NOV 26 2002

Comprehensive Long-Term Environmental Action Navy (CLEAN) for Pacific Division, Naval Facilities Engineering Command Pearl Harbor, Hawaii

CTO No. 0229

RED HILL BULK FUEL STORAGE FACILITY INVESTIGATION REPORT
VOLUME I OF III
(FINAL)

FOR
FLEET INDUSTRIAL SUPPLY CENTER
(FISC)
OAHU, HAWAII

HDOH FACILITY ID NO. UNASSIGNED
Fac. ID: 9-102271
Rel. ID: 990051, 010011, 020028

AUGUST 2002

II of II

11-8-00

L. DeMoss L Williams

S. Toma B Sheldon H Holmes

0630 picked up Keys at FISC

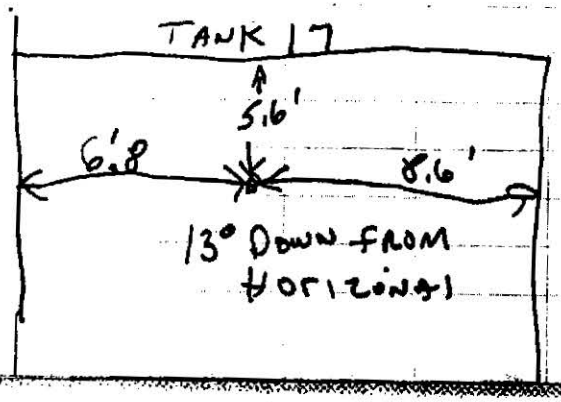
0700 Arrive at Adit 6
Phone outside door
not working called
from Adit 5
Elevator not working
Climbed down stairs.

0740 at lower tunnel,
power system not working

0840 Power on control panel
Fused Blown

0850 Started coring

0905 Drillcrew down working on
core barrel
~~Started back drilling~~



11-8-00

Pull Depth RAW Rec Loss gain
Began H coring through grout @ 2.9
2. Changed to N core
~~2~~ TONY
1100. operator called ~~sa~~ said
we could not work
without elevator. Climbed
out of tunnel
called operator TONY
He said that Elevator man
would be in later. Call
and check in, went with
Lance to DHL and shipped
samples turned in Keys at
FISC.

Fac. ID: 4-102271
Rel. ID: 990051, 010011, 020028

11-8-00

1500 Talked with Jim Gammon He will try to get Elevator fixed. does not want us to climb out on ladder.

Ray

11-9-00

L. DeMoss L. Williams
B Sheldon H Holmes

0630 Picked up keys at F/SC
0700 Arrive at Adit 6 gate worked on Equipment at Adit 6 gate. Elevator still Down
1100 Called gauging station Elevator still Down
1245 Elevator still Down
1400 Checked in at Lower Tunnel Elevator still Down
1500 Turned in Keys and Tried to fing Jim G. Gone for the day NO ONE will be in ON Fri 11-10-00. NO WORK

11-9-00

1600 Stephanny called. Jim Gammon said we could work 11-10-00
Pick up keys at Fisc
If man is not there
call 471-8081
Fisc duty officer
4730673
to contact Dispatcher
he will find operator
to get keys

Jim Dr

11-10-00

L. Domoss L. Williams
B Sheldon H. Holmes S. Tomm
0630 pick up keys at Fisc
0700 Arrive at Lower Tunnel
0720 Lance & I put Bentonite
seal in MW18 from 9 ft
to 6 feet and hydrated it
0750 Started Drilling
0800 having Trouble with
wire line system.
Drill crew working on it
0900 Back Drilling
using pump in wireline
system
11:00 Drilling going Good.
Operator Alex came over
and checked on us. Said
to pump sump any time
today. The valve is open.

11-10-00 SU 10.4
CB 7.6

Poll	Depth	RAN	Rec	LOSS	gain
	Began NC Scoring AT				
2	12.1	4.8	4.6	0.2	
	50% DWL @		10.4		
3	16.7	4.6	4.6		
4	22.1	5.4	5.3	0.1	
5	27.1	5.0	5.1		0.1
6	32.1	5.0	5.0		
7	37.1	5.0	5.0		
8	42.1	5.0	5.0		
9	47.1	5.0	3.9	1.1	
	44.0	45.8	OPEN CAV		100% DWL
10	52.1	5.0	5.0		
11	57.1	5.0	5.0		
12	62.1	5.0	5.0		
13	66.2	4.1	4.1		
14	70.1	3.9	3.9		
15	74.8	4.7	4.7		
16	75.3	0.5	0.4		
17	79.5	4.2	4.1	0.1	
18	86.8	2.3	2.3		
19	83.5	1.7	1.7		
20	85.1	1.6	1.3	0.3	
21	90.3	5.2	5.2		

11-10

Poll	Depth	RAN	Rec	Loss	gain
22	95.6	5.3	5.2		
23	100.8	5.2	5.2		
24	105.9	5.1	4.6	0.5	

Pumped Sump Dry Before Leaving

1740 Left site and called operator from ADITS

1.0 ~~Returned keys to fist~~ gate at prison locked called the operator at pumphouse to come and open gate.

1800 got out of gate Turned keys in at Fist

Leon Dunn

11-13-00

L. Demoss B. Sheldon H. Holmes

0630 Picked up Keys at Fisc
0645 Enter Prison Gate
Elevator at Adit 6 Down
Called Fisc Fuel Dispatcher
at 473 2942. Repair man
on the way out to fix
0815 Talked to Jim Gammon
Elevator Down parts hard
to find. May be tomorrow
1200 Checked in with Fisc
Elevator still down
1700 Check with gauge station
Elevator still down
1800 Check with gauge station
Both elevators down

Leon Demoss

11-14-00

L. Demoss

0630 Picked up keys at Fisc
Key Lady said Elevators
still Down Waiting on parts
0655 Talked w Gammon
Told him we were at Adit 6
He said Elevator still Down
Called gauging station
No one worked on Elevator
last night still Down.
0800 Talked with Gammon. He is
going to have a meeting before
noon and will know how long
Elevator will be down.
0830 Talked with Evetts.

1145 Call Jim Gammon
one part Ready and waiting
on Electricians part will
call Back
1700 Talked with Jim Gammon
gear will be ready Fri morning
if all goes well fixed by noon

11-15-00

Elevator still down
Kent called and every thing
is still on for Friday

Larry Dunn

11-16

0730 called Lance left message
0735 Talked with Bob S. gave him update
0910 Kent called far as he knows every thing on for Friday

Larry Dunn

11-17-00

L. Demoss L. Williams
Bob Sheldon H. Holmes

0630 ARRIVE AT FISC TO pick up keys
Key Lady said Both elevator
STILL DOWN

0700 ARRIVE AT PRISON gate

0730 Checked IN AT STAGING
STATION Operator said Both
elevators STILL DOWN
TRIED TO call J. Gammon. He
WAS NOT IN and his voice mail
WAS FULL

0900 CALLED J. GAMMON
NOT IN

0950 TALKED WITH J GAMMON.
He has NOT heard anything on
The Elevator Repair. Told me
TO CALL SCOTT AUGST OR
Chuck at 845 3291

1000 Called elevator company
SCOTT NOT IN. Receptionist said
Chuck will call back

1035 Chuck has NOT called
LEFT SITE

11-17-00

1100 TURNED IN Keys AT FISC

1120 called Chuck AT elevator
company. LEFT MESSAGE

1330 TALKED WITH J Gammon
Told him Elevator people
did NOT CALL BACK. He
said he would call them
And CALL me

1700 NO CALL

1730 NO CALL

11-19-00

~~0530~~
1730 Called Tunnel. Operator Said Both Elevators still Down. Called Lance, Stephanny And Drillers crew To inform them.

Larry Dunn

11-20-00

0730 Arrive at FISC Pick up keys
Talked with Herb. He said
Elevators still Down. Repairman
Has been coming in everyday to
work on it. Parts hard to find.
L. Demoss L. Williams
B Sheldon H. Holmes
At Prison gate.
0900 went to Adit 3.
walked in. Checked out
Location for vertical wall.
Need power & water Talked with
Alex at Operators Station.
Went to Adit 5
0910 went in Adit 5 to talk
with Scott Elevator man
0900 Talked with Scott. Working
on Elevator Does not know when
it will be Fixed.
1155 Called J. Gannon not in
1315 Talked with Elevator Repairman
Needs another part. Might Be back
Tomorrow.
1335 Left site.

Larry Dunn

11-21.00

Operator Said Elevator is working

0850 Pickup keys at FISC.

0900 Arrive at Adit 6
Called in operator
L. DeMoss L. Williams S Toma
Bob Sheldon H Holmes

0930 Started Drilling
Drilling going slow. Making short runs. Clinker zone
Stopping up barrel.

1250 Called operator. Sump full
Said ok to pump.

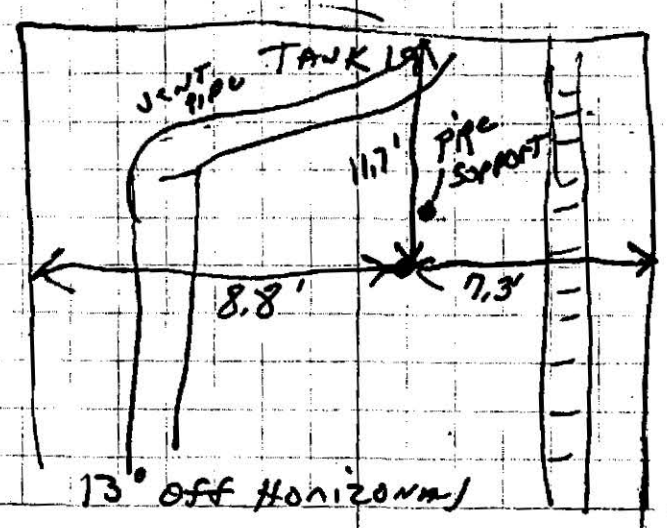
1340 124.2 Bottom of the hole
Installing 1½" pvc well
15 feet of screen
Installed well through drill rods. Did not think core hole would stay open.
Installed Bentonite seal 4ft to 6ft
Moved to Tank 19.

1650 Fuse blown in transformer.

1720 System working

11-21-00

Pull	Depth	Ran	Rec	Loss	Gain
25	106.2	~~0.3~~	0.8		0.5
26	111.2	5.0	5.2		0.2
27	114.7	3.5	2.4	1.0	
	112.8 -		clinkers		
28	115.4	0.7	0.7		
			Clinkers		
29	116.7	1.3	1.3	clinkers	
30	118.0	1.3	1.0	0.3	
	Clinkers				
31	119.9	1.9	1.1	0.7	clinkers
32	124.2	4.3	5.2		0.9



11-21-00

Got Drill Rig Bolted
Down and Ready to Drill
1800 Left Site
Prisongate Locked. had
to wait for someone
to open
Turned in Keys at FISC

Sam Oher

11-22

L. Demoss L. Williams
B. Sheldon Harold Holmes
0630 picked up keys at FISC
0700 Arrived at Prisongate
Talked with Herb said
ok to work Friday & Saturday.
0740 Started Drilling
Drilled H casing in to 7 feet
Pulled Rods and casing and
1000 Installed protective cover
used 1½ Bags of Quickrete
Quick setting cement
to grout in cover.
Let grout set
1200 Started Drilling
1630 Sump full called operator
He told us that there was no
where to pump it.
1700 J Gammon stoped by
told him the results of the
hole. He wants us to work
Fri-Sat and Sunday. Elevator
inspector coming Tuesday to
inspect Elevator.
1730 Left Site

Pull	Depth	Ran	Rec	Loss	gpm
1	6.5	6.5	3.7	2.8	
	3.9	5.9	soft		
2	7.0	0.5	0.8		0.3
	Began N coring			100% DWR	
3	9.3	2.3	0.7	1.6	
4	12.2	2.9	1.6	1.3	
	soft at end of Run				
5	14.6	2.4	1.0	1.4	fuel odor
	intermiten drill water				
6	17.1	2.5	2.6		0.1
	100% DWL at Begining of Run				
7	22.1	5.0	5.0	50% DWR	
8	25.4	3.3	3.3	100% DWL	
9	28.1	2.7	1.4	1.3	
10	32.9	4.8	4.1	0.7	
11	34.2	1.3	1.0	0.3	
12	35.9	1.7	1.4	0.3	
13	36.8	0.9	1.2		0.3
14	40.1	3.3	2.5	0.8	
15	44.0	3.9	3.8	0.1	fuel odor
16	47.3	3.3	3.3		fuel odor
17	48.4	1.1	0.2	1	0.1

Innen Barrel Did not Lock in
pulled Rods out to get core out

11-24

L. Demoss L. Williams
B. Shelton H. Holmes S. Toma

0630 Picked up Keys AT Fisc
Told Key person we will be
working Sat. & Sun.

0700 AT Adit 6 gate called
in. Simmons said sump was
Dry

0715 AT TANK 19. Started drilling
Trying to get corebarrel back
To the bottom of the hole. Having
To drill Them Down. got to
bottom. Ran short runs to
51.4 ft. very Low PID Reading
pulled N rods and Tried to get
2½" PVC in. Hole caved in.
Reamed hole and tried to
install pipe Several Times
Unable to get pipe in

1220 Alex came Down. Elevator
Broken Again.
Unable to Keep the crehole
Open. Decided to Pump fuel
of Grout And let it Set. Will have
To drill out Tomorrow

11-24

Roll	Depth	Ran	Rec	Loss	Gain
18	49.2	0.8	0.8		
19	50.8	1.6	1.4	0.2	
20	51.4	0.6	0.6		

0815 Low PID Reading pulled N Rods
~~And set 2½" pvc~~ SLO

1440 Jim Gammon called. Just found out that the elevator is down. Will call back

1450 Jim Gammon called. Repairman is on the way. Does not want us to climb out on the ladder. If we have to need to call Midget Fire Department here.
grout used 6 bags portland

1500 Standby for grout to set

1800 Elevator still down. Stuck in lower tunnel.

1845 Herb called: cannot fix elevator. He is calling Fire Dept. Will call back

1930 Climbed out of tunnel
Left site

Larry DeMuth

Time Lost from Elevator

11-24	1220 - 1930		
11-21	630AM	9AM	2½
11-20	8 Hrs		
11-19	8 Hrs	Sunday	
11-17	8 Hrs		
11-16	8 Hrs		
11-15	8 Hrs		
11-14	8 Hrs		
11-13	8 Hrs		
11-9	8 Hrs		
11-8	11:00 - 330		4½
11-7	1400 - 1600		2
11-1	7:00am	8:00AM	1
11-1 power out	11:00 - 1740		6¾

11-26-00
1700 Called Tunnel
Both Elevators still down
Operator said to call Gammon on Monday around 8 AM.

Larry DeMuth

11-27-00

0800 Called Jim Gammon - No answer
Left page

0840 Called Jim Gammon - No answer
Left page

0848 Called Tunnel talked with
operator (Alex). Alex said Elevator
Repairman signed out keys at 730 but had
not shown up at Tunnel. Gave him my
Telephone number. Said he would call
when he found out anything

0945 Paged J. Gammon again.

1005 Gammon called I was out.

1055 Paged J. Gammon Again

1050 Paged J. Gammon Again.

1055 gammon called, He cannot
find out anything about the Elevator over
the Telephone. He is going to drive up and
will call when he finds out.

1150 Gammon called. Repairman taking
Brake shoes off. out of service. will
fix tomorrow. called Lance

1200 Called Everts.

11-28

800 gammon will call when Ready
waited All day for call

1600 Called Gammon No answer

1630 called gammon. he said
Elevator will be Ready About
9-10 Am. Called everyone
and let them know

11-29-00

0800 Picked up Keys AT FiSC
L. DeMoss L. Williams S. Toma
B. Sheldon H. Holmes

0830 AT Adit 5. called gaging station. Operator said he had not seen operator

1000 called J. Gammon No answer

1025 got in touch with gammon.

1025 Repairman here. said should be ready around 1230.

1500 Repairman said he cannot get it repaired. will only run if he operates it

1530 Gammon called. will arrange for us to move out tomorrow. said he will call when he knows anymore. I called everyone to let them know

Jay Dunn

L. DeMoss L. Williams
B. Sheldon H. Holmes 1130

0700 waiting for J. Gammon to call

0900 called J. m Gammon. No word yet on when repairman can be there

0935 Gammon called Repairman (Scott) will be at tunnel around 1030. I called everyone.

1000 Picked up Keys at FiSC
Talked with J. gammon. M. Garnett. They said to move out and go to Adit 3. move in to tank 6. Talked with Herb. he will have train and hoist for us at 10 AM tomorrow

1035 started moving out of lower tunnel to Adit 6. Scott stayed with Elevator to make sure it runs,

1500 got every thing out of lower tunnel. hole at 19 grouted to surface and protective cap screwed on. working on organizing equipment for

11-30

TOMORROW.

1530 Drill crew left site to pickup Boomtruck.

1630 Drill crew back with Boomtruck

1700 Left site

1730 Talked with Jim Gammon Told him everything went ok he wants to start on tank 15 and work toward #1.

Loyd on Bernie with civil mechanical J. A Jones management Big Boss David Gray.

Larry Dem

12-1

L. Demoss

0630 Picked up keys at Fisc

0700 At Adit 6 to load equipment

L. Demoss L. Williams H. Holmes B. Sheldon

Train setup for 10:00 AM

0715 Started loading equipment and moving to Adit 3

Moved 2 loads into lower tunnel to tank 15

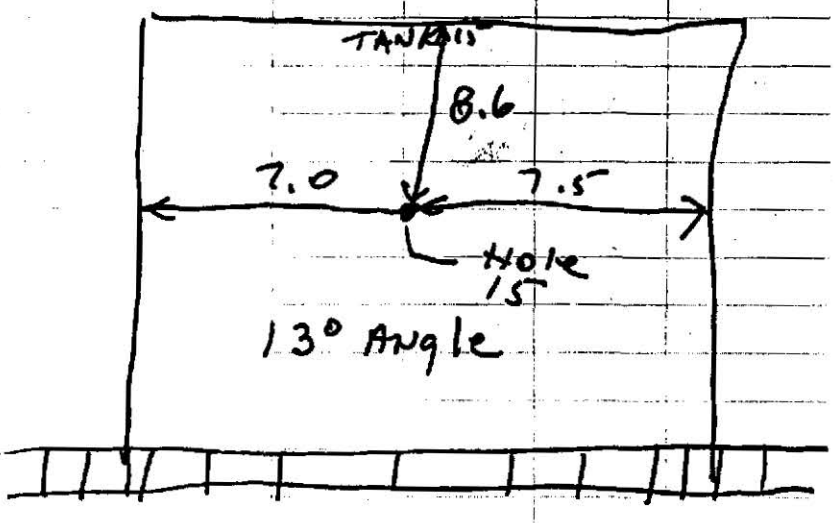
1530 Came out to get the last load and pipe train was in the way. Pipe crew said they would be out soon. waited until ~~500~~ 1700

1730 Left site will take last load in 12-2

Larry Dem

12-2

0630 AT FESG TO get Keys
0650 ARRIVE AT Adit 3
L. Demoss C. Williams
B Sheldon H Holmes
Moved The Rest of The
Equipment in And set
up AT TANK 15



1200 Started Drilling.
Drilled H casing to 2 ft
Cored The concrete out of The
casing.

TANK 15

12-2

Poll	Depth	Ran	Rec	Loss	Gain
1					
	4.3	4.3	2.2	2.1	
2	6.3	2.0	0.6	1.4	
	Soft				
3	7.8	1.5	1.8	0	0.3

Reamed H casing to 7.8
1620 Installed 6 feet of
Sch 80 steel casing and
grouted in place using
cement grout 1 bag portland

1500 Came out of tunnel
cars had been broken
into called operator
let him know had to
leave my car on site
No keys
1530 Left site

12-21 TANK 15

L Demoss B Sheldon H Holmes
L. Williams S. Toma

0630 Pick up Keys AT FISC
0700 AT ADIT 3 gate.
0735 AT Drill
0800 Started Drilling. Drilling H core, will make 2 or 3 runs To see if Borehole is clean or Dirty. No odor or PID Reading At 12.8 poll. Changed to N core, Rock Broken up. Making Short runs
1515 Called Base police About Cars being Broken into He said No Report needed Nothing stolen or damaged
1655 finished The hole cleaned up Around the hole put in Drum
1705 Rode the Train out to ADIT 3 Pipe crew left Train on Track we had to walk from well out.
1730 outside AT cars
1755 Turn in Keys AT FISC

TANK 15 12-Y

Poll	Depth	Run	Rec	Loss	Gain
4	9.8	2.0	2.0		
5	12.8	3.0	3.0	No odor or PID	
Changed over to N core					
6	13.9	1.1	1.1		
7	17.9	4.0	3.7	0.3	
8	19.5	1.6	1.1	0.5	
9	23.7	4.2	4.1	0.1	
10	27.9	4.2	4.0	0.2	
11	32.3	5.4	5.2	0.2	
12	35.5	2.2	2.1	0.1	
100% DWL AT Begining of Run					
13	40.4	4.9	4.6	0.3	
50% DWL During Run					
14	45.5	5.1	5.1		
15	50.5	~~4.65.0~~	5.3		0.3
16	55.8	5.3	5.2	0.1	
17	61.1	5.3	5.3		
100% DWL AT Begining of Run					
18	65.5	4.4	3.1	1.3	
Soft Drilling					
19	70.7	5.2	5.0	0.2	
Soft Drilling 68.9-69.1 open cave					
20	75.9	5.2	5.2		

TANK 15

12.4

Pull	Depth	Ran	Rec	Loss	Gain
21	81.1	5.2	5.2		
22	86.2	5.1	5.1		
23	91.0	4.8	5.0		0.2
24	96.2	5.2	5.2		
25	101.3	5.1	5.1		
26	106.5	5.2	5.2		
27	111.7	5.2	5.2		
28	116.9	5.2	5.2		
29	122.1	5.2	5.2		
30	126.4	4.3	4.3		

Bottom of Hole 126.4
100% DWL

L. Domiss L. Williams
S. Tomm B. Sheldon H. Holmes 12.5

0630 Pick up Keys at Fisc
0700 At Adit 3
0730 At Drill Rode in on train
0735 Health And Safety Meeting
0800 Installed 1½" well
Jim Gammon called will talk
to Glenn Y. About which
hole to move to. If we do not
hear from him we will move
to Tank 13 or 14
0805 Well 1½ inch Sch 80 PVC
15 feet screen. Screened
Across Lower Clinker Zone
And Rock at Bottom of the
boring very fractured.
0810 Started pulling Rods out of the
hole.
0900 J. Gammon Called. He talked
with Glenn Y. Said to move to
Tank 13 or 14
1100 Moved to Tank 14 And Started
Setting up Drill
1130 Started Drilling
Drilled Hc Casing in 8.0 feet

12-5 TANK 14

Then cored H Core to 8.3

1325 Installed steel protective cover using FASTSET GROUT

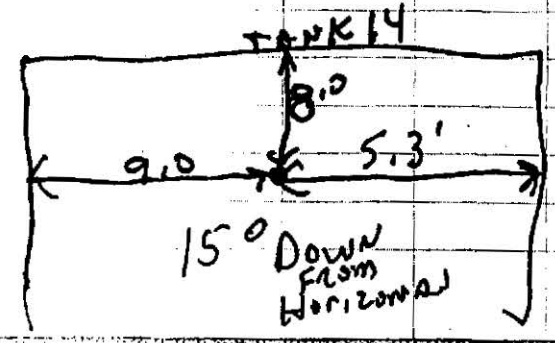
Let grout set

1540 Started drilling

1700 Rode train out

1715 Left site

Returned keys to FISC



TANK 14 12-5

Pull	Depth	Ran	Rec	Loss gain
1	3.0	3.0	0.4	2.6
	Concrete 0.0-3.0		Sand 3.0-6.0	
2	8.3	5.3	4.0	1.3
3	10.2	1.9	1.8	0.1
4	15.4	5.2	5.2	No odor No PID Reading

Changed to N core

L. Demoss L. Williams S. Toma

12-6 B. Sheldon H Holmes TANK 14

0630 Pickup Keys at FISC

0700 Arrive at Adit 3. have to wait on Train

0740 Arrive at Drill. Changed Tool over to N core

0840 Began Drilling
fuel odor at 26 ft – 61-62 ft

0945 Took sample at 35 ft

11:05 Took sample at ~~61 ft~~ 60.5 + Dup

1235 Took sample at 75.0

1400 Took sample 96.0

1525 Took sample 116.0

Borehole had no clinker zones
~~or about Tubes 32.0~~

1630 Finished The hole
Left Drill. Rode Train out to Adit 3

1700 Left site
Turned in Keys at FISC

Jerry Dr

TANK 14 12-6

Pull	Depth	Run	Rec	Loss	gain
5	20.3	4.9	4.9		
6	25.4	5.1	5.2		0.1
7	30.7	5.3	5.2	0.1	Light fuel odor
8	36.0	5.3	5.2	0.1	Light fuel odor
9	41.1	5.1	5.2		0.2 fuel odor
	50% DWL				
10	46.1	5.0	5.1	Gain 0.1	Strong fuel odor
11	51.1	5.0	5.0		fuel odor
12	56.2	5.1	5.1		fuel odor
13	61.4	5.2	5.2		fuel odor
14	66.6	5.2	4.8	0.4	No fuel odor
↑100% DWL at Beginning of Run					
15	71.1	4.5	5.1		0.6 fuel odor
16	76.2	5.1	5.1		Slight old fuel odor
17	81.5	5.3	5.2	0.1	No odor
18	86.0	4.5	4.6		0.1
	Strong fuel odor @ 85				
19	91.2	5.2	5.2		Strong fuel odor
20	96.3	5.1	5.1		Strong fuel odor oily
21	101.4	5.1	5.1		Strong fuel odor & oily
22	106.6	5.2	5.2		fuel odor
23	111.8	5.2	5.2		Slight fuel odor

12.6

TANK 14

Pull	Depth	Ran	Rec	Loss	gain
24	117.0	5.2	5.2		fuel odor + oily
25	121.9	4.9	5.0		fuel odor oil
26	127.2	5.3	5.1	0.2	slight fuel odor
27	133.4	6.2	5.3	0.9	strong fuel odor
	128.5 -		128.9.		open end
	Bottom of hole				~~133.4~~
	1007 DWL				136.0

Jerry Dr

136.0
5.3
130.7
20.0
110.7

136.0
5
131

132.5

138
129
5.5
134.5
138
5.5
132.5
20
112.5

L. DeMoss L. Williams
B. Sheldon H. Holmes M. Bigelow 12-7

0545 TALKED WITH KENT EVETTS
WANTS A SUMP ON the well
and 20 feet of Screen
0630 picked up keys AT FISC
0700 ARRIVE AT ADIT 3 WAIT ON TRAIN
0730 get ON TRAIN
0750 ARRIVE AT Drill
0800 Put BAILER inside Rods
NO Liquid inside rods
0830 Need to MAKE ANOTHER
RUN.
Oily zone 116

Pull	Depth	Ran	Rec	Loss	gain
28	136.0	2.6	2.6	strong fuel odor	

0900 Pulled Rods out to install
well
0935 STARTED INSTALLING well
2" PVC
SUMP + Point 136.0 - 130.7
SCREEN 130.7 - 110.7
RISER 110.7 - 0.0
Bentonite SEAL 15.4 - 14.5

12-7

1030 finished Installing way
waiting on train to take us
out to Decon.

1200 Loaded train and went to
Adit 3 to Decon

1230 at Adit 3 Built Decon pad
Deconed Rods & tools
Loaded Rods & tools on train
and carried them back to
The hole

1500 Arrive back at TANK 14
Moved Equipment to TANK
13. Cleaned up at
TANK 14 put cuttings in 55 gal Drum

1700 Got on train to get out

1730 Left Site
Droped off Keys at F.S.C

Larry Davis

TANK 13

12-8

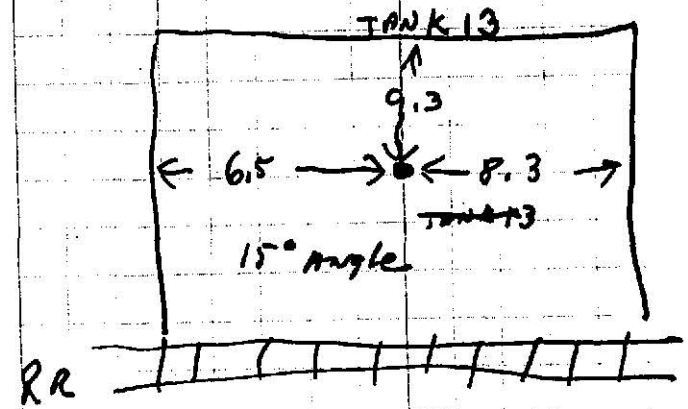
L. DeMoss L. Williams
B Sheldon H. Holmes

0630 Pick up Keys at FSC

0700 Arrive at Adit 3. have
to wait on train

0730 Train comes out. we load up

0780 Arrive at TANK 13.
Set up Drill Rig at TANK 13
15° Angle



Had to move the hole out from
The Back wall Because of electric
TANK valves.

0800 Started Drilling. Reaming in
H casing. Ran H casing to
3 feet. The Sand under The concrete
floor had very strong fuel odor
Drill water had filmon it

1-17-01 TANK 8 + 7

Rods. Hole caved AT 100 feet
will have TO clean OUT the
hole TO the Bottom.

1030 got the Rods TO the Bottom
And INSTALLED A 1½" PVC
Well.
5 foot sump 127.2 - 122.0
15 feet screen 122.0 - 107.0
Riser 107.0 - 0.0

1045 Began pulling Rods
Rods OUT, INSTALLED Bentonite
Seal 16.0 - 14.0
moved EQUIPMENT TO TANK 7
And set up

1300 STARTED Drilling H CASING
ON TANK 7

1330 Drilled through the Floor
Slab. Sand Layer had fuel
Odor TOOK A Sample
PID 1.8 Drill water Lost
under slab

1500 got well cover INSTALLED
PUT grout inside CASING ON
MW 8

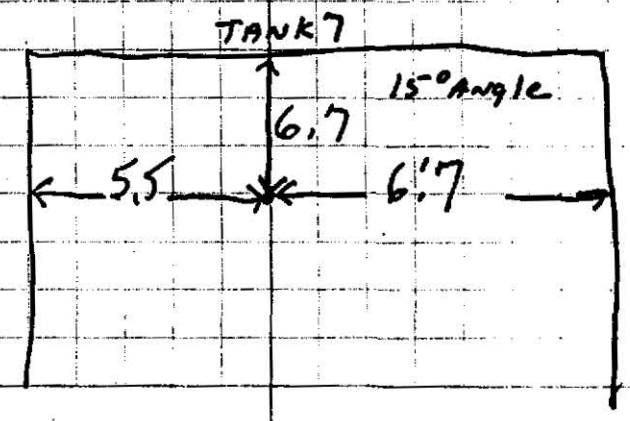
TANK 7 1-17-01

PULL	Depth	RAN	Rec	Loss	gain
1	2.0	2.0	2.0		
	CONCRETE 0.0 - 2.0				
	Sand 2.0 - 4.0				
2	7.0	5.0	1.8	3.2	P.I.D 0.7
	Soil 2.0 - 5.0				

1530 TOOK Rods + TOOLS TO Ad IT S
TO Decon

~~1600~~ 1645 Finished Decon. PUT Decon fluids
IN 55 gallon Drum. will Dump
Drum in Lower TUNNEL TRENCH
when Full

1700 Left site
Returned Keys TO FISC



1-18-01 TANK 7

0630 Pick up keys at FISC

0700 Arrive at Adits

L. Ormoss G. Gleason

K. Barker T. Feilen

0739 Started Drilling

Drill crew got plugs for us, plug to fit socket on beam so we could have lights

0900 M. Bigelow arrived

0940 Drilled casing (4 rods w/shoe) to 13.3 to keep broken rock from caving in and get Drill water return.

1050 Took sample @ 25.9-26.5 PID 110.2

1500 Drilling going well. Drill water still lost.

1540 Stoped work operator said they have a scheduled power outage at 4 pm

TANK 7

1-18-01

Pull	Depth	RAN	Rec	L+G	PID
3	8.7	1.7	0.8	L 0.9	0.0
4	100% DWL		concrete		
4	13.3	4.6	3.0	L 1.6	0.0
	soft	8.7-	10.5		
	Changed to N core				
5	13.7	0.4	0.4	100% DWL	0.0
6	17.6	3.9	3.8	L 0.1	0.0
7	22.7	5.1	5.4	G 0.3	0.0
8	25.9	3.2	2.7	L 0.5	0.0
9	32.1	6.2	5.0	L 1.2	110.2
	Took sample 26.0				
10	35.4	3.3	0.4	L 2.9	57.1
	Inner barrel did not latch				
	Pulled rods out Recovered 3.7				
	PID reading low. Core had been				
	washed while inside rods				
10	35.4	3.3	4.1	G 0.8	1.1
11	40.5	5.1	5.1		0.0
12	45.7	5.2	5.3	G 0.1	26.3
50% DWL at end of run					
13	50.9	5.2	5.2		12.0
	DWL while drilling 50%				
	DWL after rods stoped				

1-19-01 TANK 7

Pull	Depth	Ran	Rec	L+G	PID
14	56.0	5.1	5.2	G0.1	0.6
15	61.3	5.3	5.0		0.0
16	66.6	5.3	5.1	L0.2	
17	71.6	5.0	5.2	G0.2	
18	73.7	2.1	2.0	L0.1	
19	78.7	5.0	5.1	G0.1	0.3
20	82.8	4.1	4.0	L0.1	0.3
21	87.8	5.0	5.1	G0.1	0.4
22	93.1	5.3	5.2	L0.1	0.6
23	98.3	5.2	5.2		6.6
1-19-01					
24	102.8	4.5	4.4	L0.1	0.0
25	107.8	5.0	5.0		9.3
	TOOK SAMPLE				47.0
26	112.8	5.0	5.2	G0.2	~~15.4~~
	TOOK SAMPLE				
27	118.0	5.2	5.2		15.2
28	120.0	2.0	2.0		15.4
29	125.2	5.2	5.2		36.9
30	128.9	3.7	2.5	1.2	26.0

Bottom of hole 128.9
100% DWL

TANK 7 + 6 1-19-01

0630 pickup keys at FISC
0645 Arrive at Adit 5
0710 Arrive at Drill
L. Demoss G. Glenson M. Bigelow
T. Feiler K. Becker
0725 Started drilling
0850 Rods vibrating Drilling slow
115 feet.
1035 finished coring @ 128.9
hole has a lot of loose zones
we will install 1½ inch
well.
1100 got pipe in the hole, pulling
rods out.
5 foot sump 128.9 - 123.6
15 feet screen 123.6 - 108.6
Riser 108.6 - 0.0
1200 Finished at hole 7.
move to Tank 6
put Bentonite seal in
MW 7 - 13.3 to 10.0
Setup drill at Tank 6
1325 Started reaming to
casing

1-19-01 TANK 6

Drilled through the Floor SLAB. Sand layer hard STRONG fuel odor. got SAMPLE of Sand and Also got sample of product PID Reading in hole is >8.0

TOOK Sample Black oily Liquid

Pull	Depth	Ran	Rec	L+G	PID
1	2.0	2.0	2.0		
2	7.0	5.0	1.0	4.0	132.0

0.0-2.0 concrete

2.0- Sand & gravel

1645 ~~[illegible]~~ Jim

Installed protective cover

TANK 6 1-22-01

0630 pick up keys at FISC

0700 Arrive at Adits

0720 Arrive at Tank 6

L. Demoss G. Gleason M. Bigelow T Feeler K. Becker

0740 took rods outside adits to Decon

0905 Finished Decon and took tools back to Tank 6

0830 J Gammon stoped by to check on progress and tell us that someone would be by Around 1300

0910 started Drilling

0915 Took PID Reading at 13.0 163 ppm Took Another Reading @0916 3.5 ppm.

1055 Took PID Reading @ 17.0 feet 193.0 Took sample

1100 hole caving in Ran casing in to 18.5

1210 hit Lava Tube at 32.5-34.1 pulled rods up to 32.5 Ran Bailer down to check for fuel

1200 No fuel in Boiler. Also no water.

1230 Started Drilling

1430 hydraulic line on the Drill Rig has a Leak. Drill crew took it off

1530 left site

I took Drill crew to get hose and pickup supplies

Jay Pike

TANK 6

Pull	Depth	Raw	Rec	grain loss	1.2204 PID
3	8.6	1.6	1.3	L 0.3	0.6
4	11.3	2.7	2.4	L 0.3	0.0
5	16.5	5.2	5.2		163.0
	changed to N core				
6	16.6	0.1	0.4	G 0.3	
7	19.5	2.9	2.2	L 0.7	193.0
			took sample		
8	21.7	2.2	2.2		121.0
9	26.1	4.4	4.3	L 0.1	21.0
10	30.9	4.8	4.7	L 0.1	40.0
11	37.3	6.4	4.5	L 1.9	65
	32.5	34.1	open cavity		
12	42.6	5.3	5.2	L 0.1	42
13	46.9	4.3	4.5	G 0.2	66.7
14	52.3	5.4	5.2	L 0.2	40.
15	57.5	5.2	5.2		65.0
16	62.9	5.4	5.3	L 0.1	26.0
17	68.2	5.3	5.2	L 0.1	16.0

1-23-01 TANK 6

0630 Arrive at FISC pickup keys

0700 Arrive at ADJS
L. DeMoss G. Gleason
M. Bigelow K Becker T Fellon

0710 Arrive at TANK 6. Drill crew fixed Drill

0725 Started Drilling
Rods vibrating Drill water lost having to rotate rods very slow.

0820 Drill head leaking oil
Drill crew stoped to fix

1145 Drill crew tried to fix
crew unable to fix. Shaft threads broken.

1310 Drill crew got Drill repaired and started Drilling
Rods vibrating, Drilling slow

1700 Stoped Drilling for the day

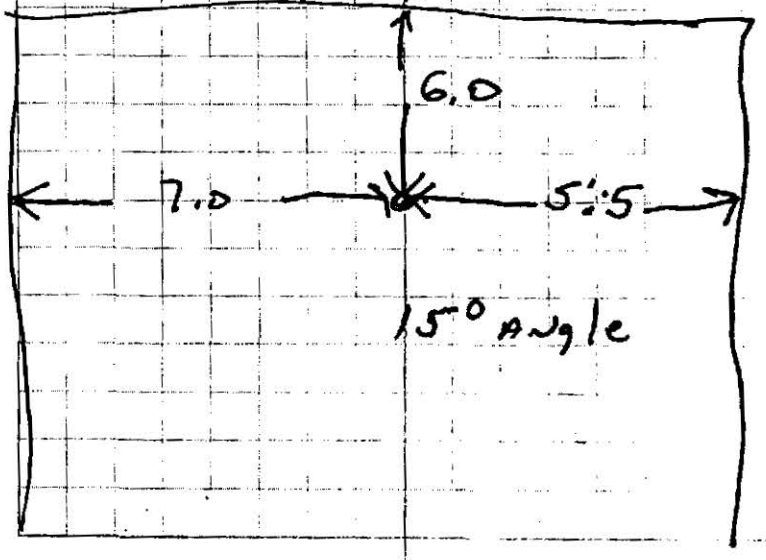
1745 Left site
Dropped of Keys at FISC

TANK 6

1-23-01

Poll	Depth	Ran	Rec	L+G	PID
18	73.0	4.8	4.9	G 0.1	25.0
19	77.7	4.7	3.9	L 0.8	25.0
20	82.1	4.4	5.3	G 0.9	0.3
21	87.1	5.0	5.1	G 0.1	16.8
22	92.2	5.1	4.7	L 0.4	30.1
23	96.9	4.7	5.2	G 0.5	10.1
24	102.2	5.3	5.2	L 0.1	3.0

TANK 6



1-24-01 TANK 6

0630 Pick up Keys at RSC

0650 Arrive at Adit 5

L. DeMoss G. Glenn

M. Bigelow K. Decker T. Fuller

0700 Arrive at Tank 6

0710 Started Drilling

Rods vibrating. Drilling slow

0945 J. Gammon, Glenn Y, & Kent Eutis stoped by, Talked about what we were finding and about vertical well.

1040 Inner barrel did not lock in. Will have to pull rods out to get core out of the rods.

1100 Rods out of the hole

Tried to install 1½" well in open hole. Would not go hole caved in at 60 feet

put rods back in the hole, cored 1 foot to clean out the hole.

TANK 6 + TANK 5 1-24

Pull	Depth	Ran	Rec	L+G	PID
25	107.1	4.9	5.2	G 0.3	0.9
26	112.3	5.2	5.2		17.8
27	117.8	5.5	5.2	L 0.3	12.2
28	123.1	5.3	1.1	L 4.2	
29	125.4	2.5	1.7	L 0.8	0.0
30	125.6	0.0	2.5	G 2.5	
31	126.6	1.0	1.0		10.0

Bottom of the hole 126.6

100% DWL

1200 Installed 1½ inch well through rods

5 foot sump 126.6 - 121.3

15 foot screen 121.3 - 106.3

Riser 106.3 - 0.0

1205 Started pulling rods

1330 Finished pulling rods. Moved equipment to Tank 5. Installed Bentonite seal on MW6 16.5 15.0

1-24-01 TANK 5

Setup Drill & Equipment

1410 Started Drilling

Reaming & casing, Drilled

Through the Floor Slab

1445 Pulled out casing, Sand

Layer under concrete hard

No fuel odor PID Reading

of hole 19.0

Put Rods back in the hole

And Drilled to 7.6

Pulled tools out of the hole

And installed Steel

protective cover

Filled protective cover with

grout on MW6 & MW7.

1700 Left site

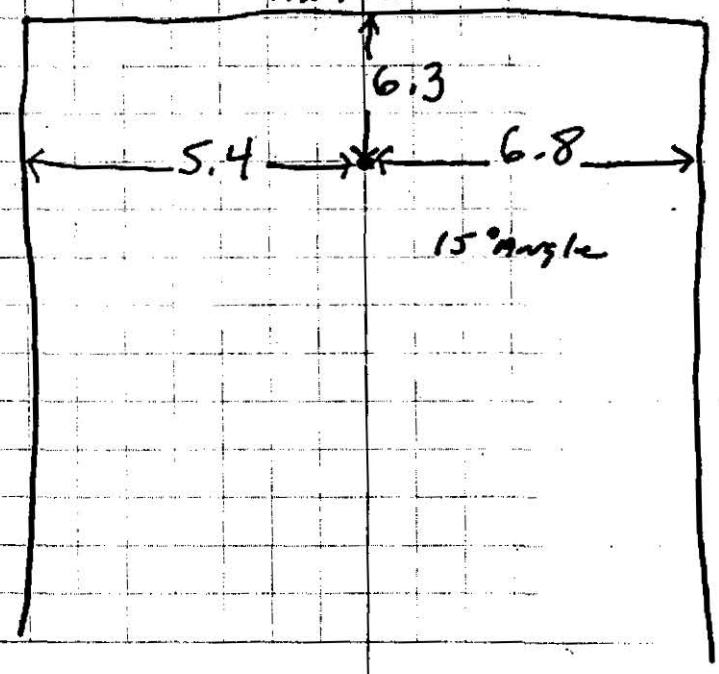
Returned keys to F.S.C.

Larry D

TANK 5 1-24-01

Pull	Depth	Ran	Rec	Lab	PID
1	3.0	3.0	2.0	L 0.0	19
	0.0 2.0 concrete				
	2.0- Sand				
	100% DRDL under Floor Slab				
2	7.6	4.6	1.3	L 3.3	46

TANK 5



1-25-01 TANK 5 STA 81+48

0630 pickup keys at F&SC

0650 Arrive at Adit 5

L. Demoss G. Glenson

K Becker T Feilen

0700 Bring Rods & Tools out to Adit 5 to Decon

Finished Decon And carried Tools & Rods Back to Tank 5

0825 Arrived at Tank 5

Started Drilling

0910 Drill head Leaking oil

Stoped Drilling

0950 Drill fixed started Drilling

1200 wireline cable Broken

Drill Down.

1235 got Drill Repaired started Drilling

1255 Lost Drill Water

1340 Drill head Losing oil stoped Drilling

TANK 1-25-01

Poll	Depth	RAN	R-C	L+G	PID
3	12.3	4.7	4.7	Gain 0.0	72.0
		Took Sample			
4	17.6	5.3	5.2	L.0.1	63.1
		Changed TO NCORE TOOK SAMPLE			
5	22.6	5.0	5.2	GAIN 0.2	43.0
6	23.7	1.1	1.2	GAIN 0.1	14.3
7	28.0	5.3	5.2	L.0.1	142.8
8	30.6	1.6	1.6		14.2
9	35.1	4.5	4.4	L 0.1	23.3
10	40.1	5.0	5.2	Go.[illegible]	75.6
		100% Dust During Rod			
11	44.6	4.5	4.1	L 0.4	55.0
		31.0	32.0	soft	
12	50.0	5.4	5.4		14.9

1-26-01 TANK 5

0630 PICK UP KEYS AT F.S.C.

0640 ARRIVE AT ADIT 5

0700 ARRIVE AT TANK 5

L. DeMoss G. Gleason M. Bigelow

T. Feiler K Becker

Drill crew puting drill Back Together

0730 GOT Repaired And started drilling Drilled RUN 13. Trying to Retrieve inner Barrel. Retrieve NOT working properly.

0830 GOT high Reading of 26.2 AT 55.0 feet. NO odor TOOK sample

1050 Operator Al stoped by. Elevator Broken. Will Keep US informed.

1400 Drilling slow Rods vibrating Because of water loss.

1500 operator Al said Elevator ok

1510 Inner barrel did NOT Lock in. RAN 5.0 NO Recovery. Will have To pull Rods out to get core out of The Rods.

TANK 5 1-26-01

Pull	Depth	RAN	Rec	L+G	PID
13	54.8	4.8	5.2	G 0.4	52.0
14	60.1	5.3	4.9	L 0.4	103.0
~~15~~	RH-Be-5-503		TOOK Sample		262.0
15	65.0	4.9	5.1	G 0.2	33.0
16	70.2	5.2	5.2		308.0
	High PID NO odor				
17	75.6	5.4	3.6	L 1.8	
18	76.4	0.8	2.6	G 1.8	26.0
19	78.0	1.6	1.6		8.5
20	83.2	5.2	4.8	L 0.4	36.0
21	88.2	5.0	5.3	G 0.3	208
22	93.4	5.2	4.0	L 1.2	
23	97.2	3.8	5.1	G 1.3	35
24	101.1	3.9	4.2	G 0.3	175
25	106.6	5.5	4.5	L 1.0	31
26	111.6	5.0	1.9	L 3.1	
27	111.8	0.2	0.2		
28	114.0	2.2	2.2		308.0
	No fuel odor TOOK Sample				
29	119.2	5.2	5.2		173.0
	TOOK Sample				

1-26-01 TANK 5
1650 Stoped Drilling for the day
1705 Left Drilling
1730 Left Site

Gary Dhm

TANK 5 + TANK 4 1-29-01

0630 Pick up Keys @ FISC
0645 Arrive at Adit 5
0730 Arrive at TANK 5
Health + Safety Meeting
L. Damass G. Glanton M Bystrom
K. Becker J Eilen
0725 Started Drilling
Rods vibrating Badly. Drilling slow. Stoped hole at 124.3
0810 Started pulling out rods. will try to install a two inch well through the open hole.
Installe 2 inch well.
5 foot sump 124.3-119.0
15 foot Screen 119.0-104.0
Riser 104.0-00
0840 Started taking Equipment apart to move
Moved to TANK 4. Got Equipment set up
1035 Started Drilling
Reaming in Casing

1-24.01 TANKS & TANK 4

Pull	Depth	Man	Rec	L+G	PID
30	124.3	5.1	4.8	L0.3	104

No fuel odor or visual signs of fuel

Bottom Hole 124.3

100% DWL

TANK 4

Pull	Depth	Man	Rec	L+G	PID
1	2.5	2.5	2.0		308

concrete - 0.0 2.0

weathered sand

2	7.0	4.1	2.0	2.5	95

Drill water had light sheen while drilling

3	8.2	1.2	1.0	L0.2	294

took sample string fuel odor

4	11.2	3.0	3.0		180
5	15.6	4.4	3.9	L0.5	

12.1 - 13.5 soft 100% DWL

Changed to N core set N casing

6	16.2	0.6	0.6		225
7	21.3	5.1	5.1		26

Reamed N casing to 21.5

100% DWR

TANK 4 1-29-01

1110 Drilled through the floor removed concrete took reading of the hole 308 ppm. No fuel odor. Took sample of sand & soil

1120 Started drilling removing casing & coring. Drill to 7.0 feet. Removed the drill rods and casing from the hole. Filled the hole with FastSet cement and installed the casing.

1230 Got finished installing protective cover, took tools to ADIT 5 to decon

1430 Finished decon. Took tools to TANK 4.

1435 Started drilling. Drilled to 12.1 100% DWL. Drilled to 13.6 w/ N core. Changed to N, drilled to 21.3 then reamed N casing to 21.5 to get drill water return

1710 Left drill site

1-30-01 TANK 4

Pull	Depth	RAN	Rec	L+G	PID
8	25.7	4.4	4.3	L 0.2	308
			NO ODOR		
9	30.5	4.8	5.1	L 0.3	308
	Pulled Flange on core				No fuel odor
10	35.7	5.2	5.2		
11	40.5	4.8	4.8		191
	100% DWL		Recal. PID		
12	45.6	5.1	5.1		465
	50% DWL		DURING	RUN	No fuel Odor
13	50.9	5.3	5.2	L.01	465
14	56.0	5.1	5.1	No fuel odor	120.1
15	61.1	5.1	5.1	"	47.1
16	66.4	5.3	4.3	L 1.0	465
				NO ODOR	
17	70.7	4.3	5.2	G 0.9	37.5
18	75.9	5.2	5.2	No odor	46.5
19	81.0	5.1	5.1	No odor	51.7
20	86.3	5.3	5.2	L 0.1 No odor	66.1
21	87.7	1.4	1.0	L 0.4	142
22	92.8	5.1	5.1	No odor	112.3
23	93.9	1.1	0.3	L 0.8	No odor
24	98.3	4.4	4.3	L 0.1	41.7

TANK 4 1-30-01

0630 pick up Keys at FISC
0645 Arrive at Adit 5
0700 Arrive at TANK 4
L. Dumas G. Glasow
T. Feilen K Becker
Cleaned up cuttings and put in Drum
0730 Started Drilling
0755 got PID Reading of 308 at 25.7 feet No fuel odor or signs of fuel. Did not sample.
0915 Still getting high PID Readings from core. No usual signs of fuel No odor of any kind
0925 At 56.0 feet. Starting Run #15. Rods vibrating Bad Drill water lost. Reamed in Casing in some. Trying to get Drill water return
1300 Drill rods vibrating Drilling slow
1450 Wireline Retriever got hung in Rods at 173.6 feet. Drill Crew had to take AW Rods and push it down. This did not work

1-30-01 TANK 4

Pull	Depth	Run	Rec	Gain Loss	PID
25	103.3	5.0	5.2	G 0.2	50.7 No odor
26	108.6	5.3	5.2	L 0.1	53.2 No odor
27	113.6	5.0	3.5	L 1.5	74.3 No odor

112.1 - 112.9 open cmu

1-31-01

Changed to B core

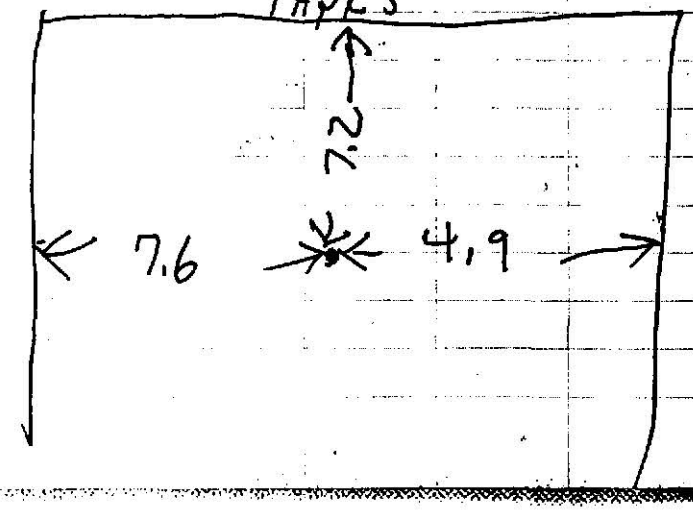
Set B casing 100% DWL

28	118.8	5.2	5.2	No odor	96.4
29	123.9	5.1	5.1	No odor	45.4
30	129.1	5.2	5.2	No odor	91.6

Bottom of Hole 129.1

100% DWL

TANK 5



TANK 4 1-30-01

Had to pull rods out of the hole to get inner barrel to release. Got rods out of the hole. Latch springs broken on inner barrel

1545 Stop to fix inner barrel

1715 Unable to fix inner barrel, left site

1730 Left Adit 5

Returned keys to FESC

Lee Dr

1-31-01 TANK 4
0630 PICKUP Keys AT FSG
0645 ARRIVE AT ADIT 5.
L. DeMoss G. Gleason
T Feiler K Becker
0700 ARRIVE AT TANK 4. Drill
crew Switching to B core
~~Started Drilling~~ PID
Drill crew Does NOT have
A CASING Shoe for B casing
we went BACK to wells
MW6 MW7 MW5 MW8 MW9
And filled with grout.
0915 Finished grouting wells
And filling Anchor holes
with cement.
0940 NO CASING Shoe for N casing
PUT N CASING IN the hole with
OUT A Shoe
1025 Began B coring
1200 Finished B coring
INSTALLED 1½ inch well
5 foot SUMP 129.1 - 123.8
15 feet screen 123.8 - 108.8
Riser 108.8 - 0.0
Bentonite 15.6 - ~~3.0~~ SLD 0.0

TANK 4 + TANK 3 1-31-01

pulling Rods and casing.
finished pulling casing
1411 Moved to TANK 3 and set
UP Equipment
1435 Started Drilling Reaming
H casing Drilled to 2.5
feet. Pulled out casing
got A sample of sand PID
Reading 2.4. Same fuelodor

1-31-01 TANK 3 STATION 29+45

Run	Depth	Ran	Rec	L+G	PID
1	2.7	2.7	1.6		214

0.0-1.6 concrete
1.6-2.7 sand

2 Took sample of sand

2	7.4	4.7	2.0	2.7	65

2.7-3.3 sand 3.3-7.4 concrete
6.0-7.4 Prt filled cav.
100% DWL during run
Removed casing from the hole
Looked back in the hole using
flashlight. Large void in concrete.
Could see face wall under the
floor.

1700 got the steel casing
installed used 2 bags
portland 1/2 bag quick
set

1730 Left site
Returned keys to Fiso

TANK 3 21-01

0630 Pick up keys at Fiso
0645 Arrive at Adit 5
L. Demoss G. Gleason
T. Feiler K Becker
0700 Arrive at TANK 3
Cleaned up cuttings and
put in 55 gallon drum
Deconed rods + tools
0840 Started Drilling
Drilling going good. Still getting
high PID readings but no odor
or visual sign of fuel. Lost
Drill water in cavity at 60 feet.
No sign of product in cavity.
Rods started vibrating at 80
feet. hooked hose to top of casing
to let water run down the inside
of the casing to help reduce rod
vibration.
1340 Inner barrel stuck on 100
foot run. Drill crew used A rods
to try and release it. Got inner
barrel released. Screw came
out of one of the springs.

2-1-01

Poll	Depth	RAN	Rec	Loss Gain	PID
~~2~~	~~8.6~~	~~1.7~~	100% DNR		Slight odor
3	7.9	0.5	0.7	G0.2	244.6
4	9.7	1.8	1.9	G0.2	151.2 slight odor
5	10.4	0.7	0.7		346 No odor
6	14.1	3.7	2.3	L1.0	228 No odor
	Changed TO	N core			
7	17.9	3.8	4.8	G1.0	240.7 No odor
8	~~22.6~~ 22.9	5.0	5.0		327.0 No odor
9	27.6	4.7	5.1	G0.4	51.2 No odor
10	32.6	5.0	5.2	G0.2	82.4 No odor
11	37.8	5.2	4.9	L0.3	62.9 No odor
12	42.9	5.1	5.0	L0.1	54.3 No odor
13	47.3	4.4	4.4		189.2 Light fuel odor
			TOOK SAMPLE		
14	52.5	5.2	5.2		82.4 No odor
15	57.7	5.2	5.2		40.1 No odor
16	61.1	3.4	2.5	L0.9	9.9 No odor
	60.0-61.1 OPEN CAU				
	100% DWL				
17	66.5	5.4	5.2	L0.2	66.7 No odor
18	71.1	4.6	4.5	L0.1	71.4 No odor

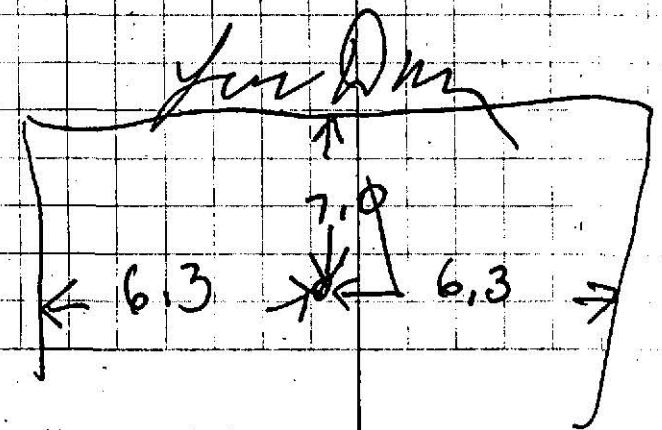
2-1-01

Poll	Depth	RAN	Rec	Loss Gain	PID
19	75.5	4.4	4.5	G0.1	15.6 No odor
20	80.6	5.1	4.8	L0.3	50.1 No odor
21	85.7	5.1	5.2	G0.1	2.6 No odor
22	90.9	5.2	5.2		50.8 No odor
23	96.0	5.1	5.3	G0.2	22.9 No odor
24	100.6	4.6	4.3	L0.3	8.7 No odor
25	106.4	5.8	2.7	L3.1	
		Stop			

Inner Barrel Stuck Again

1715 Unable to get Barrel out
Left Tank 3

1730 Left site
Returned Keys to F.S.C
Went to Homedepot to
get supplies



2-2-01 TANK 3

0630 Pick up Keys AT Fisc
0700 ARRIVE AT ADIT 5
0715 ARRIVE AT TANK 3
L. DeMoss G Gleason
T. Feiler K. Bicken
Drill crew started pulling Rods OUT of the Hole to get INNER BARREL OUT
0845 got BARREL OUT, INNER BARREL Bolts ~~cam~~ had come out and Locked INNER BARREL in, Drill crew Rebuilt it
1020 Drill crew putting Rods BACK IN The hole
1040 STARTED Drilling
1038 calibrate OVM 97.8 Used ISOBUTYLENE 100 PPM TO CALIBRATE
1045 Driving slow Rods vibrating
1340 finished Drilling on TANK 3
1440 got Rods out of the hole, Tried to put well in open hole hole caved in AT 115 feet, put Rods BACK in The hole and Drilled to BOTTOM

TANK 3 2-2-01

Pull	Depth	Ran	Rec	Gain Loss	PID
26	110.5	4.1	4.4	G 0.3	4.4
27	111.9	1.4	1.3	L 0.1	38.1 no odor
28	116.9	5.0	5.0		16.1 No odor
29	119.6	2.7	2.3	L 0.4	3.0 No odor
	119.4		119.6	0.0 NEAR	
30	125.2	5.6	2.8	L 2.8	7.8 No odor
31	130.2	5.0	~~0.9~~ 1.7	L ~~4.1~~ 3.3	33.3 No odor

Bottom of hole 130.2
100% OVM

INSTALLED 1½" well
5 foot SUMP 130.2 - 124.9
15 feet Screen 124.9 - 109.9
Riser 109.9 - 0.0
~~Cold wood~~ SLD

JLD PULLED Rods OUT, well coming OUT with Rods pulled well out, Then pulled Rods out
1510 Reinstalled well, pulled Rods OUT of the hole. Installed Bentonite Seal 14.0 - 3.0
1545 STARTED MOVING TO TANK 2
1725 LEFT Drill
1730 Left Site

Jay Dean

25-01 TANK 2

0630 Pick up Keys at FISC

0645 Arrive at Adit 5
L. DeMoss G. Gleason
T. Feilen K Becker

0710 Arrive at Drill, finished moving to TANK 2. and started setting up

0840 Started Drilling Reaming H casing

0900 got H casing through Flowsand pulled casing out, pulled concrete core out. Took sample of sand under floor PID 135. cored H size and Reamed H casing to 6.8 feet.

1055 Installed steel protective cover. used 2 buckets fast set Deconed Rods and tools while concrete sets

1320 Started Drilling

1405 changed from H core No odor No signs of fuel changed to N.

1500 Drill shaft cracked. Crew ~~cut~~ stoped Drilling to fix

TANK 2 25-01

Pull	Depth	RAN	Rec	Loss gain	PID
1	2.5	2.5	2.5		135
100% DW	R 0.0-2.0	Concrete	2.0	2.5	sand
					no odor
2	6.8	4.3	3.8	L0.5	71.8
	Installed steel casing				105
3	7.4	0.6	0.5	L0.1	no odor
					131.7
4	9.2	1.8	1.9	G0.1	no odor
					115.6
5	12.6	3.4	3.3	L0.1	NO ODOR
	Changed to N core				
					60.0
6	17.5	4.9	5.1	G0.2	No odor
					45.3
7	20.4	2.9	3.0	G0.1	No odor
					10.0
8	22.9	2.5	2.5		No odor

1700 Drill fixed Did not start Drilling

1730 Left site returned Keys to FISC

Jim Dr

2-6-01 TANK 2

0625 pick up keys at FESC

0645 Arrive at Adits

L. DeMoss G. Gleason

K. Becker T Feiler

0710 Arrive at Tank 2

0730 Started Drilling

0840 Drilling going good No odor in core PID Readings High to medium

1005 Lost Drill water when starting Run 18. Hooked hose to casing. Took water run inside casing and on the outside of the rods. Try to keep rods from vibrating

1157 got PID Reading of 79.7 Core had light fuel odor took sample

Drill rods vibrating. having to drill slower.

1500 Inner barrel came apart inside coreborrel. will have to pull rods out of the hole to get it out.

TANK 2 7-6-01

Run	Depth	Run	Rec	Less than	PID
~~9~~	~~26.5~~				
9	26.5	3.6	3.9	G 0.3	171.1 No odor
			Pulled Flange		
10	31.8	5.3	5.2	L 0.1	59.1 No odor
11	37.0	5.2	5.2		115.2 No odor
12	42.1	5.1	5.2	G 0.1	28.3 No odor
13	42.2	0.1	0.1		
14	47.4	5.2	5.2		85.1 No odor
15	51.6	4.2	4.2		20.3 No odor
16	56.4	4.8	4.8		57.0 No odor
17	61.6	5.2	5.2		80.9 No odor
	100% Dwl at end of run				
18	66.5	4.9	4.8		53.3 No odor
19	71.8	5.3	5.2	L 0.1	23.0 No odor
20	76.9	5.1	5.2	G 0.1	28.3 No odor
21	82.0	5.1	4.8	L 0.3	34.1 No odor
22	87.2	5.2	5.2		30.4 No odor
23	92.3	5.1	5.1		79.7 Light odor
	took sample				C 90.0
24	97.4	5.1	5.2		34.0 No odor
25	102.4	5.0	4.1	L 0.9	41.3 No odor
26	103.7	1.3	1.3		29.5 No odor

2-6-01 TANK 2

Run	Depth	Ran	Rec.	Loss gain	PID
27	107.4	3.7	4.0	G 0.3	58.1 No odor
28	112.4	5.0	4.8	L 0.2	23.9 No odor
29	117.2	4.8	4.2	L 0.6	32.0 No odor
30	117.9	0.7	1.0	G 0.3	36.1 No odor
31	120.9	3.0	2.6	L 0.4	21.2 No odor
32	126.3	5.4	4.3	L 1.1	56.3 No odor
			2.0		

1540 got rods back in the hole and started Drilling

1630 Drill crew stoped to fix Drill. Drill would not go into low gear. Took transmission apart. unable to fix

1745 Left Tank 2

1800 Left site
Returned Keys to fisc

TANK 2 2-7-01

0620 Picked up Keys at Fisc

0700 Arrive at Adit 5
L. Dumoss K Backen
T. Feilen

0721 Arrive at Tank 2
Drill crew working on
Drill transmission

0815 Gary Gleason Arrived at
Tank 2. Drill crew still
working on Drill

~~0830~~ Drill fixed went outside
to take trash and bring
in supplies

1030 Back at Tank 2. Waiting
for gasket to dry

1125 Started Drilling

1210 Inner Barrel did not lock in
Lost 3.1 of core. Sent Inner
Barrel back in retrieved 2
of core. Pulled rods out
to get core out of Barrel,
~~In~~ Got rods out, 2.0 feet
of core in the Barrel.

