N00164.AR.000877
NSWC CRANE
5090.3a

# Resource Conservation and Recovery Act Facility Investigation Report for Round 1 and Round 2 Field Work

at

## Mine Fill B (SWMU 13) and Cast High Explosives Fill/ Building 146 Incinerator (SWMU 16)

## VOLUME III - APPENDICES D - I

## Naval Surface Warfare Center Crane

Crane, Indiana

NAVFAC
Naval Facilities Engineering Command

**Southern Division**
**Naval Facilities Engineering Command**

**Contract Number N62467-94-D-0888**
**Contract Task Order 0279**

July 2004

# APPENDIX D
# MISCELLANEOUS FIELD DOCUMENTATION

APPENDIX D.1.1
SWMU 13 AND SWMU 16
SITE LOGBOOK
ROUND 1

NSWC CRANE

N9060

CTO 279

SWMU 13 & 16

LOG BOOK

1363

START : 2-11-03

END :

TETRA TECH NUS, INC.

Terry R. Rojahn
Biologist

661 Andersen Drive, Pittsburgh, PA 15220-2745
(412) 921-8857 ▪ FAX (412) 921-4040
rojahnt@ttnus.com ▪ www.tetratech.com

IF LOST
RETURN
TO :

NSWC CRANE

PROJ. NO = 9060

SWMUS = 13 & 16

PROJECT TOM = RALPH BASINSKI

ASSIT. TOM = TOM JOHNSTON

FOL = TERRY ROJAHN

GEOLOGIST = BOB BALKOVEC

**TITLE** CRANE (NSWC)

**PROJECT NO.** 9060
**BOOK NO.** 1363



TUES. 2-11-03
Work continued from Page

- TRAVEL DAY -

1350 Hrs - ARRIVE @ BLDG 3245 AFTER RECEIVING BADGE @ MAIN GATE
- PREP. to lay out Monitoring Well & DPT Locations
- T. BRENT out of OFFICE
- CALL OFFICE talk to TOM JOHNSTON

1505 Hrs - LOCATE SWMU 16 - NEED ACCESS CLEARENCE FROM MIKE ROACH Ext. 3546

1530 Hrs - RETURN to BLDG 3245 - MEET w/ T. BRENT
TOM will contact & get clearence @ SITES/SWMUS 13 & 16 FOR tomorrow

1550 Hrs - MEET with PUBLIC WORKS
- MARK locations in WHITE
- contact PW when finished locating borings & MWs
- Check back via phone FEB 24 → 27 - talk to DONNA (812) 854 6903

1610 Hrs - LEFT CENTER

1730 Hrs - SHOP FOR SUPPLIES - STAKES & PK NAILS

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE Terry Rogers DATE 2-11-03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

B 100 P ©

2

VOID THIS PAGE

WED. 2-12-03
Work continued from Page

0700Hrs - Arrive @ BLDG #3245
Wait for word from Army Environmental on security issues @ both SWMUS
Army contact is Doug Johnson X 1481
0835Hrs - Got go ahead from Mr. Johnson to access SWMUS 13 & 16 this date
- @ SWMU 13 to inform Mr Marvin Kluesner X 1790 before entery area around BLDG 165
- Need to inform Mike Dages X-1472 to access BLDG 146
Jeff Franklin - Supervisor
(TL) ~~Dor~~ Mike Roach - Production Super X-3546
SEE Doug Johnson's FAX - Pages 4 → 6 (X-1481)
0845 Hrs - Arrive @ SWMU 16
- Cannot be around BLDG 147 during defuser operations - included are locations 16SB04,05, 16MWT04 & 16SW/SD03
- Check in w/ guard & Jeff Franklin
- Located sampling locations until 1300Hrs
1315Hrs - Check in w/ T. Brent - Regarding Boiler removals @ BLDG #s 171 & 166
- 1400Hrs - T. Brent & T. Rojahn reconed Boiler removal areas
- T. Rojahn - made sketches for R. Basinski to use to place boring locations - SEE SKETCHES ON pages - 7 & 8 & PHOTOS ON P. 11
1605Hrs - Finish sketches @ BLDS 171 & 166
1615Hrs - Arrive @ BLDG. #146 - talk to Jeff Franklin
- Defuser down - Finish location of Boring sites near defuser
- Jeff said Defuser will be down 2/13/03 so T.R. could have free access
1700Hrs - Left BLDG 146 Area
1710Hrs - Left Crane

Work continued to Page 4 → 9

SCIENTIFIC BUSINESS PRODUCTIONS CHICAGO 60605 MADE IN USA

SIGNATURE

DATE 2/12/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

**Brent Thomas J CNIN**
**From:** Johnson, Douglas G [JohnsonD@crane.army.mil]
**Sent:** Wednesday, February 12, 2003 10:09 AM
**To:** Brent Thomas J CNIN
**Subject:** FW: TTNUS ACCESS

**Importance:** High

Here are the rules of engagement. Main issue is to ensure coordination with the area supervisors before beginning operations. I should have covered that requirement a little more clearly. Also, another rule that is not listed but is very important - POVs are not allowed inside red flagged areas (denoting explosives operations). It's easier to phone the supervisors ahead of time, as the supervisors are normally within the red-flagged area and are not easily accessible if you're driving a POV.

I can help in coordination with the production folks if needed. Current supervisor @ 146 is Mike Dages (X-1472), and supervisor at B-165/MFB is Marvin Kluesner (X-1790). The head Production Supervisor is Mike Roach (X-3546).

In March, we'll have a short sit-down with the crew to go over the Safety and Security requirements. Shouldn't take too long, but should help in eliminating any problems during their work.

----Original Message----

**From:** **Clinton, Leah K**
Sent: Wednesday, February 12, 2003 9:55 AM
To: Voorhies, John D; Johnson, Douglas G; Baker, Sheryl G; Roach, Michael D; Flynn, Thomas R
Cc: SS Personnel
Subject: RE: TTNUS ACCESS
Importance: High

I believe we've coordinated this as much as possible given the short notification.

Here's the plan for this week:

1. MEA will notify people assigned access control duties. Although the contractor must check in, access will be authorized without an escort.
2. Doug Johnson will:
   a. Coordinate access for Friday, 14 Feb
   b. Make sure the contractor is made aware of the contractor's responsibilities (3 below).
3. The contractor will:
   a. Stop and identify himself to the person performing access control.
   b. Check in with the area supervisor immediately upon entry if the area is in operation and comply with all instructions/prohibitions given to him by the supervisor concerning safety and security.

Here's the plan for the longer term operation planned for mid-March:

1. Doug Johnson will:
   a. Make arrangements to provide the Key/Lock Officer with a copy of the contract or scope of work.
   b. Sign for all controlled contractor core keys
   c. Issue controlled keys to the contactor on DA Form 5513-R
   d. Make sure the contractors are made aware of their responsibilities.
   e. Oversee work and make sure the contractor turns the keys back in immediately upon completion of the work and prior to authorization for release of payment.

2. The Key/Lock Officer will:
   a. Install controlled contractor core locks on 145/146 area and MFB
   b. Provide assistance to Doug Johnson on proper issuance of keys to the contractor
   c. Remove the controlled locks once all keys have been returned by Doug Johnson.

3. The contractor will:
   a. Strictly control keys and immediately turn the keys back in once the contract work has been completed.
   b. Stop and identify himself to the person performing access control.

If gates are locked and nobody is at the guard house, the contractor is responsible for securing the gate behind him (coming and going). NOTE:

Locks must be relocked in their specific original order.

   c. Check in with the area supervisor immediately upon entry if the area is in operation and comply with all instructions/prohibitions given to him by the supervisor concerning safety and security.

4. MEA will notify people who are assigned access control duties. Although the contractor must check in, access will be authorized without an escort.

---Original Message---

**From:** **Johnson, Douglas G**
Sent: Tuesday, February 11, 2003 3:33 PM
To: Clinton, Leah K
Subject: FW: TTNUS ACCESS

Leah,

TetraTech is an environmental contractor that does corrective action work for Crane Navy. They are wanting to work on flagging, soil sampling, and drilling for studies at B-146 and Mine Fill B to determine levels of contamination. These actions are part of the overall Crane site cleanup effort.

Since we're at Bravo +, what is the best way to get TetraTech access to work in those areas and what level of supervision will they need? The scope of the operations is listed in Tom Brent's e-mail below. Terry Rojahn is at Crane currently, and would like to begin the flagging operations. The soil boring and drilling operations should not begin until March.

Let me know your thoughts on this issue.

Thanks,

Doug Johnson
Environmental Protection Specialist
SJMCN-SF
Crane Army Ammunition Activity
(812)854-1481
DSN 482-1481

---Original Message-----

**From:** **Brent Thomas J CNIN** [mailto:brent_t@crane.navy.mil]
Sent: Tuesday, February 11, 2003 3:14 PM



SIGNATURE

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE 2/12/03 DATE

6

To: Johnson, Douglas G
Subject: TTNUS ACCESS

Doug,

Terry Rojahn from Tetra Tech NUS needs access to B146 area & MFB to put in pin flags to obtain a PW digging permit. This will take about 3 days. Furthermore, he has a rented vehicle & would very much like to get this into the 2 sites (after all, MFB is a BIG place). Let me know what you can work out.

Just so you know, Tetra Tech will be mobilizing a full field crew about mid-March w/drill rigs to collect soil boring samples and install wells. I'll let you know more as soon as I find out details. Please let me know what we need to do to make this happen at these 2 sites.

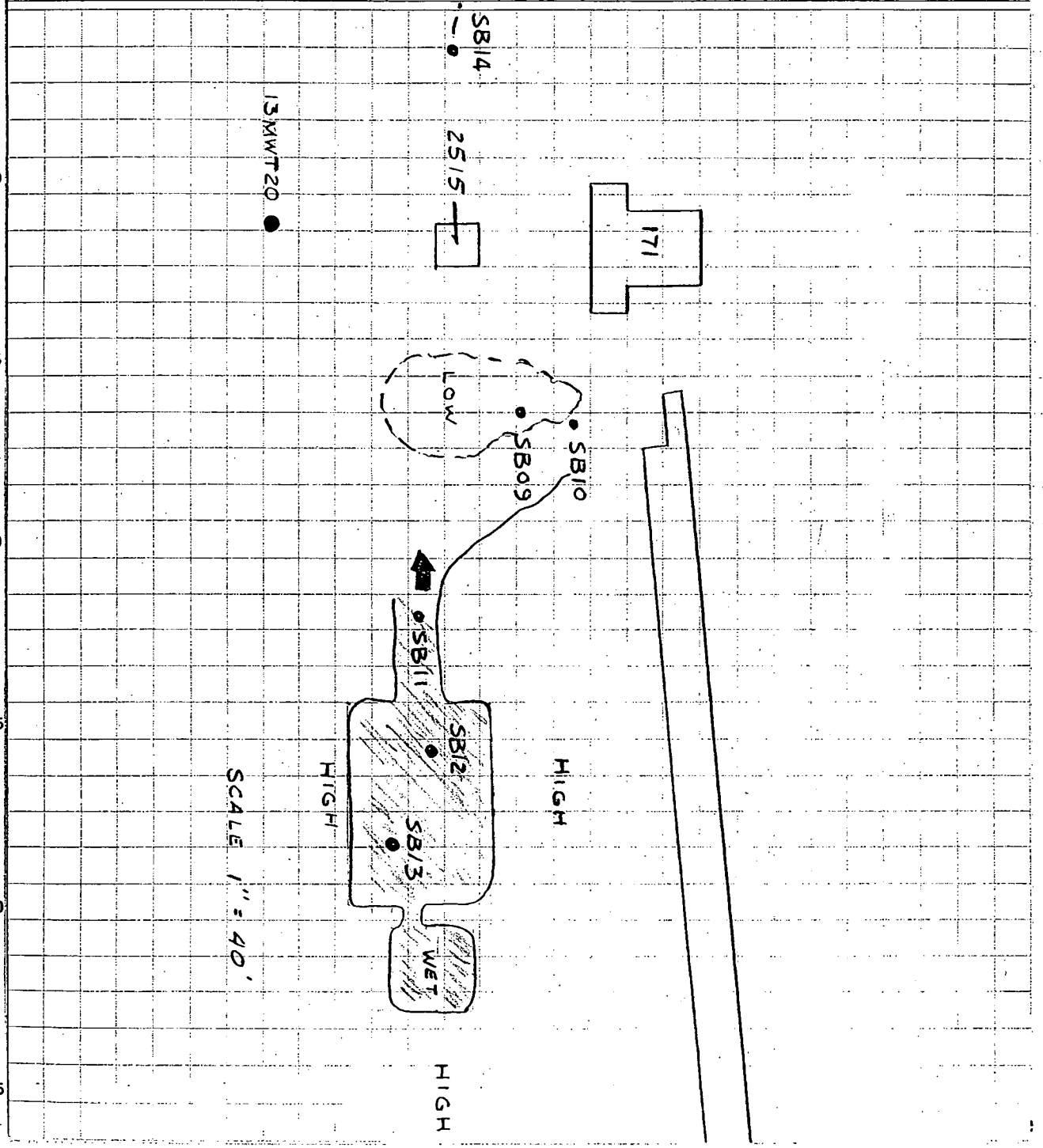
Thanks,
Tom

**TITLE**

**PROJECT NO.** 9060
**BOOK NO.** 1363



| | |
|---|---|
| CLIENT: CRANE | JOB NUMBER: 9060 |
| SUBJECT: SOIL REMOVAL NEAR BLDG 171 | |
| BASED ON: FIELD MEASUREMENTS | DRAWING NUMBER: |
| BY: T.R / CHECKED BY: | APPROVED BY: / DATE: 2-12-03 |




SIGNATURE: Tom Nagel — DATE: 2/12/03

DISCLOSED TO AND UNDERSTOOD BY — DATE — WITNESS — DATE

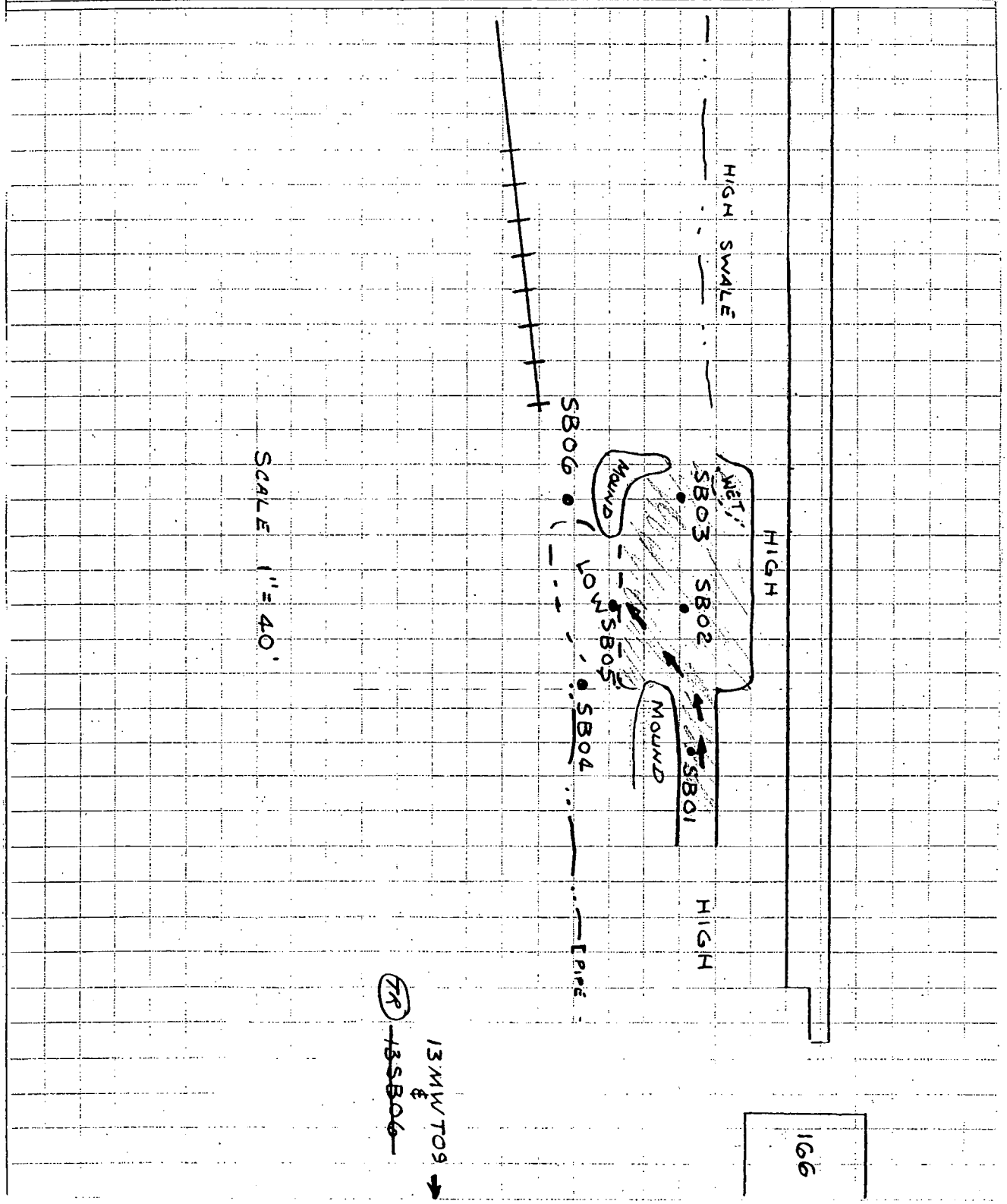
8

| CLIENT | JOB NUMBER |
|---|---|
| CRANE | 9060 |

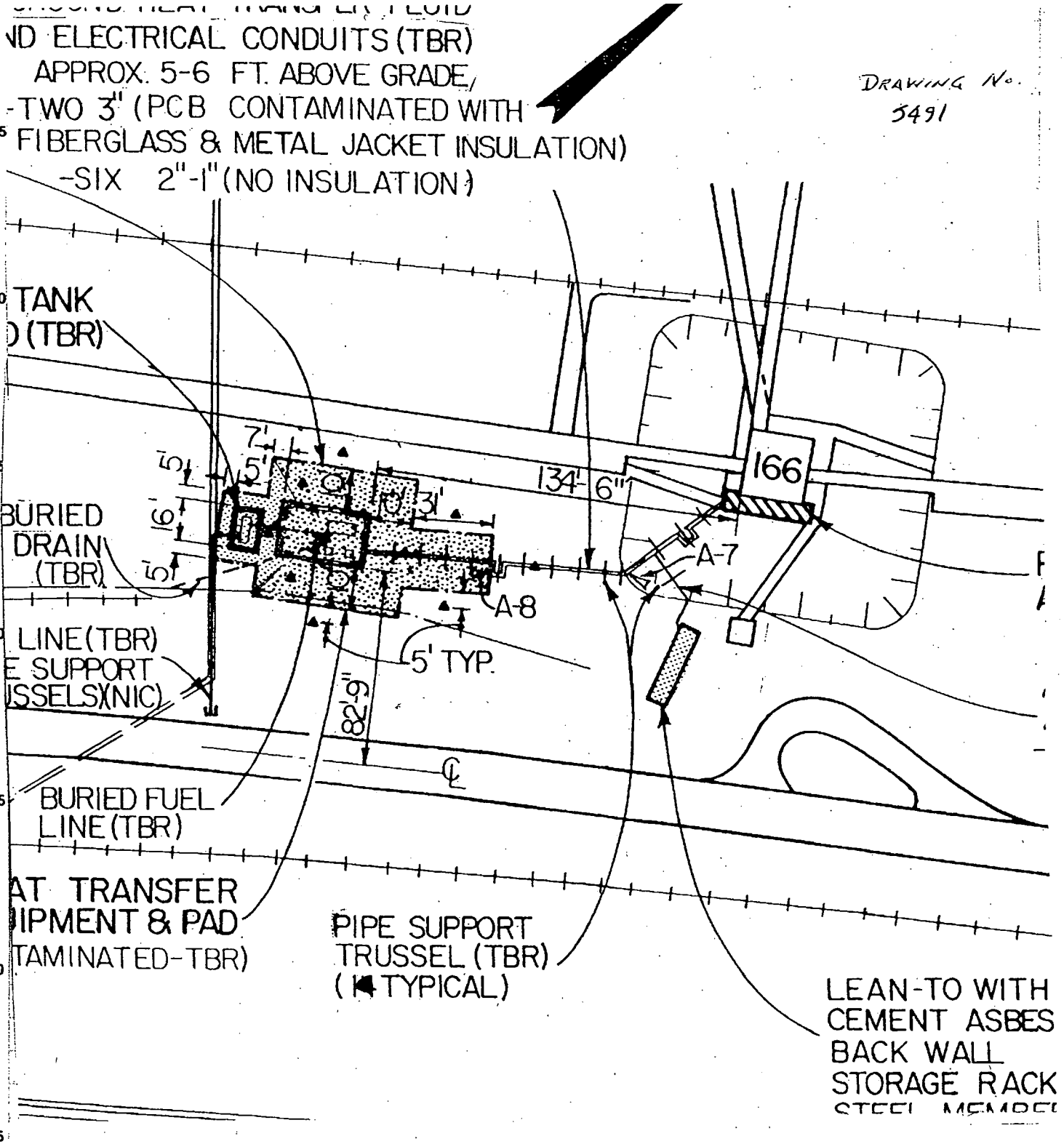
| SUBJECT | |
|---|---|
| SOIL REMOVAL NEAR BLDG 166 | |

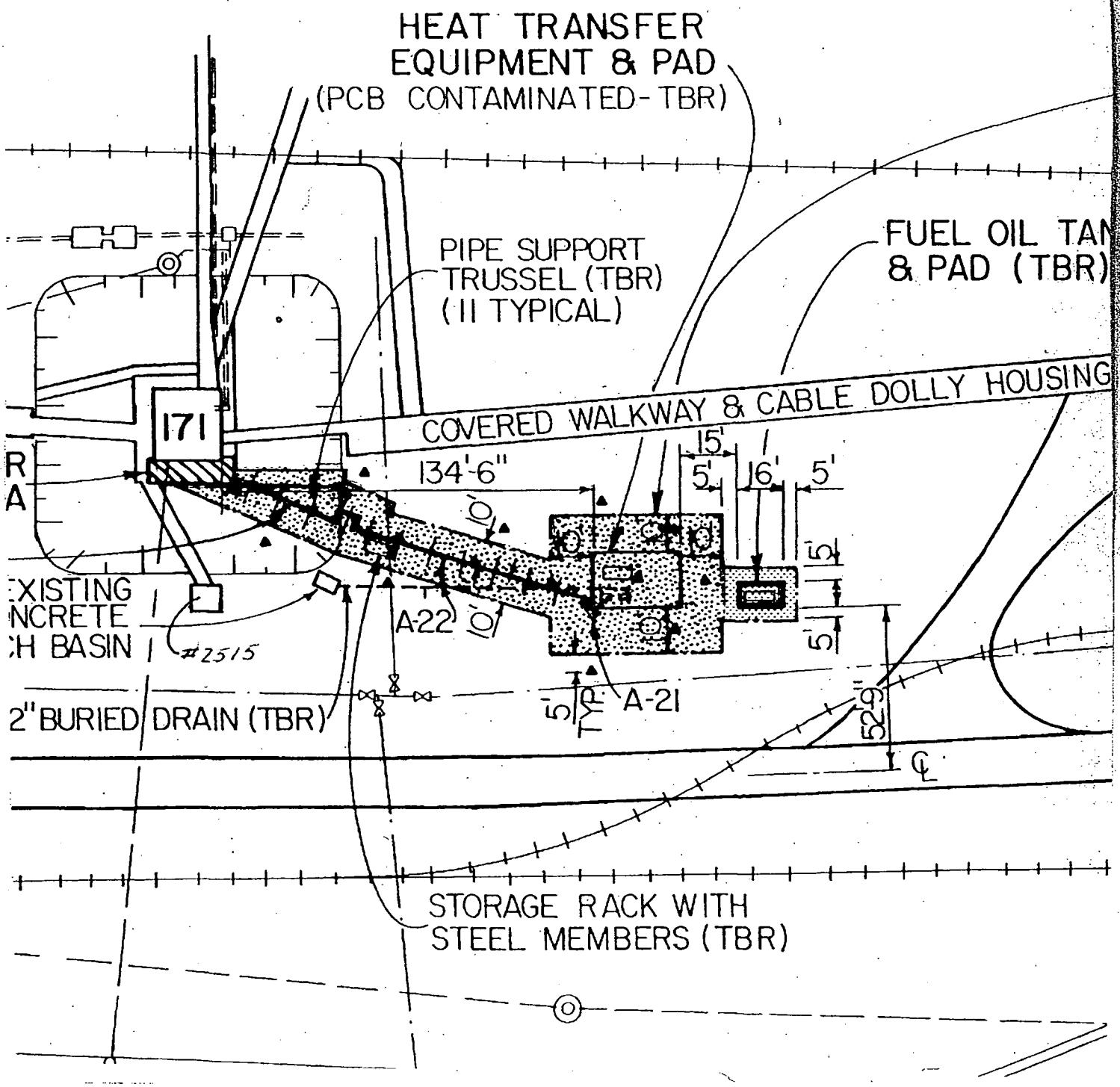
| BASED ON | DRAWING NUMBER |
|---|---|
| FIELD MEASUREMENTS | |

| BY | CHECKED BY | APPROVED BY | DATE |
|---|---|---|---|
| T.R | | | 2-12-09 |

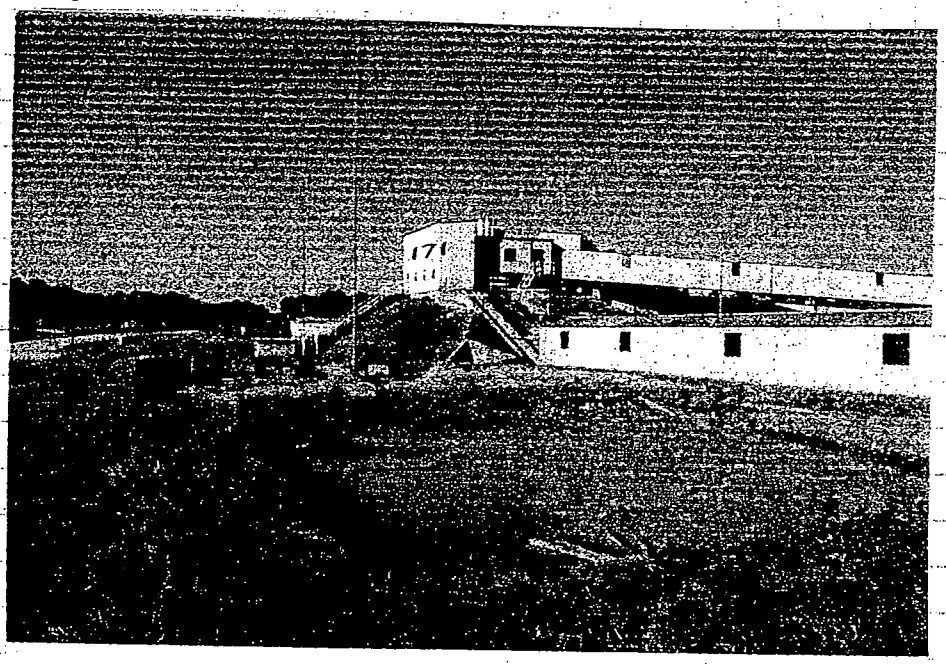


DRAWING No. 5491

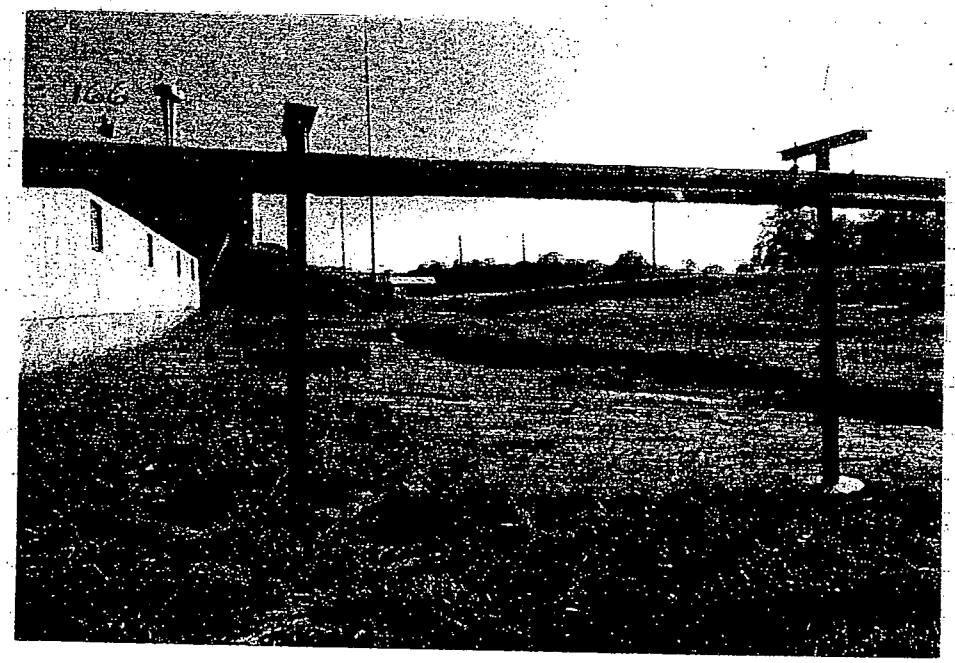



HEAT TRANSFER
EQUIPMENT & PAD
(PCB CONTAMINATED-TBR)
PIPE SUPPORT
TRUSSEL (TBR)
(11 TYPICAL)
FUEL OIL TAN
& PAD (TBR)
COVERED WALKWAY & CABLE DOLLY HOUSING
171
134'-6"
15'
5'
16'
5'
10'
10'
5'
5'
A-22
A-21
EXISTING
NCRETE
CH BASIN
#2515
2" BURIED DRAIN (TBR)
5'
52'9"
STORAGE RACK WITH
STEEL MEMBERS (TBR)

Work continued from Page




24




25

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 2/12/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

VOID THIS PAGE

**TITLE** NSWC CRANE

**PROJECT NO.** 9060
**BOOK NO.** 1363



THURS. 2/13/03

Work continued from Page

0710 Hrs - Arrive @ BLDG 3245
- PREP DRAWING # 5491 OF BLDGS 171 & 166 to FAX to R. BASINSKI
- FAX DRAWING # 5491 to RALPH
- TALKED to RB, SENT up CONFERENCE CALL FOR 1430 Hrs

0805 Hrs - Arrive @ SWMU 16 - PARK outside FENCE/gates lock - will stake out borings outside South END OF site
- staked out 13 locations
- CHECK Existing well KEY # 34567
- CHECK locations OF SUMPS & proximity OF SUMPS to FENCE FOR WELL stake out - SUMPS INSIDE FENCE site MAP SHOWS them on the outside

1030 Hrs - Arrive @ BLDG # 3245
- CALL MR KLUESNER FOR ACCESS to SWMU 16 BLDG 165 - BLDG SHUT DOWN FOR MAINTENCE tomorrow - will HAVE FREE ACCESS - NEED to call tomorrow FOR ACCESS through gate

1050 Hrs - Arrive @ SWMU 13 - locate WELL sites

1410 Hrs - LEFT FOR BLDG. # 3245

1420 Hrs - Arrive @ BLDG # 3245
- CONFERENCE call with R. BASINSKI, T. DENT Bill GATES Doug JOHNSON, Tim JOHNSTON, V. Plachy Matt COCKRAN & B. BALKOVEC; SEE FAX PAGE 14
- Address SAMPLING locations @ BLDGS 171 & 166
- " moving MW locations @ SWMUS 13 & 16
- " site ACCESS ISSUES & ONgoing operations

1550 Hrs - Locate SB01 → 06 & 09-14 @ SWMU 13 w/ T. BRENT then continue to map ABOVE locations & locate MW sites outside FENCE

1700 Hrs - LEFT SECURED FENCED AREA

1745 Hrs - FINISH locating 13MWT13, 14 & 19

1755 Hrs - LEFT CRANE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE Terry Rogers

DATE 2/13/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

14



**Brent Thomas J CNIN**

---

**From:** Basinski, Ralph [BasinskiR@ttnus.com]

**Sent:** Thursday, February 13, 2003 9:56 AM

**To:** Johnston, Tom; Cochran, Matthew; Plachy, Valerie; 'Bill Gates'; Brent Thomas J CNIN CNIN

**Subject:** NSWC Crane SWMUs 13 and 16 Sampling Locations / Access Issues

When: Thursday, February 13, 2003 2:30 PM-3:30 PM (GMT-05:00) Eastern Time (US & Canada).
Where: Main Conference Room

*~*~*~*~*~*~*~*~*~*

Terry Rojahn is currently conducting the utility clearance site visit. He has identified several issues. These include

1] Inadequate # of samples for PCBs at therimonal boilers at MFB

2] Access issues for several monitoring locations at SWMUs 13 and 16

3] General access issues due to ongoing operations and heightened security.

