IN TO 63.5'.
 PUMP HOLE CLEAN.

62.5-66.0 NO SAMPLE

66-68.5 BAILED, TAN FINE SAND w/ ORG.

68.5-71 BAILED, TAN FINE SAND w/ ORG.

71-73.5 BAILED, TAN FINE SAND

PULLING SAND INTO HOLE. PUMP
CLEAN, ORG. % DECREASING.

73.5-76 BAILED TAN FINE SAND w/ ORG.,

CONS. SAND BALLS. CLAY RUBBS PRESENT.

76-78.5 BAILED. AS ABOVE. CLAY CONTENT
INCREASING.

78.5-81 ~~BAILED~~ BAILED, TAN FINE SAND
w/ LOW % CLAY RUBBS & ORG.

SMALL WHITE ROUND PARTICLES.

POSSIBLY FORAMS?

81-83.5 AS ABOVE BAILED

83.5-86 BAILED TAN FINE SAND w/

ORG & SMALL WHITE ROUND
PARTICLES. DRILLED RUDLY,

BUT NO INDICATION OF RUBBLE IN
SAMPLE

86-88.5 BAILED, AS ABOVE

88.5-91.0 BAILED, AS ABOVE

91.0-93.5 AS ABOVE. w/ SHELL FRAGS.

TD CLAY CLAY ON END OF BAILED,

COULD NOT RUN BENTONITE GROUT
IN Q/L BIT WAS PLUGGED. BOTTOM
3' WAS GLEY AND CLAY W/
SHELL. ~~END~~ 90.5-93.5
HOLE PLUG @ 9'. BENTONITE
FILL TO GROUND SURFACE
CLEAN UP & MOVE TO NEXT
SITE.

END DAY 6:30 PM

STANDING P.O. #s

ENUR Mfg. Co 53700-B32024

LOWES

902054

Toney Drilling

902072

Atlantic Drilling

902071

Holley

902068

Tallahassee Welding

902050

GORMAN

902064

Connie Liles

902051

L+C machine

902069

CHRISTENSEN Boylen

902070

MID AMERICA

902073

CURVE TABLES

HOW TO USE CURVE TABLES

Table I. contains Tangents and External to a 1° curve. Tan. and Ext. to any other radius may be found nearly enough, by dividing the Tan. or Ext. opposite the given Central Angle by the given degree of curve.

To find Deg. of Curve, having the Central Angle and Tangent: Divide Tan. opposite the given Central Angle by the given Tangent.

To find Deg. of Curve, having the Central Angle and External: Divide Ext. opposite the given Central Angle by the given External.

To find Nat. Tan. and Nat. Ex. Sec. for any angle by Table I.: Tan. or Ext. of twice the given angle divided by the radius of a 1° curve will be the Nat. Tan. or Nat. Ex. Sec.

EXAMPLE

Wanted a Curve with an Ext. of about 12 ft. Angle of Intersection or I. P. = $23^\circ 20'$ to the R. at Station 542 + 72.

Ext. in Tab. I opposite $23^\circ 20' = 120.87$

$120.87 \div 12 = 10.07$. Say a 10° Curve.

Tan. in Tab. I opp. $23^\circ 20' = 1183.1$

$1183.1 \div 10 = 118.31$.

Correction for A. $23^\circ 20'$ for a 10° Cur. = 0.16

$118.31 + 0.16 = 118.47 = \text{corrected Tangent}$.

(If corrected Ext. is required find in same way)

Ang. $23^\circ 20' = 23.33^\circ \div 10 = 2.3333 = \text{L. C.}$

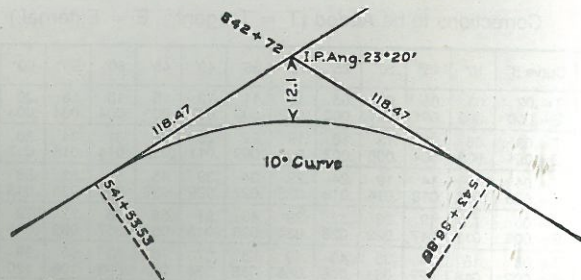
$2^\circ 19\frac{1}{2}' = \text{def. for sta.}$	542	I. P. = sta.	542 + 72
$4^\circ 49\frac{1}{2}' = \text{" " "}$	+ 50	Tan. =	118.47
$7^\circ 19\frac{1}{2}' = \text{" " "}$	543	B. C. = sta.	541 + 53.53
$9^\circ 49\frac{1}{2}' = \text{" " "}$	+ 50	L. C. =	233.33
$11^\circ 40' = \text{" " "}$	543 +	E. C. = Sta.	543 + 86.86
	86.86		

$100 - 53.53 = 46.47 \times 3' (\text{def. for 1 ft. of } 10^\circ \text{ Cur.}) = 139.41' =$

$2^\circ 19\frac{1}{2}' = \text{def. for sta. 542}$.

Def. for 50 ft. = $2^\circ 30'$ for a 10° Curve.

Def. for 36.86 ft. = $1^\circ 50\frac{1}{2}'$ for a 10° Curve.