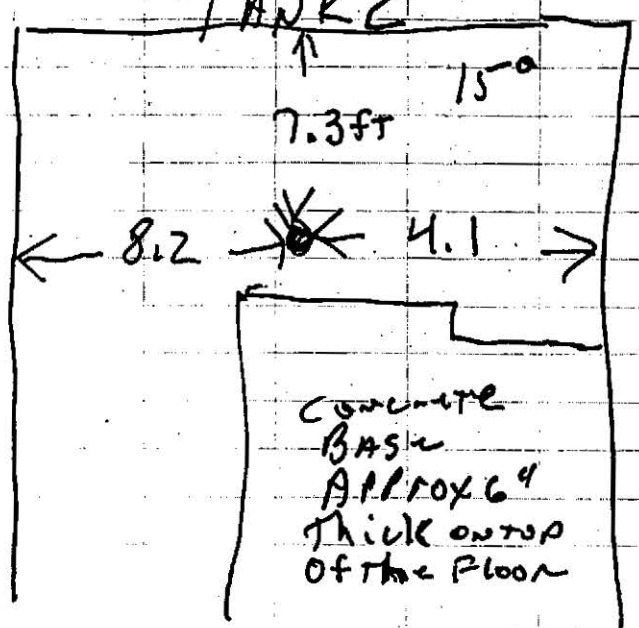
2-7-01 TANK 2 + TANK 1

Installed a two inch PVC well ~~5 foot~~. The well did not go all the way to the bottom of the hole. Well at 124.4 feet

5 foot sump 124.0 - 119.7
15 feet screen 119.7 - 104.7
Riser 104.7 - 0.0
Installed Bentonite Seal 12.6-

1250 Started moving Equipment to TANK 1

TANK 2



TANK 1 2-7-01

1405 Got Equipment Setup and Started Drilling Reaming + Casing

Reamed + casing through the Floor slab. Removed casing and concrete core. Strong fuel odor under Floor PID 330

Sand and soil Black took sample.

Drilled to 7.3 feet with + core. Then Reamed + casing to 7.3. pulled casing out. The hole caved in. had to dig it out. Strong fuel odor coming from hole

Pull	Depth	Ran	Rec	Loss	PID
1	2.5	2.5	2.0	Dr	330
	0.0 - 2.0	Concrete			
	2.0 - 2.5	Sand 100% Dark			
	Drill water running under Floor into small void in the ground.				
2	7.3	4.8	1.4	L3.4	103.7 strong odor @ 7.3
		4.2	~~5.6~~	100% Dark Soil	

2-7-01 TANK 1

Installed steel protective cover. Used 1½ bags Portland cement.

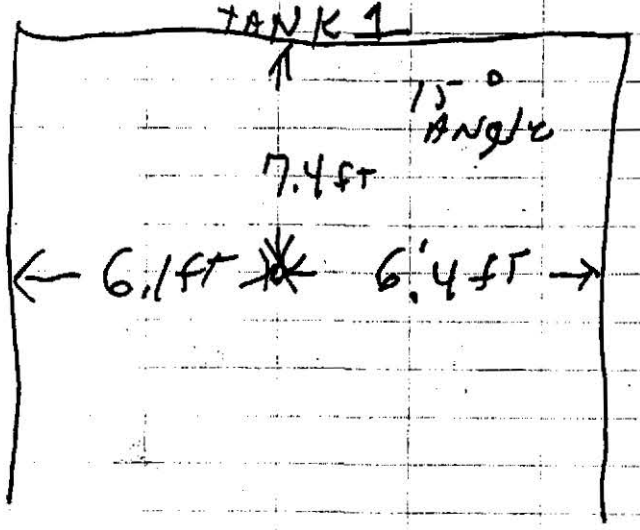
1635 got cover installed. Cleaned up area

1515 Left Tank 1 area

1530 Left site

Returned keys to FISC

TANK 1



TANK 1 020301

0625 Pick up keys at FISC

0645 Arrive at Adit 5

L. Demoss G. Gleason

K Becker T. Feiler

0710 Arrive at TANK 1

Set up to Decon tools

0720 Started Decon

0830 finished Decon & started Drilling

0845 Got High PID Reading of 573 at 8.8 strong fuel odor took sample. The next run slow getting Drill water return. When finish came back only 50%.

0900 changed to N. core. Set N casing to 15.6 to keep hole open and get Drill water return, casing not sealed good only 50% DWR.

0955 Reamed N casing to 26.0 to try and get Drill water return 100% DWR

1030 Lost Drill water at 28.5

2-8-01 TANK 1

Run	Depth	Ran	Rec	Loss Gain	PID
3	8.8	1.5	1.2	0.3	573
	TOOK SAMPLE				Strong odor
4	11.8	3.0	3.0		185 Slight odor
5	15.6	3.8	3.9	G0.1	235.5 No odor
	50% DWR		Slow getting		Return
	Changed to N core				50% DWR
6	18.4	2.8	2.8		204.8 No odor
7	23.4	5.0	5.0		38.9 No odor
8	26.0	2.6	2.6	Pulled Flange	30.1 No odor
	Reamed N casing to 26.0				
9	100% DWR				
9	31.2	5.2	4.7	L0.5	No odor
	28.5 100% DWL				
	Reamed N casing to 31.2				
	100% DWR				
10	35.8	5.6	5.2	G0.6	147.1 No odor
11	40.3	4.5	4.6	G0.1	164.3 No odor
12	45.3	5.0	5.3	G0.3	76.2 No odor
	50% DWL @ 43.8				
13	50.6	5.3	5.0	L0.3	48.7 No odor
14	55.6	5.0	5.1	G0.1	116.0 No odor
15	60.7	5.1	5.1		
16	PID 266 @ 59.7				

TANK 1 02-08-01

Finished out the run. Needed more casing. Went to end of tunnel at office where we had supplies and got more casing. Returned to Tank 1

1140 Started Drilling Reaming N casing. No Drill water while reaming. Got N casing reamed to 31.2. 100% Drill water return. Lost approximately 50% of Drill water at 43.8 feet

1320 Drilling going good. Rods not vibrating yet.

1340 Got High PID reading at 59.7 feet strong fuel odor PID 266 PPM Took sample

1350 Got High PID of 453 PPM at 61.5 feet, core strong fuel odor full length of core

1400 Got High PID reading at 67.6 feet on core 192 PPM strong odor full length of core. No free product at any of the zones.

2-08-01 TANK 1

Poll	Depth	Ran	Rec	Loss Gain	PID
16	65.8	5.1	5.1		453PPM
	STRong full Length of core @61.5ft				
	Took Sample				
17	71.1	5.3	5.2	L0.1	
	PID 192PPM STRong odor Full Length				
	AT 67.6 feet				
18	76.1	5.0	5.1	G0.1	
	PID 478PPM AT 71.5				
	STRong odor full Length of core				
19	81.3	5.2	4.8	L0.2	116.9 Light odor
		80.2.	81.3 soft		
20	85.8	4.5	4.6	G0.1	48.5 No odor
21	90.9	5.1	~~5.1~~ 4.8	L0.3	NO ODOR
22	95.6	4.7	5.2	G0.5	59.2 No odor
23	100.9	5.4	4.6	L0.8	43.9 No odor
24	105.5	4.6	4.4	L0.2	43.7 No odor
25	110.2	4.7	5.2	G0.5	115.3 No odor

TANK 1 2-08-01

1700 Finished Drilling for the Day

1730 Left Tank 1 Area

1745 Left Site

Returned Keys to FISC

Jerry Dan

2-9-01 TANK 2

0625 Pick up Keys AT Fisc
0645 ARRIVE AT Adit 5
L. DeMoss G. Glewsin
T Feiler K Becker
0710 ARRIVE AT TANK 1
Cleaned up cuttings and
PUT IN 55 gallon Drum
0725 STARTED Drilling
100% Drill water Lost.
Rods not vibrating Drilling
SMOOTH
0900 finished Drilling.
0920 INSTALLED 1½ Inch well
5 foot sump 129.7 – 124.4
15 feet screen 124.4 – 109.4
Riser 109.4 – 0.0
0935 STARTED pulling Rods and
PUTING THEM ON TRAIN TO
take OUTSIDE Adit 5
TO DECON.
1150 got Rods And TOOLS OUTSIDE AT
Adit 5 STARTED Decon
1320 finished Decon of N Rods
And N Core Barrel and put Decon

TANK 1 2-9-01

PID	Depth	RAW	Rec	Loss Gain	PID
26	115.2	5.0	3.9	L 1.1	222.7 No odor
27	119.5	4.3	5.1	G 0.8	151.7 No odor
28	124.5	5.0	5.0		111.5 No odor
29	129.7	5.2	5.1	L 0.1	54.7 No odor

Bottom of hole 129.7
1009 DWL

Fluids in 55 gallon Drum. Carried
Drum to lower TUNNEL And Dumped
into Floor Trench.
1440 finished Decon of other Rods
And tools. put Decon fluids in 55 gallon
Drum. pushed Rods and tools Back
in TUNNEL.
1515 got TOOLS + Rods Back
AT ~~Adit~~ TANK 1
Moved some of The Equipment
TO Vertical hole Location
1700 LEFT Drill site
1715 LEFT TUNNEL
Returned Keys to Fisc

Vertical Hole 2
2-12-01 Deep
0630 PICK UP KEYS AT FISC
0700 ARRIVE AT ADIT 5
L. DeMOSS G GLENSON
K Becker T. Feiler
0715 ARRIVE AT TANK 1.
Moved Rest of Equipment
TO Vertical hole S.T.O
0900. Left site to get supplies
to make DAM Around
Drill to catch water.
The water FROM the
Drill is Trying to run
AWAY from The Sump
Also bought Sump pump
to pump The water
TO The MAIN SUMP.
0930 ARRIVE AT Drill LOCATION
Set up Drill and TOOLS.

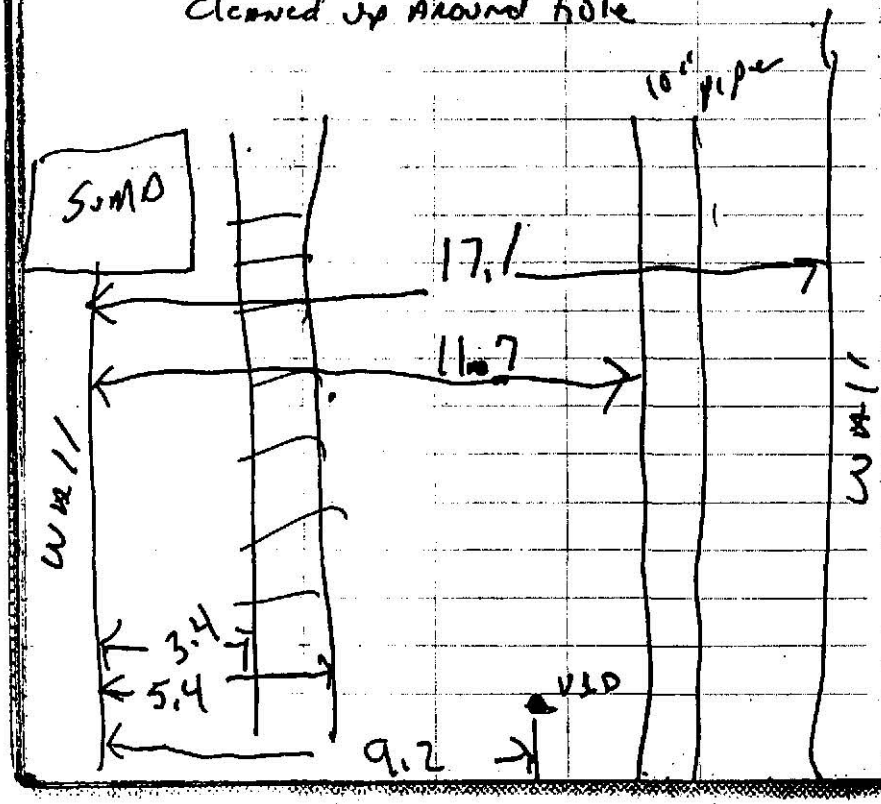
Vertical Deep Hole 2-13-01
Hole # V2D
0630 PICKUP KEYS AT FISC
0645 ARRIVE AT ADIT 5
L. DeMOSS G GLENSON
T. Feiler K Becker
0710 Arrive AT Drill SITE
0715 STARTED Drilling
Drilled THROUGH floorslab
GOT TO Sand Layer NO Air
ODOR in SAND. Did NOT
TAKE A SAMPLE. Drill water
CONTAINMENT PAD is Holding
NO LEAKS. PUMPING Drill WATER
INTO SUMP.
0830 Drill DOWN. Feed chain
Broken
1040 Drill Repaired, STARTED
Drilling Reamed # CASING
TO 6.8.
11.50 GOT Hole Drilled TO 6.8
Ready TO INSTALL CASING
1220 TRIED TO INSTALL CASING
quick set Concrete set up
Before Drill crew could get
CASING INSTALLED.

STATION 25+38.5

2-13-04

Pull	Depth	Ran	Rec	Loss gain	PID
1	0.5	0.5	0.5		0.0
	CONCRETE		0.0-0.5		
2	4.0	3.5	2.9	L0.6	172.4 No odor
	0.5-1.5	SAND			
3	6.8	2.8	2.0	L0.8	99.2 No odor

1430 GOT STEEL CASING INSTALLED
USED 2 BAGS FAST SET GROUT
Cleaned up around hole



Vertical Hole

2-13-04

1530 LEFT Drill site
1545 LEFT TUNNEL
WENT TO PASS office
TO pick up NEW PASS.
1615 GOT NEW PASS
1630 Droped of keys AT Fisc

Jerry Dhu

Hole

2-14-01 V1D

0630 Pickup Keys AT Fisc

0645 ARRIVE AT Adit 5

0700 ARRIVE AT Drill

L. Demoss G Glanson

T Feiler K Becker

0710 Cleaned up inside containment pad.

0725 STARTED Drilling coring using H Barrel

0740 Lost Drill water During Run #5

0820 Hole CAVING IN having TROUBLE getting core Barrel to Bottom

Drilled H core to 41.6 feet No fuel no odor no high PID readings. OUT OF H Rods. Pulled rods out of the hole. Checked water Level, WATER AT 41.5. Hole Dry.

1025 STOPED TO get Supplies For 3 inch ISOLATION CASING

V1D 2-14-01

Poll	Depth	RAN	Rec	Loss gain	PID
4	7.2	0.4	0.0	L 0.4	100% DWL
5	8.4	1.2	0.4	L 0.8	No odor
6	8.9	0.5	0.5		No odor
7	10.8	1.9	2.0	G 0.1	No odor
8	16.5	5.7	5.3	L 0.4	124 No odor
	16.0 -		16.3	open cav	
9	20.9	4.4	4.6	G 0.2	No odor
10	26.3	5.4	5.4		No odor
11	31.3	5.0	5.0		3.2 No odor
12	36.4	5.1	5.0	L 0.1	10.8 No odor
13	41.6	5.2			

1200 STARTED grouting in 3" PVC casing. Bore hole has good Air Flow from it Before grouting

Mixed Portland cement And 5% Bentonite grout put in 6 Bags of portland And ½ bag gel grout came up to 20 FEET but would not come up Any further. Mixed fast set grout And poured in the

2-14-01 V1D

hole. The grout came up to 16.3 feet. We stoped and let the grout set up. Then we mixed portland grout 1 bag and put in the hole. Did not come up.

1630 Stoped for the day

1645 Left tunnel
Returned keys to FISC
went with Drill crew to pickup supplies

Jerry Dr

V1D 2-15-01

0630 pick up keys at FISC
0645 Arrive at Adit 5
0700 Arrive at Drill site.
L. DeMoss G. Gleasin
K. Becker J. Feiler
0715 Started Drilling
Reaming N casing through grout.
0745 Reamed N casing to 10 feet. 100% DWL. pulled casing out and tried to put H core barrel in. Barrel would not go. Casing shoe smaller than core barrel bit. put casing back in and reamed out the hole. Reamed to 5 feet. pulled casing out and put H core barrel back in. Dr
0820 Drilled to 16.3 100% DWL pulled rods out, water at 7.0 feet. Mixed fast set grout. filled the hole up to 3 feet.
0840 Let grout set. used 3½ bags

2-15-01 Hole V1D

0940 Checked grout. It is still soft. Walked to MOGAS area. Contractor putting in valves is still working at tank 20. He has not started on tank 19.

1040 checked grout slightly soft.

1155 Checked grout, firm will try to drill.

1230 Drilled to 16.3 ft Drill water lost. Cement plug at cavity did not hold. Pulled rods out and mixed up fast set cement and poured into cavity. Mixed portland cement and poured in to the hole filled the hole up to 3.0 ft

Hole V1D 2-16-01

0630 pick up keys at FSC

0645 arrive at Adit 5
L. DeMoss G. Gleason
T Felix K Becker
waiting for operator to let us in.

0730 Operator let us in

0745 Arrive at Drill
Started Drilling coring out grout. 100% down

0815 J Gammon stoped by I told him we would be moving to MOGAS in about 1 week

1145 got back to 41.5 feet 100% down.

1220 Bailed the hole dry Mixed quickset grout installed 45 ft 3 inch pvc.
While grout set we took H coring tools and decon'd them.

2-16-01 V1D

1440 Started puting Rods in The hole

1500 Started N coring @ 46 100% DWR

1500 hit A small void AT 45.8 Lost Drill water

1645 ~~Re~~ TOOK water Level Reading IN The Hole water Level 73.0,

1745 Left Drill site

1800 Left site Returned Keys to Fisc

Larry D

41.6

V1D 2-16-01

Pull	Depth	RAN	Rec	Loss Gain	RFD
14	45.3	3.7			No odor
	48.9 -		44.1	Soft	
15	49.5	4.2	4.1	L0.1	No odor
	45.6 45.8		open cav	100% DWL	
16	54.5	5.0	4.9	L0.1	No odor
17	59.2	4.7	4.2	L0.5	No odor
18	64.2	5.0	5.0		No odor
19	68.3	4.1	3.4	L0.7	No odor
20	73.4	5.1	4.7	L0.4	No odor

2190/ V1D

0625 tried to get keys at 15c
Roads Blocked off

0635 Arrive at Adit 5

0645 Drill crew Arrived
at Adit 5
L. DeMoss L. Williams
T. Fefer K Becker

0700 Tried to get operator
No answer

0730 operator for next
shift arrived let us
in.

0750 Arrive at Drill and
started Drilling 100% DWL
stoped Drilling at 86.9 feet
water Table should be
around 90 feet. We will
grout in 2½ inch PVC
isolation casing.

0845 pulled Rods out checked
water level. water
level 77.6

V1D 2.69

DWL	Depth	Rod Rec	Core Rec	Gain Loss	PID
21	78.5	5.1	5.2	G 0.1	0.0 No odor
22	83.7	5.2	5.2		0.0 No odor
23	86.9	3.2		G 0.2	No odor

100% DWL

0900 Bailed the hole dry

0945 mixed up portland cement
grout and put in corehole
25 gallons. Tried to put
2½ inch pipe. would
NOT go.

1015 put Rods back in the hole
and flushed out the
hole. Pulled Rods out.

1050 put PVC 2½" pipe in
the hole to make sure
it will go. No problems
Checked water level. 77 ft
Bailed out.
mixed grout put pipe
back in the hole and
put Rods inside pipe
and pushed to bottom.
Cleaned up site

1530 Left site

8

2-20-01 V1D

0630 Picked up Keys AT Fisc

0645 ARRIVE AT Adit 5

L. DeMoss L. Williams

K Becker T Feiler

0700 ARRIVE AT Drill

STARTED Drilling. Drilling

using Bcore, STARTED Bcore

AT 86.9 100% DWR

0815 WATER NOT going through

Core barrel. Had to pull

Rods OUT OF the hole.

0944 Checked water Level

86.0

1025 Bailed the hole for

30 min water Level

did NOT DROP

Drilled to 100 feet

1210 INSTALLED 4 inch pvc well

Screen 100 - 89.8

Riser 89.8-0.0

1215 STARTED pulling Rods

1300 finished pulling Rods

PUT SAND PACK IN WELL

While Drill crew moved,

9

86.9 V1D + V2S 2-20-01

Poll	Depth	Ran	Rec	Loss gain	PID
24	92.4	5.9	5.3	L0.2	0.0 NO odor
	88.3-88.5				50% OPEN CAV. 100% DWL
25	96.0	3.6	3.1	L0.5	
	94.3-94.8				~~Soft Dwl~~
~~26~~	~~100.~~	1.6			
26	99.6	1.3	0.9	L0.7	No odor
27	100.0	2.1	1.2	L0.9	no odor

1500 SAND 100-88 ft

Bentonite 88-80

portland - Bentonite grout

80.0-0.6

Drill crew got Drill setup

AND CONTAINMENT

Pad setup.

1525 STARTED Drilling using

H core Barrel & casing.

1530 Drilled through Floor Slab

Checked Sand Layer No

fuel odor NO PID

Drilled to 11.1 feet

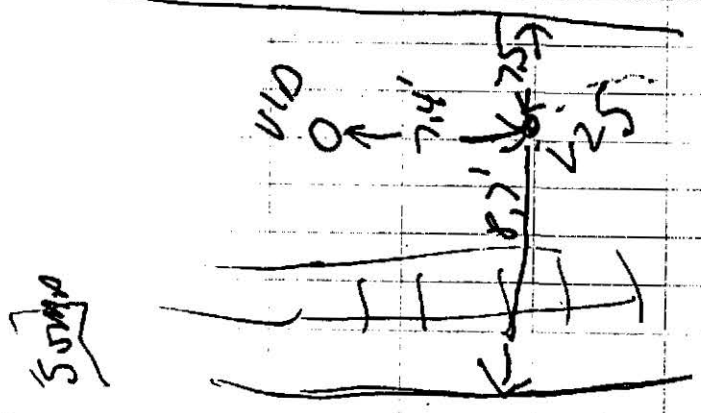
1715 LEFT Drill

1730 LEFT site

Returned Keys to Fisc

2-20-01 V25

PUM	Depth	Rec	Rec	Loss Gain	VIS
1	1.5	1.5	0.5	L1.0	
	0.5	CONCRETE			
	0.5-	1.1		SAND+GRAVEL	
2	3.4	1.9	1.9	50% DWL	No odor
3	5.5	2.1	2.0	L0.1	No odor
4	7.2	1.7	1.9	G0.2	No odor
5	11.1	3.9	3.6	L0.3	No odor
2-21-01					
6	13.4	2.3	2.2	L0.1	No odor
7	18.9	5.5	5.0	L0.5	No odor
	16.7-16.9	open cavity DWL			
8	24.7	5.8	5.2	L0.6	No odor
	24~~.8~~-24.5-~~24.5~~	open cavity			
9	27.4	2.7	2.7		No odor



V25 2-21-01

0630 Picked up keys at F.S.C
0645 Arrive at Adit 5
L. Demoss L. Williams
K Becker J Feiler
0700 Arrive at Drill
Started Drilling coring
0715 H and Reaming H casing
1125 Drill head stuck in High gear
Pulled Rods and casing out of the hole and put 3 inch PVC to 25.1 feet would not go down any further
Grout pipe in place using Fast set grout and portland cement grout
While grout was setting we chiseled out VID for Flush mount cover
1700 Finished grouting PVC, used 4 Bags quick set grout 1½ Bags portland
1715 Left site Returned keys to F.S.C

2-22-01 V2S

0630 pickup Keys AT Fisc
0645 ARRIVE AT ADIT 5
L. DeMoss L. Williams
T. Felton K Becker
0710 ARRIVED AT Drill
0715 STARTED Drilling
10070 DWN
0730 Drill DOWN, SEALON
Hydraulic MOTOR LEAKING
1000 LEFT SITE
Returned Keys to FISO

Jerry Dm

22.4

V2S

23
2-22-0

Pull	Depth	Run	Rec	LOSS GAIN	PID
~~10~~	~~27.5~~	~~0.1~~			
			31.3		
10.0	320	4.6	4.3	L0.3	NO Odor
		31.1 -	31.3	OPENCAV 100% DWL	
11	35.5	3.5	2.9	L0.6	no odor
		34.8 -	35.2	OPENCAV	
12	40.2	4.7	4.2	L0.5	no odor
13	43.6	3.4	3.2	L0.2	no odor
14	48.5	4.9	4.7	L0.2	
15	52.0	3.5	3.5		

100% DWL

Set 1½ inch well
5 foot Sump 52.0-47.0
15 feet Screen 47.0-32.0
Riser 32.0-0.0
Sand 52.0-30.0
Bentonite 30.0-28.0
Cement Bentonite grout
28.0-0.0

2-23-01 V2S

0700 Picked up Keys AT F-50
0715 Arrive at Adit 5
L. DeMoss L. Williams
K Becker T Feiler
0730 Arrive at Drill
Drill crew putting new
Hydraulic motor on.
0815 started Drilling
Drill crew got core barrel
stuck in concrete had to
pull rods out and put
New Bit and inner barrel
in The core barrel.
0900 got Rods Back in the
hole
1130 finished Drilling the
hole. Installed 1½ inch
PVC well.
1145 Started Loading Rods
ON Train cars
1715 Left Drill site
Returned Keys to F-50

[signature]

V2S 2-26-01

0625 pickup Keys AT F-50
0640 Arrive at Adit 5
L. Demoss L. Williams
K. Becker T. Feiler
0700 Arrive AT V2S L. Williams
And L. Demoss Installed
A Flush cover over V2S.
While Drill crew moved
Equipment.
0830 Train operator came
in and we Loaded
The Drums on the Train
And took them to Adit
3. Put 9-55 gallon drums
Beside Generator.
1130 finished moving drums
And started moving
Equipment to Tank 19
The Rollup door at upper
Tunnel Elevator 73 was
stuck had to use a Jack
to get it open enough
that we could get
Equipment Through

2

TANK 19

1445 Drill crew/Scant Broke
they left to go to Grainger
to get parts
1600 Drill crew back with
parts. Moved more
Equipment to TANK 19
1700 ~~1500~~ Left TANK 19
Had trouble getting
Rollup Door closed
17 ~~1530~~ got Door closed
~~1530~~ 1745 Left Tunnel
Returned Keys to FSO

Larry Dr

TANK 19

2-22-01

0625 Picked up Keys at FSC
0645 Arrive at Adit 5
L. Demoss L. Williams
M. Bigelow T. Feilen K Becker
0710 Arrive at Drill
Drill crew Bolting Drill
Down and Setting up.
0830 Started Drilling
Drilling out grout from
That we put in Before
1430 Got to Bottom of old
Hole 10090 DWR
1700 Left Drill Site
1715 Left Tunnel
Returned Keys to FSO

Larry Dr

18 51.4

2-27-01 TANK 19 13° angle

Poll	Depth	RAN	Rec	LOSS GAIN	PID
21	52.6	1.2	1.5	6 0.3	82
22	55.1	2.5	2.5		
23	60.3	5.2	5.2		
24	62.6	2.3	2.3		
25	67.8	5.2	4.7	L 0.5	175
		Took Sample			STRONG ODOR
26	73.8	5.0	5.2	6 0.2	167
	71.5-71.6	open cAV			NO odor
27	77.1	4.3	3.5	L 0.8	
28	79.9	2.8	2.1	L 0.7	
29	85.0	5.1	5.2	G 0.1	334 Wooden
30	90.2	5.2	5.2		157 Wooden
31	92.5	2.3	2.4	G 0.1	
32	94.9	2.4	2.8	G ~~L~~ 0.4	
33	96.5	1.6	1.1	L 0.5	
34	99.0	2.5	2.2	L 0.3	

TANK 19 2-28-01

0630 picked up keys at FSS
0640 Arrive at Adit 5
L. DeMoss L. Williams
S. Tomak Becker T. Feilon
0700 Arrive at TANK 19
cleaned up floor
0730 Started Drilling
100% DWR
coring is going slow
Rock is very hard.
1100 operator called and told
us to get out. Smoke in
lower tunnel.
1430 operator said that
there was a fire in the
water station vent shaft.
But fire dept could not find
it. No work today
Left site
returned keys to FSS

[signature]

3-01-01

0630 picked up keys AT FESC

0700 Arrived AT Adit 5

L. DeMOSS L. Williams

S TOMA K Becker T Feilen

0730 M. GARRETT called

AND SAid NO work today

Larry Dunn

3-2-01

0630 ARRIVE AT FESC TO

get KEYS. NO KEYS issued

0700 ARRIVED AT PRISONGATE

L. DeMOSS L. Williams

S TOMA K Becker T Feilen

0705 M. GARRETT STOPPED BY

will check AT Adit 3

0740 GOT OK TO GO IN AT

Adit 5 BUT Elevator in

MO GAS AREA #73 IS DOWN

0745 STARTED MOVING EXTRA

Drill Rods AND TOOLS OUT OF

LOWER TUNNEL TO Adit 6 GATE

0945 Elevator REPAIRMAN SAID

Elevator 73 WORKING

0930 ARRIVE AT TANK 19

STARTED Drilling

1030 CALLED JIM GAMMON TO See

IF we could work 3-3-01

WILL CALL HIM BACK AT 1130

1115 CALLED GAMMON LEFT MESSAGE

1145 CALLED GAMMON NO ANSWER

1150 getting high PID Readings

FROM ROCK core but no odor

Pipe

3" X 10' 12 + 3
2½ X 10 46
2" X10 22 + 22
1½ X 10 Screen 2
1½" X 5' Screen 2
2½ X 5' Risen 2
3 X 5' Screen 2"
3 - 2½" X 5 Risen
2½ X 5 Risen 2
3 X 5 " 1
2½ X 10 " 1
2 X 5 " 1

Used at 19 & 20
well 19. 1½" X 10' screen
1½" X 5' screen
1½" X 5' Risen
11 - 1½" X 10' Risen
well #20

99.0

TANK 19

3-29

Pull	Depth	RAN	Rec	Loss Gain	PID
35	104.1	5.1	5.2	G 0.1	NA
36	109.3	5.2	5.2		No odor
37	114.2	4.9	5.0	G 0.1	No odor
38	116.6	2.4	2.9	G 0.5	
39	121.1	4.5	4.7	G 0.2	

100% DNR

Installed 1½" well
5 foot sump 121.1 - 116.1
15 foot screen 116.1 - 101.1
Risen 101.1 - 0.0
Bentonite 7.0 - 5.0

3-2-01 TANK 19 + TANK 20

1210 J GAMMON called and said that it is ok to work 3-3- Saturday

1335 Rock very hard Drill crew having trouble getting the hole down. Stoped the hole at 121.1

1350 Installed well 1½ inch moved to TANK 20 setup equipment

1530 Started Drilling Roaming H casing

1630 Drilled through floor slab. Pulled casing out and took reading of sand 612 PID, took sample. Strong fuel odor Drilled to 7.0 feet pulled tools out of the hole and installed steel casing Deconed rods + tools

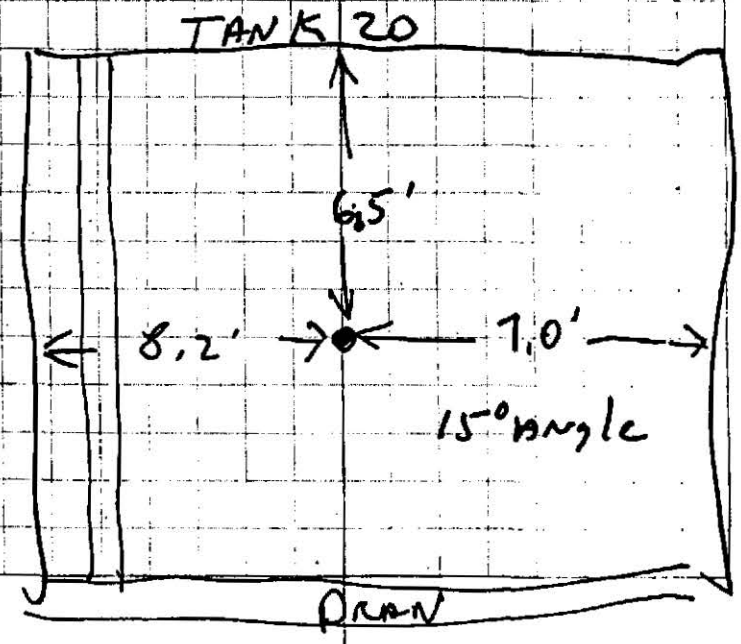
1745 Left site

Larry [illegible]

TANK 20 3-2-01

Poll	Depth	Ran	Rec	Loss Sand	PID
1	2.5	2.5	2.1	0.4	
		sand under concrete			612 strong odor
	concrete 0.0 - 2.1				
	sand 2.1 -				
2	7.0	4.5	1.1	3.4	
	5.0 - 6.0 Sat 100% PWL				

Intermitten water return during run



26 SOT

3-3-01 TANK 20

0630 Pick up keys at FESC

0700 Arrive at Adits

L. Demoss L. Williams

T. Feilen K Becker

0710 Arrive at TANK 20

Cleaned up around Drill

0725 Started Drilling

Drilled H core to 11.5 feet

had a zone at 9.0 PID 357

Strong fuel odor. Changed

to N Set N casing to 11.5

No Drill water Returned.

0841 Reamed N casing to 16.5

100% Drill water Returned

0926 Rock cutting very fast

Drill crew put new bit

with soft matrix on

at start of N coring.

1120 Rods started vibrating

After Drill water loss

at Run Number 16. Drill

crew had to put Bleeder

hose on casing. Drilling going

slower.

SA 721

TANK 20 3-3-01

Pull	Depth	Ran	Rec	Loss gain	PID
3	7.5	0.5	0.12	-0.3	
4	11.5	4.0	3.4	-0.6	357 strong odor 9 feet
	11.3	100% DWL			
	Took Sample				
Changed to N core set N casing 100% DWL					
5	15.9	4.4	4.4		
6	20.4	4.5	4.9	G 0.4	
Reamed N casing to 16.5 100% DWL					
7	21.7	1.3	2.3	G 1.0	no odor
8	27.9	6.2	5.2	L 1.0	no odor
9	33.2	5.3	5.2	L 0.1	no odor
10	35.9	2.7	3.0	G 0.3	no odor
11	41.1	5.2	4.7	G 0.5	no odor
12	45.7	4.6	5.2	G 0.6	no odor
13	47.1	1.4	1.4		no odor
14	50.4	3.3	3.3		no odor
15	55.8	5.4	5.2	L 0.2	no odor
16	61.0	5.2	5.1	L 0.1	no odor
100% DWL During Run					
17	66.0	5.0	4.5	L 0.5	no odor
18	70.7	4.7	5.2	G 0.5	no odor
19	74.9	4.2	2.2	L 2.0	no odor
71.6-73.0 gap					

28 SWJT
3-3-01 TANK 20

Pull	Depth	Ran	Rec	Gain Loss	PID
20	79.2	4.3	4.2	L 0.1	No odor
21	81.6	2.4	1.5	L 0.9	No odor
22	85.4	3.8	2.5	L 1.3	No odor
88.9	~~88~~ 83.4		open void		
23	89.4	4.0	4.0		No odor
24	92.3	2.9	3.0	G 0.1	No odor
25	95.0	2.7	2.6	L 0.1	No odor
26	96.6	1.6	1.1	L 0.5	No odor
27	99.2	2.6	0.8	L 1.8	No odor
28	100.7	1.5	1.1	L 0.4	No odor
29	101.4	0.7	0.7		No odor
30	103.9	2.5	0.8	L 1.7	No odor
31	106.3	2.4	1.2	L 1.2	No odor
32	109.3	3.0	2.9	L 0.1	No odor
33	111.2	1.9	1.9	L 0.9	No odor
34	114.6	~~2.8~~ 3.4	1.0	L 2.4	

SA29
3-3-01

TANK 20

1340 INNER BARREL NOT GOING DOWN RODS. Drill crew pulled rods TO find PROBLEM, Rod had BAD SPOT ON the inside

1355 Rods BACK in and coring

1450 Rods vibrating. Drilling SLOW. Rock also Broken up Badly. CAUSING Driller TO make short RUNS.

1655 STOPED Drilling for the DAY

1715 LEFT Drilling LEFT Site

~~RETUR~~

Returned Keys TO Site

3-5-01 TANK 20

0630 Pickup Keys at FSG

0645 Arrive at Adit 5

L. DeMoss L. Williams S. Toma

K Becker T Fenton

called operator no answer

0700 Operator called smoke

in water station vent

0740 Operator said we can

go in

0745 Arrive at Drill

0755 Started Drilling

0930 finished Drilling the

hole

Installed 1½" well

5 foot sump 127.7 - 122.5

15 feet screen 122.5 - 107.5

Riser 107.5 - 0.0

1015 Started pulling Rods

Got Rods out put Bentonite

Seal from 11.0 - 9.0 grout

9.0 - 0.0 Also put grout

in MW19 from 5.0 - 0.0

Drill crew started carring

Equipment out to Adit 6

TANK 20 Gain 3-5-01

Poll	Depth	Raw	Rec	Loss	PID
35	115.4	0.8	1.0	0.2	No odor
36	116.2	0.8	0.9	G 0.1	No odor
37	120.7	4.5	3.6	L 0.1	
38	125.8	5.1	3.8	-1.3	
39	127.7	1.9	2.8	G 0.9	

1330 Shipping container Arrived

at Adit 6

L Williams S Toma & L DeMoss

checked wells MW17 Dry

MW18 Dry MW19 Dry

MW20 water at bottom

of the well in the sump. Bailed

for 1 hour unable to bail

Dry. Probably Drill water

That was lost.

1715 Left site

Returned Keys to FSG

3-6-01

0630 Picked up ~~Tools~~ Keys AT FISC
0700 ARRIVE AT Prison Gate
L. DeMoss
T Feiler K Becker
0710 M. GARRETT stopped by
Told him we were Loading
out today.
Started Loading Equipment
And tools, NYO Shipping
Container. Moved all equipment
And Tools out of Tunnel.
Moved well material to lower
TUNNEL NEXT TO TANK 14.
1700 GOT All Equipment Loaded
And site Cleaned up
1715 Left site
Returned Keys to FISC

37-01

0630 pick up Keys AT FISC
0700 Arrive at Adit 6
L. DeMoss L. Williams
T Feiler K Becker
Drill crew TOOK FORKLIFT
BACK TO RENTAL COMPANY and
Then came to site and waited
for TRUCK COMPANY to pick
up CONTAINER. L. DeMoss
And L Williams Checked
Wells.
1000 AT well #1 Bailed the
hole water AT 5.5 ft
IN the well Bailed 2
gallons. WATER KEEPS
COMING IN. Called
K Everitts. He said
TO TAKE A SAMPLE.
Probably Drill water,
Captured in A small void
When drilling
1100 opened V10 up water level
8.11 feet. Bailed Approximately
3 volumes from The well.

3-7-01

Well	Dia.	Above Floor	
16	2"	.35	Dry
15	1½"	.30	Dry
14	2"	.40	Dry
13	2"	.44	Dry
12	2"	.5	Dry
11	1½"	1.0	Dry
10	1½"	.70	Dry
9	1½"?	.40	Dry
8	1½	.85	Dry
7	1½	.33	Dry
6	1½	.32	Dry
5	2"	.40	Dry
4	1½"	.46	Dry
3	1½	.38	Dry
2	2"	.35	Dry
1	1½	.44	5.5 from bottom
VOD	1"	.12	86.11
V25	1½"	.05	Dry
17	1½		Dry
18	1½		Dry
19	1½	.16	8 feet
20	1½	.20	Dry

Took sample Also took Readings After each volume. pH cond + Temp, When we were finished we hung the 1 inch Bailer Inside the well for further use

1200 Took sample of rock from Hole #1 at 93.98 feet. solid core for better sample

Went back to all holes checked steel caps to make sure they are on tight and work properly Also patch any holes in Floor Took samples to DHL to Ship, Took Equipment to office storage.

3-8-01

0900 Talked with Jim Gammon. He wants to walk through the Tunnel and check out to see if everything look ok.

1000 I arrived at Coast Guard Housing gate. waiting for J. Gammon.

1015 J. Gammon on Adit 5

walked to 15 & 20 and He wants Ditch cleaned out.

wants me to show hand Electrician Electrical panel

1100 Started walk through at Tank 16

Tank 10, 8, 7, 6, 5, 3, 1, 2, Sump, Ditch 1 & 2

Jim Gammon wants trench cleaned out at these. said call him when finished

1245 L. DeMoss & L. Williams cleaned Mogas side and Tank 10

3-9-01

0630 Picked up Keys at FISC

0700 Arrive at Adit 5 L. DeMoss & Tom

0715 Started cleaning at Tank 8 moved down in number shoveled out trench and used broom to sweep trench. put material in drums. Cleaned out trench at sump and swept out train tracks. Loaded 3 drums on to train

~~0700~~ 1200 Tried to call Gammon no answer paged him no answer

1300 Tried to call Gammon no answer paged him no answer

1400 Called Gammon and paged him no answer

1500 same

1600 moved drums to Adit 3 with other drums

1750 Left site. Returned keys to FISC. got oil & fuel on 2 shirts 1 pair blue jeans and boots put them in the trash

SAMPLE NOMENCLATURE

DAY	TANK	TIME	DEP	OGDEN ID
11-6-00	18	1015	80.5	RH-BR-18-S01
11-6-00	18	1550	104.4	RH-BR-18-S02
11-6-00	18	1720	116.0	RH-BR-18-S03
11-6-00	18	-	116.0	RH-BR-18-D01
11-10-00	17	0905	20.0	RH-BR-17-S01
11-10-00	17	1045	34.0	RH-BR-17-S02
11-10-00	17	1045	34.0	RH-BR-17-D02
11-10-00	17	1250	66.2	RH-BR-17-S03
11-22-00	19	1605	43.0	RH-BR-19-S01
12-4-00	19S	1310	62.5	RH-BR-15-S01
12-4-00	19S	1310	62.5	RH-BR-15-D03
12-4-00	19S	1415	86.0	RH-BR-15-S02
12-4-00	15	1615	115.0	RH-BR-15-S03
12-6-00	14	35.0 0945		RH-BR-14-S01
12-6-00	14	1105	60.5	RH-BR-14-S02
12-6-00	14	1105	60.5	RH-BR-14-D04
12-6-00	14	1235	75.0	RH-BR-14-S03
12-6-00	14	1400	95.5	RH-BR-14-S04
12-6-00	14	1515	116.0	RH-BR-14-S05

DAY	TANK	TIME	DEP	OGDEN ID
12-11	13	1250	72.0	RH-BR-13-S01
12-11	13	1255	72.0	RH-BR-13-D05
12-11	13	1415	100.0	RH-BR-13-S02
12-11	13	1555	125.0	RH-BR-13-S03
12-12	13	0800	8.0	RH-BR-13-S04
12-12	12	1410	8.0	RH-BR-12-S01
12-13	12	1505	33.5	RH-BR-12-S02
12-13	12	1620	61.0	RH-BR-12-S03
12-14	12	1130	104.3	RH-BR-12-S04
12-14	12	1130	104.3	RH-BR-12-D01
12-14	12	1400	121.9	RH-BR-12-S05
12-15	11	0950	4.5	RH-BR-11-S01
12-15	11	1455	11.3	RH-BR-11-S02
12-18	11	1030	67.1	RH-BR-11-S03
12-18	11	1205	85.0	RH-BR-11-S04
12-18	11	~~1205~~ 1430	~~85.0~~ 95.0	RH-BR-11-S05
- FINGERPRINT ANALYSES -				
12-18	11	0730	GW	RH-MW-11
12-6	14	1400	95.5	RH-BR-14-S04

H Casing Depth in feet bgs

TANK	17	7.3	
	18	6.9	
	19	7.0	
	15	7.8	
	14	15.4	
	13	~~8.6~~	13.5
	12	12.6	
	11	20.3	

TOTAL DEPTHS OF WELLS in ft bgs

TANK	19	51.4
	18	126.0
	17	124.2
	15	126.4
	14	136.0
	13	133.0
	12	133.6
	11	131.0

length of well screen

* Note: All wells have a 5 foot Sump in bottom.

18	15'
17	15'
15	15'
14	20'
13	20'
12	20'
11	30'

Angle of boring

19	13°
18	13°
17	13°
15	13°
14	15°
13	15°
12	15°
11	15°

Clinker Zones

WELL	Depth
19	0-51.4'
18	115-121'
17	
15	12.8-13.9'
14	NA
13	NA
12	61-62'
11	115-131'

TANK 18 BORING

①

11/2/00 0.0 - 5.0 H casing

Pull #1 start core at ~~[illegible]~~ 0.0'

TIME: 1230 TD = 6.6'

ran = ~~[illegible]~~ 6.6

gain = -2.0

recovery = 4.6' CORE

color N-2.5

m. natural fractures at 2.75'-6.6'

5YR 2.5/2

hard no odor

no grout seams

0-2.7' concrete/grout

11/3/00

Pull #2	Depth	Ran	Rec	GAIN/LOSS
TIME: 0910	6.9	0.3	0.1	-0.2

Grout from outer casing of well being installed.

Pull #3	Dep	Ran	Rec	GAIN
0855	10.7	3.8	4.2	+0.4

SAA - m natural fractures all thru

7.7-8.2 SAMPLE PID = 101

BACKGROUND IS 10.0

②

Pull #4 TANK 18

TIME:	Depth	Ran	Rec	Gain
1030	16.0	5.3	5.2	-0.1

(SAA) m natural fractures
at 10.7 - 11.2
- not fracture @ 12.0
12.4, 13
13.6, 14.1, 14.9, 15.4, 16.3
- mech fractures at
13.4, 16
- NO grout, hard

PID = 12.3 @ 12.4

Pull #5

	Depth	Ran	Rec	Gain
Time 1050	21.1	5.1	5.2	+0.1

N-4 color
10YR 2/1

m. natural fractures: 17.1
17.8, 18.9, 20
mech. fractures:
20.8

PID = 10.7 @ 20.8'

Pull #6 TANK 18 ③

Time	Depth	Ran	Rec	Gain
1145	26.3	5.2	5.2	0

SAA (10YR 2/1)
- m. natural fractures: 22.5, 23.9, 24.0
- mech fractures: 24.3, 24.5
- Grout in seams at 22.1, 22.8
and ~~[illegible]~~ 21.9
ALW

PID = 10.8 @ 26.0

Pull #7

Time	Depth	Ran	Rec	Gain
1205	31.4	~~6.9~~ 5.1	5.1	0

SAA (10 YR 2/1)
m natural fractures: 26.8, 27.0
28.3 - 29.5, 28.8, 30.2
mech fractures: 27.3, 27.6
29.3

NO grout seams

PID = 18.1 @ 31.0

TANK 18

Pull #8

TIME	DEPTH	RAN	REC	GAIN
1225	36.4	5.0	5.0	0

SAA until 33.4 then
5YR 3/2
(n-4)

- m natural fractures - every 4-6 inches
- mechanical fractures - NONE
- PID = 10.8 @ 35.4

Pull #9

TIME	DEPTH	RAN	REC	GAIN
1245	41.6	5.2	5.2	0

(n-4)
SAA hard. NO GROUT or odor
NO mech fractures (5YR 3/2)
m. natural fractures:
37.0, 37.5, 38.0, 38.3, 39.1
39.5 - 41.6

PID = 10.7 @ 41.3

TANK 18

Pull #10

TIME	DEPTH	RAN	REC	GAIN
1306	46.7	5.1	5.1	0

SAA no grout (5YR 3/2)
slight odor at 44.3
(n-4)
mechanical fractures: 44.8

m. natural fractures:
42.1, 42.4, 42.9, 43.1, 44.0
44.3, 44.5, 45.3, 45.8
46.3, 46.6

PID = 10.6 @ 46.4

Pull #11

TIME	DEPTH	RAN	REC	GAIN
1355	51.9	5.2	5.2	0

SAA until 50.4 then (5YR 3/2)
(n-4) 5YR 3/3 then SAA (5YR 3/2)
at 51.2
m. natural fractures: 47.1, 47.9 - 48.4
48.8, 49.3, 49.8, 50.4, 50.8
51.2, 51.6

PID = 12.3 @ 51.5

(6)

TANK 18

Pull #12

TIME	Depth	Ran	Rec	GAIN
1425	57.1	5.2	5.2	0

SAA (5YR 3/2) (n-4)

m. natural fractures: 52.4, 52.8, 53.2, 53.5, 54.6, 55.7

mechanical fractures: ~~none~~ 54.9, 55.2

PID = 10.4 @ 56.8

Pull #13

TIME	DEPTH	RAN	REC	GAIN
1450	62.5	5.1	5.1	0

(5YR 3/2) SAA until 59.1 then 5YR 3/3 changes back to 10YR 2/1 (59.6)

m. natural fractures: 57.3, 57.5, 57.9, 58.3, 58.5-58.8, 59.1, 59.3, 60.3, 61.3-62.0

mechanical fractures: 59.5 (n-4)

PID = 10.5 @ 62.1

TANK 18

(7)

Pull #14

TIME	DEPTH	RAN	REC	GAIN
1540	67.1	4.9	5.2	+0.3

10YR 2/1 (n-4)

no grout or odor

large vesicle size

m. natural fractures: 63.1, 64.5, 65, 65.4, 66.2, 66.8

no mechanical fractures.

PID = 10.7 @ 66.9

Pull #15

TIME	DEPTH	RAN	REC	GAIN
1620	72.3	5.2	5.2	0

10YR 2/2 (n-4)

no grout, no odor

mechanical break:

m. natural breaks: 67.5, 68.0-68.6, 69.2-69.8, 70.6, 71.2, 71.8, 71.9

large vesicle size

PID = 11.3 @ 72.0

TANK 18

Pull # 16

TIME	DEPTH	RAN	REC	GAIN
1700	76.7	4.4	4.1	-0.3

10YR 2/2 (n-4)

PID = 10.7 @ 76.4

mechanical break at 76.0

m. natural breaks: 72.3 - 73.0, 73.3 - 74.4, 75.1, ~~75.9~~, (RW) 76.0 - 76.7

11-6-00

Pull # 17

TIME	DEPTH	RAN	REC	GAIN
1015	81.6	4.9	5.2	+0.3

(n-4) 10YR 2/1, 10YR 3/3 @ 80.5

Grout seams @ 77.0 - 79.1

m. natural fractures:

77.0, 77.3, 77.8, 78.2, 78.4
79.3, 79.8, 80.2, 80.5
81.0 - 81.6

SAMPLE @ 80.5' = S01

PID = 8.6 @ 81.4'

TANK 18

Pull #18

TIME	DEPTH	RAN	REC	GAIN
1055	86.9	5.3	5.2	-0.1

10YR 3/2 (n-4)

m. natural fractures: 81.6 - 82.4
~~86.9~~ 82.6, 82.9, 83.8
83.8 - 84.5, 86.1

Grout seams @ 86.5

PID = 9.4 @ 86.4

Pull #19

TIME	DEPTH	RAN	REC	GAIN
1155	89.4	7.5	2.9	+0.4

10YR 3/2 (n-4)

m. natural fractures:

87.0, 87.9, 88.1, 88.4, 88.6
88.7 - 89.4

PID = 12.4 @ 89.2

Small vesicle size

TANK 18

Pull #20

TIME	DEPTH	RAN	REC	GAIN
1245	94.4	5.0	5.2	+0.2

10 YR 3/1 (n-4)

PID= 9.2 @ 95.8

m. natural fractures: 89.4 - 90.1
90.6 - 91.1, 92.0, 95.1
93.8

Pull #21

TIME	DEPTH	RAN	REC	GAIN
1420	99.3	4.9	4.9	0.0

10 YR 3/1 (n-4)

PID = 10.4 @ 99.0

m. natural fractures:
96.3, 97.4, 97.8, 97.9,
98.4

mech. fractures: 95.1
95.4, 97.2, 99.1

TANK 18

Pull #22

TIME	DEPTH	RAN	REC	GAIN
1455	99.7	0.4	0.6	+0.2

10 YR 3/1 (n-4)

~~SAMPLE #2 at~~ NOT ENOUGH RECOVERY

PID= 10.4 @

m. natural fractures:
99.3, 99.5 99.8

Pull #23

TIME	DEPTH	RAN	REC	GAIN
1550	104.9	5.2	5.2	0.0

10 YR 3/2 (n-4)

PID= 10.7 @ 104.7

m. natural fractures:
99.9, 100.2-100.6, 101.5
101.9, 102.4, 103.8
104.4-104.9

Sample #2 taken at 104.4

TANK 18

Pull #24

TIME	DEPTH	RAN	REC	GAIN
1630	110.2	5.3	5.3	0.0

large vesicle size
10YR 3/2 (n-4)
PID = 9.8 @ 110.0
grout seam at 106.6
m. nat fractures: 104.9 - 106.6

mech fractures:
107.0, 107.2, 108.4
108.9, 109.2, 109.6
109.9

Pull #25

TIME	DEPTH	RAN	REC	GAIN
1700	115.5	5.3	5.3	0.0

5YR 3/1 (n-4)
PID = 10.3 @ 115.3
no odor or grout
m. natural fractures:
110.4, 112.9, 112.4
112.9 - 115.5

TANK 18

Pull #26

TIME	DEPTH	RAN	REC	GAIN
18:20	121.5	6.0	5.2	-0.7

10YR 3/2 (n-4)
PID = 10.7 @ 121.2
m. natural fractures: throughout
clinker zone at 116.0
Small voids in collection tube

11-7-00

Pull #27

TIME	DEPTH	RAN	REC	GAIN
0840	126.0	4.5	5.0	+0.5

10YR 3/2 (n-4)
PID = @ 125.8
m. natural fractures throughout

END BORING AT TANK 18.

① TANK 17

Pull # 1

TIME	DEPTH	RAN	REC	GAIN
1300	7.3	7.3	2.9	-4.4

100% concrete
mech fractures: 0.2, 1.0, 1.3
1.8
PID = 11.2 @ 4.4

11-8-00

TIME	DEPTH	RAN	REC	GAIN
0915				

- Began coring through grout @ 2.9

11-10-00

Pull #2

TIME	DEPTH	RAN	REC	GAIN
0905	12.1	4.5	4.6	-0.2

PID > 17.4 @ 11.5
10YR 2/1
(N-4)
vesicle size - medium
grout recovery = 1.8 feet
m natural fractures: ~~22~~ 9.5, 10.0, 10.3, 10.7, 11.3

Pull #3 TANK 17 ②

TIME	Depth	RAN	REC	GAIN
0930	16.7	4.6	4.6	0.0

5YR 2.5/1 (n-4)
PID = 10.7 @ 16.2
m. natural fractures: throughout run

Pull # 4

TIME	DEPTH	RAN	REC	GAIN
0940	22.1	6.4	5.3	-0.1

PID = 10.1 @ 21.8
10YR 3/2 (n-4)
m. natural fractures: 16.7 - 18.2, approximately every 3 inches until 22.1

Pull #5

TIME	DEPTH	RAN	REC	GAIN
1015	27.1	5.0	5.1	+0.1

10YR 3/1 (n-4)
PID = 10.7 @ 24.6
m. natural fractures: 22.8, 23.9, 24.3, 24.6, 24.8, 25.4, 26.0-26.4,

(3)

PL11 #6 TANK 17

TIME	DEPTH	RAN	REC	GAIN
1035	32.1	6.0	5.0	-1.0

10YR 3/2 (n-4)

PID= 10.1 @ 31.8

m. natural fractures: 28.2 - 30.0, 30.4, 31.0, 31.4, 31.8

PL11 #7

TIME	DEPTH	RAN	REC	GAIN
1045	37.1	5.0	5.0	0.0

PID= 10.4 @ 36.8

10YR 3/1 (n-4)

m. natural fractures: 32.6 - 32.7, 33.8 - 35.8, 36.2 - 36.6, 36.9

PL11 #8 TANK 17 (4)

TIME	DEPTH	RAN	REC	GAIN
11:05	42.1	5.0	5.0	0.0

PID= 9.8 @ 41.9

5YR 3/2 (n-4)

m. natural fractures: 37.5, 37.7, 38.6, 39.4 - 41.1, 41.6

PL11 #9

TIME	DEPTH	RAN	REC	GAIN
1120	47.1	5.0	3.9	-1.1

100% DWL

44.6 - 46.8 open cavity

PID= 10.7 @ 46.8

5YR 3/2

m. natural fractures: 42.4, 42.8, 43.5 - 45.6, 46.8

(5)

TANK 17

Pull #10

TIME	DEPTH	RAN	REC	GAIN
1135	52.1	5.0	5.0	0.0

10 YR 3/1 (n-y)
PID = 10.3 • 51.8

m. natural fractures: 47.1 - 47.7, 48.3 - 48.8, 49.6, 50.4, 51.4, 51.6, 51.8

mechanical fractures: 50.1, 52.1

Pull #11

TIME	DEPTH	RAN	REC	GAIN
1155	57.1	5.0	5.0	0.0

10 YR 3/1 (n-y)
PID = 10.6 • 56.5

m. natural fractures: 52.8, 53.7, 55.4, 56.5

mech fractures: 54.7

Pull #12 TANK 17 (6)

TIME	DEPTH	RAN	REC	GAIN
1215	62.1	5.0	5.0	0.0

PID = 10.5 • 61.8
5 YR 2.5/1 (n-y)

m. natural fractures: 57.1, 57.4 - 58.1, 58.2 - 59.1, 60.1, 60.4, 60.9 - 62.1

grout seam at 59.1 feet

mud inclusion at 61.6

Pull #13

TIME	DEPTH	RAN	REC	GAIN
1230	66.2	4.1	4.1	0.0

PID = 10.7 • 66.0
10 YR 2/1 (n-y)

m. natural fractures: 62.9, 62.1, 63.3, 63.8, 64.0, 64.3, 64.9, 66.6, 66.9 - 66.2

TANK 17

Pull #14

Time	Depth	Ran	Rec	Gain
1280	70.1	3.7	3.9	0.0

PID= 10.6 @ 66.0
5YR 2.5/1 (n-4)

m. natural fractures:
66.2 - 67.2, 67.8, 68.2,
68.6, 68.9 - 70.1

Pull #15

Time	Depth	Ran	Rec	Gain
1305	74.8	4.7	4.7	0.0

PID = 10.7 @ 74.4
5YR 3/1 (n-4)

m. natural fractures: 70.1 - 72.2
72.9, 73.5, 74.2

mud inclusion @ 72.9 - 74.8
grout at 72.8

Pull #16 TANK 17

Time	Depth	Ran	Rec	Gain
1330	75.3	0.5	0.5	0.0

PID= -@ NO
5YR 3/1 (n-4)
m natural fractures: 74.8 - 75.1

Pull #17

Time	Depth	Ran	Rec	Gain
1400	78.5	4.2	4.1	-0.1

PID = 10.3 @ 78.2
10YR 2/2 (n-4)

mud inclusions throughout
m. natural fractures:
75.3 - 77.1, 78.0 - 79.5

TANK 17

Pull #18

Time	Depth	Ran	Rec	Gain
1420	81.8	2.3	2.3	0.0

PID= 10.7 @ 81.5
10YR 3/1 (n-4)

m. natural fractures:
78.5 - 79.2, 79.6, 79.7
79.9, 80.2 -

mud inclusion at 79.9 - 80.2
no grout seams

Pull #19

Time	Depth	Ran	Rec	Gain
1450	83.5	1.7	1.7	0.0

PID= @ 83.2
10YR 3/1 (n-4)
m. natural fractures: throughout run/pull

Pull #20 TANK 17

Time	Depth	Ran	Rec	Gain
1510	85.1	1.6	1.3	-0.3

10YR 3/1 (n-4)
PID= 10.7 @ 84.8

m. natural fractures: ~~throughout~~ (AW)
@ 83.5 - 84.2, 85.0 - 85.1
clinker zone

Pull #21

Time	Depth	Ran	Rec	Gain
1545	90.3	5.2	5.2	0.0

PID= 7.7 @ 89.9 - 90.3
10YR 3/1 (n-4)

m. natural fractures:
85.1 - 85.3, 85.5, 86.2, 86.6,
86.9, 87.3 - 87.5, 87.9,
88.1, 89.1, 89.4, 89.7
89.9

TANK 17

Pull #22

TIME	DEPTH	RAN	REC	GAIN
1615	95.6	5.3	5.3	0.0

PID= @ 95.1
10 YR 3/1 (n-4)

m. natural fractures: 90.7, 91.1 -
91.5, 92.0, 92.3 - 93.3,
93.7, 93.9, 94.2 - 94.4,
94.8, 95.1, 95.4 -

Pull #23

TIME	DEPTH	RAN	REC	GAIN
1650	100.8	5.2	5.2	0.0

10YR 2/2 (n-4)
PID=14.1 @ 100.4
m. natural fractures:
95.6-96.1, 96.9, 97.6
98.0, 98.2, 98.4, 99.2
99.6, 100.4
mech: 97.2, 99.0

Pull #24 TANK 17

TIME	DEPTH	RAN	REC	GAIN
1725	105.9	5.1	4.6	-0.5

10 YR 2/1 (n-4)
PID=16.5 @ 105.4
m. natural fractures: 101.3, 102.7
103.5, 104.3, 104.8-105.9
large vesicle size

11-21-00
Pull #25

TIME	DEPTH	RAN	REC	GAIN
1010	106.2	0.3	0.8	+0.5

(n-4)
10 YR 2/1
PID= NA @
m. natural fractures: 106.0

TANK 17

Pull #26

TIME	DEPTH	RAN	REC	GAIN
1045	111.2	5.0	5.2	0.2

104R 2/1 (n-4)
PID= 7.0 @ 110.8
m. natural fracture: 107.5, 107.8, 108.2, 108.6, 109.0, 109.2, 110.6, 110.8
mech fracture: 107.1

Pull #27

TIME	DEPTH	RAN	REC	GAIN
1130	114.7	3.5	2.4	-1.1

104R 2/2 (n-4)
PID= 7.0 @ 114.4
m. natural fractures: 111.6, 112.8, 113.2
mechanical fracture: 112.0

TANK 17

Pull #28

TIME	DEPTH	RAN	REC	GAIN
1200	115.4	0.7	0.7	0.0

104R 2/1 (n-4)
multiple natural fractures throughout
clay inclusions throughout.
clinker zone begins

Pull #29

TIME	DEPTH	RAN	REC	GAIN
1230	116.7	1.3	1.3	0.0

104R 2/1 PID= 7.8 (n-4)
multiple natural fractures throughout.
clay inclusions throughout.
clinker zone

Pull #30

TIME	DEPTH	RAN	REC	GAIN
1245	118.0	1.3	1.0	-0.3

104R 2/1 (n-4)
m. natural fractures throughout
clinker zone continues

(5) TANK 17

Pull #31

TIME	Depth	Ran	Rec	Gain
1315	119.8	1.8	1.1	-0.7

10 YR 2/1 (n-4)
m. natural fractures throughout
clinker zone continues
clay inclusions throughout

Pull #32

TIME	DEPTH	RAN	REC	GAIN
1335	124.2	4.3	5.2	0.9

10 YR 2/1 (n-4)
clay inclusions throughout
clinker zone is tightly compacted
m. natural fractures: 120.2, 120.6, 121.0, 121.4, 122.4, 123.2, 123.5-124.2

mechanical fracture: 122.8
PID = @ 124.0

11/22/00 TANK #19 (1)

Pull #1

TIME	DEPTH	RAN	REC	GAIN
0845	6.5	6.5	3.7	-2.8

2' concrete then grout/concrete seam merges with 10 YR 3/2 (n-4) at 2.2 feet bgs
m. natural fractures: 0.8, 1.5, 1.8, 2.2, 2.8-3.2

Pull #2

TIME	DEPTH	RAN	REC	GAIN
0920	7.0	0.5	0.8	0.3

10 YR 2/2 (n-4)
small vesicle size
m. natural breaks: 6.5, 6.9-7.0

H casing ends/set as 7.0 feet bgs.