It may be necessary to add or move sample locations. A conference call will be held among Bill Gates, Tom Brent, Terry Rojahn, Ralph B, Tom Johnston, and Valerie P. At the end of the conference call we hope to have determined the locations of additional samples and whether any sample locations have to be moved. Also any modifications to the QAPP (Submittal of the revisions to the QAPP is being held up until it is determined whether any additional modification must be made to the QAPP).

Field sketches made by Terry are attached for use in the meting.

<<Field Sketch for PCB Samples MFB.pdf>>

FRI 2/14/03

Work continued from Page

0700 Hrs - Arrive @ BLDG # 3245
Paperwork & wait for D. Johnson to deliver
Key to access SWMU 16
0805 Hrs - T. Brent received key to access gate to
BLDG 146 - went w/ T.B. to BLDG 146
Tom unlocked gate & returned to BLDG 3245
T.R. located sampling sites for wells next to
East & West sumps, etc. @ SWMU 16
0905 Hrs - Return to BLDG # 3245 - inform T. Brent of
my return so that he could secure gate @ BLDG 146
0920 Hrs - Arrive @ SWMU 13 - Check in with Mr Kluesner
- Locate 13 monitoring well sites
- Photo Boiler removal areas near BLDGs 171 & 166
1125 Hrs - Finish @ SWMU 13 Check out w/ Mr. Kluesner
1205 Hrs - Arrive @ Public Works
- Adjust maps to reflect changes in well locations
- Add soil boring locations for BLDGs 171 & 166
- Adjust Dig Permit Request to reflect the
addition of 6 more soil borings @ SWMU 13
1238 Hrs - Arrive @ BLDG # 3245
- Demob SUV & clean
- Prep. to depart to Airport
- Check out w/ T. Brent
1335 Hrs - Left Crane → Remainder of day TRAVEL

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE Terry Rogers DATE 2/14/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

VOID THIS PAGE

MON 3/24/03

Work continued from Page

TRAVEL DAY

1325 Hrs - ARRIVE @ MAIN GATE (Bloomington) obtain badges - MATT COCHRAN, BOB BALKOVEC & T. ROJAHN

1338 Hrs - ARRIVE @ BLDG 3245 (FIELD OFFICE)
Start opening boxes & coolers to organize EQ. & sample containers

1430 Hrs - PICK UP DIG PERMIT FOR SWMU 16
Problem w/ SWMU 13 Public works having trouble getting on-site.

1500 Hrs - RETURN to BLDG 3245 - Drillers ARRIVED
TIM BOEHMER - FOREMAN
DAVE SCHRECENGOST - DRILLER
JON KEIFER - HELPERS
CHAD MAHAFFY -
TONY MAYRER -

Drillers organize supplies

1600 Hrs - H&S meeting

1715 Hrs - FINISH H&S MEETING
PREP. EQ FOR DPT work tomorrow
LEAVE MESSAGE FOR R. BASINSKI ON DAY'S EVENTS

1755 Hrs - LEFT BASE

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 3/24/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

B 100 P ©

ON SITE
THNUS - M. Cochran, Bob Balkovec, T. Rojahn
B-M - T. Boehmer, D. Schreckenost, J. Keifer, C. Mahaffy, T. Mayer & J. Akers

TUES 3/25/03 SUMMARY

Kick off Meeting w/ T. Brent, C. Freeman & Army
Receive Key to SWMU 16 & 13
Receive Dig Permit for SWMU 13
Gave H&S to Jeff Akers
Sample Borings
135B01 → 135B06

Install - 13MW T16 See W.B. # 2555

LOACs Generated
Laucks - 0963 & 0964
Triangle - 0965

SCIENTIFIC BINDERY PRODUCTS CHICAGO 50605 MADE IN USA

TUES 3/25/03

Work continued from Page AM Weather mild & sunny PM mild w/period of heavy rain start ~1400 Hrs

0700 Hrs - Arrive @ BLDG 3245
Prep. to sample W/DPT @ SWMU 16
0800 Hrs - Arrive @ Kick off meeting w/ Tom Brent & C. Freeman; Army represented by Frank Mitchell & Mike Roach (x3546)
They presented maps w/ limited access due to material handling. Also, received 3 keys (T. Brent, B. Balkouce & T. Rojahn) for access to S. Gate @ SWMU 13 & gates @ SWMU 16
Others @ meeting included T. Boehmer & D. Schregengost of B-M & M. Cochran, B Balkouce & T. Rojahn of TtNUS
No access to SWMU 16 until Thursday 3/27/03
Have to switch focus from SWMU 16 to SWMU 13
0840 Hrs - Stop at Public works to try to hurry up SWMU 13 dig permit - Donna very helpful will call gas co. & us when permit is finished
1200 - 1300 Hrs
0910 Hrs - Arrive @ SWMU 13 to show MW locations to B-M (T.B. & D.S.) & TtNUS (M.C. & B.B.)
Select location 13MWT15 to start when dig permit is obtained - meanwhile will start setup of drilling rig
1130 Hrs - Lunch
1200 Hrs - Prep. to sample @ SWMU 13
Pick up Dig Permit
1230 Hrs - Arrive @ Boring locations near BLDG 166
Begin sampling @ 1240 Hrs end @ 1420
See CoCs 0964, 0963 & 0965
1500 Hrs - Return to BLDG 3245 for packing & paperwork
1800 Hrs - Left site
1830 Hrs - Drop off samples ship to Lauks on Fed. Ex AirBill # 8316 7332 7269

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 3/25/03
DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

CREW:

T+NUS - M. COCHRAN, B. BALKOVEC & T. BJAHN

B-M - D. SCHREGENGOST, J. KEIFER, C. MAHAFFY, T. MAYCEK & J. AKERS

SUMMARY WED 3/26/03

INSTALLED: 13MWT17 & 18 SEE NB 2555

SAMPLED SOIL BORINGS - 135807 &
135809 → 135813

ALSO, COLLECTED RINSATE & SOURCE BLANKS FOR TAP WATER & DI

COFCS GENERATED
LANCKS - 0968, 0970
TRIANGLE - 0966

DI IS NERL REAGENT GRADE WATER
NERL DIAGNOSTICS
14 ALMEIDA AVE
E. PROVIDENCE, RI 02914
LOT # 0109313
EXP DATE 01-2004

SCIENTIFIC BINDERY PRODUCTS, CHICAGO

WED 3/26/03

Work continued from Page AM sunny & mild PM - Same

0650 Hrs - Arrive @ BLDG 3245
Prep. to sample @ SWMU 13
0730 Hrs - Arrive @ SWMU 13 - set up to sample Soil Borings
M.C & T.R sampled 135809 → 135813
SEE CoFCs 0966 & 0968
1000 Hrs - Finish sampling @ SWMU 13
1015 Hrs - Return to BLDG # 3245
- FAX CoFCs to Laucks
- " " " OFFICE
- Call T. Patton order soil auger & bucket bits to sample @ 135814 - Refusal w/ DPT
- Called office left message w/ R. Basinski
1200 Hrs - Lunch
1230 Hrs - Return to BLDG # 3245
- Prep. to collect Source Blanks & Rinsate
SEE CoFC # 0970
- M.C. & B.B. collect samples @ 135807
- T.R. collected S.Blanks & Rinsates
- Pacicage samples for shipment on
CoFCs 0966 & 0965 for Triangle &
0968 & 0970 for Laucks
1740 Hrs - Left Base for FED. EX. Drop off the following:
Triangle samples on AB# 8316 7332 7247
Laucks samples on AB# 8316 7332 7258
1830 Hrs - Arrive @ Motel

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE T. Patton DATE 3/26/03
DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

CREWS - SAME AS 3/26/03 P 20

THURS. SAMPLE SUMMARY 3/27/03

INSTALLED : 13MWT 10, 12 & 16 SEE NB #2555

SAMPLED SOIL BORINGS : 165B01 → 11, 14-17 & 41

COECS GENERATED

LAUCKS : 0959 & 0960

TRIANGLE : 0962

SCIENTIFIC SINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

**TITLE** NSWC CRANE

**PROJECT NO.** 9060

**BOOK NO.** 1363



THURS. 3/27/03

Work continued from Page

AM SUNNY & MILD PM - SAME

0700 Hrs - ARRIVE @ BLDG # 3245

0730 Hrs - TRY to ACCESS 2nd GATE @ BLDG 146 CONTRACTOR LOCK NOT IN PLACE YET - RETURN to BLDG 3245 INFORMED C. FREEMAN - SHE WILL TAKE CARE OF THE PROBLEM (CALLED FRANK MITCHELL)

0810 Hrs - ACCESS 2nd GATE - MAINTENANCE OPENED GATE MC & T.R.
Collected soil samples @ 165B01 → 07 & 165B41
WATER LEVEL @ SUMP NEAR 165B14 @ 4' w/ TD @ 8'

1130 Hrs - LUNCH

1200 Hrs - RETURN to BLDG 3245
REFRIGERATE samples; check in @ OFFICE

1310 Hrs - RETURN to SWMU 16
Collected soil samples 165B08 → 11 & 165B14 → 17

1615 Hrs - SECURED 2nd gate w/ Contractors lock
RETURN to BLDG #3245
PACKAGE samples taken this date ON COFCs 0959 & 0960 FOR SHIPMENT ON FED. EX. AIRBILL # 8316 7332 7236

1830 Hrs - DROP OF SAMPLES @ FED. EX.

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 3/27/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

CREW - SAME AS 3/26/03

J. AKERS & C. MAHAFFY LEFT FOR HOME @ the END OF DAY.

FRI. : 3/28/03 SUMMARY

INSTALLED - 13 MWT 11, 21, 22, 25 & 26, SEE NB 2555

Sampled - 21 Soil Borings SEE P. 25

SUMP @ SWMU 16 (16SB40) - WATER @ 5'
TD = 8'

COCs GENERATED
LAUCKS: 0961, 0972, 0981
TRIANGLE: 0967 & 0971

SCIENTIFIC BINDERY PRODUCTS CHICAGO 60605 MADE IN USA

**TITLE** NSWC CRANE

**PROJECT NO.** 9060

**BOOK NO.** 1363



FRI 3/28/03

Work continued from Page

Weather Partly cloudy & windy/cool 50's

0700 Hrs - ARRIVE @ BLDG. 3245
PREP to SAMPLE soils

0745 Hrs - Arrive @ SWMU 16 set up to sample soils
SAMPLE 16SB 12, 13, 31, 30, 29, 22 & 25 SEE CoFC 0972
SAMPLE 16SB 25, 24, 23, 18, 19, 21, 27 & 28 SEE CoFC 0961
SAMPLE 16SB 28, 20, 35, 37, 38, 39 & 40 SEE CoFC 0981

1500 Hrs - Finish collecting soils and leave SWMU 16

1510 Hrs - Arrive @ BLDG # 3245
PACKAGE & SHIP SAMPLES FOR LAUCKS LAB
Collected on above CoFCs

1730 Hrs - LEAVE BASE FOR FED. EX.

1800 Hrs - DROP OFF SHIPMENT @ FED. EX ON AB#
8316 7332 7225

1020 Hrs - SENT FAX to Hugh Prentice of Laucks - w/ CoFCs - Samples
Collected this date - FOR SAT. Pick up.

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 3/28/03

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE

CREW - THNUS - M. COCHRAN, B. BAIKOVOC & T. ROSAHN
B-M - D. SCHREGENGOST, J. KEIFER & T. MAYREC

SAT : 3/29 / SUMMARY

INSTALLED : 13MWT 01, 02 & 05
SAMPLE : SURFACE WATERS
13SW01-07, 09 & 10
13SD01 - 10, 17, 18, 22 & 23
ADDED

COFCS GENERATED
LAUCKS : 0973, 0980, 0975 & 0978

SCIENTIFIC SINDERY PRODUCTS CHICAGO 5 MADE IN USA

**TITLE** NSWC CRANE **PROJECT NO.** 9060 **BOOK NO.** 1363



SAT 3/29/03

Work continued from Page

Weather Cloudy & cold 30's

0650 Hrs - Arrive @ BLDG # 3245
Prep for surface water & sed sampling
Checked BLDG 3260 for water quality eq.
Found only Cali. solutions & Turbidity meter
0815 Hrs - Checked @ BLDG 41 for peristalic pump
& YSI - Found @ signed form
0855 Hrs - Returned to BLDG 3245
Calibrated YSI
Finish prep for sampling surface waters
& sediments
1000 Hrs - Arrive @ SWMU 13
Sample: 13SD22, 01, 02 & 23; and 13SW01 & 02
1200 Hrs - Break for lunch
1300 Hrs - Return to BLDG 3245
Prepare bottle sets for remainder of day's
sampling effort
1400 Hrs - Arrive @ SWMU 13
Sample: 13SW/SD 03, 04, 05, 06, 07, 09 & 10 &
13 SD 08, 17 & 18
1800 Hrs - Complete sampling this date
1810 Hrs - Arrive @ BLDG 3245
Paperwork & secure samples
1900 Hrs - Left site for Hotel.

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE Terry Rogers DATE 3/29/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

CREWS: SAME AS ON P. 26

SUN: 3/30/03 SUMMARY

INSTALLED: 13MWT01, 03, 04 & 08; SEE NB 2555

SAMPLED: SURFACE WATER - 13SW12 & 13

SEDI - 13SD11→16, & 19→21

SOIL - 13SB08 - SS & SB

COPCs GENERATED

LAUCKS: 0980, 0978 & 0979

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

SWH 3/30/03

Work continued from Page

Weather Cloudy & Cold 30°s

0650 Hrs - Arrive @ BLDG #3245
PREP. to sample SW/SD @ SWMU 13

0900 Hrs - Arrive @ SWMU 13
SAMPLE Locations
13 SW/SD 11 - Dry collect SD only
13 SW/SD 12 & 13
13 SD 14 → 16 & 21

1200 Hrs - Return to BLDG #3245 - LUNCH

1235 Hrs - Return to SWMU 13
SAMPLE Locations 13 SD 20 & 19

1335 Hrs - Return to BLDG #3245
PAPERWORK & Sample Handling

1840 Hrs - LEAVE BASE FOR Hotel
Stop FOR GAS & Supply PURCHASE

2120 Hrs - FAX OFFICE FRI. SHIPMENT CoFCs
0961, 0972 & 0981

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 3/30/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

CREWS : SAME AS ON P.26

MON 3/31/03

INSTALLED 13MWT 14 & 19

SCIENTIFIC BINDERY PRODUCTS., CHICAGO 60605 MADE IN USA

**TITLE** NSWC CRANE

**PROJECT NO.** 9060

**BOOK NO.** 1363



MON. 3/31/03

Work continued from Page

WEATHER: mostly sunny & 40's

0650 Hrs - Arrive @ BLDG #3245
PAPERWORK & PACKAGING
CHECK IN @ OFFICE; FAX CoCs to Ed Sedlmyer for distribution

1400 Hrs - CHECK Drilling Locations w/ Tom Brent for restoration + REVEGETATION; Relocate 13MWT20 & 09 to DPT locations.
CHECK IN w/ OFFICE (ED) checked w/ LAWCKS ok to sample tomorrow
CHECK SWMU 16 - SW locations dry; ~~key~~ (TC) BLUE Lock on Back Gate for Access to Existing wells & SW/SDs
Return to BLDG - SECURE OFFICE; pick up samples.
Rig stuck @ 16MWT13; will have to relocate and inform PW.

1700 Hrs - LEFT BASE FOR SAM'S CLUB & LOWES - FOR SUPPLIES, stakes & ~~Cold tar to~~ (TC) cold tar to patch Boreholes in Asphalt @ SWMU 16

1845 Hrs - Return to Hotel.

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 3/31/03

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE

CLEWIS: SAME AS P 26

INSTALLED: 13MWT09, 20, 23 & 24

SAMPLED: SW/SD @ SWMU 16

SEE COCs 0983 & 0982

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

**TITLE** NSWC CRANE

**PROJECT NO.** 9060

**BOOK NO.** 1363



TUES.

Work continued from Page

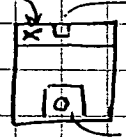
SUNNY & 70's

0650 Hrs Arrive @ BLDG 3245

PREP to sample SW/SD @ SWMU 16

TALK to Tom regarding sump next to BLDG. 189

SAMPLE behind divider




0815 Hrs - TALK to MEAD. to bring dozer through North gate - He okeed

0830 Hrs - Check in w/ drill crew

0930 Hrs - ACCESS dozer to BMWT09 w/ boards on road crossings

0947 Hrs - Talked to Donna @ PW about moving BMWT13 - she will get it cleared will talk to her on Monday

1000 Hrs - Return to BLDG #3245

Called F. Mitchell regarding work @ BLDG 146 NEXT WEEK - He said it looks good through MAY however there is work sch. @ BLDG #145 so he would have to talk to Mike Roach to see if that would impact us - he would get back to Tom B.

1020 Hrs - Arrive @ SWMU 16

SAMPLE 165D11, 02, 10, 04 & 05

1135 Hrs - BREAK FOR LUNCH

1200 Hrs - Return to BLDG PICK up Additional supplies

1215 Hrs - Arrive @ SWMU 16

Sample 165D08, 09, 06, 03 & 165W0101

1505 Hrs - Arrive @ BLDG #3245 prep. samples FOR SHIPPING ON COFCs 0982 & 0983

1730 Hrs - Drop of Samples ON FED. EX. AB# 8316 7332 7199

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 4/1/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

B 100 P ©

VOID this page

SCIENTIFIC BINDERY PRODUCTS CHICAGO 60607 MADE IN USA

**TITLE** NSWC CRANE

**PROJECT NO.**

**BOOK NO.**



WED APRIL 2, 2003

Work continued from Page

0700Hrs - Arrive @ BLDG #3245
General House Cleaning @ BLDG 3245
FAX C.O.C 0982 & 0983 to LAB & OFFICE
0815Hrs - Left Base For Airport

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 4/2/03

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE

T+N&S - B. BALKOVEC & T. KOJAHN
B-M - D. SCHRECENGOST, Jim KEHGA, J. AKERS, T. MAYER & C. MAHAFFY

MON 4/7/03 SUMMARY

- TRAVEL DAY
- Installed: 13MW106 see NB 2535
- SAMPLED: Rinsates RB040703 01 @1615 ss mixing bowl
  RB040703 02 @1630 ds: trowel
- ~~HSO on site survey crew (TT)~~

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

MON 4/7/03

Work continued from Page COOL & OVERCAST

TRAVEL DAY

1245 Hrs - ARRIVE @ BLDG #3245
Organize newly delivered coolers + EQ. SHIPMENTS

1330 Hrs - CHECK IN @ PW - OK to install 13 MWT 13

1345 Hrs - CHECK IN @ MAIN gate for picture badge - CANNOT get picture badge - but will RECEIVE A laminated long term badge CHECK BACK WED or THURS.

1410 Hrs - Return to BLDG #3245 - check on operations @ BLDG 265 M. Kluesner said may be FINISH OPERATIONS @ 1630 Hrs. but Check @ BLDG 165 first.

1440 Hrs - CHECK ON DRILLERS - gone to ESCORT dozer pick up to SWMU 13 - D.S. ARRIVED

1510 Hrs - RETURN to BLDG 3245
PREP LABELS FOR RINSATES

1615 Hrs - Collected Rinsate of S.S. Mixing bowl RB04070301 w/ Reagent Grade $H_2O$ by NEKL Lot # 0109313 EXP. 01-2004

1630 Hrs - Collected Rinsate of Disposable Plastic Trowels RB04070301 w/ SAME Reagent Grade $H_2O$ as above

- Labeled & Tag Rinsate containers & SECURE IN Frig
- PREP FOR SURVEYORS to ARRIVE tomorrow

1900 Hrs - LEFT SITE

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 4/7/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

CREWS
T+NCUS & B-M SAME AS on P 36
B.T.&R - M. Cooper & Corey Allen

4-8-03 SUMMARY
Installed - 1.6MWT O! SEE NB 2555
SEE PAGES 40 & 41 FOR RULES to ACCESS MFB
JK & CM - worked on well pads @ SWMU 13
Surveyors - Locate SW/SO @ SWMU 13 outside FENCE

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 50605 MADE IN USA

TUES. 4/8/03

Work continued from Page Cool & OVERCAST

0655 Hrs - ARRIVE @ BLDG #3245
PREP. FOR SURVEYORS

0730 Hrs - SURVEYORS ARRIVE - MATT Cooper & Corey Allen
GIVE H&S TRAINING W/ Work Permit
SHOW SURVEYORS SWMU 13

1000 Hrs - SURVEY crew to work outside of MFB SED/SVI locations - Got DRILLING CREW INSIDE SWMU 16

1025 Hrs - MEET W T. Brent - said someone SAW someone W/ A GPS inside Buffer zone @ BLDG 165 - CHECK IN W/ Mr Kluesner - HE didn't Know anything about it. Also checked W/ Guard at North Gate

1105 Hrs - MEET W/ LEAH Clinton (HEAD OF SECURITY)
Worked out ground rules for subs accessing SWMU 13 - SHE will get E-Mail to T. Brent

1130 Hrs - Unlock gate @ SWMU 16 to let drilling crew out for lunch

1200 Hrs - LUNCH

1300 Hrs - MEET W/ SURVEY crew & drilling crew to discuss ACCESS rules @ SWMU 13
- WAIT FOR E-mail FROM LEAH Clinton
- tally soil samples TAKEN & APPROPRIATE DUPS & MS/MSDs NEED to take @ SWMU 16
- Prep. CoFCs FOR tomorrow & CHECK in W/ OFFICE
- RECEIVE E-Mail FROM Cris Freeman & LEAH Clinton

1700 Hrs - LEFT BASE

END



Work continued to Page

SIGNATURE [signature] DATE 4/8/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

**Freeman Christine D CNIN**
**From:** Freeman Christine D CNIN
**Sent:** Tuesday, April 08, 2003 4:18 PM
**To:** 'ClintonL@crane.army.mil'
**Cc:** Brent Thomas J CNIN; 'Johnson, Douglas G'; Mitchell Frank CNIN
**Subject:** RE: Contract Work in MFB

Leah,
Code 095 acknowledges receipt of your instructions (Tom had to leave for the day). The contractors will receive a copy of this email.

The following are the names of the contractors conducting work in MFB:

TtNUS:

Robert Balkovec
Terry Rojahn
Bowser-Morner:

Dave Schrecengost
Tony Mayrer
Jon Keifer
Jeff Akers
Chad Mahaffy
Bledsoe Tapp & Riggert, Inc.:

Matthew Cooper
Corey Allen

Thank you for you assistance.

----Original Message----

**From:** **Johnson, Douglas G [mailto:JohnsonD@crane.army.mil]**
Sent: Tuesday, April 08, 2003 15:53
To: Freeman Christine D CNIN
Subject: FW: Contract Work in MFB
Importance: High

----Original Message----

**From:** **Clinton, Leah K**
Sent: Tuesday, April 08, 2003 3:45 PM
To: 'brent_t@crane.navy.mil'; Mitchell, Frank E; Johnson, Douglas G; Wininger, Terri L; Roach, Michael D; Baker, Sheryl G; Kluesner, Marvin J; Voorhies, John D; Guard Supervisors
Cc: Helms, Mark E; Shearin, Walter F; Meals, Sterling W; Thomas, Norman R; XO; SS Personnel
Subject: Contract Work in MFB
Importance: High

BACKGROUND: TTNUS (contractor) is currently performing work in the MFB > area. We must make sure that:

- access controls are maintained in all of our operational areas
- contractors are granted the necessary access in order to perform > requested work and that access is consistent with safety and security requirements

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 2665 MADE IN USA

Work continued from Page

- contractors are made aware of and comply with key and access control requirements
- persons performing access control (both CAAA guards and in-house personnel) are given the proper guidance necessary to adequately perform their duties

TTNS employees or other contractors performing work in the area shall:

- provide the name(s) of the contract employees or a list of supervisors who can "vouch" for the identity of the contract employees (so we may provide this information to the guard force).
- check in and out with the guard/access control person prior to entering and upon leaving MFB (the guard is located at the gate nearest bldg 165). Contractors are not required to check in/out if a guard is not/no longer on duty (e.g., after hours or on weekends when there are no operations in the area).
- call the bldg 165 supervisor (854-1790) to notify him/her that contractors will be working in the area and to obtain any approvals/prohibitions concerning movement in/around/behind the general area of bldg 165 (as provided by Mr. Mike Roach on a color-coded map). For convenience, the guard will make the phone in the guard house available for this purpose. The contractor shall not go in/around/behind bldg 165 without specific approval in advance by the bldg 165 supervisor. Approval shall be obtained on a case-by-case basis.
- go around to the opposite gate and enter the area (nearest bldg 174) (where a contractor cored lock has been installed). The contractor shall secure the gate behind him/her. The contractor shall not permit anyone other than his/her own employees to enter the area at the same time (i.e., no "piggybacking").
- exit thru the same gate he/she entered, secure the gate behind him/her; and "check out" thru the gate guard.
- control keys assigned to them. Making duplicates is unauthorized.
- turn in all keys immediately upon completion of requested work.

ALL: Similar written/detailed instructions must be provided to all contractors working in our areas and coordinated with all parties concerned. I will be happy to provide you advice and assistance if you are preparing similar instructions for contract work being performed in your area of responsibility.

Mr. Brent: Please acknowledge receipt and provide the names of the contract employees who can enter our areas on an unaccompanied basis (e.g., a roster that we can furnish to the guards so we know who is working for TTNS on this project or a list of supervisors who can "vouch" for TTNS employees)

Leah Clinton
CAAA Security Officer
DSN 482-3960
(812) 854-3960

"Only Our Best For the World's Best"



SIGNATURE DATE 4/8/03
DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

CREW SAME AS ON P. 40

4/9/03 SUMMARY

INSTALLED - 16 MWT 04 & 05

SAMPLED - 16 SB 26, 32, 33, 34 & 36

Collected RB040903 01

JK & CM - worked on WELL PADS @ SWMU 13

SURVEYORS - Locate SW/SD & SBs @ SWMU 16

Poured 1 pad by hand @ SWMU 13

LATE INSIDE BUFFER ZONE.

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

**TITLE** WEO 4/9/03

**PROJECT NO.** 9060

**BOOK NO.** 1363



Work continued from Page

Cold 40's & overcast.

0655 Hrs - Arrive @ BLDG 3245
Give Drillers E-Mail from Mr Clinton
Discuss said E-mail on pp 40 & 41

0740 Hrs - Arrive @ North Gate MFB talk to
Guard leave copy of E mail - let
Guard know that J. Keifer & C. Mahaffy
will be working inside

0755 Hrs - Let J.K & C.M inside MFB from S. Gate

0810 Hrs - Return to BLDG 3245 - meet w/ surveyors
• Recon swmu w/ survey crew

0845 Hrs - Return to BLDG # 3245
Discuss well installation @ 13MW13
w/ T. Brent - may have to block main road.

0945 Hrs - Set up @ swmu 16 to same soil
Collect samples @ 16SB 26, 32, 33, 34 & 36

1130 Hrs - Finish soil sampling Break for Lunch

1210 Hrs - Return to BLDG # 3245
• Collect Rinsate from core sleeve (RB04090301)
@ 1230 Hrs
• Prep samples collected for shipment to
Laucks ~~via~~ on C.o.C.s 0984 & 0986 via
FED. EX. AB# 8316 7332 7063
• Clean up

1800 Hrs - Left site

1830 Hrs - Drop off samples @ FED EX.
B. Balkovec remained on site to oversight
drillers working on pad inside the BLDG 165
Buffer Zone

END



Work continued to Page

SIGNATURE [signature] DATE 4/9/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

CREW
TINUS - B. BALKOVEC & T. COSAHN
B-M - D. SCHREECENGOST, JON KEIFER & T. MAYER

4/10/03 SUMMARY

INSTALLED - 16MWT03

SAMPLED - 13SB14 & 09
16SW02 & 07

DECIDE ON INSTALLATION OF 13MWT3 w/ TRACK HOG
WEEK OF 4/21 @ ORIGINAL SITE.

MFB BUFFER ZONE OPEN SAT & SUN
CHECKED W/ MR KLUESNER

POUR PADS @ SWMU 13 - 16 PADS

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

**TITLE** NSWC CRANE

**PROJECT NO.** 9060

**BOOK NO.** 1363



THURS. 04/10/03

Work continued from Page

MILD & SUNNY

0700 Hrs - ARRIVE @ BLDG # 3245
FAX CoCs FROM YESTERDAY to E. SEDLMYER
PREP to SAMPLE E. SUMP (16SW02); CHECK IN @ OFFICE

0835 Hrs - ARRIVE @ SWMU 16
Collect MS/MSD @ E. SUMP (16SW02) @ 0850 Hrs

0955 Hrs - LEAVE SWMU 16 FOR BLDG 3245
Label & Tag Containers From 16SW0201 & secure in Frig

1105 Hrs - LUNCH

1135 Hrs - Return to BLDG - PREP. to sample soils @ SWMU 13
Collect samples @ 135814 & 09 w/ B. Balkouse

1320 Hrs - Arrive @ SWMU 16
Collect W. sump sample (16SW07 & Dup)

1450 Hrs - Return to BLDG # 3245
Prep samples FOR SHIPMENT ON
CoCs 0987 & 0969 FOR LAUCKS &
CoC 0985 FOR TRIANGLE

1900 Hrs - Drop of Samples @ FED EX
AB# 9316 7332 7166 to Laucks
AB# 9316 7332 7177 to Triangle

1915 Hrs - Return to Hotel

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 4/10/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

CREW - SAME AS PAGE 44

04/11/03 SUMMARY

INSTALLED Monitoring WELL 16MWT02 SEE NB #2555

DEVELOPED & INSPECTED 3 WELLS @SWMU 16

WES-14-4-83
WES-14-3-93
WES-14-5-83

DRILLERS - Also, dug out pads @ SWMU 16
Painted 11 wells & bollards @ SWMU-13
& Hand poured pad @ BMWT09

SCIENTIFIC BINDERY PRODUCTS.. CHICAGO 60505 MADE IN USA

FRI 04/11/03

Work continued from Page Mild & Sunny Temp 60's

0650 Hrs - Arrive @ BLDG #3245
Fax Docs to ED SEDLMYER
Clean up office area
Decon Whale Pumps
Prep Vehical for Well Development
Call ED SEDLMYER
1010 Hrs - Get Extended Pass from main Gate w/ B.B.
1030 Hrs - Return to BLDG 3245 - Give Tom list of weekend works for weekend work Lothen
1055 Hrs - Lunch
1130 Hrs - Return to BLDG #3245
Call in Hrs to office
Call Denny - Straw supplier; he will see how much he has (bail count) and get back to me
1210 Hrs - Start surging @ WES-14-4-83
Develope / purge from 1224 to 1255 remove 24 gals
Final Turbidity = 8 NTUS ; Well Inspection @ 1300 Hrs
1315 Hrs - Return to BLDG #3245
Decon whale pump & pick up for purge H2O containers
1400 Hrs - Start surging @ WES-14-3-83
Purge from 1416 Hrs - 1501 Hrs ; Dry out 3 times
Removed 10 gal. Final Turbidity = 32 NTUS
Well Inspection Completed @ 1506
1515 Hrs - Start surging @ WES-14-5-83
Purge from 1523 to 1602 Hrs ; almost dry out @ 1548
stop to let well recharge (Turbidity was on the rise)
Allowed well to recharge & turbidity dropped to 12 NTU
Removed 34 gals ; Finish Well Inspection @ 1607
1620 Hrs - Return to BLDG #3245
Dump Purge Water & Decon WHALE PUMPS
Check YSI calibration ; B.B. checking on Drillers @ SWMU 13.
1800 Hrs - Left Base

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 4/11/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

CREWS - SAME AS P. 44

Summary 4/12/03

Drilling - Installed 12 Pads & Painted Bollards
+ Protective Casings

All pads poured & Painting Completed
@ Both SWMU's

10 Wells Developed @ SWMU 13
13MW-T-26, 06, 18, 15, 10 & 11

SCIENTIFIC BINDERY PRODUCTS., CHICAGO 50605 MADE IN USA

SAT. 4/12/03

Work continued from Page

Mild & Sunny Temp 70's

0635Hrs - Arrive @ BLDG # 3245
Prep to Dev. wells while drillers prep to pour pads - Cement truck due @ 0700Hrs.