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Volume of grout required to grout 10 feet of a two-inch annulus

Size of
Casing

Size of
Borehole

Volume of
Annulus

Bags of Cement

2"

4"

6"

8"

10"

12"

6"

8"

10"

12"

14"

16"

1.74 ft. 3

2.62 ft. 3

3.49 ft. 3

4.36 ft. 3

5.24 ft. 3

6.11 ft. 3

1.5

2.2

2.9

3.5

4.4

94 lb. bag of cement = 1.2 ft. 3

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Cement	
Materials	Advantage and/or Purpose
Portland cement	Regular grouting
High early strength cement	Better penetration of small crevices
Quick setting cement	Portland cement with accelerator added
Opusculum cement	Made from calcium sulphate Sets and hardens in about 2 hrs.
Ad Mixtures	
Calcium chloride	To accelerate setting time
Sodium silicate	
Sodium hydroxide	To retard setting time
Sodium tannate	
gypsum	
Lime sugar	
Bentonite	
Sawdust grains	To bridge crevices for high angle repose
Cotton seed hulls	
Asbestos fiber	
Cellulose fiber	
Mica flakes	
Sand	To reduce grout shrinkage. To increase plasticity
Finely ground bentonite	
Rock flour clay	
Ground shale	To lower cost of grout where strength is not important
Plastics	
Resistance to contamination. Ability to penetrate materials with low permeability.	
Chemicals	
Sodium silicate	To control setting time.
Calcium chloride	For grouting materials with low permeability.
Aluminum sulphate	
Metal salt	
Acids	

Diameter of Casing or Hole (in)	Gallons per foot of Depth	Cubic Feet per Foot of Depth
1	0.041	0.0055
1½	0.092	0.0123
2	0.163	0.0218
2½	0.255	0.0341
3	0.367	0.0491
3½	0.500	0.0668
4	0.653	0.0873
4½	0.826	0.1104
5	1.020	0.1364
5½	1.234	0.1650
6	1.469	0.1963
7	2.000	0.2673
8	2.611	0.3491
9	3.305	0.4418
10	4.080	0.5454
11	4.937	0.6600
12	5.875	0.7854
14	8.000	1.069
16	10.44	1.396
18	13.22	1.767
20	16.32	2.182
22	19.75	2.640
24	23.50	3.142
26	27.58	3.687
28	32.00	4.276
30	36.72	4.909

PIPE AND CASING					
Volume and Height Between Casing and Hole					
Size of Casing	Diameter of Hole (Inches)	Gallons per Lin. Ft.	Lin. Ft. per Gallon	Sacks Cement* per Lin. Ft.	Lin. Ft. per Sack Cement*
O.D.	5	0.1938	5.1600	0.0236	42.3729
6	.6426	1.5562	.0781	12.8041	
4.500"	7	1.1730	.8525	.1426	7.0126
or	8	1.7850	.5602	.2169	4.6104
4 1/2"	10	3.2538	.3073	.3954	2.5291
O.D.	6	.2346	4.2626	.0285	35.0877
5.500"	7	.7650	1.3072	.0930	10.7527
or	8	1.3770	.7262	.1673	5.9773
5 1/2"	9	2.0706	.4830	.2516	3.9746
	10	2.8458	.3514	.3458	2.8918
O.D.	7	.2085	4.7962	.0253	39.5257
6.625"	8	.8204	1.2189	.0997	10.0301
or	9	1.5140	.6605	.1840	5.4348
6 1/2"	10	2.2892	.4368	.2782	3.5945
	12	4.0845	.2448	.4964	2.0145
O.D.	9	.2697	3.7078	.0327	30.5810
8.625"	10	1.0449	.9569	.1270	7.8740
or	11	1.9017	.5258	.2311	4.3271
8 1/2"	12	2.8401	.3521	.3452	2.8969
	14	4.9615	.2016	.6030	1.6584
O.D.	12	1.1603	.8618	.1410	7.0922
10.750"	13	2.1803	.4587	.2650	3.7736
or	14	3.2818	.3047	.3988	2.5075
10 1/2"	16	5.7298	.1745	.6963	1.4362
	18	8.5043	.1176	1.0336	.9676
O.D.	14	1.1016	.9078	.1339	7.4683
15	2.2848	.4377	.2777	3.6010	
16	3.5496	.2817	.4314	2.3180	
13"	17	4.8960	.2042	.5950	1.6807
	20	9.4248	.1061	1.1454	.8731
O.D.	15	1.1832	.8452	.1438	6.9541
16	2.4480	.4085	.2976	3.3613	
17	3.7944	.2636	.4611	2.1687	
14"	18	5.2224	.1915	.6347	1.5755
	20	8.3232	.1201	1.0115	.9687
O.D.	17	1.3464	.7427	.1636	6.1125
18	2.7744	.3604	.3372	2.9656	
19	4.2840	.2334	.5206	1.9209	
16"	20	5.8752	.1702	.7140	1.4006
	22	9.3024	.1075	1.1306	.846
O.D.	21	1.6728	.5978	.2033	4.9191
22	3.4272	.2918	.4165	2.4009	
23	5.2632	.1900	.6396	1.5634	
20"	24	7.1808	.1393	.8727	1.1459
	26	11.2608	.0888	1.3685	.7307

*Cement calculations based on the volume of an average cement mixture being 1.1 cubic feet per sack of cement.

The Water Well Journal thanks Edwin Huntoon, Waupaca, Wisconsin, for sharing the information found in this and other removable facts pages.