TANK 19

Pull #3

TIME	DEPTH	RAN	REC	GAIN
1250	9.3	2.3	0.7	-1.6

10YR 2/2 (n-y)
m. natural fractures throughout
slight clay inclusions

Pull #4

TIME	DEPTH	RAN	REC	GAIN
1300	12.2	2.9	1.6	1.3

1 foot concrete at 9.3 - 10.3
m. natural fractures: 10.3 - 10.7
10YR 2/2 (n-y)
PID = 13.5 @ 10.5

Pull #5

TIME	DEPTH	RAN	REC	GAIN
1315	14.6	2.4	1.0	-1.4

10YR 2/2 (n-y)
PID = 14.0
m. natural fractures throughout - clinker zone

TANK 19

Pull #6

TIME	DEPTH	RAN	REC	GAIN
1330	17.1	2.5	2.6	0.1

10YR 5/1 (n-y)
PID = 10.4
medium vesicle size
m. natural fractures:
14.8, 15.4, 15.7, 16.0, 16.4 - 17.1

Pull #7

TIME	DEPTH	RAN	REC	GAIN
1340	22.4	5.0	5.0	0.0

10YR 2/2 (n-y)
PID = 10.6 @ 22.2
m. natural fractures: 17.1 - 19.1, 19.7, 19.9 - 21.1, 21.1 - 22.4
mechanical fracture: 19.1

TANK 19

Pull #8

TIME	DEPTH	CAN	REC	GAIN
1400	25.4	3.3	3.3	0.0

5YR 3/4 (n-3)

PID= 10.4 @ 25.2

m. natural fractures: throughout 23.4-25.4

clay inclusions throughout clinker zone

Pull #9

TIME	DEPTH	CAN	REC	GAIN
1410	28.1	2.7	1.4	-1.3

5YR 3/4 (n-3)

PID= 8.9

m. natural fractures: 25.4-25.7, 26.0, 26.3-28.1

TANK 19

Pull #10

TIME	DEPTH	CAN	REC	GAIN
1430	32.9	4.8	4.1	-0.7

10YR 3/2 (n-4)

m. natural fractures: 28.1-28.4, 29.4, 30.4, 31.0, 31.8, 32.9

mech. fracture: 29.8

larger vesicle size

PID=10.1

Pull #11

TIME	DEPTH	CAN	REC	GAIN
1450	34.2	1.3	1.0	-0.3

5YR 3/4 (n-3)

PID= NA

m. natural fractures: throughout clinker zone

TANK 19

Pull #12

TIME	DEPTH	RAN	REC	GAIN
1505	35.9	1.7	1.4	-0.3

SYK <1/4 (n-3)
PID= 10.0
m. natural fractures: throughout clinker zone (cont.)

Pull #13

TIME	DEPTH	RAN	REC	GAIN
1530	36.9	0.9	1.2	0.3

SYK 3/4 (n.3)
PID= 10.7
m. natural fractures: 35.9 - 36.2, 36.6 - 36.9
clinker zone (cont.)

TANK 19

Pull #14

TIME	DEPTH	RAN	REC	GAIN
1545	40.1	3.3	2.5	-0.8

SYK 3/4 (n-3)
PID= 7.7
m. natural fractures: 36.9 - 37.9, 38.2, 38.4, 39.0-40.1
clinker zone (cont.)

Pull #15

TIME	DEPTH	RAN	REC	GAIN
605	44.0	3.9	3.8	-0.1

SYK 3/4 (n-3)
PID= 94.7 @ 43.0
m. natural fractures: 40.1, 40.3, 40.5, 40.9 - 41.9, 42.5, 43.1
HC odor present. No staining.
SAMPLE S01 here

TANK 19

Pull #16

TIME	DEPTH	RAN	REC	GAIN
1625	47.3	3.3	3.3	0.0

10 YR 3/2 (n-4)
medium vesicle size
end of clinker zone at 45.0'
m. natural fractures: 44.0 - 45.4
45.8, 46.1, 46.8 - 47.3
HC odor but no staining.
PID = 47.8 @ 47.0'

Pull #17

TIME	DEPTH	RAN	REC	GAIN
1700	48.4	1.1	1.2	0.1

10 YR 3/2 (n-4)
PID = 10.7
m. natural fractures: throughout

11/24/00 TANK 19

Pull #18 11-24-00

TIME	DEPTH	RAN	REC	GAIN
0855	49.2	0.8	0.8	0.0

10 YR 3/2 (n-4)
PID = NA
medium vesicle size
m. natural fractures: 48.4 - 48.8
some clay inclusions

Pull #19

TIME	DEPTH	RAN	REC	GAIN
0805	50.8	1.6	1.4	-0.2

10 YR 3/2 (n-4)
PID = @ 50.4
m. natural fractures: throughout
(clinker zone)

(10) TANK 19

Pull # 20

TIME	DEPTH	RAN	REC	GAIN
0815	51.4	0.6	0.6	0.0

10YR 3/2 (n-4)
PID = 8.3 @ 51.2
m. natural fractures: throughout
(clinker zone cont.)

Pull # 21 (AW)

TIME	DEPTH	RAN	REC	GAIN

Boring grouted completely
Moved off TANK 19 to
TANK 15 due to elevator
issues.

12-2-00 TANK 15 (1)

Set up on Tank 15. Drill H-casing
to 7 feet. Set well casing
in floor.

Pull #1

TIME	DEPTH	RAN	REC	GAIN
1445	~~2.8~~ 4.3	~~2.8~~ 4.3	2.2	-2.1

NA: YR / Concrete
m. natural fractures: 1.0 - 2.2

Pull #2

TIME	DEPTH	RAN	REC	GAIN
1500	6.3	2.0	0.6	-1.4

concrete

slight uncertain odor ?

Pull #3

TIME	DEPTH	RAN	REC	GAIN
1600	7.8	1.5	1.8	0.3

Concrete until 7.5 feet bgs
then 10YR 2/2 (n-4)
m. natural fractures: 6.3 - 6.9, 7.5
uncertain odor

② TANK 15

12-4-00

Pull #4

TIME	DEPTH	RAN	REC	GAIN
0855	9.8	2.0	2.0	0

- grout/concrete seal of well casing.
7.8 - 8.0 (n-4)
- 10 YR 2/2 medium vesicle size
PID = 0.0
m. natural fractures: 8.0, 8.4, 8.4 - 9.8

Pull #5

TIME	DEPTH	RAN	REC	GAIN
0910	12.8	3.0	3.0	0

10 YR 2/2 (n-4)
PID = 0.2 m. vesicle size
m. natural fractures: 9.8, 10.3-10.5
10.8 ; 12.8 (begin clinker zone)

TANK 15 ③

Pull #6

TIME	DEPTH	RAN	REC	GAIN
1000	13.9	1.1	1.1	0

10 YR 2/2 (n-4)
med. vesicle size
PID = 0
m. natural fractures throughout
clinker zone continues and ends at 15.9

Pull #7

TIME	DEPTH	RAN	REC	GAIN
1015	17.9	4.0	3.7	-0.3

5 YR 3/2 small vesicle size
PID = 0 (n-4)
m. natural fractures: 13.9, 14.3 - 15.3, 15.9 - 17.1, 17.3
17.5 - 17.9
grout seam at 15.3-15.9
clay inclusions

④ TANK 15

Pull #8

TIME	DEPTH	RAN	REC	GAIN
1025	19.5	1.6	1.1	-0.5

5YR 3/2 (n-3)

small vesicle size

PID = 1.0

m. natural fractures: throughout

Pull #9

TIME	DEPTH	RAN	REC	GAIN
1045	23.7	4.2	4.1	-0.1

5YR 3/2 (n-3)

small vesicle size

PID = 1.2

m. natural fractures throughout

clay inclusions throughout

TANK 15 ⑤

Pull #10

TIME	DEPTH	RAN	REC	GAIN
1100	27.9	4.2	4.0	-0.2

10YR 2/2 (n-4)

med. vesicle size

PID = 0.4

m. natural fractures: 23.7-25.7, 24.4, 24.6, 26.8, 27.3, 27.6

Pull #11

TIME	DEPTH	RAN	REC	GAIN
1115	33.3	5.4	5.2	-0.2

10YR 2/2 (n-4)

med vesicle size

PID = 1.6

m. natural fractures: 28.0, 29.0, 29.2, 29.4, 30.2, 30.4, 30.6-31.2, 31.8, 32.4, 32.6, 32.7

clay inclusions throughout

TANK 15

Pull # 12

TIME	DEPTH	RAW	REC	GAIN
1125	35.5	2.2	2.1	-0.1

10 YR 2/2 (n-4)

PID = 1.2 medium vesicle size

m. natural fractures:
33.3, 33.5 - 34.2

Pull # 13

TIME	DEPTH	RAW	REC	GAIN
1145	40.4	4.9	4.6	-0.3

10 YR 2/2 (n-4)

PID = 1.4 large vesicle size

m. natural fractures:
35.5 - 36.0, 36.2, 36.5 - 36.8
37.1, 37.7 - 38.3, 39.2, 39.5
40.0, 40.4

clay inclusions throughout

TANK 15

Pull # 14

TIME	DEPTH	RAW	REC	GAIN
1205	45.5	5.1	5.1	0

10 YR 2/2 (n-4)

PID = 1.2 med. vesicle size

m. natural fractures: 40.8, 43.1
43.9, 44.3, ~~45.2~~ ALW

mechanical fractures: 41.2, 45.2 - 45.5

Pull # 15

TIME	DEPTH	RAW	REC	GAIN
1220	50.5	5.0	5.3	0.3

10 YR 2/2 (n-4)

PID = 1.2 medium vesicle size

m. natural fractures: 46.5,
47.3, 48.1, 48.6 - 48.9, 49.2 - 49.5, 50.1 - 50.3, 50.5

TANK 15

Pull #16

TIME	DEPTH	RAN	REC	GAIN
1235	55.8	5.3	5.2	-0.1

10 YR 2/2 (n-4)
PID= 0.2 small vesicle size
m. natural fractures: 50.9, 51.5, 52.6, 52.9, 53.2, 53.7, 54.0, 54.2 - 55.8

Pull #17

TIME	DEPTH	RAN	REC	GAIN
1300	61.1	5.3	5.3	0

10 YR 2/2 (n-4)
PID= 1.2 vesicle size
m. natural fractures: 56.2 - 56.6, 56.9, 57.1, 57.3 - 57.8, 58.3 - 59.5, 60.1, 60.4, 61.0

TANK 15

Pull #18

TIME	DEPTH	RAN	REC	GAIN
1310	65.5	4.4	3.1	-1.3

10 YR 2/2 (n-3)
PID= 1.0 small vesicle size
m. natural fractures: throughout run
clay inclusions

SAMPLES RH-BR-15-S01 and RH-BR-15-D03 taken here.

Pull #19

TIME	DEPTH	RAN	REC	GAIN
1325	70.7	5.2	5.0	-0.2

10 YR 2/2 (n-4)
PID= med. vesicle size
m. natural fractures: 65.4, 65.8, 67.0, 67.2, 67.5, 68.3, 68.5 - 69.6, 69.8, 70.1, 70.3 - 70.7
68.9 - 69.1 open cavity

(10) TANK 15

Pull #20

TIME	Depth	Ran	Rec	Gain
1340	75.9	5.2	5.2	0

10 YR 2/2 (n-4)
PID= 1.4 med. vesicle size
m. natural fractures: 71.3, 71.6, 71.8, 72.0, 73.1, 73.7, 74.5, 75.1, 75.9
Grout seam at 75.4-75.9

Pull #21

TIME	Depth	Ran	Rec	Gain
1400	81.1	5.2	5.2	0

10 YR 2/2 (n-4)
PID= 0.9 med. vesicle size
m. natural fractures:
77.0, 77.8, 78.4, 79.0, 79.6, 80.2, 80.7, 81.0, ~~81.4~~ ALL

grout seam from 75.9-77.0

TANK 15 (11)

Pull #22

TIME	Depth	Ran	Rec	Gain
1420	86.2	5.1	5.1	0

10 YR 2/2 (n-4)
PID= 1.2 vesicle size
m. natural fractures: 82.3, 82.6, 83.1, 83.9, 85.2, 85.5, 85.6-86.2
* 86.0 SAMPLE *
* SAMPLE RH-BR-15-S02 taken here

Pull #23

TIME	Depth	Ran	Rec	Gain
1425	91.6	4.8	5.0	0.2

10 YR 2/2 (n-4)
PID= 1.2 Small vesicle size
m. natural fractures: 86.7, ~~86.9~~, 86.9, 87.3, 87.8, 88.2, 88.4, 89.0, 89.4, 90.8-91.0

TANK 15

Pull # 24

TIME	Depth	Ran	Rec	Gain
1500	96.2	5.2	5.2	0

10 YR 2/2 (n-4)

PID= 0.9 med. vesicle size

m. natural fractures:
91.2, 91.4, 91.7, 92.0, 92.2,
92.5, 92.7, 93.0, 93.3, 93.6,
93.9, 94.6, 95.2, 95.5
95.8, 96.0

Pull # 25

TIME	Depth	Ran	Rec	Gain
1515	101.3	5.1	5.1	0

5 YR 2.5/1 (n-4)

PID= 1.2 small vesicle size

m. natural fractures: 96.2-96.5, 96.8
96.9, 97.0, 97.5, 97.7,
98.0, 98.5, 99.0, 99.5,
99.8, 100.1, 100.5, 100.8
101.0-101.3

TANK 15

Pull # 26

TIME	Depth	Ran	Rec	Gain
1530	106.5	5.2	5.2	0

5 YR 2.5/1 (n-4)

PID= 1.4 small vesicle size

m. natural fractures: 101.5, 102.3
103.4-103.8, 104.1-104.5,
105.1, 105.4, 105.6, 106.1,

Pull # 27

TIME	Depth	Ran	Rec	Gain
1550	111.7	5.2	5.2	0

5 YR 2.5/1 (n-4)

PID= 1.0 small vesicle size

m. natural fractures: 107.6, 108.0,
108.2, 108.5, 108.9, 109.4-
109.8, 110.2-110.4,
110.8-111.1, 111.3

TANK 15

Pull #28

TIME	DEPTH	RAN	REC	GAIN
1615	116.9	5.2	5.2	0

5YR 2.5/1 (n-4)

PID= 1.2 small vesicle size

m. natural fractures: 112.1, 112.7, 112.9, 114.7, 115.2-116.1, 116.4-116.9

mechanical break: 114.0

SAMPLE RH-BR-15-S03 taken at 115.0

Pull #29

TIME	DEPTH	RAN	REC	GAIN
1630	122.1	5.2	5.2	0

5YR 2.5/1 (n-4)

PID= 1.2 small vesicle size

m. natural breaks: 117.2-118.8, 119.2, 119.5, 119.8, 120.3, 120.5, 120.8-121.9, 121.9-122.1

TANK 15

Pull #30

TIME	Depth	Ran	Rec	Gain
1700	126.4	4.3	4.3	0

5YR 2.5/1 (n-4)

PID= 0.6 medium vesicle size

m. natural fractures: 122.1-123.1, 123.5, 124.0-125.6, 126.0, 126.2-126.4

End Drilling at TANK 15 on 12/4/00.

Jim Williams

① TANK 14

12/5/00

Pull #1

TIME	DEPTH	RAN	REC	GAIN
1230	3.0	3.0	0.4	-2.6

Concrete
m. fracture: 0.3

Pull #2

TIME	DEPTH	RAN	REC	GAIN
1305	8.3	5.3	4.0	-1.3

Concrete
m. natural breaks: 0.6, 1.4, 3.0 - 3.2, 4.0 - 4.4

TANK 14 ②

Pull #3

TIME	DEPTH	RAN	REC	GAIN
1625	10.2	1.9	1.8	-0.1

10 YK 3/1 (n-4)
PID = 0.0 medium vesicle size
m. natural fractures: 8.3 - 8.9, 9.8, 10.2

Pull #4

TIME	DEPTH	RAN	REC	GAIN
1445	15.4	5.2	5.2	0

10 YK 3/1 until 1. then 10 YK 2/2 (n-4)
PID = 0.0 medium vesicle size
mech breaks: 10.8, 11.1, 12.5
m. natural fractures: 11.7, 11.9, 13.9, 14.4, 14.7, 15.4
grout seams at 13.2 feet
End 4-ROD use @ 15.4' bgs

③ TANK 14

12-6-00

Pull #5

Time	Depth	Ran	Rec	Gain
0905	20.3	4.9	4.9	0

10 YR 3/1 (n-4)

PID = 0.0 medium vesicle size

m. natural fractures: 15.7, 16.4, 16.6, 17.5, 18.9, 19.8, 20.1

mechanical break: 19.4

Pull #6

Time	Depth	Ran	Rec	Gain
0920	25.4	5.1	5.2	0.1

10 YR 2/2 (n-4)

PID = 0.0 medium vesicle size

m. natural fractures: 20.3-21.6, 22.2, 22.6, 23.4,

mechanical break: 23.9

Grout seams for 23.4-25.0

TANK 14 ④

Pull #7

Time	Depth	Ran	Rec	Gain
0930	30.7	5.3	5.2	-0.1

10 YR 2/2 (n-4)

PID = 2.0 small vesicle size

m. natural fractures: 25.7, 26.7, 27.3, 28.3, 30.4

mechanical break: 29.4, 29.9

Grout seams: 26.7-28.3, 30.4

Pull #8

Time	Depth	Ran	Rec	Gain
0945	36.0	5.3	5.2	-0.1

10 YR 3/2 medium vesicle size

PID = 6.2 (n-4)

m. natural fractures: 31.5, 33.5, 33.9, 34.3, 35.4-36.0

grout seams: 31.5-33.5, 34.9

*SAMPLE RH-BC-14-S01 taken at 36.0' bgs.

TANK 14

Pull # ~~8~~ 9

TIME	DEPTH	RAN	REC	GAIN
1000	41.1	5.1	5.2	0.1

10 YR 3/2 (n-4)

PID = 9.8 large vesicle size

m. natural fractures: 37.2, 37.8, 38.7 - 39.7, 40.1

grout seams throughout entire run

Sol: A grout at 39.7 - 40.4

Pull # 90

TIME	DEPTH	RAN	REC	GAIN
1020	46.1	5.0	5.1	0.1

10 YR 3/1 (n-4)

PID = 10.8 medium vesicle size

m. natural fractures: 43.2, 43.6, 44.4, 44.8, 45.1, 45.7, 46.1

mechanical break: 42.2, 43.0

TANK 14

Pull # ~~10~~ 11

TIME	DEPTH	RAN	REC	GAIN
1035	51.1	5.0	5.0	0

10 YR 3/1 (n-4)

PID = 4.7 medium vesicle size

m. natural fractures:
46.4, 47.2, 47.9, 48.9, 49.2, 49.6, 50.0

Pull # 12

TIME	DEPTH	RAN	REC	GAIN
1050	56.2	5.1	5.1	

10 YR 2/2 (n-4)

PID = 2.0 large vesicle size

m. natural fractures: 52.3, 53.1, 54.6, 55.2, 55.8, 56.0

mechanical break: 54.9

grout seam at 55.7

TANK 14

Pull #13

TIME	DEPTH	RAN	REC	GAIN
1105	61.4	5.2	5.2	0

10YR 3/2 (n-4)
PID = 2.0 small vesicle size
m. natural breaks: 57.9, 58.5, 58.9, 59.1, 59.2, 59.4, 59.8 - 60.2, 60.4, 60.6, 60.9 - 61.4
grout seam at 57.1' bgs.
* Sample RH-BG14S02 and RH-BC-14-D04 taken at 60.5'

Pull #14

TIME	Depth	Ran	Rec	Gain
1125	66.6	5.2	4.8	-0.4

10YR 2/2 (n-4)
PID = 1.6 vesicle size
m. natural breaks: 61.4 - 62.0, 62.9, 63.3, 63.9, 64.3, 65.2, 65.8, 66.0

Pull #15

TIME	Depth	Ran	Rec	Gain
1220	71.1	4.5	5.1	0.6

10YR 2/1 (n-4)
PID = 0.6 medium vesicle size
m. natural fractures: 67.6, 68.4, 68.7, 69.0, 69.5, 69.8, 70.5 - 71.1
grout seams: 67.2, 68.0, 68.7, 69.7 - 70.8

Pull #16

TIME	DEPTH	RAN	REC	GAIN
1235	76.2	5.1	5.1	0

10YR 3/2 (n-4)
PID = 0.2 vesicle size
m. natural fractures: 71.7, 72.1, 72.6, 72.8, 73.1, 73.6, 73.9, 74.1, 74.2, 74.8, 75.4, 75.8, 76.2
grout seam at 72.0
* SAMPLE RH-BC-14-S03 taken at 75.0' bgs.

Pull # 17

Time	DEPTH	RAN	REC	GAIN
1250	81.5	5.3	5.2	-0.1

10YR 2/2 (n-4)
PID = 1.6 large vesicle size
m. natural fractures: 76.5, 76.8, 77.3, 77.4, 77.6, 78.2, 78.5, 78.7-80.4, 80.8, 81.3

Pull # 18

Time	Depth	Ran	Rec	Gain
1310	86.0	4.5	4.6	0.1

10 YR 2/2 (n-4)
PID = 2.0 medium vesicle size
m. natural fractures: 81.9, 82.3, 82.5, 82.6-83.1, 84.1-, 84.0

Pull # 19

Time	Depth	Ran	Rec	Gain
1530	91.2	5.2	5.2	0.0

10 YR 2/2 (n-4)
PID = 19.8 medium vesicle size
m. natural fractures: 86.3, 86.9, 87.5, 87.9, 88.5, 89.5, 89.5-89.9
grout seam at 90.2-91.2

Pull # 20

Time	DEPTH	RAN	REC	GAIN
1400	96.3	5.1	5.1	0

10 YR 2/2 (n-4)
PID = 19.7 Small vesicle size
m. natural fractures: 91.5, 93.6, 94.6, 95.0, 95.2, 95.8, 96.0-96.3
grout seams throughout
* heavy staining of core, sample collected for fingerprint lab also
** Collect RH-BR-14-S04 at 95.5'

TANK 14

Pull #21

TIME	DEPTH	RAN	REC	GAIN
1415	101.4	5.1	5.1	0.0

10 YR 2/2 (n-4)
PID = 44.4 large vesicle size
m. natural fractures:
96.3-97.3, 97.9, 98.2-98.8,
99.3, 99.8, 100.5, 100.7
great seam at 100.4

Pull #22

TIME	Depth	Ra	Rec	Gain
1435	106.6	5.2	5.2	0.0

10 YR 2/2 (n-4)
PID = 9.1 small vesicle size
m. natural fractures:
103.5, 104.1, 104.7-105.1
105.4-105.7, 106.1

HC odor + stain

TANK 14

Pull #23

Time	Depth	Ran	Rec	Gain
1445	111.8	5.2	5.2	0

10 YR 2/2 (n-4)
PID = 3.9 medium vesicle size
m. natural fractures:
106.9, 107.5, 108.5, 109.0-109.3
110.0-110.3, 110.6, 111.2

HC odor + stains
great seam at 109.3 - 110.7

Pull #24

TIME	DEPTH	RAN	REC	GAIN
1515	117.0	5.2	5.2	0

10 YR 2/2 (n-4)
PID = 2.0 small vesicle size
m. natural fractures: 112.2, 114.0
114.2, 114.6, 115.7, 116.3
116.9
HC odor + stain
Sample RH-BC-14-505 at 116.0
at 1515 on 12-6-00.

(13) TANK 14

Pull #25

TIME	DEPTH	RAN	REC	GAIN
1540	121.9	4.9	5.0	0.1

10 YR 2/2 (n-Y)
PID = NA medium vesicle size
m. natural fractures: 117.1, 117.4, 117.5, 117.7, 118.5, 118.7, 119.3, 119.9, 120.5, 120.8, 121.2, 121.4 end
- HC odor + sheen

Pull #26

TIME	DEPTH	RAN	REC	GAIN
1600	127.2	5.3	5.1	-0.2

10 YR 2/2 (n-Y)
PID = 2.0 large vesicle size
m. natural fractures:
121.9-122.4, 122.8, 122.9, 123.3, 123.7, 124.5-124.9, 125.6-125.9, 126.2, 126.8
- HC odor + sheen

TANK 14 (14)

Pull #27

TIME	DEPTH	RAN	REC	GAIN
1630	133.4	6.2	5.3	-0.9

10 YR 2/2 (n-Y)
PID = 2.0 vesicle size
m. natural fractures:
128.1, 128.7, 129.2, 130.0, 130.2, 130.8, 131.3, 131.7

lava tube at 128.1 - 129.2

No clinker zones in Tank 14 drilling. Sheen and FP over much of core samples.

Pull #28 12-7-00

Time	Depth	Ran	Rec	Gain
0900	136.0	2.6	2.6	

10 YR 2/2 (n-Y)
PID = 69.4 medium vesicle size
m. natural fractures: 133.7, 133.7-134.1, 134.6, 135.2, 135.5-136.0

(5)

TANK 14

12-7-00

- Drilled another 2.6 feet in order to create a "sump" below the lava tube to collect any type of free product or contamination.

- Outer well casing head became loose. Used drill-hammer to create small void and place new concrete in order to create watertight seal and secure well.

- Moved from Tank 14 to Tank 13.

Well Out 12/7/00

① TANK 13

12-8-00

Pull # 1

TIME	DEPTH	RAN	REC	GAIN
0945	4.0	4.0	2.0	-2.0

~~HE~~ Concrete
m. natural fractures: 1.7, 1.9
HC odor present
Sheen on water from drilling

Pull # 2

TIME	DEPTH	RAN	REC	GAIN
0955	5.6	1.6	0.7	-0.9

10 YR 5/3 Small vesicle size
PID = 179.2 (n-4)
m. natural fractures: 4.0 - 4.3,
high HC odor

TANK 13 ②

Pull # 3

Time	Depth	Ran	Rec	Gain
1000	7.6	1.5	1.1	-0.4

10 YR 3/1 (n-4)
m. natural fractures throughout
Small vesicle size
Strong HC odor
PID = 83.2

Pull # 4

TIME	Depth	Ran	Rec	Gain
1025	8.6	1.5	1.5	0.0

10 YR 2/2 (n-4)
PID = 92.9 large vesicle size
m. natural fractures:
~~6.8~~, 7.3, 7.9

③ TANK 13

12-11-00
Pull # 5

TIME	DEPTH	RAN	REC	GAIN
0850	13.5	4.9	4.9	0.

10 YR 2/2 (n-4)
PID = 4.4 large vesicle size
m. natural fractures: ~~14.0, 14.3, 14.6~~
9.1, 9.4, 9.7, 10.2, 10.8,
11.3, 11.5-12.0, 12.5-13.5
no odor
some clay inclusions in 12.0-13.5

Pull # 6

TIME	DEPTH	RAN	REC	GAIN
0940	15.9	2.4	2.4	0.0

10 YR 2/2 (n-4)
PID = 6.4 medium vesicle size
m. natural fractures: 13.5-14.5,
14.9-15.9
no odor

TANK 13 ④

Pull # 7

TIME	DEPTH	RAN	REC	GAIN
1000	23.6	7.7	5.2	-2.5

10 YR 2/2 (n-4)
PID = 6.7 large vesicle size
m. natural fractures: 15.9-16.1, 16.9,
17.2, 17.8, -18.2, 19.0, -19.4,
20.5, 20.7, 21.4
no odor
lava tube from: 20.0 to 22.8.

Pull # 8

TIME	DEPTH	RAN	REC	GAIN
1020	28.8	5.6	5.1	-0.5

10 YR 2/2 (n-4)
large vesicle size PID = 5.7
m. natural fractures: 24.9, 26.7,
27.1, 28.1-28.8
no odor
slight clay inclusions in run length.

(5) TANK 13

Pull # 9

TIME	DEPTH	RAN	REC	GAIN
1035	38.8	5.0	5.0	0

10 YR 2/2 (n-4)
PID: 7.0 medium vesicle size
m. natural fractures:
29.9, 30.5, 30.8, 31.4 - 32.0,
32.6 - 32.9, 33.2, 33.4, 33.8
no odor

Pull # 10

TIME	DEPTH	RAN	REC	GAIN
1045	38.8	5.0	5.0	0

10 YR 2/2 (n-4)
PID: 7.4 large vesicle size
m. natural fractures:
33.8 - 34.0, 34.4 - 35.0, 35.3,
35.8, 36.6, 38.2,

no odor
clay inclusions throughout run

TANK 13 (6)

Pull # 11

TIME	DEPTH	RAN	REC	GAIN
1105	43.4	4.6	4.8	0.2

10 YR 2/2 (n-4)
PID = 6.8 large vesicle size
clay inclusions 38.8 - 40.2
no odor
m. natural fractures: 39.4, 39.5, 39.8
40.0, 40.9, 41.2, 42.5, 42.7
43.0
mechanical fracture:

Pull # 12

TIME	DEPTH	RAN	REC	GAIN
1115	46.9	3.3	2.1	-1.2

10 YR 2/2 (n-4)
PID: 3.3 large vesicle size
no odor
clay inclusions throughout run
m. natural fractures: 43.6,
44.2 - 44.8, 45.0

TANK 13

Pull #13

TIME	DEPTH	RAN	REC	GAIN
1135	51.3	4.6	5.2	0.6

10YR 2/2 (n-4)
PID = 4.4 medium vesicle size
trace clay inclusion throughout
48.2, 49.0, 49.8, 50.2
50.4, 51.0

no odor

Pull #14

TIME	DEPTH	RAN	REC	GAIN
1150	56.4	5.1	5.2	0.1

10YR 2/2 (n-4)
PID = 2.3 medium vesicle size
no odor, no clay
m. natural fractures:
52.0, 52.6, ~~53.3~~, 53.8
54.0, 54.4, 55.0, 55.8
56.4
mechanical fractures: 53.3

TANK 13

Pull #15

TIME	DEPTH	RAN	REC	GAIN
1205	61.8	5.4	5.0	-0.4

5YR 2.5/2 (n-4)
PID = 5.9 small vesicle size
clay inclusions no odor
m. natural fractures:
57.3, 58.0, 58.4, 59.2-59.7,
60.2, 60.6, 61.8

Pull #16

TIME	DEPTH	RAN	REC	GAIN
1220	65.6	3.8	3.8	0

5YR 2.5/2 (n-4)
PID = 7.1 small vesicle size
no odor no clay
m. natural fractures: 62.0
62.4, 63.0-63.9, 64.1-64.4,
64.7-65.6

Pull #17

TIME	DEPTH	RAW	REC	GAIN
1235	70.7	5.1	5.2	0.1

10YR 2/2 (n-y) PID = 5.5
medium vesicle size, no odor
trace clay inclusions throughout
m. natural fractures:
65.9, 66.1, 66.6, 66.9,
~~70.7~~ 67.7, 68.2, 69.0
69.7, 70.3-70.7

Pull 18

TIME	DEPTH	RAW	REC	GAIN
1255	76.1	5.4	5.1	-0.3

10YR 2/2 (n-y)
PID = 5.3 medium vesicle size
no odor, no clay inclusions
m. natural fractures:
70.7-71.4, 71.6-72.4, 73.4, 73.8
74.3, 75.2
75.4, 75.8
* Sample RH-BR-13-S01 and RH-BR-13-D05 taken at 72.0'

Pull #19

TIME	DEPTH	RAW	REC	GAIN
1315	81.2	5.1	5.1	0

10YR 2/2 (n-y)
PID = 6.8 vesicle size
m. natural fractures: 76.9, 78.2,
78.5, 79.0, 79.5, 80.5
80.8

no odor, no clay

Pull 20

TIME	Depth	Raw	Rec	Gain
1330	87.4	6.2	5.2	-1.0

10YR 2/2 until 82.9 then 5YR 2.5/2
PID = 7.0 small vesicle size
m. natural fractures:
82.9, 83.1, 83.2, 83.5,
84.0, 84.3, 84.5, 85.0, 85.5,
85.7, 86.0, 86.3, 86.5,
86.7, 86.9

no odor
zone of clay at 83.1-83.4

Tank 13

Pull 21

Time	Depth	Ran	Rec	Gain
1345	92.7	5.3	5.2	-0.1

10 YR 2/2 (n-4)
PID = 5.8 small vesicle size
no odor, no clay
m. natural fractures: 88.0, 88.3, 89.3, 89.5, 89.8, 90.0, 90.7, 91.6, 92.1

Pull 22

Time	Depth	Ran	Rec	Gain
1400	97.7	5.0	5.1	0.1

10 YR 2/2 (n-4)
PID = 7.8 medium vesicle size
no odor, no clay
m. natural fractures:
93.3, 93.5, 94.0, 94.3, 94.8, 95.2, 95.4, 95.8, 96.2, 96.8

Tank 13

Pull 23

Time	Depth	Ran	Rec	Gain
1415	103.0	5.3	5.1	-0.2

10 YR 2/2 (n-4)
PID = 5.5 small vesicle size
no odor, clay at 102.7-103.0
m. natural fractures: 98.4, 98.5, 99.3, 99.5, 100.4, 101.1, 101.8, 102.0, 102.2, 102.7

& Sample RA-BE-13-S02 taken at 100.0'

Pull 24

Time	Depth	Ran	Rec	Gain
1440	108.2	5.2	5.1	-0.1

5 YR 2.5/2 (n-4)
PID = 6.8 medium vesicle size
no odor, trace clay throughout
m. natural fractures
103.3, 104.2, 104.6, 104.9, 105.1, 105.9, 106.4, 106.6, 107.1, 107.3, 107.7

TANK 13

Pull 25

Time	Depth	Ran	Rec	Gain
1500	113.2	5.0	5.2	0.2

10 YR 2/2 (n-4)
PID = 6.7, large vesicle size
no odor, trace clay throughout
m. natural fractures:
109.2, 109.5, 110.2, 110.7
111.6, 111.9, 112.2, 113.1

Pull 26

Time	Depth	Ran	Rec	Gain
1515	118.0	4.8	4.5	-0.3

10 YR 2/2 (n-4)
PID = 5.7, medium vesicle size
no odor, clay throughout
m. natural fractures:
113.2-114.4, 114.7, 115.7,
115.9, 116.1, 116.5, 116.8,
117.0

Pull 27

Time	Depth	Ran	Rec	Gain
1535	123.1	5.1	5.0	-0.1

10 YR 2/2 (n-4)
PID = 5.0, small vesicle size
no odor, clay from 121.1-123.1
m. natural fractures:
118.5, 118.7, 119.7, 120.4,
120.6, 121.2, 121.7, 122.0-
122.4, 122.9

Pull 28

Time	Depth	Ran	Rec	Gain
1555	128.1	5.0	5.2	0.2

10 YR 2/2 (n-4)
PID = 5.1, small vesicle size
no odor, trace clay throughout
m. natural fractures: 123.6, 124.0,
124.9, 125.2, 125.6, 126.4,
126.8, 127.2, 127.9

*Sample RH-GC-13-503 here 125.0'

12-8

TANK 13.

Cored to 8.6. Then Removed Hcasing
To 8.5 ft. Removed casing and
1200 got cover installed
1300 Left site
Returned Keys. TO FISC

Larry Dunn

TANK 13

12-8

Poll	Depth	Run	Rec	Loss	gain
1	4.0	4.0	2.0	2.0	
	Concrete	0.0 - 1.8		sand 1.8 - 3.9	
2	5.6	1.6	0.7	0.9	strong fumes PID 180
3	7.1	1.5	1.1	0.4	PID 83
4	8.6	1.5	1.5	PID 92	

Removed Hcasing And Installed
6 foot Steel protective cover

L. Domoss L. Williams TANK13

12-11 S. Toma B. Sheldon H. Holmes

0600 Called Evetts, Get with Gammon About Keys

0630 Pickup Keys AT Fisc

0700 Arrive AT Adits

0720 Arrive AT Drill

0735 Started Drilling. Cored grout out of protective cover then cored H core to 13.5 no odor changed to N core. Drilling is going good No sign of fuel And No high PID Readings

1625 J Gammon stopped by. gave him information on hole finished Drilling

1635 Left Drill

1645 Left site

Returned Keys to Fisc

TANK13

12-11

Pull	Depth	Ran	Rec	Loss	Gain
5	13.5	4.9	4.9	No fuel odor	
	Changed to N Core				
6	15.9	2.4	2.4		
7	23.6	7.7	5.2	2.5	
	20.0 -	22.8	open cav. 100% DWL		
8	28.8	5.2	5.1	0.1	
9	33.8	5.0	5.0		
10	38.8	5.0	5.0		
11	43.4	4.6	4.8		0.2
12	46.7	3.3	2.1	1.2	
13	51.3	4.6	5.2		0.6
14	56.4	5.1	5.2		0.4
15	61.8	5.4	5.0	0.4	
16	65.6	3.8	3.8		
17	70.7	5.1	5.2		0.1
18	76.1	5.4	5.1	0.3	
19	81.2	5.1	5.1		
20	87.4	6.2	5.2	1.0	
	82.6 -	83.5	Pnt Filled cav		
21	92.7	5.3	5.2	0.1	
22	97.7	5.0	5.1		0.1
23	103.0	5.3	5.1	0.2	
24	108.2	5.2	5.1	0.1	

12-11-00 TANK 13

Poll	Depth	Raw	Rec	Loss	gain
25	113.2	5.0	5.2		0.2
26	118.0	4.8	4.5	0.3	
27	123.1	5.1	5.0	0.1	
28	128.1	5.0	5.2		0.2
29	133.1	5.0	5.0		

TANK 13 & TANK 12 12-12-00

L. DeMoss L. Williams
K Holmes B Sheldon

0630 pickup keys at FISC
0700 Arrive at Adit 5
0715 Arrive at Drill
0730 Started pulling Rods out.
0800 Set well
5' sump 133.1-127.8
20' screen 127.8-107.8
Riser 107.8-0.0
0815 Talked with Gammon. Said he talked with Kent. They want to drill another hole at 13 and get sample of sand
0820 Drill crew ~~Repositioning~~ moving Drill to do 13A, 1.5 ft toward 15. Drilled to 6 feet very strong fuel odor hard to get sample.
0900 Took Drill apart and moved to TANK 12.
1230 Started setting up Drill. Lance Stephanny & Larry Deconed H core Barrel, H-Rods and inner Barrel.
1300 Lance & Larry put Bentonite seal

12-12 TANK 12

IN well #13. Seal 15.6-14.6

1310 STARTED Drilling TANK 12, Drilling IN H casing. Drilled to 3 ft. Then Cored H to 8.8. Reamed H casing to 8.8 to open hole up for Protective cover.

1530 got protective cover set and grouted in.
Cleaned up Around hole

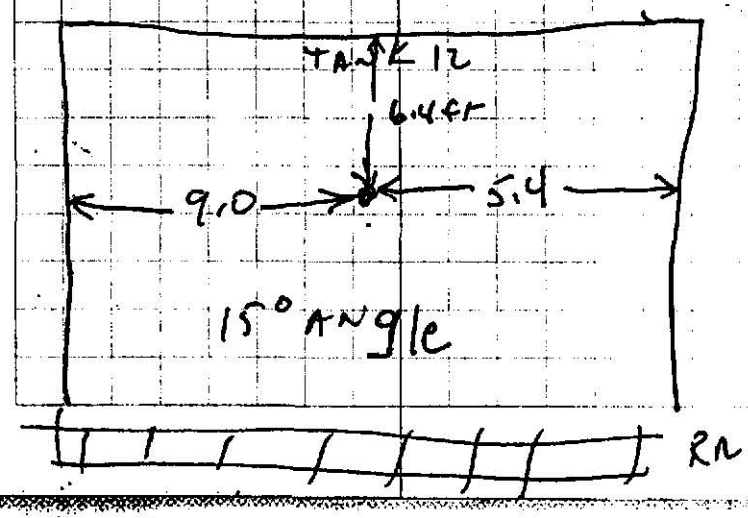
1600 PUT Rods ON TRAIN TO Take TO Decon AT Adit 3 Operation had wrong Key, He went Back to office but could not find Key. We TOOK Rods Back TO hole.

1715 Left site
Returned Keys to FSC

Larry Dunn

TANK 12 12.12

Pull	Depth	Run	Rec	Loss	gain
1	4.6	4.6	1.7	2.9	
Concrete 0.0		1.7	Sand 1.7-4.6		
2	6.4	1.8	1.0	0.8	
☆	100% DWL During Run				
3	7.6	1.2	1.1	0.1	
4	8.8	1.2	1.2		



12-13 TANK 12.

L. DeMoss L. Williams S. TOMA
B Sheldon H Holmes

0630 Pick up Keys AT FISC
0700 ARRIVE AT ADIT 5
0710 ARRIVE AT TANK 12
0725 Health + SAFETY MEETING
WAITING ON TRAIN TO TAKE US
TO DECON PAD
~750 TRAIN LEFT TANK 13
0810 ARRIVE AT ADIT 3 pipecrew's
TRAIN IN THE WAY GOT THEM TO MOVE IT
0820 AT Decon pad. Someone has taken
3 of our Drums Empties
0910 finished Deconing Rods and tools
put Decon water in 55 gallon
Drum.
0900 Called for TRAIN to come pick us up
0920 TRAIN ARRIVED. Loaded Rods and
Tools. WENT TO SUMP AND Picked up
2 more Flat cars. Bob WANTS TO
MOVE All of his equipment FROM
ADIT 3 AREA TO ADIT 5 Area
1145 got Equipment moved. Dumped
Decon water IN SUMP.

TANK 12 12-13

Fuel Leak AT valve on TANK 12
had to wait to get fixed.
1215 STARTED TO WORK
1310 Changed to N core. No odor
on PID Reading @ 12.6
~~1700 Stopped Drilling~~
Gammon And Navy people
over TANK FARM Stopped
by, Looked at what we
were doing
1700 Stopped Drilling
1715 LEFT TUNNEL
Returned Keys TO FISC

Guy Dr

12-13

TANK 12

Run	Depth	Ran	Rec	Loss	gain
5	12.6	3.8	3.8		
	changed to N core				
6	17.0	4.4	3.9	0.5	
	100% DWL at Beginning of Run				
7	21.9	4.9	5.0		oil
8	26.9	5.0	4.8	0.2	0
9	31.7	4.8	5.0		0.3
10	36.7	5.0	5.1		0.1
				fuel odor	
11	41.7	5.0	5.0	fuel odor	
12	46.6	4.9	5.0	slight fuel odor	0.1
13	51.7	5.1	5.1	1%	
14	57.0	5.3	5.1	0.2	no odor
15	62.2	5.2	5.2	fuel odor	
16	67.5	5.3	5.2	0.1 fuel odor	
17	72.8	5.3	5.3	No odor	

~~12-14~~

TANK 12

12-14

0630 Pickup Keys at FISC
0645 Arrive at Prison gate
L. DeMoss L. Williams S. Tomm
B. Sheldon H Holmes
0700 Arrive at Adit 5
0710 Arrive at ~~Adit~~ TANK 12
Bob wants to move Rest of supplies inside
0810 Bob moved supplies inside
Started Drilling
Drilling going good. No fuel odor
on the core from 67.5
1045 Drill crew having trouble getting inner barrel out. Sent the retriever in several times.
1125 Drill crew got inner barrel out and Returned to Drilling
1230 Drilling going slow Lost Drill water Rods vibrating.
1310 Drill crew having trouble with Retriever again
1410 Drilling again
1515 finished drilling started pulling Rods out of the hole

12-14 TANK 12

Pull	Depth	Ran	Rec	Loss	Gain
18	76.7	3.9	3.5	0.4	No odor
19	77.9	1.2	1.2		No odor
20	83.0	5.1	5.2		0.1
21	88.2	5.2	4.8	0.4	No odor
22	93.0	4.8	4.8		No odor
23	97.7	4.7	5.2	0.	0.5
24	102.5	4.8	4.7	0.1	
25	107.9	5.4	5.2	0.2	
26	113.0	5.1	5.2	Slight fuel odor	0.1
27	118.2	5.2	5.3	No odor	0.1
28	123.6	5.4	5.2	0.2	fuel odor @ 123.0
29	128.6	5.0	5.0		No fuel odor
30	133.6	5.0	5.0		No fuel odor

1610 INSTALLED 2" well
5 ft sump 133.6 - 128.3
screen 128.3 - 108.3
Risen 108.3 - 0.0

1645 LEFT TUNNEL
Returned Keys to F.S.'s

Larry Dunn

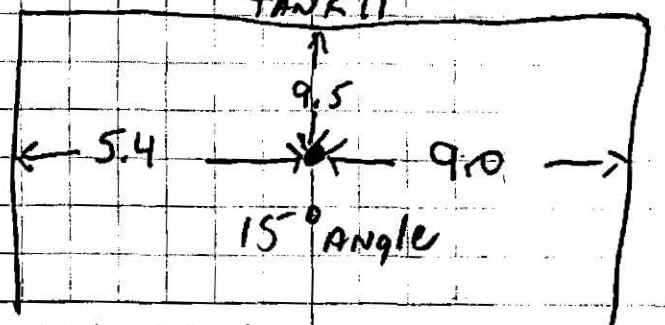
TANK 12 + 11

1205

L. Dumoss L. Williams
B Sheldon W Holmes

0630 Pick up Keys at F.S.
0700 Arrive at Adit 5
0710 Arrive at TANK 12
Moved Equipment to TANK 11 and Started Setting up, Cleaning up at TANK 12.
0830 Installed Bentonite Seal on well 12 (12.6 - 11.5)
0845 Air compressor Broken, Seal Leaking on hydraulic motor Bad
0855 Unable to fix. Started Drilling Reaming Casing. Began Coring at

TANK 11



12-15 TANK 11

Pull	Depth	Ran	Rec	Loss	gain
1	4.0	4.0	2.1	1.9	
	Concrete 0.0—		2.1	Sand 2.1-4.0	
2	5.5	1.5	1.5		
3	6.0	0.5	0.3	0.2	wood
4	7.4	1.4	1.6		0.2

wood to concrete 6.0-7.4
Heavy Sheen + film on Drill water
Return strong fuel odor

5	8.8	1.4	0.2	1.2

wood
Removed Rods and casing
1145 Installed protective cover using Quickset grout
Carried Rods + tools to Adit 5 to decon.
1330 finished Decon, put Decon fluid in 55 gallon drum.
1400 Arrive at Drill, Began to coring, cored concrete out of casing
1515 pulled Rods out of the hole and put 2" pvc inside to see if product is there monday unable to get pipe in the hole.

TANK 11 12-15

Pull	Depth	Ran	Rec	Loss	gain
6	9.5	0.7	0.7	Strong fuel odor	
7	10.3	0.8	0.8	Strong fuel odor—	
8	15.1	4.8	5.0	strong odor	0.2
9	20.3	5.2	5.2	strong odor	

Put Rods Back in the hole
And set the pipe through the Rods Then pulled the Rods, Bailed the water out of the well
1500 Left site
Returned Keys to FESC

Larry Dm

12-18 TANK 11

0630 Picked up Keys at FISC

0645 Arrived at Adits

0710 Arrive at Drill

L. DeMoss L. Williams

S.TOMA Bob Sheldon & Holmes

0715 Health & Safety meeting

0720 Checked well at 11. 10 1/16"

Free product.

0725 pulled well pipe out and

changed open to N core 20.3

0750 Called Kent Save in UDA

Do not grout casing

0810 Began N coring

1010 Rods vibrating. Lost Drill

water. Drilling slow

1100 Inner Barrel Retriever not working

Properly. Drill crew stopped to fix

1110 Working Properly

samples 1030 67.1 1205 85.0

1430 95.0

1700 Stopped Drilling for the day

1715 Left site

Returned Keys to FISC

TANK 11 12-17

Pull	Depth	Run	Rec	Loss gain	
10	24.4	4.1	3.9	0.2	fuel odor at 100
11	29.6	5.2	5.2		
	100% Dwl During Run				
12	36.2	8.6	3.9	4.7	
	32.1-	35.6	open core		
	37.2	37.9	open core		
13	43.3	5.1	5.2		0.1
14	48.5	5.2	5.1	0.1	
15	53.6	5.1	5.1		
	52.9-53.0	open core			
15	58.7	5.1	5.2		0.1
16	62.7	4.0	2.9		1.1
	60.3	61.8	soft		
17	68.1	5.4	5.2	0.2	fuel odor end
PID 243	sample	67.1			
18	73.3	5.2	5.2		fuel odor
19	76.3	3.0	2.7	0.3	no odor
20	81.4	5.1	5.1		no odor
21	82.0	5.6	2.2	3.4	
	83.5-	86.9	soft		
22	89.5	2.5	0.5	2.0	

Inner Barrel did not lock to

pulled rods out Recovered 1.8

12-18 TANK 11

Pull	Depth	RAN	Rec	Loss	gain
23	94.9	5.4	5.2	0.2	
	strong fuel odor @ 94.8 PID 55.8				
24	99.3	4.4	4.1	0.3	
	strong fuel odor PID 80.3 99.3 ft				
25	104.0	4.7	5.0	no fuel odor	0.3
26	109.4	5.4	5.0	0.4	
27	114.5	5.1	5.3		0.2
28	121.5	7.0	3.0	4.0	
	115.5 - 121.5			soft	

12-19

28	128.0	6.5	1.5	5.0
	121.5 - 127.3 soft			
29	131.0	3.0	0.5	2.5
	soft			

Bottom of the hole 131.0
100% DWL

TANK 11 12-19

0630 pick up keys at FISO
0645 Arrive at Adit 5
0715 Arrive at Tank 11
L. DeMoss L. Williams S. Toma
B Sheldon H. Holmes
0720 Started Drilling
Drilled to 131 ft.
Installed 1½" well through
N Rods.
0835 5' sump 131 - 125.7
Screen 125.7 - 95.7
Liner 95.7 - 0.0
Used 30' screen to get
over Bad zone at 99.3
0840 Began pulling rods out
well coming out with rods. A
Piece of core stuck in the
Barrel. Had to remove the
well and pull rods to get
core out, Tried to install
well in the hole without the rods
The hole caved in at 80 ft. Had to
Drill rods Back to the Bottom.
1015 Rods at the Bottom of the hole

12.19

Hand well installed. Started pulling Rods out again. Well staying in Place as Rods are Being Removed.

1200 Carried Rods and tools outside to Adit 5 to decon.

1235 L. DeMoss & L Williams at Fuel Lab to pickup fuel samples

1420 finished Decon and took equipment back to tank 4 Bob Left to get covers at Trucking company

1600 Bob returned

1605 Lance and Larry went to MW 14. There was no fuel in the well. Only water in The sump. Bailed the water out, there was no fuel odor or Sheen. The water had a stagnant odor

12-19

1600 Drill crew cleaning up at tank 11

→ Bob moved all of his equipment to tank 14 area

1700 Left site

Returned keys to F.S.G

12-20

0630 Pickup keys at Fisc

0645 At Adit 5

0700 Arrive at Tank 11

L. Demoss L. Williams

B Sheldon H. Holmes

0730 L. Demoss & C Williams put Bentonite seal in well #11 10ft - 6ft.

Drillcrew mixed Bentonite - cement grout and filled protection covers.

0830 BOB + Harold moving Equipment up to ~~TOT~~ Tank 14 area to store while we are gone. Afraid someone will ~~TA~~ take it took Bob to hose shop. He worked on air compressor

1430 Left site

Returned keys to Fisc

Talked with J. Gammon told him we locked all equipment up at Tank 16 + 14. Will be back to work Jan 3. 2001.

Larry Dan

Need

Bailers 1" + 1½"

Plug

Ext cord w/ 2 outlets

12' Tape measures 5C569

Strap wrench 4A505

hacksaw 5C925

Reflective Tape

01-02-01

0700 picked up vehicle pass

0900 called SAI to find out when drill crew would be here

1000 went to office to pick up cooler and supplies Talked with M Bigelow

TANK 16 01-03-01

0600 called Evetts

0700 met up with Drill crew Took them to get pickup truck

0900 Picked up keys at FISC Drove up to Adit 5 and unloaded well pipe. went inside tunnel

1000 Left tunnel and went with drill crew to pick up well covers and Drums.

1230 Arrive at tunnel and carried Drums inside

1430 Turned keys into FISC picked up supplies

01-04-01 TANK 16

0630 met Drill crew
Keith Jerry
0700 pickup Keys AT FISC
0720 ARRIVE AT ADIT 5
AND TAKE supplies in
0800 opened wells 16-16A+16B
16 Dry 16A+16B Dry BUT
Bailer had Black oil on.
outside. No Liquid TO
SAMPLE.
put cement plug AT 10 feet
IN center hole 16
Then started grouting
16A+16B.
1030 finished grouting 16A+16B
Used 3½ bags portland
¾ Bag gel. Mixed grout
Approx. 90% portland 10%
Bentonite.
1045 STARTED SETTING drill
UP AT 16 center
1100 Air compressor Down
Drill crew went to Grainger
AND Bought New hammerdrill

TANK 16 01-04

1330 BACK AT Drill setting up
1535 Began Drilling reaming Hole Step
IN AT
RAW CASING IN 107 feet
1700 Began to coring TO clean
OUT CASING.
INSTALLED protective cover
Used quickset grout
2½ bags
1740 LEFT Drill
1750 LEFT SITE
Turned in Keys TO FISC

Jerry D M

104 50 10.0

01.05-01 TANK 16

0630 Pick up keys at FISC

0700 Arrive at Tunnel.

L. DeMoss M. Bigelow Keith Becker

Terry Feiler

0720 Arrive at Drill site & safety meeting

0800 Started Drilling

Drilling going good

Origional hole Depth was 104.8 Reamed the hole using N core barrel 3"

1 Got the hole Drilled Down to 100' having Trouble

1915 Left Drill site

Returned Keys to FISC

Terry Dr

TANK 16 + TANK 10 01.08

0625 Arrive at FISC to get keys

0700 Arrive at Adit 5

L. DeMoss L. Williams M. Bigelow

K. Becker Terry Feiler

0750 Finished Cleaning out hole. Drilled to 104.8

Started Pulling Rods out.

Installed 2 inch pvc well to 104.8

5 foot sump 104.8 - 99.5

15 feet screen 99.5 - 84.5

Riser to 0.0

0920 Patched Floor on 16 at 16B.

Carried Drill Rods and tools to Adit 5 to Decon

1300 Finished Decon and move Equipment to Tank 10 and Set up

1600 Started Drilling. Drilling in H casing

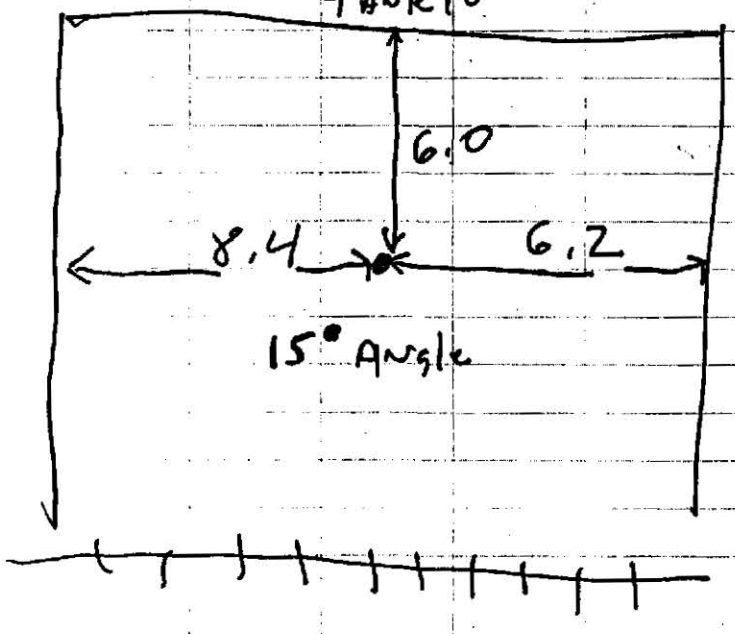
Drilled Through Floor slab to sand layer. Sand had very little odor. Did not take a sample

TANK 10

0.0 - 1.9 CONCRETE
1.9 - SAND
Drilled TO 5-6 feet.
STOPED for the day
1730 LEFT Drill.
Returned Keys to FISC

Jerry Dunn

TANK 10



TANK 10 01-09

0625 ARRIVE AT FISC TO get Keys
0700 ARRIVE AT Adits
L. DeMOSS L. Williams G. Gleason
K. Becker T. Fowler
0720 STARTED Drilling
0810 Drilled TO 7.2 feet. Pulled Rods and casing out of the hole and Installed protective cover.
0825 got cover installed used 2 Buckeys of fast set grout.
1045 STARTED Drilling
1200 having Trouble with inner barrel. pulled out and fixed
1300 Returned to Drilling
1700 STOPED Drilling for the day
1715 LEFT site
Returned Keys to FISC

Jerry Dunn

1-9-01 TANK 10

Pull	Depth	RAN	Rec	Loss	gain
1	5.6	5.6	~~3.6~~ 3.6	2.0	
2	7.2	1.6	1.4	0.2	
	INSTALLED STEEL PROTECTIVE CASING				
3	8.7	1.5	1.5		
4	13.2	4.5	4.0	0.5	
	CHANGED TO N CORE				
5	14.5	1.3	1.3		
6	15.7	1.2	1.3		0.1
7	16.9	1.2	1.3		0.1
8	20.0	3.1	3.0	0.1	
9	21.3	1.3	1.2	0.1	
~~10~~	~~23.8~~	~~2.5~~			
10	25.6	4.3	4.4		0.1
11	26.2	0.6	0.6		
12	30.5	4.3	4.2	0.1	
13	32.1	1.6	1.6		
14	37.1	5.0	5.0		
15	42.0	4.9	5.0		0.1
16	47.0	5.0	5.0		
17	51.8	4.8	4.8		
18	57.0	5.2	5.2		
	53.8	100% DWL			

TANK 10 1-10-01

0625 ARRIVE AT FISC TO get Keys
0700 ARRIVE AT ADIT 5
L. DeMoss L. Williams G. Gleyson
K. Becker T. Feiler
0715 ARRIVE AT Drill. had to Reset
~~Brac~~ Breakers on panel
0745 STARTED Drilling
0950 INNER BARREL STUCK inside
Rods while trying to pull
core out. had to use "A" Rods
TO push DOWN
1101 START Drilling
Drilling slow Drill water
LOST. Rods vibrating
1500 finished Drilling
STARTED INSTALLING well
INSTALLED 1½" well inside
Rods. Then pulled Rods
1½" 5 foot sump
1½" 15 feet Screen
well came up with Rods. pulled
out well pipe and put inner
Barrel Back in. Drilled
TO Bottom. pulled inner tube

1-10-01 TANK 10.

Roll	Depth	RAN	Rec	Loss	gain
19	61.6	4.6	4.6		
	59.2-59.4	Supt			
20	66.4	4.8	4.8		
21	71.1	4.7	5.0		0.3
22	75.6	4.5	5.2		0.7
23	80.8	5.2	4.1	0.7	
	78.4-79.6	OPENCAO			
24	85.7	4.9	5.0		0.1
25	90.9	5.2	5.2		
26	95.8	4.9	5.0		0.1
27	101.1	5.3	5.3		
28	106.7	5.6	4.8	0.8	
29	111.8	5.1	4.8	0.3	
30	116.2	4.4	4.2	0.2	
31	121.3	5.1	5.1		
32	126.5	5.2	4.8	0.4	
33	130.7	4.2	0.4	3.8	

Supt. grounded core while drilling

100% OWL

TANK 10 1-10-01

Rock core fell out of inner barrel and into rods, well would not go through rods, pulled rods out. Tried to put well through openhole. The hole had caved in at 45 feet. pulled wellpipe out and SLD

1645 Started putting Rods back in the hole to clean it out

1730 Left Drill

1745 Left site

Returned Keys to Fisc

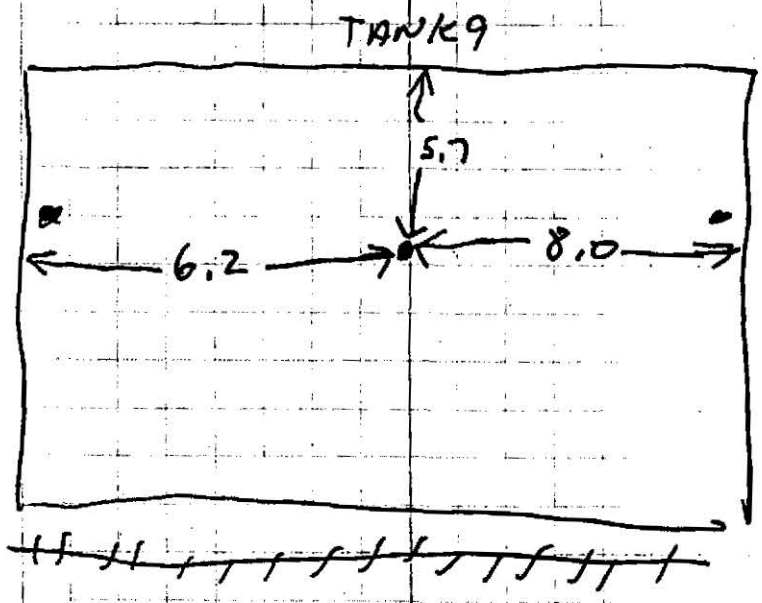
[signature]

1-11-01

0630 Pickup Keys at F.S.C
0700 Arrive at Adit 5
0725 Arrive at Drill and started pulling Rods out of the hole
L. Demoss M. Bigelow L. Williams
E. Becker T. Feiler G. Gleason
0845 Finished pulling Rods and move Equipment to TANK 9
1000 Started Reaming H Casing
1200 Finished Reaming Casing and Installed protective Steel Casing. Used 2 Bags of Fast Set grout.
Pot grout in the two sideholes used 3 Bags portland and ½ Bag of Bentonite.
Put Bentonite Seal in 10. Seal 13.0-11.0. Put grout to 1.0
Took Equipment to Adit 5 to Decon
Finished Decon. Fire Alarm going off had to stay outside.
1525 Alarm ok Back at TANK 9

1-11-01

Patched Floor. Replaced Sand Bags.
1645 Left Drill
Returned Keys to F.S.C



98.3

1-12-01 TANK 9

0630 Get keys at FISC

0700 Arrive at ADIT 5

L. Demoss L. Williams

M. Bigelow K Becker J Feiler

0715 Started work

0755 Drilled H core to 9.6 feet to clean out casing Changed to N core

0810 Checked MW10 for liquid well 10 Dry.

0830 Mark & Lance went to check other wells for liquid

0830 Dumped Decon water from hole 10 into Lower Tunnel Trench.

1000 Lance & Mark back at Tank 9 No product in any wells

1010 Drill water Lost @ 50 feet Rods vibrating Drilling slower Drilled to 100 feet. Looked at ~~Inst~~ 10 old Log. Core hole caving in. We Installed 1½" well.