0700Hrs - Arrive @ S. Gate
Wait for drillers to arrive w/ concrete truck

0730Hrs - No drillers yet - They Arrived @ 0755 Hrs to pour pads
Will set up @ 13MWT26 @ South Gate to Develop

0735Hrs - Start surge @ 13MWT26 - Dry out 4 times
Start Purge Time = 0745 Hrs Vol. Purged = 4 gal
End Purge Time = 0847 Hrs Final NTUs = +1000 v. slow recharge

0900Hrs - Start surge @ 13MWT08 Dry out 4 times
Start Purge = 0905 Vol. Purged ≈ 1.8
End Purge = 1013 Final NTUs = +1000

1035Hrs - Start surge @ 13MWT18 Dry out 3 times
Start Purge = 1044 Vol. Purged = 7 gal
End Purge = 1127 Final NTUs = +1000

1143Hrs - Start Surge @ 13MWT15 Dry out 3 times
Start Purge = 1146 Vol Purged = 9 gal
End Purge = 1235 Final NTUs = +1000

1245 Hrs - Break for Lunch

1330 Hrs - Get Gas

1355 Hrs - Return to BLDG 3245; Decon Pumps & dump Dev. H2O

1450 Hrs - Surge 13MWT10 Purged Dry 3 times
Start Purge = 1515 VOL PURGED = 7 gal
End Purge = 1604 Final NTUs = +1000

1620Hrs - Start Surge @ 13MWT11 Purged Dry 3 times
Start Purge = 1629 Vol Purged = 8 gal
End Purge = 1723 Final NTUs = +1000

1745Hrs - Return to BLDG # 3245
Decon Pumps & Dump Dev. H2O

1830 Hrs - Leave Base

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 4/12

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

CREW: B. BALKOVEC & T. COUTAN
Drilling crew left this date ~ 0840 hrs

SUMMARY 4/13/03

| WELL ID | START PURGE | END PURGE | VOL. PURGED | TIMES DRIED OUT |
|---|---|---|---|---|
| 13MWT01 | 0850 | 1003 | 7 gal | 5 TIMES (BB) |
| 13MWT03 | 0851 | 0932 | 4 gal | 3 TIMES (TC) |
| 13MWT02 | 1005 | 1101 | 4.5 gal | 3 TIMES (TC) |
| 13MWT07 | 1116 | 1205 | 8 gal | 3 TIMES (BB) |
| 13MWT05 | 1123 | 1205 | 4 gal | 3 TIMES (TC) |
| 13MWT08 | 1358 | 1445 | 12 gal | 3 TIMES (TC) |
| 13MWT04 | 1356 | 1456 | 4 gal | 3 TIMES (BB) |
| 13MWT12 | 1511 | 1551 | 5 gal | 3 TIMES (TC) |
| 13MWT16 | 1517 | 1605 | 4 gal | 3 TIMES (BB) |

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 63692 MADE IN USA

Sun 4/13/03

Work continued from Page

Weather - Mild & Sunny high 60's & 70's

0720 Hrs - Arrive @ BLDG # 3245
Prep. Vehicles for Well Development. Cal. Instrument.
Drillers Prep to Leave Base - complete all related paperwork; get gate Key; Etc.

0830 Hrs - Arrive @ SWMU 13
Develope 13MWT01, 03, 02, 07 & 05 (See Page 50)

1220 Hrs - Arrive @ BLDG # 3245
• Dump Purge $H_2O$ & Decon Whale Pumps

1245 Hrs - Lunch

1310 Hrs - Prep. Vehicles for return to develope wells

1325 Hrs - Development @ SWMU 13
13 MWT 08, 04, 12 & 16

1615 Hrs - Finish Clean up @ SWMU 13

1625 Hrs - Return to BLDG # 3245
• Clean Offices (4 rooms & Hall way)
• Decon Whale pumps & Dump Purge Water
• Unload vehicles

1715 Hrs - Left Base for Hardware store

1830 Hrs - Left Manards - Purchased PE tubing fastvalves tamper, rake etc. for Well development & site restoration work

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 4/13/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

SUMMARY 4/14/03

| WELL ID | START PURGE | END PURGE | VOL PURGED | TIMES PUMPED WELL DRY |
|---|---|---|---|---|
| 13MWT17 | 0825 | 0847 | 24 gal | — |
| 13MWT21 | 0908 | 0947 | 10 | 3 |
| 13MWT22 | 1008 | 1046 | 4.5 | 3 |
| 13MWT25 | 1100 | 1133 | 2.5 | 3 |
| 13MWT24 | 1255 | 1337 | 7.5 | 3 |
| 13MWT23 | 1353 | 1432 | 5.5 | 3 |
| 13MWT20 | 1450 | 1531 | 5.0 | 3 |
| 13MWT09 | 1547 | 1633 | 17.0 | 3 |
| 13MWT19 | 1654 | 1735 | 6.0 | 3 |

SCIENTIFIC BINDERY PRODUCTS., CHICAGO 60605 MADE IN USA

MON 4/14/03

Work continued from Page

0653 Hrs - Arrive @ BLDG #3245
- Prep Vehicles for Well Dev.
- Call Matt Cooper (Surveyor) to come later - after 13MWT13 is installed
- Call T. Patton - track missing bladder tool & order Peristaltic Pump.
- Call PID - see P.52 for wells developed @ SWMU13

1150 Hrs - Lunch
1215 Hrs - Return to BLDG #3245
Call office - no answer
Make reservations for return trip 4/21-30/03
1235 Hrs - Return to SWMU 13
See P.52 for wells developed
1745 Hrs - Finish clean up at SWMU 13 return to BLDG #3245
Clean eq & dump purge $H_2O$
1800 Hrs - Leave Base

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 4/14/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

SUMMARY 4/15/03

| WELL ID | START PURGE | END PURGE | VOL. PURGE | TIMES PURGED WELL DRY |
|---|---|---|---|---|
| 13MWT14 | 0809 | 0852 | 10.0 gal | 3 |
| 16MWT02 | 0929 | 1010 | 4.5 gal | 3 |
| 16MWT03 | 1025 | 1109 | 6.0 gal | 3 |
| 16MWT05 | 1245 | 1402 | 21.0 gal | 3 |
| WES-14-01-83 | 1246 | 1340 | 10.0 gal | 1 |
| 16MWT04 | 1425 | 1508 | 9.0 gal | 3 |
| 16MWT01 | 1525 | 1605 | 1.5 gal | 3 |
| WES-14-02-83 | 1623 | 1718 | 20.0 gal | 3 |

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

**TITLE** NSWC CRANE

**PROJECT NO.** 9060

**BOOK NO.** 1363



TUES. 4/15/03

Work continued from Page

0605 Hrs - Arrive BLDG #3245
- CHECK IN W/ T. Brent - update on Progress & Bobcat Hands-on.
- Cal. Instruments & CHECK YSI
- PREP. VEHICLES FOR WELL DEV.
- Order 2nd Turbidity meter from T. Patton

0800 Hrs - Arrive @ SWMU 13 FOR 13MWT 14 DEVELOPMENT

0915 Hrs - Arrive @ SWMU 16 DEV. 16MWT02 & 03

1130 Hrs - Arrive @ BLDG. #3245
- Empty Purge $H_2O$
- Pick up Batteries for YSI (Showing low battery)

1200 Hrs - LUNCH

1230 Hrs - Return to SWMU 16
DEVELOPE 16MWT01 - 05; WES-14-01 & 02

1725 Hrs - FINISH CLEAN UP @ SWMU 16

1730 Hrs - RETURN to BLD # 3245
- Dump Purge $H_2O$
- CLEAN INSTRUMENTS
- PAPERWORK
- CHECK IN W/ R. BASINSKI @ OFFICE

1815 Hrs - LEFT BASE

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 4/15/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

VOID THIS PAGE 4/16/03

SCIENTIFIC BINDERY PRODUCTS., CHICAGO 60605 MADE IN USA

WED 4/16/03

Work continued from Page

0655 Hrs - Arrive @ BLDG #3245

- Decon whale pumps & bucket bits
- Called Denny & set up straw delivery for Wed.
- Clean up office space
- Pull together paper work to take to P.H. office
- Clean out vehicles

0850 Hrs - Left Base

Remainder of Day = Travel

Made Stop @ Enterprise in Martinsville, IN and reserved a pick up truck for the week of May 5th.

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

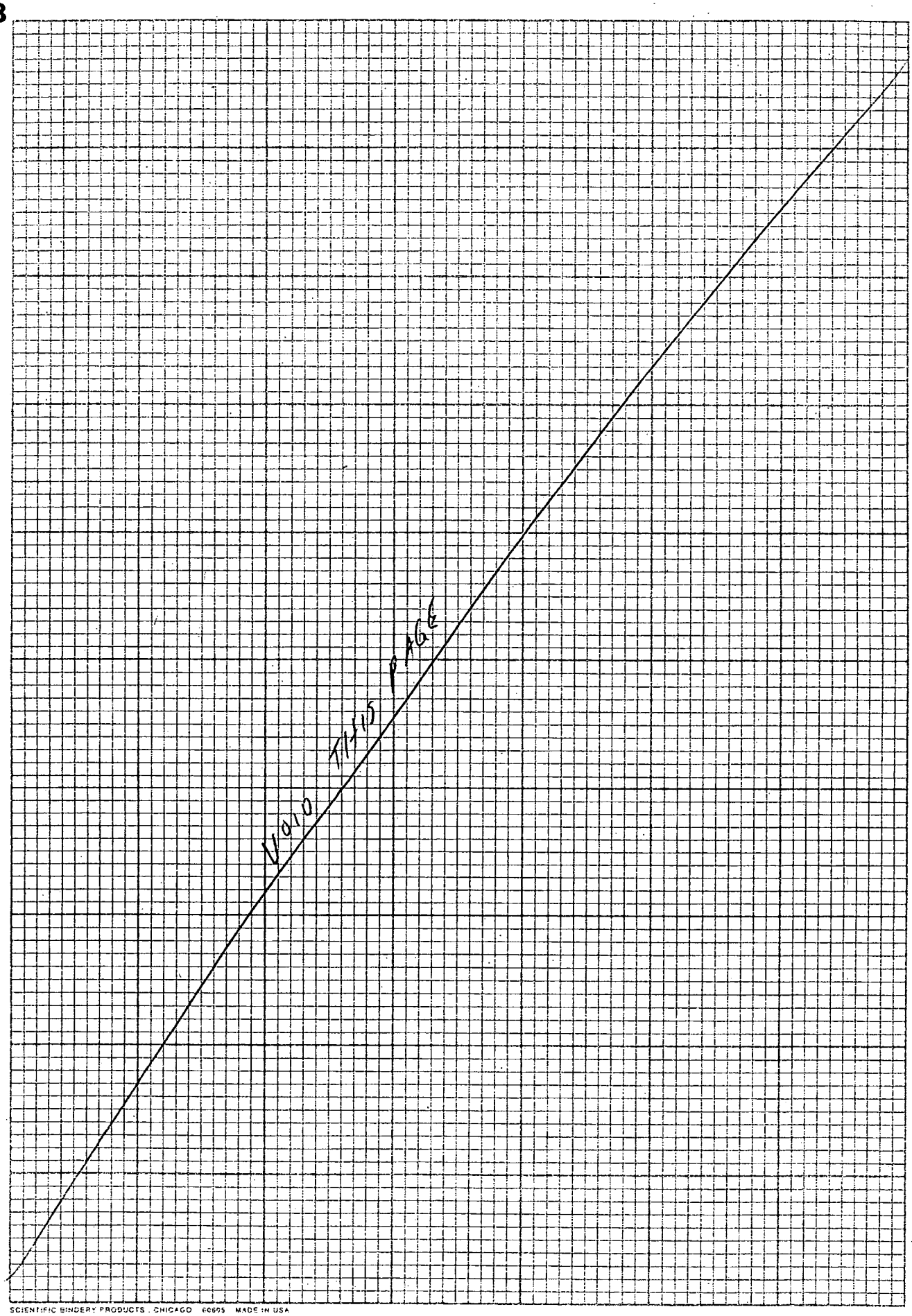
DATE 4/16/03

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE




SCIENTIFIC BINDERY PRODUCTS . CHICAGO 60605 MADE IN USA

**TITLE**

**PROJECT NO.**

**BOOK NO.**



Work continued from Page

5

10

15

20

25

30

35

VOID THIS PAGE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

| SIGNATURE | | | DATE |
|---|---|---|---|
| DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE |

CREW: BOB BALKOVEC & TERRY ROJAHN

MON. 4/21/03

| WELL ID | TIME | W.L. |
|---|---|---|
| WES-14-01-83 | 1505 | 31.49 |
| 02 | 1445 | 14.75 |
| 03 | 1457 | 19.98 |
| 04 | 1500 | 27.61 |
| 05 | 1502 | 33.47 |
| 13MW-01 | 1512 | 25.61 |
| 02 | 1450 | 8.33 |
| 03 | 1453 | 27.88 |
| 04 | 1510 | 11.04 |
| 05 | 1455 | 30.66 |

WEATHER: Cool & overcast

SCIENTIFIC BINDERY PRODUCTS CHICAGO 60605 MADE IN USA

MON 4/21/03

Work continued from Page

TRAVEL DAY

1000 Hrs - Arrive Indy Airport

1115 Hrs - Check in @ Hotel

1145 Hrs - Pick up supplies @ Sam's Club & Lowes

1300 Hrs - Arrive @ BLDG #3245

CHECK IN W/ T. BRANT

Calibrate YSI & prep. to purge 16MWT01

1445 - 1512 Hrs - Take Round of Water Levels @ SWMU 16

1515 Hrs - Purge 16MWT01

Dry ~ 5 min. purge 1.1 L SEE Low Flow Purge Data Sheet

1550 Hrs - Return to BLDG #3245

PREP. SAMPLE SETS; Check in @ OFFICE W/ T. JOHNSTON

Go over well development sheets - determine which wells to purge via bladder or peristaltic pump.

1700 Hrs - LEFT BASE

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 4/21/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

TUES 4/22/03 SUMMARY

| WELL ID | Start PURGE | END PURGE | SAMPLE TIME | |
|---|---|---|---|---|
| 16GWT0101 | * | * | 0800 | |
| 16GWT0201 | 0828 | 0945 | 0946 | |
| 16GW0501 | 0900 | 1040 | 1045 | MS/MSD |
| 16GWT0401 | 1243 | 1435 | 1437 | |
| RB042203d1 | — | — | 1630 | Teflon & Silicon Tubing Rinsate for Peristaltic Pump |

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60603 MADE IN USA

**TITLE** NSWC CRANE

**PROJECT NO.** 9060

**BOOK NO.** 1363



TUES 4/22/03

Work continued from Page

Weather - Cool & Mostly Cloudy

0650 Hrs - Arrive @ BLDG 3245
Prep to sample Groundwater
0745 Hrs - Arrive @ SWMU 16
SEE PAGE 62 & CoC # 0988
1600 Hrs - Return to BLDG # 3245
Call office - check in w/ T. Johnston
Call Denny Wagner - set up straw delivery for tomorrow 0700 Hrs
Collect Rinsate Blank - R8042203 01 (Tubing)
Check Calibration on YSIs
1730 Hrs - Leave Crane

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 4/22/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

WED 4/23/03 SUMMARY

| Well ID | START PURGE | END PURGE | SAMPLE TIME |
|---|---|---|---|
| 16GW0401 | 0723 | 0810 | 0811 |
| 16GW0101 | 0750 | 1122 | 1130 |

Installed : 13MWT13 SEE NB #2550 FOR DETAILS

SCIENTIFIC BINDERY PRODUCTS . CHICAGO 60605 MADE IN USA

WED 4/23/03

Work continued from Page AM - Cold & Partly Sunny, PM Sunny & Mild

0630 Hrs - Arrive @ BLDG #3245
Prep. to sample groundwater
0702 Hrs - Arrive @ BWMW 16
SEE PAGE 64 & CoC # 0988
1515 Hrs - Arrive @ BLDG #3245
- Paperwork & Package samples on CoC # 0988 for shipment via FED EX AB# 8316 7332 7155
- Decon Bladder Pumps
- Check in w/ T. Johnston
- CHECK CALIBRATION ON YSIs
1700 Hrs - Left Base for FED EX
1730 Hrs - Drop off samples (7 coolers) @ FED EX.

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 4/23/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

B 100 P ©

THURS 4/24/03 SUMMARY

| WELL ID | Start Purge | END PURGE | SAMPLE TIME | COMMENTS |
|---|---|---|---|---|
| RB04240301 | NA | NA | 0830 | RINSATE OF BLADDER PUMP & TEFLON TUBING |
| 16GW0201 | 1041 | 1200 | 1201 | |
| 16GWT0501 | 1045 | 1255 | 1300 | Also FD0424 0301 |
| 16GW0301 | 1433 | 1630 | 1632 | |

Installed 2ND WELL @ location 16MWT01 to REPLACE dry well

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 50605 MADE IN USA

THURS. 4/24/03

Work continued from Page WEATHER - Mostly Cloudy & 50's

0630 Hrs - Arrive @ BLDG #3245
Prep. to meet Denny Wagner
0650 Hrs - Arrive @ Crane Gate meet w/ D. Wagner
Escort him to SWMU 13 @ 0715
• Unload straw @ SWMU13
0748 Hrs - Return to BLDG #3245; Prep TB04240301 @ 0800 Hrs
Prep. to sample groundwater @ SWMU 16
Collect Pump & teflon Tubing Rinsate @ 0830 Hrs
T. Johnston call wants to install deeper well
@ 16MWT01 - ORIGINAL went dry
1000 HRS - Arrive @ SWMU 16
CHECK Location for NEW WELL 16MWT01
Sample Groundwater SEE P. 66 & CoC #0991
1718 Hrs - Return to BLDG #3245 B.B. still @ 16GW03 01
• Paperwork
• Cali. YSI
• Dump Purge $H_2O$
• Decon Bladder Pump
• B.B. Arrive @ 1845 Hrs
1910 Hrs - Leaves BLDG #3245

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 4/24/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

FRI. 4/25/03 SUMMARY

| WELL ID | Start PURGE | END PURGE | SAMPLE TIME | Comments |
|---|---|---|---|---|
| RB0425030I | NA | NA | 0810 | Rinsate of Peristaltic RE tubing & Silicon Tubing |
| 13GWT2601 | 0804 | 1020 | 1022 | |
| 16GWT0301 | 0940 | 1130 | 1135 | |
| 13GWT2101 | 1237 | 1345 | 1346 | DUP FD0425030I |
| 13GWT2501 | 1110 | 1210 | NA | PUMPED DRY |

Drillers - Pour pad @ 16MWT06 AND DEMOB

16MWT06 - Located NEXT to DRY WELL 16MWT01.

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

FRI. 4/25/03

Work continued from Page (Sprinkle of Heavy Rain & Cool (50°s))

0630Hrs - Arrive @ BLDG 3245
- Prep. to sample Groundwater @ SWMU 16
- Call Surveyors - inform them that all wells have been completed - they will check their schedule
- Called T. Johnston w/ 4/24/03 summary
- Called in Hours to L. Yeager

0740Hrs - Check in w/ PAM @ Break BLDG. for BLDGs 145 & 146 OK to work @ SWMU 16 today

0745Hrs - Return to BLDG #3245 to wait for drillers
- No one work inside gate @ BLDG 146 so gate is locked - need to wait on drillers to give them access to SWMU 16 to pour wall pad
- Collect Rinsate Blank for PE tubing & Silicon for SWMU 13 @ 0810 Hrs

0840Hrs - Drillers Arrive

0845Hrs - Arrive @ SWMU 16
- Drillers to pour pad @ NSW 16MWT01 (Finish @ 1010Hrs)
- T.R. set up @ 16MWT03 with Tent (Renamed 16MWT06)

Start Purge @ 0940Hrs
End Purge @ 1130 Hrs
Sample Time @ 1135 Hrs

1605 Hrs - Return to BLDG #3245 to package samples for shipment via FED EX (AB# 8316 7332 7144); samples on COC #0991.

1730Hrs - Left Base

1800 Hrs - Drop off samples @ FED. EX.

1836Hrs - Pick up supplies @ Lowes

1845 Hrs - Return to Motel

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 4/25/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

SUN 4/27/03 SUMMARY

B.B sampled 13GWT0801, 1001 & 1101
FINISHED sampling 13GWT0201

T.R. FINISHED SAMPLING 13GWT0501, started sampling
13GWT0601 & Purged / sampled 13GWT0701
& 13GWT1201

SCIENTIFIC SINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

**TITLE** NSWC CRANE

**PROJECT NO.** 9060

**BOOK NO.** 1363



SAT 4/26/03

Work continued from Page

AM - Cool & Sunny PM - Mild & Sunny

0630 Hrs - Arrive @ BLDG # 3245
PREP. to sample Groundwater; Check YSI Cal.

0730 Hrs - Arrive @ SWMU 13

| WELL ID | Start Purge | END PURGE | SAMPLE TIME | COMMENTS |
|---|---|---|---|---|
| 13MWT06 | 0745 | 0843 | NA | PUMPED Dry |
| 13MWT03 | 0745 | 1145 | 1146 | |
| 13MWT01 | 0912 | 1022 | 1024 | |
| 13MWT05 | 1117 | 1349 | NA | PUMPED Dry |
| 13MWT25 | NA | NA | 1230 | Purged 4/25/03 |
| 13MWT02 | 1246 | 1535 | 1536 | |
| 13MWT08 | ~~1343~~ 1412 | 1542 | 1545 | |

1638 Hrs - Return to BLDG # 3245
Pick up WELL dev. supplies

1700 Hrs - Start WELL development @ 16MWT06
Start Purge = 1700 Hrs
END Purge = 1746 Hrs
Vol. Purged = 13.5 gal
Pumped Dry 3 times

1805 Hrs - Return to BLDG # 3245
Prep to LEAVE BASE

1838 Hrs - LEFT CRANE

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 4/26/03

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE

SEE SAMPLE SUMMARY FOR 4/27/03 ON PAGE 70

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

SUN. 4/27/03

Work continued from Page

0730 Hrs - Arrive @ BLDG #3245
Prep. to sample groundwater, check YSI Cal.
0815 Hrs - Arrive @ SWMU3
0835 Hrs - Start sampling 13GWT06 - Extremly slow recharge
0910 Hrs - Start sampling 13GWT05
0955 Hrs - Finish " "
1020 Hrs - Start purge @ 13MWT07
1200 Hrs - Start sampling 13GWT0701
1305 Hrs - Start purge @ 13MWT12
1710 Hrs - Start sampling 13GWT1201
1815 Hrs - Pump down 13MWT06 into Explosives Container
1835 Hrs - Return to BLDG #3245
- Secure Samples in Frig
- Clean & mop office areas
1930 Hrs - Leave Base

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE
DATE 4/27/03
DISCLOSED TO AND UNDERSTOOD BY
DATE
WITNESS
DATE

SURVEYORS - MATT COOPER & COREY ALLEN
FINISH SURVEYING @ SWMUS 13 & 16

SAMPLE SUMMARY 4/28/03

| WELL ID | START PURGE | END PURGE | SAMPLE TIME | COMMENTS |
|---|---|---|---|---|
| 13GWT0901 | 0740 | 0910 | 0911 | Collected Dup |
| FD042803 01 | ↓ | ↓ | 0000 | DUP OF ABOVE |
| 16GWT0601 | 0835 | 0930 | 0932 | SEE Comments on P.75 may have to resample/collect additional sample; WELL ID MAY change |
| 13GWT2401 | 1311 | 1455 | 1456 | |
| 13GWT2001 | 1205 | 1605 | 1606 | |

## NSWC Crane, IN

## Bledsoe Tapp & Riggert - Surveyors Daily Sign-In

(± 2hr DRIVE & Prep. Time Per DAY)

MC

| DATE | NAME (print) | TIME IN | TIME OUT | TOTAL HOURS * | SITE/S WORKED ON |
|---|---|---|---|---|---|
| 4/8/03 | Corey Allen | 7:00 | 4:45 | 12 | #13 |
| 4/8/03 | Matt Cooper | 7:00 | 4:45 | 12 | #13 |
| 4/9/03 | Matt Cooper | 7:30 | 1:00 | 7.5 | #16 |
| 4/9/03 | Corey Allen | 7:30 | 1:00 | 7.5 | #16 |
| 4/28/03 | Matt Cooper | 8:00 | 7:30 | 11.5 | #13 + 16 |
| 4/28/03 | Corey Allen | 8:00 | 7:30 | 11.5 | #13 + 16 |
| | | | | | |
| | | | | | |

* *Include total daily hours to be charged (travel, time on site, etc.)*

**Sites =** SWMU 13 – Mine Fill B
SWMU 16 – Cast High Explosives Fill/B146 Incinerator

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 50608 MADE IN USA

MON 4/28/03

Work continued from Page

Weather - Mostly sunny & 60's Late Afternoon Rain

0630 Hrs - Arrive @ BLDG #3245
Prep to sample groundwater

0815 Hrs - Arrive @ SWMU 16 - 2ND WELL @ Location 16MWT01
Start Purge @ 0835 (Surveyors Arrive @ 0850 Hrs left them in gate)
END " @ 0930
Start Sampling @ 0932 - still draw down in well but will sample anyway to obtain groundwater incase well dries out and doesn't recover in tight formation as did the 1st well installed @ this location.
WELL DRY @ 1015 Hrs

1035 Hrs - Arrive @ BLDG #3245
Prep. to sample GW @ SWMU 13

1100 Hrs - Arrive @ SWMU 13
let surveyors into area (MFB)

1130 Hrs - Set up @ 13MWT20
Problem w/ BLADDER PUMP (water siphoning out of flow cell and back into well - switched to peristaltic Pump)
Start purge @ 1205 ; @ 1345 B.B. took over @ well - T.R. returned to BLD #3245 to package samples for shipment.

1400 Hrs - Arrive @ BLDG #3245
- Package samples for shipment on CoFCs 993 & 992
- T. Johnston called - spoke with him regarding the disposition of the 1st well @ location 16MWT01 & what to ID the 2ND well @ same location - will talk again tomorrow @ 0830 CT.

1745 Hrs - Left Base for FED. EX.

1815 Hrs - Deliver samples under CoFCs 0992 & 0993 to FED EX. (AB# 8316 7332 7133)
B. Balkovec - stayed @ site w. surveyors to secure buffer area around BLDG #165
left site ~ 1900 Hrs

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 4/28/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

SAMPLE SUMMARY 4/29/03

| WELL ID | Start PURGE | END PURGE | Vol PURGED | COMMENTS |
|---|---|---|---|---|
| 13GWT1401 | 0755 | 0925 | 0926 | |
| 13GWT2501 | — | — | — | Collect Additional Vol. |
| 16GWT0601 | — | — | — | Collect Additional Vol. |

ALSO, DEVELOPED 13MWT13, SEE P. 77 FOR DETAILS.

SCIENTIFIC BINDERY PRODUCTS CHICAGO MADE IN USA

Tues - 4/29/03

Work continued from Page

0636 Hrs - Arrive @ BLDG #3245
Fax CoFCs 992 & 993 to office & lab
Paperwork; Organize files
Check Cal. on YSI
0830 Hrs - Conference call w/ T. Brent, ED Seoltyer, T. Johnston & T. Kuhn
0950 Hrs - Arrive @ SWMU 16
16MWT06 - W.L. @ 26.95
16MWT01 - W.L @ 25.70
Start Sampling 16MWT06 @ 1002 Hrs
Dry @ 1037 ~3L collected VOCs & ~2.5 L of Glass Amber
1040 Hrs - T. Brent arrived @ SWMU-16 - showed existing wells needing work; and discussed 16MWT01 & 06
1120 Hrs - Left SWMU 16, Arrive BLDG #3245
1135 Hrs - Lunch @ CAF.
1210 Hrs - Return to BLDG #3245
- Call T. Johnston - ok to ship samples collected 4/29/03 @ 16MWT06 w/ today's collection
- Prep. to develope 13MWT13
1250 Hrs - Arrive @ 16MWT06
- Start Development 1308 hrs
END Development 1353 hrs; vol. Purged 17 gals
- Removed pad forms @ 13MWT13, 19 & 19 then went to ~~gate 10~~ (TR) S. gate @ MFB and someone by passed our lock - informed security @ N. Gate
1430 Hrs - Arrive @ Bldg #3245; Told T. Brent about the lock
Remainder of Day - Package samples for shipment and clean-up; Prep. Turbidy meter (malfunctioning) for shipment to U.S. ENV.
1645 Hrs - Left Base
1715 Hrs - Arrive @ FED.EX.
SHIP SAMPLES ON CoFC #0994 ON AB #8316 7332 7122
SHIP TURBIDITY METER ON AB #8316 7332 7111

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 4/29/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

Void this page

SCIENTIFIC BINDERY PRODUCTS CHICAGO

WED. 4/30/03

Work continued from Page

0640 Hrs - Arrive @ BLDG # 3245
Fax C.o.Cs to OFFICE & LAB (0994)
CLEAN OFFICE AREA (mop); Prep. Paperwork to return to Pit.
CLEAN out VEHICALES
0755 Hrs - LEAVE OFFICE (BLDG 3245) For Airport
0820 Hrs - Stop @ ABELLS Nursery - check on bulk for sod
$35/YD, will load pick ups.
1030 Hrs - Arrive @ Airport
Remainder of day travel
END.