1440 5 foot sump 100-95 ft

TANK 9 & 8 1-12-01

15 feet of Screen 95-80

Riser 80-0.0

1450 Started pulling Rods out

Got the Rods out of the hole and Installed Bentonite seal 10.0-7.0

1625 Move Equipment to Tank 8.

Cleaned up at Tank 9

1700 Left Tank 8

Returned keys to FISC

Larry Dunn

1-15-01 TANK 8

0630 pickedup Keys AT FESC

0700 ARRIVED AT ADIT 5

L. DeMOSS G-Glenaboo

M Bigelow . K Becker T Feiler

0712 ARRIVE AT DRILL

0725 STARTED DRILLING

cored through slab. sand

Layer had slight fuel odor

0800 PID 2.5 TOOK SAMPLE

Reaming H CASING. Drilled

CASING TO 7 feet pulled casing

OUT And TRIED TO INSTALL protectivecover. hole caved

IN. grout set up Before we

could get casing in. Drilled

OUT The hole again And Then Installed

The protective cover. Used 2½ Bags

of Buckets of FAST SET grout

1135 TOOK TOOLS OUT TO ADIT 5 TO

DECON

1330 BACK AT Drill Rig. grout

AROUND STEEL CASING NO

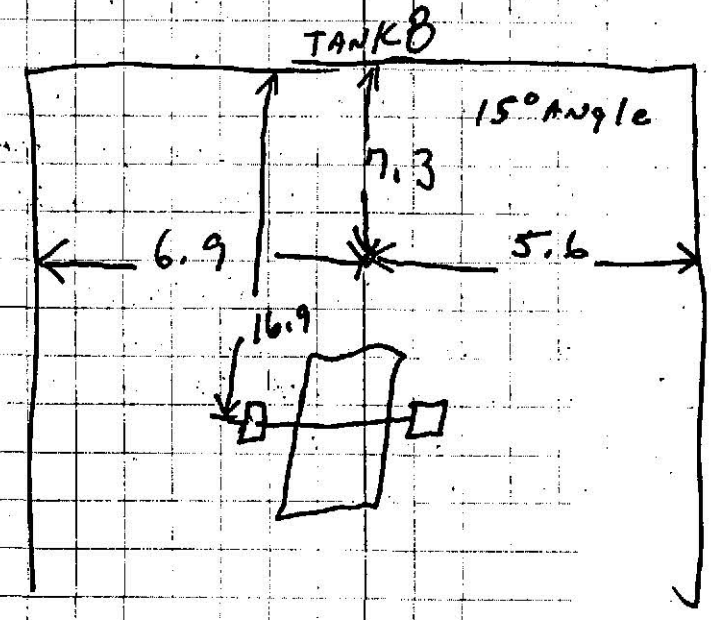
SETUP.

1630 LEFT SITE

TANK 8 1-15

Pull	Depth	Ran	Rec	Loss g Air
1.	2.1	2.1	2.1	
	CONCRETE 0.0-2.1		SAND 2.1-3.4	
2	4.3	2.2	1.3	0.9
3	8.3	4.0	3.3	0.7
	100% DWL		Soft 4.9-5.8	

Pulled H CASING TO INSTALL protective CASING



1-16-01 TANK 8

0630 picked up Keys at FISC
0655 Arrive at Adit 5
L. DeMoss, G. Gleason
K. Becker T. Reilen
0715 Arrive at TANK 8
Started Drilling
0915 Drilling going good, No problems
Operator stoped by said he will
be transferring fuel to tank 6 or 2
1205 Inner Barrel did not lock in,
got pushed up in the rods while
coring, Had to pull rods out
of the hole to get it out
1225 Rods out of the hole, got core
out and putting rods back in
the hole
1235 Started Back Drilling, Rods
vibrating, Drilling slow
1545 J. Gammon stoped by to check
on our progress.
1730 Left Drill

TANK 8 1-16-01

Pull	Depth	Ran	Rec	Loss	gain	
4	10.6	2.3	2.3			P2000
5	16.0	5.4	5.2	0.2		P1000
6	Changed to N Core					
6	18.8	2.8	2.8			P1000
7	23.8	5.0	4.6	0.4		P1000
8	28.3	4.5	5.2		P1000	0.7
9	33.6	5.3	5.3		P10	0.0
10	38.6	5.0	5.0		P10	0.0
11	43.8	5.2	5.2		P10	0.0
12	49.1	5.3	5.1	0.2	P10	0.0
Time 10:03 100% DWL During Run						
13	54.2	5.1	5.1		P10	0.0
14	59.3	5.1	5.1		P10	0.0
15	64.5	5.2	5.2		P10	0.0
16	69.8	5.3	5.2	0.1	P10	0.0
17	74.9	5.1	5.2	G 0.1	P10	0.0
18	79.2	4.3	3.7	L 0.6	P10	0.0
19	82.0	3.2	3.0	L 0.2	P10	0.0
20	86.6	4.6	4.6		P10	0.0
21	91.8	5.2	5.0	L 0.2	P10	0.0
22	96.3	4.5	4.6	G 0.1	P10	0.0
23	101.6	5.3	5.2	L 0.1	P10	0.0
24	106.8	5.2	5.3	G 0.1	P10	0.0

1-16-01 TANK 8

Poll	Depth	Pan	Rec	Lag	PID
25	112.1	5.3	5.3		0.0
26	117.3	5.2	5.1	L 0.1	0.0
1-17-01					
27	122.4	5.1	5.2	G. 0.1	0.0
28	127.2	4.8 ~~5.2~~	~~5.2~~ 4.8		0.0

Bottom of Hole 127.2

TANK 8 1-17-01

0630 Pick up Keys at FISC
0700 Arrive at Adit 5
L. Demoss G. Glenson M. Bigelow
T Feiler K Becker
Phone at Adit 5 not working
unable to get in. Waited until
7:15
0730 Arrive at Drill Tank 8
Drill crew fixing Hyd.
Leak.
0750 Started Drilling
0845 finished Drilling the hole.
Started pulling rods out. We
will try to install a 2 inch
well if the hole doesn't cave.
0915 Beg to Installing well. 2 inch
pipe would not go down the
hole. The hole had caved in
at 60 feet. Tried 1½ inch
it would not go. put rods
back in the hole and Reamed
out the hole
1000 Reamed to 60 feet tried to
install the well through the

(15) TANK 13

Pull 29

Time	Depth	Ran	Rec	Gain
1620	133.1	5.0	5.0	0

10YR 2/2 (n-y)
PID = 1.9 vesicle size
no odor, trace clay to 129.1
m. natural fractures:
128.8, 129.0 - 129.3,
130.0, 130.9, 131.2,
131.4, 131.8, 132.4,
133.0

- no clinker zones in Tank 13 drilling.
End boring at 133.1' bgs.

- Drilled a boring next to Tank 13 well in attempt to collect sample under concrete for analysis. PID was 10.7 and sample name was RH-BR-13-S04. Time was 0800.

TANK 12 (1)

12-12-00
Pull #1

Time	Depth	Ran	Rec	Gain
1340	4.6	4.6	1.7	-2.9

concrete
~~YR~~ 1 (n-y)
PID = NA NA = vesicle size
no odor,
m. natural fractures: 0.3

Pull #2

Time	Depth	Ran	Rec	Gain
1350	6.4	1.8	1.6	-0.8

10YR 2/2 (n-y)
PID = 1.6 med. vesicle size
slight odor,
m natural fractures: throughout

TANK 12

Pull 3

Time	Depth	Ran	Rec	Gain
1400	7.6	1.2	1.1	-0.1

10 YR 2/2 (n-4)
PID= 0.6 small vesicle size
strong odor,
m. natural fractures:
6.6, 6.9, 7.2-7.3

Pull 4

Time	DEPTH	RAN	REC	GAIN
1410	8.8	1.2	1.2	0

10 YR 2/2 (n-4)
PID= 0.3 medium vesicle size
slight odor,
m. natural fractures: 7.6-8.5

* RH-BC-12-S01 taken at 8.0 on 12/12/00 in solid rock.

12/13/00 TANK 12

Pull 5

TIME	DEPTH	RAN	REC	GAIN
1305	12.6	3.8	3.8	0

10 YR 2/2 (n-4)
PID= 1.0 small vesicle size
no odor, no clay
m. natural fractures: 8.9, 9.1, 9.7
9.8, 10.8, 11.5, 12.3

Pull 6

Time	Depth	Ran	Rec	Gain
1405	17.0	4.4	3.9	-0.5

10 YR 2/2 (n-4)
PID= 1.3 vesicle size
no odor, grout seen at 16.8-17.0
m. natural fractures: 12.7, 13.1, 13.2
13.3, 13.4, 13.8, 13.9, 14.3
14.7, 15.1, 15.5, 15.7
16.8

Pull 7

Time	Depth	Ran	Rec	Gain
1420	21.9	4.9	5.0	0.1

10 YR 2/2 (n-4)
PID= 1.2 small vesicle size
no odor, grout seams at 17.0, 18.2
m. natural fractures: 17.4, 17.5, 18.0, 19.0, 19.4-19.7, 20.6, 20.9, 21.2, 21.5

Pull 8

Time	Depth	Ran	Rec	Gain
1435	26.9	5.0	4.8	-0.2

10 YR 2/2 (n-4)
PID= 1.5 small vesicle size
no odor, grout seams 22.9-26.9
m. natural fractures: 22.9, 24.9

mech. breaks: 23.7, 25.8

Pull 9

Time	Depth	Ran	Rec	Gain
1445	31.7	4.8	5.1	0.3

10 YR 2/2 (n-4)
PID= 1.3 small vesicle size
no odor, grout seams throughout
m. natural fractures: 27.9, 28.4, 28.9, 29.2, 29.8, 30.4, 30.7, 31.0

mech. breaks: 27.5

Pull 10

Time	Depth	Ran	Rec	Gain
1505	36.7	5.0	5.1	0.1

10 YR 2/2 (n-4)
PID= 26.0 small vesicle size
strong odor, grout inclusions
m. natural fractures: 32.0, 32.6, 33.5, 33.7, 34.9, 35.4, 36.0

mech. break: 33.9

* Sample RH-BR 12-502 at 33.5', solid core.

TANK 12

Pull 11

Time	Depth	Ran	Rec	Gain
1515	41.7	5.0	5.0	0

10 YR 2/2 (n-y)
PID = 2.8 small vesicle size
strong odor, grout inclusions throughout
m. natural fractures:
37.3, 37.8, 38.1, 38.5,
39.1, 39.3, 39.5, 40.1
40.8, 41.0, 41.2, 41.3

Pull 12

Time	Depth	Ran	Rec	Gain
1530	46.6	4.9	5.0	0.1

10 YR 2/2 (n-y)
PID = 2.2, large vesicle size
slight odor, grout seam at 46.0
m. natural fractures:
42.2, 42.5, 43.1, 43.7, 43.7
44.2, 44.7, 45.0, 46.0
46.2

TANK 12

Pull 13

Time	Depth	Ran	Rec	Gain
1550	51.7	5.1	5.1	0

10 YR 2/2 (n-y)
PID = 1.8, medium vesicle size
slight odor, grout seams at: 47.8, 49.5-50.4
m. natural fractures: 47.4, 47.6, 48.4,
50.0, 51.1, 51.4

mech break: 49.4

Pull 14

Time	Depth	Ran	Rec	Gain
1605	57.0	5.3	5.1	-0.2

10 YR 2/2 (n-y)
PID = small vesicle size
no odor,
m. natural fractures: 52.0, 53.4, 54.2
56.0, 56.4

mech. break: 52.6, 54.7

TANK 12

Pull 15

TIME	Depth	Ran	Rec	Gain
1620	62.2	5.2	5.2	0

10 YR 2/2 (n-4)

PID = 1.9 medium vesicle size

strong odor,

m. natural fractures: 57.5, 58.1
58.5, 59.0, 60.1, 60.4
61.0, 61.6

broken
↓ B4-BR-12-503 taken at 61.0, clinker zone

Pull 16

TIME	DEPTH	RAN	REC	GAIN
1635	67.5	5.3	5.2	-0.1

10 YR 2/2 (n-4)

PID = 17.3 vesicle size

slight odor, grout seam at 65.0

m. natural fractures: 62.3, 62.8
63.3, 63.6, 63.9-64.4,
65.0, 65.5, 66.0, 66.1, 66.6
67.0

TANK 12

Pull 17

TIME	DEPTH	RAN	REC	GAIN
1700	72.8	5.3	5.3	0

10 YR 2/2 (n-4)

PID = 1.0 smaller vesicle size

no odor,

m. natural fractures:
67.8, 68.8 ~~68.2~~ 69.1
69.5 70.0, 70.5, 71.4
71.7, 71.9, 72.2

12-14-00

Pull 18

TIME	Depth	Ran	Rec	Gain
0830	74.7	3.9	3.5	-0.4

10 YR 2/2 (n-4)

PID = 0.1 medium vesicle size

no odor, no grout

m. natural fractures: 73.0, 73.4
73.6, 74.2-74.8, 75.0,
75.3, 75.7-76.7

TANK 12

Pull 19

TIME	Depth	Ra	Rec	Gain
0845	77.9	1.2	1.2	0

10 YR 2/2 (n-4)
PID = 0.1 , small vesicle size
no odor, no grout
m. natural fractures:
76.8, 77.0,
77.2

Pull 20

TIME	Depth	Ra	Rec	Gain
0905	83.0	5.1	5.2	0.1

10 YR 2/2 (n-4)
PID = 2.2 small vesicle size
no odor, no grout
m. natural fractures:
78.2, 78.3, 78.5, 79.1,
80.1 - 80.7, 81.0, 81.9
82.3, 82.7, 83.0

TANK 12

Pull 21

TIME	Depth	Ra	Rec	Gain
0920	88.2	5.2	4.8	-0.4

10 YR 2/2 (n-4)
PID = 0 medium vesicle size
no odor, no grout
m. natural fractures:
~~84.0~~ 83.0 - 85.0, 85.5,
85.7, 85.9, 86.3 - 86.7,
86.9, 87.1, 87.3, 87.5, 87.9

Pull 22

TIME	Depth	Ra	Rec	Gain
0945	93.0	4.8	4.8	0

10 YR 2/2 (n-4) medium vesicle size
no odor, no grout
m. natural fractures:
88.8, 89.5, 90.0, 90.4,
90.8, 91.2, 91.7, 91.9,
92.2, 92.8

TANK 12

Pull 23

Time	Depth	Ran	Rec	Gain
1005	97.7	4.7	5.2	0.5

10 YR 2/2 (n-4)
PID= 97. 0.1 medium vesicle size
no odor, no grout
m. natural fractures:
93.6, 93.8, 94.0, 94.2, 94.6
94.9, 95.2, 95.6, 95.7,
96.6, 96.7, 97.5

Pull 24

Time	Depth	Ran	Rec	Gain
1035	102.5	4.8	4.7	-0.1

10 YR 2/2 (n-4)
PID= 0.0 , medium vesicle size
no odor, no grout
m. natural fractures:
97.9, 98.2, 98.5, 98.6
98.9, 99.3, 99.7, 100.0
100.4, 100.6, 101.3, 101.9

Pull 25

Time	Depth	Ran	Rec	Gain
1130	107.9	5.4	5.2	-0.2

10 YR 2/2 (n-4)
PID= 0.0 large vesicle size
no odor, no grout
m. natural fractures:
103.2, 103.5, 104.3, 105.2
105.5, 107.3, 107.5

* Sample RH-BK-12-S01 and
RH-BK-12-D01.
at 1130 at depth of 104.3
Solid core, NO clinker zone

Pull 26

Time	Depth	Ran	Rec	Gain
1200	113.0	5.1	5.2	0.1

10 YR 2/2 (n-4)
PID= 0.7 medium vesicle size
slight odor, no grout
m. natural fractures:
108.8, 109.3, 109.9, 110, 111.5,
111.8, 112.1, 112.3, 112.5

Pull 27 ~~Depth~~

Time	Depth	Ran	Rec	Gain
1240	118.2	5.2	5.3	0.1

10 YR 2/2 (n-4)
PID = 1.9 large vesicle size
odor,
m. natural fractures:
113.4, 114.8, 115.4, 115.6
116.6, 117.3, 117.6,
118.0

Pull 28

Time	Depth	Ran	Rec	Gain
1400	123.6	5.4	5.2	-0.2

10 YR 2/2 (n-4)
PID = 26.4, medium vesicle size
slight odor,
m. natural fractures:
118.5, 119.6, 119.8, 120.5
121.3, 122.6, 123.0, 123.2
123.4

& Sample RH-BC-12-505 at 121.9 at 1400. Solid core with slight HC odor. No clinker zone here.

Pull 29

Time	Depth	Ran	Rec	Gain
1445	128.6	5.0	5.0	0

10 YR 2/2 (n-4) vesicle size
PID = 1.9
no odor, no grout
m. natural fractures:
123.8, 124.1, 124.8, 125.1, 125.5,
125.7, 126.4, 126.8, 127.3
127.4, 127.9

Pull 30

Time	Depth	Ran	Rec	Gain
1515	133.6	5.0	5.0	0

10 YR 2/2 (n-4)
PID = 0.8 small vesicle size
no odor, changes to 5 YR 2.5/2 at 129.4 bgs
m. natural fractures: 129.4, 129.7-
131.4, 131.9, 132.2,
132.4, 132.6, 133.2
Only clinker zone at 131.0 feet. Sample collected here.

① TANK 11.

12-15-00

Pull 1

Time	Depth	Ran	Rec	Gain
0935	4.0	4.0	2.1	-1.9

concrete recovery
HE (n-)

PID = NA resicle size
slight odor,
m. natural fractures:
1.0, 1.4, 2.0

Pull 2

Time	Depth	Ran	Rec	Gain
0950	5.5	1.5	1.5	0

Concrete recovery
HE (n-)

PID = 14.1 NA resicle size
strong odor,
m. natural fractures: throughout

* Sample RH-BR-11-S01 taken at 4.5' on 12/15/00 at 0950. Concrete zone broken rock no clinker.

TANK 6 ②

Pull 3

Time	Depth	Ran	Rec	Gain
1005	6.0	0.5	0.3	-0.2

concrete and wood recovery
HE (n-4)

PID = NA No resicle size
strong odor,
m. natural fractures: NA

Pull 4

Time	Depth	Ran	Rec	Gain
1015	7.4	1.4	1.6	0.2

wood and concrete recovery
HE (n-4)

PID = NA NA resicle size
strong odor,
m. natural fractures: NA

TANK 11

Pull 5

Time	Depth	Ra	Rec	Gain
1100	8.8	1.4	0.2	-1.2

wood recovery

~~HR~~ 1 (n)

PID = 12.0 No vesicle size

slight odor,

m natural fractures: NA

Pull 6

Time	Depth	Ra	Rec	Gain
1425	9.5	0.7	0.7	0

10 YR 2/2 (n-4)

PID = 17.0 medium vesicle size

strong odor

m. natural fractures: 9.0, 9.3

TANK 11

Pull 7

Time	Depth	Ra	Rec	Gain
1435	10.3	0.8	0.8	0

10 YR 2/2 (n-4)

PID = 19.4 medium vesicle size

strong odor, sheen on rock

m. natural fractures: throughout

Pull 8

Time	Depth	Ra	Rec	Gain
1455	15.1	4.8	5.0	0.2

10 YR 2/2 (n-4)

PID = 19.8 vesicle size

strong odor

m. natural fractures: 10.3, 10.5, 11.2, 11.4, 11.9, 12.4, 13.4, 13.7, 14.3, 14.7, 15.0

* Sample RH BR-11-502 taken at 11.3' on 12-15-00. Solid, no clinker zone

TANK 11

Pull 9

Time	Depth	Ran	Rec	Gain
1510	20.3	5.2	5.2	1.0

- clay inclusions in center of core.

10 YR 2/2 (n-4)

PID = 2.7, medium vesicle size

no odor, no grout

m. natural fractures: 15.4, 15.7, 15.9, 16.2, 16.4, 16.6-16.9, 17.3, 17.5, 17.9, 18.2, 18.5, 18.8, 19.1-19.3, 19.5, 19.8, 20.1

Pull 10 * 12-18-00 *

Time	Depth	Ran	Rec	Gain
0825	24.4	4.1	3.9	-0.2

10 YR 2/2 (n-4)

PID = 3.1, large vesicle size

slight odor, no grout

m. natural fractures: 20.3-20.7, 21.1, 21.2, 22.2, 23.7, 24.1

mech. breaks - 22.8, 23.1

Pull 11

Time	Depth	Ran	Rec	Gain
0840	29.6	5.2	5.2	0

10 YR 2/2 with 24.0;
5 YR 3/2 at 24.0 (n-4)

PID = 4.0 medium vesicle size

no odor,

m. natural fractures: 24.8, 26.0, 26.3, 26.7, 26.8, 27.0, 27.6, 28.0, 28.3

Pull 12

Time	Depth	Ran	Rec	Gain
0900	38.2	8.6	3.9	-4.7

5 YR 3/2 (n-4)

PID = 2.3 large vesicle size

no odor, no grout

m. natural fractures: ~~24.7, 25.5, 25.8, 25.9~~ 29.9, 30.7, 31.0-35.6 open cavity, 37.7-37.9 - open cavity.

TANK 11

Pull 13

Time	Depth	Ron	Rec	Gain
0910	43.3	5.1	5.2	0.1

10 YR 2/2 (n-4)
PID = 9.8, medium vesicle size
slight odor, clay inclusions
m. natural fractures: 38.5, 39.4, 39.9, 41.0, 41.6, 42.3, 42.4, 43.0
mech. break: 42.0

Pull 14

Time	Depth	Ron	Rec	Gain
0925	48.5	5.2	5.1	-0.1

10 YR 2/2 (n-4)
PID = 0.0, medium vesicle size
slight odor, clay inclusions
m. natural fractures: 43.6, 43.9, 44.1, 44.8-44.9, 45.1, 45.6, 46.3, 46.6, 47.1, 47.7, 47.9, 48.5

TANK 11

Pull 15

Time	Depth	Ron	Rec	Gain
0940	53.6	5.1	5.1	0

10 YR 2/2 (n-4)
PID = 0.5, small vesicle size
no odor, clay inclusions
m. natural fractures: 49.0, 49.2, 49.4, 49.7, 50.1-50.3, 50.7, 51.2, 51.4, 51.9, 52.2, 52.3, 52.5, 52.9, 53.5

Pull 16

Time	Depth	Ron	Rec	Gain
0955	58.7	5.1	6.2	0.1

10 YR 2/2 (n-4)
PID = 0.2, medium vesicle size
no odor, clay inclusions
m. natural fractures: 53.9, 54.4, 54.6, 54.8, 55.0, 55.2, 55.4, 56.0-56.5, 57.4, 58.2, 58.4

TANK 11

Pull 17

Time	Depth	Ran	Rec	Gain
1005	62.7	4.0	2.9	-1.1

10 YR 2/2 (n-4)
PID = 0.2, medium vesicle size
no odor, no clay
m. natural fractures:
59.2, 59.4, 59.7, 60.1, -62.7

changes to 5 YR 3/2 at 60.1'

Pull 18

Time	Depth	Ran	Rec	Gain
1030	68.1	5.4	5.2	-0.2

5 YR 3/2 (n-4)
PID = 24.3 large vesicle size
strong odor,
m. natural fractures:
62.7 - 64.5, 65.1, 65.7, 66.9,
67.2, 67.6, 67.9 - 68.1

SAMPLE RH-DR-11-503 at ~~68.5'~~ 67.1'
broken core, no clinker, HC odor

TANK 11

Pull 19

Time	Depth	Ran	Rec	Gain
1055	73.3	5.2	5.2	0

5 YR 3/2 (n-4)
PID = 7.9 large vesicle size
strong odor,
m. natural fractures: 68.5, 69.2, 69.5,
70.2, 70.4, 70.6, 70.9, 71.3, 71.5
71.9, 72.3, 72.6, 72.8, 73.0

Pull 20

Time	Depth	Ran	Rec	Gain
1115	76.3	3.0	2.7	-0.3

5 YR 3/2 (n-4)
PID = 3.9 medium vesicle size
no odor, no clay
m. natural fractures: 73.6,
73.9, 74.2, 74.8, 75.1,
75.2 - 76.3

Pull 21

TIME	DEPTH	RAN	REC	GAIN
1135	81.4	5.1	5.1	0

10 YR 2/2 (n-4)
P.I.D = 2.8 large vesicle size
no odor
m. natural fractures:
76.6, 77.0, 77.9, 78.3, 78.7,
79.0, 79.4, 79.6 - 80.0
80.5, 80.9, 81.2

Pull 22

TIME	DEPTH	RAN	REC	GAIN
1205	87.0	5.6	2.2	-3.4

10 YR 2/2 (n-4)
medium vesicle size
PID = 21.4
strong odor, grout seam at 86.5

* SAMPLE RH-BR-11-S04
at 1205 on 12-18-00
at 85.0:
m. natural fractures: 81.4-81.6, 82.0,
82.4, 82.9, 83.4

Pull 23

TIME	DEPTH	RAN	REC	GAIN
1225	89.5	2.5	0.5	-2.0

10 YR 2/2 (n-4)
no odor, medium vesicle size
m. natural fractures: length of recovery. (0.5)

Pull 24

TIME	DEPTH	RAN	REC	GAIN
1350	94.9	5.4	5.2	-0.2

10 YR 2/2 (n-4)
PID = 55.8
Strong odor, large vesicle size
grout seams at: 90.2, 91.4,
94.8
m. natural fractures: 89.5-90.5
90.5, 91.0, 91.2, 91.6,
92.7, 93.2, 93.7

TANK 11

Pull 25

Time	Depth	Ran	Rec	Gain
1430	99.3	4.4	4.1	-0.3

104K 2/2 (n-4)

PID = 80.3 large vesicle size

strong odor, clay inclusions

m. natural fractures: 94.9, 95.5, 96.1, 97.0, 97.2, 97.6, 98.1, 98.4, 98.8

* Sample RH-BR-11-505 taken at 1450 at 95.0', no clinker, broken, HC odor

Pull 26

Time	Depth	Ran	Rec	Gain
1515	104.0	4.7	5.0	0.3

104K 2/2 (n-4)

PID = 3.5

no odor, clay inclusions

grout seam at: 101.1

m. natural fractures: 100.1, 100.5, 101.3, 101.4, 102.2, 102.4, 103.0, 103.3, 103.5

TANK 11

Pull 27

Time	Depth	Ran	Rec	Gain
1540	109.4	5.4	5.0	-0.4

104K 2/2 (n-4)

PID = 1.6 medium vesicle size

no odor, no grout

m natural fractures: 104.0, 105.2, 105.9, 107.2, 107.7, 107.8, 108.2, 108.8, 109.0

Pull 28

Time	Depth	Ran	Rec	Gain
1630	114.5	5.1	5.3	0.2

104K 2/2 (n-4)

PID = large vesicle size

no odor, no grout

m. natural fractures: 109.5, 110.8, 112.0, 112.8, 113.6, 114.2

TANK 11

Pull 29

TIME	DEPTH	RAN	REC	GAIN
1700	121.5	7.0	3.0	-4.0

10 YR 2/2 (n-y)
no odor, no grout
Small vesicle size, PID= 0.5
m. natural fractures:
115.3, 115.6, 115.9, changes to
5YR 3/2 115.9-116.6, 117.0, 117.8
-soft drilling

Pull 30 12-17-00

TIME	DEPTH	RAN	REC	GAIN
0755	128.0	6.5	1.5	-5.0

10 YR 2/2 (n-y)
no odor, medium vesicle size
PID= 0.0
m. natural fractures: 121.5-122.1,
122.5

TANK 11

Pull 31

TIME	DEPTH	RAN	REC	GAIN
0820	131.0	3.0	0.5	-2.5

10 YR 2/2 (n-y)
no odor PID= NA
Small vesicle size
m. natural fractures thraghout
a clinker zone extends
from 115-131.
Terminate boring at 131.0 feet bgs.

① TANK 10

1-8-01

Pull # 1

TIME	DEPTH	RAN	REC	GAIN
1700	5.6	5.6	3.6	-2.0

Concrete recovery
PID = NA no odor
* no sample taken due to absence of odor

1-9-01
Pull 2

TIME	DEPTH	RAN	REC	GAIN
0810	7.2	1.6	1.4	-0.2

10 YR 2/2 (n-4)
PID = 0.0 no odor
medium vesicle size
m. natural fractures:
6.0, 6.1, 6.7, 6.8

TANK 10 ②

Pull 3

TIME	DEPTH	RAN	REC	GAIN
1135	8.7	1.5	1.5	0

5YR 3/2 (n-4)
no odor
medium vesicle size
multiple natural fractures throughout. Not a clinker zone.
Grout seam from setting casing at 7.8.

Pull 4

TIME	DEPTH	RAN	REC	GAIN
1155	13.2	4.5	4.0	-0.5

10 YR 2/2 (n-4)
no odor
large vesicle size
grout seams at 9.3, 9.7, 10.7-11.7
m. natural fractures: 9.0, 9.1-9.4, 10.2, 10.7-11.8

③

TANK 10

Pull 5

TIME	DEPTH	RAN	REC	GAIN
1300	14.5	1.3	1.3	0

10 YR 2/2 (n-3)
large vesicle size, no odor
m. natural fractures: 13.2 –
13.5, 13.7, 14.3

Pull 6

TIME	DEPTH	RAN	REC	GAIN
1315	15.7	1.2	1.3	0.1

10 YR 2/2 (n-4)
large vesicle size, no odor
m. natural fractures:
15.2, 15.5

TANK 10

④

Pull 7

TIME	DEPTH	RAN	REC	GAIN
1330	16.9	1.2	1.3	0.1

10 YR 2/2 (n-4)
no odor, large vesicle size
m. 16.2, 16.3, 16.9
natural fractures:

Pull 8

TIME	DEPTH	RAN	REC	GAIN
1345	20.0	3.1	3.0	-0.1

10 YR 2/2 (n-4)
no odor large vesicle size
grout seam at 17.0
m. natural fractures: 17.0, 17.3
17.6, 18.2, 19.3, 19.4

TANK 10

Pull 9

TIME	DEPTH	RAN	REC	GAIN
1352	21.3	1.3	1.2	-0.1

10YR 2/2 (n-4)
no odor medium vesicle size
m. natural fractures
20.0, 20.9, 21.1

Pull 10

TIME	DEPTH	RAN	REC	GAIN
1420	25.6	4.3	4.4	0.1

10YR 2/2 (n-4)
no odor medium vesicle size
m. natural fractures: 21.4 21.5, 21.7, 21.8, 22.5, 24.3, 24.6, 24.8, 24.9, 25.0
mechanical fracture: 23.3

TANK 10

Pull 11

TIME	DEPTH	RAN	REC	GAIN
1440	26.2	0.6	0.6	0

10YR 2/2 (n-4)
no odor, small vesicle size
m. natural fractures: 26.1
grout seam at 26.1

Pull 12

TIME	DEPTH	RAN	REC	GAIN
1500	30.5	4.3	4.2	-0.1

10YR 2/2 (n-4)
no odor, small vesicle size
mechanical breaks: 29.6, 29.3
m. natural fractures: 26.5-26.7, 27.0, 27.6, 27.8, 28.7, 28.9, 30.0

Pull 13

Time	Depth	Ran	Rec	Gain
1510	32.1	1.6	1.6	0

10 YR 2/2 (n-4)
no odor, large vesicle size
m. natural fractures: 31.5

Pull 14

Time	Depth	Ran	Rec	Gain
1530	37.1	5.0	5.0	0

10 YR 2/2 (n-4)
no odor, medium vesicle size
grat seam at 36.3-37.1
mech. break at: 32.9
m. natural fractures: 32.2, 34.6, 35.0, 35.4, 36.3

Pull 15

Time	Depth	Ran	Rec	Gain
1550	42.0	4.9	5.0	0.1

5YR 3/2 (n-4)
no odor, medium vesicle size
grat seams from 37.1 - 41.2:
m. natural fractures: 38.1, 38.4, 38.7, 39.0, 39.5, 40.0, 40.2, 40.7, 41.2, 41.4, 41.6

Pull 16

Time	Depth	Ran	Rec	Gain
1610	47.0	5.0	5.0	0

10 YR 2/2
no odor, large vesicle size
grat seams:

m. natural fractures: 43.1, 43.3, 44.3, 44.5, 45.0, 45.2, 45.5, 46.4, 46.9

TANK 10

Pull 17

Time	Depth	Ran	Rec	Gain
1430	51.8	4.8	4.8	0

10 YR 2/2 (n-4)
no odor, medium vesicle size
grout seams at 47.6-49.0, 51.5
m. natural fractures: 47.6, 47.8-48.4, 49.5, 50.0, 50.3, 51.1, 51.4

Pull 18

Time	Depth	Ran	Rec	Gain
1645	57.0	5.2	5.2	0

10 YR 2/2 (n-4)
no odor, large vesicle size
grout seams at: 54.2

m. natural fractures: 52.4, 52.7, 53.0, 53.2, 53.5, 53.8, 54.2, 55.0, 55.2, 55.4, 55.6, 56.0, 56.7

1-10-01 TANK 10

Pull 19

Time	Depth	Ran	Rec	Gain
0805	61.6	4.6	4.6	0

10 YR 2/2 (n-4)
no odor, medium vesicle size
grout seam at 59.0
m. natural fractures: 57.7, 57.9, 58.2, 59.0, 59.2, 59.5, 59.7, 60.2, 60.8, 61.2
1 SAMPLE RH-BK-10-S01 taken at 60.0'. Solid core, no staining or odor, no clinker zone.

Pull 20

Time	Depth	Ran	Rec	Gain
0825	64.4	4.8	4.8	0

10 YR 2/2 (n-4)
no odor, medium vesicle size
grout seam at 66.3
m. natural fractures: 62.4, 62.8, 63.0-64.4, 64.7, 65.0, 65.5, 66.0

Clinker zone at 63.0-64.7'

TANK 10

Pull 21

Time	Depth	Ro	Rec	Gain
0835	71.1	4.7	5.0	0.3

10 YR 2/2 (n-4)

no odor, large vesicle size
grout seams from 66.4 - 68.0
m. natural fractures: 67.3, 67.7, 67.9, 68.1, 68.3, 68.4, 69.6, 69.9

Pull 22

Time	Depth	Ro	Rec	Gain
0855	75.6	4.5	5.2	0.7

10 YR 2/2 (n-4)

no odor, medium vesicle size
grout seams at ~~75.2~~ (RW) 73.7 - 75.2
m. natural fractures: 71.5, 72.1, 72.6, 73.6, 73.8, 74.5, 74.8, 75.0

TANK 10

Pull 23

Time	Depth	Ro	Rec	Gain
0910	80.8	5.2	4.5	-0.7

10 YR 2/2 (n-4)

no odor, medium vesicle size
grout seams at 75.6 - 77.7.
m. natural fractures: 75.8, 76.0, 76.3, 76.4, 76.9, 77.3, 77.8, 78.0, 79.2, 79.6, 80.2

Pull 24

Time	Depth	Ro	Rec	Gain
0930	85.7	4.9	5.0	0.1

10 YR 2/2 (n-4)

no odor, medium vesicle size
grout staining at 81.4 - 83.6
m. natural fractures: 81.4, 81.9, 82.3, 83.0, 83.4, 83.8, 84.3, 84.8, 85.3, 85.5

(13) TANK 10

Pull 25

Time	Depth	Ran	Rec	Gain
1025	90.9	5.2	5.2	0

10YR 2/2 (n-4)
no odor, large vesicle size
no grout
m. natural fractures: 86.5, 86.8
87.0, 87.6, 88.0, 88.2, 88.5
89.3, 89.6

Pull 26

Time	Depth	Ran	Rec	Gain
1130	95.8	4.9	5.0	0.1

10YR 2/2 (n-4)
no odor, large vesicle size
no grout
m. natural fractures: 91.8, 92.1,
92.4, ~~92.9~~ (ALW) 93.8,
94.0, 94.6, 94.7, 94.8
95.6

mech. break: 92.9

TANK 10 (14)

Pull 27 * RH-BR-10-S02 at 100.0'
no clinker, solid core

Time	Depth	Ran	Rec	Gain
1205	101.1	5.3	5.3	0

10YR 2/2 (n-4)
no odor, large vesicle size
no grout
mech break at 99.8
m. natural fractures: 95.9, 96.4, 96.8,
97.1, 97.7, 98.0, 98.9,
99.7, 99.9, 100.1, 100.7

Pull 28

Time	Depth	Ran	Rec	Gain
1231	106.7	5.6	4.8	-0.8

10YR 2/2
No odor Medium vesicle size
No Grout
Multiple Natural Fractures:
101.3, 101.8, 102.2, 102.4, 102.7,
103.1, 103.5, 103.8, 104.1, 104.2,
104.4, 104.7, 104.8, 105.1, 105.7,
105.9, 106.3 – 106.7

TANK 10

Pull 29

Time	Depth	Ran	Rec	Gain
1317	111.8	5.1	4.8	-0.3

10 YR 2/2

No Odor — Medium Vesicle size

No Grout

Multiple Natural Fractures:

107.0, 107.1, 107.3, 107.5, 107.8, 108.2, 108.4, 109.2, 109.6 - 110.7, 110.0, 111.2

Mechanical Break: 109.6

Pull 30

Time	Depth	Ran	Rec	Gain
1339	116.2	4.4	4.2	-0.2

10 YR 2/2

No Odor — Medium Vesicle size

~~No~~ DJB

Multiple Natural Fractures:

112.0, 112.15, 112.45 - 114.25

114.6 *DJB, 114.75, 114.95, 115.2, 115.35, 115.85

Grout Seams: 112.0 - 112.6

Clinker Zone: ~~114.25~~ DJB 112.45 - 114.25

Pull 31

Time	Depth	Ran	Rec.	Gain
1411	121.3	5.1	5.1	0

10YR 2/2

No Odor — Large Vesicle Size

Multiple Natural Fractures:

116.35, 116.4, 116.75, 116.85, 116.95, 117.35, 117.7, 117.85, 118.05, 118.2, 118.75, 119.05, 119.3, 119.5, 120.0, 120.35, 120.8, 120.85

Grout Seams: 117.85, 116.4 - 116.8

Pull 32

Time	Depth	Ran	Rec.	Gain
1441	126.5	5.2	4.8	-0.4

10YR 2/2

No Odor — Small - Medium Sized Vesicles

- Multiple Natural Fractures:

122.2, 122.5 — 123.1 *DJB

123.4, 123.6, 123.9, 124.2, 124.3, 124.8, 125, 125.4 - 125.7, 126.0

- Clinker Zone: 122.5 - 123.1

* Sample Core RH-BR-10-S03 solid Taken @ 123.9

(17) Tank 10

Pull 33

Time	Depth	Ran	Rec.	Gain
1522	130.7	4.2	0.4	-3.8

10YR 2/2

No Odor Medium sized Vesicles

No Natural Fractures

~~Pull 34~~

~~Time Depth Ran Rec. Gain~~ DTB

SAMPLE NOMENCLATURE

DATE	TANK	TIME	DEPTH	Ogden ID
2-27-01	19	1625	67.7	RH-BR-19-S02
2-28-01	19	0945	93.2	RH-BR-19-S03
3-2-01	19	1330	118.0	RH-BR-19-S04
3-2-01	20	1630	1.0	RH-BR-20-S01
3-3-01	20	0750	8.8	RH-BR-20-S02
3-3-01	20	1540	104.0	RH-BR-20-S03
3-7-01	1	1010	GW	RH-MW-01
3-7-01	19	1440	GW	RH-MW-19
3-7-01	VID	1120	GW	RH-MW-VID
3-7-01	1 Geotech Sample	1210	93-98	RH-BR-01-G01

RH-BR-20-S01 is sand under the concrete flooring-Strong odor (612 ppm). No clinker.

H casing of TANK 20 to 16.5'

Clinker Zones

- TANK 19 -
  0-51.4 -

  51.4 - 121.1 - no clinker zones

- TANK 20 -
  71.6-73.6

Depth of Wells

TANK 19 - 121.1' bgs on 13° angle
TANK 20 - 127.7' bgs on 15° angle

Length of Well Screen

TANK 19 - 15 feet

TANK 20 - feet

* each well has a 5 foot sump at the bottom of the screen.

①

TANK 19

2-27-01

Pull 21

Time	Depth	Ran	Rec	Gain
1500	52.6	1.2	1.2	0

- 10 YR 2/2
- PID = 131 ppm, slight odor
- Small vesicle size
- MNF: 51.4 - 51.6, 52.1 - 52.4
  ~~52.4~~ ALL
- Mech F: N/A

Pull 22

Time	Depth	Ran	Rec	Gain
1515	55.1	2.5	2.5	0

- 10 YR 2/2
- PID = 111 ppm, slight odor
- Small vesicle size
- MNF: 52.6 - 52.9, 53.2, 53.5, 53.6 - 53.7, 53.7, 54.5
- Mech F:

TANK 19 ②

Pull 23

Time	Depth	Ran	Rec	Gain
1540	60.3	5.2	5.2	0

- 10 YR 2/1
- PID = 0 ppm, no odor
- Small vesicle size
- MNF: ~~51.2~~ 55.8, 56.0, 56.4, 56.6, 57.0, 57.2, 57.6, 58.3, 58.5, 58.8, 59.0, 60.0
- Mech F: N/A

Pull 24

Time	Depth	Ran	Rec	Gain
1355	62.6	2.3	2.3	0

- 10 YR 2/2
- PID = 154 ppm, slight odor
- Small vesicle size
- MNF: 60.8, 61.2, 61.5, 61.9, 62.2, 62.4
- Mech F: NA

Pull 25

Time	Depth	Ran	Rec	Gain
1625	67.8	5.2	4.7	-0.5

- 10 YR 2/2
- PID= 175 ppm, strong odor
- medium vesicle size
- MNF: 62.9, 63.4, 63.7, 64.2, 64.4, 65.7, 66.0, 67.0, 67.2
- Mech F: N/A

* RH-BR-19-502 taken @ 62.7, solid core, no clin

- Pull 26

Time	Depth	Ran	Rec	Gain
1655	73.0	5.0	5.2	+0.3

- 10 YR 2/2
- PID = 167 ppm, ~~strong~~ no odor
- vesicle size
- MNF: 67.6, 68.2, 68.7, 69.1, 69.5, 70.4, 70.9, 71.3, 71.9, 72.7
- Mech. F: NA

2/28/01

Pull 27

Time	Depth	Ran	Rec	Gain
0815	77.1	4.3	3.5	-0.8

- 10 YR 2/2
- PID= 200 ppm, no odor
- small vesicle size
- MNF: 73.6, 73.8, 74.1, 74.4, 74.5, 74.8, 75.3, 75.4, 75.7, 76.0, 76.4 - 77.1
- Mech. F: NA

Pull 28

Time	Depth	Ran	Rec	Gain
0840	79.9	2.8	2.1	-0.7

- 10 YR 2/2
- PID= 25 ppm, no odor
- medium vesicle size
- MNF: 77.5, 77.9, 78.0, 78.2 - 78.7, 78.8, 78.9 - 79.2
- Mech F:

TANK 19

Pull 29

Time	Depth	Ran	Rec	Gain
0900	85.0	5.1	5.2	0.1

- 10 YR 2/2
- PID = 334 ppm, no odor
- small vesicle size
- MNF: 80.1, 80.4, 80.7, 81.0, 81.3, 81.4, 81.6, 81.9, 82.2, 82.6, 83.5, 83.8, 84.5, 84.7-84.8, 85.0
- Mech F: NA

Pull 30

Time	Depth	Ran	Rec	Gain
0920	90.2	8.5.2	5.2	0

- 10 YR 2/2 clay inclusions
- PID = 189 ppm, no odor
- large vesicle size
- MNF: 85.0-85.2, 85.7, 86.1, 86.5-86.7, 86.9, 87.2, 87.4, 88.3, 88.5, 89.1, 89.8-90.2
- Mech F: NA

TANK 19

Pull 31

Time	Depth	Ran	Rec	Gain
0945	~~93.2~~ 92.5	2.3	2.4	~~-0.6~~ 0.1

- 10 YR 2/2
- PID = 630 ppm, no odor
- large vesicle size
- MNF: 90.5, 91.0, 91.7, 92.1-92.3, ~~92.6-93.2~~ ALL
- Mech F: NA

#RH.BR.19.S03, solid core, no clinker, no odor at 93.2' bgs.

Pull 32

Time	Depth	Ran	Rec	Gain
1005	94.9	~~1.7~~ 2.4	2.8	~~1.1~~ 0.4

- 10 YR 2/2
- PID = 667 ppm, no odor
- medium vesicle size
- MNF: 93.9, 94.0, 94.4,
- Mech F: NA

(7) TANK 19

Pull 33

Time	Depth	Ran	Rec	Gain
1025	96.5	1.6	1.1	-0.5

- 10 YR 2/2
- PID= ppm, no odor
- large vesicle size
- MNF: 95.5, 95.7 - 96.0

- Mech F: N/A

Pull 34

Time	Depth	Ran	Rec	Gain
1010	99.0	2.5	2.2	-0.3

- 10 YR 2/2
- PID= ppm, no odor
- small vesicle size
- MNF: 96.5 - 97.1, 97.5, 97.6, 97.7, 97.9, 98.2, 98.5

- Mech F: NA

8/2/01 TANK 19 (8)

Pull 35

Time	Depth	Ran	Rec	Gain
1010	101.1	5.1	5.2	0.1

- 10 YR 2/2
- PID= NA ppm, no odor
- large vesicle size
- MNF: 99.2, 99.7, 100.1, 100.5 - 100.8, 101.1, 101.3, 101.5, 102.5, 102.9

Pull 36

Time	Depth	Ran	Rec	Gain
1050	109.3	5.2	5.2	0

- 10 YR 2/2
- PID= NA ppm, no odor
- large vesicle size
- MNF: 104.9, 105.3, 105.7, 105.9, 106.9, 107.4, 107.9, 109.0, 109.3

TANK 19

Pull 37

Time	Depth	Ran	Rec	Gain
1140	114.2	4.9	5.0	0.1

- 10 YR 2/2 clay inclusions
- PID= ~~NA~~ 350 ppm, no odor
- large vesicle size
- MNF: 109.3 - 109.8, 110.8, 111.0, 111.2, 111.4, 112.0, 112.7, 112.9 - 113.2, 113.6

Pull 38

Time	Depth	Ran	Rec	Gain
1220	116.6	2.4	2.9	0.5

- 10 YR 2/2 clay inclusions
- PID= 582 ppm, no odor
- large vesicle size
- MNF: 114.5, 115.0-115.2, 115.9, 116.3
  ~~116.3~~ ALW

TANK 19

Pull 39

Time	Depth	Ran	Rec	Gain
1330	121.1	4.5	4.7	0.2

- 10 YR 2/2 clay inclusion
- PID= 406 ppm, no odor
- large vesicle size
- MNF: 117.5, 117.9, 118.7, 119.0, 119.1, 119.5, 120.6, 120.9

* RH-BR-19-S01 taken at 118.0, solid core, no odor

~~Pull 40~~ ALW

~~Time Depth Ran Rec Gain~~

Terminate boring at 121.1' bgs.

① TANK 20

3/2/01

Pull 1

Time	Depth	Ran	Rec	Gain
1700	~~7.0~~	~~7.0~~	~~1.1~~	~~-5.9~~ ALW
	2.5	2.5	2.1	0.4

- Concrete for 6 inches
- 10YR 2/2 for 7 inches
- MNF: throughout
- odor is strong, 75.1 ppm

Pull 2

Time	Depth	Ran	Rec	Gain
1715	7.0	4.5	1.1	-3.4

- 10YR 2/2
- medium vesicle size
- no odor
- MNF: throughout

TANK 20 ②

3/3/01

Pull 3

Time	Depth	Ran	Rec	Gain
0740	7.5	0.5	0.2	-0.3

- grout and rock mixture
- place where well casing was set in place. This is confirming bed.

Pull 4

Time	Depth	Ran	Rec	Gain
0750	11.5	4.0	3.4	-0.6

- 10YR 2/2
- PID = 375, strong odor
- small vesicle size
- MNF: 7.5-7.9, 8.2, 8.8, 9.3, 9.5, 9.8, 10.0, 10.1-11.0, 11.3-11.5

- RH-BR-20-S02 taken at 8.8'
no dikes, solid core, strong HC odor

Pull 5

Time	Depth	Ran	Rec	Gain
0825	15.9	4.4	4.4	0

- 10YR 2/2
- small vesicle size
- no odor
- MNF: 11.5- 11.9, 12.2, 12.5, 12.9, 13.9, 14.1, 14.5, -14.7, 15.2, 15.4, 15.9

Pull 6

Time	Depth	Ran	Rec	Gain
0850	20.4	4.5	4.9	0.4

- 10YR 2/2
- no odor
- medium vesicle size
- MNF: 16.3, 16.8, 17.5, 18.0 - 18.2, 18.6-18.9, 19.5, 20.1

Pull 7

Time	Depth	Ran	Rec	Gain
0900	21.7	1.3	2.3	1.0

- 5YR 3/2
- small vesicle size
- no odor
- MNF: 21.1, 21.3, 21.5 - 21.9
- mech F: 20.7, 20.9

Pull 8

Time	Depth	Ran	Rec	Gain
0915	27.9	6.2	5.2	-0.1

- 5YR 3/2 to 24.4
- 10YR 2/2 from 24.4 - 27.9
- no odor
- small vesicle size
- grout seams from 22.7 - 25.2
- mech F: 27.7
- MNF: 21.7, 22.7, 23.3, 23.5, 23.5, 23.6, 23.8, 24.1 - 24.4, 24.7, 25.2, 25.5, 25.8, 26.0, 26.4, 27.0

TANK 20

Pull 9

Time	Depth	Ran	Rec	Gain
0930	33.2	5.3	5.2	-0.1

- 10 YR 2/2 from 27.9 - 32.4
- 5 YR 3/2 at 32.4 - 33.2
- Small vesicle size
- no odor
- MNF: 28.1, 28.7, 29.4 - 29.7, 30.1, 30.3, 30.6, 31.1, 31.3 31.5, 31.6, 31.8 - 32.1, 32.3 - 32.9, 33.0

Pull 10

Time	Depth	Ran	Rec	Gain
0945	35.9	2.7	3.0	0.3

- 10 YR 2/2 no odor
- Small vesicle size
- MNF: 33.8 - 34.1, 34.5 - 34.7, 34.7 - 35.0, 35.3 - 35.7

TANK 20

Pull 11

Time	Depth	Ran	Rec	Gain
0955	41.1	5.2	4.7	-0.5

- 10 YR 2/2 no odor
- medium vesicle size
- MNF: 36.8, 37.5, ~~38~~ 37.9, 38.3 - 38.9, 39.4, 40.2, 40.3, 40.5, 40.8

Pull 12

Time	Depth	Ran	Rec	Gain
1005	45.7	4.6	5.2	0.6

- 10 YR 2/2 no odor
- medium vesicle size
- MNF: 42.1, 42.7, 43.1, 44.6, 45.3, 45.5, 45.6

TANK: 20

Pull 13

Time	Depth	Ran	Rec	Gain
1015	47.1	1.4	1.4	0.

- 5 YR 3/2 no odor
- Small vesicle size
- MNF: throughout (no clinker)

Pull 14

Time	Depth	Ran	Rec	Gain
1025	50.4	3.3	3.3	0

- 10 YR 2/2 no odor
- Small vesicle size
- MNF: 47.8, 48.0 — 48.3
  49.0, 49.1, 49.4, 50.1

TANK 20

Pull 14/15

Time	Depth	Ran	Rec	Gain
1040	55.8	5.4	5.2	-0.2

- 10 YR 2/2 no odor
- large vesicle size
- grout seam at 52.3
- MNF: 50.5, 51.0, 51.8, 52.0,
  52.3, 52.4, 53.4, 54.3,
  54.5, 55.1, 55.4

Pull 16

Time	Depth	Ran	Rec	Gain
1100	61.0	5.2	5.1	-0.1

- 10 YR 2/2 no odor
- medium vesicle size
- grout seam at 58.0
- MNF: 56.8-57.1, 57.6-57.8,
  58.2-58.4, 58.7, 59.1 -
  59.3 59.9, 60.1, 60.9

TANK 20

Pull 17

Time	Depth	Ron	Rec	Gain
1130	66.0	5.0	4.5	-0.5

- 10 YR 2/2 no odor
- large vesicle size
- grout seams at 61.3-64.3, 65.5
- MNF: 62.7, 63.6, 63.9, 64.3 - 65.7

Pull 18

Time	Depth	Ron	Rec	Gain
1150	70.7	4.7	5.2	0.5

- 10YR 2/2 no odor
- medium vesicle size
- grout seams:
- MNF: 66.8, 66.9, 67.6-67.8, 67.9-68.3, 69.0, 69.2, 70.1, 70.5

TANK 20

Pull 19

Time	Depth	Ron	Rec	Gain
1205	74.9	4.2	2.2	-2.0

- 5 YR 2/2 no odor
- small vesicle size
- clay inclusions
- clinker zone from 71.6-73.0
- MNF: 71.1, 71.6 - 73.6

Pull 20

Time	Depth	Ron	Rec	Gain
1230	79.2	4.3	4.2	-0.1

- 10 YR 2/2 clay inclusions
- no odor small vesicle size
- grout seam 75.0-79.1
- MNF: 75.8, 75.9, 76.1, 76.4, 76.8, 77.4, 77.8-78.2, 78.5, 78.8-79.1

TANK 20

Pull 21

Time	Depth	Ros	Rec	Gain
1245	81.6	2.4	1.5	-0.9

- 10YR 2/2 clay inclusions
- grout seam at 79.4
- no odor, small vesicle size
- MNF: 79.2, 79.5 - 81.6

Pull 22

Time	Depth	Ros	Rec	Gain
1255	85.4	3.8	2.5	-1.3

- 10YR 2/2 clay inclusions
- small vesicle size, no odor
- grout seam at 81.7-81.9
- MNF: 81.9 - 84.7, 84.8
  84.9, 85.2

83' small void

TANK 20

Pull 23

Time	Depth	Ros	Rec	Gain
1310	89.4	4.0	4.0	0

- 5YR 3/2 no odor
- small vesicle size
- MNF: 85.7, 85.9, 86.5, 86.9 -
  87.1, 87.3, 87.5, 87.7 -
  88.7, 88.9 ~~89.7~~ ALLO
  89.2

Pull 24

Time	Depth	Ros	Rec	Gain
1325	92.3	2.9	3.0	0.1

- 5YR 3/2 no odor
- small vesicle size
- MNF: 89.6 - 89.9, 90.2
  90.6, 91.0, 91.9, 92.1

Pull 25

Time	Depth	Ros	Rec	Gain
1400	95.0	2.7	2.6	-0.1

- 10 YR 2/2 clay inclusions
- Small vesicle size, no odor
- MNF: 93.5, 93.6, 93.8-94.3, 94.6-95.0

Pull 26

Time	Depth	Ros	Rec	Gain
1410	96.6	1.6	1.1	-0.5

- 10 YR 2/2 clay inclusions
- Small vesicle size, no odor
- MNF: throughout

Pull 27

Time	Depth	Ros	Rec	Gain
1430	99.2	2.6	0.8	-1.8

- 10 YR 2/2 no odor
- Small vesicle size
- MNF: throughout

Pull 28

Time	Depth	Ros	Rec	Gain
1445	100.7	1.5	1.1	-0.4

- 10 YR 2/2 no odor
- Small vesicle size
- MNF: throughout

(15) TANK 20

Pull 29

T	D	Ran	Rec	G
1500	102.4	0.7	0.7	0

- 10 YR 2/2
- no odor, small vesicle size
- MNF: throughout

Pull 30

T	D	Ran	Rec	G
1520	103.9	2.5	0.8	-1.7

- 5 YR 3/2, clay inclusions
- small vesicle size
- no odor
- MNF: throughout

ALW ~~101.6, 102.4, 103.1, 103.7~~

TANK 20 (16)

Pull 31

T	D	Ran	Rec	G
1540	106.3	2.4	1.2	-1.2

- 5 YR 3/2 no odor
- small vesicle size
- MNF: throughout

RH-BR-20-503 taken at 104.0' broken core, no odor, no clinker zone.

Pull 32

T	D	Ran	Rec	G
1600	109.5	3.0	2.9	-0.1

- 10 YR 2/2 no odor
- large vesicle size
- clay inclusions
- MNF: 101.6, 102.4, 103.1, 103.7

(17) TANK 20

Pull 33

T	D	Ran	Rec	G
1620	111.2	1.9	1.0	-0.9

- 10YR 2/2
- no odor clay inclusions
- small vesicle size
- MNF: throughout

Pull 34

T	D	Ran	Rec	G
1645	114.6	3.4	1.0	-2.4

- 10YR 2/2
- no odor
- small vesicle size
- MNF: throughout

3/5/01 TANK 20 (18)

Pull 35

T	D	Ran	Rec	G
0805	115.4	0.8	1.0	0.2

- 10YR 2/2 clay inclusions
- small vesicle size
- no odor, 311 ppm
- MNF: throughout

Pull 36

T	D	Ran	Rec	Gain
0820	116.2	0.8	0.9	0.1

- 10 YR 2/2
- Small vesicle size
- no odor
- MNF: throughout

(19)

TANK 20

Pull 37

T	D	Ron	Rec	G
0840	120.7	4.5	3.6	-0.9

- 10YR 2/2 clay inclusions
- medium vesicle size
- no odor, PID = 467 ppm
- MNF: 117.7, 118.0, 118.4, 118.7 - 119.8

Pull 38

T	D	Ron	Rec	G
0905	125.8	5.1	3.8	-1.3

- 10YR 2/2 clay inclusions
- large vesicle size
- no odor, 629 ppm
- MNF: 121.0, 121.3, 121.6, 121.9, 122.2, 123.1, 123.1 - 123.4, 124.0, 124.5

TANK 20

Pull 39

T	D	Ron	Rec	Gain
0925	127.7	1.9	2.8	+0.9

- 10YR 2/2
- PID = 420 ppm, no odor
- large vesicle size
- MNF: 126.6, 127.7

- END OF BORING
- 127.7' bgs
- feet screen

DRUM INVENTORY

Drum #	ID	DATE	CONTENT
1	TAN B-0018	11-2-00	rock cuttings/grat
2	TANK 19	2-28-01	
3	TANK 20	3-5-01	
4	TANK 15/14/13		
5	TANK 13/12/11		
6	TANK 16/10		
7	TANK 12/9		
8	TANK V25		
9	TANK V10	2-20-01	
10	TANK 2/3	2-7-01	
11	TANK 4	1-30-01	
12	TANK 8/7	1-18-01	

GW Sampling

VIP
Depth to Water 86.1
Total Depth 102.0

Purge Volume
well casing size 1"

DATE	TIME	pH	Temp	Cond.
3-7-01	1100	8.58	82.0	0.83
	1105	8.92	79.3	0.82
	1110	8.93	79.4	0.83
	115	8.89	79.4	0.84
	1120	8.88	79.4	0.84

MW-19

DATE	TIME	pH	Temp	cond
3-7-01	1425	7.64	77.4	0.81

Sample Nomenclature

Date	Tank #	≈Time	≈Depth	OEES/AMEC ID
1/15/01	8	08:00	≈0.5'/2'	RH-BR-8-S01
1/16/01	8	~~08:00~~ 12:40	~~≈0.5'~~ ≈77.85'	RH-BR-8-S02
1/16/01	8	~~08:00~~ 17:00	~~≈0.5'~~ ≈114.5'	RH-BR-8-S03
1/18/01	7	13:50	0.5'/2'	RH-BR-7-S01
1/18/01	7	10:35	≈25.9	RH-BR-7-S02
1/18/01	7	15:28	≈92.4'	RH-BR-7-S03
1/19/01	7	08:14	105.95	RH-BR-7-S04
1/19/01	7	08:41	111.2	RH-BR-7 S05
1/19/01	6	14:13	0.5'/2'	RH-BR-6-S01
1/19/01	6	14:18	0.5'/2'	RH-~~BR~~ MW-6-S01
1/19/01	6	15:30	0.5'/2'	RH-~~BR~~ OK-6-S02
1/22/01	6	10:53	19.8	RH-BR-6-S03
1/22/01	6	10:53	19.8	RH-BR-6-D07
1/24/01	6	11:08	125.1	RH-BR-6-S04
1/25/01	5	09:05	9.15'	RH-BR-5-S01
1/25/01	5	10:14	14.7'	RH-BR-5-S02
1/26/01	5	08:29	55.75'	RH-BR-5-S03
1/26/01	5	16:18	113.3'	RH-BR-5-S04
1/26/01	5	16:48	115.3'	RH-BR-5-S05
1/29/01	4	11:15	2.5'	RH-BR-4-S01
1/29/01	4	14:55	8.2'	RH-BR-4-S02
1/31/01	4	12:01	123.9	RH-BR-4-S03
1/31/01	4	12:01	123.9	RH-BR-4-D08
1/31/01	3	15:13	2'	RH-BR-3-S01
2/1/01	3	12:04	46.35'	RH-BR-3-S02
2/2/01	3	14:00	125.2	RH-BR-3-S03
2/5/01	2	09:08	≈2.5	RH-BR-2-S01
2/6/01	2	11:57	~~≈~~ 84.45	RH-BR-2-S02
2/6/01	2	16:40	119.9	RH-BR-2-S03
2/7/01	1	14:30	2.5	RH-BR-1-S01
2/8/01	1	08:27	8	RH-BR-1-S02
2/8/01	1	13:34	59.6	RH-BR-1-S03
2/8/01	1	13:39	59.6	RH-BR-1-D09
2/8/01	1	13:52	61.35	RH-BR-1-S04
2/9/01	1	09:27	129.2	RH-BR-1-S05
2/16/01	V1D	16:49	72.4	RH-BR-V1D-S01
2/19/01	V1D	0825	84.7	RH-BR-V1D-S02
2/20/01	V1D	1115	97.6	RH-BR-V1D-S03
2/20/01	V2S	1135	10.0	RH-BR-V2S-S01
2/21/01	V2S	0955	21.5	RH-BR-V2S-S02
2/2/01	V2S	1010	43.0	RH-BR-V2S-S03

Clinker Zone ~~8~~ 212 Depths

Tank #	Depth Range(s) [ft. bgs]
8	40.45 - 41.25
~~8~~ 7	NA
6	NA
5	NA
4	NA
3	NA
2	NA
1	NA
V10	93.0 - 100.0 bgs
V25	30.3 - 30.8 bgs

"H" Coring Depth

Tank#	Depth [ft. bgs]
8	16
~~8~~ 7	13.3
6	16.5
5	17.6
4	15.6
3	14.1
2	12.6
1	15.6
V1D	41.6

TANK	Depth
V2S	25.4

Depth of Wells per Larry De Moss

Tank#	Depth [ft. bgs]
8	127.2
~~8~~ 7	128.9
6	126.6
5	124.3
4	129.1
3	130.2
2	124.0
1	129.7
V~~0~~1D	100.0
V2S	52.0

Length of Well Screen per Larry De Moss

- Note: Unless otherwise noted, screen just before 5 ft. sump at bottom

Tank#	Length [ft.]
8	15
7	15
6	15
5	15
4	15
3	15
2	15
1	15

Tank#	Length [ft.]
V1D	10' (no sump)
V2S	15'

Angle of Boring per Larry De Moss

Tank#	Angle [degrees → °]
8	15
~~8~~ 7	15
6	15
5	15
4	15
3	15
2	15
1	15
V~~0~~1D	90
V2S	90

- Note(s):
  - All length and depth measurements ~~are~~ bgs (Depth, "Run" Length, "Rec." overy Length, "Gain" + or - in Rec., and "Cum" mulative Gain) are approximate + in ft. and Depths are bgs.
  - Time in Military /24 hr. Time
  - Colors are based on Munsell Soil Color Charts and are generally one of the following:
    - 2.5 YR 4/8 → Red (silty Clay Material)
    - 5YR 3/2 → Dark Reddish Brown
    - 10YR 2/2 → Very Dark Brown
    - 10 YR 2/1 → Black
    - 10 YR 3/1 → Very Dark Gray
  - All measurements are approximate
  - If the PID reads Ø ppm it may also be refered to as an Undetectable reading → PID Undetect.
  - PID readings are in ppm and are a maximum for any particular pull
  - MNF → Multiple Natural Fractures

P → Pull R/R → Run/Rec.
T → Time G → G
D → Depth C → Cummulative Gain (Negative if Loss)

① Tank #1 ~~8~~

1/15/01

— Pull 1

* Time	Depth	Run	Rec.	Gain	Cum.
08:00	2.1	2.1	2.1	0	0

- Concrete "Slab" + Fine-Coarse Sand, Slightly Fine Gravel "Bedding Material"
- ~~Slight~~ Odor
- PID ≈ 2.5 ppm
* No Box Sample Taken per Larry De Moss
* Slab ≈ 6" Thick + in Tact per Larry De Moss
* Sample RH-BR-~~1~~8-S01 D=6" = 0.5' 1/15/01 ≈ 08:0~~8~~0 Fine-Coarse Sand, Slight Fine Gravel

— Pull 2

* Time	Depth	Run	Rec.	Gain	Cum.
08:34	4.3	2.2	1.3	-0.9	-0.9

- Concrete
- Odor / PID ≈ 3.4 ppm
- Multiple Natural Fractures: 3.2', 2.7', 2.4' - 2.2'

(2) Tank #8

- Pull 3

≈ Time	Depth	Run	Rec.	Gain	Cum.
~~08:47~~ 09:05	8.3	4.0	3.3	-0.7	-1.6

- 5YR 3/2 - Small to Medium Vesicles
- No Odor ~~/PID NA~~
* Top ≈ 0.6' Concrete
- Multiple Natural Fractures: 9.65, ~~9.95~~, 7.6 6.6' - 6.4', 6.1, 5.65, 4.95 - 5.4

1/16/01

- Pull 4 ~~Depth~~

Time	Depth	Run	Rec.	Gain	Cum.
07:45	10.6	2.3	2.3	0	-1.6

- 5YR 3/2
- Small to Primarily Medium Vesicles
- No Odor
- Multiple Natural Fractures: 8.6, 8.75, 8.95, 9.4, 9.85, 10.15 - 10.6
- Grout seam from Drilling Operation 8.3

(3) Tank #8

- Pull ~~4~~ 5

Time	Depth	Run	Rec.	Gain	Cum.
08:09	16	5.4	5.2	-0.2	-1.8

- 5YR 3/2
- Small to Medium Vesicles
- No Odor / PID Undetectable (i.e. 0 reading)
- Multiple Natural Fractures: 15.6 - 15.4, 14.9, 14.45, ~~to 14.5~~, 14.05, 13.95, 13.7, 13.5, 13.9, 12.7, 12.4, ~~12.15 - 11.95, 11.45, 10.95, 10.15, 9.~~ 11.9, 11.4 - 10.6
- Pull 6

Time	Depth	Run	Rec.	Gain	Cum.
08:43	18.8	2.8	2.8	0	-1.8

- 5YR 3/2
- Primarily Small to Medium Vesicles
- No Odor
- Multiple Natural Fractures: ~~14~~ 16.35 - 16.7, 17.2 - 17.3, 17.7 - 17.9, 18.25 - 18.55, 18.75
- Grout Seams: 16.7 - 17.9 and bottom ≈ 0.05' all Grout

(4) Tank #8

— Pull 7

Time	Depth	Run	Rec.	Gain	Cum.
08:57	23.8	5	4.6	-0.4	-2.2

- 10YR 2/2
- Small to Primarily Large Vesicles
- No Odor ~~/ PID Undetect.~~ bfb
- Multiple Natural Fractures:
  18.85, 19.15, 19.45, 19.85, 20.3 - 21.05
  22.1, ~~22~~ bfb, 21.4
- Grout Seams: 18.8, 20.2, ~~22~~ bfb, 21.15 - 22.1

— Pull 8

Time	Depth	Run	Rec.	Gain	Cum.
	28.3	4.5	5.2	0.7	-1.5

- 10YR 2/2
- No Odor / PID Undetect.
- Small to Primarily Large Vesicles
- Multiple ~~Fra~~ bfb Natural Fractures:
  ~~24.1, 24.6~~ bfb 27.35, 25.3, 25.16
- Mechanical Fractures: 26.75 and 26.36

(5) Tank #8

— 8' bfg Pull 9

Time	Depth	Run	Rec.	Gain	Cum.
09:26	33.6	5.3	5.3	0	-1.5

- 10YR 2/2
- Small to Primarily Large Vesicles
- No Odor / PID Undetect.
- Multiple Natural Fractures:
  28.75, 30.1, 31.3, 31.6

— Pull 10

Time	Depth	Run	Rec.	Gain	Cum.
09:37	38.6	5	5	0	-1.5

- 10YR 2/2
- Small to Large, Primarily Medium Vesicles
- No Odor / PID Undetect
- Multiple Natural Fractures:
  ~~34 - 4~~ bfb 35.5 - 35.55, 37.9, 36.85

(6) Tank #8

Pull 11

Time	Depth	Run	Rec.	Gain	Cum.
09:55	43.8	5.2	5.2	0	-1.5

- 5YR 3/2
- Small to Medium Vesicles
- No Odor / PID Undetect.