Work continued to Page

SIGNATURE [signature] DATE 4/30/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

MON 5/05/03

| WELL ID | TIME | W.L. | |
|---|---|---|---|
| WES-14-01-83 | 1757 | 31.00 | |
| 02 | 1551 | 14.23 | |
| 03 | 1443 | 18.80 | |
| 04 | 1437 | 26.80 | |
| 05 | 1800 | 32.59 | |
| 16MWT 01 | 1422 | 25.19 | |
| 02 | 1433 | 6.55 | |
| 03 | 1430 | 27.20 | |
| 04 | 1426 | 8.05 | |
| 05 | 1428 | 29.77 | |
| 06 | 1420 | 22.33 | |
| 13MWT 01 | 1730 | 6.21 | |
| 02 | 1732 | 17.15 | Patch NEEDED @ stick up |
| 03 | 1728 | 8.79 | Bollards NEED topped OFF |
| 04 | 1737 | 12.98 | |
| 05 | 1733 | 5.42 | |
| 06 | 1720 | 15.11 | |
| 07 | 1741 | 3.12 | |
| 08 | 1738 | 3.17 | |
| 09 | 1650 | 7.74 | |
| 10 | 1636 | 13.65 | |
| 11 | 1638 | 7.87 | |
| 12 | 1639 | 7.88 | |
| 13 | 1610 | 3.62 | |
| 14 | 1612 | 13.25 | |
| 15 | 1631 | 12.88 | |
| 16 | 1629 | 8.49 | |
| 17 | 1628 | 8.70 | |
| 18 | 1633 | 19.06 | |
| 19 | 1615 | 8.31 | |
| 20 | 1646 | 4.22 | |
| 21 | 1626 | 7.69 | |
| 22 | 1624 | 7.44 | |
| 23 | 1645 | 7.45 | |
| 24 | 1642 | 8.45 | |
| 25 | 1622 | 16.00 | |
| 26 | 1619 | 9.10 | |

SCIENTIFIC BINDERY PRODUCTS CHICAGO 60605 MADE IN USA

MON. 5/05/03

Work continued from Page

Hot & Sunny (Low 90's)

TRAVEL DAY

1515 - ARRIVE @ BLDG #3245 ; AFTER trip to Lowe's Pick up HARDWARE FOR WELL

- PREP to take water levels & REPAIR EXISTING WELLS @ SWMU 16

1415 Hrs - ARRIVE @ SWMU 16

- COLLECT WATER levels
- REPAIR WELLS WES-14-04-03 NEW pad
  WES-14-03-03 FIX CAP FOR locking
- REPAIR 165807 w/ cold patch others REPAIRED by M. Cochrane

1554 Hrs - LEAVE SWMU 16

1556 Hrs - Stop @ BLDG 3245 FOR Drinking water

1607 Hrs - Check in @ N. GATE SWMU-13 (MEB)

13MWT25

Start Purge @ 1702

END Purge @ 1708 (Dried out WELL)

Pumped ~1 gal

13MWT06

Start Purge @ 1720

END Purge @ 1724 (Dried out WELL)

Pumped ~1.5 gal

1747 Hrs - FINISH W.Ls @ SWMU 13

1755 Hrs - ARRIVE @ SWMU 16

Returned to get two WELLS that were in need of equalization

Lids on to tight @ WES-14-01 & 05-03

1800 Hrs - ARRIVE @ BLDG #3245

CLEAN UP & UN load Pick up Truck

1825 Hrs - LEFT BASE

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE Terry Rogers DATE 5/5/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

B 100 P ©

SAMPLE SUMMARY 5/06/03

| WELL ID | Start PURGE | END PURGE | SAMPLE TIME | COMMENTS |
|---|---|---|---|---|
| 13GWT1601 | 0748 | 0840 | 0842 | |
| 13GWT2301 | 0840 | 1240 | 1242 | |
| 13GWT1801 | 0938 | 1340 | 1342 | |
| 13GWT2201 | 1400 | 1540 | 1542 | |
| 13GWT1501 | 1445 | 1700 | 1702 | |
| 13GWT2501 | Repurged 5/5/03 | | | → Added to sample collected 5/06/03 @ 1440 Ammonia & Nitrates |
| 13GWT0601-F | Repurged 5/6/03 | | | |
| | Collected Filtered Metals @ 1735 Hrs 5/6/03 | | | |

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

TUES 5/06/03

Work continued from Page

WEATHER Mostly Sunny TEMP. 80°F

0640Hrs - ARRIVE @ BLDG #3245
PREP. to SAMPLE groundwater
Load Pick up
Calibrate YSI & LaMotte
0815Hrs - Arrive @ SWMU 13
0840Hrs - BEGIN Purge @ 13MWT23
END Purge @ 1240Hrs ; Vol purged = 22.1L
1242Hrs - Sample 13GWT8301
1400Hrs - BEGIN PURGE @ 13MWT22
END PURGE @ 1540Hrs ; Vol. purged = 10.6L
1542Hrs - Sampled 13GWT2201
REMOVED pad forms @ 13MWT22 & 23
1650Hrs - CHECK IN ON B.B. - get sample log sheets - start sample summary
ON PAGE 82
1720Hrs - REMOVE FORM @ 13MWT16
1735Hrs - Sampled Filtered METALS @ 13MWT06
1750Hrs - RETURN to BLDG #3245
SECURE samples in Frig.
CLEAN UP
Unload Pick up Truck
LEAVE MESAGES for Both Ralph & Tom on
progress made today & yesterday
1830Hrs - LEFT BASE

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE
DATE 5/6/03
DISCLOSED TO AND UNDERSTOOD BY
DATE
WITNESS
DATE

SAMPLE SUMMARY 5/7/03

| WELL ID | Start PURGE | END PURGE | Sample TIME | COMMENTS |
|---|---|---|---|---|
| 13GWT1301 | 0730 | 0945 | 0947 | ALSO DUP ED050703 01 |
| 13GWT1701 | 0750 | 1020 | 1022 | MS/MSD |
| * 13GWT2501 | — | — | 1300 | *Filtered Metals Only |
| 13GWT1901 | 1155 | 1345 | 1347 | |
| * 13GWT0601 | — | — | 1700 | *Ammonia & Nitrate only |

* Slow Recharge wells purged dry 5/5/03

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 69605 MADE IN USA

WED 5/7/03

Work continued from Page WEATHER OVERCAST to RAIN (HEAVY @ times)

0640 Hrs - ARRIVE @ BLDG #3245
PREP. to SAMPLE GROUNDWATER
Check YSI METER

0730 Hrs - ARRIVE @ SWMU 13 - 13MWT17
Start Purge @ 0750 Hrs
END Purge @ 1020 Hrs. Vol. Purged = 15.2 L
Start Sampling @ 1022 13GWT1701

1300 Hrs - Sampled Filtered Metals @ 13GWT2501

1335 Hrs - Returned to BLDG #3245
Unloaded Pick up Truck

1400 Hrs - LUNCH

1445 Hrs - RETURN to BLDG #3245
- Called Ralph B. & Tom J. gave them progress Report.
- PAPERWORK & Prep. SAMPLES FOR SHIPMENT to FED. EX. on AirBill 8316 7332 7074 & C.O.C # 6995

1630 Hrs - LEFT BASE FOR FED. EX

1700 Hrs - Drop of :
SAMPLES to LAUCKS on AB# 8316 7332 7074
EQ. to U.S. ENU on AB# 8316 7332 7100

B.B. REMAINED @ site to SAMPLE FOR AMMONIA & Nitrate @ 13MWT06 (Inside BUFFER FOR BLDG # 265)

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 5/7/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

Day Summary 5/8/03

Surface Water Samples Collected - 13SW0801 & 13SW0101

Well Sites Restoration Locations Completed:

13MWT 21, 17, 16, 12, 11, 25(OK), 26, 22 & 15

Start Restoration @ 13MWT 18 & 24

Ship samples on CofC #0996

SCIENTIFIC BINDERY PRODUCTS., CHICAGO 60605 MADE IN USA

THUR 5/8/03

Work continued from Page

WEATHER - Mostly Cloudy & 60's

0700 Hrs - Pick up computer disk & Drinking Water @ Wal-Mart
0745 Hrs - Purchase SEED & A yard of Top Soil @ ABELL NURSERY
0815 Hrs - Arrive @ BLDG #3245
- B.B. Check Cali. on YSI
- Prep. to do site Restoration @ SWMU 13 & TK
And Surface Water Sampling @ Location 8 & 11
0840 Hrs - Check Surface Water locations @ SWMU 16
After yesterdays rain - locations Not conducive to sampling (DRY)
0855 Hrs - Return to BLDG #3245
0910 Hrs - Collected 135W0801
0935 Hrs - Collected 135W1101
0950 Hrs - Began Site Restoration
Did 13MWT 21, 17, 16, 12, part of 11, 25 (ok) & 26
1145 Hrs - Left SWMU 13 for Lunch; B.B. stayed @ SWMU 13
1210 Hrs - Arrive @ BLDG #3245
Check in w/ R. Basinski
1250 Hrs - Leave BLDG for ABELL'S Nursery
1410 Hrs - Return to SWMU 13
Restored 13MWT 11, 15 and part of 18
B.B. Restored 13MWT 22
1630 Hrs - Return to BLDG #3245
Prep. samples for shipment on COFC #0996
1715 Hrs - Left Base for FED. EX
1745 Hrs - Drop of samples on FED. EX AB #8316 7332 7085

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 5/8/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

SAMPLE SUMMARY 5/09/03

SLUG TESTING FINISHED @
13MW17, 11, 26 & 15

RESAMPLED SVOCS @ 13MW09 & 20

SCIENTIFIC SINDERY PRODUCTS, CHICAGO 5C505 MADE IN USA

FRI. 5/9/03

Work continued from Page

0630 Hrs - ARRIVE ON BASE
- B.B. check cali. on YSI
- FAX CofC to OFFICE & LAB
- PREP. to Collect Groundwater Samples

0750 Hrs - ARRIVE @ 13MWT09 AFTER CHECK IN w/ N. Gate Guard
Start Purge @ 0816
END Purge @ 0958
Sample Time @ 1000 FOR 13GWT0902 & FD050903 01

13MWT20
Start Purge @ 1103
END Purge @ 1503
Sample Time @ 1505 FOR 13GWT2002

1545 Hrs - Finish @ SWMU 13 - ARRIVE @ BLDG #3245
PACKAGING & PAPERWORK
Unload Pick up

1635 Hrs - LEFT SITE FOR FED. EX.

1700 Hrs - Drop of Samples on CofC # 0989 & FED. EX.
AB# 8316 7332 7096

1715 Hrs - ARRIVE @ ABELL NURSERY
Purchase 1 yard of Top Soil

1805 Hrs - ARRIVE @ BLDG #3245
PARK Pickup under Port & RIDE BACK
to motel w/ B.B.

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 5/9/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

SUMMARY 5/10/03

BB SLUG TESTED: 13MWT08, 14 & 20 & started 13MWT02

Restored the following locations 13MWT01 → 08 and
Finished restoration @ 13MWT08

Purchased 2 yards (2 trips) of Topsoil & 50lbs
Bag of Seed.

SCIENTIFIC BINDERS PRODUCTS CHICAGO 60603 MADE IN USA

SAT. 5/10/03

Work continued from Page Mostly Cloudy 70's & Humid

0650 Hrs - Arrive @ Site (BLDG #3245)
Call Security & BLDG #165
Also, track Package SHIPPED 5/8/03 - (ok)
0720 Hrs - Arrive @ SWMU 13
Restore 13MWT06, 03 & 01
0930 Hrs - Left Base for ABELLS Nursery
1003 Hrs - Purchase Bulk Top Soil Load @ Nursery
1045 Hrs - Return to SWMU 13
Spread Soil @ 13MWT05 & 08 (07 ok)
1200 Hrs - Heavy Rain Break for Lunch
1245 Hrs - Return to SWMU 13
Seed & Hay @ 08; AB will seed & Hay 13MWT04 while T.L. picks up seed & Soil
1430 Hrs - Left Site for seed & Soil
1510 Hrs - Arrive @ Good Earth (ABELLS out of top soil)
1552 Hrs - Arrive @ ABELLS for seed
1640 Hrs - Return to SWMU 13
Finish Hay & seed @ 13MWT18
1730 Hrs - Return to BLDG #3245
Clean up - will pick up supplies this evening
1800 Hrs - Left Site

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE Tony Kopel DATE 5/10/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

| LOCATION | W.L. | TIME | |
|---|---|---|---|
| 13MWT01 | 5.82 | 1359 | |
| 02 | 17.10 | 1350 | |
| 03 | 8.88 | 1401 | |
| 04 | 12.75 | 1449 | |
| 05 | 4.13 | 1505 | |
| 06 | 15.62 | 1402 | |
| 07 | 3.10 | 1500 | |
| 08 | 2.92 | 1448 | |
| 09 | 7.40 | 1405 | |
| 10 | 13.11 | 1443 | |
| 11 | 7.78 | 1458 | |
| 12 | 7.58 | 1457 | |
| 13 | 3.18 | 1516 | |
| 14 | 13.08 | 1514 | |
| 15 | 12.63 | 1432 | |
| 16 | 8.61 | 1425 | |
| 17 | 8.09 | 1423 | |
| 18 | 19.04 | 1436 | |
| 19 | 6.80 | 1529 | |
| 20 | 4.00 | 1410 | |
| 21 | 7.34 | 1421 | |
| 22 | 7.25 | 1420 | |
| 23 | 7.17 | 1412 | |
| 24 | 8.23 | 1413 | |
| 13MWT 25 | 16.61 | 1417 | ~FLOW RATES |
| SG 01 | 1.73 | 1354 | <1 gpm |
| 02 | 3.64 | 1355 | 1-5 gpm |
| 03 | 1.96 | 1517 | 1-5 gpm |
| 04 | 2.38 | 1518 | 1-5 gpm |
| 05 | 3.89 | 1520 | <1 gpm |
| 06 | 2.37 | 1523 | <1 gpm |
| 07 | 1.50 | 1414 | <1 gpm |
| 08 | 5.05 | 1419 | 5-25 gpm |
| 09 | 4.15 | 1429 | 5-25 gpm |
| SG 10 | 4.78 | 1455 | 20-50 gpm (cannot get to weir downstream of gauge to measure flow) - Bank to steep & slippery |
| 13MWT26 | 8.93 | 1415 | |

SUMMARY 5/11/03

TR: ECO ASSESSMENTS @ SWMUS 13 & 16

Restore - 16 MWT 01, 06 & 05
13 MWT 24 &
Begin @ DECON AREA

BB = SLUG TEST
16 MWT 02, 04 & 05
Continued @ 13 MWT 02
RESAMPLE WELLS:
16 MWT 06
WES-14-02-03

TR/BB - Round of W.L. @ SWMU 15

SCIENTIFIC BINDERY PRODUCTS

**TITLE** NSWC CRANE **PROJECT NO.** 9060 **BOOK NO.** 1363



SUN 5/11/03

Work continued from Page Mostly Cloudy, 70's & Windy

0645 Hrs - Arrive @ ~~SWMU~~ BLDG #3245
Call Security for work @ BLDG 148 & MFB

0710 Hrs - Site Restoration @ SWMU-16
Restore 16MWT01 & 02 & 05

0930 Hrs - Start Eco. Assessment
Take 15 Photos & Cover Type Area

1145 Hrs - Finish Eco. Assessment @ SWMU-16

1150 Hrs - Return to BLDG #3245 for Lunch

1220 Hrs - Arrive @ SWMU-13
Restoration @ 13MWT24
Start Eco. Assessment

1350 Hrs - Start Water Levels & Staff Gauge Measurements
SEE P. 92; Pick up Form lumber

1525 Hrs - End Water Levels. - Resume Eco Assessment
Take Photos 16 → 33

1730 Hrs - Complete Eco. Assessment
Begin Restoration @ Decon Area
Spread Seed & Hay

1810 Hrs - Return to BLDG #3245
Dry off lumber in area behind BLDG #3245
Prep. to Leave

1945 Hrs - Left Site

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 5/11/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

MON 5/12/03 SUMMARY

B.B. FINISHED SLEG TEST @ 13MWT02

B.B/TR RESTORATION @ DECON AREA, 13 MWT10, 14 & 19

TR RESTORATION @ 13MWT20

DEMOB FOR 906°

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 50605 MADE IN USA

Work continued from Page

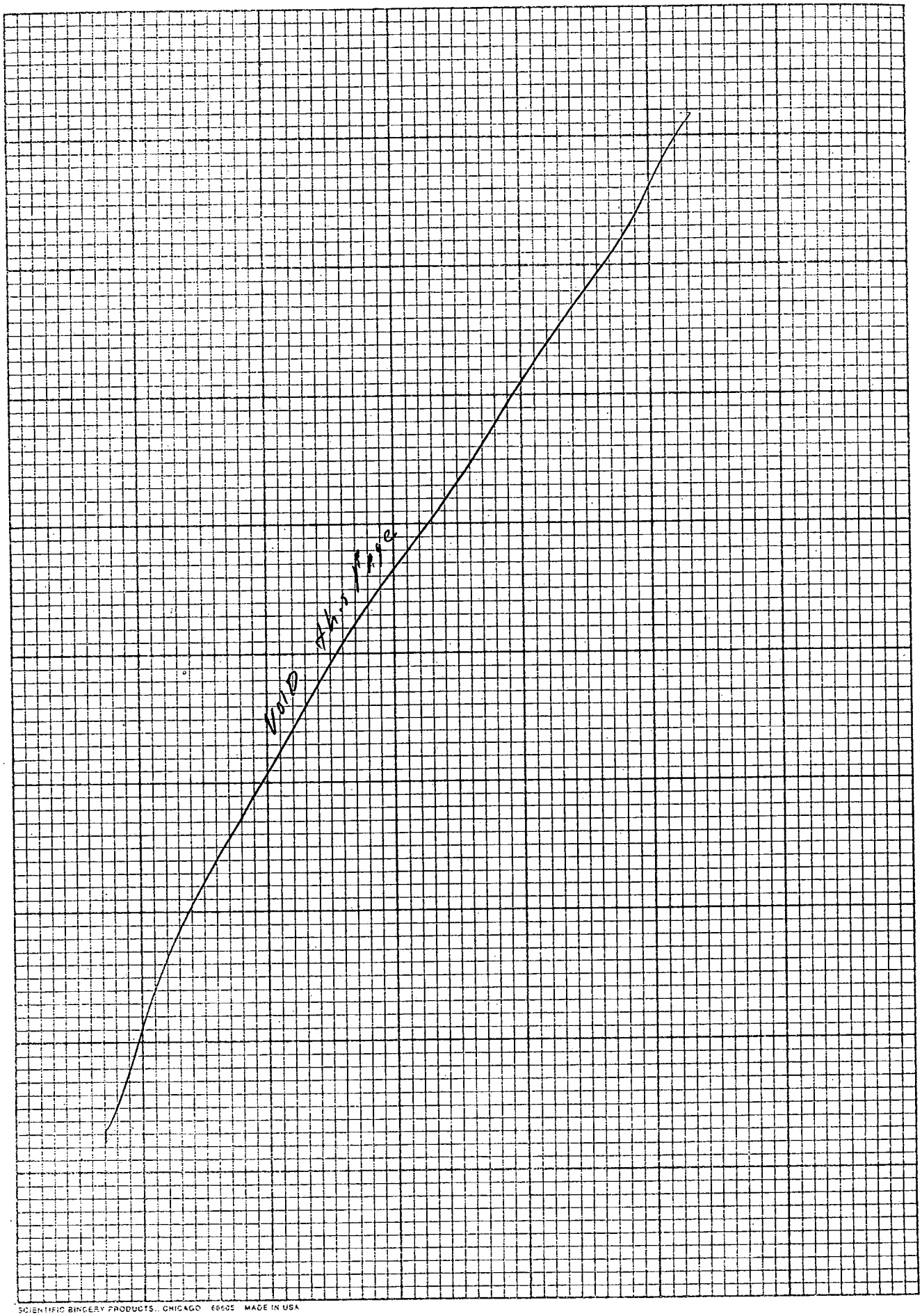
0715 Hrs - Arrive @ Wal Mart - Purchase Hacksaw for Mustard Gas Site & drill bit
0740 Hrs - Arrive @ Good Earth for 1/2 of top soil
0801 Hrs - Left " "
0845 Hrs - Arrive @ BLDG #3245
Send Faxes to LAO & OFFICE
Some office clean up
Check in w/ Tom Brent
0930 Hrs - Arrive @ SWMU 13 - Detour on Rte 45
Resume - 13 MW-10, 14, 19, 20 & Decon
1445 Hrs - Return to BLDG #3245
Meet w/ Tom Brent to store core boxes & straw bails
1600 Hrs - Return to BLDG #3246 after storage of straw
1630 Hrs - Arrive @ Mustard Gase Site
Attemp to drill holes for well tag OTOZ - drill not heavy duty enough for the task - put tag inside well hd ; cut grounding rod @ Mustard Gas site flush w/ ground.
1530 Hrs - Return to BLDG #3245 for Desk
- Prep. samples on C.o.C # 0997 for shipment
- Prep. EQ. for shipment to Pitt Warehouse & U.S. Environmental on FED EX AB# 8243 8234 9739 & 8243 8234 9740 respectively
- Clean & mop office space
- Inventory EQ. & Supplies
- Clean out Pick up truck
2030 Hrs - Left site for Motel

Note: B.B. Left site @ 1800 Hrs to Drop of Samples and EQ @ FED.EX. (Sample on AB# 828074028990)

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE DATE 5/12/03
DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE




SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

**TITLE** NSWC CRAN

TUES 5/13/03

**PROJECT NO.** 9060

**BOOK NO.** 1363



Work continued from Page

TRAVEL DAY (only)

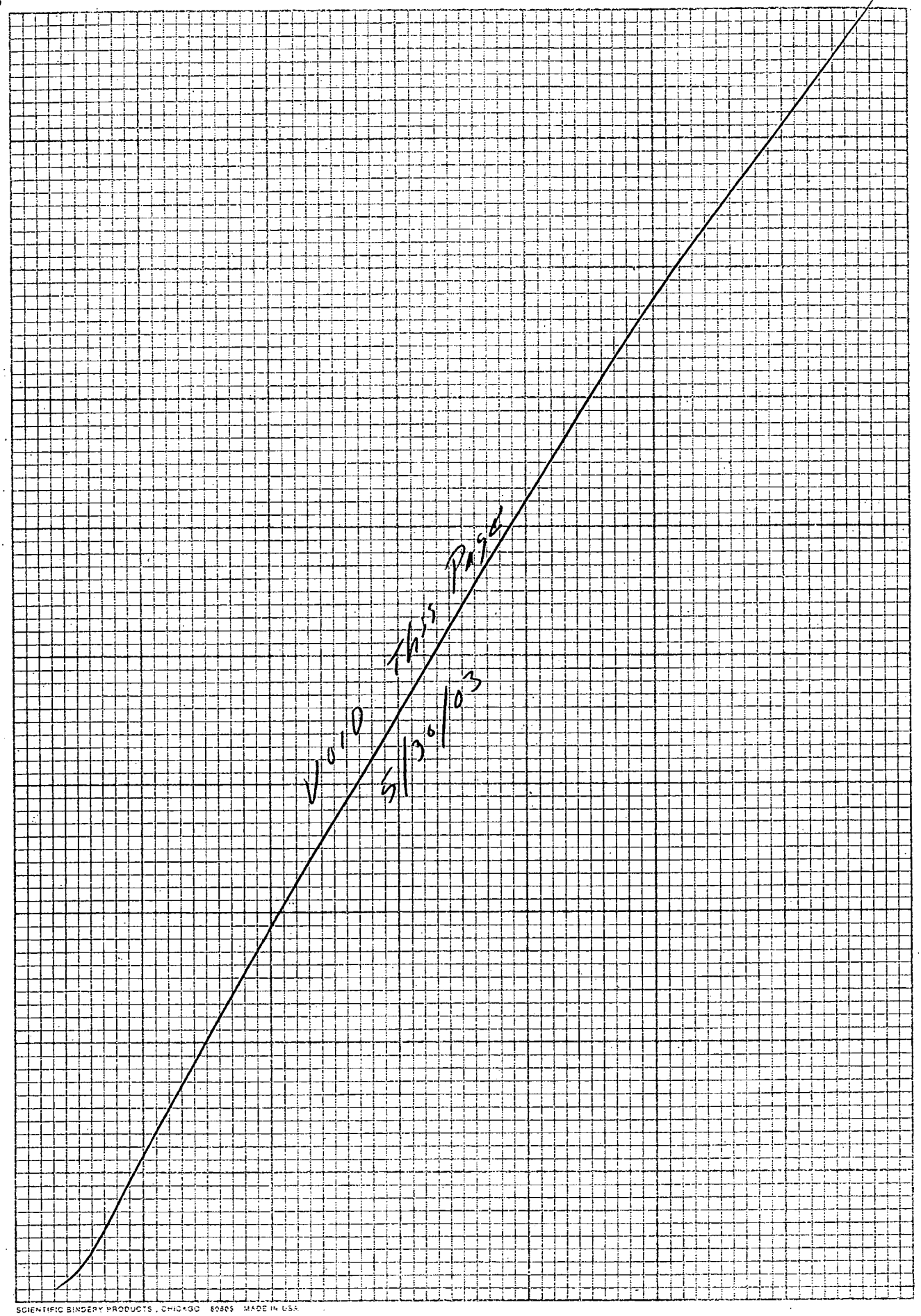
SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

**SIGNATURE** [signature] **DATE** 5/13/03

**DISCLOSED TO AND UNDERSTOOD BY** **DATE** **WITNESS** **DATE**

B 100 P ©




SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

FRI - 05/30/03

Work continued from Page

WEATHER : 75°F & SUNNY (ON SITE WORK @ SWMU-7 FRR)
1640 HRS - LEFT BLDG FOR SWMU 16

| WELL ID | W.L. | TIME |
|---|---|---|
| WES-14-01-83 | 31.00 | 1714 |
| WES-14-02-83 | 14.56 | 1654 |
| WES-14-03-83 | 19.83 | 1710 |
| WES-14-04-83 | 27.27 | 1718 |
| WES-14-05-83 | 33.05 | 1716 |
| 16MWT01 | 22.70 | 1656 |
| 16MWT02 | 12.18 | 1706 |
| 16MWT03 | 28.07 | 1704 |
| 16MWT04 | 13.14 | 1659 |
| 16MWT05 | 30.39 | 1701 |
| 16MWT06 | 15.92 | 1658 |

1730 HRS - RETURN to BLDG # 3245

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 5/30/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

APPENDIX D.1.2
SWMU 13 AND SWMU 16
SITE LOGBOOK
ROUND 2

**From:** Rojahn, Terry
**Sent:** Wednesday, October 15, 2003 4:07 PM
**To:** 'Tom Brent'
**Cc:** Basinski, Ralph
**Subject:** RE: Bowser Morner personnel Participating in Fieldwork Starting October 20, 2003 at NSWC Crane

Tom, the following personnel from Bowser Morner need clearance, however not all of them will be starting work on October 20, 2003:

| | |
|---|---|
| Tim Boehmer | Dayton, OH |
| Ken Boehmer | Dayton, OH |
| John Davis | Dayton, OH |
| Jon Keifer | Dayton, OH |
| Maynard Laati | Dayton, OH |
| Dennis Sinic | Dayton, OH |
| Robert Trader | Dayton, OH |
| Todd Wollenhavpt | Dayton, OH |
| Nick Post | Dayton, OH |
| Tony Mayrer | Dayton, OH |
| Joshua Dean | Toledo, OH |
| James Walsh | Toledo, OH |

All the above are US citizens.

Just a heads up...you should be receiving a lot of coolers and equipment over the next few days.

-----Original Message-----
**From:** Basinski, Ralph
**Sent:** Wednesday, October 15, 2003 2:34 PM
**To:** 'Tom Brent'
**Cc:** Rojahn, Terry; Cochran, Matthew; Wudkwych, Frank; Ramser, Fred; 'Bill Gates'; Goldman, Mary Lou
**Subject:** TtNUS Personnel Participating in Fieldwork Starting October 20, 2003 at NSWC Crane

The following Tetra Tech NUS, Inc. personnel will be participating in fieldwork at NSWC Crane SWMUs 1, 13, and 16 starting October 20, 2003

Terry Rojahn
Matt Cochran
Frank Wudkwych
Fred Ramser
Robert Balkovec

All of these staff are located at Pittsburgh, Pennsylvania office of Tetra Tech NUS.

The award for the drillers has been made to Bowser-Morner. Terry Rojahn is in contact with the driller and will send an e-mail to you with the list of drillers and their home office locations.

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 43633 MADE IN USA

Work (

**Basinski, Ralph**

**From:** Basinski, Ralph
**Sent:** Tuesday, October 07, 2003 2:30 PM
**To:** Cochran, Matthew; Rojahn, Terry; Schubert, Jeff
**Cc:** 'Bill Gates'; 'Tom Brent'; Johnston, Tom; Goldman, Mary Lou
**Subject:** Access for Fieldwork at SWMUs 13 & 16

**Terry, Jeff, and Matt**

Tom and Bill informed me of the following.

SWMU 13 – No operations will be occurring that will limit access. Follow the procedures developed last time in regards to access.

SWMU 16 - Operations will be occurring. The Army has agreed to limit operations to Monday through Thursday on alternate weeks. SWMU 16 cannot be accessed during that time. No operations will occur on Friday, Saturday, and Sunday. SWMU 16 is fully accessible during that time. Please note that the Army is working the 4-10s in order to accommodate our fieldwork at SWMU 16. Therefore, we need to make sure that any schedule changes are communicated to the Tom and the Army as soon as known. Also, we should inform Tom as soon as our work at SWMU 16 is complete so that the Army can revert to their normal schedule.

**Ralph**

-----Original Message-----
**From:** Basinski, Ralph
**Sent:** Tuesday, October 07, 2003 1:57 PM
**To:** 'Tom Brent'
**Cc:** 'Bill Gates'; Johnston, Tom; Cochran, Matthew; Rojahn, Terry
**Subject:** Fieldwork at SWMUs 13 & 16

**Tom**

As you are aware we are scheduled to be in the field starting October 20, 2003 at SWMUs 13 and 16. Currently we are in the office mobilization and planning phase.

During the last field event we ran into access issues at SWMUs 13 and 16 due to operations occurring at these facilities. Can you find out anything about the operations schedules from October 20 through mid-December. This information would be useful for planning purposes.

Also, during the last field event, security / access procedures were established for TtNUS and subcontractor staff. Was anything written regarding these procedures? If something written is available, please provide a copy or call me to discuss.

Ralph



Work continued to Page

SIGNATURE DATE

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

VOID THIS PAGE

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

Monday 10-20-03

Work continued from Page

700 Hrs - Arrive @ Pitt Airport
TRAVEL DAY
1300 Hrs - Arrive @ NSWC CRANE
OBTAIN BADGE
1315 Hrs - Arrive @ BLDG 3245
OPEN & BEGIN to ORGANIZE EQ & SUPPLIES
SHIPMENT
Missing SOME RENTAL EQ. - BLADDER PUMP,
(2) M-Scopes, (1) YSI etc.
1400 Hrs - Drillers ARRIVE - UNLOAD SUPPLIES + EQ
1415 Hrs - T.R. & F.R. ARRIVE @ PUBLIC WORKS
OBTAINED Dig PERMITS
1) West side of SWMU 13 Mine Fill B
~10 WELLS CLEARED FOR drilling
2) Mustard GAS SWMU 1 Complete Site
1445 Hrs - RETURN to BLDG. #3245
MEET W/ Drillers JON KEIFER, DENNIS SIMIC &
TODD Wollenhaupt - NEEDED to get
badged @ Bloomington Gate
1520 Hrs - Drillers RETURN - go to check out drilling
locations W. of Mine Fill B
1650 Hrs - RETURN to BLDG #3245
PAPERWORK, PREP FOR H&S MEETING FOR tomorrow
1745 Hrs - LEFT BASE

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE
DATE 10/20/03
DISCLOSED TO AND UNDERSTOOD BY
DATE
WITNESS
DATE

10/21/03

BOWSER MORNER

- RECEIVE HES TRAINING
- RECON WELL LOCATIONS W OF MINE FILL B
- PURCHASE SUPPLIES FOR DECON PAD
- BUILD DECON PADS
- OBTAIN 20 slot SCREENS
- TRACK DOWN BULLDOZER to CONSTRUCT ROADS to WELLS @ MINE FILL B (W. SIDE)

SAMPLING:

- CONDUCTED SEEP SEARCH W SIDE OF MINE FILL B - SEEP 135P04 FOUND
- CONDUCTED trenching Activities - MC & FVol

SCIENTIFIC BINDERY PRODUCTS

TUES. 10-21-03

Work continued from Page

0655 HRS - ARRIVE @ BLDG #3245
H&S SITE SPECIFIC TRAINING

TT HUS

BOWSER MARNER

MATT COCHRAN MC
FRED RAMSER FR
FRANK WUDKWYCH FW
T. ROMANA T.R

TIM BOEHMER (TB)
JON KEIFER (JK)
TODD WOLLENHAUPT (TW)
DENNIS SINIC (DS)

- EQUIPMENT INSPECTION
- GO OVER WORK PERMITS

0910 Hrs - T.B, JK., MC FR & TR RECON W. SIDE OF MINE FIELD B ; T.B. UNABLE to comment Rotasonic Rig to drill in AREA unless ACCESS ROADS ARE CONSTRUCTED.
CHECK IN WITH OFFICE - MC. will coordinate Road construction W T. BRENT & NSWC CRANE FORESTER

1100 Hrs - T.R. & FR check in w/ Public Works to SEE IF other AREAS CAN be CLEARED besides W. side of MINE FILL B - Public Works still having problems to complete SWMU 16 by 10/25/03 & REMAINDER OF MINE Fill B by 10/27/03
DONNA Zollman told T.R. that WELLS & Borings inside MINE FILL B WERE not located - T.R. & F.R. will locate & get back to Public Works when job is Accomplished.

1200 Hrs - LUNCH

1230 Hrs - RETURN to BLDG #3245
- M.C. & F.W. TRENCH (2) SEEPS & (1) SW location, W backhoe & dig ONE SW location W. SHOVEL
- RECON & OK Road construction FOR ACCESS to drilling locations W of MINE Fill B W/ Rotasonic T. BRENT & FORESTER CONFIRM - BE CAREFUL & AVOID All shag bark hickory TREES (ADULT & SAPling)

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 10/21/03
DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

**Brent Thomas J CNIN**
**From:** Johnson, Douglas G (PKI) [DOUG.JOHNSON1@US.ARMY.MIL]
**Sent:** Tuesday, October 07, 2003 3:56 PM
**To:** Clinton, Leah K (PKI); Voorhies, John D (PKI); Roach, Michael D (PKI)
**Cc:** Brent Thomas J CNIN
**Subject:** FW: TtNUS Participants in Fieldwork at SWMUs 1, 13 & 16

Partial list of TetraTech employees that will be conducting fieldwork @ MFB and 146. Will provide the names of the drilling crew as soon as Tom forwards.

-----Original Message-----

**From:** **Brent Thomas J CNIN [mailto:brent_t@crane.navy.mil]**
Sent: Tuesday, October 07, 2003 2:27 PM
To: Johnson, Douglas G (PKI)
Subject: FW: TtNUS Participants in Fieldwork at SWMUs 1, 13 & 16

Doug,

Here's the partial particulars. Current plan is to begin work at B146 on Friday, October 24, 2003. I'll pass along the names of the drillers once I get them. Note that SWMUs 1, 13, & 16 are Mustard Gas Burial Grounds, Mine Fill B, and B146, respectively.

Thanks,
Tom

-----Original Message-----

**From:** **Basinski, Ralph [mailto:BasinskiR@ttnus.com]**
Sent: Tuesday, October 07, 2003 2:13 PM
To: Brent Thomas J CNIN
Cc: 'Bill Gates'; Rojahn, Terry; Cochran, Matthew; Johnston, Tom; Goldman, Mary Lou
Subject: TtNUS Participants in Fieldwork at SWMUs 1, 13 & 16

The following Tetra Tech NUS, Inc. personnel will be participating in fieldwork at NSWC Crane SWMUs 1, 13, and 16.

Terry Rojahn
Matt Cochran
Frank Wudkwych
Fred Ramser
Robert Balkovec
All of these staff are located at Pittsburgh, Pennsylvania office of Tetra Tech NUS.

The award for the drillers will be made shortly. Once the award is made the driller will be requested to provide a list of staff and their office locations.

The fieldwork is scheduled to start on Monday, October 20, 2003.

SCIENTIFIC BINDERY PRODUCTS CHICAGO 60601 MADE IN USA

**Brent Thomas J CNIN**

**From:** Brent Thomas J CNIN
**Sent:** Thursday, October 16, 2003 1:41 PM
**To:** Johnson Douglas G CNIN
**Subject:** FW: Bowser Morner personnel Participating in Fieldwork Starting O ctober 20, 2003 at NSWC Crane

Doug,

As promised, here is the list of drillers who will be working with the Tetra Tech folks on the upcoming fieldwork at B146 and MFB. Please distribute to CAAA Security. As a reminder, they will begin mobilizing here on Monday, October 20, 2003. The 1st shift will end on Wednesday, October 29, 2003. Please let me know if you have any questions.

Thanks,
Tom

-----Original Message-----
**From:** Rojahn, Terry [mailto:RojahnT@ttnus.com]
**Sent:** Wednesday, October 15, 2003 3:07 PM
**To:** Brent Thomas J CNIN
**Cc:** Basinski, Ralph
**Subject:** RE: Bowser Morner personnel Participating in Fieldwork Starting O ctober 20, 2003 at NSWC Crane

Tom, the following personnel from Bowser Morner need clearance, however not all of them will be starting work on October 20, 2003:

| | | |
|---|---|---|
| | Tim Boehmer (TM) | Dayton, OH |
| | Ken Boehmer | Dayton, OH |
| | John Davis | Dayton, OH |
| | Jon Keifer (JK) | Dayton, OH |
| * | Maynard Lahti (ML) | Dayton, OH |
| | Dennis Sinio (DS) | Dayton, OH |
| | Robert Trader | Dayton, OH |
| | Todd Wollenhaupt (TW) | Dayton, OH |
| | Nick Post (NP) | Dayton, OH |
| | Tony Mayrer | Dayton, OH |
| * | Joshua Dean JD | Toledo, OH |
| * | James Walsh JW | Toledo, OH |

All the above are US citizens.

Just a heads up...you should be receiving a lot of coolers and equipment over the next few days.

-----Original Message-----
**From:** Basinski, Ralph
**Sent:** Wednesday, October 15, 2003 2:34 PM
**To:** 'Tom Brent'
**Cc:** Rojahn, Terry; Cochran, Matthew; Wudkwych, Frank; Ramser, Fred; 'Bill Gates'; Goldman, Mary Lou

**Subject:** TtNUS Personnel Participating in Fieldwork Starting October 20, 2003 at NSWC Crane

The following Tetra Tech NUS, Inc. personnel will be participating in fieldwork at NSWC Crane SWMUs 1, 13, and 16 starting October 20, 2003

Terry Rojahn
Matt Cochran
Frank Wudkwych
Fred Ramser
Robert Balkovec

All of these staff are located at Pittsburgh, Pennsylvania office of Tetra Tech NUS.

The award for the drillers has been made to Bowser-Morner. Terry Rojahn is in contact with the driller and will send an e-mail to you with the list of drillers and their home office locations.

L. Clinton - 854-3960

## Brent Thomas J CNIN

**From:** Johnson, Douglas G (PKI) [DOUG.JOHNSON1@US.ARMY.MIL]
**Sent:** Monday, October 20, 2003 9:37 AM
**To:** Clinton, Leah K (PKI)
**Cc:** Voorhies, John D (PKI); Brent Thomas J CNIN
**Subject:** TetraTech Fieldwork @ MFB

Leah,

Just wanted to make you aware that TetraTech personnel conducting fieldwork usually work until dark. Are there any special procedures we need to implement for after normal hours-work?

If after hours work is a problem, please let me or Tom Brent know.

Doug Johnson
Environmental Protection Specialist
SJMCN-SF
Crane Army Ammunition Activity
(812)854-1481
DSN 482-1481

SCIENTIFIC EINDERY PRODUCTS CHICAGO 60605 MADE IN USA

10/21/03 Con't

Work continued from Page

- T.R. & F.R. - problems accessing Mine Fill B; security @ North Gate need E-mail to confirm our access - T. Brent got access Email to Gate via D. Johnson & L. Clinton see Pages 106-108
- TR & F.R. → Accessed Mine Fill B @ 1500 Hrs & Talked w/ Mr. Kluesner; Talk Mr. Kluesner about drilling & sampling activities in area - Mr Kluesner said extraction maybe completed in ~1 week & Bldg #165 Buffer Zone will not be needed
- TR & F.R. - Lay out 5 well & 10 Boring locations within Mine Fill B
- TR & F.R. - Return to Public Works to let Donna know that above was accomplished

1640 Hrs - Return to Bldg #3245
- Paperwork
- Check on sediment & soil containers w/ Anh Ho - should arrive tomorrow
- Check in @ Pitt office - T. Johnston - report progress w/ accessing Mine Fill B; decission to build roads W. of Mine Filled B; & progress w/ deep search & trenching

1730 Hrs - Left site for Lowes (F.R. & TR) & Sams (F.R. & MC) to purchase supplies.

1840 Hrs - Return to Hotel.

END



Work continued to Page

SIGNATURE [signature] DATE 10/21/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

T+NUS - Crew Same as 10/21/03 P. 105
MB - " " " " P. 105

10/22/03 SUMMARY

Drilling:

- Bull Dozer Arrived this date
- Installed 13MWT42
- Start Installation of 13MWT40
- Site Access Completed on W. Side of Mine Fill B to Access wells on Sewer Utility Corridor
- See Note Book 2555 for Details

Sampling Completed:

| Seeps | Surface Water | Sediment |
|---|---|---|
| 13SP0101 | 13SW1601 | 13SD290004 (13FD10220302) |
| 13SP0201 | 13SW1401 (13FD10220301) | 13SD310004 |
| 13SP0301 | 13SW3101 | 13SD300004 |
| 13SP0401 | 13SW2201 | 13SD280004 |
| | 13SW1302 (13FD10220303) | |
| | 13SW1202 | |
| | 13SW3001 | |

CoFCs = 4801, 4802 & 4803; Shipped this date on AB # 8412 2491 1051 to Laucks

Surface Water Locations that were Dry:
13SW29, 13SW15 & 13SW28

Dry Seep: Seep Location A down grade of 13SW15.

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60635 MADE IN USA

WED 10/22/03

Work continued from Page

WEATHER - Mostly Sunny TEMP 60°; mild

0650 Hrs - ARRIVE @ BLDG #3245
- CHECK IN w/ R. BASINSKI
- " YSI & LaMotte
- INVENTORY BOTTLE SHIPMENT
- PREP. to SAMPLE SW/SD

0820 Hrs - CHECKED ACCESS AREAS W. OF MINE FILLS FOR CLEARING FOR ROTASONIC RIG - MARKED TREES NOT to BE REMOVED (TREES 7A" DBH); NO SHAGBARK HICKORIES WERE REMOVED

0930 Hrs - START SAMPLING SURFACE WATER & SEDIMENT @ SWMU 13; FRANK, MATT & TERRY

1130 Hrs - LUNCH

1200 Hrs - REFRIGERATE SAMPLES @ BLDG #3245 TAKEN thus far - SECURED in REFRIGERATOR

1230 Hrs - RETURN to SWMU 13 CONT SAMPLING SW, SD & SEEPS

1630 Hrs - RETURN to BLDG #3245 PREP. SAMPLES collected this date FOR SHIPMENT ON COCs 4801, 4802 & 4803 to LAUCKS ON AB# 8412 2491 1051

1800 Hrs - LEFT BASE FOR FED. EX

1835 Hrs - DROP OFF SAMPLES @ FED. EX

1900 Hrs - RETURN to Motel

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE Terry Rogers

DATE 10/22/03

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE

T+NUS / BM - CREWS SAME AS 10/21/03 P. 105

10/23/03 SUMMARY

SAMPLING: SURFACE WATER (SW) & SEDIMENT (SD)

SW:

13SW08, 10, 18, 19, 20 & 27

SD:

13SD24, 25, 26, 27

SAMPLES SHIPPED VIA FED-EX AB # 8412 2491 0813
ON COCCs 4804 & 4805

DRILLING SUMMARY

Installed 13MWT40

Installed upper casing @ 13MWT41

SEE NB # 2555 FOR DETAILS

SCIENTIFIC BINDERY PRODUCTS (CHICAGO) 50201 MADE IN USA

THUR. 10/23/03

Work continued from Page

WEATHER - Mostly Sunny TEMP 60s

0700 Hrs - ARRIVE @ BLDG #3245
- Prep. to sample SW/SD @ SWMU 13
- Check YSI cali.
- Calibrate LaMotte
- FAX CoFCs FROM 10/22/03 to LAUCKS LAB & OFFICE (E.S.)

0830 Hrs - Check in @ N. GUARD Gate @ SWMU 13 (out @ 0900

0850 Hrs - Begin sampling SW/SD @ SWMU 13

1100 Hrs - LUNCH

1150 Hrs - ARRIVE @ BLDG #3245
SECURE MORNING SAMPLES in Frig.

1215 Hrs - RETURN to SWMU 13 cont sampling SW/SD

1450 HRS - RETURN to BLDG #3245
- PACKAGING + PAPERWORK OF SAMPLES ON CoFCs 4804 & 4805

Dig Permits
- Contact DONNA (Public Works) SWMU 16 will Not be CLEARED FOR this weekend's work (drilling only)
- Dig PERMIT FOR SWMU 13 inside ~~bldg~~ FENCED

- TALK w/ R. BASINSKI - Progress REPORT
- CLEAN / ORGANIZE FIELD OFFICE

1745 Hrs - F.W. & M.C. LEFT SITE to DELIVER SHIPMENT to FED. EX (SAMPLES ON CoFCs 4804 & 4805)
T.R. REMAINED ON SITE - PAPERWORK, ETC. to WAIT ON drilling CREW & F.R.

1845 Hrs - LEFT BLDG 3245 FOR Model

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 10/23/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

B 100 P ©

THUS - SAME CREW
BM - JK, DS, TW & NEW ARRIVAL NICK POST

10/24/03 SUMMARY

SAMPLING: Collected

| SW | SD |
|---|---|
| 13 SW3201 | 13 SD32 & 16 SD19, 17, 16, 18 |
| 16 SW1701 | 15, 14, 21 & 22 |
| 16 SW1801 | |
| 16 SW1401 | |
| 16 SW2101 | |

SAMPLES SHIPPED VIA FED. EX AB# 8412 2491 0824
ON COFCs 4806 & 4807.
* Conducted SEEP SEARCH NONE FOUND THIS DATE. @ SWMU 16

Drilling:
- Nick Post on site this Date - EK gave him HES
- Installed 13MWT37
- Drilled to 40' BGS @ 13MWT38, Cored 25-40' BGS
- See Notebook #2555 for Additional Detail

SCIENTIFIC STATIONERY PRODUCTS, CHICAGO 60655 MADE IN USA

SAT 10/25/03

Work continued from Page OVERCAST W/ PERIODS OF RAIN

0650 Hrs - ARRIVE @ BLDG #3245

- PREP to FINISH SW/SD sampling @ SWMU 16
- PREP to COLLECT GW SAMPLES @ SWMU 16

CALI. Additional YSI & LaMotte METER

CALI. PID

DETERMINE order of WELL sampling w/ relationship to hits & MNA

CHECK OUT NA METER DR/890 Colorimeter

1) ABSORBANCE Solution FOR INST. PERFORMANCE VERIFICATION

| Program # | nm | Standard 1 | Standard 2 | Standard 3 |
|---|---|---|---|---|
| 42 | 420 | 0.629 | 1.216 | 1.850 |
| 52 | 520 | 0.612 | 1.267 | 1.832 |
| 56 | 560 | 0.586 | 1.204 | 1.760 |
| 61 | 610 | 0.581 | 1.243 | 1.839 |

2) ACCURACY CHECK FOR Nitrite USING $NO_2^-$-N STANDARD = 5 mg/L

- 5.00 ml of 250 mg/L $NO_2^-$-N standard dilute in 250 mL vol flask (500 mg/L)
- Above took 10 ml of dilute & diluted in 500 mL " " to make 0.100 mg/L NO2-N
- RAN test using ABOVE Dilute - Results 0.091 SHOULD READ between 0.090 & 0.110

1200 Hrs - LUNCH

1245 Hrs - PREP FOR GW Sampling @ SWMU 16 @ 1400 Hrs

FW on 16GW0202

MC & TR on 16GW0502 - ~~Collected~~ RAN NA PARAMETERS

1800 Hrs - ARRIVE @ BLDG #3245

CLEAN UP; bring in meters; decon bladder pump etc.

1900 Hrs - LEFT NSWC CRANE FOR MOB/

BHD



SIGNATURE [signature] DATE 10/25/

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

TI HILLS - SAME CREW
BM - JK, DS, TW & NP

DRILLING:

Grouting top off casings & wells
Installed 1 PAD @ 13MT37

SAMPLING:

GW @ SWMU-13

WES-10-04-83
WES-14-01-83
16MWT02

Lay out soil boring @ SWMU 16

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 50605 MADE IN USA

Work continued from Page

WEATHER - OVERCAST AM SUNNY AFTERNOON & COLD

0650 Hrs - Arrive @ BLDG #3245
Prep to sample GW @ SWMU 16
Cal. Instruments, etc.

0830 Hrs - Arrive @ SWMU 16
Assist MC with set up @ 16GW01
F.W. to sample @ 16GW04

1015 Hrs - Set up @ 16GW02 - to run NA w/ FR.

1131 Hrs - Finish Running NA @ 16GW02
Lay out All 9 soil Borings @ SWMU w/ FR

1330 Hrs - Lunch

1400 Hrs - PM to check on drillers
TR PAPERWORK, ORGANIZE OFFICE & FIELD DOC.

1750 Hrs - LEFT NSWC CRANE FOR Motel

END



SIGNATURE | DATE

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

VOID THIS PAGE

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60503 MADE IN USA

Mon. 10/27/03

Work continued from Page Weather AM Cold PM Sunny

0700 Hrs - Arrive @ BLDG #3245
- Cal. Instruments
- Check on Dig Permit
- Problems Associated w/ Dig Permits Talk to T. Brent
  SWMU 13 - Production
  SWMU 16 - Security
- Start PREP for Well Dev. - check pumps

0915 Hrs - Talked to T. Brent - Public work must think to existing wells need cleared - will go check if proposed are cleared

0918 Hrs - Leave for SWMU 13

0923 Hrs - Check in @ N. Gate SWMU 13 Guard
Check for ~~clearo~~ TA utility flags inside SWMU 13

0956 Hrs - Check out @ N. Gate w/ Guard

1020 Hrs - Talk w/ Tom Brent - NO water/sewer located on West side/INSIDE FENCE @ SWMU 13
- Tom called PW - checked in w/ Compressed Air & Sewer & Water personnel Also if they need any access help we would be available

1100 Hrs - T. Brent & T.R - met with Max @ N. Gate
Assisted with locating utilities

1215 Hrs - Left Mine Fill B - Max to sign work permit

1220 Hrs - Arrive @ P. Works - All signed but Compressed Air

1230 Hrs - Talked to T. Brent - Tom said that Compressed Air personnel would be showing after lunch

1300 Hrs - Picked up ~~Work~~ DIG Permit - Drilling Crew off Stand By ~1310 (Returned to BLDG #3245)
- Check in w/ OFFICER B.
- Checked in w/ Laucks - Coolers arrived in Temp.
- More Coolers & Unpreserved HDPE on the way
- Check in w/ Microseeps - sending additional bottle sets & Coolers
- Called U.S. Environmental for Working Geopumps
- Fax Calls to Laucks & Office

Work continued to Page 122

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

SIGNATURE Terry Lynch DATE 10/27/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

CREWS SAME AS ON 1/4

SAMPLING:

13SW1501, 28, 09, 25, 07, 24 & 26 sampled this Date

LAUCKS SAMPLES SHIPPED ON COFCS # 4804, 4811, 4813 & 4814 via FED EX AB# 8412 2491 1040

MICROSEEPS samples SHIPPED ON COFC # 4812 via FED EX AB# 8412 2491 0846

DRILLING:

Stand By All Morning

39' of Isolation Casing Installed @ 13:00 1/5

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

10/27/03 Cont

Work continued from Page

- PACKAGING & SHIPPING
  1) LANCES (10 Coolers) AB# 8412 2491 1040
     CoFCs # 4808, 4811, 4813, & 4814
  2) MICROSEEPS (1 Cooler) AB# 8412 2491 0846
     CoFC # 4812
  3) US ENVIRONMENTAL AB# 8412 2491 0835
     GEOPUMP

1715 Hrs - LEFT NSWC CRANE FOR FED EX

1800 Hrs - Drop off SAMPLES @ FED EX

1820 Hrs - PURCHASE PAPER TOWELS, Zip Lock bags & drinking WATER @ SAMS

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE Terry Rapt

DATE 10/27/03

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE

CREWS SAME AS ON P. 114

SAMPLING

13GWT 24, 23 & 19 sampled THIS DATE
ALONG with 2 Source Blanks
LAUCKS SAMPLES SHIPPED ON C-of-C # 2815
VIA FED EX AB# 8412 2491 1030

DRILLING

Set two Isolation Casings @ 13MWT 45 & 35 and
Drilled shallow WELL 13MWT 32 to TD.

SCIENTIFIC BINDERY PRODUCTS CHICAGO 60603 MADE IN USA

TUES 10/28/03

Work continued from Page

0700 Hrs - Arrive @ BLDG. #3245
Call Meters (YSI, Turb. & PID)
Refax COCs to Labs
Prep. to sample GW @ SWMU 13 & run MNA
0810 Hrs - Arrive @ Mine Fill B After checking in w/Guard
Set up @ 13MWT23 & 24
Run NA on both wells
1050 - 1151 Hrs - Run NA @ 13MWT24
1200 Hrs - Lunch
1230 Hrs - Return to BLDG #3245
Refrigerate samples from 13MWT24 & Pick up supplies
1355 Hrs - 1438 Hrs Run NA @ 13MWT23
1450 Hrs - Finish cleanup inside Minefill B ~~EH~~ TK
1500 Hrs - Check in w/ N. Gate Guard ... Report everyone out of Minefill B including Drilling Crew
1515 Hrs - Arrive @ BLDG #3245
- Unload Rental Car
- TK Collect Trip Blank TB10280301
- FW & TK Collect Source Blanks
  1) SB10280301 - Drilling Water
  2) SB10280302 - DI Water Reagent Grade Water
     NELL Lot # 0807253
     EXP 08-2004
- Check in w/ R. Basinski - Regarding Work Progress
- Packaging & Shipping

1755 Hrs - Left NSWC Crane for Fed. Ex.
1832 Hrs - Drop of Samples on AB # 8912 2491 1030

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE
DATE 10/28/03
DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

CREW: THUS: FRASER & T. ROSAHL
BM = JK, DS, TW & NP

Drilling: Complete installation of 13MWLT32

SAMPLING: NONE this date - Travel Day

SCIENTIFIC BINDERY PRODUCTS . CHICAGO 50605 MADE IN USA

WED. 10/29/03

Work continued from Page

0655 Hrs - Arrive @ BLDG #3245

- FAX COC 4815 to LAUCKS & OFFICE from Yesterday's Sampling Effort
- Submit Personnel Names to T. Brent for next shifts passes.
- Organize office
- Sweep & mop office area, lab & bathroom & path to bathroom.

0930 Hrs - Left NSWC Crane for Airport

Remainder of Day: Travel

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 10/29/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

HACH DR/Check™
Absorbance Standard

CERTIFICATE OF ANALYSIS

| WL nm | Std No. 1 ABS Lot 43 | Std No. 2 ABS Lot 43 | Std No. 3 ABS Lot 43 |
|---|---|---|---|
| 420 | 0.610 ± 0.050 | 1.199 ± 0.050 | 1.770 ± 0.050 |
| 520 | 0.617 ± 0.050 | 1.220 ± 0.050 | 1.804 ± 0.050 |
| 560 | 0.593 ± 0.050 | 1.212 ± 0.050 | 1.756 ± 0.050 |
| 610 | 0.621 ± 0.050 | 1.227 ± 0.050 | 1.786 ± 0.050 |

- Certified at 25°C -

SIGNED: Patrick J. Hartman

For and on behalf of the Hach Company
NOTE: This certificate may be removed and affixed to a laboratory notebook or other quality record. AR603A

Kit Lot Number 3281 Expiry Date: Feb 2005 27639-07A

DR 890

HACH DR/Check™
Absorbance Standard

INSTRUMENT READING

| WL nm | Std No 1 ABS Lot 43 | Std No 2 ABS Lot 43 | Std No 3 ABS Lot 43 |
|---|---|---|---|
| 420 | 0.622 | 1.223 | 1.804 |
| 520 | 0.618 | 1.240 | 1.797 |
| 560 | 0.596 | 1.187 | 1.734 |
| 610 | 0.594 | 1.213 | 1.792 |

RECORD INITIAL VALUES IN ABOVE TABLE

NOTE: This certificate may be removed and affixed to a laboratory notebook or other quality record. AR603A

Kit Lot Number 3281 Expiry Date: Feb 2005 27639-07B

DR 850

| | | | |
|---|---|---|---|
| 52 | 0.646 | 1.234 | 1.815 |
| 61 | 0.627 | 1.238 | 1.809 |

MCs Cases - Set up on 13 MAY 29 (ATU cases)
SEE NB # For Details

FRs Cases - Set up & start during @ 13 MAY 28
SEE NB # 2553 For Details
(Radionuclide Cases)

SCIENTIFIC BINDERY PRODUCTS . CHICAGO 60605 MADE IN USA

MON 11/03/03

Work continued from Page

1425 Hrs. - ARRIVE @ BLDG 3245
• CAL: YSIs ; Problem w/ PH SENSOR ON 98F047848

1500 - 1545 Hrs - HES FOR J. WALSH & J. DEAN
M. LAHTI WAS A NO SHOW - to ARRIVE tomorrow

1600 Hrs - PREP. FOR WELL DEV. OF 11/04
PREP. to INSTALL PUMPS
CHECK DR Colorimeters w/ Absorbance Standards
CHECK IN W/ R. BASINSKI

1820 Hrs - LEFT SITE (BLDG #3245) FOR Hotel

END

Work continued to Page

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

SIGNATURE Ty Nagel

DATE 11/3/03

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE

B 100 P ©

CREWS:

THUS - F.W., R.K., M.C. & TK
BM - ML, JK, D.S., TH, MP, JW & JD

SUMMARY 10/4/03

SAMPLING:

DEVELOPE WELLS

13MWT 42, 40, 37 & 32

DRILLING:

INSTALLED 13 MWT 29
13 MWT 28 ~~Casing only~~ (TK) Isolation Casing
13 MWT 39
13 MWT 38 Isolation Casing

SEE Note books #2565 (MC) & 2553 (FR) For Details

SCIENTIFIC BINDERY PRODUCTS CHICAGO 60605 MADE IN USA

TUES 11-04-03

Work continued from Page WEATHER Mostly Sunny TEMP High 70's Low 80's

0650 Hrs - Arrive @ BLDG #3245
PREP to HES TRAIN M. LANTI

0700 - 0800 Hrs - TRAINING (HES) M. LANTI

0830 Hrs - RECEIVE M.L'S HES PAPERWORK
PREP. to DEVELOPE WELLS

0845 Hrs - SHOW M.L. SWMU 13

0930 Hrs - Arrive @ 13MWT42
DEVELOPE WELL Start = 0939
Stop = 1021 Volume Purged (3L) dryout 3 times

1035 Hrs - Arrive @ 13MWT40
Start = 1053
END = 1145 Volume Purged (11.5gal) dry out 3 times

1200 Hrs - Lunch

1230 Hrs - Arrive @ BLDG #3245
DECON Pumps & Call OFFICE

1315 Hrs - Return to SWMU 13 WELL 13MWT37
Start = 1329
END = 1417 Volume Purged (10gal) dry out 3 times

1426 Hrs - Arrive @ 13MWT32
Start = 1435
END = 1522 Vol. PURGED (8gal) dry out 3 times

1540 Hrs - Return to Bldg #3245

- RUN Nitrite Standard on DR 850 (HACH Colorimeter)
  Read = 0.093
- REPAIR - pH PROBE on 98F0478AB sonde
- DECON - WHALE PUMPS
- Start PREP. FOR GW SAMPLING

1750 Hrs - LEFT BLDG #3245 FOR Motel

END

Work continued to Page

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

SIGNATURE

DATE 11/4/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

CREWS: SAME AS ON P. 130

SAMPLING: SEE TABLE ON P. 133

DRILLING:

Drilled & Installed the Following:

13MWT3C
13MWT31 > MC NB#2545

13MWT38
13MWT27 > FR NB#2555

SCIENTIFIC BINDERY PRODUCTS CHICAGO 60601 MADE IN USA

**TITLE** NSWC CRANE

**PROJECT NO.** 9660

**BOOK NO.** 1363



WED 11-5-03

Work continued from Page

WEATHER Mostly Cloudy Temp 40°s

0655 Hrs - ARRIVE @ BLDG #3245

PREP to SAMPLE GW

0810 HRS - ARRIVE @ SWMU 13

| SAMPLE ID | START PURGE | END PURGE | VOL. PURGED | SAMPLE TIME | COMMENTS *(SAMPLER) |
|---|---|---|---|---|---|
| 13GWT2502 | 0830 | 0925 | 15.2 L | DRY | *(TR) |
| 13GWT2102 | 0825 | 0950 | 2.2 gal | 0950 | *(FW) MS/MSD (TR NA) |
| 13GWT1702 | 0945 | 1045 | 6 L | 1047 | *(TR) NA 13FD110503 |
| 13GWT4004 | 1455 | 1630 | 2.2 gal | 1630 | *(FW) |
| 13GWT4201 | 1535 | 1614 | 3 L | DRY | *(TR) |

NOTES:

- CHECK IN W/ BLDG 165 VIA PHONE - to mob Rotasonic through buffer zone to 13MWT43 & 44 (OK)
- CHECK IN W/ LAB
- CHECK IN W/ R. BASINSKI

1730 Hrs - RETURN to BLDG. #3245

DROP OFF EQ

PAPERWORK

WAIT FOR FW

1800 Hrs - LEFT NSWC CRANE

END

Work continued to Page

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

SIGNATURE [signature] DATE 11/5/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

Summary 11-6-03

CREWS - SAME AS ON P. 130 ~~EXCEPT JK is off-site~~ (TO)

Drilling

SEE NB 2565 MC

SEE NB 2555 FR

Stalling

SEE tables on P. 135

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

THURS 11-6-03

Work continued from Page WEATHER - OVERCAST & TEMP LOW 40's

0655 HRS - ARRIVE @ BLDG #3245
PREP to SAMPLE GW

0815 HRS - CHECKED IN W/ N. GATE GUARD & MINEFILD B

| SAMPLE ID | START PURGE | END PURGE | VOL PURGED | SAMPLE TIME | COMMENTS |
|---|---|---|---|---|---|
| 13GMT2502 | 11-5-03 | | 15.2 L | 0845 | (TR) PURGED (11-5) start sampling on 11-6 (Explosives only) |
| 13GWT0502 | 0920 | 1320 | 21.7 L | 1320 | (TR) NA RUN |
| 13GWT4201 | 11-5-03 | | 3 L | 1500 | (TR) PURGED (11/5) start samples on 11-6 (All but metals) |
| 13GWT3701 | 1400 | 1550 | 2.3 gal | 1550 | (EW) |

WELL DEVELOPMENT:

| SAMPLE ID | START DEV. | END DEV. | VOL. PURGED | COMMENTS |
|---|---|---|---|---|
| 13MWT29 | 0827 | 1000 | 22 gal | — |
| 13MWT39 | 1043 | 1140 | 6.5 gal | — |
| 13MWT38 | 1300 | 1650 | 3 gal | WILL CON'T DEVELOPING ON 11/7 |

1600 HRS - PICKED up DIG PERMIT FOR SWMU 16 @ Public works
1615 HRS - RETURN to BLDG #3245
- PAPERWORK & PREP. SAMPLES FOR SHIPMENT ON COC # 4816 VIA FED EX AB# 8412 2491 0629
- CHECK IN W/ Ralph BASINSKI
- CHECK IN W/ LAB talked to H. PRENTICE, also CONFIRMED SAT. DELIVERY

1845 HRS - DROP OFF SAMPLES @ FED EX.
1915 HRS - FAX COCs to OFFICE & LAB FROM Hotel

END



SIGNATURE Tony Rogers DATE 11-06-03
DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

SUMMARY 11-7-03

CREWS - SAME AS ON PAGE 130, EXCEPT JK IS OFF SITE TODAY

Drilling:

SEE NB 2565 MC

SEE NB 2555 ER

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

FRI 11-07-03

Work continued from Page Weather - Partly cloudy Temp High 30's

0650 Hrs - Arrive @ BLDG #3245
- Cal: YSI; Prep to sample GW @ SWMU 13
- Give MC EER priority wells to install first @ SWMU 16
- Check Lock out Tag @ SWMU16 for 16 MWT 13 & 15. Not sure so T. Brent will make calls to confirm that the lines (ele.) were turned off
- Call in Hrs to Pittsburgh

0845 Hrs - Check on FW; gave him charge # for GW sampling & Dev.
0910 Hrs - Arrive @ 13 MWT29

| SAMPLE ID | START PURGE | END PURGE | VOL. PURGED | TIME SAMPLED | COMMENTS |
|---|---|---|---|---|---|
| 13GWT2901 | 0935 | 1205 | 15 L | 1205 (TR) | NA RUN |
| 13GWT3901 | 0913 | 1400 | 5.1941 | 1400 (FW) | |
| 13GWT4201 | | | | | (FW) (Completed sampling Collected Tot. & Dis Meta |
| 13GWT2502 | | | | | (TR) Collected Partical Misc. E |

1400 Hrs - Set up @ 13GWT2502 collected partical misc. explosive. Very slow recharge well.
1435 Hrs - Check on drilling progress @ SWMU 16
1455 Hrs - Arrive @ BLDG #3245
- Check in w/ office - R. Basinski (Progress Report) & T. Johnston (Status of Mustard Gas Start up)
- Made travel arrangements for return next shift (Nov 17-26) - Also talked to Seth Gr about travel arrangements for next shift
- Call Laucks (Mike Baxter) - gave MB tracki No. for Sat shipment
- Paperwork @ Packing for samples on CoC 481

1835 Hrs - Drop off samples @ FED EX (AB# 8412 2491 0618
1852 Hrs - Fax copy of CoC to M. Baxter @ Laucks Lab from Hotel.



SIGNATURE DATE 11-7-03
DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

SUMMARY 11-8-03

CREW SAME AS ON P. 130

DRILLING: SEE NB 2565 MC
SEE NB 2555 F-R

SCIENTIFIC BINDERY PRODUCTS CHICAGO 95605 MADE IN USA

**TITLE** NSWC CRANE

**PROJECT NO.** 9060

**BOOK NO.** 1363



SAT 11-08-03

Work continued from Page

Weather : mostly sunny Temp high 30's

0655 Hrs - Arrive @ BLDG #3245 ; Collect Trip Blank TB11080301 @ 0700

Prep for GW sampling @ SWMU 16

0810 Hrs - Left FW inside SWMU 16

0900 Hrs - Arrive @ 13GWT25 - Finish collecting Misc. Explosives

Let MLahti in to secure protective casing @ 13MWT27

0930 Hrs - Exist Minefield B (SWMU 13)

0945 Hrs - Arrive @ SWMU 16 to setup on WES-14-03-83

| SAMPLE ID | Start Purge | END Purge | VOL Purged | SAMPLE Time | Comments |
|---|---|---|---|---|---|
| 16GW0302 | 1015 | 1215 | 12.1L | 1215 | (TR) RAN NA |
| 16GWT0602 | 0908 | 1308 | 5.1gal | 1308 | (FW) Will run NA 11/5 |
| 16GWT0402 | 1430 | 1640 | 14.8L | 1640 | (TR) RAN NA |
| 16GWT0102 | 1455 | 1800 | 4.2gal | NA | (FW) will sample 11/9 |

Note - Attempt to develope 16MWT14 today - Well Dry

1805 Hrs - Left SWMU 16 for BLDG #3245

1807 Hrs - Arrive @ BLDG #3245

- Secure samples in Frig.
- Unload meters, etc.

1820 Hrs - Left BLDG #3245 for Hotel

END



SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

SIGNATURE [signature] DATE 11/8/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

SUMMARY 11-09-03

CREW SAME AS ON P. 130

SAMPLING: SEE P. 141

DRILLING:

MC's CREW (NB#2565)
Install 16MWT10 & 16 (2nd shallow well 1st WELL T14 was DRY)

FR's CREW (NB#2555)
Install - 16MWT08 & 15

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

SUN 11-09-03

Work continued from Page

WEATHER - Mostly Sunny Low 40's

0655 Hrs - Arrive @ BLDG #3245

- Prep. for GW sampling & NA @ SWMU 13 (TR)
- (FW) Prep to Purge 13GWT38
- FAX R. Basinski - Status for GW Sampling & Well installation thus far.