- Multiple Natural Fractures:
  39.65, 40.3, 40.45 - ~~38.55~~ 41.25
  43.8 - 43.55, 43.05, 42.35, 42,
  41.55
- * Clinker Zone: 40.45 - 41.25

Pull 12

Time	Depth	Run	Rec.	Gain	Cum.
10:13	49.1	5.3	5.1	-0.2	-1.7

- 5YR 3/2
- Small to Medium Vesicles
- No Odor / PID Undetect

- Multiple Natural Fractures:
  44.25, 44.55 - 44.7, 45.2 - 45.3,
  ~~45.8~~ - 45.65 - 45.8, ~~46.65~~, 46.1,
  46.5 - 48.1
  48.75, ~~48.1~~

(7) Tank #8

Pull 13

Time	Depth	Run	Rec.	Gain	Cum.
10:35	54.2	5.1	5.1	0	-1.7

- 5YR 3/2
- Medium to Large Vesicles
- No Odor / PID Undetect.
- Multiple Natural Fractures:
  49.1 - 49.8, 50.5, 50.4 - 51.4, 52.1 - 53.6

* Grout Seams: 50.6 - 50.9 and 53.5

Pull 14

Time	Depth	Run	Rec.	Gain	Cum.
10:52	59.3	5.1	5.1	0	-1.7

- 10YR 2/2
- Medium to Large Vesicles
- No Odor / PID Undetect.
- Multiple Natural Fractures:
  ~~54.95~~, 54.85, 55.25, 56.65,
  56.85, 57.15, 58.6, 59.2 - 59.3
- Grout Seams: 56.85, 59.2 - 59.3

(8) Tank #8

— Pull 15

Time	Depth	Run	Rec.	Gain	Cum.
11:08	64.5	5.7	5.2	0	-1.7

- 10YR 2/2
- Small to Medium Vesicles
- No Odor / PID Undetect.
- Multiple Natural Fractures:
  59.9, 60.6 – ~~58.7~~ 67.5, 63.95, 63.3,
  59.3, ~~58.7~~ 61.2.

*Grout Seams: 59.3 - 62.2, 59.3 - 59,
63.95, 63.3

— Pull 16

Time	Depth	Run	Rec.	Gain	Cum.
11:28	69.8	5.3	5.2	-0.1	-1.8

- 5YR ~~2~~ 3/2
- Primarily Small to Large Vesicles
- No Odor / PID Undetect.
- Multiple Natural Fractures:
  65.6, 65.7 - 67 ~~3~~ 61.2, ~~68, 68.5, 69.3 - 69.8~~
  67.7, 68.2, 69 - 69.~~8~~ 7 18.6
*Grout Seam: 69.5

(9) Tank #8

— Pull 17

Time	Depth	Run	Rec.	Gain	Cum.
11:41	74.9	5.1	5.2	0.1	-1.7

- 10YR 2/2
- Medium to Large Vesicles ~~Size~~ 28.8
- No Odor / PID Undetectable
- Multiple Natural Fractures: 74.8 - 74.9,
  74.1, 73.6 - 73.5, 72.1, 70.9 ~~X~~ 71.8, 70.8,
  70.05 - ~~70.3~~ 61.8 70.2
- Mechanical Fractures: 71.65 and 70.~~4~~ 0x 61.1

— Pull 18

Time	Depth	Run	Rec	Gain	Cum.
12:25	79.2	4.3	3.7	-0.6	-2.3

- 5YR ~~2~~ 3/2 2.6
- Small to Large Vesicles
- No Odor / PID Undetectable
- Multiple Natural Fractures:
  75.25, 75.45 - 76.05, 76.45, 76.95,
  77.05, 77.65, 77.75, 78.35 - 78.6
* Sample RH-BR-8-502 D≈77.65'
  1/16/01 ≈ 12:40

Rock Core / ~~Broken~~ 07.4 Rock Core Naturally Fractured

(10) Tank #8

— Pull 19

Time	Depth	Run	Rec.	Gain	Cum.
13:05	82	3.2	3.0	-0.2	-2.5

- 5YR 3/2
- Small to Medium Vesicles
- No Odor / PID Undetectable
- Multiple Natural Fractures:
  81.4, 80.85 - 80.25, 79.9 - 79.2

* Grout Seams: 81.55 - 80.8

— Pull 20

Time	Depth	Run	Rec.	Gain	Cum.
13:29	86.6	4.6	4.6	0	-2.5

- 5YR 3/2
- primarily Small to medium Vesicles
- No odor / PID Undetectable
- Multiple Natural Fractures:
  82.4, 82.8, 82.95 - 83.15, 83.55
  84.45 - 85.4,
  85.7, 85.55

* Grout Seams: 83.25 - 83.35, ~~84~~ 86
  and 86.3 - 86.6

(11) Tank #8

— Pull 21

Time	Depth	Run	Rec.	Gain	Cum.
14:00	91.8	5.2	5.0	-0.2	-2.7

- 5YR 3/2
- Primarily Small to Medium Vesicles
- No odor / PID Undetectable
- Multiple Natural Fractures:
  86.95, 87.1, 87.3, 90 - 91.6

- Mechanical Fracture: 89.15
- Grout Seam: 87.5 - 90 "Saturated" w/ Grout

— Pull 22

Time	Depth	Run	Rec.	Gain	Cum.
14:38	96.3	4.5	4.6	0.1	-2.6

- 10YR 3/1 "Very Dark Grey"
- Small to Large Vesicles
- No odor / PID Undetectable
- Multiple Natural Fractures:
  95.65, 95.45, 95.4, 95, 94.6,
  93.6, 93.05, ~~92.75~~ 92.6, 92.25 ~~91.7~~ 91.6
  91.85 - 91.75

- Mechanical Fractures: 92.75 and 92.55

(12) Tank #8

— Pull 23

Time	Depth	Run	Rec.	Gain	Cum.
15:15	101.6	5.3	5.2	-0.1	-2.7

- Approx Top 2/3 10YR 3/1 and Bot 1/3 5YR 3/2
- Small to Primarily Large Vesicles (Top 2/3)
- No Odor / PID Undetectable
- Multiple Natural Fractures:
  97.35, 98.2, 98.7, 99, 99.25 - 99.85,
  ~~99.15~~ 100, 100.2, 100.65, 101.05 - 101.15,

— Pull 24

Time	Depth	Run	Rec.	Gain	Cum.
15:52	106.8	5.2	5.3	0.1	-2.6

- Approx Top 0.1 5YR 3/2 then 10YR 3/1
- " " Small to Medium then Large Vesicles
- No Odor / PID Undetectable
- Multiple Natural Fractures:
  101.6 - 101.7, 102.3, 103.05, 103.65,
  103.9 - 104.25, 106.35, 105.65 ✓ DSB
- Mechanical Fractures: 102.2 and 106.15

(13) Tank #8

— Pull 25

Time	Depth	Run	Rec.	Gain	Cum.
16:29	112.1	5.3	5.3	0	-2.6

- 10YR 3/1
- Small to Medium Vesicles
- No Odor / PID Undetectible
- Multiple Natural Fractures:
  107.65, 107.75 - 107.9, 108.3, 108.85,
  109.0 - 109.55, 111.7 - 111.45,
  111.35 - 111.05, 110.9, 110.45, 110.2,

— Pull 26

Time	Depth	Run	Rec.	Gain	Cum.
16:51	117.5	5.2	5.1	-0.1	-2.7

- 10YR 3/1
- Small to Medium Vesicles:
  117.2, 116.95, 116.4, 115.65, ~~114.5~~ DSB,
  ~~117.3 ✓ DSB - 117.1, 117.5, 117.65, 117.9~~
  ~~118.35~~ DSB
  112.1 - 112.1, 112.2, 112.35, 112.6,
  113.05 - 114.5
- * Sample RH-BR-8-5Ø3 D≈114.5'
  1/16/01 @ 17:04
  Rock Core
- Mechanical Break: 112.95

(19)

Tank #8

1/17/01

- Pull 27

Time	Depth	Run	Rec.	Gain	Cum.
08:27	122.4	5.1	5.2	0.1	-2.6

- 10YR 3/1 and 5YR 3/2
- Small to Medium Vesicles
- No Odor / PID Undetectable
- Multiple Natural Fractures:
  17.8, 18.2, 18.5, 19.1 - 119.2, 121.35 - 121.75, 120.95, ~~120.75~~ 120.35, 119.75, 119.6, 119.4
- Mechanical Fracture: 120.75
- ~~Mecha~~ - Grout Seams: 119.45 - 119.95

- Pull 28

Time	Depth	Run	Rec.	Gain	Cum.
08:53	127.2	~~5.2~~ 4.8	~~5.2~~ 4.8	0	-2.6

- 5YR 3/2 and 10YR 3/1
- Small to Medium Vesicles
- No Odor / PID Undetectable
- Multiple Natural Fractures:
  ~~122.5, 122.65, 129.95, 123.15, 123.75 -~~
  ~~124.4, 124.65 - 125.05, 125.25,~~
  ~~125.4 - 126.15, 126.35, 126.9, 125.3, 125.65~~
- ~~Grout Seams: 122.7 - 123.35~~
  ~~126.3, 126, 125.4 - 125.8, 124.95, 125.05~~

- Multiple Natural Fractures:
  122.5, 122.65, 129.95, 123.15, 123.75 - 124.1, 126.3, 126, 125.05 - 125.8, 124.95, 124.7 - 124.85
- Grout Seams: 122.4 - 123.05

(6.5)

1/17/01 Tank 7

- Pull Ø (Prior to Pull 1)
  core through approximately 0.5' Concrete slab and sampled Bedding Sand below
  - Fine to Coarse SAND, slight fine GRAVEL and wood, brownish gray
  - Odor / PID ≈ 1.8 ppm
  - No "Box/Core" sample taken per Larry DeMay
  * Sample RH-BR-7-SØ1 @ D ≈ 0.5' on 1/17/01 @ ≈ 13:50 of fine - coarse SAND, slight fine gravel

GFG

~~to 125.3, 125.1 - 125.15, 123.75~~
~~124.1 - 123.75~~
~~124.7 - 124.35~~

Tank 7

① 1/17/01

- Pull 1

Time	Depth	Run	Rec.	Gain	Cum.
~~13:50~~ ~~14:27~~ 13:50	2.0	2.0	2.0	0	0

- Concrete ~~(w/ a few pieces of 10YR 2/2 Rock in Range)~~
- ~~Slight~~ Odor / PID ≈ 0 ~~ppm~~ 1.8 ppm
- ~~Multiple Natural Fractures:~~
  ~~1.45, 1.2, 0.5 2~~
- No Bag Sample taken per Larry Demoss
- Sample RH-BR-7-S01 @ D ≈ 0.5' (2' of fill Hole) on 1/17/01 @ ≈ 13:50 of fine to coarse "Bedding" SAND, slight fine gravel below slab

- Pull 2

Time	Depth	Run	Rec.	Gain	Cum.
14:27	7	5	1.8	-3.2	-3.2

- Concrete (w/ a few pieces of 10YR 2/2 Rock in Range)
- Slight Odor / PID ≈ 0.7ppm
- Multiple Natural Fractures:
  6.65, 6.4, 5.7 – 2 (accounted for ~~the~~ loss in this range)

② Tank 7

1/18/01

- Pull 3

Time	Depth	Run	Rec.	Gain	Cum.
07:54	8.7	1.7	0.8	-0.9	-4.1

- Concrete
- No Odor / No PID

- Pull 4

Time	Depth	Run	Rec.	Gain	Cum.
08:04	13.3	4.6	3.0	-1.8	-5.9

- 5YR 3/2
- Slight Odor / No PID
- Small to Medium Vesicles
- Multiple Natural Fractures:
  10.9, 12.7, 12.5, 12.4, 10.05 – 11.65, 11.25 – 8.7 (accounted for loss in this range, Possible Backfill)

(3) Tank 7

- Pull 5

Time	Depth	Run	Rec.	Gain	Cum.
09:06	13.7	0.4	0.4	0	-5.9

- 5YR 3/2
- Primarily Small w/ Medium Vesicles
- No Odor / PID = 0
- 1 Natural Fracture: 13.45

- Pull 6

Time	Depth	Run	Rec.	Gain	Cum.
09:24	17.6	3.9	3.8	-0.1	-6

- 10YR 2/2
- Small to Medium Vesicles
- No Odor / PID = 0
- Multiple Natural Fractures:
  13.1 - 13.95, 14.3, 15, 15.25, 15.75,
  16.2 ~~bld~~, 16.75, 16.6 - 17

*Grout Seams: 16.3 - 17.2

(4) Tank 7

- Pull 7

Time	Depth	Run	Rec.	Gain	Cum.
04:~~08~~58	22.7	5.1	5.4	0.3	-5.7

- 10YR 2/2
- Small to Medium Vesicles
- No Odor / PID = 0
- Multiple Natural Fractures:
  ~~18 - 18.75~~, 18.4, 19.3, 19.55, ~~19.95~~
  ~~19.05 - 19.2~~, ~~19.6~~, ~~20.5 - 20.9~~, ~~bld~~
  ~~20.15 - 20.3~~, ~~20.7~~, ~~21.2 - 21.6~~, ~~22~~, ~~20.4 - 20.6~~
- Grout Seams: ~~18 - 18.75 - 22.7~~, 17.7 and 18.15 - 22.7
  17.7 - 18.15, 18.6, 19, 19.25, 19.95 - 20, 20.4, 20.4 - 21.3,
  21.7, 22.1 - 22.3

- Pull 8

Time	Depth	Run	Rec.	Gain	Cum
10:19	25.9	3.2	2.7	-0.5	-6.2

- 10YR 2/1
- Small to Large Vesicles
- No Odor
- Multiple Natural Fractures:
  25.4 - ~~22.7~~ bld 25.2, 24.7 - 24.4,
  23.~~7~~ - 22.7
- Grout Seams: 25.4 - 25.1, 24.4 - 22.7

(5) Tank 7

- Pull 9

Time	Depth	Run	Rec	Gain	Cum.
10:29	32.1	6.2	5.0	-1.2	~~-7.6~~ -7.4

- 10YR 2/1
- Small to Large Vesicles
- Odor / PID ≈ 110 ppm
- Multiple Natural Fractures:
  26.95, ~~27.1~~ 28, 29.6, 30.15
- Mechanical Breaks: 27.25 + 27.55
* Grout Seams: 25.9 - 27.45, 28, + 28.95, 29.9-30.7
* Sample RH-BR-7-S02 @ D% 25.9'
  on 1/18/01 @ ≈ 10:35 of Rock Grout Core w/ Odor / PID ≈ 110 ppm
- Pull 10

Time	Depth	Run	Rec	Gain	Cum.
10:50	35.4	3.3	~~4.3~~ 4.1	~~-2.9~~ 0.8	~~-10.3~~ -6.6

- 10YR 2/1 + Grout
- Small to Medium Vesicles
- Odor / PID ≈ 57 ppm
- ~~Multiple~~ ~~One Natural Fracture~~
- Multiple Natural Fractures:
  34.85 - 34.8, 34.05, 33.65, 31.1 - 32.5,
  32.85, 32.55, 32.15, 31.85 - 31.75, 31.5,
* Grout Seams: through out

(6) Tank 7

- Pull 11

Time	Depth	Run	Rec.	Gain	Cum.
11:25	40.5	5.1	5.1	0	-6.6

- 10YR 2/1 to 3/1
- Small to Large Vesicles
- No Odor / PID = 0
- Multiple Natural Fractures:
  36.05, 36.65, 38.6, 38.75, 38.95,
  39.25, 39.75
* Grout Seams: 35.7, 35.8 - 36.4, 38.75

- Pull 12

Time	Depth	Run	Rec.	Gain	Cum.
11:46	45.7	5.2	5.3	0.1	-6.5

- 10YR 3/1
- Very few Vesicles, Small to Large
- ~~Slight~~ Odor / PID ≈ 26.5
- Multiple Natural Fractures:
  42.2, ~~43.3~~, 44.3, 44.45, 44.95
- Mechanical Fracture: 44.2

(7) Tank 7

- Pull 13

Time	Depth	Run	Rec.	Gain	Cum.
≈12:07	50.9	5.2	5.2	0	-6.5

- 10YR 3/1
- Few Vesicles, medium to Primarily Large
- Odor / PID ≈ 12.2 ppm
- Multiple Natural Fractures:
  46.65, 47.8, 48.65, 49.7, ~~50.3~~

- Mechanical Fractures: 46.15 and 50.3

- Pull 14

Time	Depth	Run	Rec.	Gain	Cum.
12:28	56	5.1	5.2	0.1	-6.4

- 10YR 3/1
- Small to Large Vesicles
- No Odor / PID ≈ 0.6 ppm
- Multiple Natural Fractures:
  ~~52.95, 53.45, 53.6, 53.3, 54.2~~
  ~~53.35, 53.5, 54.2, 55.1~~
- ~~Mechanical Fractures~~
  52.8, 53.2, 53.35, 54.05, 54.95
- Mechanical Fractures: 51.35, 51.75, 52.75

(8) Tank 7

- Pull ~~14~~ 15

Time	Depth	Run	Rec.	Gain	Cum.
12:50	61.3	5.3	5.3	0	-6.4

- Primarily 10YR 3/1 but 10YR 2/1 to 2 last ≈2'
- Medium to Small Vesicles
- No Odor / PID = 0
- Multiple Natural Fractures
  57.85, 59.95-60
- Grout Seams: 59.95 - 60.95
- One Mechanical Fracture: 59.75

- Pull 16

Time	Depth	Run	Rec.	Gain	Cum.
13:11	66.6	5.3	5.1	-0.2	-6.6

- 10YR 2/2
- No Odor / PID = 0
- Small to Large Vesicles
- Multiple Natural Fractures:
  62, 62.6, 63.05, 63.4, 63.9,
  63.45, 64.25, ~~64~~ 66, 65.3 - 65.75
- Mechanical Fracture @ 64.9

(9) Tank 7

- Pull 17

Time	Depth	Run	Rec.	Gain	Cum.
13:31	71.6	5	5.2	0.2	-6.4

- 10YR 3/1 to 2/1 to 2/3
- No Odor / PID = 0
- Small to Large Vesicles
- Multiple Natural Fractures: 66.65 - 66.7, 68.95, 69.2, 70.35 - 71.6
- Mechanical Fractures: 67.2 and 68.75

- Pull 18

Time	Depth	Run	Rec.	Gain	Cum.
13:47	73.7	2.1	2.0	-0.1	-6.5

- 10YR 2/2
- Small to Medium Vesicles
- Multiple Natural Fractures: through out
- No Odor / PID = 0.2

(10) Tank 7

- Pull 19

Time	Depth	Run	Rec.	Gain	Cum.
14:13	78.7	5.0	5.1	0.1	-6.4

- 10YR 2/2
- Small to medium Vesicles
- No Odor / PID ≈ 0.3 ppm
- Multiple Natural Fractures: 74.05 - 73.6, 74.05 - 74.8, 75.55 - 76.1, 76.4 - 77.8, 78.3, 78
- Mechanical Break @ 75.15
- *Grout Seams: 77.5 and 76.65 - 76.9

- Pull 20

Time	Depth	Run	Rec.	Gain	Cum.
14:30	82.8	4.1	4	0.1	-6.5

- 10YR 2/2 to 1
- Small to Medium Vesicles
- No Odor / PID ≈ 0.3 ppm
- Multiple Natural Fractures: 79.71, 79.2 - 79.25, 79.5 - 79.7, 79.95, 80.25, 80.5, 80.7, 80.45 - 81.2, 81.5, 81.9, 82.2 - 82.7
- Grout Seams: 79.3, 81 - 81.6, 82

(11) Tank 7

- Pull 21

Time	Depth	Run	Rec.	Gain	Cum.
~~X~~ 14:55	87.8	5.0	5.1	0.1	-6.4

- 10YR 2/2 to 3/1
- Small to Large Vesicles
- No Odor / PID ≈ 0.4 ppm
- Multiple Natural Fractures:
  82.9, 83 - 83.05, 83.45 - 83.55, 83.65,
  83.9 - 84, 84.1 - 84.5, 84.75 - 85.45, 85.7,
  85.9, 86.35 - 87, 87.6
- Grout Seams: 83.9 - 84.5, 85.45, ~~85.5~~ 85.1
  85.2 - 85.35, 87, 87.8
- Pull 22

Time	Depth	Run	Rec.	Gain	Cum.
15:13	93.1	5.3	5.2	-0.1	-6.5

- 10YR 3/1 to 2/2
- Large to Small Vesicles
- No Odor / PID = 0.6
- Multiple Natural Fractures: 87.8, 88.55 - 88.65, 89.45 - 89.55, ~~90~~ 90.45, 90.6, 90.8 - 91.1, 91.8 - 92.6, 97.8 - 97.75
- Grout Seams: 89.55, 91.1 - 91.5, 91.8 - 92
- * Sample RP - BR - 7 - 5 ~~0~~3 @ 0 ≈ 97.4 on 1/18/01 @ ≈ 15:38 Rock Core & Frag Memory No Odor + PID ≈ 0.6 ppm

(12) Tank 7.

- Pull 23

Time	Depth	Run	Rec.	Gain	Cum.
15:38	98.3	5.2	5.2	0	-6.5

- 5YR 3/2
- Odor / PID ≈ 6.6 ppm
- Small to Large Vesicle Size
- Multiple Natural Fractures:
  98 - 97.4, 97.25, 97.05 - 96.75,
  96.35, 96.05 - 95.7, 95.3 - 95.05,
  94.75, 94.35 - 94.25, 93.75,
  93.55 - 93.5, 92.9, 93.4 - 93.1
- 1/19/01
- Pull 24

Time	Depth	Run	Rec.	Gain	Cum.
07:41	102.8	4.5	4.4	-0.1	-6.6

- 10YR 2/2 to 2/1
- No Odor / PID = 0
- Small to Medium Vesicles
- Multiple Natural Fractures:
  102.35 - 102.4, 101.~~25~~ 65 - 101.~~7~~ 6, 101.35, 100.~~9~~ 85 - 100.~~1~~ 15
  100.2 ~~100.75~~, ~~99.8~~, ~~99.5~~, ~~99.35~~, 98.85
  ~~95.5 - 95.3 - 100~~, 99.85, 99.~~6~~ 5, 99.~~2~~ 3, 98.85, 98.55 - 98.3
- Grout Seams: 102.~~7~~ 75 - 102.35, 101.~~4~~ 45 - 101.5,
  100.4 - 101, 100.7 ~~98.85 - 99.05, 99.3 - 98.7~~
  ~~98.5 - 99.05, 99.~~ 35 - ~~99.55, 101 - 102~~
  99.7 - 99.3, 99.15 - 98.45

(13) Tank 7

Pull 25

Time	Depth	Run	Rec.	Gain	Cum.
08:14	107.8	5	5	0	7.6

- 10YR 2/1
- Odor / PID = 9.6 ppm
- Small to Medium Vesicles
- Multiple Natural Fractures:
  103.45 - 103.5, 104.4, 105, 105.8,
  106.35 - 106.45, 106.9 - 107.55
- * Grout Seams: 102.5 - 103.75, ~~104.4 - 105~~ 103.85 - 105.2, 105.5 - 107
- * Sample RH-BR-7-S~~4~~ @ D ≈ 105.95 on 1/19/01 @ ≈ 8:14 of ROCK CORE & FRAGMENTS w/ Odor / PID ≈ 9.6

- Pull 26

Time	Depth	Run	Rec.	Gain	Cum.
08:41	112.8	5	5.2	0.2	-6.4

- 10YR 2/1
- Odor / PID ≈ 41 ppm
- Large to Small Vesicles
- Multiple Natural Fractures: 108, 108.75, 109.95, 109.75, 109.9 - 110.15, 110.55, 111.05 - 111.35, 111.45, 111.85, 112.35
- Grout Seams: 112.8 - 111.6
- * Sample RH-BR-7-S~~4~~5 @ D ≈ 111.2 on 1/19/01 @ ≈ 8:44 of Rock Core & Fragments w/ Odor / PID ≈ 41 ppm

(14) Tank 7

Pull 27

Time	Depth	Run	Rec.	Gain	Cum.
09:18	114.0	5.2	5.2	0	-6.4

- 10YR 2/1 to 2/2
- Small to Medium Vesicles
- Odor / PID ≈ 15.2 ppm
- Multiple Natural Fractures:
  113.8, 114.35, 114.7 - 114.95, 117.5,
  116.5, 116.3 - 116.05, 115.6
- * Grout Seams: 112.8 - 114, 114.15 - 114.9,
  118 - 116.3, 116 - 115.6

- Pull 28

Time	Depth	Run	Rec.	Gain	Cum.
09:35	~~18.0~~ 120	~~5.2~~ 2.0	2.0	0	-6.4

- 10YR 2/2
- Small to Medium Vesicles
- Odor / PID ≈ 15.4 ppm
- Multiple Natural Fractures:
  118.45, 118.8, 119.15, 119.4,
  119.9, 119.45
- * Grout Seams: 116 - 119.7

(15) Tank 7

Pull 29

Time	Depth	Run	Rec.	Gain	Cum.
10:11	125.2	5.2	5.2	0	-6.4

- 1042 2/1
- Small to Medium Vesicles
- Odor / PID ≈ 36.4
- Multiple Natural Fractures: 120.6, 120.85, ~~120.1~~, 121.1, 121.4, 121.7, 122.1 - 122.25, 122.8 - 123.35, 123.8 ~~-130.05~~ - 130.05, 124.75
- * Great Section: 120.4 - 121, 121.25 - 122.1, 122.2 - 122.85, 123.2, 123.8 - 125.2
- Pull 30

Time	Depth	Run	Rec.	Gain	Cum.
10:42	128.4	3.7	2.5	-1.2	-7.6

- 1043 2/1 to 2/2
- Small to Medium Vesicles
- Odor / PID ≈ 36
- Multiple Natural Fractures:
  125.8 - 126, 126.2 - 126.75, 126.7 - 126.75, 127 - 127.7 * Driller Believes He "ground-up" This Last Section
- Great Section: 125.2 - 127.05

(16) Tank 7 228

- Pull 31

Time	Depth	Run	Rec.	Gain	Cum.

Tank 6

① Tank 6

1/19/01

- Pull 1

Time	Depth	Run	Rec.	Gain	Cum
14:13	2	2	2	0	0

- Concrete
- Strong Odor / PID ≈ 78 (@ Hole)
- No Box Sample Taken per Larry Dennis
* Product / Drill Water Sample RH-~~BR~~ MW-6-S01@ D ≈ 0.5'/2' on 1/19/01 ≈ 14:18 w/ Strong Odor/PID ≈ 78 ppm, 6 VOA's + one 1-Liter Bottle
- Slab Bedding
* Sample RH-BR-6-S01 @ D ≈ 0.5'/2' on 1/19/01 ≈ 14:13 of Fine to coarse sand
- Slight fine gravel w/ Strong Odor / PID ≈ 78 ppm
- Pull 2

Time	Depth	Run	Rec.	Gain	Cum.
15:08	7	5	1	-4	-4

- Concrete
- Strong Odor / PID ≈ 132 ppm
- Multiple Natural Fractures; through out

* Sample RH-BR-6-S02 @ D ≈ ~~2'~~ 1.8'/2' 0.5'/2' on 1/19/01 ≈ 15:30 of Rock Fragments / Fine to Coarse Sand / Fine Gravel w/ Product, Strong Odor / PID ≈ 74 ppm * Found just under slab while cleaning out Hole (≈ 2.25 Jars)

② Tank 6

1/22/01

- Pull 3

Time	Depth	Run	Rec.	Gain	Cum.
09:22	8.6	1.6	1.3	-0.3	-4.3

- Top 1/3 Concrete Bottom 2/3 10YR 2/1 + 5YR 3/2
- Medium to Primarily Small Vesicles
- Odor / PID ≈ 0.6 ppm
- Multiple Natural Fractures: 7.25 - 8.0 3

- Pull 4

Time	Depth	Run	Rec.	Gain	Cum
09:33	11.3	2.7	2.4	-0.3	-4.6

- 5YR 3/2 to 10YR 2/1
- Small to Medium Vesicles
- No Odor / PID = 0 ppm
- Multiple Natural Fractures; throug out

(3) Tank 6

— Pull 5

Time	Depth	Run	Rec.	Gain	Cum.
09:58	16.5	5.2	5.2	0	-4.6

- 5YR 3/2 to 10YR 2/2
- Small to Medium Vesicles
- Slight Odor / PID ≈ 163 ppm
- Multiple Natural Fractures:
  16.25 - 15.85, 15.45 - 15.4, 15, 14.75,
  14.6 - 14, 13.5 - 13.95, 11.55,
  12.05 - 12.65,

— Pull 6

Time	Depth	Run	Rec.	Gain	Cum.
10:35	16.6	0.1	0.4	+0.3	-4.3

- 10YR 2/2
- Small to Medium Vesicles
- No Odor / PID ≈ 247 ppm
- No Fractures

(4) Tank 6

— Pull 7

Time	Depth	Run	Rec.	Gain	Cum.
10:53	19.5	2.9	2.7	-0.7	-5

- 5YR 3/2 to 10YR 2/1
- Small to Medium Vesicles
- Odor / PID ≈ 141 ppm
- Multiple Natural Fractures throughout
- Sample RH-BR-6-5 Ø3 and RH-BR-6-D Ø7 D≈19.8' on 11/22/01 @ ≈ 10:53 of Rock core and fragments w/ odor / PID ≈ 191 ppm

— Pull 8

Time	Depth	Run	Rec.	Gain	Cum.
11:32	21.7	2.2	2.2	0	-5

- 5YR 3/2 to 10YR 2/1
- Small to Medium Vesicles
- No Odor / PID ≈ 121 ppm
- Multiple Natural Fractures:
  21.7 - 20.5, 20.15 - 19.5

(5) Tank 6

- Pull 9

Time	Depth	Run	Rec	Grain	Cum.
11:47	26.1	4.4	4.3	-0.1	-5.1

- 10YR 2/1 to 2/2
- Small to primarily Medium Vesicles
- No Odor / PID ≈ 21 ppm
- Multiple Natural Fractures:
  25.55, 25.4, 24.9 - 24.35, 23.65 -
  23.4, 23.1 - 22.75, 22.55 - 22.5, 22.1,
  21.9 - 21.7
- * Grout Seams: 24.95 - 24.45

- Pull 10

Time	Depth	Run	Rec	Grain	Cum.
12:02	30.9	4.8	4.7	-0.1	-5.2

- 10YR 2/2 to 2/1
- Small to medium Vesicles
- Strong Odor / PID ≈ 40 ppm
- Multiple Natural Fractures:
  30.8 - 30.75, 30.45, 30.05 - 30, 29.55, 29.3,
  29, 28.55, 28.15 - 26.65, 26.5
- Grout Seams: 30.05, 29, 26.15 - 27.6

(6) Tank 6

- Pull 11

Time	Depth	Run	Rec	Grain	Cum
12:14	37.3	6.4	4.5	-1.9	-7.1

* Open Cavity ≈ 32.5 - 34.1 per Larry DeMos

- 10YR 2/1 w/ a few off-white to brown inclusions
- Small to Primarily Large Vesicles
- Odor / PID ≈ 65 ppm
- Multiple Natural Fractures:
  30.9 - 30.95, 31.15, 31.25, 34.85, 2 #11
  36.2 - ~~36.5~~ #11, 35.9

- Pull 12

Time	Depth	Run	Rec.	Grain	Cum
12:46	42.6	5.3	5.2	-0.1	-7.2

- 10YR 2/2
- Large to Small Vesicles
- Slight Odor / PID ≈ 42
- Multiple Natural Fractures:
  41.9, 41.75 - 41.3, 40.9 - 41.1,
  39.8 - 39.45, ~~39.45~~ 0.6, 37.3 - 37.6,
  38.05 + #11
- * Grout Seams / off-white to brown Inclusions
  37.3 - 38.05, 41.45 - 40.9

(7) Tank 6

- Pull 13

Time	Depth	Run	Rec.	Gain	Cum.
13:01	46.9	4.3	4.5	0.2	-7

- 10YR 2/2
- Medium to Primarily Small Vesicles
- Odor / PID ≈ 66.7
- Multiple Natural Fractures:
  42.95 - 45.95, 46.9 - 46.35

* Grout Seams: 42.95 - 46.9

- Pull 14

Time	Depth	Run	Rec.	Gain	Cum.
13:14	52.3	5.4	5.2	-0.2	-7.2

- 10YR 2/2 to 5YR 3/2
- Small to Medium Vesicles
- Odor / PID ≈ [illegible] ppm
- Multiple Natural Fractures:
  47.25 - 48.6, 51.4, 51.25, 50.85 - 50.55, 49.85 - 49.15

- Grout Seams: 46.9 - 47.25

(8) Tank 6

- Pull 15

Time	Depth	Run	Rec.	Gain	Cum.
13:31	57.5	5.2	5.2	0	-7.2

- 10YR 2/2 to 2/1
- Small to Medium Vesicles
- Odor / PID ≈ 65 ppm
- Multiple Natural Fractures:
  ~~58.05~~ 52.85, 53.55 - 53.85, 55.55, 56.25, 56.95

* Grout Seams: ~~57.9 - 58.2~~ 52.7 - 53, 53.55 - 53.65, 56.9 - 57.1

- Pull 16

Time	Depth	Run	Rec.	Gain	Cum.
13:49	62.9	5.4	5.3	-0.1	-7.3

- 5YR 3/2 to 10YR 2/2
- Small to Medium Vesicles
- No Odor / PID ≈ 26 ppm
- Multiple Natural Fractures:
  62.3, 61.8, 61.3, 61.25, 60.65, 60.3, 60.1 - 59.8, 59.6, 59.5, 59 - 57.5

* Grout seams: 57.9 - 59.5, 59.9, 60.65

(9) Tank 6

- Pull 17

Time	Depth	Run	Rec.	Gain	Cum.
14:11	68.2	5.3	5.2	-0.1	-7.4

- 10YR 2/2
- Small to Large Vesicles
- No Odor / PID ≈ 16 ppm
- Multiple Natural Fractures: 63.05 - 63.2, 64, 64.95, 65.2 - 65.3, 65.65, 65.95, 66.3, 66.9 - 67.1, 67.5, 68.1

* Grout Seams / White Inclusions: 68.1, 66.35 - 66.1, 65.9 - 65.4, 63.35

1/23/01
- Pull 18

Time	Depth	Run	Rec.	Gain	Cum.
08:20	73	4.8	4.9	0.1	-7.3

- 10YR 2/2
- Small to Large Vesicles
- No Odor / PID ≈ 25 ppm
- Multiple Natural Fractures: 68.5 - 68.7, 69.4, 69.55 - 69.75, 70.3 - 70.55, 71.05, 71.2, 71.4, 71.5, 71.7, 72.15

* Grout Seams: 68.1, 71.1 - 71.3

(10) Tank 6

Pull 19

Time	Depth	Run	Rec.	Gain	Cum.
13:48	77.7	4.7	3.9	-0.8	-8.1

- 10YR 2/2
- Medium to Primarily Large Vesicles
- No Odor / PID ≈ 25 ppm
- Multiple Natural Fractures: 73.4 - 74.35, 74.9, 75.1, 75.3, 76.1 - 76.3, 76.5, ~~76.75~~

- Pull 20

Time	Depth	Run	Rec.	Gain	Cum.
14:50	82.1	4.4	5.3	0.9	-7.2

- 10YR 2/2 to 2/1
- Large to Small Vesicles
- No Odor / PID ≈ 0.3 ppm
- Multiple Natural Fractures: 77.25, 77.45, 77.75, 78.15, 78.85 - 79, 79.1, 79.5, 79.65 - 80, 81.9 - 81.85, 81.4, 81.35, 81.1,
- One Mechanical Break @ 80.25

(11) Tank 6

- Pull 21

Time	Depth	Run	Rec.	Gain	Cum.
15:22	87.1	5.0	5.1	0.1	-7.1

- 10YR 2/1 to 5YR 3/2
- Small to Medium Vesicles
- No odor / PID ≈ 16.8 ppm
- Multiple Natural Fractures:
  82.05, 82.8 - 81, 83.25 - 83.45, 83.6, 83.65,
  84.45, 84.6 - 84.75, 83.9 - 84.1, 85.30, 85.50,
  85.6, 86.3 - 86.7, 87.05
- *Grout Seams: 82 - 82.3

- Pull 22

Time	Depth	Run	Rec.	Gain	Cum.
15:58	92.2	5.1	4.7	-0.4	-7.5

- 5YR 3/2 to 10YR 2/1
- Small to Medium Vesicles
- No odor / PID ≈ 30.1 ppm
- Multiple Natural Fractures:
  87.45, 87.8, 88.45 - 88.5, 88.95,
  89.15 - 89.25, 90.1 - 90.4, 90.8 - 91.25,
- *Grout Seams: 88.2 - 90.4, 91.05 - ~~92, 92.2~~
  91.55, 91.8

(12) Tank 6

- Pull 23

Time	Depth	Run	Rec.	Gain	Cum.
16:24	96.9	4.7	5.2	+0.5	-7

- 10YR 2/1 to 5YR 3/2
- Small to Medium Vesicles
- No odor / PID ≈ 10.1
- Multiple Natural Fractures:
  91.75, 92.15, 93, 93.5, 93.55
  93.8 - 95.2, 96.7, 96.6, 96.45, 96.1, 95.8
- One Mechanical Break @ 92.2
- *Grout Seam @ ≈ 91.75

- Pull 24

Time	Depth	Run	Rec.	Gain	Cum.
14:56	102.2	5.3	5.2	-0.1	-7.1

- 5YR 3/2 to 10YR 3/1
- Small to Large Vesicles
- No Odor / PID ≈ 3 ppm
- Multiple Natural Fractures:
  97.2, 97.65, 98.15 - 98.5, 98.75
  99.25 - 100.35, 100.9, 100.85
  ~~100.35~~
- One Mechanical Break @ 101.5

(13) Tank 6

1/24/01

- Pull 25

Time	Depth	Run	Rec.	Gain	Cum.
08:01	107.1	4.9	5.2	0.3	-6.8

- 10YR 3/1
- Small to Large Vesicles
- No Odor / PID ≈ 0.9 ppm
- Multiple Natural Fractures: 106.1, 105, 103.7, 102.65, 102.3 – 102.15 ~~102~~
- Two Mechanical Fractures: 106.55 + 103.1

- Pull 26

Time	Depth	Run	Rec.	Gain	Cum.
08:42	112.3	5.2	5.2	0	-6.8

- 10YR 3/1 to 5YR 3/2
- No Odor / PID ≈ 17.8 ppm
- Multiple Natural Fractures:
  107.7, 107.9, 108.15, 108.4, 108.95
  109.85 – ~~0~~110.2, 110.4, 110.5, 110.95,
  111.2 – 111.35 ~~112~~, 111.7, 111.85, 111.9 – 112.3

(14) Tank 6

- Pull 27

Time	Depth	Run	Rec.	Gain	Cum.
09:13	117.8	5.5	5.2 ~~5.2~~	~~5.2~~ -0.3	-7.1

- 5YR 3/2 to 10YR 2/1
- No Odor / PID ≈ 12.2 ppm
- Medium to Primarily Small Vesicles
- Multiple Natural Fractures:
  112.3 – 112.75, 112.80 – 113, 112.3, 113.35,
  113.6 – 114.4, 114.8, 115.4 – 115.55,
  115.75, 115.85, ~~115.95~~ ~~116~~, 116.05, 116.35 – 116.6
  116.85 – 117.3

- Pull 28

Time	Depth	Run.	Rec.	Gain	Cum.
09:40	123.1	5.3	1.1	-4.2	-11.3

* Driller Believe He was Grinding on core; hence low recovery

- 5YR 3/2
- No Odor / PID ≈ 3.3 ppm
- Small Vesicles
- Multiple Natural Fractures:
  118, 118.2, 118.2 – 124.3

(15)

- Pull 29

Time	Depth	Run	Rec.	Gain	Cum.
10:24	125.6	2.5	1.7	-0.8	-12.1

- 5YR 3/2 to 10YR 2/2
- Small to Medium Vesicles
- No Odor / PID ≈ 0ppm
- Multiple Natural Fractures:
  123.2, 123.35, 123.6, 123.95,
  124.4 – 124.55, 124.7, 124.8

- Pull 30

Time	Depth	Run	Rec.	Gain	Cum.
11:08	125.6	0	2.5	+2.5	-9.6

- 5YR 3/2 to 10YR 2/2
- Small to Medium Vesicles
- No odor / PID ≈ 15 ppm
- Multiple Natural Fractures: 123.6 - 125.1,
  124.9, 124.7 - 124.5, 124.15, 124,
  123.55 35 – 123.25, 123.15

* Sample RH-BR-6-504 @ D ≈ 125.1
on 11/24/01 @ ≈ 11:08 of Rock core / Fragments
w/ PID ≈ 15 ppm

Note: Pull 28 and 29 may / should probably be adjusted from the bottom of Pull 30 to account for loss/gain and over lap of Pull 29 & 30 depths.

- Pull 31

Time	Depth	Run	Rec.	Gain	Cum.
≈12:00	126.6	1	1	0	-9.6

- 10 YR 2/2
- Small to Medium Vesicles
- No odor / PID ≈ 10 ppm
- One Natural Fracture 126.45

① Tank 5

1/24/01

Pull 1

Time	Depth	Run	Rec.	Gain	Cum.
14:44	3'	3'	2'	-1	-1

- Concrete (≈ 7') over Bedding Sand (fine to course Sand, slight fing gravel, slight rock fragments)
- No Odor / PID ≈ 19.5 *max at surface of hole
- No Box or Jar Samples taken per Larry DeMoss

- Pull 2

Time	Depth	Run	Rec.	Gain	Cum.
15:13	7.6	4.6	1.3	-3.3	-4.3

- 0.9 Concrete over 0.4 10YR 2/2 to 5YR 3/2
- Small to Medium Vesicles
- No Odor / PID ≈ 46 ppm
- Multiple Natural Fractures: 4.05 - 3.8 (Gravel Like Concrete + Rock w/ a nail), 3.3 - 3

* Not enough Rock to take sample even if worth while

② Tank 5

- Pull 3

Time	Depth	Run	Rec.	Gain	Cum.
08:57	12.3	4.7	4.7	0.0	-4.3

- 10YR 2/2
- Small to Large Vesicles
- Multiple Natural Fractures: 7.6 - 7.85, 8.25, 9.15, 10.1, 10.9, 11.25, ~~12.25~~
* Grout Seams: 7.6 - 8.9, 9.15 - 10.3, 10.9 - 11.35, 12.25
* Sample RH-BR-5-S01 @ D ≈ 9.15' on 1/25/01 @ ≈ 09:05 w/ slight Odor + PID ≈ 72ppm of Rock Core

- Pull 4

Time	Depth	Run	Rec.	Gain	Cum.
10:11	17.6	5.3	5.2	-0.1	-4.4

- 10YR 2/2
- Small to Primarily Large Vesicles
- Odor / PID ≈ 63.1 ppm
- Multiple Natural Fractures: 17.5 - 17.2, 16.95, 16.55 - 15.9, 15.5 - 14.7, 13.85 - 13.45, 13.05 - 12.3
* Grout Seams: 15.5 - 15.7, 14.7 - 14.3, 13.4 - 14,
* Sample RH-BR-5-S02 @ D ≈ 14.7 on 1/25/01 ≈ 10:14 of Rock Fragments w/ odor / PID ≈ 63.1

③ Tank 5

- Pull 5

Time	Depth	Run	Rec.	Gain	Cum.
10:35	22.6	5	5.2	0.2	-4.2

- 10YR 2/2 to 10YR 3/1
- Slight Odor / PID ≈ 46 ppm
- Small to Primarily Large Vesicles
- Multiple Natural Fractures:

22.25, 22.05, 21.85, 21.6 - 20.8, ~~21.25, 21.2, 8/12~~ 20.4 b/t

b/t ~~21.05 - 20.75, 20.~~ ~~20.65~~ b/t, ~~19.8, 19.45, 18.7,~~

b/t ~~18.5, 18.4~~ 20.4, 20.35, 20.2 - 19.1, 19.75

17.95, 18.10, 17.85, 17.65, 17.55

*Grout Seams: 22.25 - 20.95

- Pull 6

Time	Depth	Run	Rec.	Gain	Cum.
10:10	23.7	1.1	1.2	0.1	-4.1

- 10YR 3/1
- No Odor / PID ≈ 14.3
- Small to Large Vesicles (Primarily Medium)
- Multiple Natural Fractures:

22.~~0~~ b/t 55, 23.65 - 23.7

④ Tank 5

Pull 7

Time	Depth	Run	Rec.	Gain	Cum.
11:07	24.0	5.3	5.2	-0.1	-4.2

- 10YR 3/1 to 5YR 3/2
- Small to Large Vesicles
- NO ODOR / PID ≈ 14.8
- Multiple Natural Fractures:

24.75, 25.55 - 25.95, 26.1, 26.7 - 26.9,

27.7 - 28.05 b/t, 28.8

*Grout Seams: 26.7 - 26.9,

- Pull 8

Time	Depth	Run	Rec.	Gain	Cum.
11:40	30.6	1.6	1.6	0	-4.2

- 5YR 3/2
- Small to Medium Vesicles
- No Odor / PID ≈ 14.2
- Multiple Natural Fractures:

29.5 - 29.9 b/t, 30.15 - 30.6

*Grout Seams: 30.15 - 30.6

⑤ Tank 5

- Pull 9

Time	Depth	Run	Rec.	Gain	Cum.
12:37	35.1	4.5	4.4	-0.1	-4.3

- 5YR 3/2 to 10YR 2/2
- Small to Large Vesicles
- No Odor / PID ≈ 23.3 ppm
- Multiple Natural Fractures: 30.9, 31.05, 31.25-31.85, 32.35-32.45, 32.5, 32.85, 33.2-33.4, 33.7, 34.2, 34.35, 34.6
- * Grout Seams = 34.15 - 34.4

- Pull 10

Time	Depth	Run	Rec.	Gain	Cum.
12:53	40.1	5	5.2	0.2	-4.1

- 10YR 2/2 to 5YR 3/2
- Large to Small Vesicles
- No Odor / PID ≈ 15.6
- Multiple Natural Fractures: 35.4, 35.7, 36.55 - 36.7, 37.15, 37.65 - 37.85, 38.25, 38.7, 38.95 - 39.35, 39.7, ~~39.5~~

⑥ Tank 5

- Pull 11

Time	Depth	Run	Rec.	Gain	Cum.
13:09	44.6	4.5	4.1	-0.4	-4.5

- 5YR 3/2 to 10YR 2/1
- Small to Medium Vesicles
- No Odor / PID ≈ 5 ppm
- Multiple Natural Fractures: 40.4, 40.7, 40.9 - 41.4, 41.9 - 41.9, 42.4, 42.7, 43, 43.75 - 44.2
- * Grout Seams: 42.45 - 43.3, 33.75 - 44.2

- Pull 12

Time	Depth	Run	Rec.	Gain	Cum.
13:38	50.0	5.4	5.4	0	-4.5

- 10YR 2/1 - 10YR 3/1
- Small to Primarily Large Vesicles
- No Odor / PID ≈ 14.9 ppm
- Multiple Natural Fractures: ~~44.6, 45.2, 46, 46.65, 47.15, 47.9, 49.1 - 49.55~~ 44.1, 45.255, 46.35, 47, 47.5, 48.25, 44.75 - 50
- * Grout Seam: 49.45 - 50

(7) Tank 5

1/26/01

Pull 13

Time	Depth	Run	Rec.	Gain	Cum.
08:00	54.8	4.8	5.2	0.4	-4.1

- 10YR 3/1
- Small to Primarily Large Vesicles
- No Odor / PID ≈ 57ppm
- Multiple Natural Fractures:

50.7, 54.65, 54.55, 53.95, 53.75 - 53.45

- Mechanical Breaks: ~~55.5, 59.5, 56.6, 57.3~~ bit
51.55 bit, 51.95, 52.6, 53.25

- Pull 14

Time	Depth	Run	Rec.	Gain	Cum.
08:27	60.1	5.3	4.9	-0.4	-4.5

- 10YR 3/1
- Few Small to Primarily Large Vesicles
- No Odor / PID ≈ 267 ppm
- Multiple Natural Fractures:

54.9, 55.25, 55.4

55.5-55.55 56.1, 56.7

- Mechanical Breaks: 59.3, 58.15, 57.75, 57.35
* Sample RH-BB-5-503 @ D ≈ 55.25 of Rock core w/ PID ≈ 267 ppm on 1/26/01 @ ≈ 08:27

(8) Tank 5

Pull 15

Time	Depth	Run	Rec.	Gain	Cum.
09:11	65.0	4.9	5.1	0.2	-4.3

- 10YR 3/1
- Few small to Primarily Large Vesicles
- NO ODOR / PID ≈ 308 ppm
- Multiple Natural Fractures: 59.9-59.95, ~~61.4~~ bit 61.75, 63.4
- Mechanical Break @ 61.4

Pull 16

Time	Depth	Run	Rec.	Gain	Cum.
09:27	70.2	5.2	5.2	0	-4.3

- 10YR 3/1 to ≈ 73.65 then 5YR 3/2
- Large to Small Vesicles
- No Odor / PID ≈ 308
- Multiple Natural Fractures:

67.3, 73.65, 68.9, 69.1-70.2

- Mechanical Break @ 66.95
* Grout Seams: 68.8 - 67.35

(9) Tank 5

- Pull 17

Time	Depth	Run	Rec.	Gain	Cum.
09:49	75.6	5.4	3.6	-1.8	-6.1

- 5YR 3/2 to 10YR 2/2
- Small to Primarily Large Vesicles
- No Odor / PID ≈ 68
- Multiple Natural Fractures:
  70.2 - 70.8, 71.4, 71.75 - 71.8, 72.2,
  72.7 - 73.8 7
  Bit

- Pull 18

Time	Depth	Run	Rec.	Gain	Cum
10:04	76.4	0.8	2.6	1.8	-4.3

- 10YR 2/2 to 5YR 3/2 (Last ≈ 0.75')
- Large to Small Vesicles
- No Odor / PID ≈ 26ppm
-
- Multiple Natural Fractures:
  74.55, 74.75, 75.55 - 75.6, 75.9
  76.05 - 76.1
  Bit

(10) Tank 5

Pull 19

Time	Depth	Run	Rec.	Gain	Cum
10:29	78	1.6	1.6	0	-4.3

- 5YR 3/2
- No Odor / PID ≈ 8.5ppm
- Small to Medium Vesicles
- Multiple Natural Fractures: Through Out

- Pull 20

Time	Depth	Run	Rec.	Gain	Cum
11:00	83.2	5.2	4.8	-0.4	-4.7

- 5YR 3/2 to 10YR 3/1
- No Odor / PID ≈ 36 ppm
- Small to Very Large Vesicles
- Multiple Natural Fractures: 78.2, 78.3,
  78.55, 79.4 - 79.85
  82.1, 81.5, 81.2, 80.6, 80.1

- One Mechanical Break at 82.55

(11) Tank 5

— Pull 21

Time	Depth	Run	Rec.	Gain	Cum
11:38	88.2	5	5.3	0.3	-4.4

- 10 YR 3/1
- Small to Large Vesicles
- No Odor / PID ≈ 78 ppm
- Multiple Natural Fractures: 83.2, 83.45, 84.1, ~~84.4~~ 84.8, 85.4, 86.3, 86.75-86.9, 87.5, 87.15, ~~87~~ 87.6
- One Mechanical Fracture @ 84.4
- Grout Seams: 83.2-83.45, 86.75-86.9

— Pull 22

Time	Depth	Run	Rec.	Gain	Cum.
12:33	93.4	5.2	4.0	-4.2	~~-4~~ -5.6

- 10 YR 3/1
- Five Small to Primarily Large Vesicles
- No Smell / PID ≈ 12 ppm
- Multiple Natural Fractures: 88.3, 89.25, 89.65-89.7, 90.4-90.5, 90.7-90.75, 91.3-91.45, 91.05, 91.45-92.2
- One Mecanical Fracture @ 90.05

* Grout Seams: 90.4-90.5

(12) Tank 5

— Pull 23

Time	Depth	Run	Rec.	Gain	Cum
3:29	97.2	3.8	5.1	1.3	-4.3

- 10 YR 3/1 to 10 YR 2/2
- Few Small to Primarily Large Vesicles
- No Odor / PID ≈ 35.9 ppm
- Multiple Natural Fractures: 93.6, 94.25, 94.75, 96.3, 96.7
- Grout Seam @ 94.25

— Pull 24

Time	Depth	Run	Rec	Gain	Cum.
14:04	101.1	3.9	4.2	0.3	-4

- 10 YR 3/1
- Small to Large Vesicles
- No Odor / PID ≈ 12 ppm
- Multiple Natural Fractures: 100.5-100.45, 99.65, 99, 98.1, 97.2-97.05

* Grout Seams: 97.2, 97.05

(13) Tank 5

- Pull 25

Time	Depth	Run	Rec.	Gain	Cum.
14:42	106.6	5.5	4.5	-1	-5

- 10YR 3/1 to 5YR 3/2 to 10YR 2/2
- Medium to Primarily Small Vesicles
- No Odor / PID ≈ 31 ppm
- Multiple Natural Fractures: 101.2 - 101.25, 101.35, 101.55, 101.95, 102.25 - 102.45, 102.9, 103, 103.1, 103.3 - 103.8, 103.9 - cont...