0840 Hrs - Arrive @ SWMU 16

Set up @ 16MWT06 to run NA

0910 Hr - 1000 Hrs - Ran NA @ 16MWT06

1035 Hrs - Sample VOCs @ 16MWT01 Sample ID 16GWT0102

- Well was purged on 11-08-03 by FW

1100 Hrs - Arrive @ BLDG #3245

Paperwork & Lunch

Prep. to Dev. Wells @ SWMU 16

| SAMPLE ID | Start Purge | End Purge | Vol Purged | Sample Time | | Comments |
|---|---|---|---|---|---|---|
| 16GWT0102 | ← | 11/8/03 | → | 1035 | (TR) | Purged 11/8; Sampled 11/9 VOCs |
| 16GWT0302 | 1425 | 1635 | 2.1 gal | 1635 | (FW) | |
| 13GWT3801 | | | | NA | (FW) | Purged only will sample 11/10 |

Wells Developed

| Sample Loc | Start Dev | End Dev | Vol. Purged | |
|---|---|---|---|---|
| 16MWT12 | 1355 | 1500 | 35.7 L | (TR) |
| 16MWT9 | 1540 | 1648 | 17 gal | (TR) |

1700 Hrs - TR check on FW @ 16MWT03 work out return time to open gate

1715 Hrs - TR Arrive @ BLDG #3245

- Clean & Mop Floors
- Paperwork
- MC to get FW out of SWMU 16 fence

1820 Hrs - Left NSWC Crane for Hutt

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 11-9-03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

Summary of 11/10/03

Sam's Crew as on P 138
AL to leave today

Sampling SEE P 143

Drilling:

MC's Crew (NB #2565): Installed 13 MWLT 44

FR's Crew (NB #2350): Installed 13 MWLT 45 & 41

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

MON. 11/10/03

Work continued from Page

WEATHER - Partly Sunny Temp MID 40°s (AM); MID 60°s (PM)

0655 Hrs - ARRIVE @ BLDG # 3245

- Prep. to sample GW
- Check in w/ office Ralph Basinski
- Fax CoFC # 4817 to ED Seelmayer
- Cali Instruments
- Ask Chris Freeman to ask Public Works to hold off on reconnecting street light @ SWMU 16 around 16 MWT 13 & 15 well installation location

0930 Hrs - Stop @ Public Works to discuss moving location of 13MWT47.

0945 Hrs - Arrive @ 13MWT03

| SAMPLE ID | Start Purge | End Purge | Vol. Purged | Sample Time | Comments |
|---|---|---|---|---|---|
| 13GWT3801 | (← 11-09-03 → ) | | | 0915 | (FW) |
| 13GWT0302 | 1005 | 1209 | 10.9L | NA | (TK) will sample 11/11 |
| 13GWT0702 | 1120 | 1330 | 2.2gal | 1330 | (FW) |

1225 Hrs - Finish Cleanup @ 13MWT03 after completion of Pu[illegible] will sample tomorrow

1230 Hrs - Check on FW

1245 Hrs - Arrive @ BLDG #3245

- Check in w/ ED Seelmayer on QT Samples
- Give list of THUS personnel to start next shift for Gate Passes
- Prep for Well Development

1340 Hrs - Arrive @ 13MWT36

Start purge 1400 Hrs, END PURGE 1502 Hrs, Vol PURGED 29.4L

1515 Hrs - Check on FW; FR is working nearby will let FW out Gate

1530 Hrs - Arrive @ 13MWT25 - Collect additional sample volume for Total Metals & Hg

1600 Hrs - Return to BLDG #3245, Empty SUV to carry coolers to FED-EX Paperwork & Packaging CoC # 4818 (Lacks) & CoC 4819 (Microscopes) Lacks on AB# 8412 2491 0375 & Microscopes on AB# 8412 2491 0386

1840 Hrs - Drop off Samples @ FED-EX

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 11-10-03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

SUMMARY OF 11/11/03

CREW - SAME AS ON P. 130 EXCEPT FOR ML left 11/10.

DRILLING:

MC'S CREW = INSTALLED 13MWT 34, 16MWT 07 & 13

FR'S CREW = INSTALLED 16MWT 11

SAMPLING: SEE P. 145

TUES 11/11/03

Work continued from Page

WEATHER: Lt Showers & Temp 50's

0653 Hrs - Arrive @ BLDG #3245
- Prep to run NA & sample
- Prep for well Dev.

0805 Hrs - Arrive @ 13MWT38 to run NA (0824-0908 Hrs)

0925 Hrs - (TK) Filled Total Metals From 13MWT25 - Started Filling on 11/9
(FW) Set up @ 13MWT03 to sample

0940 Hrs - TK Arrived @ 13MWT03 to assist FW w/ Sampling and running NA

1130 Hrs - Leave for Lunch / Finish @ 13MWT03

1215 Hrs - Refrigerate samples @ BLDG #3245

1235 Hrs - Arrive @ 13MWT41
- Only 1.5' of water in well will let well set until start of Next shift to develope

1315 Hrs - Return to BLDG #3245
- Check in @ Office talked to Ralph & ED
- Collect Trip Blank ~~#3~~ TB111 0301 @ 1315

1400 Hrs - Arrive @ 16 for Development

| WELL ID | Start Dev | End Dev | Vol. Purged | Comments |
|---|---|---|---|---|
| 16MWT10 | 1420 | 1650 | 12 gal | (FW) |
| 16MWT16 | 1435 | 1545 | 4.5 L | (TK) |

1600 Hrs - Arrive @ BLDG #3245
- Unload Car
- Paperwork & Packaging for shipping samples on COC #4820
- Sweep & Mop Floors (Field office Bathroom Hallway & LAB)
- FW to drop of sample shipment on AB# 8412 2491 0397
- MG cleaned drain & car port area

1830 Hrs - Left Site for Hotel

END



SIGNATURE T. Hogan DATE 11/11/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

B 100 P ©

VOID THIS page

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

TITLE

PROJECT NO. 9060

BOOK NO. 1363



WED. 11/12/03

Work continued from Page

TRAVEL DAY ONLY

PAID

5

10

15

20

25

30

35

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 11/12/03

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE

Summary 11/17/03

Drilling Crew: Jon Keifer
Dennis Sinic
Todd Wollenhaupt } Rotasonic Scott's Crew
Nick Rust
Jim Walsh } ATV Matt's Crew
Joshua Dean

Tenus Crew: Matt Cochran
Jim Goerdt
Scott Greer
T. Rosahn

Matt's Crew - set up on 13 MW T35
Scott's Crew - " " " 13 MW T28

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

**TITLE** NSWC CRANE

**PROJECT NO.** 9060

**BOOK NO.** 1363



MON 11-17-03

Work continued from Page

1405 HRS - ARRIVE @ BLDG #3245
- Hold H&S Specific Training for Scott Grier & Jim Gogadt

1500 HRS - ARRIVE @ Public Works
- Check on Monitoring well location 13MW147 Moved to END OF TREE LINE OK w/ Public works - Donna Z. checked on

1525 HRS - ARRIVE @ SWMU 13 - SHOW J. G. AROUND SWMU - ATTEMPT to dev. 13MW147 - ACCESS WET - NEED to let utility road dry out VERY SLIPPERY.

1655 HRS - RETURN to BLDG #3245
CAL YSIs
PREP SAMPLE SETS
PAPERWORK

1800 HRS - LEFT CRANE FOR Hotel

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 11/17/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

Summary 11/18/03

No Drilling performed this date to to Road

Sampling see p. 151 - Repurge 13 mwlt 25 (S.G.) @ 1345 hrs

Crews see p. 148

SCIENTIFIC BINDERY PRODUCTS

**TITLE** NSWC CRANE

**PROJECT NO.** 9060

**BOOK NO.** 1363



TUES 11-18-03

Work continued from Page

WEATHER: MID 50'S & RAIN

0702 HRS - ARRIVE @ BLDG #3245

- PREP to SAMPLE GROUNDWATER & DEVELOPE WELLS
- TALK w/ TOM JOHNSTON

0930 HRS - ARRIVE @ SWMU 13 & SET UP @ 13 MWT12 JG & TR

Start Purge = 1002

End Purge = 1402 Vol. Purged = 21.4L

Sample Time = 1408 RAN & NA

1400 HRS - M.C. SAMPLED 13SW1102

MONITORING WELL DEVELOPMENT

| WELL ID | Start Purge | End Purge | Vol. Purged | COMMENTS |
|---|---|---|---|---|
| 13MWT27 | 1230 | 1403 | 33.6L | (TR) DRY OUT 3 TIMES |
| 13MWT41 | 1500 | 1505 | 4L | (MC) DRY OUT WELL |
| 13MWT34 | 1500 | 1658 | 52.4L | (SG & TR) DRY OUT WELL & REMOVE 5 CASING VOLUMES |

1600 HRS - ASSIST S.G. with development @ 13MWT34

1720 HRS - CHECK out of SWMU 13 @ North Gate

1730 HRS - JG, SG & T.R. MEET MC. @ BLDG #3245

SECURE all samples in Frig.

DROP of METERS inside BLDG

CHECK in w/ K. BASINSKI

1800 HRS - LEAVE BLDG 3245 FOR HOTEL

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 11-18-03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

SUMMARY 11-19-63

CREWS SAME AS ON P. 148

SAMPLING SEE P. 153

DRILLING:

MAIN'S CREEK = Complete 13 MW 1 35 & start 47

SCOTTS CREEK = Complete 13 MW 1 28

SCIENTIFIC BINDERY PRODUCTS., CHICAGO 60605 MADE IN USA

WED. 11/19/03

Work continued from Page

WEATHER = Mostly Sunny AM 40's PM 50's

0650 Hrs - Arrive @ BLDG #3245
- PREP. to SAMPLE groundwater

0908 Hrs - Arrive @ SUMMU 13

0815 Hrs - Start Sampling Dis. Metals @ 13MWT25 - Purged DRY 11/18

| WELL ID | Start Purge | END Purge | Vol. Purged | Time Sampled | Comments |
|---|---|---|---|---|---|
| 13GWT2602 | 0855 | 1135 | 13.2L | 1140 | (TR) RAN NA |
| 13GWT2003 | 0828 | 1228 | 24.6L | 1235 | (JG) " " |
| 13GWT3201 | 1409 | 1539 | 8.25L | 1543 | (JG) |

1315 - 1429 Hrs - RAN NA @ 13MWT20

1440 Hrs - Return to BLDG #3245
- Drop off samples in Frig.
- PREP SUV FOR DEVELOPMENT

1525 Hrs - Arrive @ 13MWT33
Start DEV = 1542 Hrs
END DEV = 1633 Hrs
Vol. Purged = 12.8L

1650 Hrs - Return to BLDG #3245
PREP. PAPERWORK (COC #4821) & SAMPLES FOR SHIPMENT ON FED.EX. AB# 8412 2491 6401

1745 Hrs - LEFT CRANE FOR FED EX.

1820 Hrs - Drop off Samples @ FED. EX.

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 11/19/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

Summary 11/20/03

Crews: Same as on P. 148; Except T. Bachmann Returned

Drilling: Completed BMW47; and worked on Well Pads.

Sampling: See P 156

SCIENTIFIC SUNDRY PRODUCTS CHICAGO 8665 MADE IN USA

THURS 11-20-03

Work continued from Page

WEATHER - Mostly Sunny Temp AM 40's / PM 60's

0655 Hrs - Arrive @ BLDG #3245

- Prep for GW Sampling
- Assist S.G. w/ Well Dev. Prep.
- Select wells to sample for JG & TR
- T. Johnston Called - discussed drilling & sampling status
- Fax CoC # 4821 to LAB & OFFICE (A. Ho & E. Sedlmyer)

0910 Hrs - Arrive @ N. Gate Check in w/ Guard

| SAMPLE ID | Start Purge | END Purge | VOL. PURGED | SAMPLE TIME | COMMENTS |
|---|---|---|---|---|---|
| 13GWT1102 | 0930 | 1050 | 7.65 L | 1055 | (TR) RAN NA |
| 13GWT1002 | 0917 | 1317 | 18.6 L | 1322 | (JG Purged) TR RAN NA & Sampled until 1558 Hrs |
| 13GWT1602 | 1404 | 1534 | 8.2 L | 1537 | (JG) |
| 13GWT2502 | ← | 11/18/03 | → | 1610 | (TR) Finish Collecting Dig. Metals & Nitrate Nitrite & Ammonia |

WELLS DEV BY SG

| WELL ID | Start DEV | END DEV | Vol DEV |
|---|---|---|---|
| 13MWT45 | 1020 | 1205 | 7.25 gal |
| 13MWT31 | 1330 | 1455 | 11 gal |
| 13MWT30 | 1550 | 1650 | 7.5 gal |

1700 Hrs - Returned to BLDG # 3245

- Checked in w/ T. Johnston talked for ~35 min
- Unloaded EQ & Samples
- Labeled bottles from 13MWT25

1815 Hrs - Left Crane for Hotel

END



SIGNATURE

DATE 11-20-03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

Summary 11-21-03

CREWS: SAME AS ON P. 148

DRILLING: Install isolation casing @ 13MWT46
SEE NB 2555 (S.G.)
Work on well pads cont'd
ABANDON 16MWT14 SEE NB #2565

Sampling: SEE P. 157

MC: Slug Testing (NB 2565)

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

FRI 11-21-03

Work continued from Page WEATHER - Mostly Sunny & 50's

ARRIVE BLDG 3245 @ 0655 Hrs

- PREP. FOR WELL DEV & WELL SAMPLING
- PREP. WEEK END PERSONNEL LIST FOR T. BRENT

0820 Hrs - ARRIVE @ SWMU 16

| SAMPLE ID | START PURGE | END PURGE | VOL. PURGED | SAMPLE TIME | COMMENTS |
|---|---|---|---|---|---|
| TB1210301 | — | — | — | 0700 | TRIP BLANK (TR) |
| 16GWT1001 | 0842 | 0957 | 7.5 L | 1003 | JG WELL SAMPLER, TR RAN |
| 16GWT1201 | 1148 | 1313 | 9.5 L | 1316 | ↓ ↓ |
| 16FD1210301 | " | " | " | 0000 | DUP FROM 16GWT12 |

| WELL ID | START DEV | END DEV | VOL PURGED | COMMENTS |
|---|---|---|---|---|
| 16MWT11 | 0845 | 0947 | 28 L | (TR) SLOW RECHARGE (DRY OU |
| 16MWT07 | — | — | — | DRY WELL |
| 16MWT08 | 1316 | 1338 | 15 gal | (Dry out) TR & MC |
| 16MWT13 | 1520 | 1700 | 41 L | MC & SG |
| 16MWT15 | 1610 | 1720 | 8 gal | MC & SG |

1620 Hrs - TR ARRIVE @ BLDG #3245 w/ J.G.

- PREP SAMPLES FOR SHIPMENT ON COFC #4822 ON FED EX AB # 8412 2491 0607
- CALL LAUCKS LAB - Talk to H. PRENTICE - Report Sat. SHIPMENT
- Attempt to call - T. JOHNSTON & R. BASINSKI

1790 Hrs - LEAVE CRANE FOR FED EX

1815 Hrs - DROP OFF SAMPLES @ FED EX ON ABOVE AB #. FAX COFC #4822 FROM Hotel @ 2200 Hrs to LAUCKS

END

Work continued to Page

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

SIGNATURE Terry Rogers

DATE 11-21-03

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE

CREWS SAME AS ON P 148

Drilling : Complete Installation of 13 MWT 4C
SEE WB 2555 for Details
Remainder of day Well Pad Construction

M.C (WB 2565) - Slug Testing

Sampling SEE P. 159

SCIENTIFIC BINDERY PRODUCTS., CHICAGO 60605 MADE IN USA

SAT 11-22-03

Work continued from Page WEATHER - Partly Sunny & WARM 60°S

0705 Hrs - Arrive @ BLDG # 3245
- Prep to sample GW w/ Bladder Pump
- Coordinate w/ M.C. (Slug Testing) as to which wells to sample so that samplers don't interfer w/ slug tests
- Calibration & Decon of Bladder Pump

0910 Hrs - Arrive @ SWMU 16
(TR) Purge well # 16MWT16 ; (JG) to setup on 16MWT13

0940 Hrs - Return to BLDG # 3245
- to pick up Dev. Eq. to Dev. 16MWT17
- waited for MC. so that he could access SWMU 16

1020 Hrs - Arrive @ SWMU 16 w/ MG - get M.G Dev. Sheets on 16MWT11 & 10 to assist slug test

1040 Hrs - Arrive @ 16MWT17 to Dev
Start Dev = 1100 Hrs
End Dev = 1230 Hrs
Volume Dev = 54 L

| SAMPLE ID | Start Purge | End Purge | Vol Purged | Sample Time | Comments |
|---|---|---|---|---|---|
| 16GWT1301 | 0927 | 1157 | 17.65 L | 1200 | (JG) TR RAN NA |
| 16GWT0901 | 1422 | 1612 | 10.6 L | 1614 | (JG) |
| 16GWT0502 | 1446 | 1615 | 10.0 L | 1617 | (TR) |
| 16GWT1601 | 0926 | 0926 | 1.0 L | 1745 | (TR/JG) MIN. Vol. very slow Recharge PURGED DRY @ 0925; ALLOWED to Recharge & SAMPLED @ 1745 Hrs w/ JG. |

| WELL ID | Dev. Start | Dev End | Vol Purged | Responsible Person |
|---|---|---|---|---|
| 13MWT28 | 1020 | 1110 | 3.25 g | (S.G.) |
| 16MWT17 | 1100 | 1230 | 54 L | (TR) |

1810 Hrs - Arrive @ BLDG # 3245
- Secure all samples in Lab Frig.
- Unload EQ

1830 Hrs - Left Crane

END



SIGNATURE [signature] DATE 11-22-03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

CREWS: SAME AS ON P. 148

Drilling & Complete WELL PAD @ 13MW146 & DEMOB

MC - Slug Testing

Sampling - SEE P. 160

SCIENTIFIC BINDER PAPER

SLIN 11-23-03

Work continued from Page WEATHER: Mostly Cloudy 60°s

0700 Hrs - Arrive @ BLDG #3245
- Prep. to sample Groundwater / develope & Run NA

0915 Hrs - Collect Additional Sample Parameters from 16MWT16 (Explosives) - This is a very slow recharge well Purged 11/22/03

| SAMPLE ID | START PURGE | END PURGE | VOL. PURGED | TIME SAMPLED | COMMENTS |
|---|---|---|---|---|---|
| 16GWT1601 | ← | 11-22-03 | → | 0915 | (TR) Collected additional Perchlorate Explosives & Dis metals |
| 18GWT4101 | 1025 | 1030 | 1.5 L | 1530 | (TR) Very slow yielding well sampled - Expl. & Misc. Explo |
| 13GWT0402 | 0942 | 1042 | 5.9 L | 1044 | (JG) |
| 13GWT0102 | 1215 | 1315 | 6.7 L | 1320 | (JG) MS/MSD |
| 13GWT0802 | 1330 | 1505 | 5.0 L | 1515 | (SG) TR RAN NA |
| 13FD11230301 | 0000 | " | " | — | (SG) DUP of 13GWT0802 |

| WELL ID | START DEV | END DEV | VOL. PURGED | COMMENTS |
|---|---|---|---|---|
| ~~13MWT41~~ (TR) | | | | |
| 13MWT44 | 1100 | 1153 | 10 gal | TR & SG |
| 13MWT43 | 1230 | 1347 | 21.6 L | TR |

1530 Hrs - Sample @ 13MWT41
1600 Hrs - Run NA @ 13MWT08
1705 Hrs - Complete NA @ 13MWT08
1730 Hrs - Collect more AQ sample @ 16MWT16 w/ JG
1800 Hrs - Return to BLDG #3245
- Securing samples in Frig.
- Clean & Mop Bathroom, Hallway, LAB & Field OFFICE

1908 HRS - LEFT BLDG #3245 for motel.

END

Work continued to Page

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

SIGNATURE [signature] DATE 11-23-03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

B 100 P ©

Client: TINUS ONLY
M. Cochran
J. Goerdt
S. Grier
T. Rojahn

MC - SLUG TESTING SEE NB T2565

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 50605 MADE IN USA

MON 11-24-03

Work continued from Page

Weather - Cold 30's; Overcast w/ Flurries

0655 Hrs - Arrive @ Site
- Check in w/ R. Basinski
- Prep to Dev Monitoring Well
- Fax Office (E.S.) CoC # 4822
- Paperwork / Assign Initials to JG & SG

0945 Hrs - Check in w/ N. Gate Guard

1000 Hrs to 1200 Hrs - Sample (Complete) 13GWT4101 (West under fence dead to west)

1210 Hrs - Check out w/ N. Gate Guard

| SAMPLE ID | Start Purge | END Purge | Vol Purged | SAMPLE TIME | Comments |
|---|---|---|---|---|---|
| 13GWT4101 | ← | 11-23-03 | → | 1000 | (TK) Completed sampling from 11/23/03 |
| 13GWT1402 | 0935 | 1105 | 2.94L | 1115 | (SG) |
| 13GWT3101 | 0903 | 1113 | 12.7L | 1118 | (JG) |
| 13GWT3001 | 1415 | 1605 | 26.4L | 1615 | (SG) |
| 13GWT3301 | 1330 | 1730 | 21.7L | 1732 | (JG) Sampled Explosives only well day will complete 11/25 |

1225 Hrs - Lunch

1300 Hrs - Arrive @ 13MWT47 to Dev
Start Dev. = 1335 Hrs
End Dev. = 1445 Hrs
Vol. Dev. = 48L

1515 Hrs - Return to BLDG # 3245
- Package & Ship Samples on CoCs & Lauck's = 4824 & 4825 (FED EX AB# 8412 2491 0580)
Microscops = 4826 (FED EX AB# 8412 2491 0592)

1800 Hrs - Left Crane for FED EX

1835 Hrs - Drop of Samples @ FED EX (MC & TK)

END



SIGNATURE [signature] DATE 11/24/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

CREW - SAME AS ON P. 162

M.C. - Slug Testing SEE NB# 2565

SCIENTIFIC BINDERY PRODUCTS., CHICAGO 60605 MADE IN USA

TUES 11-25-03

Work continued from Page

WEATHER: Partly Cloudy & Cold (Temp 30's)

0655 Hrs - Arrive @ Bldg #3245
- Prep to sample Groundwater
- Fax offices & Lab. CoCs
- Check in w/ R. Basiaski

0920 Hrs - Check in w/ Guard @ N. Gate

| Sample ID | Start Purge | End Purge | Vol. Purged | Sample Time | Comments |
|---|---|---|---|---|---|
| 13GWT 3301 | ← | 11/24 | → | 0845 | (JG) completed this date |
| 13GWT 1302 | 1016 | 1146 | 10.9 L | 1150 | (JG) TK RAN NA w/SG |
| 13GWT 1502 | 0945 | 1345 | 18L | 1347 | (TR) TOC MS/MSD & DUP RAN NA |
| 13GWT 2701 | 1005 | 1415 | 85 gal | 1425 | (SG) |
| 13~~GWT~~ FD 11250301 | — | — | — | 0000 | (TR) TOC DUP OF T13 |

1600 Hrs - Return to BLDG #3245 - Start Prep to ship samples on CoC #4827 (AB# 8412 2491 0570)

1640 Hrs - Arrive @ 13MWT13 RAN NA w/ SG.

1725 Hrs - Finish Running NA @ BMWT13

1740 Hrs - Return to BLDG #3245
- Prep. some eq. to return to US Environmental on FED. EX AB # 8412 2491 0412
- Clean office, Bathroom, hallway, Lab, etc. & Mop
- Work on Paperwork
- JG took samples to FED EX & Misc. EQ Also
- Shipped mini trolls to Pittsburgh office on FED EX AB # 8412 2491 0423
- M.C. & SG - Clean verticals & back of BLDG #3245 & Dr
- Organize office
- Inventory sample containers

2030 Hrs - Left Crane

END



SIGNATURE DATE
DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

VOID THIS PAGE

SCIENTIFIC BINDERY PRODUCTS., CHICAGO 60605 MADE IN USA

**TITLE** NSWC CRANE

**PROJECT NO.** 9060

**BOOK NO.** 1363



WED 11-26-03

Work continued from Page

0715 Hrs - FAX COEC #4827 to LAUCKS LAB & Pittsburgh OFFICE

0800 Hrs - TRAVEL to INDIANAPOLIS Airport

REMAINDER on day = TRAVEL

END

Work continued to Page

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

SIGNATURE

DATE 11-26-03

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE

VOID THIS PAGE

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

**TITLE** NSWC CRANE

**PROJECT NO.** N9060

**BOOK NO.** 1363



WED 12-03-03

Work continued from Page

CREW: J. GOERDT, S. GRIER & T. ROJAHN

1400Hrs - ARRIVE @ NSWC CRANE

- CALIB YSIs
- PREP. to Collect Rinsate Blanks

SAMPLE

| ID | TIME | SAMPLER | COMMENTS |
|---|---|---|---|
| TB12030301 | 1500 | TR | TRIP BLANK |
| 16RB12030301 | 1520 | JG | BLADDER PUMP |
| 13RB12030301 | 1535 | SG | PERISTALTIC TUBING (PE |
| 13RB12030301-F | 1535 | SG | " " (" |
| 16RB12030302 | 1600 | SG | PERISTALTIC TUBING (TEF |

REAGENT GRAD WATER - NERL LOT# 0807253 EXP. DAT - 8/04

1700Hrs - TRAIN JG to RUN NA

1806Hrs - LEFT CRANE FOR HOTEL

END

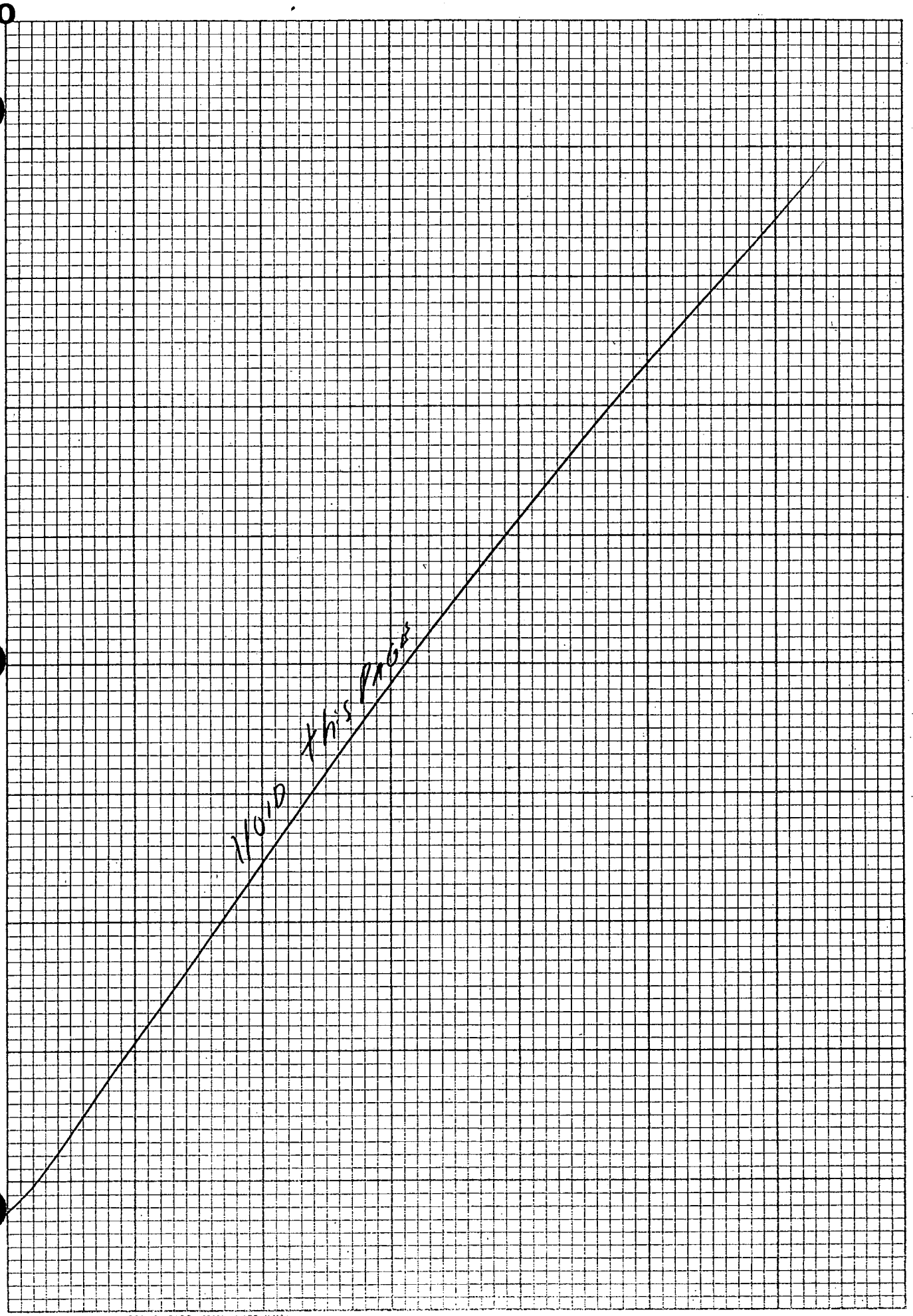
Work continued to Page

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

SIGNATURE

DATE 12-3-03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE




SCIENTIFIC BINDERY PRODUCTS CHICAGO 60605 MADE IN USA

THURS. 12-04-03

Work continued from Page Weather: Overcast, Periods of Lt Rain & High[illegible]

0655 Hrs - Arrive @ BLDG #3245
Prep. to Sample Groundwater

| SAMPLE ID | Start Purge | End Purge | Vol Purged | Sample Time | Comments |
|---|---|---|---|---|---|
| 13GWT0902 | 0835 | 1015 | 9.0 L | 1018 | (JG) NA RAN |
| 13FD12040301 | " | " | " | 0000 | (JG) |
| 13GWT4301 | 0900 | 1040 | 3 gal | 1050 | (SG) |
| 13GWT3401 | 0955 | 1145 | 10.5 L | 1150 | (TC) NA RAN |
| 13GWT2202 | 1340 | 1455 | 7.5 L | 1510 | (JG) NA RAN |
| 13GWT4401 | 1430 | 1650 | 4.0 gal | 1700 | (SG) |

1330 Hrs - Return to BLDG #3245 - Check in @ Office & Secure Sam
- Prep. to Develope Monitoring Wells
- Assist S.G. w/ Bladder Pump @ 13MWT44
  SG having trouble getting it going

1520 Hrs - Arrive @ 13MWT46 to Dev.
Start Dev. = 1533 Hrs
End Dev. = 1707 Hrs
Vol. Purged. = 84L

1720 Hrs - Assist J.G. w/ Clean up @ 13MWT22 then check on SG @ 13MWT44

1805 Hrs - Return to Bldg #3245
- Check in w/ K. Basinski - left message
- Unload NA Eq & Inst. secure inside Bldg #3245
- Receive Paperwork from SG & JG

1830 Hrs - Left NSWC Crane

END

Work continued to Page

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

SIGNATURE [signature] DATE 12-4-03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

VOID THIS PAGE

SCIENTIFIC BINDERY PRODUCTS

Work continued from Page Weather - Overcast Periods of Rain & High 30's

0655 Hrs - Arrive @ BLDG # 3245
- Prep to sample soils

| SAMPLE ID | START PURGE | END PURGE | VOL PURGED | SAMPLE TIME | COMMENTS |
|---|---|---|---|---|---|
| 16RB12050301 | — | — | — | 0800 | Rinsate on Bucket Bi |
| 16GWT0701 | 0900 | 1025 | 7.65 L | 1027 | (JG) Ran NA |
| 16RB12050302 | — | — | — | 1130 | Rinsate on Bucket Bi |

Purged this Date 2 wells (16MWT08 (JG) & 16MWT11 (SG)) but not sampled (went Dry)

0900 Hrs - Arrive @ SWMU 16 - start clearing gravel from sampling Bore Hole 47 → 50.
- TR & SG sample soil borings 16 58 42 → 50
SEE CoFC # 4829