* Grout Seams: 102.9, 103 - 103.25

cont... 105.1, 105.6 - 105.3

- Pull 26

Time	Depth	Run	Rec.	Gain	Cum.
15:27	111.6	5.0	1.9	-3.1	-8.1

- 10 YR 2/2 to 5YR 3/2
- Small to Medium Vesicles
- No Odor / PID ≈ 21 ppm
- Multiple Natural Fractures:

106.8, 106.9, 107.45, 107.75 - 107.8, 108 - 108.3, 108.35

* Grout Seams: 106.9 - 107, 107.75

(14) Tank 5

- Pull 27

Time	Depth	Run	Rec.	Gain	Cum.
15:50	111.8	0.2	0.2	0	-8.1

- 5YR 3/2
- Small to Medium Vesicles
- No Odor / PID ≈ 9 ppm
- Multiple Natural Fractures: None

- Pull 28

Time	Depth	Run	Rec.	Gain	Cum.
16:18	114.0	2.2	2.2	0	-8.1

- 5 YR 3/2
- Small Vesicles
- No Odor / PID ≈ 308 ppm
- Multiple Natural Fractures: 112 - 113.3, 113.6

* Sample RH-BR-5-504 @ D ≈ 113.3 on 112601 @ ≈ 16:18 of Rock Core and Fragments w/ PID ≈ 308 ppm

(15) Tank 5

- Pull 29

Time	Depth	Run	Rec.	Gain	Cum.
16:43	119.2	5.2	5.2	0	-8.1

- 10YR 2/2 to 10YR 3/1
- Small to Medium Vesicles
- No Odor / PID ≈ 173 ppm
- Multiple Natural Fractures: 114.65, 115.65, 115.75, 115.9, 116, 116.1 - ~~117.75, 118.2, 118.76~~ 116.7, 117.15, 117.2, 117.95, 118.25-118.45, 118.7, 118.95,
* Sample RIA-BR-S-505 @ D ≈ 115.3 on 1/26/01 @ ≈ 16:48 or Rock Core w/ PID ≈ 173 ppm

- Pull 30 1/29/01

Time	Depth	Run	Rec.	Gain	Cum.
08:09	124.3	5.1	4.8	-0.3	-8.4

- 10YR 2/2 to 5YR 3/2
- Small to Medium Vesicles
- No Odor / PID ≈ 104 ppm
- Multiple Natural Fractures:
119.2 - 119.5, 119.85 - 119.95, 120.3, 120.4 - 120.45, 120.5, 121.05, 121.25, 122.05, 122.55, - 124

① Tank 4

1/29/01

- Pull 1

Time	Depth	Run	Rec.	Gain	Cum.
11:15	2.5	2.5	2	-0.5	-0.5

- Concrete over Bedding Sand (Brown fine to course sand, slight fine Gravel + silt)
- No Odor / PID ≈ 5.6 ppm ; But PID ≈ 308 ppm from hole
- ~~Multiple Natural Fractures.~~

* Sample RH-BR-4-S01 @ D ≈ 2.5' on 1/29/01 @ ≈ 11:15 of Brown fine to course sand, slight fine Gravel and silt w/ PID ≈ 5.6 ppm

- Pull 2

Time	Depth	Run	Rec.	Gain	Cum.
11:49	7	4.5	2	-2.5	-3

- Concrete (Top 1.3') + 10YR 2/2
- Small to Medium Vesicles
- Odor / PID ≈ 95 ppm
- Multiple Natural Fractures:
  2.5 - 2.85, 3.4, ~~3.7~~ 3.6
  3.65 - 3.8, 4 - 4.5

* No sample taken per Larry DeMoss (not really enough material to sample)

② Tank 4

- Pull 3

Time	Depth	Run	Rec.	Gain	Cum.
14:55	8.2	1.2	1	-0.2	-3.2

- 10YR 3/1 "Bedding" Sand
- Fine to Course Sand, slight fine gravel, rock fragments, and silt
- Odor / PID ≈ 294 ppm
- Multiple Natural Fractures: through out

* Sample RH-BR-4-S02 @ D ≈ 8.2' on 1/29/01 @ ≈ 14:55 of fine to course sand, slight fine gravel, rock fragments, and silt w/ Odor / PID ≈ 294 ppm

- Pull 4

Time	Depth	Run	Rec.	Gain	Cum.
15:15	11.2	3	3	0	-3.2

- 10YR 3/1
- Small to Medium Vesicles
- Odor / PID ≈ 180 ppm
- Multiple Natural Fractures: through out

* No Sample Per Larry DeMoss

(3) Tank 4

- Pull 5

Time	Depth	Run	Rec.	Gain	Cum.
15:31	15.6	4.4	3.9	-0.5	-3.7

- ≈ Top Half 10YR 3/1 + ≈ Bottom Half ~~10~~ 5YR 3/2 DJB
- Small to Medium Vesicles
- Slight Odor / PID ≈ 103 ppm
- Multiple Natural Fractures: through out

* Don't believe clinker zone + Larry DeMoss couldn't say, possibly over blast rock since so shallow

- Pull 6

Time	Depth	Run	Rec.	Gain	Cum.
16:08	16.2	0.6	0.6	0	-3.7

- ≈ Top Half 10YR 3/1 + ≈ Bot. Half 5YR 3/2
- Small to Medium Vesicles
- Odor / PID ≈ 225 ppm
- Multiple Natural Fractures:
  15.6 - 15.9, 15.95

* Didn't sample per Larry DeMoss, waiting for next run (Not Enough Material Anyway)

(4) Tank 4

- Pull 7

Time	Depth	Run	Rec.	Gain	Cum.
16:22	21.3	5.1	5.1	0	-3.7

- ≈ Top Half 5YR 3/2 + ≈ Bottom Half 10YR 3/1
- Small to Large Vesicles
- No Odor / PID ≈ 48 ppm
- Multiple Natural Fractures: ~~15.85 - 15.6~~, DJB
  ~~19.9 - 19.55, 18.9 18.5 - 18.2 17.95~~
  DJB ~~14.8 - 14.45, 13.8, 13.1 - 13.1, 12.85~~ - 17.2,
  16.2 - 16.75,
- * Grout Seams: ~~14.8 15.05, 13.4, 12.85~~ DJB
  19.9 - 20.15, 18.5, 17.95

- Pull 8 1/30/01

Time	Depth	Run	Rec	Gain	Cum
07:47	25.7	4.4	4.2	-0.2	-3.9

- 10YR 3/1
- Small to Large Vesicles
- No Odor / PID ≈ 308 ppm
- Multiple Natural Fractures:
  24.0, 23.25, 21.65, 21.45 - 21.3
  DJB

- One mechanical Break @ 24.5 DJB
- * Grout Seams: 24.95 - 25.5

(5) Tank 4

- Pull 9

Time	Depth	Run	Rec.	Gain	Cum.
08:01	30.5	4.8	5.1	+0.3	-3.6

- 10YR 3/1
- Small to Primarily Large Vesicles
- Null Odor / PID ≈ 308 ppm
- Multiple Natural Fractures:
  26, 26.6, 26.8, 27.45, 27.65, 28, 29.15

* Grout Seams: 25.4-27.8

- Pull 10

Time	Depth	Run	Rec.	Gain	Cum.
08:13	35.7	5.2	5.2	0	-3.6

- 10YR 3/1
- ~~Large~~ bld Small to Primarily Large Vesicles
- No Odor / PID ≈ NA
- Multiple Natural Fractures:
  30.55, bld ~~38.55 - 38.75~~ 30.85 - 31.05, 31.75, 33.35, 35.05,

* Grout Seams: 30.55, ~~31.75 - 38.85~~ bld 30.05 - 30.15, 33.35 - 33.35,

(6) Tank 4

- Pull 11

Time	Depth	Run	Rec.	Gain	Cum.
08:35	40.5	4.8	4.8	0	-3.6

- 10YR 3/1
- Small to Primarily Large Vesicles
- NO Odor / PID ≈ 191 ppm
- Multiple Natural Fractures: 36.55, 38.05 - 38.15, 39.35, 39.55 - ~~39.6~~ bld 40
  * Grout Seams: 36.55, 38.05 - 38.15, ~~39.55~~ bld 40.5, 39.85 - 40

- Pull 12

Time	Depth	Run	Rec	Gain	Cum.
08:51	45.6	5.1	5.1	0	-3.6

- 10YR 3/1
- Small to Medium Vesicles
- N Odor / PID ≈ 465 ppm
- Multiple Natural Fractures:
  40.8, 40.9, ~~41.25~~ bld, 43.25, 43.6
- One Mechanical Break @ 45.1
  * Grout Seams: 40.5 - 40.8

(7) Tank 4

- Pull 13

Time	Depth	Run	Rec	Gain	Cum.
09:08	50.4	5.3	5.2	-0.1	-3.7

- 10YR 3/1 to 5YR 3/2
- Small to Large Vesicles
- No Odor / PID = 465 ppm
- Multiple Natural Fractures: 46.3, 47.05, ~~48.05~~, 50.4, 50.05, 49.65, 49.15, 48.85, 48.7 - 48.05

*Grout Seams: 47.05, 48.05 - 48.7, 50.4

— Pull 14

Time	Depth	Run	Rec.	Gain	Cum.
09:14	56.0	5.1	5.1	0	-3.7

- 10YR 2/2
- Small to Medium Vesicles
- No Odor / PID = 120.1 ppm
- Multiple Natural Fractures:

51.1, 51.9, 52.55, 53.6, 53.65, 53.95, 54.15, 54.35, 54.55, 54.7, 54.75

- Mechanical Breaks: 55.7 + 55.45

*Grout Seams: 51.9 - 52.1, 54.7

(8) Tank 5

- Pull 15

Time	Depth	Run	Rec.	Gain	Cum.
09:50	61.1	5.1	5.1	0	-3.7

- 10YR 2/2
- Small to Medium Vesicles
- No Odor / PID = 47.1
- Multiple Natural Fractures:

56.7, 56.8, 57.05, 57.8 - 58, 58.9, 59.35, 59.75, 59.95, 60.35, 60.7 - 60.75, 60.85 - 61.1

*Grout Seams: 59.35 - 59.5, 59.95

- Pull 16

Time	Depth	Run	Rec.	Gain	Cum.
10:03	66.4	5.3	~~5.1~~ 4.3	~~-0.2~~ -1	~~-3.9~~ -4.7

- 5YR 3/2 to 10YR 2/2
- Small to Medium Vesicles
- No Odor / PID = 465 ppm
- Multiple Natural Fractures:

61.2, 61.35, ~~65.5~~, ~~66.1, 65.95~~, ~~65.45 - 64.05, 64.1~~, ~~63.6~~, ~~64.05~~, ~~63.7, 65.35, 61.55~~, 65.3, 65.15, 64.65 - 63.95, 63.3, 63.25, 62.9, 62.7 - 61.55

(9) Tank 4

- Pull 17

Time	Depth	Run	Rec.	Gain	Cum.
10:22	70.7	4.3	5.2	0.9	-3.8

- 10YR 2/2 to 5YR 3/2
- Small to Medium Vesicles
- No Odor / PID ≈ 37.6 ppm
- Multiple Natural Fractures:
  67 - 67.15, 68.1, 68.4 - 68.5, 68.85,
  69.2, 69.4, 69.75 - 69.9, 69.95 - 70.7
- *Grout Seams: 68.85, 69.75 - 69.9, 69.97, 70.7

- Pull 18

Time	Depth	Run	Rec.	Gain	Cum
10:38	75.9	5.2	5.2	0	-3.8

- 5YR 3/2 to 10YR 2/2
- Small to Medium Vesicles
- No Odor / PID ≈ 46.5 ppm
- Multiple Natural Fractures:
  71.15, 71.25, 71.55 - 72.35, ~~75.7~~, 75.5, 75.55, DSL
  75.85, 75.55, 75, ~~72~~, 74.75, 74.55, 74.35,
  74.15, 73.95, 73.75, 73.35, 72.7, 72.65,
  ~~72.35~~ DSL
- *Grout Seams: 71.15, 75.9 - 73.75 (Heavy @ Times), 72.65 - 71.55

(10) Tank 4

Pull 19 DSL

Time	Depth	Run	Rec.	Gain	Cum.
11:09	81	5.1	5.1	0	-3.8

- 10YR 2/2
- Small to Medium Vesicles
- No Odor / PID ≈ 51.7
- Multiple Natural Fractures: 76.1, 76.45, DSL
  77.1, 77.6, 77.9, ~~78.3~~ DSL - 78.65, ~~78.85~~ DSL, ~~78.95~~ DSL;
  80.75, 80.65, 80.2, 79.75 - 79.75
- *Grout Seams: 75.9 - ~~78.3~~ DSL, 80 - 79.45

- Pull 20

Time	Depth	Run	Rec.	Gain	Cum
11:28	86.3	5.3	5.2	-0.1	-3.9

- 10YR 3/1 to 5YR 3/2
- Small to Medium Vesicles
- No Odor / PID ≈ 66.1 ppm
- Multiple Natural Fractures:
  ~~81.45, 82.5, 82.9 - 83, 83.45, 83.8 - 85~~ DSL
  82.95, 83.5, 83.9 - 84, 84.45, ~~83~~ DSL 84.8 - 85
- *Grout Seams: ~~82.9 - 82.95, 83.45~~ DSL
  83.9 - 83.95, 84.45

(11) Tank 4

- Pull 21

Time	Depth	Rec.	Run	Gain	Cum.
11:56	87.7	1.4	1	-0.4	-4.3

- 5YR 3/2 to 10YR 2/2
- No Odor / PID ≈ 14.2 ppm
- Multiple Natural Fractures:
  86.3 - 86.85, 87.18 [illegible]

- Pull 22

Time	Depth	Rec.	Run	Gain	Cum.
12:20	92.8	5.1	5.1	0	-4.3

- 10YR 2/2 to 3/1
- Small to Medium Vesicles
- No Odor / PID ≈ 1121.3
- Multiple Natural Fractures
  92.7, 92.4, 91.9, 91.45, 91.4, 91
  90.5, ~~1.3~~ ~~87~~ 89.7 - 89.8, 89,
  88.65 - 88.3, 87.7 - 87.75, 87.85 - 87.9,
  88.25, ~~88~~ [illegible]
- Grout Seams: 92.7, 91.9, 91.45 - 90.95,
  89.8 - 87.7

(12) Tank 4

- Pull 23

Time	Depth	Rec.	Run	Gain	Cum.
12:41	93.8	0.3	~~-0.8~~ [illegible] 1.1	-0.8	-5.1

- 10YR 3/1
- Small to Medium Vesicles
- No Odor / PID ≈ NA
- ~~Multiple Natural Fractures:~~
  2 Pieces

- Pull 24

Time	Depth	Rec.	Run	Gain	Cum.
13:12	98.3	4.3	4.4	-0.1	-5.2

- 10YR 3/1 to 2/2
- Small to Large, but Primarily Medium Vesicles
- No Odor / PID ≈ 41.7 ppm
- Multiple Natural Fractures:
  98.15, 97.55, 97.1 - 97.35, 96.7, 96.55
  96.1, 95.95, 95.55, 95.05 - 94.75, 93.8 - 93.95,
- Grout Seams: 96.1, ~~95.05~~ [illegible] 93.85 - 93.95,
  94.3 - 94.5

(13) Tank 4

- Pull 25

Time	Depth	Run	Rec.	Gain	Cum.
13:41	103.3	5.0	~~Rec~~ 5.2	0.2	-5

- 10YR 3/1 to 5YR 3/2
- Small to Medium Vesicles
- No Odor / PID ≈ 50.7 ppm
- Multiple Natural Fractures:

~~104.6, 105, 105.3, 99.6, 100, 100.3, 100.55,~~
99.4, 99.8, 100.1 - 100.15, 101.1 - 101.25, 101.4,
101.55 - 101.87, 101.9,
101.95, 102.35, 102.7,
102.95

* Grout Seam @ ~~101.50~~ 99.8

- Pull 26

Time	Depth	Run	Rec.	Gain	Cum.
14:12	108.6	5.3	5.2	-0.1	-5.1

- 10YR 2/2 to 10YR 3/1
- Small to Medium Vesicles
- No Odor / PID ≈ 53.2 ppm
- Multiple Natural Fractures:

103.6, 103.65, 104.15 - 104.2, 104.4,
104.5 - 104.75, 104.9, 105.5, 105.65,
106.05, 106.8, 107.65, 107.75, ~~108.65~~

(14) Tank 4

- Pull 27

Time	Depth	Run	Rec.	Gain	Cum.
15:53	113.6	5.0	3.5	-1.5	-6.6

- 10YR 3/1 + 2/2
- Small to Large Vesicles
- No Odor / PID ≈ 74.3 ppm
- Multiple Natural Fractures:

109.2, 109.7, 109.8, 110.3, 111, 111.3
111.45, 111.7

- Pull 28 1/31/01

Time	Depth	Run	Rec.	Gain	Cum.
11:11	113.8	5.2	5.2	0	-6.6

- 10YR 3/1
- Small to Large Vesicles
- No Odor / PID ≈ 96.4 ppm
- Multiple Natural Fractures:

115.3 - 115.35, 115.6 - 115.65, 117 - 117.5
117.35, 118.05 - 118.3, 118.7

* Grout Seams: 113.6 - 114.15

(15) Tank 4

- Pull 29

Time	Depth	Run	Rec.	Gain	Cum.
11:30	123.9	5.1	5.1	0	-6.6

- 10YR 3/1
- Medium to primarily Small Vesicles
- No Odor / PID ≈ 45.4 ppm
- Multiple Natural Fractures: 119.9 - 120.2, 120.25, 123.8, 123, 122.9, 122.75, 121.9, 122.15, 121.9, 121.35, 120.85, 121
- * Grout Seams: 122.35

- Pull 30

Time	Depth	Run	Rec.	Gain	Cum.
11:48	129.1	5.2	5.2	0	-6.6

- 10YR 3/1
- Small Vesicles
- No Odor / PID ≈ 41.6 ppm
- Multiple Natural Fractures:
  124.7, 125.4, 125.9, 126.25, 126.7
  127.9, 128.2,

* Samples RH-BR-4-503 & D08 @ 123.9 on 1/31/01 @ ≈ 12:01, of Rock Core w/ PID ≈ 96.1 ppm

(1) Tank 3

1/31/01

- Pull 1

Time	Depth	Run	Rec.	Gain	Cum.
15:13	2.7	2.7	1.6	-1.1	-1.1

- 1.6' Concrete above Brown Fine to Course "Bedding" Sand, slight fine gravel and silt
- Slight Odor / PID ≈ 214 ppm
- Multiple Natural Fractures: NA
- * No Box Sample of Concrete Taken per Larry DeMoss
- * Sample RH-BR-3-501 @ 0 ≈ 2' on 1/31/01 @ ≈ 15:13 of fine to course "Bedding" Sand, slight fine gravel and silt w/ slight odor / PID ≈ 214 ppm

- Pull 2

Time	Depth	Run	Rec.	Gain	Cum.
15:48	7.4	4.7	2	-2.7	-3.8

- "2.7 - 3.3 Sand, 3.3 - 7.4 Concrete,
- 6.0 - 7.4 Partially Filled Cavity" per Larry DeMoss
- No Odor / PID ≈ 165 ppm
- Multiple Natural Fractures:
  2.7 - 3.3, 4.15 - 4.3, 4.35, 4.55

② Tank 3

— Pull 3

Time	Depth	Run	Rec.	Gain	Cum.
08:53	~~8.6~~ 7.9	0.5	0.7	0.2	-3.6

- 10YR 3/1
- Small to Medium Vesicles
- Slight Odor / PID = 244.6 ppm
- Multiple Natural Fractures:
  7.45 - 7.9

— Pull 4

Time	Depth	Run	Rec.	Gain	Cum.
09:09	9.7	1.8	1.9	0.1	-3.5

- 10YR 3/1
- Medium to Primarily Small vesicles
- Slight Odor / PID = 151.2 ppm
- Multiple Natural Fractures:
  9.45, 9.25, 9 - 8.85, 8.5, 8.15 - 7.8

③ Tank 3

— Pull 5

Time	Depth	Run	Rec.	Gain	Cum.
9:18	10.4	0.7	0.7	0	-3.5

- 10YR 3/2
- Small to medium vesicles
- No Odor / PID = 346 ppm
- Multiple Natural Fractures:
  9.9, 9.95 - 10, 10.3 - 10.4,

— Pull 6

Time	Depth	Run	Rec.	Gain	Cum.
09:33	14.1	3.7	~~3.0~~ 2.7	~~-0.7~~ -1	~~-4.2~~ -4.5

- 10YR 2/2
- Small to Medium Vesicles
- No Odor / PID = 278 ppm
- Multiple Natural Fractures:
  10.55, 10.75, 11.25 - 11.4, 11.75, 12, 12.4, 12.6 - ~~13.4~~ 13.1

* Growth Seams: 10.4, ~~11.75~~, 11.25 - 12

(4) Tank 3

- Pull 7

Time	Depth	Run	Rec.	Gain	Cum.
10:01	17.9	3.8	4.8	1	-3.5

- 10YR 2/2
- Small to Large Vesicles
- No Odor / PID ≈ 240.07 ppm
- Multiple Natural Fractures: 13.1 - 13.15, 13.75, 14.65, 15.75, 16.5, 17.1, 17.35, 16.15, 17.75

* Grout Seams: through out

- Pull 8

Time	Depth	Run	Rec.	Gain	Cum.
10:21	22.9	5	5	0	-3.5

- 10YR 2/2 to 3/1
- Small to Large Vesicles
- No Odor / PID ≈ 327 ppm
- Multiple Natural Fractures: 22.71, 21.75, 21.6, 21.35, 20.5, 19.65, 19.1, 18.45, 18.7 - 18.2

*Grout Seams: 22.2 - 21.9, 21.35 - 21.1, 20.5 - 17.9

(5) Tank 3

- Pull 9

Time	Depth	Run	Rec.	Gain	Cum
10:33	27.6	4.7	5.1	0.4	-3.1

- 10YR 3/1 to 2/2
- Small to Medium Vesicles
- No Odor / PID ≈ 51.7 ppm
- Multiple Natural Fractures: 25.05, 26.15, 27.0
- Mechanical Break at 24.2

* Grout Seams: 23.15, 24.8 - 27.6

- Pull 10

Time	Depth	Run	Rec.	Gain	Cum
10:54	32.6	5	5.2	0.2	-2.9

- 10YR 2/2
- Medium to Primarily Small Vesicles
- No Odor / PID ≈ 32.6 ppm
- Multiple Natural Fractures: 27.75, 28.5, 29.05, 29.6, 29.9, 30, 30.15, 30.4, 30.5, 30.9, 31.15, 31.3, 31.6, 31.75 - 32.35

* Grout Seams: Through Out

(6) Tank 3

- Pull 11

Time	Depth	Run	Rec.	Gain	Cum
11:15	37.8	5.2	4.9	-0.3	-3.2

- 5YR 3/2 to 10YR 2/2
- Small to Medium Vesicles
- No Odor / PID ≈ 62.9ppm
- Multiple Natural Fractures: 32.7 - 33.05, 33.4, 33.45, 34, 34.15, 34.4, 34.55, 34.75 - 35.2, 35.3, 35.85 - 36.65, 36.85

*Grout Seams: 33, 34 - 35.45, 37.5 - 36.75

- Pull 12

Time	Depth	Run	Rec.	Gain	Cum.
11:30	42.9	5.1	5.0	-0.1	-3.3

- 10YR 2/2 to 5YR 3/2
- Small to Medium Vesicles
- No Odor / PID ≈ 84.3ppm
- Multiple Natural Fractures: 38.3, 38.6, 38.7, 38.8, 38.95, 39.25 - 39.4, 39.8, 40.4, 40.75, 40.85, 41.05, 41.1, 41.3, 41.55, 41.95, 42.05, 42.4, 42.5, 42.8 - 42.75

*Grout Seams: 37.8 - 38.7, 40.1 - 41.35

(7) Tank 3

- Pull 13

Time	Depth	Run	Rec	Gain	Cum.
12:00	47.3	~~8~~ 4.4	4.4	0	-3.3

- 10YR 2/2
- Medium to Primarily Small Vesicles
- Slight Odor / PID ≈ 189.2ppm + Sheen
- Multiple Natural Fractures: 46.95, 46.65, 46.35, 46.15, 46.05, 45.7, 45.35, 44.5, 44.1, 43.6 - 42.9

*Grout Seams: 44.5, 44.1, 43.45

*Sample RH-BR-3-S02 @ D ≈ 46.35 on 2/16 @ ≈ 17:04 of Rock Core w/ slight Odor + Sheen / PID ≈ 189.2 ppm

- Pull 14

Time	Depth	Run	Rec.	Gain	Cum.
12:11	52.5	5.2	5.2	0	-3.3

- 10YR 2/2 to 5YR 3/2
- Small to Medium Vesicles
- No Odor / PID ≈ 82.9ppm
- Multiple Natural Fractures: 48.3, 48.9, 44.05, 44.1, 49.3, 50.05, 50.45 - 50.5, 50.6 - 50.7, 50.95, 51.4, 51.7 - 52, 52.2 - 52.5

*Grout Seams: 47.45 - 47.7, 49.3 - 49.5, 49.75 - 49.95, 50, 51.4 - 51.55

(8) Tank 3

- Pull 15

Time	Depth	Run	Rec.	Gain	Cum
12:30	57.7	5.2	5.2	0	-3.3

- 5YR 3/2
- Small to Medium Vesicles
- No Odor / PID = 40.1 ppm
- Multiple Natural Fractures: 52.7, 52.75, 53.4, 53.6, 54, 54.4 - 54.95, 57.15, 55.95, 55.6, 55.25 - 55.15,

* Grout Seams: 52.5, 54, 57, ~~55~~ 55.6 - 57, 55.7 - 55.55,

- Pull 16

Time	Depth	Run	Rec	Gain	Cum
12:47	61.1	3.4	2.5	~~-0.5~~ -0.9	-4.2

Driller Noted Void ≈ 60 - 61.1

- 5YR 3/2 - 10YR 3/1
- Small to Medium Vesicles
- No Odor / PID ≈ 9.9 ppm
- Multiple Natural Fractures: 57.7 - 57.75, 57.9, 57.95, 58.2, 58.65, 59, 59.2, 59.85 - 60

* Grout Seams: 59.9 - 60.2

(9) Tank ~~4~~ 3

- Pull 17

Time	Depth	Run	Rec.	Gain	Cum
13:01	66.5	5.4	5.2	-0.2	-4.4

- 10YR 3/1 to 2/2
- Small to Medium Vesicles
- No Odor / PID ≈ 66.7
- Multiple Natural Fractures: 62.5, 62.8, 63, 63.5, 63.65 - 63.7, 64.3, 65.2 - 65.6
- Mechanical Break @ 64.7

* Grout Seams: 61.1 - 62.3, 63 - 63.5, 64.8, 65.2, 65.6, 66.1 - 66.5

- Pull 18

Time	Depth	Run	Rec.	Gain	Cum
13:21	71.1	4.6	4.5	-0.1	-4.5

- 5YR 3/2 to 10YR 3/1
- Small to Medium Vesicles
- No Odor / PID ≈ 71.4 ppm
- Multiple Natural Fractures: 66.5 - 66.55, 66.8, 67.1 - 67.25, 67.45, 67.65, 68.7, 68.3, 69.2, 69.3, 69.5, 69.65, 69.85, 69.95, 70.15 - 70.4, 71 - 70.95, 70.8, 70.55

* Grout Seams: 67.1 - 71

(10) Tank 3

- Pull 19

Time	Depth	Run	Rec.	Gain	Cum.
13:40	75.5	4.4	4.5	0.1	-4.4

- 5YR 3/3 to 10YR 3/1
- Small to Medium Vesicles
- No Odor / PID ≈ ~~71.4 ppm~~ 15.6 ppm
- Multiple Natural Fractures: 71-71.55, 7, 72.4 - 72.75, 73, 73.3, ~~74~~ 73.65, 74.15, 75.25
- * Grout Seams: 71-71.7, 74.15, 75.5
- Mechanical Chip/Break @ 73.65

- Pull 20

Time	Depth	Run	Rec.	Gain	Cum.
14:01	80.6	5.1	4.8	-0.3	-4.7

- 5YR 3/2 to 10YR 2/2
- Small to Medium Vesicles
- No Odor / PID ≈ 50.1 ppm
- Multiple Natural Fractures: 75.65, 75.85, 76.1, 76.45, 76.9 - 77.15, ~~77.5~~ 77.45, 77.65, 78.15, 78.65, 78.8, 79.05, 79.25, 79.55 - 80.05, 80.55
- * Grout Seams: 75.5 - 75.85, 78.15

(11) Tank 3

- Pull 21

Time	Depth	Run	Rec.	Gain	Cum.
14:21	85.7	5.1	5.2	0.1	-4.6

- 10YR 2/2
- Sm. - Med. Vesicles
- No Odor / PID ≈ 2.6
- Multiple Natural Fractures: 80.95, 81.45, 81.9, 82.25, 82.6, 82.75, 83.15, 83.3, 83.4, 83.65, 83.8, 84.2, 84.25, 84.6, 84.7, 85.05 - 85.7, ~~88.75~~
- * Grout Seam @ 83.3

- Pull 22

Time	Depth	Run	Rec.	Gain	Cum.
14:37	90.9	5.2	5.2	0	-4.6

- 10YR 3/1 to 5YR 3/2
- Sm. - Med. Vesicles
- No Odor / PID ≈ 50.8 ppm
- Multiple Natural Fractures: 86, 86.45, 87.45, 87.55, 87.75 ~~87.8~~ 88.1, 88.95, 89.15, 89.25, 89.45, 89.8, 89.9, 90.15, 90.65, 90.75
- * Grout Seam @ 88.45

(12) Tank 3

- Pull 23

Time	Depth	Run	Rec.	Gain	Cum.
15:06	96.	5.1	5.3	0.2	-4.4

- 5YR 3/2
- Sm.-Med. Vesicles
- No Odor / PID ≈ 72.9
- Multiple Natural Fractures: 91, 91.15, 91.3, 91.45, 91.6, 91.75, 92.05, 92.1, 92.25, 92.65, 92.95, 93.5, 93.9, 94, 94.35, 94.45, 94.55, 94.8, ~~94.85~~ 94.85, 95.35-95.75
- *Grout Seams: 93.5-93.6, 93.8

- Pull 24

Time	Depth	Run	Rec.	Gain	Cum.
16:00	100.6	4.6	4.3	-0.3	-4.7

- 5YR 3/2 to 10YR 2/2
- Sm.-Med. Vesicles
- Multiple Natural Fractures:
- No Odor / PID ≈ 8.7 ppm
- 96-96.4, 96.8, 97-97.25, 97.7-98.3, 98.5-99, 99.3, 99.7-99.9, 100.1
- *Grout Seam: 97-97.75

(13) Tank 3

- Pull 25 2/1-2/01

Time	Depth	Run	Rec.	Gain	Cum.
08:43	106.4	5.8	2.7	-3.1	-7.8

- 10YR 2/2 - 5YR 3/2
- Small to Large Vesicles
- No Odor / PID ≈ NA
- Multiple Natural Fractures:
- 100.65, 100.8, 101.1, 101.3, 101.55, 101.65, 101.7, 102.05, 102.75, 102.95, 102.6, 102.8-103.3
- *Grout Seams: 101.1-102, 102.5-102.6

- Pull 26 2/2/01

Time	Depth	Run	Rec.	Gain	Cum.
11:18	110.6	4.1	4.4	+0.3	-2.5

- 5YR 3/2 to 10YR ~~2/1~~ 2/2
- Large to Small Vesicles
- No Odor / PID ≈ 4.4 ppm
- Multiple Natural Fractures:
- 106.1-106.4, 106.75, 107.15, 107.5, 107.75, 108, 108.4, 108.6-108.65, 109.2-~~110.6~~ 109.4, 109.4-110.6
- *Grout Seams: 106.1-106.~~4~~6, 109.4-110.6

(14) Tank 3

- Pull 27

Time	Depth	Run	Rec.	Gain	Cum.
11:38	111.9	1.4	1.3	-0.1	-7.6

- 10YR 2/2
- Sm. - Lg. Vesicles
- No Odor / PID ≈ 38.1 ppm
- Multiple Natural Fractures:

110.6 - 110.9, 111.7 - 111.8

* Grout Seams through out + 111.05

- Pull 28

Time	Depth	Run	Rec.	Gain	Cum.
12:20	116.9	5.0	5.0	0	-7.6

- 5YR 3/2 to 10YR 2/2
- Small to Lg. Vesicles
-
- No Odor / PID ≈ 16.1
- Multiple Natural Fractures:

111.9 - 112.95, 112, 112.2, 112.55, 112.95, 113.15 - 113.9, 114.45, 114.55 - 114.9, 114.95, 115.05, 115.5 - 115.55, 116.15

* Grout Seams: 111.9 - 114.55

(15) Tank 3

- Pull 29

Time	Depth	Run	Rec.	Gain	Cum.
12:49	119.6	2.7	2.3	-0.4	-8

119.14 - 119.16 Void Per Driller

- 5YR 3/2 to 10YR 3/1
- Small to Medium Vesicles
- No Odor / PID ≈ 3.0 ppm
- Multiple Natural Fractures:

~~119.6 - 120.05, 120.35, 120.5, 120.7~~ ~~Void~~

~~116.9 - 117.55, 117.75, 118, 118.25~~ ~~Void~~

~~118.1, 118.75, 119.05~~ ~~Void~~

116.7 - 117.35, 117.55, 117.8, 118.05 - 118.2, 118.65, 118.85 - 119.2

- Pull 30

Time	Depth	Run	Rec.	Gain	Cum.
13:21	125.2	5.6	2.8	-2.8	-10.8

- 10YR 3/1 to 5YR 3/2
- Small to Med. Vesicles
- No Odor / PID ≈ 7.8 ppm
- Multiple Natural Fractures:

119.6 - 119.95, 120.3, 121.35 - 122.4

* Grout Seam @ 120.3

(16) Tank 3

- Pull 31.

Time	Depth	Run	Rec.	Grain	Cum.
13:50	130.2	5.0	~~0.9~~ 1.7	~~-4.1~~ -3.3	~~-13.3~~ -11.5

- 10YR 5/1 to 5YR
- 5m. - Med. Vesicles
- No Odor / PID ≈ 33.3 ppm
- Multiple Natural Fractures:
  125.2 - 125.4, 125.65, 126, 126.1, 126.15, 126.3, 126.45
- * Sample RH-BR-3-503 @ D ≈ 125.2 on 2/2/01 @ ≈ 14:00 of Rock Core/Fragments w/ PID ≈ 33.3 ppm
- *Grain Seam @ 125.65

- ~~Pull~~

Time	Depth	Run	Rec.	Grain	Cum.

- ~~Multiple Natural Fractures:~~
- ~~Odor / PID ≈~~

(1) Tank 2

- Pull 1 2/5/01

Time	Depth	Run	Rec.	Grain	Cum.
≈09:08	2.5	2.5	~~0~~ 2.5	0	0

- ≈0' - 2' Concrete + ≈2' - 2.5' "Bedding" Sand
- (fine-course sand, slight f-mg gravel)
- Slight Odor / PID ≈ 135 ppm
- Multiple Natural Fractures: NA

* Sample RH-BR-501 @ D ≈ 2.5' on 2/5/01 ≈ 09:08 of fine to course "Bedding" Sand, slight fine gravel w/ slight odor/PID ≈ 135 ppm

- Pull 2

Time	Depth	Run	Rec.	Grain	Cum.
10:05	6.8	4.3	3.8	-0.5	-0.5

- ~~Concrete wood 0.8'~~ 2.5 - 3.3 concrete, 10YR 5/1, and wood fragments; 3.3 - 4.5 concrete; 4.5 - 4.6 wood; 4.6 - 6.3 10YR 2/2 w/ small to large vesicles
- No Odor / PID ≈ 76.8
- Multiple Natural Fractures:
  2.5 - 3.3, 3.7, 3.8 - 3.9, 4.1, 4.5 - 4.6, 4.85 - 5.1, 5.55 - 5.9, 6.05 - 6.3

(2) Tank 2

- Pull 3

Time	Depth	Run	Rec.	Gain	Cum.
13:33	7.4	0.6	0.5	-0.1	-0.6

- 10YR 2/2
- Small to Medium Vesicles
- No Odor / PID ≈ 105 ppm
- Multiple Natural Fractures: 7.1

- Pull 4

Time	Depth	Run	Rec.	Gain	Cum.
13:44	9.2	1.8	1.4	0.1	-0.5

- 10YR 2/2
- Sm. - lg. Vesicles
- No Odor / PID ≈ 131.9 ppm
- Multiple Natural Fractures:
  8.2, 8.4/8.4, 8.35, 8.4, 8.6, 8.75

* Grout Seams: 8.4 - 8.6

(3) Tank 2

- Pull 5

Time	Depth	Run	Rec.	Gain	Cum.
13:59	12.6	3.4	3.3	-0.1	-0.6

- 10YR 2/2
- Small to Medium Vesicles
- No Odor / PID ≈
- Multiple Natural Fractures:
  9.4-9.5, 9.85, 10.35, 10.85, 10.8, 10.95, 11.1, 11.35-11.7, 12.35, 12.05

* Grout Seams: 9.4, 9.5, 12.5

- Pull 6

Time	Depth	Run	Rec.	Gain	Cum.
14:29	17.5	4.9	5.1	0.2	-0.4

- 5YR 3/2 to 10YR 2/2
- Small to Med. Vesicles
- No Odor / PID ≈ 60 ppm
- Multiple Natural Fractures:
  12.85, 12.95, 13.15, 13.95, 14.35, 14.6, 14.85, 15.35 - 15.55, 15.75, ~~16.05~~ 16.4, ~~17.1~~, 15.9 - 16.1, 16.75, 16.9, 17.15

* Grout Seams through out

(4) Tank 2

- Pull 7

Time	Depth	Run	Rec.	Gain	Cum.
14.39	20.4	2.9	3	+0.1	-0.3

- 5YR 3/2 to 10YR 2/2
- Sm - Med. Vesicles
- No Odor / PID ≈ 45.3 ppm
- Multiple Natural Fractures:
18.05 - 18.1, 18.6, 19, 19.2, 19.3, 19.6, 19.7, 19.85, ~~19.9~~, 20

* Grout Seams thinning out

- Pull 8

Time	Depth	Run	Rec	Gain	Cum.
14:55	22.9	2.5	2.5	0	-0.3

- 5YR 3/2 to 10YR 2/2
- Small to Med. Vesicles
- No Odor / PID ≈ 10.0 ppm
- Multiple Natural Fractures:
20.7, 21.5, 21.6 - 21.8, 22.1 - 22.6

* Grout Seams: 20.4 - 20.45, 21.8, 22.1 - 22.6, 22.9

(5) Tank 2

- Pull 9 2/6/01 Note: -7 from Original measurements

Time	Depth	Run	Rec	Gain	Cum.
07:48	26.5	3.6	3.9	0.3	0

- 10YR 3/1
- Sm - Med. Vesicles
- No Odor / PID ≈ 171 ppm
- Multiple Natural Fractures:
23.0, 23.25, 23.35, 23.55 - 23.75, 23.85, 24.35, 24.45, 24.9, 25.15, 25.2, 25.3, 25.55, 25.45

* Grout Seams: ~~29.55 - 30.4~~, ~~32.35 - 32.65~~
23.55 - 23.9, 25.35 - 25.65

- Pull 10

Time	Depth	Run	Rec.	Gain	Cum.
08:06	31.8	5.3	5.2	-0.1	-0.1

- 10YR 2/2 to 3/1
- Small (Primarily) to Large Vesicles
- No Odor / PID ≈ 59.1 ppm
- Multiple Natural Fractures: 26.55, 26.8, 27.35, 28.05, 29.2 - 29.25, 29.55, 29.9, 30.35, 30.55, 31.1

* Grout Seams 29.2 - 31.7

(6) Tank 2

- Pull 11

Time	Depth	Run	Rec.	Gain	Cum.
~~08:21~~	~~20.4~~	~~2.0~~	~~3.0~~	~~0.1~~	-0.1
08:21	37.0	5.2	5.2		

- 10YR 2/1 to 10YR 2/2 to 5YR 3/2
- Small to Medium Vesicles
- No Odor / PID ≈ 115.2
- Multiple Natural Fractures: 32.65, 32.9, 33.1, 33.4, 33.7, 33.85 - 34, 34.2 - 34.35, 34.55 - 34.65, 34.85, 34.9, 35.05, 35.1, 35.2, 35.5, 35.75 - 35.8, 36.65 - 36
- Grout Seams 31.8 - 33.6

- Pull 12

Time	Depth	Run	Rec.	Gain	Cum.
08:33	42.1	5.1	5.2	0.1	0

- 10YR 2/2 to 5YR 3/2
- Sm. - Med. Vesicles
- No Odor / PID ≈ 0.8.3 ppm
- MNF: 37.2, 37.3 - 37.5, 37.6, 38.1, 38.4, 38.5, 38.75, 39.15 - 39.55, 39.7, 40.05, 40.25, 40.6, 41 - 42.1

(7) Tank 2

- Pull 13

Time	Depth	Run	Rec.	Gain	Cum
08:49	42.2	0.1	0.1	0	0

- 10YR 2/1 to 10YR 3/1
- Small Vesicles
- No Odor / PID ≈ NA
- MNF: NA One piece

- Pull 14

Time	Depth	Run	Rec.	Gain	Cum.
09:10	47.4	5.2	5.2	0	0

- 10YR 3/1 to 5YR 3/2
- Sm. - Med. Vesicles
- NO Odor / PID ≈ 85.1
- MNF: 43.5, 44.15 - 44.25, 44.95, 45.25 - 45.3, 45.65, 46.5 - 46.9, 47.25 - 47.4
- Grout Seams: 44.15 - 44.25, 44.65 - ~~44.75~~, 45.8, 46.3 - 46.65

(8) Tank 2

- Pull 15

Time	Depth	Run	Rec.	Gain	Cum.
09:25	51.6	4.2	4.2	0	0

- 10YR 2/2 to 5YR 3/2
- Sm. Vesicles
- No Odor / PID ≈ 2.3 ppm
- MNF: 47.45, 47.6, 47.75, 48.4, 48.9 - 49.1 *, 49.45 - 51.6

*Grout Seams 49.1 - 50.05, 51.15 - 51.6

- Pull 16

Time	Depth	Run	Rec.	Gain	Cum.
09:44	56.4	4.8	4.8	0	0

- 10YR 2/2 to 10YR 3/1
- Sm. - Med. Vesicles
- No Odor / PID ≈ 57 ppm
- MNF: 51.6 - 54.9, 56.4 - 55.7, 55.1

Note: Dotie Gleason & De Moss believed this to be highly fractured Rock not Clinker

(9) Tank 2

- Pull 17

Time	Depth	Run	Rec.	Gain	Cum.
09:55	61.6	5.2	5.2	0	0

- 10YR 3/1 to 2/2
- Sm. Vesicles
- No Odor / PID ≈ 80
- MNF: 56.5, 56.65, 56.9, 57.2, 57.55 - 57.85, 58.35 - 58.4, 58.45 - 58.9, 61.45, 61.2, 61, 60.6 *, 59.55, 59.75 - 59.55, 59.6, 59.2, 59.15

*Grout Seams: 56.4 - 56.55, ~~61.46~~ - 61.6 - 61.2

- Pull 18

Time	Depth	Run	Rec.	Gain	Cum.
10:26	66.5	4.9	4.9	70.8	70.8

- 10YR 3/1 to 2/2
- Sm. Vesicles
- No Odor / PID ≈ 53.3 ppm
- MNF: 61.9, 62.45, 62.7, 62.9, 63.15, 63.2, 63.25, 63.35, 63.7, 63.95, 64.0, 64.1, 64.45, 64.6, 64.95, 65.05 - 65.65, 66.4, 66.0

*Grout Seams: 62.45, 66.6 - 66.4

(10) Tank 2

- Pull 19

Time	Depth	Run	Rec.	Gain	Cum.
10:46	71.8	5.3	5.2	-0.1	-0.1

- 10YR 2/2 to 3/1
- Sm.-Med. Vesicles
- No Odor / PID ≈ 23.0 ppm
- MNF: 67.05, 68, 68.65, 68.85, 69.4, 69.45-70.6, 71.35-71.2

* Grout Seams: 66.85-67.75, 68, 68.8-69.65, 71.6-70.5

- Pull 20

Time	Depth	Run	Rec	Gain	Cum.
11:05	76.9	5.1	5.2	0.1	0

- 10YR 2/2 to 3/1
- Small to Medium Vesicles
- No Odor / PID ≈ 28.3 ppm
- MNF: 74.85, 73.05, 74.35-74.5, 74.6, 75-75.15, 75.4, 75.7, 75.85

* Grout Seams: 73.05, 73.7-74.25, 74.4-74.85, 75.4, 76.05, 76.15-76.1

(11) Tank 2

- Pull 21

Time	Depth	Run	Rec.	Gain	Cum.
11:17	82.0	5.1	4.8	-0.3	-0.3

- 10YR 3/1 to 5YR 3/2
- Sm.-Med. Vesicles
- No Odor / PID ≈ 34.1 ppm
- MNF: 77.15, 77.25-77.45, 78.05, 78.3, 78.45, 78.55, 78.8-79.8, 79.85, 80.15-80.45, 80.85-~~82.0~~ 81.7

* Grout Seams: 76.9-77.55, 78.8-79.8, 80.15-80.45, 81-81.2

- Pull 22

Time	Depth	Run	Rec.	Gain	Cum.
11:35	87.2	5.2	5.2	0	-0.3

- 5YR 3/2 to 10YR 2/2
- Sm.-Med. Vesicles
- No Odor / PID ≈ 30.4 ppm
- MNF: 82.2, 82.4, 82.85-83.05, 83.25, 83.55, 83.85, 84.15, 84.5-84.65, 84.9, 85.1, 85.5, 85.55, 86.05, 86.5-86.8, 87.5-87.2

* Grout Seams: 82.0-82.5

(12) Tank 2

- Pull 23

Time	Depth	Run	Rec.	Grain	Cum.
11:52	92.3	5.1	5.1	0	-0.3

- 10 YR 3/1 to 2/2
- Sm. - Lg. Vesicles
- Slight Odor / PID ≈ 29.7 ppm
- MNF: 87.3, 87.45, 87.7, 87.75, 87.8, 88.2, 88.4 - 88.5, ~~89.4~~ 89.4, 89.75, ~~89.1~~ 90.1, 90.95, 91.25
- Mechanical Fracture @ D ≈ 89.45
- Sample RK BR-2-507 @ D ≈ 89.45 on 2/6/01 @ ≈ 11:57 or Rock Core/Fragments w/ slight Odor/PID ≈ 29.7 ppm

- Pull 24

Time	Depth	Run	Rec.	Grain	Cum.
12:14	97.4	5.1	5.2	0.1	-0.2

- 10 YR 3/1 to 2/2
- Sm. Med. Vesicles
- No Odor / PID ≈ 34.0 ppm
- MNF: 93.45 - 93.8 ~~93.6~~ DJL, ~~93~~ DJL 93.9, 93.65, 93.9, 94.1, 94.4, 95.25, 96.1, 97.2 - 97.4
- Mechanical Break @ ~~94.5~~ DJL 96.1

* Grout Seams throughout

(13) Tank 2

- Pull 25

Time	Depth	Run	Rec.	Grain	Cum.
12:41 DJL	102.4	5.0	4.1	-0.9	-1.1

- 10 YR ~~2/1~~ DJL 3/1 - ~~2/2~~ DJL 5 YR 3/2
- Sm. - Med. Vesicles
- No Odor / PID ≈ 41.3 ppm
- MNF: 97.65, 97.9 - 98.1, 98.45 DJL, 98.75, 98.8, 99, 99.2 DJL, 99.25 DJL, 99.4, 99.9, 100 - 100.55, 101.2, 101.35, 101.45, 101.6 - 101.5 DJL

* Grout Seams: 97.4 - 98.1

- Pull 26

Time	Depth	Run	Rec.	Grain	Cum.
13:07	104.7 DJL	1.3 DJL	1.3	0	-1.1

- 5 YR 3/2 to 10 YR 3/1
- Sm. Vesicles
- No Odor / PID ≈ 29.8 ppm
- MNF: throughout

(14) Tank 2

- Pull 27

Time	Depth	Run	Rec.	Gain	Cum.
13:39	107.4	3.7	4.0	0.3	-0.8

- 10YR 3/1
- Sm. to Primarily Med. Vesicles
- No Odor / PID ≈ 58.1 ppm
- MNF: 103.7, 104, 104.4 - 104.5, 104.7, 104.95, 105.15, 105.9, ~~X~~ 106, 106.05

- Pull 28

Time	Depth	Run	Rec.	Gain	Cum.
14:14	112.4	5.0	4.8	-0.2	-1

- 10YR 3/1 to 5YR 3/2
- Sm. - Med. Vesicles
- NO Odor / PID ≈ 23.0 ppm
- MNF: 107.65, 107.85 - 108, 109, 109.25, 109.45 - 109.5, 109.7, 109.8 - 109.85, 110.25, 110.6 - 110.65, ~~[illegible]~~, 111, 112.05 - 112.2~~4~~
- Mechanical Breaks @ 111.75 & 111.7~~6~~4

(15) Tank 2

- Pull 29

Time	Depth	Run	Rec.	Gain	Cum.
15:30	117.2	4.8	4.2	-0.6	-1.6

- 10YR 3/1 to 5YR 3/2
- Sm. - Med. Vesicles
- No Odor / PID ≈ 37 ppm
- MNF: 112.5, 113.15, 113.4 - 113.65, 113.85 - 116.6

~~X~~ Note: Bottom ≈ 1' may not have actually been so fractured, it may have been caused by drilling/coring problem

- Pull 30

Time	Depth	Run	Rec.	Gain	Cum.
15:57	117.9	0.7	1.0	0.3	-1.3

- 10YR 3/1 to 5YR 3/2
- Sm. - Med. Vesicles
- No Odor / PID ≈ 36.1 ppm
- MNF: ~~117.2 - 117.4~~, ~~117.6~~ - 117.8, 116.9 - 117.1, 117.3 - 117.7

(16) Tank 2

- Pull 31

Time	Depth	Run	Rec.	Gain	Cum.
16:31	120.4	3.0	2.6	-0.4	-1.7

- 10YR ~~X~~ 3/1 to 5YR 3/2
- Sm. - Med Vesicles
- No Odor / PID ≈ 21.7 ppm
- MNF: 118.1, 118.95, 118.6, 118.3 - 119.05, 119.3 - 120.5
* Sample RH-BR-2-S03 @ D ≈ 119.9 on 2/5/01 @ ≈ 16:40 of Rock Fragments w/ PID ≈ 21.7 ppm

- Pull 2/7/01

Time	Depth	Run	Rec.	Gain	Cum
12:00	126.3	5.4	4.3	-1.1	-4.8 -2.8

- 5YR 3/2 to 10YR 3/1
- Sm. - Med Vesicles
- No Odor / PID = 56.3 ppm
- MNF: 120.9 - 121, 121.4 - 121.45, 121.65 - 122.75, 122.45 - 122.5, 123.2, 123.5, 123.9 - 124.1, 124.45, 124.95, 125.05

(1) Tank 1

- Pull 1 2/7/01

Time	Depth	Run	Rec.	Gain	Cum
14:30	2.5	2.5	2	-0.5	-0.5

- Concrete 0 - 2 ~~X~~ over fine - course
- "Bedding" Sand, slight fine gravel + silt
- ~~Odor~~ Odor / PID ≈ 330 ppm
- MNF: NA
- No Concrete Box Sample Taken
* Sample RH - BR - 1 - S01 @ D ≈ 2.~~X~~ on 2/7/01 @ ≈ 14:30 of fine to course "Bedding" Sand, ~~X~~ slight fine gravel + silt w/ Odor/ PID ≈ 330 ppm

- Pull 2

Time	Depth	Run	Rec.	Gain	Cum.
15:35	7.3	4.8	1.4	-3.4	-3.4

- Concrete Fragments w/ Metal + Core 2.5 - 3.7
- 10YR 2/2 w/ Sm Vesicles 3.7 - 3.9
- Odor / PID ≈ 103.7
- MNF: 2.5 - 2.8, 2.95, 3, 3.25, 3.7 - 3.9

* Not enough material to take sample

(2) Tank 1

- Pull 3 2/5/01

Time	Depth	Run	Rec.	Gain	Cum.
08:22	8.8	1.5	1.2	-0.3	-4.2

- 10 YR 2/2 (under concrete 7.3-7.35)
- Sm. - med. Vesicles
- Strong Odor / PID ≈ 573 ppm
- MNF: through out

*Sample: RA-BR-1-502 @ D ≈ 8 on 2/5/01 @ ≈ 08:27 of Rock Fragments w/ strong odor and PID ≈ 573 ppm

- Pull 4

Time	Depth	Run	Rec.	Gain	Cum.
08:32	11.8	3	3	0	-4.2

- 10 YR 2/2 to 3/1
- Sm. - med. Vesicles
- Slight Odor / PID ≈ 185 ppm
- MNF: 8.8 - 9.55, 9.7 - 11.8

Note: Large chunks of core often split/fractured down middle could be pieced together

(3) Tank 1

- Pull 5

Time	Depth	Run	Rec.	Gain	Cum.
08:50	~~16.6~~ 15.6	~~4.5~~ 3.8	3.9	0.1	-4.1

- 10 YR 3/1 to 5YR 3/2
- Sm. - Med. Vesicles
- No Odor / PID ≈ 235.5 ppm
- MNF: 11.87 - 13.75, ~~15.6~~ 15.6 - 15.2, 14.95 - 14.6, 14.25, 14.15, 13.85, 13.45

- Pull 6

Time	Depth	Run	Rec.	Gain	Cum.
09:20	18.4	2.8	2.8	0	-4.1

- 10 YR 2/2 to 2/1
- Sm. Vesicles
- No Odor / PID ≈ 304.8 ppm
- MNF: 18.3, 17.5, 17.1, ~~15.95~~ - 16.35 - 16.3, 16.05,

(4) Tank 1

- Pull 7

Time	Depth	Run	Rec	Gain	Cum.
04:36	23.4	5	5	0	-4.1

- 10YR 2/1 to 5YR 3/2
- Sm. Vesicles
- No Odor / PID ≈ 38.9 ppm
- MNF: 19.3 - 20.2, 21, 21.3 - 22.1, 22.6 - 22.9

* Grout Seams 20 - 22.9

- Pull 8

Time	Depth	Run	Rec.	Gain	Cum.
16:09	26.6	2.6	2.6	0	-4.1

- 10YR 2/2 to 5YR 3/3
- Sm. Vesicles
- No Odor / PID ≈ 301 ppm (off grout area)
- MNF: 23.95, 24.05 - 24.35, 24.85, 25.05, 25.15, 25.2, 25.35, 25.9

* Grout Seams 24.05 - ~~24.35~~ 26.0

(5) Tank 1

- Pull 9

Time	Depth	Run	Rec.	Gain	Cum.
10:40	31.2	5.2	~~X~~ 4.7	~~X~~ -0.5	~~-4.2~~ -4.6

- 10YR 2/2
- Sm. - Med. Vesicles
- No Odor / PID ≈ NA
- MNF: 26.2, 26.6, 26.87, 26.35, 27.45, 27.85, ~~28.25 - 28.85~~, ~~30.45~~, 29.35, ~~29.1~~, 30.35, 29.45, 28.7, 28.25 - 28.45

- Pull 10

Time	Depth	Run	Rec.	Gain	Cum.
12:19	~~36.8~~ 35.8	~~5.6~~ 4.6	5.2	~~-0.4~~ 0.6	~~-X~~ -4

- 10YR 3/1 to 5YR 3/2
- Sm. to Med. Vesicles
- No Odor / PID ≈ 147.1 ppm
- MNF: ~~31.6~~, 31.8 - 32.1, 32.25, ~~32.6~~, ~~33.4~~, ~~34.1~~, ~~35.65 - 36.4~~

31, 31.2 - 31.5, 31.65, 32, 32.8, 33.5, 35.65 - 35.8

- Grout Seams through out

(6) Tank 1

- Pull 11

Time	Depth	Run	Rec.	Gain	Cum.
12:34	40.3	4.5	4.6	0.1	-3.9

- 5YR 3/2 to 10YR 3/1
- Sm. - Med. Vesicles
- No Odor / PID ≈ 164.3 ppm
- MNF: 35.45, 36.5, 36.8 - 37, 37.2 - 37.4, 37.95 - 38.55, 39.4, 38.8

*Great Seams throughout

- Pull 12

Time	Depth	Run	Rec.	Gain	Cum.
12:47	45.3	5.0	5.3	0.3	-3.6

- 10YR 3/1 to 2/2
- Sm. - Lg. Vesicles
- No Odor / PID ≈ 70.2 ppm
- MNF: 40.45, 40.85, 41.75, 42.5 - 42.65, 43.35 - 43.3, 43.95, 44.35, 44.55, 44.6, 44.8

* Grout Seams: 40 - 40.4, 42.35 - 43.95

(7) Tank 1

- Pull 13

Time	Depth	Run	Rec.	Gain	Cum.
13:01	50.6	5.3	5.0	-0.3	-3.9

- 10YR 3/1 to 5YR 3/2
- Sm. - Lg. Vesicles
- No Odor / PID ≈ 48.7 ppm
- MNF: 45.3 - 45.35, 45.8, 46.05, 47.35, 47.9, 48.35, 49.25, 49.85 - 50.6

- Mechanical Breaks: 46.5, 47.15, 48.65, 49.3, 49.4
* Grout Seams: 45.3 - 46.1, 49.05 - 49.8, 47.3 - 48.95

- Pull 14

Time	Depth	Run	Rec.	Gain	Cum.
13:14	55.6	5.0	5.1	0.1	-3.8

- 5YR 3/2 to 10YR 3/1
- Sm. - Med. Vesicles
- No Odor / PID ≈ 116 ppm
- MNF: 50.5 - 50.55, 50.9 - 51.3, 51.55 - 52.9, 53.2, 54.1, 54, 53.75, 53.5 - 53.3

* Grout Seams 50.5 - 50.9

(8) Tank 1

- Pull 15

Time	Depth	Run	Rec.	Gain	Cum.
13:30	60.1	5.1	5.1	0	-3.8

- 10YR 3/1
- Sm. to Lg. Vesicles
- Odor / PID ≈ 266 ppm
- MNF: 55.7, 56.2, 57, 57.8, 58.35, 58.65 – 59 *, 59.5, 59.6, 59.9

* Samples RH-BR-1-503 – DOG @ D≈ 59.6 on 2/8/01 @ ≈ 13:39 of Rock Core #11 w/ odor / PID ≈ 266 ppm

- Pull 16

Time	Depth	Run	Rec.	Gain	Cum.
13:46	65.8	5.1	5.1	0	-3.8

- 10YR 3/1
- Sm. to Lg. Vesicles
- Strong Odor / PID ≈ 453 ppm
- MNF: 61.35, 61.70, 61.95, 62.7, 63.15 – 63.2, 63.6, 64.8

* Sample RH-BR-1-504 @ D≈ 61.35' on 2/8/01 @ ≈ 13:52 of Rock Core #12 w/ Odor Strong / PID ≈ 453 ppm

(9) Tank 1

- Pull 17

Time	Depth	Run	Rec.	Gain	Cum.
14:00	71.1	5.3	5.2	-0.1	-3.9

- 10YR 3/1
- Lg. – Sm. Vesicles
- Strong Odor / PID ≈ 192 ppm
- MNF: 67.3, 67.6, 68.1, 68.45, 68.7, 69.1 to 69.2, 70.8, 70.5, 70.35, 69.9, 69.75, 69.4

* Ground Seams 67.3 – 67.45

- Pull 18

Time	Depth	Run	Rec.	Gain	Cum.
14:37	76.1	5.0	5.1	0.1	-3.8

- 10YR 3/1
- Sm. – Lg. Vesicles
- Strong Odor / PID ≈ 478 ppm
- MNF: 71.35, 71.6, 72.8, 73.45, 74.45 – 75, 75.4

- mechanical Breaks: 73.45 & 73.25

(10) Tank 1

- Pull 19

Time	Depth	Run	Rec.	Gain	Cum.
14:40	81.3	5.2	4.5	-0.7	-4.5

- 10YR 3/1
- Lg. - Sm. vesicles
- Odor / PID ≈
- MNF: 74.1, 74.65, 78.15, 78.35, 78.85, 79.45, 79.6, 74.85, - 80.5

- Pull 20

Time	Depth	Run	Rec.	Gain	Cum.
15:06	85.8	4.5	4.6	+0.1	-4.4

- 10YR 3/1
- Sm. - Med. Vesicles
- No Odor / PID ≈ 48.5
- MNF: 81.3, 81.35, 81.8, 82.4 - 83.65, 83.8 - 83.85, 84.05, 84.35, 84, 85 - 85.8

(11) Tank 1

- Pull 21

Time	Depth	Run	Rec.	Gain	Cum.
15:22	90.9	5.2	4.8	-0.3	-4.7

- 5YR 3/2 to 10YR 3/1
- Sm - Lg. Vesicles
- No Odor / PID ≈ NA
- MNF: ~~90.75, 90.75, 89.85~~, bdd ~~84.75, 88.7 - 88.4, 88, 87.3~~, bdd 86.8 - 85.8, 90.45, 89.95, 89.55, 89.45, 88.4 - 88.1, 87.7, 87
- Grout Seams ~~88.25 - 87.65, 88~~ bdd 87.95 - 87.35
- Mechanical Fractures: 88.15, 88.0

- Pull 22

Time	Depth	Run	Rec	Gain	Cum.
15:51	95.6	4.7	5.2	+0.5	-4.2

- 10YR 3/1 to 5YR 3/2
- Sm to Med. Vesicles
- No Odor / PID ≈ 59.2
- MNF: ~~91.15, 91.55, 92.75, 92.75~~ -0.5 bdd ~~92.25, 93.6, 95.15 - 93.05, 95.15~~ bdd bdd 90.65, 91.05, 91.75, 92.75, 93.25, 93.1 - 93.35, bdd 95 94.65 - 94.9, 95.4 - 95.6, 95.2
- Grout Seams ~~91.9 - 90.95, 93.6 93.85~~ bdd bdd 90.9 - 92.45, 93.1 - 93.35

(12) Tank 1

- Pull 23

Time	Depth	Run	Rec.	Gain	Cum
1~~4~~:10 6 bit	100.9	5.4	4.65	-0.75	-4.95

- 10YR 3/1
- Sm. - Med. Vesicles
- No Odor | PID ≈ 43 ppm
- MNF: 96 - 96.15, 96.35, 96.45, 96.75, 96.9, 97.45 - 97.5, 97.75 - 98, 98.75 - 98.95, 99.9

- Pull 24

Time	Depth	Run	Rec.	Gain	Cum
16:33	105.5	4.6	4.35	-0.25	-5.2

- 10YR 3/1
- Lg. - Sm. Vesicles
- No Odor | PID ≈ 43.7 ppm
- MNF: 101.7, ~~102.25~~ bit, 102.8, 103.1, 104, 104.2 - 104.8

2.5 YR 4/8
* ~~Red Brown~~ silty clay in Fractures 104.2 - 104.8
- Mechanical Break @ 102.25

(13) Tank 1

- Pull 25

Time	Depth	Run	Rec.	Gain	Cum.
16:55	110.2	~~5.2~~ 4.7 bit	5.2	0.5	-4.7

- 10YR 3/1
- Sm. - Lg. Vesicles
- No Odor | PID ≈ 115.3 ppm
- MNF: 105.65, 106.7, 107.8, 108.3, 108.8, 109.6

- Pull 26 2/9/01

Time	Depth	Run	Rec	Gain	Cum.
07:50	115.2	5.0	3.95	-1.05	-5.75

w/ 2.5 YR 4/8 silty Clay in Vesicles

- 10YR 2/2 ~~(w/ "Rusty" Coloring in Vesicles)~~ Color bit
- Sm. - Med. Vesicles
- No Odor | PID ≈ 222.7 ppm
- MNF: 110.2 - 110.4, 110.95, 111.35, 111.65, 112.25, 112.7, 113.05, 113.25, 113.6, 113.2 - 113.25

(14) Tank 1

- Pull 27

Time	Depth	Run	Rec.	Gain	Cum.
08:13	119.5	4.3	5.1	0.8	-4.95

- 10YR 3/1 w/ ~~"Rusty" color~~ 2.5YR 4/8 silty clay in some Vesicles
- Sm.-Lg. Vesicles
- No Odor / PID ≈ 151.7 ppm
- MNF: 118.3 - 118.7, 119.1 - 118.85

- Mechanical Fractures: 115.55, 117.25, 117.9

- Pull 28

Time	Depth	Run	Rec.	Gain	Cum.
08:50	124.5	5.0	5.0	0	-4.95

- 10YR 3/1 w/ 2.5YR 4/8 silty clay in most fractures and some vesicles
- Sm.-Lg. Vesicles
- No Odor / PID ≈ 118.5
- MNF: 120.5, 121.3, 122.15, 123.15, 123.65 - 123.75

(15) Tank 1

- Pull 29

T	D	R/R	G	C
09:18	129.7	5.2/5.1	-0.1	

- 10YR 3/1 w/ 2.5YR 4/8 silty clay in fractures and vesicles
- Sm.-Med Vesicles
- No Odor / PID ≈ 542 ppm
- MNF: 125.1 - 125.25, 126.05, 126.35 - 126.6, 126.75, 127.55 - 127.7, 127.9 - 128.15, 128.25, 128.4 - 128.8, 129.05 - 129.6

* Sample RA BR-1-505 @ D ≈ 129.2 on 2/4/01 @ ≈ 09:27 of Rock Fragments w/ PID ≈ 542 ppm

① Vertical Deep Hole
V 1 D

— P 1 2/13/01

T	D	R/R	G	C
07:20	0.5	0.5	0	0

- Concrete above "Bedding" Sand
-
- No Odor / PID ≈ NA
- MNF: NA

+ No Samples (Box or Jar) taken
Per Larry De Moss

— P 2

T	D	R/R	G	C
07:54	4	3.5/2.9	-0.6	-0.6

- 10YR 3/1 Under "Bedding" Sand ≈ 1' per Larry Demos
- Sm.-Lg. Vesicles
- No Odor / PID ≈ 172.4 ppm
- MNF: 3.8, 3.4, 3.2, 2.2, 1.6, 1.45 - 1.1

-- Mechanical Break @ 3.1

② V 1 D

— P3

T	D	R/R	G	C
08:30	6.8	2.8/2.8	-0.8	-1.4

- 10YR 3/1 to 2/1
- Sm.-Med.
- No Odor / PID ≈ 99.2 ppm
- MNF: 6.35, 5.8, 5.45, 5.55, 5, 4.65, 4.55, 4.3 - 4

— P4 2/14/01

T	D	R/R	G	C
—	7.2	0.4/0	-0.4	-1.8

- NA
- NA
- No Odor / PID ≈ NA
- MNF: NA

③ VID

- P5

T	D	R/R	G	C
07:54	8.4	1.2/0.4	-0.8	-2.6

- std ~~10YR~~ 5YR 3/2 to 10YR 2/2
- Sm. Vesicles
- No Odor | PID = NA
- MNF: 7.2 - 7.6

- P6

T	D	R/R	G	C
08:18	8.9	0.5/0.5	0	-2.6

- std ~~10YR~~ 5YR 3/2 to 10YR 2/2
- Sm. - Med. Vesicles
- No Odor | PID = NA
- MNF: 8.4 - 8.9

④ VID

- P7

T	D	R/R	G	C
08:34	10.8	1.9/2	0.1	-2.5

- 10YR 2/2
- Lg. to Sm. Vesicles
- No Odor | PID = NA
- MNF: 11.65, 11.8, 12.55

- P8

T	D	R/R std	G std	C std
08:52	16.5	5.7/5.3	-0.54	~~-3~~ -2.9

std * ~~15.7 - 16.2~~ 5YR 16 - 16.2 Open Cavity per Lutry De Moss

- 10YR 2/2 to 3/2
- Lg. to Small Vesicles
- No Odor | PID = 124 ppm
- MNF: 10.8 - 11.8, 12.55 - 13.35, 13.6 - 13.85, 14.05, 14.75, 15.3 - 15.45, 16

(5) VID

- P9

T	D	R/R	G	C
09:10	20.9	4.6/1.4	0.2	-2.7

- 10 YR 2/2
- Primarily Sm. to Med. Vesicles
- No Odor / PID ≈ NA
- MNF: 17.35, 17.65-17.75, 18.75, 18.85 dtt, 19.55, ~~19.75~~ dtt, 20.75, 20.55, 19.75-20.1

- P10

T	D	R/R	G	C
09:21	26.3	5.4/5.4	0	-2.7

- 10 YR 2/2 to 5YR 3/2 to 10YR 3/1 dtt
- Sm. to Primarily Lg. Vesicles
- No Odor / PID ≈ NA
- MNF: 20.9 - 21.55, 22.15 - 22.3, 22.4, 22.6, 23.25, 23.7-23.95, 24.1, 24.35, 24.65 - 25.65

Potential
* Grout Seams: 23.7, 24.65 - 25.65
(seams unlikely though)
- Lugger De Moss (Geologist) concur but driller aspect think so.