1300 Hrs - Finish soil sampling

1315 Hrs - Check on JG @ 16MWT08 - ~6' of standing water in well
Well is also a slow recharge well - Decided to bail dry

1400 Hrs - Returned to BLDG # 3245
- Prep. samples for shipment on AB # 8412 2491 0434
CoFCs include # 4828 & 4829

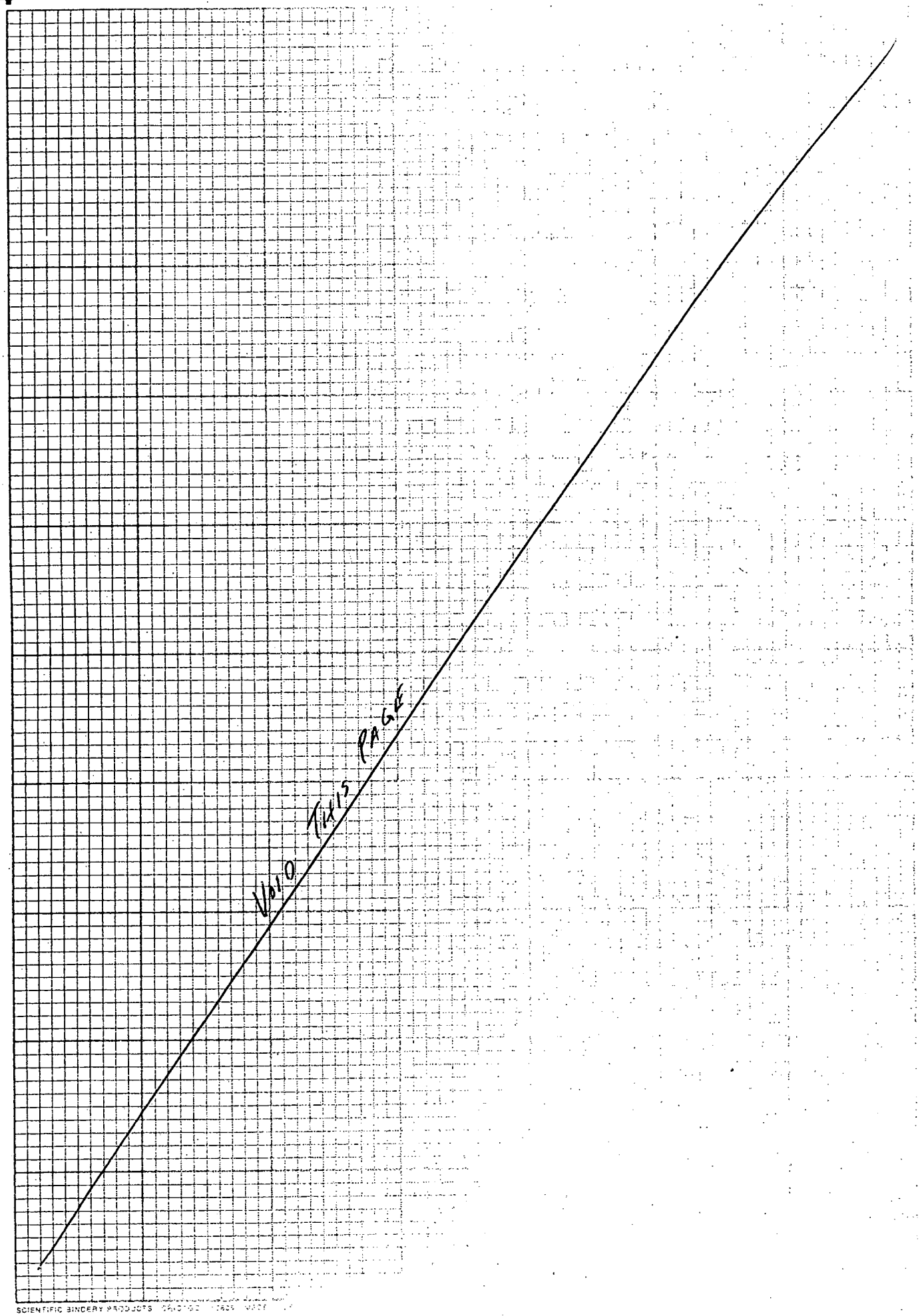
1730 Hrs - Left BLDG # 3245 for Federal Express w/ JG

1800 Hrs - Drop of samples @ Fed. Ex. 1854 Hrs Fax Laucks CoFCs

END



SIGNATURE
DATE 12/5/03
DISCLOSED TO AND UNDERSTOOD BY
DATE
WITNESS
DATE




SCIENTIFIC BINDERY PRODUCTS

**TITLE** NSWC CRANE

**PROJECT NO.** N9060

**BOOK NO.** 1363



SAT. 12-06-08

Work continued from Page

Weather - Sunny Mostly & 30's

0655 Hrs - Arrive @ BLDG #3245

- Prep. to sample sumps & GW @ SWMU 16

| SAMPLE ID | Start Purge | End Purge | Vol Purged | Sample Time | Comments |
|---|---|---|---|---|---|
| TB12060301 | NA | NA | NA | 0700 | TRIP BLANK |
| 16SW0102 | NA | NA | NA | 0905 | TR/SG N. Sump |
| 16SW0202 | NA | NA | NA | 0935 | TR/SG E Sump |
| 16FD12060301 | NA | NA | NA | 0000 | FROM 16SW0202 |
| 16SW0702 | NA | NA | NA | 1008 | TR/SG W. Sump |
| 16GWT1501 | 0950 | 1350 | 21.6 L | 1352 | JG RAN NA DUP |
| 13GWT0202 | 1210 | 1345 | 5 gal | DRY | (SG) Will collect 12/7 |
| 13GWT0602 | 1510 | 1628 | 2 gal | DRY | (SG) Start Collecting 12/7 |
| 16GWT0801 | 1320 (12/5) | 1330 (12/5) | 9L | 1030 (12/6) | (TR) Sampled VOCs; Explosives 1L; Start Total Metals & Hg |
| 16GWT1101 | 1515 (12/5) | 1600 (12/5) | 1.25 g | 1330 (12/6) | (TR) Sampled VOCs, Explosives 1L; & Metals & Hg (Total) |

1030 Hrs - Start Sampling @ 16MWT08
Collected VOCs, 1L of Explosives & started Total Metals & Hg

1145 Hrs - Stop collecting sample @ 16 MWT08 - Dry well will continue on 12/07

1200 Hrs - Return to BLDG #3245 - Checked in w/ R. Basinski
Checked on shipment from 12/5 - made it to Fed Ex. Station in Seattle

1330 Hrs - Started sampling @ 16MWT11
Milked well until 1500 Hrs - Collected VOCs, 1L of Explosives & Total Metals & Hg - well dry

1515 Hrs - Rechecked 16 MWT08 well still dry

1530 Hrs - Check on J.G. @ 16MWT1501 - Almost done sampling & running MNA

1600 Hrs - Return to BLDG #3245
- Paper work & U-Haul rental.

1730 Hrs - Left BLDG #3245 for Hotel

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

| SIGNATURE | | | DATE |
|---|---|---|---|
| | | | 12/6/08 |
| DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE |

SAMPLE SUMMARY 12-7-03

| SAMPLE ID | Start PURGE | END PURGE | VOL PURGED | Start Sampling | Comments |
|---|---|---|---|---|---|
| 16GWT1101 | 1← Purged 12-05 → | | | 1000 | (TG) Collected M. Exp. & Filtered metals 2. |
| 13GWT0202 | 1← Purged on 12-06 → | | | 0850 | (JG) FULL sample, RAN |
| 13GWT0602 | 1← Purged on 12-06 → | | | 1300 | (TG) Collected 500ml OF Exp. Sample |
| 13GWT2801 | 0930 | 1400 | 3.5gal | 1410 | (SG) Start sampling well dry - after Expl. collected will continue tomorrow started running MNA |
| 13GWT1802 | 1155 | 1535 | 16.45L | 1538 | (JG) RAN MNA |
| 13GWT4501 | 1515 | 1755 | 4141 | NA | (SG) Will start sampling 12/8/03 |

SCIENTIFIC ENDERY PRODUCTS CHICAGO 60635 MADE IN USA

SUN 12-07-03

Work continued from Page WEATHER - Mostly sunny High 40's

0655 Hrs - Arrive @ Bldg #3245
- PREP to sample GW @ SWMU 16
- Assign work to SG & JG

0845 Hrs - Arrive @ SWMU 16
- Tighten down well tags

0910 Hrs - Attempt to sample 16GWT08 - Collect some sample on 12/6 see Page 175 - Well still dry this date

1000 Hrs - Collected additional sample from 16GWT11 - Misc. Explosives & Filtered Metals - Well dry

1130 Hrs - Lunch

1200 Hrs - Check on J.G @ SWMU 13

1215 Hrs - Put Lock on 13MWT44

1230 Hrs - Check on SG. - will be ready to sample @ 1400 Hrs - will return to run MNA @ 13MWT28

1300 Hrs - Collect 0.5L of sample @ 13MW06 until well dried up.

1330 Hrs - Return to well 13MWT28 @ 1400 Hrs start to run MNA

1440 Hrs - Well 13MWT29 - water level @ pump intake - SG will move to 13MWT45 & finish sampling 13MWT28 tomorrow

1510 Hrs - Assist SG with setup @ 13MWT45

1535 Hrs - Start Dev. @ 13MWT35
Start Purge = 1535 Monitored Recovery until = 1625
End Purge = 1555
Vol. Purged = 14.5L

1635 Hrs - Finished Cleaning @ 13MWT35

1640 Hrs - Check on JG & assist w/ 13MWT18

1720 Hrs - Check on SG & assist w/ 13MWT45

1800 Hrs - Left SWMU 13 for Bldg #3245
- Unload Vehicle
- Clean office space, bathroom, hallway Lab etc.

1830 Hrs - Left Offices for Hotel

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 12/7/03

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

B 100 P ©

SAMPLE SUMMARY 12-8-03

Soil : Collected PCBs @ Soil Borings 16 - 25
SEE CoFCs 4831 & 4832

| SAMPLE ID | START PURGE | END PURGE | VOL. PURGED | SAMPLE TIME | COMMENTS |
|---|---|---|---|---|---|
| 13RB12080301 | NA | NA | NA | 0740 | BUCKET BIT |
| 13RB12080302 | NA | NA | NA | 0937 | BUCKET BIT |
| 13RB12080303 | NA | NA | NA | 1500 | BLADDER PUMP |
| 13GWT3601 | 0840 | 1040 | 13L | 1050 | JG MS/MSD RAN MNA |
| 13FD12080303 | " | " | " | 0000 | DUP OF 13GWT3601 |

Continued to collect Additional sample @ :

13MWT28 = Complete Sample Collection this date
13MWT45 = Collected 1.5L of Explosives & Misc. Expl.
13MWT06 = Collected ~500ml completed the collection of Explosive sample

SCIENTIFIC BINDERY PRODUCTS CHICAGO 60695 MADE IN USA

**TITLE** NSWC CRANE

**PROJECT NO.** N9060

**BOOK NO.** 1363



MON 12-08-03

Work continued from Page Weather - Partly Cloudy & High 30's

0658 Hrs - Arrived @ BLDG #3245

- Prep to sample soils @ SWMU 13
- Collected 13RB12080301 @ 0745 Hrs

NERL Reagent Grade $H_2O$ Lot # 0807253 Exp. 8/04

0848 Hrs - Start collecting Soil Samples @ SWMU 13

1115 Hrs - END " " " @ SWMU 13

1130 Hrs - LUNCH

1200 Hrs - ARRIVE @ BLDG #3245

- PAPER WORK & SHIPPING OF SAMPLES ON COCs:
  #4831 → 4834 to LAUCKS TESTING LAB
  #4835 to MICROSEEPS INC.
- LABEL Soils Samples

1730 Hrs - LEFT NSWC CRANE FOR FED. EX.

1800 Hrs - Drop off samples @ FED. EX

LAUCKS samples on AB # 8412 2491 0560

MICROSEEPS samples on AB # 2412 2491 0559

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE Terry Rogal

DATE 12-8-03

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE

SAMPLE SUMMARY 12-09-03

| SAMPLE ID | START PURGE | END PURGE | SAMPLE TIME | VOL PURGED | COMMENTS |
|---|---|---|---|---|---|
| 13GWT4601 | 0902 | 1122 | 1124 | 11.2 L | (JG) |
| 13GWT4701 | 0930 | 1100 | 1110 | 9.4 L | (SG) |
| 13GWT3501 | 1443 | 1530 | NA | 12 L | (JG) DRIED OUT WELL |
| 13GWT4501 | ← SEE 12/7 → | | 1645 | 12/7 | JG/TK collected Total Metals |
| 13GWT0602 | ← SEE 12/6 → | | 1730 | 12/6 | → JG/TK collected Total Metals |

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

TUES 12-09-03

Work continued from Page Mostly Cloudy & 50°s Temp.

0700 Hrs - ARRIVED @ BLDG #3245
- ASSIGN WORK to J.G. & S.G.
- FAX COPCs to OFFICE & LAUCKS LAB

0800 Hrs - PREP. to visit sites w/ B. Gates, T. Brant & R. Basinski AND C. FREEMAN

Sites visited INCLUDED:
- SWMU 18: BLDGS #104, #105, #198 & #200
- OLD GUN TUB
- Roads & Grounds - SWMU 15
- Pond - SWMU 8
- SMUU-20

1300 Hrs - RETURN to BLDG #3245

Roughed out sample location maps for BLDGs 104, 105, 198, 200 & ~~SMUU~~ SWMU 20 for B. Gates, T. Brant & R. Basinki.

1600 Hrs - Joined JG and Prep. to sample 13GWT45 & 06

1645 Hrs - Collect Total metals & Hg and complete Misc. Explosive sample @ 13GWT45 - and well DRIED out

1730 Hrs - Arrive @ 13MWT06 - Sample for Total Metals & Hg and well dried out

1795 Hrs - Return to BLDG #3245

SECURE samples in Fridge; drop off Misc. Eq.

1815 Hrs - LEFT NSWC CRANE

END

Work continued to Page

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

SIGNATURE

DATE 12-09-03

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE

SAMPLE SUMMARY 12-10-08

| SAMPLE ID | SAMPLE TIME | PURGE DATE | COMMENTS |
|---|---|---|---|
| 13GWT3501 | 1145 | 12/9 | FULL SUITE COLLECTED (TR & JG) |
| 13GWT4501 | 1300 | 12/7 | Nitrate + Nitrite, Ammonia & Filtered Metals & Hg |
| TB12100301 | 1500 | NA | TR |
| RB12100301 | 1510 | NA | TR/JG Disposable Bailer |

SCIENTIFIC BINDERY PRODUCTS., CHICAGO 60605 MADE IN USA

**TITLE** NSWC CRANE

**PROJECT NO.** N9060

**BOOK NO.** 1363



WED 12-10-03

Work continued from Page

Weather: Overcast Periods of Rain & 30's

0653 Hrs - Arrive @ BLDG #3245
- Paperwork CoC #4836, etc.
- Start office clean-up
- Start Prep. of EQ clean up & shipment prep.
- (JG) drilled screw holes in well tags 13MWT9 & 26 in prep. to securing the wells tags
- Start clean up in Storage Room / Garage

1100 Hrs - Lunch

1130 Hrs - Arrive @ No Gate Notify Guard of our access

1145 Hrs - Start sampling 13GWT35

1300 Hrs - " " 13GWT45 for Filtered Metals & Hg; and Nitrate Nitrite & Ammonia

1400 Hrs - Arrive @ BLDG #3245
- Talked to Ralph Basinsko - ask me to set up the Revegetation / Restoration w/ Jacobi Sodding
- Talked to Jacobi (Dave Fulkerson) and set up Friday 1/9/12 for work / site access
- Paperwork, Packaging / Shipping prep. for samples on 4836

1630 Hrs - (JG) to work on securing well tags & sample 13GWT06

(TR) To drop off samples & Rental EQ. @ FEDEX

1720 Hrs - Drop of Samples on CoC #4836 FED EX AB# 8412 2491 0526

US Environmental EQ shipped on FED EX AB# 8412 2491 0537

END



SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

SIGNATURE Terry Roach

DATE 12-10-03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

SAMPLE Summary 12-11-03
Note: TALKED to Mr SLAVEN NO PRODUCTION @
BLDG #165 today & tomorrow.
OK to take in REVEGETATION/RESTORATION
CREW.

Collected Nitrate + Nitrite and Ammonia sample
From 13GWT0602.

SCIENTIFIC BINDERY PRODUCTS CHICAGO 50805 MADE IN USA

**TITLE** NSWC CRANE
THURS 12/11/03

**PROJECT NO.** N9060
**BOOK NO.** 1363



Work continued from Page OVERCAST & Cold

0650 HRS - ARRIVE @ BLDG #3245 - Arranged for restoration to take place tom
- DECONS ALL WHALE PUMPS & HAND AUGER EQ.
- PREP. SOME EQ to RETURN to Pittsburgh
- GENERAL OFFICE CLEANUP - JG SECURING WELL trgs on 13MWT WELLS

0930 HRS - start taking PHOTOS OF CORE boxes
1130 HRS - LUNCH
1200 HRS - RETURN to BLDG #3245 - cont. taking PHOTOS OF CORE boxes
1330 HRS - FINISH PHOTOING CORE BOXES
T. BRENT will help deliver core BOXES to storage facility - Loaded Gov. TRUCK w/ core boxes (~1/3 of total)
1600 HRS - Complete delivering core boxes to storage (MAG. 1970)
15 core boxes REMAIN FOR NEXT shift ~ 65 MOVED.
1615 HRS - Collected Nitrate & Nitrite / Ammonia @ 13MWT06
Sample ID 13GWT0602.
1630 HRS - ARRIVE @ BLDG #3245
- PAPERWORK & PACK SAMPLE FOR SHIPMENT on FEDEX
1715 HRS - AB # 8412 2491 0504
DROP OFF Sample on COC # 4837 @ FED. EX.
ALSO, SHIPPING peristaltic PUMP to US ENVIRONMENTAL on FED. EX. AB# 8412 2491 0490
1735 HRS - ARRIVE @ MOTEL

END



Work continued to Page

SIGNATURE Terry Rogers DATE 12/11/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

SCIENTIFIC BINDERY PRODUCTS, CHICAGO 60605 MADE IN USA

**TITLE** NSWC CRANE

**PROJECT NO.** N9060

**BOOK NO.** 1363



FRI 12/12/03

Work continued from Page

0650 Hrs - ARRIVE @ BLDG #3245
- Start Packing EQ & PAPERWORK to Ship to Pittsburgh
- OFFICE ORGANIZE

0800 Hrs - MEET w/ Site Restoration CREW
- Ground to hard to dig will have to postpone Restoration to later date (Possibly spring)

0830 Hrs - Return to BLDG #3245
- Check in w/ OFFICE talk to R. Basinski - INFORM him of Site Restoration delay
- CALL in time
- CLEAN out VEHICLE
- CLEAN OFFICE LAB Hallway Storage Room & Bathroom & MOP
- CLEAN DRAIN out BACK
- Finish Preparation to ship EQ & PAPERWORK to Pittsburgh
  OFFICE - AB# 8412 2491 0478
  WAREHOUSE - AB# 8412 2491 0467

1130 Hrs - LEFT NSWC CRANE to Check out the Hotel & FED EX Drop off.

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 12/12/03

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

Synoptic Water Levels @ SWMU 13 OU
1/12/04

| WELL ID | TIME | W/L | WELL ID | TIME | W/L |
|---|---|---|---|---|---|
| 1 | 1347 | 7.55 | 35 | 1424 | 63.96 |
| 2 | 1357 | 16.24 | 36 | | |
| 3 | 1344 | 9.98 | 37 | | |
| 4 | 1408 | 14.09 | 38 | | |
| 5 | 1404 | 5.78 | 39 | | |
| 6 | 1342 | 11.91 | 40 | | |
| 7 | 1417 | 4.21 | 41 | | |
| 8 | 1412 | 3.88 | 42 | | |
| 9 | 1337 | 8.77 | 43 | | |
| 10 | 1421 | 14.96 | 44 | | |
| 11 | 1427 | 8.76 | 45 | 1505 | 72.75 |
| 12 | 1430 | 10.75 | 46 | | |
| OS 13 | | | 47 | | |
| OS 14 | | | | | |
| 15 | 1443 | 14.59 | | | |
| 16 | 1501 | 11.01 | | | |
| 17 | 1453 | 8.89 | | | |
| 18 | 1446 | 20.21 | | | |
| OS 19 | | | | | |
| 20 | 1333 | 5.00 | | | |
| 21 | 1503 | 9.09 | | | |
| 22 | 1516 | 8.18 | | | |
| 23 | 1331 | 8.56 | | | |
| 24 | 1328 | 9.25 | | | |
| 25 | 1523 | 7.05 | | | |
| 26 | 1326 | 10.05 | | | |
| 27 | 1441 | 9.31 | | | |
| 28 | 1339 | 79.63 | | | |
| 29 | | | | | |
| 30 | | | | | |
| 31 | | | | | |
| 32 | | | | | |
| 33 | | | | | |
| 34 | 1512 | 5.42 | | | |

SCIENTIFIC BINDERY PRODUCTS., CHICAGO 60605 MADE IN USA

Mon 1-19-04

Work continued from Page

Morning - worked on SWMU 1

1230 Hrs - Prep to do water levels @ SWMU 13
TR - all well measurements inside security fence & All staff Gauge measurement & install SG 11
FR - to do all measurements of wells outside of the security fence @ SWMU 13

1620 Hrs - Meet w/ Fred @ BLDG #3245 Fred got tied up with the drillers and couldn't do well measurement, we will complete the measurement tomorrow & within the 24 Hrs. of start time (1319 Hrs)
• Prep. to develope monitoring well 16 MWT18

1730 Hrs - TR assisted FR w/ well development & returned to BLDG #3245 to prep. ship of samples from SWMU 1.

SEE Notebook # 1340 (SWMU 1)

| SG | Time | W.L. | Flow | W | D | |
|---|---|---|---|---|---|---|
| 1 | 1401 | 1.77 | Stagnet | 0.15 x | 0.85 | |
| 2 | 1351 | 3.68 | 0.35 x 1.3 | | 22sec/1' | |
| 3 | 1602 | 1.87 | ICE Pool 1x3' → | | | (0 Flow Discharge other side of Road) |
| 4 | 15.35 | 2.45 | 0.04 x 0.35 | | 4sec/1 | |
| 5 | 15.39 | 3.90 | 0.01 x 0.25 | | 3sec/1 | |
| 6 | 1531 | 2.35 | 1'x1' Stagnet Pool | | | |
| 7 | 1319 | 1.47 | Stagnet | | | |
| 8 | 1519 | 5.08 | 0.01 x 0.3 | | 1sec/1' | |
| 9 | 1452 | 4.15 | 0.06 x 0.9 | | 2sec/1' | (2 streams merg @ culvert) |
| 10 | 1433 | 4.82 | 0.05 x 1.6 | | 3sec/1' | |
| 11 | 1554 | 2.74 | 0.1 x 1.2 | | 6sec/1' | |

EHD

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE [signature] DATE 1/19/04

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

Synoptic Water Levels @ SWMU 13 on 1/19/04 & 1-20-04

| WELL ID | TIME | WL | |
|---|---|---|---|
| 1 | 1347 | 7.55 | |
| 2 | 1357 | 16.24 | |
| 3 | 1344 | 9.98 | |
| 4 | 1408 | 14.09 | |
| 5 | 1404 | 5.78 | |
| 6 | 1342 | 11.91 | |
| 7 | 1417 | 4.21 | |
| 8 | 1412 | 3.88 | |
| 9 | 1337 | 8.77 | |
| 10 | 1421 | 14.96 | |
| 11 | 1427 | 8.76 | |
| 12 | 1430 | 10.75 | |
| OS 13 | 11.28 | 4.93 | |
| OS 14 | 11.04 | 14.17 | |
| 15 | 1443 | 14.57 | |
| 16 | 1501 | 11.01 | |
| 17 | 1458 | 8.89 | |
| 18 | 1446 | 20.21 | |
| OS 19 | 1058 | 10.96 | 1-20-04 |
| 20 | 1333 | 5.00 | |
| 21 | 1558 | 9.09 | |
| 22 | 1516 | 8.18 | |
| 23 | 1331 | 8.50 | |
| 24 | 1328 | 9.25 | |
| 25 | 1528 | 7.05 | |
| 26 | 1326 | 10.05 | |
| 27 | 1441 | 9.31 | |
| | 139 | 79.63 | |

| WELL ID | TIME | WL | |
|---|---|---|---|
| 35 | 1424 | 63.96 | |
| 36 | 900 | 19.26 | 1-20 |
| 37 | 913 | 14.37 | 1-20 |
| 38 | 911 | 61.90 | 1-20 |
| * 39 | 920 | 14.25 | 1-20 |
| 40 | 941 | 18.55 | 1-20 |
| 41 | 940 | 66.58 | 1-20 |
| 42 | 949 | 21.14 | 1-20 |
| 43 | 1002 | 8.50 | 1-20 |
| 44 | 1007 | 64.57 | 1-20 |
| 45 | 1505 | 72.75 | |
| * 46 | 925 | 58.10 | 1-20 |
| * 47 | 1115 | 7.32 | 1-20 |
| 32 | 1039 | 9.52 | |
| 31 | 1052 | 10.65 | 1-20 |
| 33 | 1048 | 10.63 | 1-20 |
| 19 | | 10.96 | |
| 19 | 1058 | 10.96 | 1.20 |
| 30 | 1109 | 11.72 | 1-20 |
| 29 | 1122 | 5.82 | |

TUE 1-20-04

Work continued from Page

F. RAMSER completed the synoptic WATER level MEASUREMENTS (SEE P. 190) @ SWMU 13.

END

Work continued to Page

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

SIGNATURE

DATE 1-20-04

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE

SUMMA 16 SYNOPTIC WATER LEVELS

| WELL ID | WL. L | TIME |
|---|---|---|
| WES-14-1-83 | - 31.94 | - 10:32 |
| WES-14-2-83 | - 15.36 | - 0935 |
| WES 14-3 83 | - 20.00 | - 1047 |
| WES-14-4-83 | - 28.39 | - 1041 |
| WES-14-5-83 | - 34.18 | - 1038 |
| 16MWIT 01 | - 19.12 | - 0945 |
| 02 | - 10.94 | - 1024 |
| 03 | - 28.34 | - 1021 |
| 04 | - 13.11 | - 1015 |
| 05 | - 31.44 | - 10.18 |
| 06 | - 17.41 | - 0947 |
| 07 | - DRY | - 1003 |
| 08 | - 97.03 | - 1005 |
| 09 | - 13.88 | - 1008 |
| 10 | - 22.05 | - 1010 |
| 11 | - 96.30 | - 1012 |
| 12 | - 20.13 | - 1044 |
| 13 | - 10.25 | - 1025 |
| 14 | ABANDONED | |
| 15 | - 53.23 | - 1026 |
| 16 | - 32.93 | - 0956 |
| 17 | - 15.35 | - 1000 |
| 18 | - 96.65 | - 0951 TD 104.5 |

SAT. 1-24-04

Work continued from Page

0700 Hrs -
ARRIVE @ BLDG # 3245 - Prep. to sample 16MW17 & 18 &
take a complete round of water levels @ SWMU 16.
0900 Hrs - Arrive @ SWMU 16
• 0935 - 1047 Hrs - Run ~~synoptic~~ synoptic round of water levels
1100 HRS - Start set up @ 16MW17 18
Start Purge - 1115 Hrs
END Purge - 1305 Hrs (well dry)
Vol purged - 8.6 L
Will sample well tomorrow after well recharges
1320 Hrs - Arrive @ BLDG # 3245
Prep. to sample wells @ SWMU 1
Remainder of day see NB # 1340 for N0845
charge #, CTO 315

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

SIGNATURE

DATE 1-24-04

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

B 100 P ©

VOID THIS PAGE

**TITLE** NSWC CRAN

SUN 1-25-04

**PROJECT NO.** 9060

**BOOK NO.** 1363



Work continued from Page

0700 Hrs - Arrive @ BLDG # 3245

PREP to SAMPLE 16MWT18

0853 Hrs - BEGIN sampling 16MWT18

1100 Hrs - Finish clean up @ SWMU 16 + Return to BLDG # 3245.

REMAINDER OF DAY SEE MGBG Note book # 1340

END

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

Work continued to Page

**SIGNATURE** Troy Rogers

**DATE** 1-25-04

**DISCLOSED TO AND UNDERSTOOD BY** | **DATE** | **WITNESS** | **DATE**

VOID THIS PAGE

**TITLE** NSWC CRANE

**PROJECT NO.** 9060

**BOOK NO.** 1363



MON 1-26-04

Work continued from Page

SHIP SAMPLE 16GWIT1801 this date:

LAUCKS - COC # 4395 AB# 8412 2491 0971

MICROSCOPES - COC # 4394 AB# 8412 2491 0993

DROP OFF @ FED.EX. @ 1845 HRS

END

Work continued to Page

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 MADE IN USA

**SIGNATURE** [signature] **DATE** 1-26-04

**DISCLOSED TO AND UNDERSTOOD BY** **DATE** **WITNESS** **DATE**

APPENDIX D.2.1
SWMU 13 AND SWMU 16
FIELD NOTEBOOK
ROUND 1

NSWC CRANE

N9060

CTO 0279

SWMUs 13 + 16

2555

DRILLING

START: 3/24/03

END:

## TABLE OF CONTENTS

| S | Subject | Page |
|---|---|---|
| | | |

**TITLE** CRANE

**PROJECT NO.** 9060

**BOOK**

Work continued from Page SUNNY 70's

MON 3/24/03

1345 ARRIVE @ BLDG 3245. UNPACK SUPPLIES.

1500 BOWSER MURNER ON-SITE. T. BOEHMER HAS CREW UN-LOAD MATERIALS AT BLDG. 3245.

1555 T. ROBERTS STARTS H+S TRAINING W/ DRILLERS

1735 DRILLERS LEAVE SITE. WILL MEET @ BLDG 3245 @ 0700

1820 LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS · CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bulkner

DATE 3/24/03

WITNESS

DATE

TITLE CRANE

PROJECT NO. 9060
BOOK 2555

Work continued from Page SUNNY 50's

TUES 3/25/03

0650 ARRIVE @ BLDG 3245

0700 DRILLERS SHOW UP START BUILDING DRILL PAD.

0735 CONDUCT RZG INSPECTION W/ DAVE S. ON THE PUTNSUNZE RIG.

0800 GO TO MEETING W/ NAVY PERSONNEL TO DISCUSS ACCESS FOR 13+16.

0850 BACK @ BLDG. 3245. UNABLE TO WORK @ SUMM 16 TILL THURS. CAN SET UP @ SUMM 13 BUT NEED TO WAIT FOR UTILITY CLEARANCE & 1200 START.

1055 FINISH WALK THRU. DRILLERS SET UP ON 13MWT15.

1226 START DRILLING WITH SAMPLE OUT TO BEDROCK.

1245 DRILLERS @ 15'. HIT SILTSTONE @ 13'.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkner DATE 3/25/03

WITNESS DATE



TITLE CRANE

PROJECT 9060
BOOK 2555

Work continued from Page SUNNY 60's

TUES 3/25/03

1305 DRILLERS START W/ 6" CASING

1316 DRILLERS @ 15'. SET UP TO REAM W/ 5" BIT TO 25' TO SEE IF WE HAVE A $H_2O$ PRODUCING ZONE.

1326 START REAMING THE HOLE

1335 DOWN TO 25'. WITH FLUSH OUT HOLE AND SEE WHERE WATER COMES TO

1345 WATER UP TO 17' BGS AND STILL DRILLING.

1352 WL @ 17' BGS. DRILLERS TO SET WELL @ 25'

1355 STARTING TO THUNDER + LIGHTNING. STOP DRILLING.

1506 RAIN STOPPED START SETTING WELL

1600 WELL SET @ 25'
SAND TO 13' (15-17) CHIPS
VOL CLAY 30'. HIGH BENT. TO 11'-4'

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkner DATE 3/25/03

WITNESS DATE

TITLE CRANE

PROJECT NO. 9060

BOOK 2555

Work continued from Page RAZALY SO'S. WINDY

TUES 3/25/03

— MATERIAL USED:
GLOBAL #5 SAND
PURE GOLD MED CHIPS BENTONITE:
QUIK GROUT BENT. POWDER
- BOART LONGYEAR ASTM F480-88A
↳ PIPE + SCREEN PVC SCH 40.
SLOT SIZE .20

1610 DRILLERS PULL OFF. WILL DECON CASING BEFORE NEXT HOLE.

1621 DRILLERS SETTING UP ON 13MW18.

1724 DOWN TO 20' CONT. SAMPLE.

1750 BACK @ BLDG 3245 GOING OVER DAILY W/ DRILLERS

TODAY'S TOTALS:
OUB W/ SAMPLE 35'
ROCK W/O SAMPLE 10'
WELL INST. 25' 13MW15

1800 HEAD TO BLOOMINGTON GATE TO GET ANOTHER

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bulkner

WITNESS

DATE 3/25/03

DATE



TITLE CRANE

PROJECT NO. 9060

BOOK 2555

Work continued from Page

TUES 3/25/03

PAGE PER DAVES

1615 LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bulkner

WITNESS

DATE 3/25/03

DATE

TITLE CRANE

PROJECT NO. 4060

BOOK 2555

Work continued from Page COOL 50's + SUNNY.