(6) VID

- P11

T	D	R/R	G	C
09:35	31.3	5/5.0	0	-2.7

- 10 YR 3/1 to 5YR 3/2
- Lg. - Sm. Vesicles
- No Odor / PID ≈ 3.2ppm
- MNF: 27.9, 28.55, ~~28.75~~ dtt, 29.2, 29.95, 30.75, 31.1 - 31.3

- Mechanical Fractures: 26.85, 27.4, 28.75,

- P12

T	D	R/R	Gain	C
09:54	36.4	5.1/5	-0.1	-2.8

- ~~10 YR~~ 5 YR 3/2 to 10YR 3/1 dtt
- Sm. - Med. Vesicles
- No Odor / PID ≈ 10.8 ppm
- MNF: 31.6, 31.7 - ~~32.05~~ dtt 32.30, 32.5, ~~32.45~~ dtt, 33 - 33.1, 33.35, 33.6, 33.9, 34.55 - 34.9, 35.45, 35.65, 36.15, 36.25

(7) VIP

- P 13

T	D	R/R	G	C
10:01	41.6	5.2 / 5.3	0.1	-2.7

- ~~10~~ 5YR 3/2 to 10YR 3/1
- Sm. - Lg. Vesicles
- No Odor / PID ≈ NA
- MNF: 37, 37.6 - 37.9, 39.25, 40.05, 40.25 - 40.95, 41.35

- P14 2/16/01

T	D	R/R	G	C
15:29	45.3	3.7 / 3.7	0	-2.7

- 10YR 2/2 to 5YR 3/2
- Sm. - Med Vesicles
- No Odor / PID ≈ NA
- MNF: 41.45 - 42, 42.2, 42.35 - 42.45, 42.6, 43.3, 43.9 - 44.4, 45.05, 45.15 - 45.3

* 0.35 of top of sample is in Bag Grout the Driller Placed + is not counted in measurement

(8) VIP

- P 15

T	D	R/R	G	C
15:44	49.5	4.2 / 4.1	-0.1	-2.8

Per Larry DeMoss

← Open Cavity 45.6 - 45.8 per Larry DeMoss

* Results need to be shifted to justify it

Void 45.65 - 45.75

- 10YR 2/2 to 5YR 3/2
- Sm. - Med Vesicles
- No Odor / PID ≈ NA
- MNF: 45.35, 45.45, 45.65, ~~46.25~~, 47.05, 46.85, 48.15 - 47.2, 49.15 - 49.5, 48.65, 48.3,

- P 16

T	D	R/R	G	C
≈ 15:59	54.5	5.0 / 4.9	-0.1	-2.9

- 10YR 2/2 to 5YR 3/2
- Sm - Med. Vesicles
- No Odor / PID ≈ NA
- MNF: 49.6 - 49.8, 49.85, 50.1, 50.3, 50.55, 51.05, 51.2, 51.55, 52.05, 52.8, ~~52~~, 53.25, 53.8

(9) VID

- P 17

T	D	R/R	G	C
≈ 16:11	59.2	4.7/4.2	-0.5	-3.4

- 10YR 2/2 to 5YR 3/2
- Med. - Sm. Vesicles
- No Odor | PID ≈ 1ppm
- MNF: 54.5 - 54.7, 54.8 - 55.9, 56.2 - 56.65, 56.9, 57.05, 57.3, 57.6 - 57.75, 57.95, 58.05, 58.75 - 58.9, 4 bdl

- P18

T	D	R/R	G	C
≈ 16:20	64.2	5/5	0	-3.4

- 10YR 3/1 to 10YR 2/2 to 5YR 3/2
- Sm. - Lg. Vesicles
- No Odor | PID ≈ 6.5 ppm
- MNF: ~~59.8 - 59.95, 60.55, 61.3, 62.05~~ bdl ~~62.15, 62.35, 62.55, 62.95, 65.2, 65.25~~ bdl ~~63.4 - 63.6, 63.8, 63.95 - 64.9~~ bdl
59.3 - 59.45, 59.3 - 59.45, 61.55 - 61.65, 61.85 - 62.05, 63.45, 62.7, 62.75, 6 62.9 - 63.1, 63.3, 63.45 - 63.9 ~~63.7~~ bdl
- Mechanical Breaks: 60.05, 60.8

(10) VID

- P 19

T	D	R/R	G	C
≈ 16:35	69.3	4.1/3.4	-0.7	-4.1

- 10YR 2/2 to 5YR 3/2
- Lg. - Sm. Vesicles
- NO Odor / PID ≈ 1.8 ppm
- MNF: 64.45, 64.75, 65.25 - 65.45, 66.05 - 66.6, 66.95 - ~~67~~ 67.35 bdl

- P 20

T	D	R/R	G	C
≈ 16:49	73.4	5.1/4.7	-0.4	-4.5

- 10YR 2/1, 3/1, 2/2 to 5YR 3/2
- Sm. - Med. Vesicles
- No Odor / PID ≈ 0 ppm
- MNF: 68.95 - 69.3, 69.5, 70 - 70.7, 71.1, 71.45, 72.15 - 73

* Sample RH - BR - VID - 501 @ D ≈ 72.4 on 2/16/01 ≈ 16:49 ∝ Rock Fragments
No Odor PID ≈ 0 ppm

(11)

VID

- Pull 21 2/19/01

T	D	R/R		G	C
0800	78.5	5.1	5.2	0.1	0

- 10YR 2/1
- small vesicle size
- No Odor / PID ≈ 0 ppm
- MNF: 73.4-73.7, 73.9, 74.4, 75.3, 76.0, 76.2, 76.5, 76.7, 77.9, 78.0

Mech. Fracture: 77.6

- Pull 22

T	D	R/R		G	C
0815	83.7	5.2	5.2	0	0

- 10YR 2/2
- medium vesicle size
- no Odor / PID ≈ 0 ppm
- MNF: 80.0, 80.7, 81.2-81.4, 82.0, 82.7, 83.5, 83.6
- Mech. fracture: 79.2

(12)

VID

Pull 23

Time	Depth	Ran	Rec	Gain
0825	86.9	3.2	3.4	0.2

- 10YR 2/2
- medium vesicle size
- PID = 0 ppm, no odor
- MNF: 84.7

*Collect RH-BR-VID-SO2 at 84.7'
solid rock, no odor

- Mech. Fractures: 84.8, 85.9, 86.7

Pull 24

Time	Depth	Ran	Rec	Gain
0920	92.4	5.5	5.3	-0.2

- 10YR 2/1
- large vesicle size
- PID = 0 ppm, no odor
- MNF: 87.3, 87.6, 87.7, 88.0, 88.9
- Mech. fractures: 89.5, 90.7, 91.1

V1D

Pull 25

Time	Depth	Ran	Rec	Gain
0940	96.0	3.6	3.1	-0.5

- 10YR 2/2
- PID = 0 ppm, no odor
- MNF = 92.5, 92.7, 93.0, 93.1, 93.3, 93.6 - 95.5
- small vesicle size
- Mech Fractures: N/A

* clinker zone at 93.0 - 95.5

Pull 26

Time	Depth	Ran	Rec	Gain
1045	97.6	1.6	0.9	-0.7

- 10YR 2/1
- PID = 0 ppm, no odor
- MNF: throughout
* continuation of clinker zone.
- Mech Fractures: N/A
- medium vesicle size

V1D

Pull 27

Time	Depth	Ran	Rec	Gain
1115	100.0	2.4	1.2	-1.2

- 10YR 2/2
- PID = 0 ppm, no odor
- MNF: throughout
* continuation of clinker zone
- medium vesicle size
- Mech Fractures: N/A

* RH-BR-V1D-S03 taken at 1115, 97.6', no odor, clinker zone broken rock.

- Terminate boring at 100.0 feet
- Set screen from 90.0 - 100.0'
- Sand to 86' bgs.
- Bentonite to 78' bgs.
- Grout to 2' bgs.

①

V2S

2-20-01

Pull 1

TIME	DEPTH	RAN	REC	GAIN
1545	1.5	1.5	0.5	-1.0

- ~~YR~~ / ALW Concrete
- PID = 0 ppm, no odor
- MNF: N/A

- Mech F: N/A

Pull 2

TIME	DEPTH	RAN	REC	GAIN
1600	3.4	1.9	1.9	0

- 10 YR 2/2
- PID = 0 ppm, no odor
- MNF: 1.6, 1.8 - 2.5, 2.8 - 3.1

- MECH. F: N/A
- medium resicle size

②

V2S

Pull 3

TIME	DEPTH	RAN	REC	GAIN
1610	5.5	2.1	2.0	-0.1

- 10 YR 2/2
- PID = 0 ppm, no odor
- MNF: 3.4 - 4.2, 4.6 - 4.9, 5.2
  5.4 - 5.5

- Mech. F: N/A
- Small resicle size

Pull 4

TIME	DEPTH	RAN	REC	GAIN
1620	7.2	1.7	1.9	0.2

- 10 YR 2/2
- PID = 0 ppm, no odor
- MNF: throughout (no clinker)

- mech F: N/A
- Small resicle size

Pull 5

TIME	DEPTH	RAN	REC	GAIN
1635	11.1	3.9	3.6	-0.3

- 10 YR 2/2
- PID= 0 ppm, no odor
- MNF: 7.4, 7.7 - 7.9, 8.2, 8.5
  8.9, 9.5 - 10.0, 10.3
  10.8 - 11.1
- Mech. F: N/A
- medium vesicle size

* RH-BR-V2S-S01, solid core
no clinker zone. no odor

Pull 6 2/21/01

TIME	DEPTH	RAN	REC	GAIN
0820	13.4	2.3	2.3	6

- 10 YR 2/2
- PID= 0 ppm, no odor
- MNF: 11.6, 12.3, 12.6, 12.9

- Mech. F: N/A
- medium vesicle size

Pull 7

TIME	DEPTH	RAN	REC	GAIN
0910	18.39	5.53	5.0	-0.5

- 5YR 3/2
- PID= 0 ppm, no odor
- MNF: 13.5, 13.9 - 15.4, 15.6, 15.8 - 16.4,
  16.8 - 17.0, 17.4, 17.6, 18.0, 18.7

- Mech F: N/A
- medium vesicle size

Pull 8

Time	Depth	Ran	Rec	Gain
0955	24.7	5.8	5.2	-0.6

- 10 YR 2/2
- PID= 0 ppm, no odor
- MNF: 19.4, 20.6, 20.7, 21.2,
  21.4 - 22.0, 22.3, 22.8, 23.0,
  23.3, 23.8, 24.2
- Mech. F: N/A
- large vesicle size

* RH-BR-V2S-S02 taken at 21.5
broken rock, no clinker, no odor

Pull 9

Time	Depth	Ron	Rec	Gain
1125	27.4	2.7	2.7	0

- 10 YR 2/2
- PID= 0 ppm, no odor
- MNF: 24.8, 25.4, 25.7

- Mech F: N/A
- large vesicle size

2-23-01

Pull 10

Time	Depth	Ron	Rec	Gain
0940	32.0	4.6	4.3	-0.3

- 10 YR 2/1 * 5 YR 3/2 1 cm 0.9 *
- PID= 0 ppm, no odor
- MNF: 27.4 27.6, 27.8, 30.3, 30.3-30.8, 31.4

- Mech. Fractures: 29.3
- Small vesicle size.
* clinker zone at 30.3-30.8

Pull 11

Time	Depth	Ron	Rec	Gain
0955	35.5	3.5	2.9	-0.6

- 5 YR 3/2
- PID= 0 ppm, no odor
- MNF: 32.5 - 33.1, 33.4 - 34.0, 34.3 - 34.7, 34.9

- Mech. F: N/A
- small vesicle size
- Pull 12

Time	Depth	Ron	Rec	Gain
1010	40.2	4.7	4.2	-0.5

- 10 YR 2/2
- PID= 0 ppm, no odor
- MNF: 35.9 - 37.8, 37.9, 38.1, 38.5, 39.1, 39.4, 40.1

- Mech. F: N/A
- medium vesicle size

V2S

Pull 13

Time	Depth	Ran	Rec	Gain
1040	43.6	3.4	3.2	-0.2

- 10 YR 2/2
- small vesicle size
- PID = 0 ppm, no odor
- MNF: 40.2 - 40.7
  41.1 - 42.2, 42.7
  42.9
- Mech F: N/A

* RH-BC-V2S-S03 taken at 43.0', solid core no clinker, no odor.

Pull 14

Time	DEPTH	RAN	REC	GAIN
1105	48.5	4.9	4.7	-0.2

- 5 YR 3/2
- small vesicle size
- PID = 0 ppm, no odor
- MNF: 44.4, 45.3, 45.8, 46.6, 47.1,
  47.3 - 47.5, 47.6, 47.7, 47.9
  48.2
- Mech. Fractures: N/A

V2S

Pull 15

Time	Depth	Ran	Rec	Gain
1115	52.0	3.5		

- 5 YR 3/2
- vesicle size
- PID = 0 ppm, no odor
- MNF: 49.4, 50.2, 50.4, 50.6,
  50.8, 51.4,
- Mech. Fractures: N/A

Appendix 4

APPENDIX A FROM WORKPLAN (QUALITY ASSURANCE, LABORATORY METHODOLOGY)

This Quality Assurance appendix has been prepared to supplement the Red Hill Bulk Fuel Storage Facility (RHBFSF) Draft Investigation Work Plan. This appendix is a summarization of some of the information normally included in the Quality Assurance Plan.

1.0 QUALITY CONTROL LEVELS AND DELIVERABLES

There are five levels of Quality Control (QC): A, B, C, D, and E. PACDIV QC Levels A, B, C, D, and E correspond closely with USEPA QC Levels I, II, III, IV, and V. The QC level selected for laboratory analyses for the Red Hill site is PACDIV Level D. Other QC levels may be more appropriate for certain types of samples or analyses. Therefore, a description of each level is presented below.

Quality Control Level A consists of using Organic Vapor Analyzers (OVAs), Organic Vapor Monitors (OVMs), Photoionization Detectors (PIDs), or colorimetric tubes for health and safety monitoring or sample headspace screening; certain field test kit screenings; or pH, temperature, conductivity, and dissolved oxygen meters for ground-water screening during well development and purging.

Quality Control Level B consists of onsite analyses using more sophisticated instrumentation than for Level A. This instrumentation can include gas chromatographs, immunoassay field testing kits, or X-ray fluorescence analyzers. Data collected under Level B will typically not be used in a quantitative risk assessment. Use of a laboratory that is not NFESC evaluated may also be considered Level B QC.

Quality Control Level C consists of using non-Contract Laboratory Program (CLP) methods for response action verification monitoring or for CLP methods where raw data are not required as a deliverable from the laboratory. Level C may include mobile laboratory work if it follows USEPA or other approved methods and if the mobile laboratory is NFESC evaluated. This level will be used (in conjunction or in place of Level D) for analytical work.

Quality Control Level D, for laboratory analysis using CLP methods, will be utilized for the majority of the samples. The main difference between Level C and D is that raw data will be received from the laboratory as a deliverable for Level D QC. Receipt of raw data will allow thorough data validation to be performed. Level D QC can also be used for non-CLP methods for which raw data are requested. Level D QC may be used to confirm results for approximately 10 percent of samples analyzed at Level B QC.

Quality Control Level E deliverables include results, plus limited QC data. QC Level E was originally written for nonstandard methods such as tissue matrices or product matrix analysis. This QC level will be used for sites only when limited deliverables are required for any matrix or method.

2.0 ANALYTICAL PROCEDURES

An analytical laboratory will be selected for the RHBFSF investigation based upon technical capability, capacity, experience, and price. The laboratory will follow SOPs as described in the Project Procedures Manual (Ogden, 1998) and their laboratory quality assurance plan, and any other pertinent method documentation. The methods that will be used to analyze samples will be discussed in these sections. Proper use of procedures will also be discussed in these sections to assist in data quality.

2.1 Laboratory Methods

A list of analytical methods that will be used for the analysis of samples is presented in Table 2-1.

2.2 Laboratory Equipment Calibration Procedures and Preventative Maintenance Procedures

Laboratory equipment will be calibrated following the procedures and frequency specified by the analytical methods that are used. Laboratory equipment will also be maintained in accordance with the approved laboratory QA program and as specified by the analytical method employed for sample analyses. Calibration activities and preventative maintenance for laboratory equipment will be documented. A standard operating procedure indicating the date and time of last calibration, date of required maintenance, the person performing the activity, and the next maintenance date should be implemented by personnel. Information pertaining to historical calibration and maintenance should be recorded in individual logs for each instrument.

Table 2-1
COMMON ANALYTICAL METHODS FOR
RED HILL BULK STORAGE FACILITY

Parameter	Analysis Method No.	Analysis Method	Method Reference	Extraction Method No.	Preparation Method
Subsurface Soil and Rock					
Total Petroleum Hydrocarbons	8015B/OG	GC/FID	SW-846(a)	5030 (purge and trap) 3550 (soil) 3510/3520 (water)	Extraction for fuel hydrocarbon
Volatile Organic Compounds	CLP	GC/MS	USEPA CLP SOW for Organics OLM03.2	CLP	Purge and trap (water) Heated purge and trap (soil)
Semivolatile Organic Compounds	CLP	GC/MS	USEPA CLP SOW for Organics OLM03.2	CLP	Continuous liquid/liquid extraction (water) Sonication extraction (soil)
Polynuclear Aromatic Hydrocarbons	8270 SIM	GC/MS with SIM	USEPA SW-846 modified	3510/3520 (water)	Separatory funnel/continuous liquid-liquid extraction (water) or separatory funnel
Metals			USEPA CLP SOW for Inorganics ILM04.0		
Aluminum	CLP	Trace ICP		CLP	Acid digestion
Antimony	CLP	Trace ICP		CLP	Acid digestion
Arsenic	CLP	AA, Furnace/ICP		CLP	Acid digestion
Barium	CLP	Trace ICP		CLP	Acid digestion
Beryllium	CLP	Trace ICP		CLP	Acid digestion
Cadmium	CLP	Trace ICP		CLP	Acid digestion
Calcium	CLP	ICP		CLP	Acid digestion
Chromium, total	CLP	ICP		CLP	Acid digestion
Cobalt	CLP	ICP		CLP	Acid digestion
Copper	CLP	ICP		CLP	Acid digestion
Iron	CLP	ICP		CLP	Acid digestion
Lead	CLP	AA, Furnace/ Trace ICP		CLP	Acid digestion
Magnesium	CLP	Trace ICP		CLP	Acid digestion

Manganese	CLP	Trace ICP		CLP	Acid digestion
Mercury	CLP	AA, Cold Vapor		CLP	Acid digestion
Nickel	CLP	Trace ICP		CLP	Acid digestion
Potassium	CLP	Trace ICP		CLP	Acid digestion
Selenium	CLP	AA, Furnace/ Trace ICP		CLP	Acid digestion
Silver	CLP	Trace ICP		CLP	Acid digestion
Sodium	CLP	Trace ICP		CLP	Acid digestion
Thallium	CLP	AA, Furnace/ Trace ICP		CLP	Acid digestion
Vanadium	CLP	Trace ICP		CLP	Acid digestion
Zinc	CLP	Trace ICP		CLP	Acid digestion
Cyanide	CLP	Titration or Colorimetric	USEPA CLP SOW for Inorganics ILM04.0	CLP	Distillation
<u>Groundwater</u>					
Total Petroleum Hydrocarbons	8015B/OG	GC/FID	SW-846(a)	5030 (purge and trap) 3550 (soil) 3510/3520 (water)	Extraction for fuel hydrocarbon
Volatile Organic Compounds	CLP	GC/MS	USEPA CLP SOW for Organics OLM03.1	CLP	Purge and trap (water) Heated purge and trap (soil)
Semivolatile Organic Compounds	CLP	GC/MS	USEPA CLP SOW for Organics OLM03.1	CLP	Continuous liquid/liquid extraction (water) Sonication extraction (soil)
Metals			USEPA CLP SOW for Inorganics ILM04.0		
Aluminum	CLP	Trace ICP		CLP	Acid digestion
Antimony	CLP	Trace ICP		CLP	Acid digestion
Arsenic	CLP	AA, Furnace/ICP		CLP	Acid digestion
Barium	CLP	Trace ICP		CLP	Acid digestion
Beryllium	CLP	Trace ICP		CLP	Acid digestion
Cadmium	CLP	Trace ICP		CLP	Acid digestion
Calcium	CLP	ICP		CLP	Acid digestion
Chromium, total	CLP	ICP		CLP	Acid digestion
Cobalt	CLP	ICP		CLP	Acid digestion
Copper	CLP	ICP		CLP	Acid digestion
Iron	CLP	ICP		CLP	Acid digestion

Lead	CLP	AA, Furnace/ Trace ICP		CLP	Acid digestion
Polynuclear Aromatic Hydrocarbons	8270 SIM	GC/MS with SIM	USEPA SW-846 modified	3510/3520 (water)	Separatory funnel/continuous liquid-liquid extraction (water) or separatory funnel
<u>Multiphased Hydrocarbon Fingerprinting</u>					
Hydrocarbon Fingerprinting	8015 Modified	GC/FID	SW-846(a) Modified	3510/3520 (water)	Separatory funnel/continuous liquid extraction (water) or separatory funnel
Chemical Biomarker Determination	8015 Modified	GC/FID or GC/ECD	SW-846 Modified or NOAA Modified	3510/3520 (water)	Separatory funnel/continuous liquid extraction (water) or separatory funnel
PIANO Volatile Fingerprinting and Alkyl-Substituted Homologs	8260 SIM	GC/MS with Select Ion Monitoring (SIM)	SW-846 Modified or NOAA Modified	5030	Purge and trap
Polynuclear Aromatic Hydrocarbons and Alkyl-Substituted Homologs	8270 SIM	GC/MS with Select Ion Monitoring (SIM)	USEPA SW-846 modified	3510/3520 (water)	Separatory funnel/continuous liquid extraction (water) or separatory funnel

AA=Atomic Absorption
TOC=Total Organic Carbon
CLP =Contract Laboratory Program
TPH=Total Petroleum Hydrocarbons
DBCP=1,2-Dibromo-3-chloropropane
USEPA=U.S. Environmental Protection Agency
ECD=Electron Capture DetectorXRF=X-Ray Fluorescence
EDB = Ethylene Dibromide
FID = Flame Ionization Detector
GC = Gas Chromatography
HECD = Hall Electrolytic Conductivity Detector
HPLC = High Performance Liquid Chromatography
HRMS = High Resolution Mass Spectrometry
ICP = Inductively Coupled Argon Plasma Spectrophotometry
MBAS = Methylene Blue Active Substance
MS = Mass Spectrometry
NPD = Nitrogren-Phosphorus Detector
PAH = Polynuclear Aromatic Hydrocarbon

PCB	=	Polychlorinated Biphenyl
PCDD	=	Polychlorinated Dibenzodioxin
PCDF	=	Polychlorinated Dibenzofuran
PID	=	Photo Ionization Detector
PLM	=	Polarized Light Microscopy
SIM	=	Selected Ion Monitoring
SOW	=	Statement of Work
TCD	=	Thermal Conductivity Detector

Sources:

USEPA, *Contract Laboratory Program (CLP) Statement of Work (SOW) for Organics Analysis*, 1994 and as revised.
USEPA, *Contract Laboratory Program (CLP) Statement of Work (SOW) for Inorganics Analysis*, 1994 and as revised.
USEPA, *Test Methods for Evaluating Solid Waste*, SW-846, Third Edition, November 1986. Updated 1992.
USEPA, Method for the *Determination of Asbestos in Bulk Building Materials*, USEPA 600/R-93/116, 1993b.
USEPA, Methods for the Determination of Chemicals in Water and Wastes, 1983b.
Standard Methods for the Examination of Water and Wastewater, 18th Edition, 1992.
USEPA, *Methods for Chemical Analysis of Water and Wastes*, USEPA 600/4-79/020, 1978.
Walkley-Black.

2.3 Inspection/Acceptance Requirements for Supplies and Consumables

Supplies and consumables such as glass containers and preservatives are necessary items to support the sampling activities. To ensure that these items are of acceptable quality, acceptance criteria for all common supplies and consumables should be followed. Each of the sample containers should include a Certificate of Assurance verifying that the container meets the manufacturer's specifications. Sample preservatives for organics should be at least Trace Metal Grade or equivalent. Deionized water will be inspected and certified by analyzing field blanks for possible contamination.

Sample Containers and Preservatives

Soil sample containers for analytical testing will include wide-mouth glass jars with Teflon-lined caps and amber glass jars with Teflon-lined caps. Table 2-2 provides further information.

TABLE 2-2
SAMPLE CONTAINERS, PRESERVATIVES, AND HOLDING TIMES
RED HILL BULK STORAGE FACILITY

Analysis	Matrix	Method	Container	Type	Preservative	Holding Time
Total Petroleum Hydrocarbons (TPH)	Soil	EPA 8015	100 grams	Glass with Teflon-lined Cap	Hydrochloric Acid	28 days
Polynuclear Aromatic Hydrocarbons (PAH)	Soil	EPA 8310	100 grams	Amber Glass with Teflon-lined cap	None	14 days
Semi-Volatiles	Soil	OLM03.2	20 grams	Amber Glass with Teflon-lined cap	Hydrochloric Acid	14 days
Metals	Soil	ILM04.0	10 grams	Glass	Nitric Acid	6 months
Total Petroleum Hydrocarbons (TPH)	Water	EPA 8015	1000 ml	Glass with Teflon-lined Cap	Hydrochloric Acid	28 days
Polynuclear Aromatic Hydrocarbons (PAH)	Water	EPA 8310	1000 ml	Amber Glass with Teflon-lined cap	None	14 days
Semi-Volatiles	Water	OLM03.2	80 ml	Amber Glass with Teflon-lined cap	Hydrochloric Acid	14 days
Metals	Water	ILM04.0	200 ml	Glass	Nitric Acid	6 months

2.4 Laboratory Quality Control Checks

For Level C project deliverables, the laboratory will provide method blanks and reagent blanks, matrix spike samples using site samples, matrix spike duplicate samples (organic analytes) or sample duplicates (inorganic analytes), surrogates, blank spike or laboratory control samples, and initial and continuing calibration standards. For a more detailed list of deliverables refer to the Project Procedures Manual, (Ogden, 1998).

For Level D project deliverables, the laboratory will provide a CLP data package. This package will include the summary package, initial and continuing calibration, matrix spikes, matrix spikes duplicates, blanks, duplicates, surrogate recoveries, chromatograms, mass spectra, and absorbence data. For methods which are not defined by CLP, the calibration information, method blanks, blank/spikes, chromatograms, absorbence, matrix spikes, and matrix spikes duplicates will be reported.

Laboratory personnel should perform QC analyses according to the procedures described in Ogden SOP III-A, *Laboratory QC Samples (Water, Soil)* (Ogden, 1998). Laboratory QC samples will be analyzed by each analytical method per matrix per sample activity. A sample activity will consist of 20 samples. For example, one method blank and one matrix spike (MS) will be analyzed per method per matrix per sample activity. For inorganic analysis, one duplicate sample analysis per lot will be performed. For organic analytes, one matrix spike duplicate (MSD) will be performed. Blank spikes for organic analyses and laboratory control samples for inorganic analyses will be performed per sample activity. Surrogates for organic analyses will be added to and analyzed for in all samples, when applicable.

Minimum laboratory quality control samples are provided in Table 2-3.

TABLE 2-3
RED HILL BULK STORAGE FACILITY
MINIMUM LABORATORY QUALITY CONTROL SAMPLES

	Level C and Level D	
Type of Sample	Organics	Inorganics
Method Blanks	1/extraction batch	1/extraction batch
Surrogate	All samples /chemical fraction[a]	NA[b]
Internal Standards	All samples[c]	NA
Laboratory Control Samples	1/extraction batch	1/extraction batch
Matrix Spike/Matrix Spike Duplicate	1pair/ 20 samples	1pair/ 20 samples[d]
Post-Digestion Spike	NA	Required for elements not meeting matrix spike acceptance criteria
Instrument Blank	1/10 site samples[e]	1/10 site samples or 2 hours
Instrument Tune	1/12 hours[e]	NA
Initial Calibration	Prior to sample analysis; following continuing calibration failure	Prior to sample analysis; following continuing calibration failure; every 24 hours
Initial Calibration Verification	Immediately following initial calibration	Immediately following initial calibration
Continuing Calibration	Every 10 samples or 12 hours	Every 10 samples or 2 hours

Notes:

(a) Not a requirement for fingerprint total petroleum hydrocarbon analysis.

(b) NA = Not Applicable.

(c) Required for GC/MS analyses only.

(d) Matrix spike and laboratory duplicate for inorganic analyses.

(e) Required for GC analyses only.

2.5 Holding Times

Table 2-4 lists holding times for laboratory analysis, as obtained from analytical methods. Holding times for sites will be in days beyond sample collection, which follows the USEPA SW-846 approach.

TABLE 2-4
HOLDING TIMES

Analysis	Soil Holding Time[a]	Water Holding Time[a]
VOCs	14 days	14 days[b]
SVOCs	14 days/40 days[c]	7 days/40 days[c]
Metals (except mercury)	6 months	6 months
Mercury	28 days	28 days
Cyanide	14 days	14 days
TPH, Gasoline Range Organics	14 days	7 days
TPH, Diesel Range Organics	14 days/40	7 days/40
BTEX, MTBE	14 days	14 days[b]
PAH	14 days/40	7 days/40

Notes:
NA = Not Applicable
a = from the date of sample collection
b = 7-day holding times apply if not preserved with acid to pH <2
c = x days/y days = x days for sample extraction/y days following extraction for analysis of extracts

2.6 Performance Evaluation Samples

Performance evaluation (PE) samples consist of known concentrations of analytes obtained from a reputable vendor. These samples will be submitted to the laboratory and will be indistinguishable from other site samples. The result of laboratory analyses of these samples will allow for assessment of the laboratory's analytical accuracy. PE samples containing concentrations of key analytes similar to those expected at the Red Hill site will be used. Ogden SOP III-G, *Performance Evaluation Samples,* (Ogden, 1998), describes PE samples.

2.7 Turnaround Times

Thirty-five calendar days is the typical turnaround time for reporting and delivering hard copy data and electronic data deliverables. If sites require quicker or longer turnaround times, it will be specified in the field sampling section of the work plan.

2.8 Data Validation

Data will be reported and reduced according to the requirements of SOP I-A-8, *Data Validation Planning and Coordination* (Ogden, 1998). Analyses will be performed under Level D QC requirements. Data from the first sample delivery group, and all subsequent critical samples (±10 percent) will be validated according to the procedures for Level D contained in the following CLEAN procedures (Ogden, 1998).

PROC. NO.	TITLE	REV	DATE
II-A	*Data Validation Procedure 1 Presentation*	2	October 1998
II-B	*Data Validation Procedure 2 Levels C and D Volatile Organics by GC/MS – PACDIV*	2	October 1998
II-C	*Data Validation Procedure 3 Data Validation Levels C and D Semivolatile Organics by GC/MS – PACDIV*	2	October 1998
II-E	*Data Validation Procedure 5 Levels C and D Metals and Cyanide – PACDIV*	2	October 1998
II-H	*Data Validation Procedure 8 Levels C and D Extractable Total Fuel Hydrocarbons – PACDIV*	2	October 1998
II-I	*Data Validation Procedure 9 Levels C and D Aromatic Volatiles by GC - PACDIV*	2	October 1998
II-O	*Data Validation Procedure 15 Levels C and D Polynuclear Aromatic Hydrocarbons by HPLC – PACDIV*	2	October 1998

3.0 ANALYTICAL DATA QUALITY PARAMETERS

3.1 Definitions and Discussions

The evaluation of data requires an assessment of precision, accuracy, representativeness, comparability, and completeness (PARCC) (EPA, 1993). Each of the PARCC parameters is assessed by reviewing particular types of QC sample results against predetermined criteria. A brief description of the data evaluation required for each PARCC parameter is presented below:

3.1.1 Precision

Precision can be estimated by calculating the relative percent difference of field duplicates, field collocates, field replicates, and laboratory duplicates. Where the relative percent difference (RPD) is defined by the difference of the percent recoveries (%R) of a spike and a spike duplicate as follows:

$$RPD = \frac{[(\%R\ of\ Spike) - (\%R\ of\ Spike\ Duplicate)]}{[(\%R\ of\ Spike) + (\%R\ of\ Spike\ Duplicate)]/2} \times 100\%$$

Spike/spike duplicate pairs may consist of laboratory blank spikes or laboratory matrix spikes.

3.1.2 Accuracy

Accuracy can be estimated by calculating %R of laboratory blank spikes or laboratory matrix spikes. %R is defined as the fractional difference of the spike quantity and the quantified amount as follows:

$$\%R = \frac{Spiked\ Sample\ Result - Sample\ Result}{Spiked\ Added} \times 100\%$$

3.1.3 Representativeness

Representativeness requires a more subjective evaluation which includes evaluating the adequacy of the number of samples collected given specific Site conditions and approved sampling procedures, such as those presented in the *Project Procedures Manual* (PACDIV,1998).

3.1.4 Comparability

Comparability also requires the use of subjective evaluation which includes review of such elements as normalizing data to standard conditions, such as reporting concentrations in soil based on dry weight, and appropriate units, such as those required for comparison against regulatory standards. Data for each analytical method will be reported in consistent units for each sample matrix to maximize data comparability.

3.1.5 Completeness

For the field sampling effort, completeness will be determined by calculating the percentage of the actual samples taken versus the number of samples scoped for the project. The field sampling effort will be at least 90% complete.

For each analytical method, completeness will be determined by calculating the ratio of non-rejected data points to the number of data points requested for analyses. Data will be at least 90 percent complete. Completeness will be assessed through the following:

- Level D data validation of 10 percent of the results of CLP analyses of all soil samples;
- Level D data validation of 10 percent of the results of CLP analyses of all groundwater samples;
- Level C data validation of the results of the remaining CLP analyses of soil; and
- Level C data validation of the results of other soil and ground-water laboratory chemical analyses.

Level C and Level D data validation will be conducted as described in the *Project Procedures Manual* (PACDIV, 1998).

3.1.6 Method Detection Limits, Quantitation Limits, and Preliminary Remediation Goals

Method detection limits (MDL) are the minimum level of an analyte that can be determined at the 99% confidence level. The quantitation limit (QL) is the minimum concentration of an analyte that can be measured and reported. The QL is affected by the sample matrix and by the presence of other analytes. For CLP analyses, the QL is equivalent to the Contract Required Quantitation Limit (CRQL) for organics and the Contract Required Detection Limit (CRDL) for inorganics. For non-CLP methods, the QL is equivalent to the practical quantitation limit (PQL) from USEPA SW-846 or other methods used.

Preliminary Remediation Goals (PRGs) are health-based concentrations determined by USEPA to be indicators for the protection of human health. Quantitation Limits (QLs) and PRGs are listed in Table 3-1. In some instances, the QL exceeds the PRG. The laboratory will submit method detection limit (MDL) studies demonstrating its ability to meet the PRGs, although in some instances the PRG may not be achievable. An alternate method may be necessary to achieve lower detection limits.

3.2 Laboratory Analysis Quality Assurance Objectives

3.2.1 Precision Objectives

Table 3-2 presents the precision criteria that laboratory data must meet. This table also includes USEPA criteria for CLP analyses and internal laboratory and method criteria for non-CLP analyses.

3.2.2 Accuracy Objectives

Laboratory data will meet the accuracy criteria shown in Table 3-2, which includes USEPA criteria for CLP analyses and internal laboratory and method criteria for non-CLP analyses.

3.2.3 Representativeness Objectives

The goal of representativeness is to obtain samples that are representative of each site. This applies to all media and contaminants of concern. Generally, this objective applies only to field sampling concerns.

TABLE 3-1
QUANTITATION LIMIT (QLs) GOALS TABLE

Analytical Parameter	Soil or Sediment EQL (a) mg/kg	Soil Residential PRG (c) mg/kg	Soil Industrial PRG (c) Mg/kg	Water EQL (b) ug/kg	Water PRG (c) ug/kg	Water MCL or SMLC ug/L
CLP Volatile Organics (GC/MS)						
Acetone	0.01	1400	6100	10	6100	NA
Benzene	0.01	0.62	1.4	10	0.39	1
Bromodichloromethane	0.01	0.98	2.3	10	0.18	NA
Bromoform	0.01	56	380	10	8.5	NA
Bromomethane	0.01	3.8	13	10	8.7	NA
2-Butanone (MEK)	0.01	6900	27,000	10	1900	NA
Carbon disulfide	0.01	350	1200	10	1000	NA
Carbon tetrachloride	0.01	0.23	0.52	10	0.17	0.5
Chlorobenzene	0.01	54	180	10	39	NA
Chloroethane	0.01	NA	NA	10	NA	NA
Chloroform	0.01	0.24	0.52	10	0.16	NA
Chloromethane	0.01	1.2	2.6	10	1.5	NA
Dibromochloromethane	0.01	5.3	36	10	1.0	NA
1,1-Dichloroethane	0.01	570	2000	10	810	5
1,2-Dichloroethane	0.01	0.34	0.76	10	0.12	0.5
1,1-Dichloroethene	0.01	0.038*	0.082*	10	0.046*	6
1,2-Dichloroethene (total)	0.01	75*	270*	10	55*	NA
1,2-Dichloropropane	0.01	0.34	0.76	10	0.16	5
Cis-1,3-Dichloropropene	0.01	0.51*	1.2*	10	0.081*	0.5
Trans-1,3-Dichloropropene	0.01	0.51*	1.2*	10	0.081*	0.5
Ethyl benzene	0.01	230	230	10	1300	700
2-Hexanone	0.01	NA	NA	10	NA	NA
4-Methyl-2-pentanone (MIBK)	0.01	5200*	54,000*	10	2900*	NA
Methylene chloride	0.01	8.5	2.0	10	4.3	NA
1,1,2,2-Tetrachloroethane	0.01	0.36	0.87	10	0.055	NA
Tetrachloroethene	0.01	7*	25*	10	1.1*	NA
Toluene	0.01	520	520	10	720	150
1,1,1-Trichloroethane	0.01	680	1400	10	790	NA
1,1,2-Trichloroethane	0.01	0.82	1.9	10	0.20	NA
Styrene	0.01	1700	1700	10	1600	100

Trichloroethene	0.01	7.1*	17*	10	1.6*	5
Vinyl chloride	0.01	0.02	0.048	10	0.02	0.5
m-xylene	0.01	210	210	10	1400	1750
o-xylene	0.01	280	280	10	1400	1750
p-xylene	0.01	370	370	10	-	1750
CLP Semi-Volatile Organics						
Acenaphthene	0.33	2600	28000	10	370	NA
Acenaphthylene	0.33	NA	NA	10	NA	NA
Anthracene	0.33	14000	220,000	10	1800	NA
Benzo(a)anthracene	0.33	0.56	3.6	10	0.092	NA
Benzo(b)fluoranthene	0.33	0.56	3.6	10	0.092	NA
Benzo(k)fluoranthene	0.33	5.6	36	10	0.92	NA
Benzo(a)pyrene	0.33	0.056	0.36	10	0.0092	0.2
Benzo(g,h,i)perylene	0.33	NA	NA	10	NA	NA
Benzyl butyl phthalate	0.33	NA	NA	10	NA	NA
Bis (2-chloroethyl) ether	0.33	0.18	0.56	10	0.0098	NA
Bis (2-chloroethoxy) methane	0.33	NA	NA	10	NA	NA
Bis (2-chloroisopropyl) ether	0.33	3.9*	12*	10	0.27*	NA
Bis (2-ethylhexyl) phthalate	0.33	32	210	10	4.8	NA
4-Bromophenyl phenyl ether	0.33	NA	NA	10	NA	NA
Carbazole	0.33	22	150	10	3.4	NA
4-Chlorophenyl phenyl ether	0.33	NA	NA	10	NA	NA
Chrysene	0.33	56	360	10	9.2	NA
Dibenzo (a,h) anthracene	0.33	0.056	0.36	10	0.0092	NA
Dibenzofuran	0.33	210	3200	10	24	NA
Di-n-butyl phthalate	0.33	5500	11000	10	3700	NA
1,2-Dichlorobenzene	0.33	370	370	10	370	NA
1,3-Dichlorobenzene	0.33	41	140	10	17	NA
1,4-Dichlorobenzene	0.33	3.0	7.3	10	0.47	NA
3,3-Dichlorobenzidine	0.33	0.99	6.7	10	0.15	NA
Diethylphthalate	0.33	44,000	100,000	10	29,000	NA
Dimethylphthalate	0.33	100,000	100,000	10	370,000	NA
2,4-Dinitrotoluene	0.33	130*	1400*	10	73*	NA
2,6-Dinitrotoluene	0.33	65*	680*	10	37*	NA
Di-n-octylphthalate	0.33	1300*	14,000*	10	730*	NA
Fluoranthene	0.33	2000	37000	10	1500	NA
Fluorene	0.33	1800	22000	10	240	NA

Hexaclorobenzene	0.33	0.28*	1.2*	10	0.042*	NA
Hexachlorocyclopentadiene	0.33	450*	4700*	10	260*	NA
Hexachloroethane	0.33	32*	140*	10	4.8*	NA
Indeno (1,2,3-cd) pyrene	0.33	0.56	3.6	10	0.092	NA
Isophorone	0.33	470	3200	10	71	NA
2-Methylnaphthalene	0.33	NA	NA	10	NA	NA
Naphthalene	0.33	55	190	10	6.2	NA
2-Chloronaphthalene	0.33	5200*	55,000*	10	2900*	NA
Nitrobenzene	0.33	16	100	10	3.4	NA
N-Nitrosodi-n-propylamine	0.33	0.063	0.43	10	0.0096	NA
N-Nitrosodimethylamine	0.33	0.0087	0.059	10	0.0013	NA
Phenathrene	0.33	NA	NA	10	NA	NA
Pyrene	0.33	1500	26000	10	180	NA
1,2,4-Trichlorobenzene	0.33	480	1700	10	190	NA
4-Chloro-3-methylphenol	0.33	NA	NA	10	NA	NA
2-Chlorophenol	0.33	59	240	10	38	NA
2,4-Dichlorophenol	0.33	160	3200	10	110	NA
2,4-Dimethylphenol	0.33	110	21,000	10	730	NA
2,4-Dinitrophenol	0.33	110	2100	10	73	NA
4,6-Dinitro-2-methylphenol	0.80	NA	NA	10	NA	NA
2-Nitrophenol	0.33	NA	NA	10	NA	NA
4-Nitrophenol	0.80	3400	66,000	10	2300	NA
2-Nitroaniline	0.80	3.3	64	10	2.2	NA
3-Nitroaniline	0.80	NA	NA	10	NA	NA
4-Nitroaniline	0.80	NA	NA	10	NA	NA
4-Chloroaniline	0.33	220	4300	10	150	NA
Pentachlorophenol	0.80	2.5	15	10	0.56	NA
Phenol	0.33	33,000	100,000	10	22,000	1
2,4,6-Trichlorophenol	0.33	40	270	10	6.1	NA
2,4,5-Trichlorophenol	0.80	5500	110,000	10	3700	NA
2-Methylphenol	0.33	2700	53,000	10	1800	NA
4-Methylphenol	0.33	270	5300	10	180	NA
Total Petroleum Hydrocarbons (GC-FID) EPA Method 8015B/OG						
C8 to C11	0.25	NA	NA	50	NA	NA
C11 to C14	0.5	NA	NA	100	NA	NA
C14 to C20	0.75	NA	NA	200	NA	NA
C20 to C30	1.0	NA	NA	400	NA	NA

TPH	2.5	NA	NA	1000	NA	NA
CLP Metals						
Aluminum	40	75,000	100,000	200	37,000	1000
Antimony	12	30	750	60	15	6
Arsenic	2	.38	3.0	10	0.045	50
Barium	40	5200	100,000	200	2600	1000
Beryllium	1	150	3400	5	73	4
Cadmium	1	37	930	5	18	5
Calcium	1000	NA	NA	5000	NA	NA
Chromium (total)	2	210	450	10	NA	50
Cobalt	10	3300	29000	50	2200	NA
Copper	5	2800	70000	25	1400	NA
Iron	20	NA	NA	100	NA	NA
Lead (total)	0.6	400	1000	3	4.0	NA
Magnesium	1000	NA	NA	5000	NA	NA
Manganese	3	3100	45,000	15	1700	NA
Mercury	0.1	NA	NA	0.2	NA	2
Nickel	8	1500	37000	40	730	100
Potassium	1000	NA	NA	5000	NA	NA
Selenium	1	370	9400	5	180	50
Silver	2	370	9400	10	180	NA
Sodium	1000	NA	NA	5000	NA	NA
Thallium ad Thallium carbonate	2	NA	NA	10	NA	2
Vanadium	10	520	13000	50	260	NA
Zinc	4	22,000	100,000	20	11,000	NA

GC = Gas Chromatography
MS = Mass Spectrometry
AA = Atomic Absorption
ICP = Inductively Coupled Plasma Spectrophotometry
MCL = Maximum Contaminant Level
SMCL = Secondary Maximum Contaminant Level
ECD = Electronic Capture Detector
FID = Flame Ionization Detector
SIM = Selective Ion Monitoring

Table 3 -1 (Continued)

Notes:

* PRGs from USEPA Region IX, February 1, 1995.

(a) PRGs from USEPA Region IX, September 1, 1998. PRGs presented on this table have no official status. They should be used only as a predictor of single-contaminant risk estimates for a specific environmental media (e.g., soil or tap water).

(b) QL = CRQL CLP SOW for Organics; for CLP Methods for inorganics, QL = CRDL. For non-CLP Methods, QL = PQL from USEPA SW-846 or other reference listed in Table 1-1. Practical Quantitation Limit (PQL) = 10 x method detection limit for low-level soil, not available for medium-level soil. Sample QLs are highly matrix dependent. The QLs listed are provided for guidance and may not always be achievable. The CRQLs listed for soils are based on wet weight, although the quantitation limits calculated by the laboratory will be on a dry weight basis and will therefore be higher than those listed in this table.

(c) Low = low-level extraction, Med = medium-level extraction. This extraction level is dependent upon each sample matrix and cannot be specified in advance because matrix problems cannot always be anticipated.

(d) Not available.

(e) Laboratory MDL.

(f) Instances where the PQL and/or CRQL is higher than the PRG may be due to the fact that analytical methods with detection limits below the PRG have not been developed. If the labs can report lower than the CRQLs or CRDLs, this is requested, as long as detection limit studies are available to support these lower reporting limits.

Sources:

USEPA, *Test Methods for Evaluating Solid Waste*, SW-846, Fourth Edition, December 1996.
USEPA, *CLP SOW for Organics Analysis*, OLM03.2.
USEPA, *CLP SOW for Inorganics Analysis*, ILM04.0.

Table 3-2

ANALYTICAL QA OBJECTIVES FOR COMMON METHODS

RED HILL BULK FUEL STORAGE FACILITY

Analytical Category and Parameters	Method Number and Reference[a]	MS/MSD or Surrogate Accuracy Criteria[b] (% Recovery) Water	Soil	BS/LCS Accuracy Criteria[c] Water	Soil	Precision Criteria (Maximum RPD)[f] Water	Soil
CLP Volatile Organics	CLP SOW OLM03.2	Source: EPA CLP Limit		Source: [d]		Source: EPA CLP Limit	
Benzene		76-127	66-142	70-130	70-130	11	21
Chlorobenzene		75-130	60-133	70-130	70-130	13	21
1,1-Dichloroethene		61-145	59-172	70-130	70-130	14	22
Toluene		76-125	59-139	70-130	70-130	13	21
Trichloroethene		71-120	62-137	70-130	70-130	14	24
Surrogates		Source: EPA CLP Limit					
Bromofluorobenzene		86-115	59-113	NA	NA	NA	NA
1,2-Dichloroethane-d_4		76-114	70-121	NA	NA	NA	NA
Toluene-d_8		88-110	84-138	NA	NA	NA	NA
CLP Semi-Volatile Organics	CLP SOW OLM03.2	Source: EPA CLP Limit		Source: [d]		Source: EPA CLP Limit	
Acenaphthene		46-118	31-137	70-130	70-130	31	19
4-Chloro-3-methylphenol		23-97	26-103	70-130	70-130	42	33
2-Chlorophenol		27-123	25-102	70-130	70-130	40	50
1,4-Dichlorobenzene		36-97	28-104	70-130	70-130	28	27
2,4-Dinitrotulene		24-96	28-89	70-130	70-130	38	47
4-Nitrophenol		10-80	11-114	70-130	70-130	50	50
N-Nitroso-di-n-propylamine		41-116	41-126	70-130	70-130	38	38

Pentachlorophenol		9-103	17-109	70-130	70-130	50	47
Phenol		12-110	26-90	70-130	70-130	42	35
Pyrene		26-127	35-142	70-130	70-130	31	36
1,2,4-Trichlorobenzene		39-98	38-107	70-130	70-130	28	23
Surrogates		Source: EPA CLP					
2-Chlorophenol-d_4		33-110	20-130 (j)	NA	NA	NA	NA
1,2-Dichlorobenzene-d_4		16-110	20-130 (j)	NA	NA	NA	NA
2-Fluorobiphenyl		43-116	30-115	NA	NA	NA	NA
2-Fluorophenol		21-110	25-121	NA	NA	NA	NA
Nitrobenzene-d_5		35-114	23-120	NA	NA	NA	NA
Phenol-d_5		10-110	24-113	NA	NA	NA	NA
Terphenyl-d_{14}		33-141	18-137	NA	NA	NA	NA
2,4,6-Tribromophenol		10-123	19-122	NA	NA	NA	NA
Metals	CLP SOW ILM04.0	Source: EPA CLP Limit		Source: EPA CLP Limit	EPA CLP Limit	Source:	
Aluminum		75-125	75-125	80-120	80-120	20	20
Antimony		75-125	75-125	NA	80-120	20	20
Arsenic		75-125	75-125	80-120	80-120	20	20
Barium		75-125	75-125	80-120	80-120	20	20
Beryllium		75-125	75-125	80-120	80-120	20	20
Cadmium		75-125	75-125	80-120	80-120	20	20
Calcium		75-125	75-125	80-120	80-120	20	20
Chromium (Total)		75-125	75-125	80-120	80-120	20	20
Cobalt		75-125	75-125	80-120	80-120	20	20
Copper		75-125	75-125	80-120	80-120	20	20
Iron		75-125	75-125	80-120	80-120	20	20
Lead (Total)		75-125	75-125	80-120	80-120	20	20
Magnesium		75-125	75-125	80-120	80-120	20	20
Magnesse		75-125	75-125	80-120	80-120	20	20
Mercury		75-125	75-125	80-120	80-120	20	20
Nickel		75-125	75-125	80-120	80-120	20	20
Potassium		75-125	75-125	80-120	80-120	20	20
Selenium		75-125	75-125	80-120	80-120	20	20

Silver		75-125	75-125	NA	80-120	20	20
Sodium		75-125	75-125	80-120	80-120	20	20
Thallium		75-125	75-125	80-120	80-120	20	20
Vanadium		75-125	75-125	80-120	80-120	20	20
Zinc		75-125	75-125	80-120	80-120	20	20
Cyanide	CLP SOW ILM04.0	75-125	75-125	80-120	80-120	20	20
Polynuclear Aromatic Hydrocarbons [d]	EPA 8270 SIM, EPA 8310, NOAA Method						
Acenaphthene		70-130	60-140	80-120	60-140	30	40
Pyrene		70-130	60-140	80-120	60-140	30	40
Surrogate [e]							
Acenephthene-d_{10}		70-130	60-140	NA	NA	NA	NA
Total Petroleum Hydrocarbons	EPA SW-846 8015B/OG	Source: [d]		Source: [d]		Source: [d]	
n-C6		70-130	60-140	80-120	60-140	30	40
n-C10		70-130	60-140	80-120	60-140	30	40
n-C11		70-130	60-140	80-120	60-140	30	40
n-C13		70-130	60-140	80-120	60-140	30	40
n-C15		70-130	60-140	80-120	60-140	30	40
n-C19		70-130	60-140	80-120	60-140	30	40
n-C21		70-130	60-140	80-120	60-140	30	40
n-C39		70-130	60-140	80-120	60-140	30	40
Surrogate [e]							
Ortho- or para-terphenyl(h)		65-135	65-135	NA	NA	NA	NA
Decane (n-C10) (h)		65-135	65-135	NA	NA	NA	NA
Eicosane (n-C20) (h)		65-135	65-135	NA	NA	NA	NA

Hexavalent Chromium	EPA 7196 or 218.6	75-125	75-125	80-120	80-120	20 20	
General Chemistry							
Alkalinity	EPA 310.1	75-125	NA	80-120	NA	20	NA
Bicarbonate	EPA 310.1	75-125	NA	80-120	NA	20	NA
Carbonate	EPA 310.1	75-125	NA	80-120	NA	20	NA
Chloride	EPA SW-846 (9253)	75-125	NA	80-120	NA	20	NA
Electrical Conductivity	EPA SW-846 (9050)	75-125	NA	80-120	NA	20	NA
Fluoride	EPA 340.2	75-125	NA	80-120	NA	20	NA
Nitrate/Nitrite	EPA 353.2	75-125	NA	80-120	NA	20	NA
pH	EPA SW-846 (9040)	75-125	NA	80-120	NA	20	NA
Sulfate	EPA SW-846 (9038)	75-125	NA	80-120	NA	20	NA
Sulfide	EPA 376.2	75-125	NA	80-120	NA	20	NA
Surfactants (MBAS)	EPA 425.1	75-125	NA	80-120	NA	20	NA
Total Dissolved Solids	EPA 160.1	75-125	NA	80-120	NA	20	NA
Total Hardness	Calculation	75-125	NA	80-120	NA	20	NA
Total Organic Carbon	EPA 415.2, Walkley-Black	75-125	75-125	80-120	80-120	20	35

Anion/Cation Balance will also be provided for each water sample by the laboratory.

Notes: The analyses for asbestos and TOC are not included because the various QA objectives listed in this table do not apply to the asbestos PLM or TOC methods.
NA indicates that the criteria are Not Applicable to this particular compound.

(a) Method references are provided in Table 3-1.
(b) MS/MSD = Matrix Spike/Matrix Spike Duplicate. For metals and general chemistry, a matrix spike and sample duplicate will be analyzed instead of MS/MSD.
(c) BS/LCS = Blank Spike/Laboratory Control Sample. No CLP or method criteria exist for many organic tests, so laboratory limits will be used.
(d) BS/LCS criteria are typically not provided by analytical methods. The criteria presented here should be revised after procurement of an analytical laboratory to support the investigation for each site; the laboratory limits should be as strict as, or stricter than, those criteria presented here.
(e) When analytical laboratory is selected for the project, alternative surrogate(s) may be proposed and used.
(f) The maximum relative percent difference (RPD) provided applies only to cases where all duplicate sample values are greater than 5 times the CRDL or QL. A maximum control limit of + or - CRDL or QL for water samples shall be used when at least one duplicate sample value is less than 5 times the CRDL or QL.
(j) Advisory surrogates only.

3.2.4 Comparability Objectives

To ensure comparability between RHBFSF sample sites, consistent analytical methods, sampling procedures, and data logging and recording will be used.

3.2.5 Completeness Objectives

Data completeness should equal 90 percent for each analyte and 95 percent or more for each critical analyte. Critical analytes are those analytes which are pivotal in the remediation decision process, that is, those which could determine the need for or extent of remediation required for a site.

3.2.6 Detection Limits Objectives

Detection limits will be selected for each site based on the intended use for the data.

3.2.7 Field QC Sample Quality Assurance Objectives

Standard Operating Procedure II-B, *Data Validation Procedure 2 Levels C and D Volatile Organics by GC/MS-NEESA,* (Ogden, 1998), samples will be used for Field QC. The objective for trip blanks, equipment rinsates, and field blanks is no analyte detections. For field duplicates, the goal is good reproducibility of results. Temperature blanks are required to register 4°C.

3.2.8 Data Acquisition Requirements (Non-Direct Measurements)

When using computer database systems to acquire data, the most current database available is considered acceptable. To ensure that data acquired from database systems are accurate, all data, including data qualifiers, must be properly transcribed and defined.

4.0 DATA MANAGEMENT, REDUCTION, AND REPORTING

All data will be managed, reduced, and reported in accordance with procedures Ogden DMP-2-1, *Data Management Program* and DMP-1-1, *Data Statistical Assessment, Validation, Reduction, and Reporting (Ogden, 1994)*.

4.1 DATA MANAGEMENT

Management of data begins at the point of sample collection and continues throughout the life cycle of results generation, data validation, data automation, data analysis, and data archival.

4.2 DATA REDUCTION

All field measurement data will originally be recorded in either a field notebook or field measurement logs. Lithologic descriptions will be recorded on boring logs. Following sampling activities, all field measurement logs and notebooks must be compiled, bound, and submitted to the CTO manager. Any data that will need to be included in a report must be tabulated and cross checked against the original data sheets.

4.3 DATA REPORTING

Laboratory control charts will be included in an initial notification report. Complete data tables will be included in each report for each project. Reduced data, such as summary data tables or figures showing significant contaminant concentrations, will be presented in the main portion of each report. Report text will focus on time trends, spatial patterns, and relation of analytes to waste sources. A copy of field logs will be included as an appendix to each project report. Field notes may also be included. A summary of the results of laboratory and field system and performance audits will also be included in the final project reports.

4.4 ELECTRONIC DATA DELIVERABLES

The laboratory will verify, reduce, and report data as specified in their laboratory quality assurance plan (LQAP) and in accordance with their subcontract. Both hard copy and electronic data deliverables (EDDs) will typically be required. The contents and turnaround time will be specified in the laboratory basic ordering agreement (BOA). The format for both hard copies and EDDs is specified in the Ogden laboratory BOA. Hard copy data will be delivered on CLP-like forms, along with a case narrative, table of contents, and raw data for Level D QC projects.

EDDs will be received on 3.5 inch diskettes or via e-mail in the format specified in the analytical laboratory BOA. EDDs will be loaded into a database, and checked for completeness and errors. Part of this check involves verifying that all requested analyses for each sample were performed and reported. This may be accomplished by comparing the delivered results to those recorded electronically in the COC logbook. If errors are encountered or data are not complete, the laboratory will be notified, and data must be resubmitted. If only minor errors or omissions are encountered, data management personnel will manually correct the data, but the laboratory will be notified so that it is aware of problems for future projects. Once in the database in usable form, data will be moved to a read-only location accessible for use by project personnel. Data can then be queried, reduced, and reported.

5.0 AUDITS AND CORRECTIVE ACTIONS

Audits will be conducted to assess the adequacy of field sampling and analysis activities. Laboratory audits are performed every 18 months as part of the program-wide auditing activity and will not be performed specifically for this project. Any necessary corrective actions will be conducted in accordance with the requirements presented in the Ogden Project Procedures Manual (1999).

Appendix 5

FRIEDMAN & BRUYA, INC.
FINGERPRINTING RESULTS

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Jensen, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

February 7, 2001

Kent Evetts, Project Manager
Ogden Environmental and Energy Services, Inc.
2904 Westcorp Blvd., Suite 107
Huntsville, AL 35805

Dear Mr. Evetts:

Included are the results from the testing of material submitted on January 23, 2001 from your Red Hill project. The product, soil and rock samples submitted for forensic evaluation arrived in good condition. Upon their arrival, the samples "RH-MW-6-S01" and "RH-BR-6-S02" were assigned our laboratory project number 101080 and were placed in a refrigerator maintained at 4°C until removed for sample processing.

The samples "RH-MW-6-S01" and "RH-BR-6-S02" were extracted and analyzed using a gas chromatograph with a flame ionization detector (GC/FID) and an electron capture detector (ECD). The data generated yielded information on the boiling range and general chemical composition of the material present. The GC/FID and GC/ECD traces are enclosed. A GC/FID trace of a standard consisting of normal alkanes is also provided for reference purposes.

Please contact us if additional consultation is needed by our firm in the interpretation of the analytical results provided. We appreciate this opportunity to be of service to you and hope you will call if you should have any questions. We will hold your samples for 30 days before disposal unless directed otherwise.

Sincerely,

FRIEDMAN & BRUYA, INC.

Kurt Johnson
Chemist

Enclosures
NAA0207R.DOC

Date of Report: 02/07/01
Date Received: 01/23/01
Project: Red Hill
Date Extracted: 01/29/01
Date Analyzed: 01/29/01

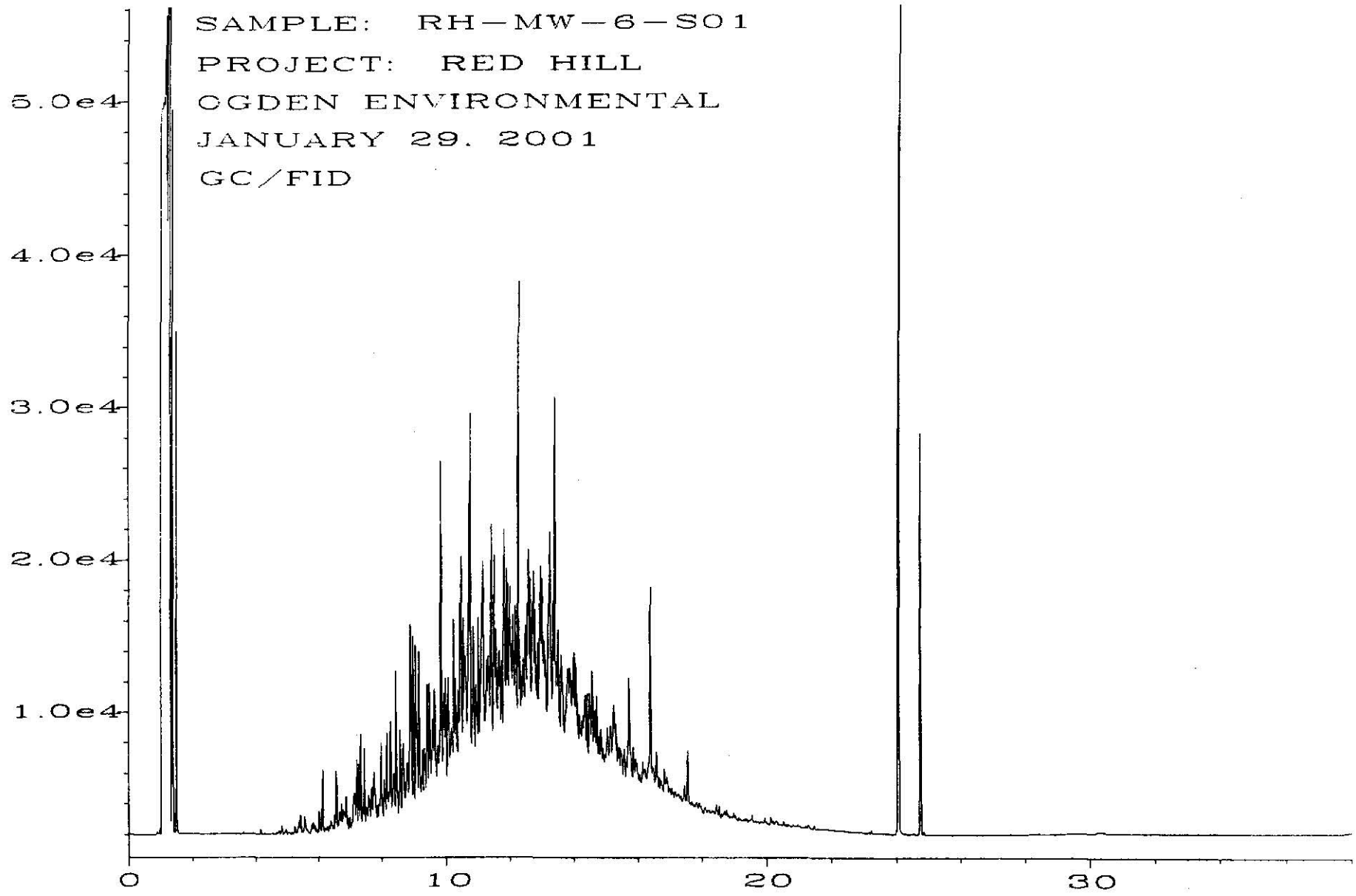
RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)

Sample ID	GC Characterization
RH-MW-6-SO1	The GC trace using the flame ionization detector (FID) showed the presence of medium boiling compounds. The majority of material present in the sample is indicative of a degraded middle distillate such as kerosence or Jet A. The medium boiling compounds appear as an irregular pattern of peaks on top of a broad hump or unresolved complex mixture (UCM). This material elutes from n-C_9 to n-C_{22} showing a maximum near n-C_{14}. This correlates with a temperature range of approximately 150°C to 370°C with a maximum near 250°C. Within this range, the dominant peaks present are indicative of isoprenoids. A discernible pattern of peaks characteristic of the normal alkanes was not present. The abundance of isoprenoids in conjunction with the apparent absence of normal alkanes indicates that the fuel present has undergone substantial biological degradation. It should also be noted that the proportion of material boiling above n-C_{17} indicates that a lower level of a degraded middle distillate such as diesel fuel #2 may also be present. The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. There is a second surrogate present that is seen on the GC/ECD trace at about 26 minutes which is dibutyl chlorendate.

Date of Report: 02/07/01
Date Received: 01/23/01
Project: Red Hill
Date Extracted: 01/29/01
Date Analyzed: 01/29/01

RESULTS FROM THE ANALYSIS OF THE SOIL/ROCK SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)

Sample ID	GC Characterization
RH-BR-6-SO2	The GC trace using the flame ionization detector (FID) showed the presence of medium boiling compounds. The patterns displayed by these peaks are indicative of a mixture of middle distillates which may include kerosene, JP-5, diesel fuel #2 and similar fuels. The medium boiling compounds appear as an irregular pattern of peaks on top of a broad hump or unresolved complex mixture (UCM). This material elutes from n-C_9 to n-C_{24} showing a maximum near n-C_{14}. This correlates with a temperature range of approximately 150°C to 390°C with a maximum near 250°C. Within this range, dominant peaks are present which are indicative of normal alkanes as well as isoprenoids such as norpristane, pristane, and phytane. The relative abundance of the normal alkanes and isoprenoids indicates that a mixture of degraded and relatively undegraded fuels are likely present in the sample. The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. There is a second surrogate present that is seen on the GC/ECD trace at about 26 minutes which is dibutyl chlorendate.



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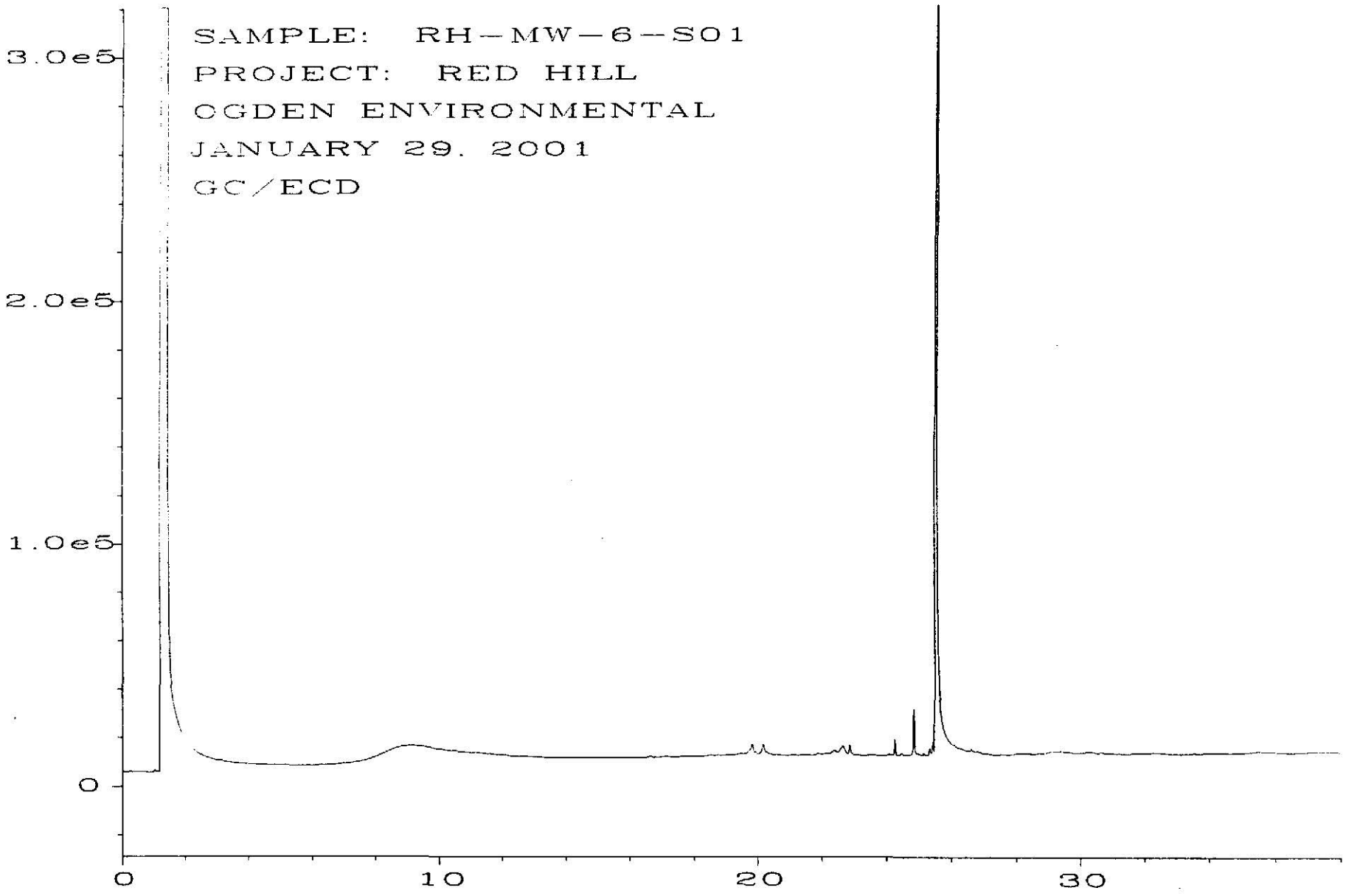

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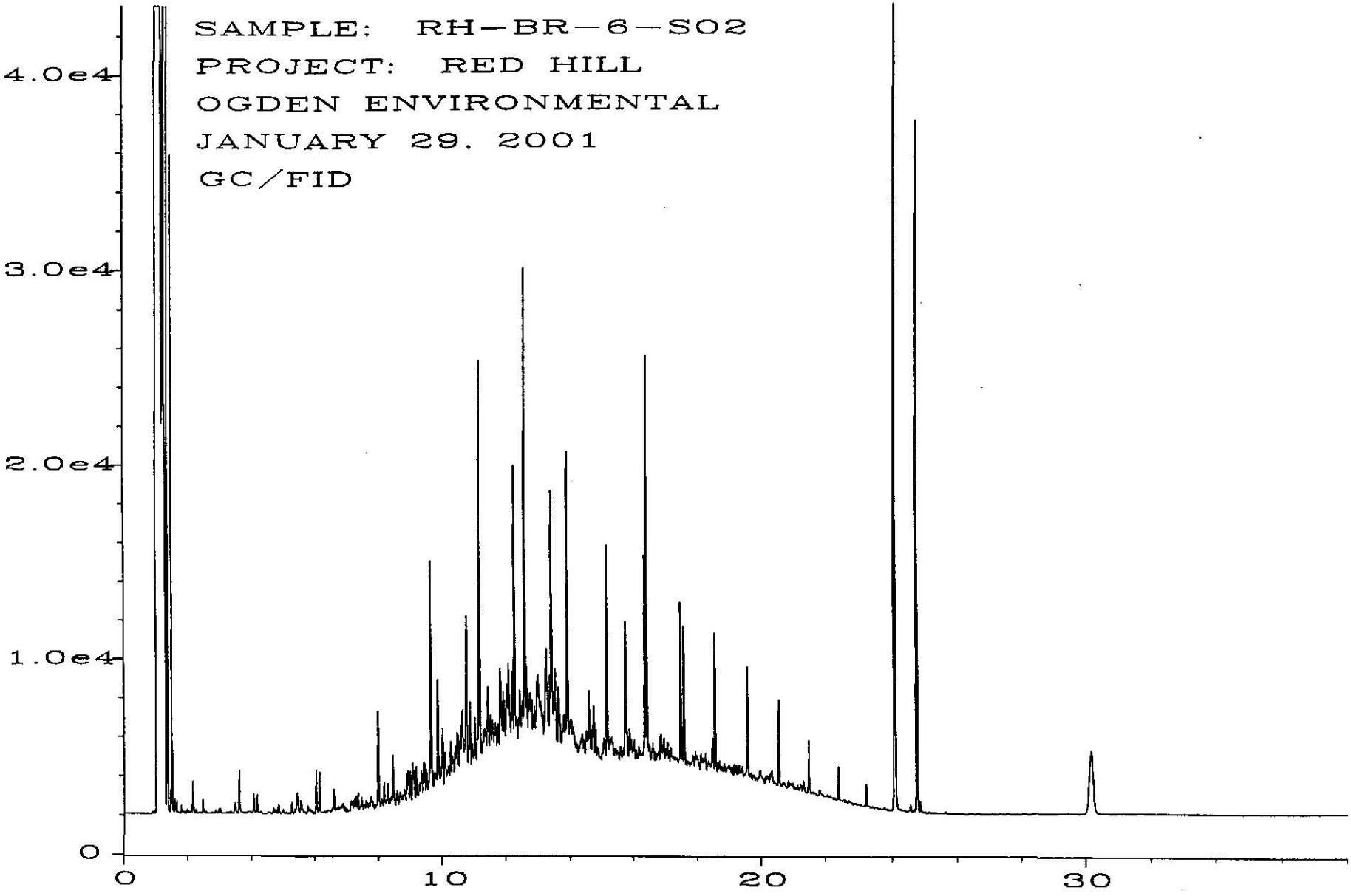

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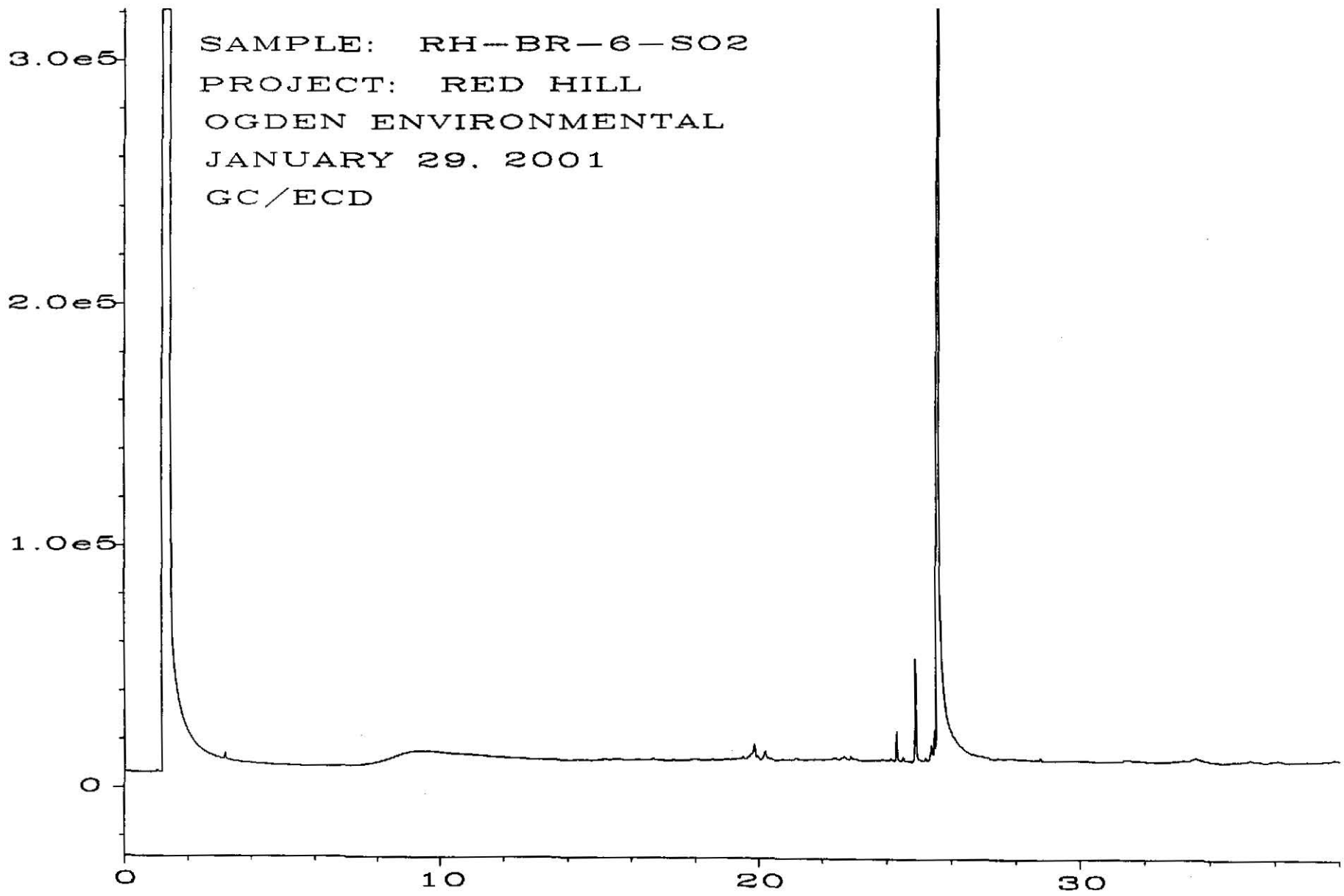

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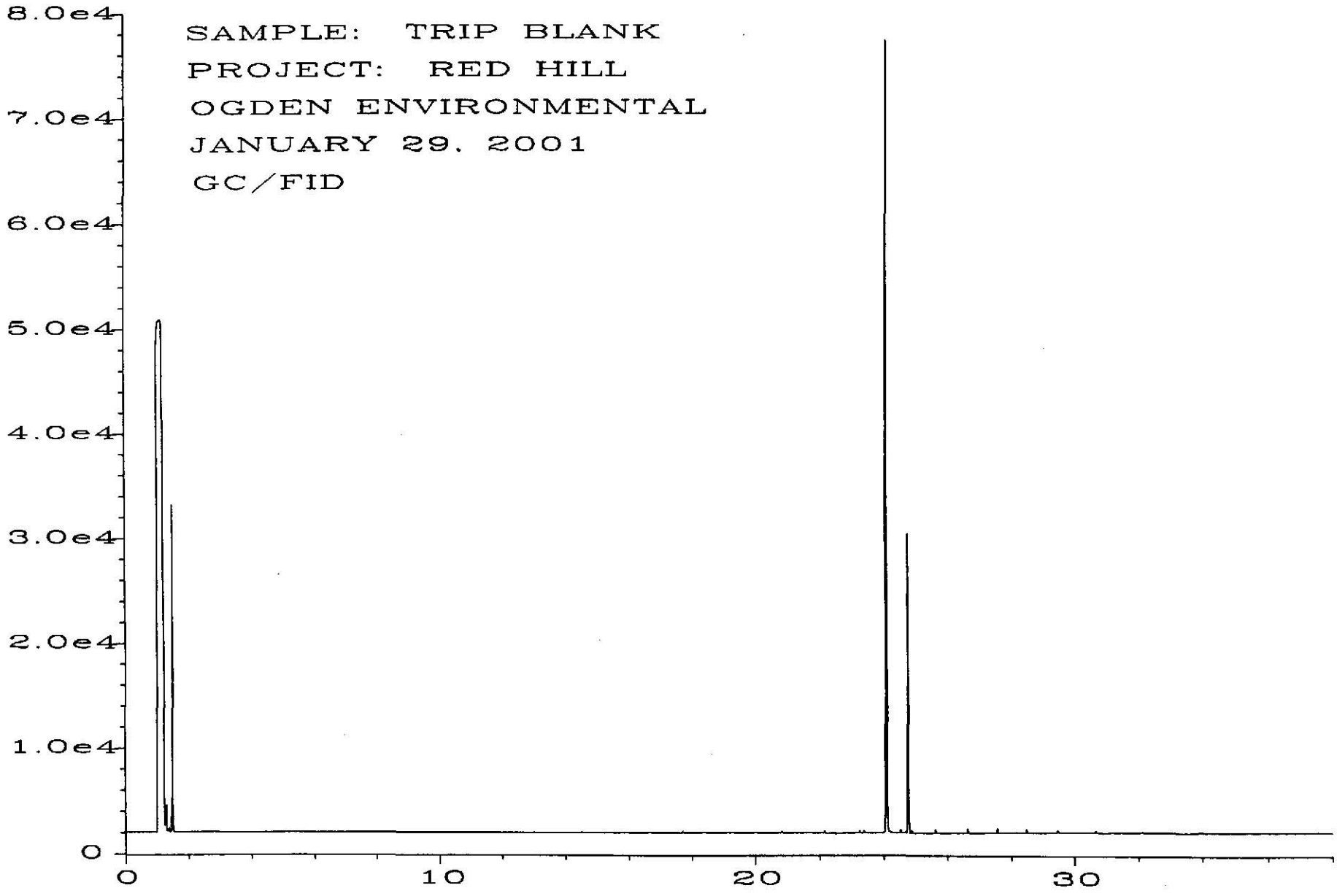

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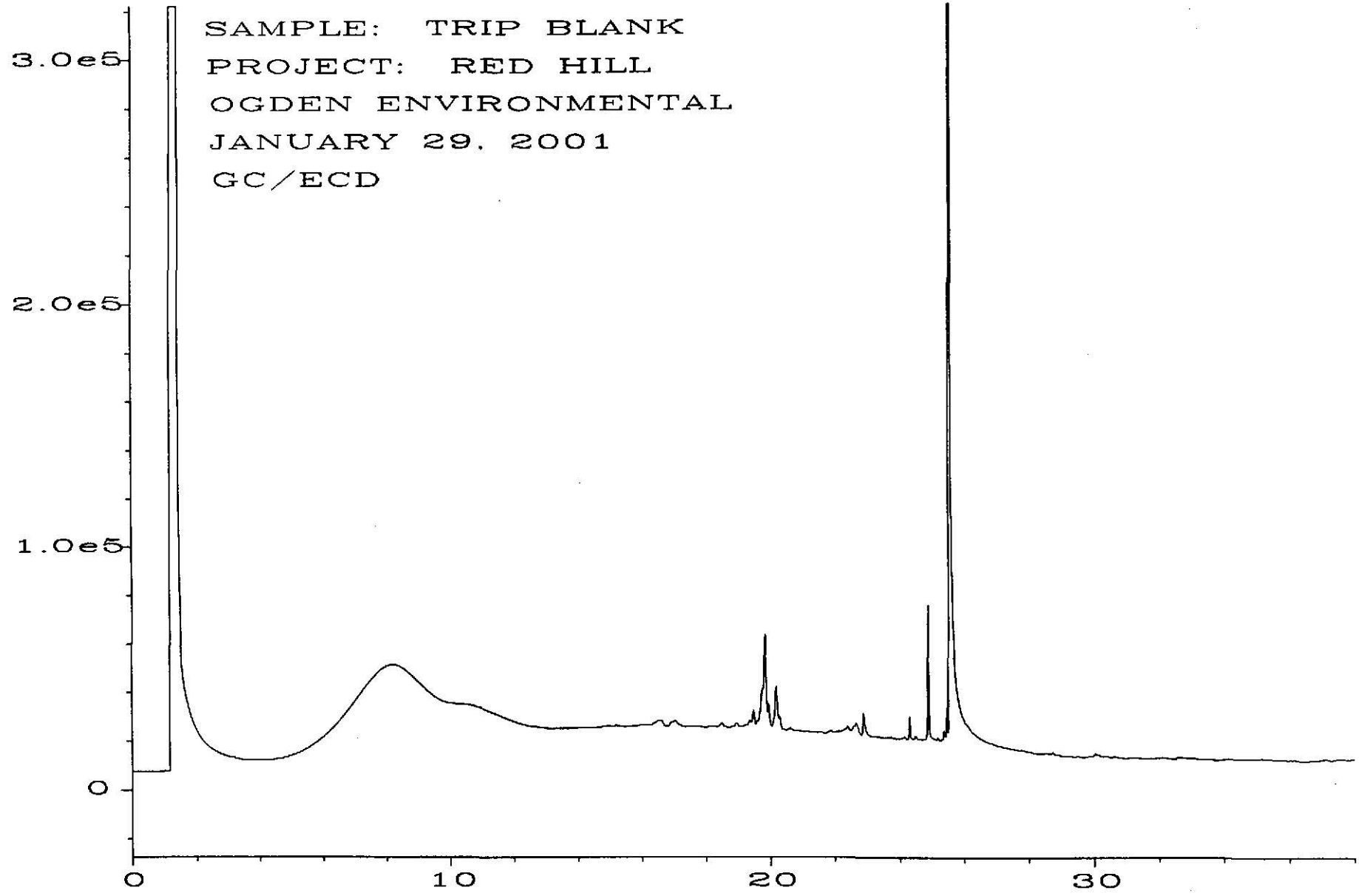

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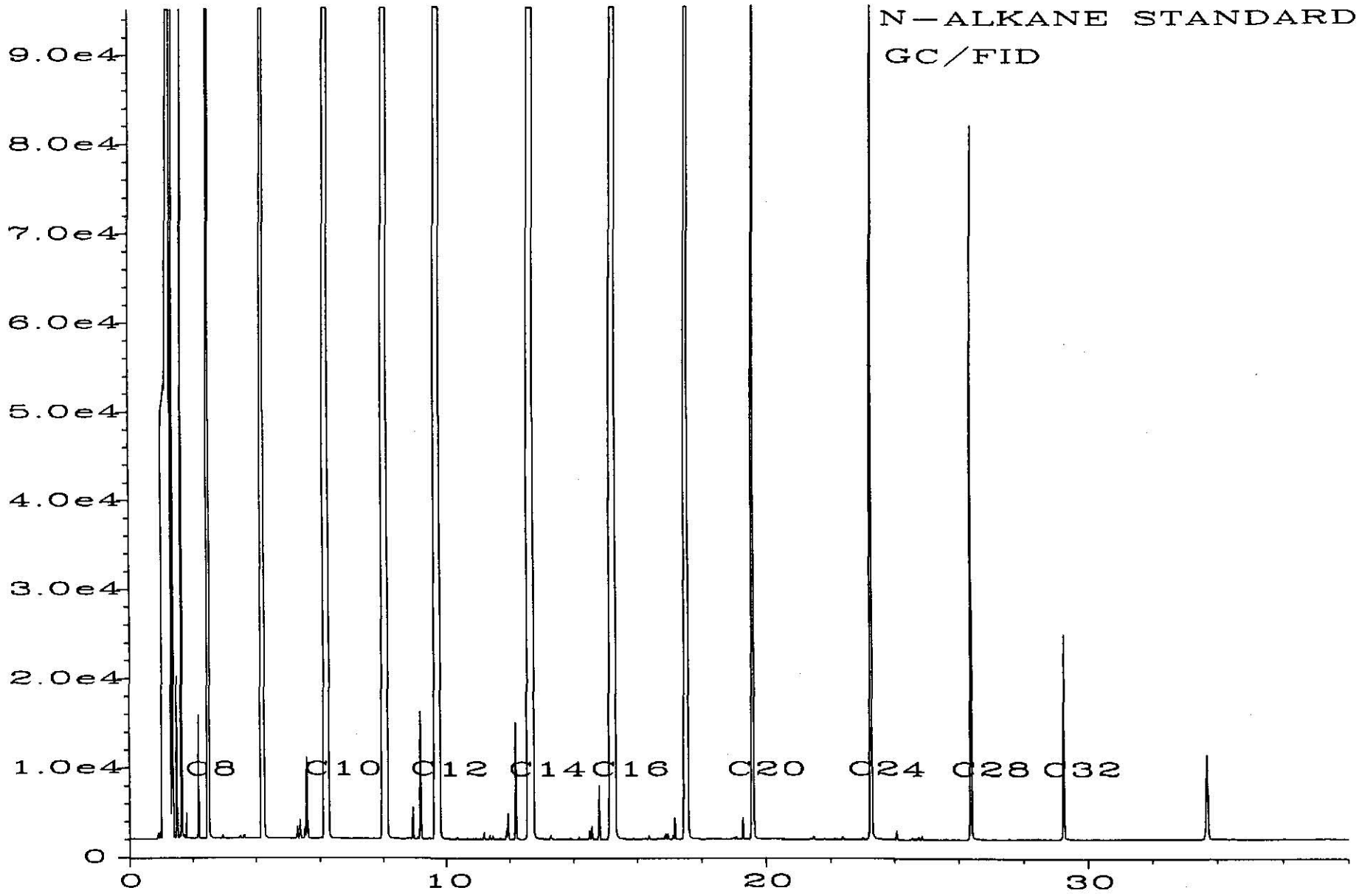

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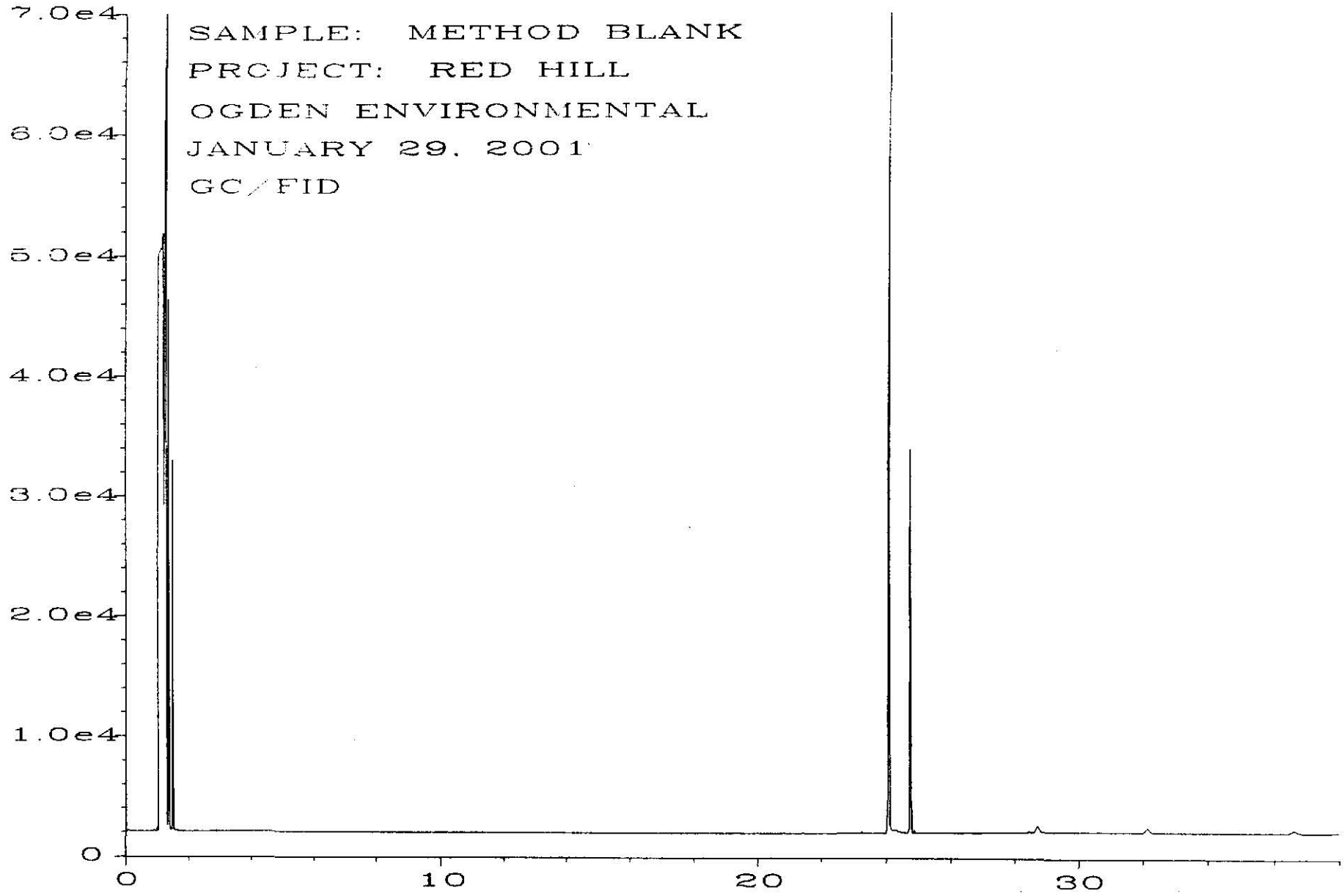

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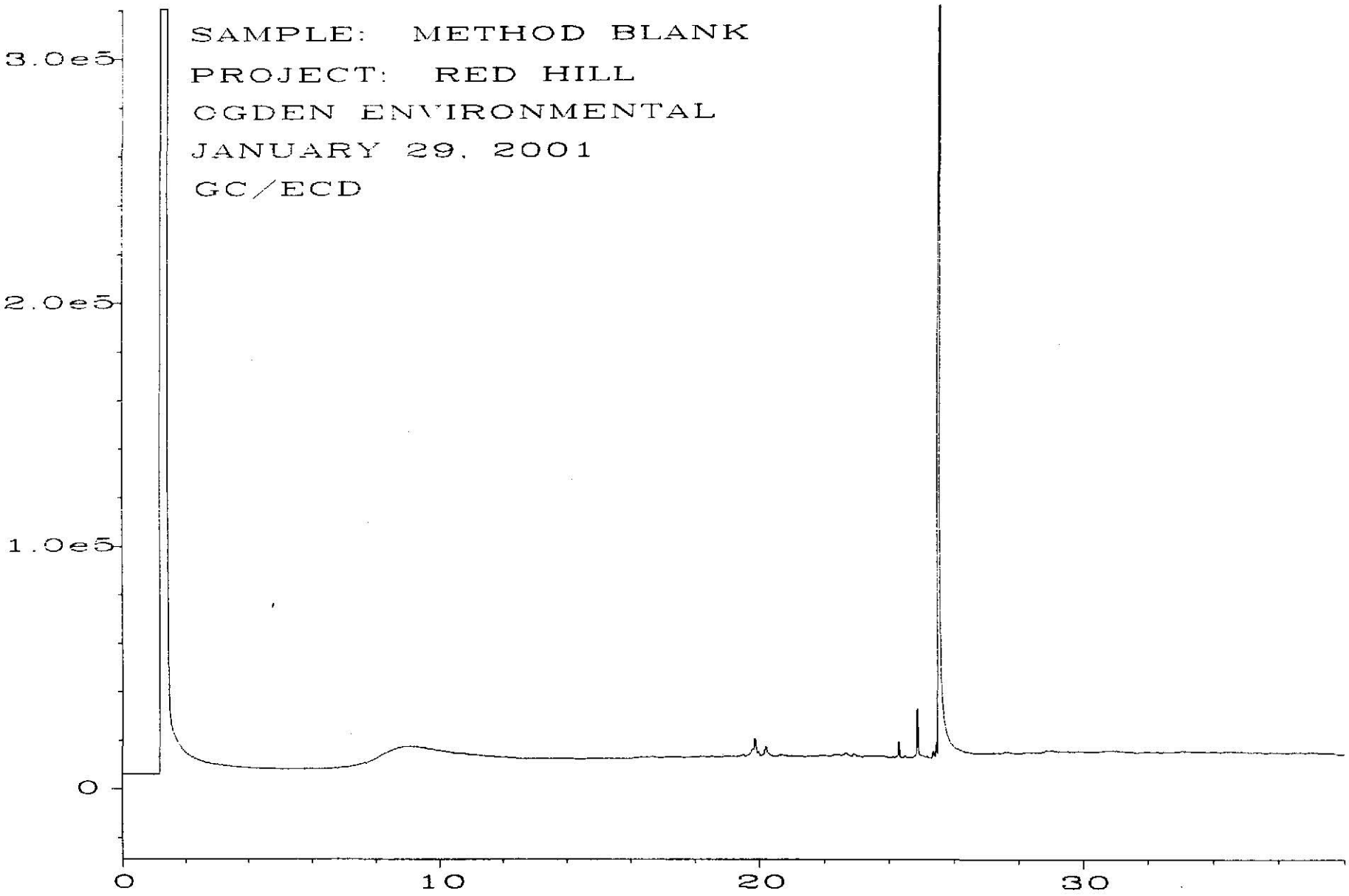

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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Jensen, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

January 11, 2001

Kent Evetts, Project Manager
Ogden Environmental
2904 Westcorp Blvd., Suite 107
Huntsville, AL 35805

Dear Mr. Evetts:

Included are the results from the testing of material submitted on December 22, 2000 from your Red Hill project. The water/sheen and rock core samples submitted for forensic evaluation arrived in good condition. Upon their arrival, the samples RH-MW-11 and RH-BR-14-SO4 were assigned our laboratory project number 012094 and were placed in a refrigerator maintained at 4°C until removed for sample processing.

The samples RH-MW-11 and RH-BR-14-SO4 were extracted and analyzed using a gas chromatograph with a flame ionization detector (GC/FID) and an electron capture detector (ECD). The data generated yielded information on the boiling range and general chemical composition of the material present. The GC/FID and GC/ECD traces are enclosed. A GC/FID trace of a standard consisting of normal alkanes is also provided for reference purposes.

Please contact us if additional consultation is needed by our firm in the interpretation of the analytical results provided. We appreciate this opportunity to be of service to you and hope you will call if you should have any questions. We will hold your samples for 30 days before disposal unless directed otherwise.

Sincerely,

FRIEDMAN & BRUYA, INC.

Kurt Johnson
Chemist

Enclosures
NAA0111R.DOC

012094 | D02

FRIEDMAN & BRUYA, INC.
3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282

SAMPLE CHAIN OF CUSTODY

Send Report To:
Company OGDEN Contact Kent Evetts

Address 2904 Westcorp Blvd Suite 107

City, State, Zip Huntsville, AL 35805

Phone # 256-539-3016 FAX # 256-539-3074 Date 12/20/00

SITE NO.	PROJECT NAME	PURCHASE ORDER #
	Red Hill	
SAMPLERS *(signature)*	Lanu William	PROJECT
LOCATION		
Oahu, HI		1-1019-0229
REMARKS		SAMPLE
DISPOSAL INFORMATION		
		☐

Dispose after 30 days ☐ Return Samples ☒ Call for Instructions

Sample #	Date/Time Sampled	Lab Sample #	Analyses Requested	Type of Sample	# of Jars	
RH-MW-11	12/18/00 0730		hydrocarbon fingerprinting	water	4	01
RH-BR-14-504	12/6/00 1100			rock core	1	02
AVGAS 100/130	NA			fuel	1	03
AVGAS 115/145	NA			fuel	1	04
MOGAS 87	NA			fuel	1	05
F-76 dock	NA			fuel	1	06
NDF	NA			fuel	1	07
JP-5	NA			fuel	1	08
* DF-2	NA			fuel	1	09
NSFuel Oil	NA			fuel	1	10
Bunker C	NA			fuel	1	11

SIGNATURE	PRINT NAME / Date	COMPANY / Time
Relinquished by: Lanu William	12/20/00	1200
Received by: Eric Young	12/22/00	3:30
Relinquished by:		
Received by:		

* - SAMPLE OPEN UPON RECEIPT, NOW RECOVERED

Arrival temp → 5°

CASE NARRATIVE

This case narrative encompasses samples received on December 22, 2000 by Friedman & Bruya, Inc. from the Ogden Environmental Red Hill project. Samples were logged in under the laboratory ID's listed below.

F&B ID No.	Ogden ID No.	Method	Date of Receipt	Date Extracted	Date Analyzed	Dilution
012094-01	RH-MW-11	GC/FID/ECD	12/22/00	12/28/00	12/28/00	None
012094-02	RH-BR-14-S04	GC/FID/ECD	12/22/00	12/28/00	12/28/00	1:2

Date of Report: 01/11/01
Date Received: 12/22/00
Project: Red Hill
Date Extracted: 12/28/00
Date Analyzed: 12/28/00

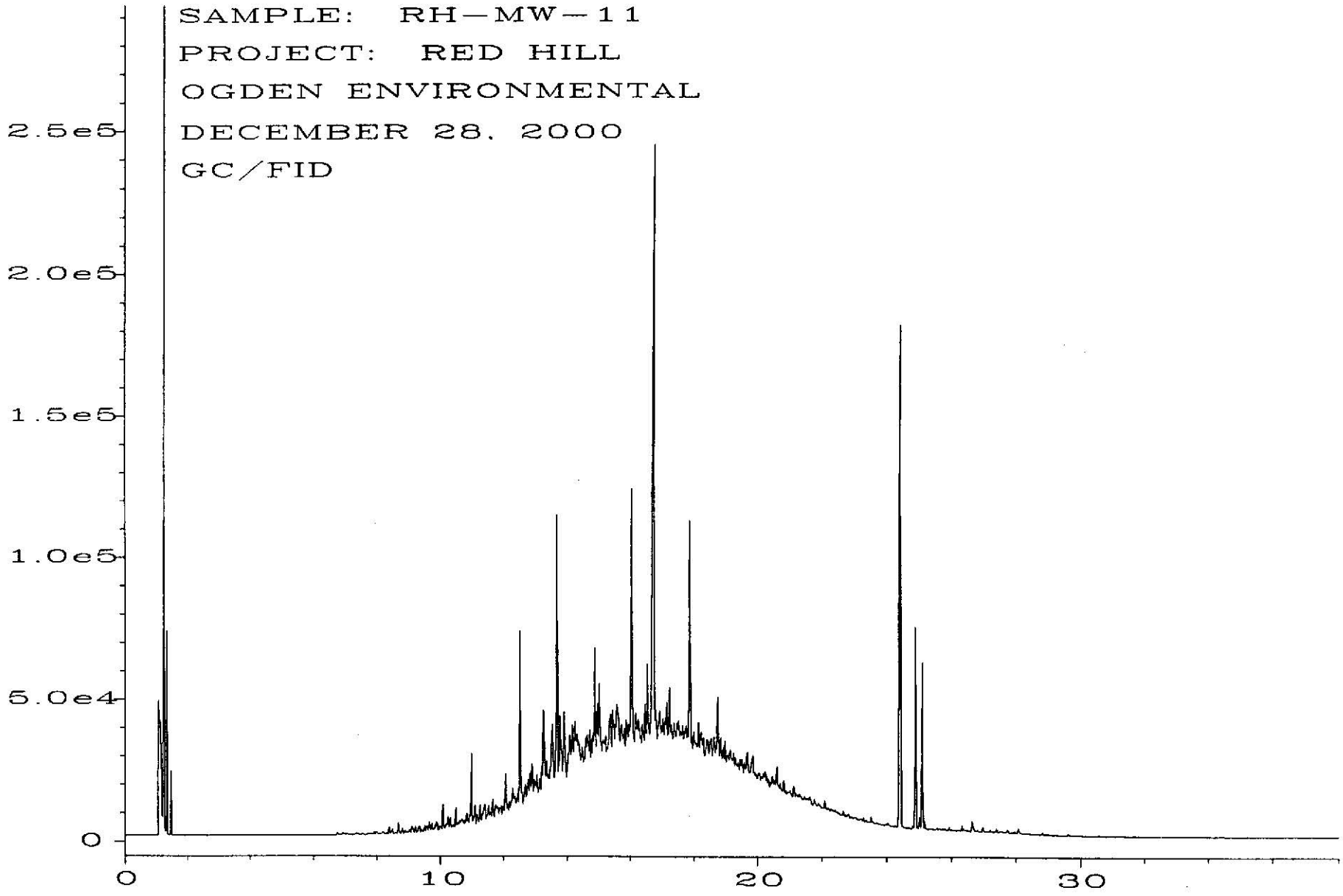
RESULTS FROM THE ANALYSIS OF THE WATER/SHEEN SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)

Sample ID	GC Characterization
RH-MW-11	The GC trace using the flame ionization detector (FID) showed the presence of medium boiling compounds. The patterns displayed by these peaks are indicative of a middle distillate such as diesel fuel #2 or similar fuel. The medium boiling compounds appear as an irregular pattern of peaks on top of a broad hump or unresolved complex mixture (UCM). This material elutes from n-C_9 to n-C_{24} showing a maximum near n-C_{17}. This correlates with a temperature range of approximately 150°C to 390°C with a maximum near 300°C. Within this range, the dominant peaks present are indicative of isoprenoids including norpristane, pristane, and phytane. A discernible pattern of peaks characteristic of the normal alkanes was not present. The abundance of isoprenoids in conjunction with the apparent absence of normal alkanes indicates that the fuel present has undergone substantial biological degradation. The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. There is a second surrogate present that is seen on the GC/ECD trace at about 26 minutes which is dibutyl chlorendate.

Date of Report: 01/11/01
Date Received: 12/22/00
Project: Red Hill
Date Extracted: 12/28/00
Date Analyzed: 12/28/00

RESULTS FROM THE ANALYSIS OF THE ROCK CORE SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)

Sample ID	GC Characterization
RH-BR-14-SO4	The GC trace using the flame ionization detector (FID) showed the presence of medium boiling compounds. The patterns displayed by these peaks are indicative of a mixture of middle distillates which may include kerosene, JP-5, diesel fuel #2 and similar fuels. The medium boiling compounds appear as an irregular pattern of peaks on top of a broad hump or unresolved complex mixture (UCM). This material elutes from n-C_9 to n-C_{24} showing a maximum near n-C_{17}. This correlates with a temperature range of approximately 150°C to 390°C with a maximum near 300°C. Within this range, dominant peaks are present that are indicative of normal alkanes as well as isoprenoids including norpristane, pristane, and phytane. The relative abundance of the normal alkanes and isoprenoids indicates that a mixture of degraded and relatively undegraded fuel is present in the sample. The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. There is a second surrogate present that is seen on the GC/ECD trace at about 26 minutes which is dibutyl chlorendate.



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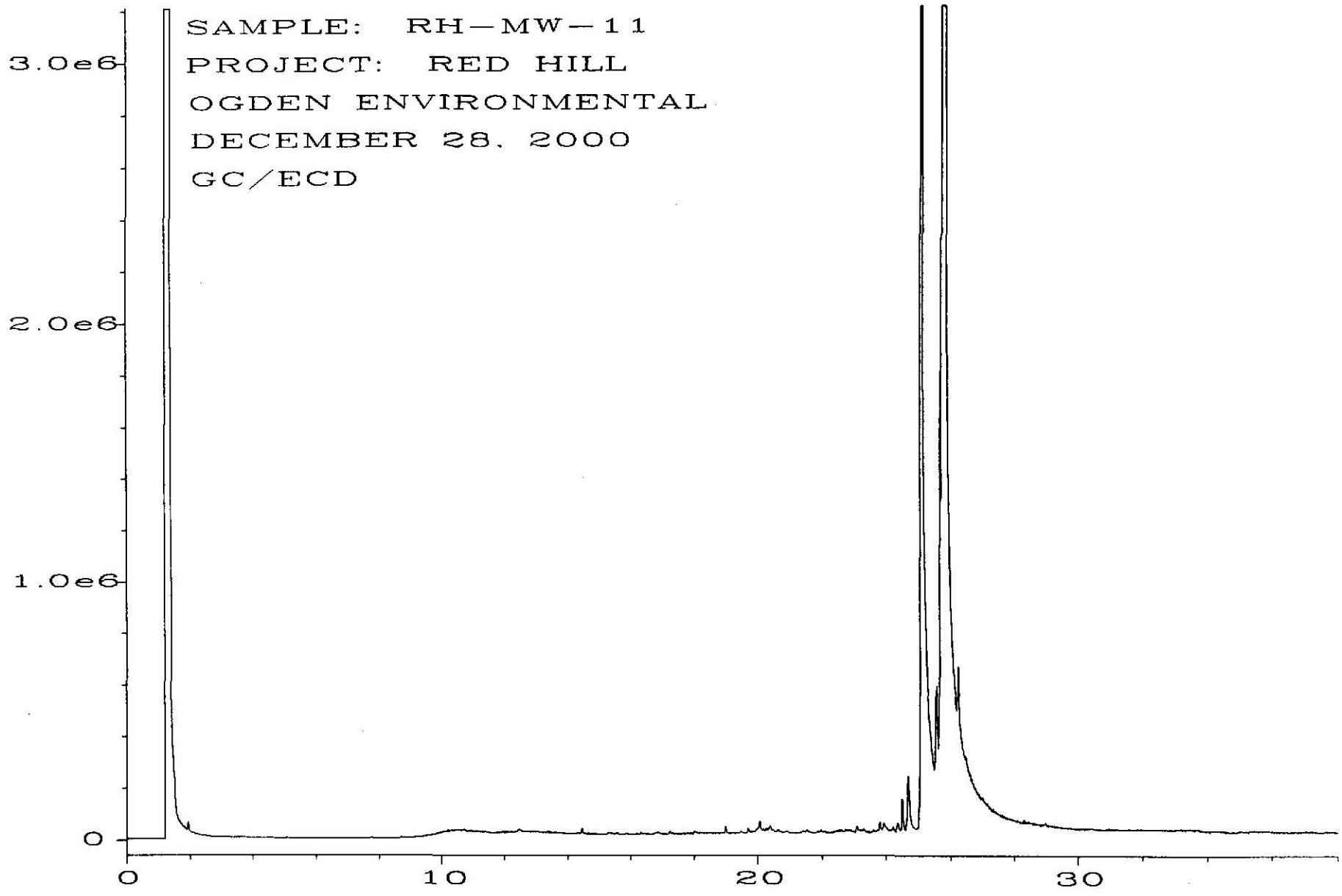

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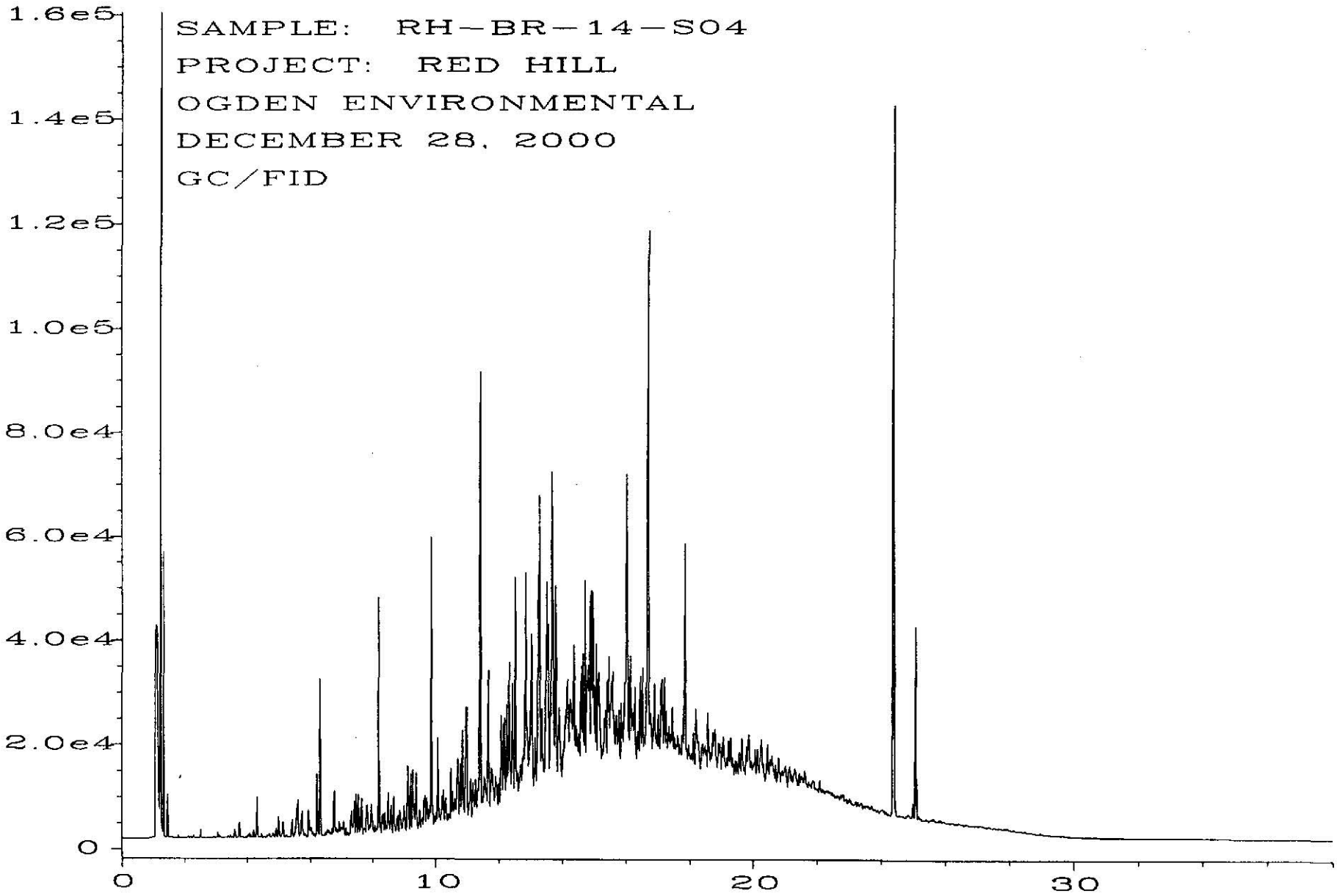

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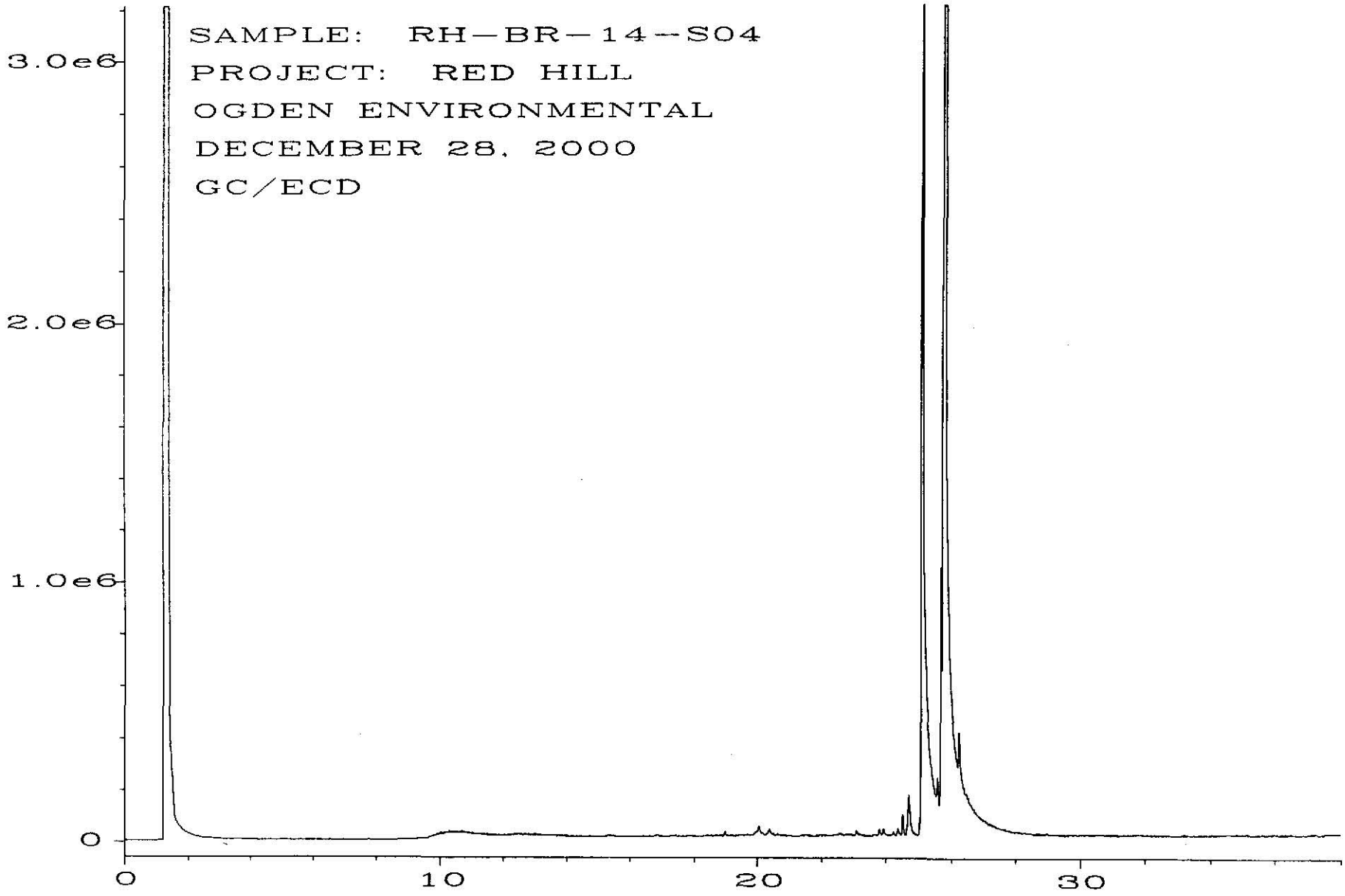

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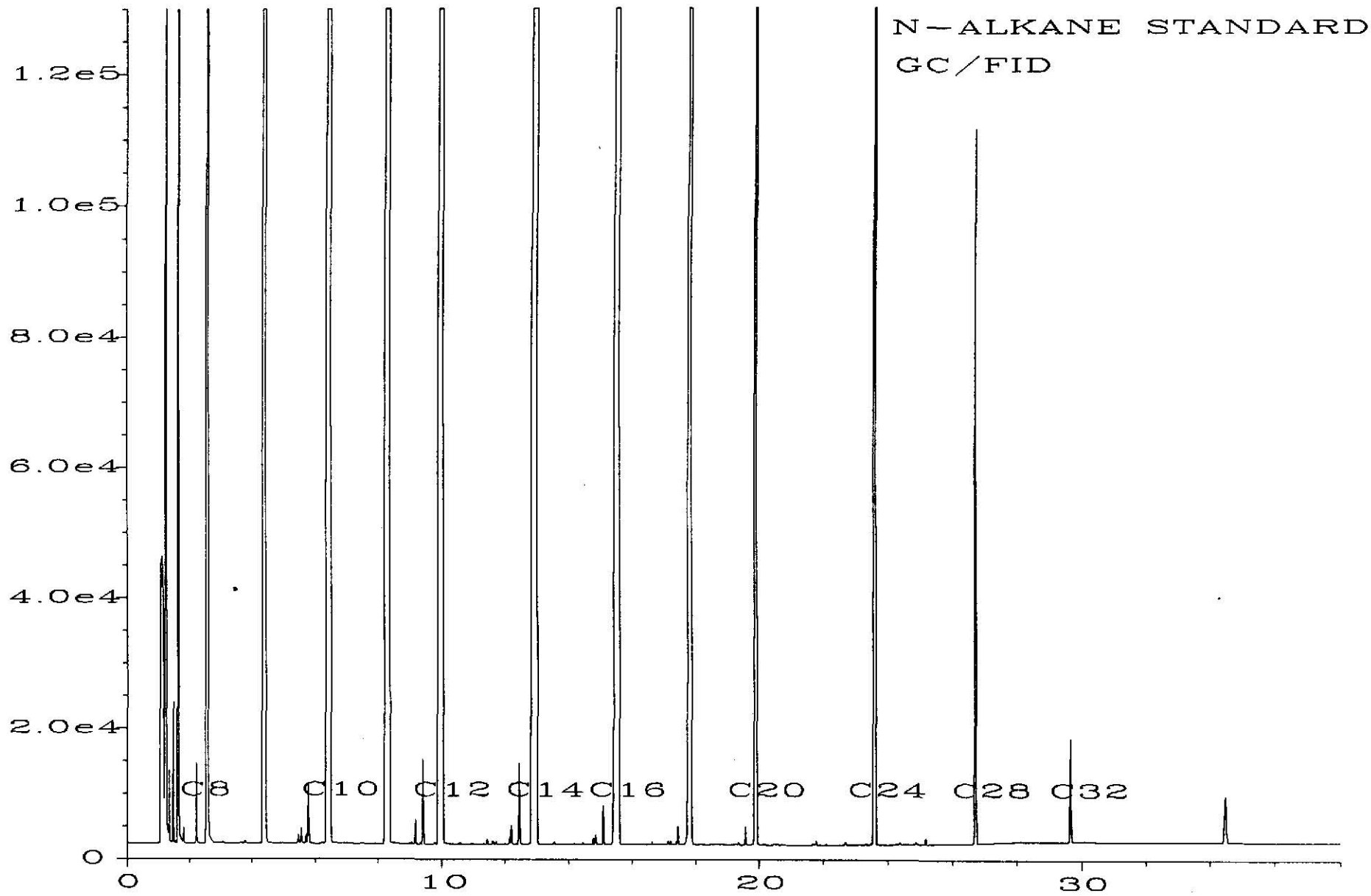

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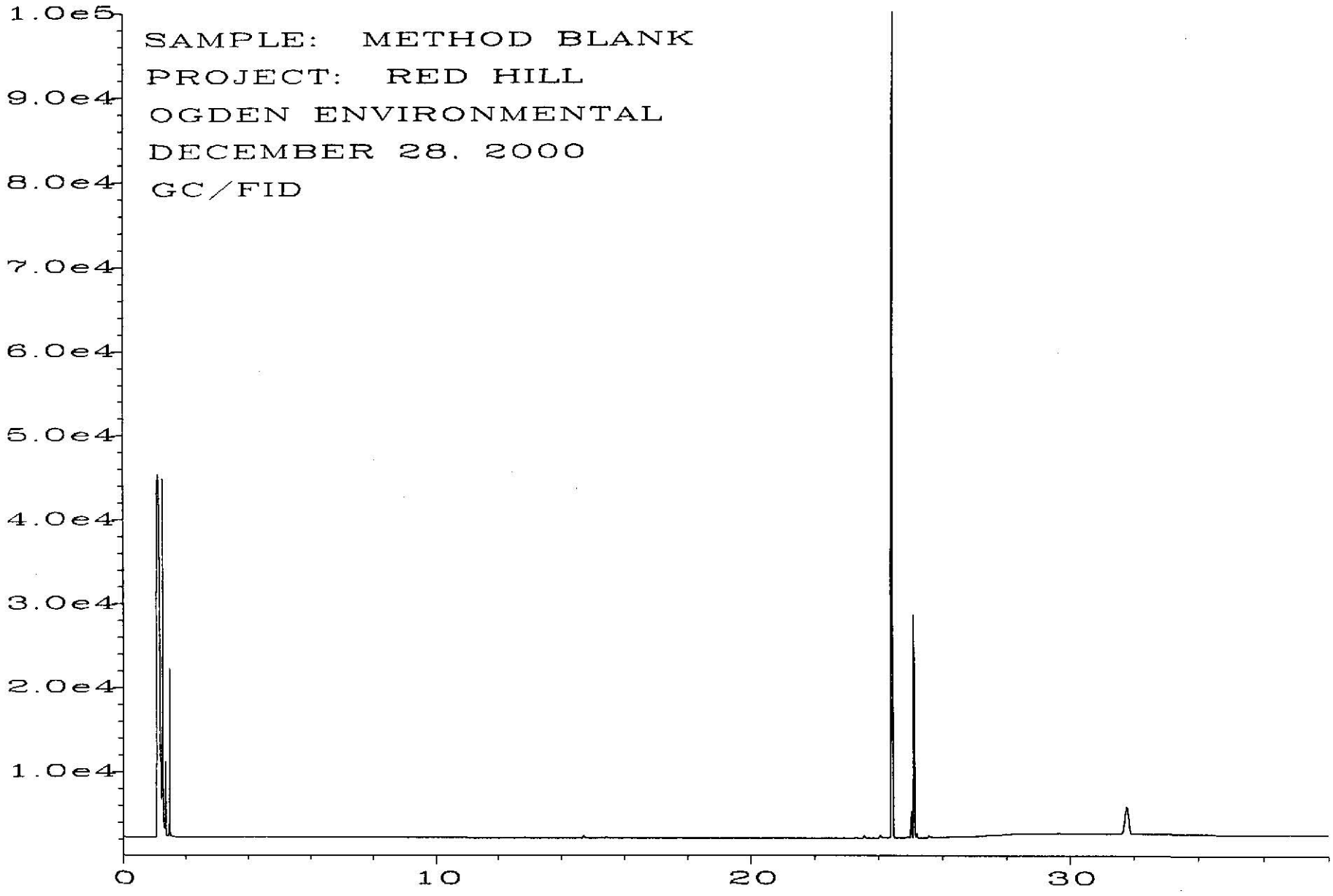

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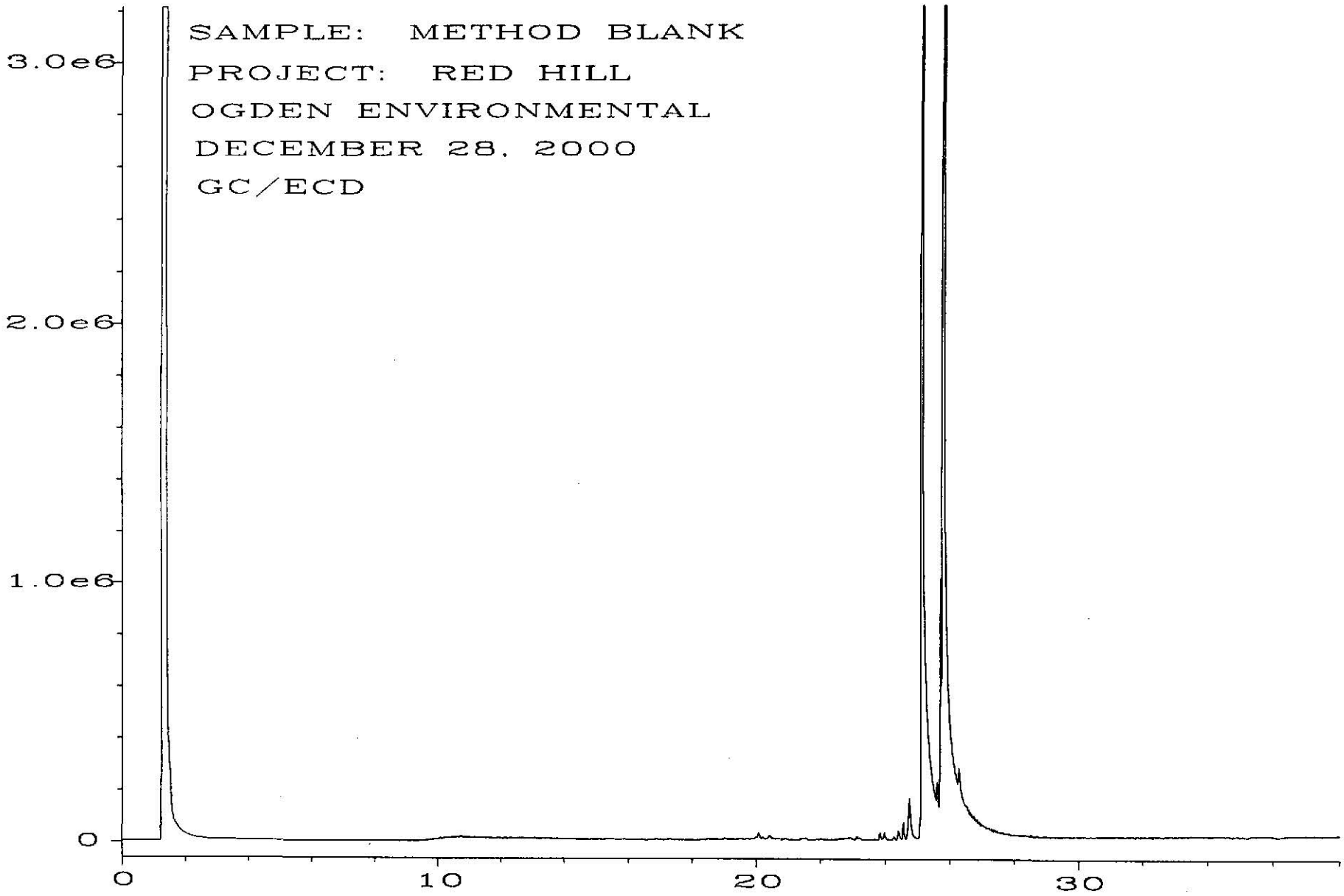

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101080

KJ 1-23-01
302

FRIEDMAN & BRUYA, INC.
3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282

SAMPLE CHAIN OF CUSTODY

Send Report To:
Company Ogden Environmental and Energy Services, Inc. Contact Kent Evetts
Address 2904 Westcorp Blvd., Suite 107
City, State, Zip Huntsville, AL 35805
Phone # (256) 539-3016 FAX # (256) 539-3074 Date 1/22/01

SITE NO.	PROJECT NAME	PURCHASE ORDER #
CTO 229	Red Hill	1-1019-0229

SAMPLERS *(signature)*	PROJECT LOCATION
Gary L. Gleason for Larry De Moss	Oahu, HI

REMARKS: * Amended COC (SW)

SAMPLE DISPOSAL INFORMATION:
- ☐ Dispose after 30 days
- ☐ Return Samples
- ☒ Call for Instructions

	Sample #	Date/Time Sampled	Type of Sample	# of Jars	Lab Sample #	Analyses Requested
21	RH-MW-6-S01	1/18/01 ≈14:18	Liquid (Product water)	3 VOA's (4-6 oz)	RH-MW-6-S01	- Hydrocarbon Fingerprinting (8015) - Piano (8270) - Biomarker
22	RH-BR-6-S02	1/19/01 ≈16:30	Solid (Product + Rock Frag)	1 (1 of 2.25)	RH-BR-6-S02	- Hydrocarbon Fingerprinting (8015) - Piano (8270) - Biomarker
	(SW)					
23	* Trip blank - amended COC	11-28-00 10:30		1		

SIGNATURE	PRINT NAME	COMPANY	Date	Time
Relinquished by: Gary L. Gleason	Gary L. Gleason	Ogden Environmental and Energy Services, Inc.	1/22/01	≈15:31
Received by: Sn C. Wines	Steven C. Wines	FBI	1-23-01	2:00 pm
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on January 23, 2001 by Friedman & Bruya, Inc. from the Ogden Environmental Hill project. Samples were logged in under the laboratory ID's listed below.

F&B ID No.	Ogden ID No.	Method	Date of Receipt	Date Extracted	Date Analyzed	Dilution
101080-01	RH-MW-6-S01	GC/FID/ECD	01/23/01	01/29/01	01/29/01	None
101080-02	RH-BR-6-S02	GC/FID/ECD	01/23/01	01/29/01	01/29/01	1:10

Appendix 6

QUANTERRA, INC. DATA PACKAGE

Appendix 7

ACCUTEST LABORATORY DATA PACKAGE