WED 3/26/03

0640 ARRIVE @ GATE. VEHICLE SEARCHED BY SECURITY

0650 ARRIVE @ BLDG 3245. DAVE S + JOHN F. INSITE

0730 BACK @ BMWT18 SETTING UP TO CORE.

0751 START CORING.

0804 DRILLERS CORED TO 30'. WE RUN 12:50 MINUTES WILL FLUSH OUT HOLE W/ AIR THEN BEGIN UP CORE RUN

0841 WL @ 13.0' BGS. WILL SET WELL @ 30'. SEEMS TO BE A GOOD H2O ZONE FROM 21.5'-25' V-WET.

0848 WL @ 11.0' BGS ON 13MWT15

0940 13MWT18 SET @ 30' 125 gal USED
SAND TO 18'
BENT CHIPS TO 16'
VOL CLAY TO 3'

0946 DRILL STUCK. DAVE S. CALLS T. BOEHMER

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bulkner DATE 3/26/03

WITNESS DATE



TITLE CRANE

PROJECT NO. 4060

BOOK 2555

Work continued from Page 60's + BREEZY

WED 3/26/03

WILL TRY TO GET A BACK HOE OR TOW TRUCK OUT.

1000 NEED TO GET A BOXER OUT TO THE SITE. $1400.00 A DAY ON-SITE. DAVE S. WILL COORDINATE AND HAVE ONE DELIVERED TO THE SITE.

1020 TOLD T. ROSAHN ABOUT SITUATION. WILL WORK W/ M. COCHRAN + CONTINUE W/ ODT

1047 M. COCHRAN AGREES THAT WE SHOULD HAVE THE DRILLERS SEND A DOZER TO THE SITE

1050 WE HEAD BACK TO BLDG 3245 TO SEE IF PUBLIC WORKS CAN SEND OUT A WRECKER TO PULL US OUT.

1100 M. COCHRAN TALKS W/ CHRIS
A WRECKER WILL BE SENT TO MAINE FILL.

1115 ARRIVE @ MAINE FILL B. SECURITY SAYS WE MISSED WRECKER. GO TO TRACK DOWN.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bulkner DATE 3/26/03

WITNESS DATE

**TITLE** Crane **PROJECT NO.** 9060
**BOOK** 2555

Work continued from Page Sunny 60's.

Wed 3/26/03

1130 Gw @ base Crane with have wrecker ready after lunch

1230 Wrecker on-site.

1320 Sampled 135807 0002 w/ M.C.

1330 Sampled 135807 0810 w/ M.C.

1335 Back w/ Sonic Rig Stem stuck

1425 Rig unstuck.

1433 Drillers Decon Equip

1448 Drillers set up on Bmw T17.

1520 Drillers stop they need to help opt rig.

1535 Drillers back. Start drilling.

1550 Drilled to 8' w/ 6" 5' from 8'-18' Flush out hole



Work continued to Page

SIGNATURE Robert Balkwill DATE 3/26/03
WITNESS DATE



**TITLE** Crane **PROJECT NO.** 9060
**BOOK** 2555

Work continued from Page

Wed 3/26/03

1558 Water to 11' will install well @ 18'.

1627 Well set @ 18' ≈ 130 gal used
Sand to 6'
Bent chips to 3'
Vol cum to — NA —

1630 Well set @ 17.5' Some collapse.

1636 Drillers pull off + head to decon.

1656 Drilling totals.

Cuts w/ sampling 15'
Rock drilling w/o sample 3'
Rock coring 10'
Well installation 47.5'

1700 Back @ 3245 w/ Dave S.

1735 Drillers leave site

1740 Leave site to get gas (End of Day)



Work continued to Page

SIGNATURE Robert Balkwill DATE 3/26/03
WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 9060

**BOOK** 2555

Work continued from Page | COOL 40'S - SUNNY

THURS 3/27/03

0640 ARRIVE @ GATE

0650 ARRIVE @ BLDG 3245 CH P20'S

0705 DRILLERS ARRIVE ON SITE.

0740 ARRIVE @ SUMMIT 13. DRILLERS NEED TO FINISH DECON. RAN OUT OF WATER YESTERDAY.

0745 @ 13MWT17 WL = 6.7

0800 SET UP ON 13MWT16. HAVE DRILLERS BLOW DOWN TO 15' BASED ON 13MWT17.

0802 RIG DOWN. DRILLERS HEAR SOMETHING FUNNY W/ THE RIG.

0812 RIG BACK UP. DRILLERS ADDED GREASE TO THE DRIVE SHAFT.

0817 START DRILLING USING 6" CASING.

0836 DRILLERS DOWN 15' WILL START TO SET WELL

SCIENTIFIC BINDERY PRODUCTS CHICAGO 60605 | Work continued to Page

SIGNATURE Robert Balkema | DATE 3/27/03

WITNESS | DATE



**TITLE** CRANE

**PROJECT NO.** 9060

**BOOK** 2555

Work continued from Page | WARM 60'S - SUNNY

THURS 3/27/03

0902 WELL SET @ 15'
SAND TO 4'
BENT CHIPS TO 2'
- NO NEED FOR VOL CLAY DUE TO SHALLOW DEPTH.
* HARDER DRILLING @ 12'

0917 DRILLERS PULL OFF AND SET UP ON 13MWT12

0939 HIT ROCK @ 7'. WEATHERED S.S. CORED TO 10' WILL SET 6' @ 10'

1014 CORED TO 15' 10-14.5' HAVE WET SEDIMENT ~~GRAVEL~~ FLUSHED OUT MORE

1025 WATER @ 11' BGS WILL DRILL TO 20' AND SET WELL

1050 WELL SET @ 20'
SAND TO 8'
BENT CHIPS TO 4'
WILL NOT USE VOL. CLAY. -

SCIENTIFIC BINDERY PRODUCTS CHICAGO 60605 | Work continued to Page

SIGNATURE Robert Balkema | DATE 3/27/03

WITNESS | DATE

**TITLE** CRANE **PROJECT NO.** 4060
**BOOK** 2555

Work continued from Page WARM 70° - SUNNY

THURS 3/27/03

1100 DRILLERS PULL OUT + HEAD TO DECATUR

1219 DRILLERS @ BLDG 3245 FILLING UP W/ WATER

1245 BACK @ SUNNY 13.

1300 DRILLERS SETTING UP ON 13 MINUTES.

1314 REFUSAL @ 3' HIT CONCRETE.

1320 OFFSET A 2ND TIME + HIT CONCRETE

1328 OFFSET A 3RD TIME

1337 DOWN TO 5'.

1414 DOWN TO 15' PUSS. SAT @ 10-12.5' WILL SIT FOR A HALF HOUR TO SEE IF WATER COMES IN.

1432 HOLE STILL DRY. DOZER SHOWS UP ON SITE.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 Work continued to Page

SIGNATURE Robert Balkwill DATE 3/27/03
WITNESS DATE

**TITLE** CRANE **PROJECT NO.** 4060
**BOOK** 2555

Work continued from Page WARM 70's

THURS 3/27/03

1442 HOLE IS DRY. WILL SEND 6" TO 15' THEN 5' REAM TO 20'.

1520 REAMED 15' - 20' WL @ 14' AFTER FLUSH

1530 REAMED 20' - 25' WL @ 14.2 AFTER FLUSH WILL SET WELL @ 25'

1620 WELL SET @ 25'
SAND TO 13'
BENT CHIPS TO 11'
VOL CUT TO 2'

1625 DRILLERS HEAD TO DECATUR

1700 DRILLERS @ BLDG. 3245. GO OVER DAILY ACTIVITIES.

1730 DRILLERS LEAVE SITE

1750 LEAVE FOR FED-EX

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 Work continued to Page

SIGNATURE Robert Balkwill DATE 3/27/03
WITNESS DATE

TITLE CRANE

PROJECT NO. 9060

BOOK 2555

Work continued from Page Cool 50's V. Windy Some Clouds

FRI. 3/28/03

0640 ARRIVE @ FRONT GATE

0650 ARRIVE @ BLDG 3345 CAL P70's

0715 DRILLERS ON SITE, LOADING UP WELL SUPPLIES.

0725 HEAD TO SUMMIT 13.

0730 BATTERY DEAD ON RIG.

0755 DRILLERS SETTING UP ON 13MWT22.

0839 4" SAMPLER TO 15' RA @ 6'. APPEARS TO BE A COLD ZONE FROM 6'-8' POSSIBLE WATER. WILL LET HOLE SET TO SEE IF WATER COMES IN.

0849 WATER @ 14' BGS. WILL HAVE DRILLERS SET 6" TO 7' AND REAM 5" TO 15'. (7'-15')

0911 BLEW OUT HOLE THREE WL-13' BGS WILL SET WELL @ 15'.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bellmer

WITNESS

DATE 3/28/03

DATE



TITLE CRANE

PROJECT NO. 9060

BOOK 2555

Work continued from Page 50's Cloudy + V. windy

FRI. 3/28/03

0934 WELL SET @ 15'
SAND TO 4'
BENT CHIPS TO 2'
- NO VOL CLAY -

0953 WILL SET UP ON 13MWT11 [redacted] BLOW DOWN TO 15' - SET WELL PASSED ON 13MWT12 T.D 20' WL @ 7.2' BGS. 13MWT16 T.D 15' WL @ 7.0' BGS

1000 SET UP ON 13MWT11 DRILLERS TO SET 6" TO 5' THEN 5" REAM TO 15'.

1004 START W/ 6".

1008 DOWN TO 5'. START W/ 5" REAM

1017 DOWN TO 15'. DRILLERS FLUSH OUT HOLE

1040 WELL SET @ 15'
SAND TO 4'
BENT CHIPS TO 2'
- NO VOL CLAY -

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bellmer

WITNESS

DATE 3/28/03

DATE

**TITLE** CRANE **PROJECT NO.** 9060
**BOOK** 2555

Work continued from Page V. WATER LOVERCAST 67°

FRI 3/28/03

1050 SETUP ON 13MW-21.
WILL REAM W/ 5" TO 15' AND SET WELL
BASED ON 13MW-17 WL = 10.1' BGS

1105 REAMED TO 15'. WILL FLUSH OUT HOLE.

1120 WELL INSTALLED @ 15'
SAND TO 4'
BENT. CHIPS TO 2'
→ DRILLER TELLS ME HE LOST HIS CIRCULATION @ 14'-15'. SHOULD BE GOOD PRODUCER

1127 DRILLERS HEAD TO DECON.

1135 BREAK FOR LUNCH

1200 BACK @ BLDG 3245 DOING PAPERWORK

1240 BACK @ SWMU 13. DRILLERS DECON RIG.

1255 SET UP ON 13MW-25.

1323 DOWN TO 14'. WILL REFLUSH W/ 4" CASING.
POSSIBLE SATURATION @ 8' WILL 5" REAM

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 Work continued to Page

SIGNATURE Robert Balthrop DATE 3/29/03
WITNESS DATE

**TITLE** CRANE **PROJECT NO.** 9060
**BOOK** 2555

Work continued from Page

FRI 3/28/03

TO 15' & FLUSH OUT HOLE.

1338 W.L @ 13' BGS WILL LET SIT TO SEE IF MORE COMES IN NOT SURE IF BLOW OUT REMOVED ALL OF THE DRILLING WATER

1406 WATER @ 13.25' AND RISING. WILL SET WELL TO SCREEN THE 8' WET ZONE. HOPEFULLY IT WILL PRODUCE.

1417 WELL SET @ 15'
SAND TO 4'
BENT CHIPS TO 2'

1435 CHECKED ON 13MW-22. WL=10.0' BGS
DRILLERS WILL SET UP ON 13MW-26.

1447 DRILLERS SET UP ON 13MW-26.
WILL SAMPLE OUB TO 10' THEN CORE TO 20'.

1450 STIFF IN OUB @ 10' WILL LOOK TO 15' W/ 4" CASING

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 Work continued to Page

SIGNATURE Robert Balthrop DATE 3/29/03
WITNESS DATE

TITLE CRANE

PROJECT NO. 9060

BOOK 2555

Work continued from Page Cloudy 30's + Overcast

FRI 3/28/03

1553 DOWN TO 20' FLUSHED OUT HOLE.
WL @ 14' AND RAISING WELL SET WELL.

1600 WELL SET @ 20'
SAND TO 8'
BENT CHIPS TO 3'
VOL CLAY TO NA+

1610 STARTING TO THUNDER + LIGHTNING.

1658 DRILLING TOTALS

49' OF OVB + ROCK SAMPLING (5' ROCK)
14' OVB NS
17' ROCK NS
80' WELL INST.
5 STANDBY
1 DAY DRILLER

GO OVER DAILY W/ DAVE S.

1705 DRILLERS OFF SITE.

1730 LEAVE FOR FED-EX.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill

WITNESS

DATE 3/28/03

DATE



TITLE CRANE

PROJECT NO. 9060

BOOK 2555

Work continued from Page Cloudy 30's + Overcast

SAT 3/29/03

0650 ARRIVE @ SITE

0705 DRILLERS ON-SITE.

0720 LEAVE FOR SWMU 13. DRILLERS STAY
NEED TO DECON

0750 CHECK W/ MONTEZ KLUESNER BLDG. 165
SUPERVISOR.

0800 DOG SET UP ON 13MW07

0846 OVB TO 5' CUTTS 5'-15'
WET @ 5' WILL SET 15' WELL

0900 WELL SET @ 15'
SAND TO 4'
BENT CHIPS TO 2'
- NO VOL CLAY.
WILL SET UP ON 13MW7
AND BLOW DOWN TO 16' + SET WELL

0917 SET UP ON 13MW05 SLIGHT INCLINE FROM

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill

WITNESS

DATE 3/29/03

DATE

**TITLE** CRANE **PROJECT NO.** 4060
**BOOK** 2555

Work continued from Page

SAT 3/29/03

13MW TO 5 WELL SET WELL @ 16'.

0435 WELL SET @ 16'
SAND TO 4'
BENT CHIPS TO 2'

0455 DRILLERS HEAD OVER TO BLDG. 3245 TO GET WATER TRUCK.

1024 SET UP ON 13MW TO 2.

1152 OUB TO 7' ROCK CUTE TO 17'
FLUSH OUT HOLE AND LET SET.

1355 WL = 16.7' BGS 3' FEET OF WATER.
WELL GO DEEPER.

1452 DOWN TO 27'. LAST RUN HAD HEAVY FRACTURED SHALE + S.S. (WATER BEARING)
LOOKS LIKE A GOOD PRODUCING ZONE.
WL @ 23' BGS AFTER FLUSH OUT
WELL SET WELL.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 Work continued to Page

SIGNATURE Robert Bulkner DATE 3/29/03
WITNESS DATE



**TITLE** CRANE **PROJECT NO.** 4060
**BOOK** 2555

Work continued from Page Cloudy 48° Cloudy

SAT. 3/29/03

1543 WELL SET @ 27'
SAND TO 15'
BENT CHIPS TO 13'
VOL CLAY TO 4'

1550 DRILLERS HEAD TO DECON.

1630 DECON FINISHED DRILLERS LOAD WATER INTO RIG. DRILLERS WILL TRY TO SET THE RIG UP ON 13MW TO 8 HARD ACCESS.

1636 RAINING

1654 RIG STUCK. DRILLERS GET DOZER.

1728 RIG SET-UP ON 13MW TO 8 HAD TO MOVE 2100' TOWARDS BLDG 165 DUE TO MUDDY CONDITIONS

1737 HEAD TO BLDG. 3245 TO GO OVER DAILY ACTIVITIES + FILL UP W/ WATER

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 Work continued to Page

SIGNATURE Robert Bulkner DATE 3/29/03
WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 4060
**BOOK** 2555

Work continued from Page

SAT 3/29/03

1800 DRILLERS LEAVE SITE

1900 LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bulkner DATE 3/29/03

WITNESS DATE



**TITLE** CRANE

**PROJECT NO.** 4060
**BOOK** 2555

Work continued from Page WND 31°

SUN 3/30/03

0655 ARRIVE @ SITE

0700 DRILLERS ON-SITE FILLING UP DECON TANK

0735 START DRILLING ON 13 MW TOP

0755 DOWN TO 10' PUSH SAT @ 8' WELL GO TO 10'

0811 DOWN TO 15' W/ 4" SAMPLER. WET ALONG THE SIDES OF THE HOLE WELL SET 6' TO 5' THEN REMA (5") 5-15'

0830 DOWN TO 15'. DRILLER LOSING WATER FLUSHED HOLE - WL 2 9' BLS. WELL SET WELL

0910 WELL SET @ 15'.
SAND TO 4'
BENT CHIPS TO 2'

0924 DRILLERS SET UP ON 13 MW TOP.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bulkner DATE 3/30/03

WITNESS DATE

**TITLE** CRANE **PROJECT NO.** 9060
**BOOK** 2555

Work continued from Page CONT 30'S. V-WINDOW

SUN 3/30/03

0930 START DRILLING

0945 DOWN TO 8'. HIT REFUSAL WILL SET 6"
@ 5' RIGHT ABOVE POSS. SATURATION @ 7-7.5'.

1000 PULL TO 15' W/ 5". WILL FLUSH OUT HOLE.
WATER @ 13' AND RISING WILL SET WELL @ 15'

1017 WELL SET @ 15'
SAND TO 4'
BENT CHIPS TO 2'

1030 DRILLERS HEAD TO DECON PAD

1120 SETUP ON BMW101
CHECKED WL ON BMW102 WL = 22' BGS.

1150 DOWN TO 10'. DIFFERENT LITH. THAN
BMW102. POSS MOISTURE @ 8'.
HOLE COLLAPSED TO 6'. DRILLERS WILL OPEN
HOLE BACK UP & LET SIT TO SEE IF
THE WEATHERED S S WILL MAKE WATER.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 Work continued to Page

SIGNATURE Robert Bulkner DATE 3/30/03
WITNESS DATE

**TITLE** CRANE **PROJECT NO.** 9060
**BOOK** 2555

Work continued from Page CONT 40'S.

SUN 3/30/03

1200 DRILLERS TAKE A BREAK. HOLE OPEN TO 10'.
WILL LET SIT TO SEE IF WATER COMES UP.

1254 WATER @ 6.5' BGS. WILL SET
WELL @ 15'.

1335 WELL SET @ 15'
SAND TO [redacted] 3'
BENT CHIPS TO [redacted] 1'

1340 PULL OFF. WILL DRIVE OVER AND
DECON TOOLING

1440 DRILLERS TRYING TO SET UP ON BMW103.

1458 NOT BACK FAR ENOUGH OFF OF THE WATER
LINE. RE-START.

1510 RIG PULLED OUT. WILL INSTALL WELL
NEAR THE ROAD.

1512 WILL SEND 5" TO 15'. BASED ON BMW101
DETAILS.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 Work continued to Page

SIGNATURE Robert Bulkner DATE 3/30/03
WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 9060

**BOOK** 2555

Work continued from Page

SUN 3/30/03

1540 WELL SET @ 15'
SAND TO 3'
BLOW TO 1'
- DRILLERS CLEAN UP. HEAD OVER TO DEKON.
PLAN IS TO MOB DOZER OUT OF FENCED AREA.

1728 DOZER + R26 SET-UP ON 13 MW-T 14.

1740 HEAD TO BLDG. 3245.

1800 DRILLERS LEAVE SITE.

1830 LEAVE SITE. NEED TO FILL UP VEHICLES

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkovec

WITNESS

DATE 3/30/03

DATE



**TITLE** CRANE

**PROJECT NO.** 9060

**BOOK** 2555

Work continued from Page CWD H26M 20[95]

MON 3/31/03

0655 ARRIVE @ BLDG. 3245

0700 DRILLERS ON SITE.

0750 BACK @ 13MW-T14.

0852 DOWN TO 17.5' REFUSAL. POSS. WATER @ 9' BGS. WILL LET HOLE SIT TO SEE IF WATER COMES IN.

0912 WATER COMING IN THE HOLE. M-SCOPE CAME UP WET. ≈ 1' WATER. SCRAPED THE SIDE WALLS ≈ 8' OF SATURATION ALONG THE SIDE WALLS.

0948 TALKED W/ M COCHRAN REGARDING THE PLACEMENT OF 13MW-T14. HE SUGGESTS GOING 5' MORE FEET THEN PULLING OFF THE HOLE. DRILLERS TO BREAK 17.5 - 23'.

1023 DOWN TO 23'. FLUSHED OUT HOLE. WATER LEVEL @ 20' AND RISING. WILL SET WELL @ 23'.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkovec

WITNESS

DATE 3/31/03

DATE

**TITLE** NSWC CRANE

**PROJECT NO.** 9060

**BOOK** 2555

Work continued from Page COLD 29° + SUNNY

MON 3/31/03

1050 WELL SET @ 23'
SAND TO 11'
BENT CHIPS TO 9'
[redacted] VOL CLAY. TO 2'.

1120 CLEAN UP + BREAK

1230 SET UP ON 13MWT19.

1252 DOWN TO 9'. HARD @ 8'-9'. WILL
CURE THE REST.

1420 DOWN TO 19'. WL @ 17' AFTER FLUSH
OUT. WILL INSTALL @ 19' TO SCREEN
POSSIBLE SATURATION @ 13'.

1500 WELL SET @ 19'
SAND TO 7'
BENT CHIPS TO 2'

1520 PULLED OUT RIG. DRILLERS HEAD TO DEWN

1640 DRILLERS TAKE RIG OVER AND TRY TO SLEE
UP ON 13MWT13.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Belkner

DATE 3/31/03

WITNESS

DATE

**TITLE** CRANE

**PROJECT NO.** 9060

**BOOK** 2555

Work continued from Page

MON 3/31/03

1615 RIG STUCK.

1650 RIG OUT. M. COCHRAN RE-SET 13MWT13
TURNED THE ROAD T. ROTMAN NEEDS
TO CLEAR UTILITIES BEFORE WE
CONTINUE.

1700 DRILLERS GO OVER AND DROP OFF RIG

1736 HEAD TO BLDG. 3245 TO GO OVER
DAILY ACTIVITIES

1815 LEAVE SITE. DRILLERS LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Belkner

DATE 3/31/03

WITNESS

DATE

TITLE CRANE PROJECT NO. 9060
BOOK 2555

Work continued from Page WARM 50's - WINDY

TUES 4/1/03

0655 ARRIVE @ SITE.

0705 DRILLERS ON-SITE

0720 LOU W/ M-CUERVAN TO TALK ABOUT LOCATION FOR 13MW713 + 13MW709. 13MW713 MOVED TOWARDS THE ROAD. T. ROSAHN NEEDS TO CONTACT PUBLIC WORKS.

0750 @ 13MW709 LOCATION. WILL NEED TO USE THE DOZER. M-CUERVAN WILL HELP.

0813 START DRILLING @ 13MW720

0850 DOWN TO 15'. WATER COMING IN. WILL WAIT TO SEE WHERE WATER COMES IN.

0909 WATER LEVEL @ 13.7' BGS

0925 DOWN TO 20'. WILL SET WELL + SCREEN THE 13' SATURATION.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 Work continued to Page

SIGNATURE Robert Balkwill DATE 4/1/03
WITNESS DATE



TITLE CRANE PROJECT NO. 9060
BOOK 2555

Work continued from Page

TUES 4/1/03

0937 WELL SET @ 20'
SAND TO 8'
BENT CHIPS TO 7'

0943 DRILLERS HEAD TO DECON.

1007 DRILLERS SETTING UP ON 13MW709.

1040 DOWN TO 20': LOOKED LITHOLOGY WILL SET WELL @ 20'? BASED ON 13MW710 + LITHOLOGY SEEN @ 13MW713.

1050 WELL SET @ 20'
SAND TO 8'
BENT CHIPS TO 7'
WL ON 13MW710 = 14.5' BGS

1104 DRILLERS PULL OUT RIG. WILL CLEAN UP + SET UP ON 13MW723.

1215 DRILLERS SET UP ON 13MW723.

1312 SAMPLED TO 22'. WATER @ 16'?
7.5' OF WATER IN HOLE.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 Work continued to Page

SIGNATURE Robert Balkwill DATE 4/1/03
WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 4060

**BOOK** 2555

Work continued from Page

TUES 4/1/03

1320 WELL SET @ 21.5'
SAND TO 4.5'
BENT TO 7.5' WELL TO 2'

1337 SETUP ON BMWT24
WELL SET WELL @ 22' BASED ON
BMWT23 + BMWT26. W.L @ BMWT26
=14.8 BLS.

1345. START DRILLING

1410 DOWN TO 22'. CUTTINGS ARE LOOKING
SIMILAR TO BOTH T26 + T23.
W/L @ 19' AFTER BLOW OUT WELL
SET WELL.

1420 WELL SET @ 22'
SAND TO 10'
BENT TO 2'
PULL OFF + DECOM.

1425 T. BRENT + CHRIS ON-SITE
SHOW THEM FINISHED WELLS

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill DATE 4/1/03

WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 4060

**BOOK** 2555

Work continued from Page

TUES 4/1/03

1443 T. BRENT + CHRIS LEAVE SITE

1500 DRILLERS FINISHED DECOM. HEAD
TO BLOCK 3245

1610 DRILLERS LEAVE SITE.

1730 LEAVE FOR FEDEX

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill DATE 4/1/03

WITNESS DATE

TITLE CRANE

PROJECT NO. 4060

BOOK 2555

Work continued from Page

WED 4/8/03

0700 ARRIVE @ SITE

0900 LEAVE FOR FED EX. 1400 FLIGHT

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bulkner

WITNESS

DATE 4/8/03

DATE



TITLE CRANE

PROJECT NO. 4060

BOOK 2555

Work continued from Page

COOL 50° + OVERCAST

MON 4/7/03

1200 ARRIVE @ SITE

1310 DRILLERS ON-SITE DRILLING PADS.

1500 RECEIVED GO AHEAD FROM PW. TALKED W M. KLUESNER @ BLDG 165 O.K. TO START @ 1630 ON B MW106 JUST NEED TO CHECK IN @ 1630 FIRST.

1600 DRILLERS ROUNDING UP EQUIPMENT.

1700 SET UP ON B MW106 AFTER TALKING W/ MARVIN K. DRILLERS ALLOWED TO KEEP DRILLING ALSO.

1729 DOWN TO 15'. POSSIBLE SATURATION @ 6.5'. WILL SET WELL @ 15'.

1800 DRILLERS OVER @ DEGRN. DOZER WINDED UP. B MW106 SET @ 15'
SAND TO 3'
BENT TO 1'

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bulkner

WITNESS

DATE 4/7/03.

DATE

**TITLE** CRANE

**PROJECT NO.** 9060

**BOOK** 2555

Work continued from Page

COOL, 50's - OVERCAST

MON 4/7/03

1830 @ BLDG 3245 TALKING W/ DAVE S. OF B.M.

1840 DRILLERS OFF-SITE

1910 LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bulkner

WITNESS

DATE 4/7/03

DATE

**TITLE** CRANE

**PROJECT NO.** 9060

**BOOK** 2555

Work continued from Page

COOL 40's

TUES 4/8/03

0700 ARRIVE @ BLDG 3245 CAL P.J.D.

0720 DRILLERS ALL ON-SITE.

0730 HEAD TO SWMU 13. WILL SET UP ON 13MW-T13.

0740 SURVEYORS ON-SITE. DIRECT THEM TO BLDG. 3245.

0830 DRILLERS UNABLE TO SET UP ON 13MW-T13 WILL NEED TO RE-LOCATE OR BLOCK TRAFFIC @ NIGHT TO SET WELL. WILL HEAD TO BLDG 3245 TO SEE ABOUT GETTING INTO SWMU 16.

1000 @ SWMU 16. DRILLERS SETTING UP ON 16MW-T01. TALKED W/ MATT COCHRAN REGARDING THE MOVEMENT OF 13MW-T13. HE SUGGESTS THAT WE MOVE MW CLOSER TO THE ROAD. IF NOT, WE MAY ELIMINATE.

1030 START DRILLING @ 16MW-T01.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bulkner

WITNESS

DATE 4/8/03

DATE

TITLE CRANE PROJECT NO. 9060
BOOK 2555

Work continued from Page WIND 40'S - OVERCAST.

TUES 4/8/03

1147 @ 19' WILL FLUSH OUT HOLE + BREAK FOR LUNCH.

1300 BACK @ 3245 NEED TO TALK W/ T. BRENT ABOUT RECENT SWMU 13 ISSUES REGARDING ACCESS AND NO-WORK ZONES

1330 BACK @ SWMU 16. W/L @ 16MW104 = 16.5' BGS WILL CORE 5 MORE FEET.

1331 RIG DOWN. ELECTRICAL PROBLEMS.

1344 BACK UP + RUNNING. WILL CORE TO 24'.

1400 WELL WILL BE SET @ 24'

1420 WELL SET @ 24'
SAND TO 12'
BENT. CHIPS TO 11'
VOL CLAY - 4'

1430 HEAD OVER TO DECON

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 Work continued to Page

SIGNATURE Robert Belhouse DATE 4/8/03
WITNESS DATE



TITLE CRANE PROJECT NO. 9060
BOOK 2555

Work continued from Page

TUES 4/8/03

1510 BACK @ SWMU 16
NEED TO MOVE 2 DUMPSTERS IN ORDER TO SET UP ON 16MW104.

1528 RIG SET UP ON 16MW104.

1530 START DRILLING.

1535 HIT ROCK @ 4'. REFUSAL @ 5'

1637 DOWN 20'. FLUSHED OUT HOLE. WILL SEE WHERE WATER COMES IN OVERNIGHT

1645 BACK @ BLDG 3245. GO OVER DAILY W/ DRILLERS

1710 DRILLERS OFF-SITE

1715 LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 Work continued to Page

SIGNATURE Robert Belhouse DATE 4/8/03
WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 9060

**BOOK** 2555

Work continued from Page Cont 30's Underest

WED 4/9/03

0700 Arrive @ Site. Drillers on-site
Call P.J.D.

0738 Back @ 16MW-W4. WL in hole = 15' BGS
Will ream to 25' & set well. Very
rainy. Want to make sure the well will
produce in dry season.

0829 Well set @ 25'
Sand to 13'
Bent chips to 12'
Vol clay to 2'.

0848 Drillers head to Decon.

Start connecting soil samples w/ T. Williams

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Belkner DATE 4/9/03

WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 9060

**BOOK** 2555

Work continued from Page

WED. 4/9/03

1120 Drillers down to 4' @ 16MW-W5
Break for lunch.

1300 Back @ 16MW-T05.

1330 Checked WL for 14-05-83 = 30.65' BGS
& 14-01-83 = 28.5' BGS. Both wells
set @ 45'.

1431 Down to 40'. Will set well there
based on nearby wells.

1510 Well set @ ~~35~~ 39'
Sand to 28'
Bent chips to 25'
Vol-clay to 2'

1515 Head to Bldg. 3245 to Decon &
discuss the installation of 13MW-T13.
Will have to install it on Sunday.

1625 Set up rig on 16MW-W3. Will
drill tomorrow.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Belkner DATE 4/9/03

WITNESS DATE

TITLE Crane

PROJECT NO. 4060a
BOOK 2555

Work continued from Page

WED 4/9/03

1655 Let drillers in @ Sump 13. Checked in w/ the Guard. Will be able to access restricted area @ 1730. T. Rutland wants me to hang around until drillers leave. Drillers work on lines outside buffer zone.

1730 Granted access inside buffer zone. Drillers start digging pads.

1905 2 more pads to dig.

1940 Drillers finish last pads.

2000 Leave site. Will take care of paperwork tomorrow. Sump 13 secured.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bulkner DATE 4/9/03

WITNESS DATE



TITLE Crane

PROJECT NO. 4060
BOOK 2555

Work continued from Page

Wind 30's + Sunny

THURS 4/10/03

0740 Arrive on-site.

0720 Discuss possibility of using a track rig to install 13MW13. M. Cochran will coordinate w/ J. Nazlowski of Bunsier Mariner.

0805 Set up on 16MW03. Previously sampled to 3' w/ 165836. Drillers setting water tub.

0910 Down to 29'. Looks wet around 20' will core to 34'.

0943 Down to 34'. Flush out hole

1023 Well set @ 35'
Sand to 23'
Bent. chips to 20'
Vol Clay to 2'
*Driller overdrilled a foot by mistake during clean out of hole.

1040 Pull off + head to Decon.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bulkner DATE 4/10/03

WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 4060
**BOOK** 2555

Work continued from Page 55° + SUNNY

THURS 4/10/03

1200 CEMENT TRUCK ARRIVES @ SWIMM B. DRILLERS WILL START W/ 13 MUD TAB AND WORK BACK TOWARDS THE SOUTH GATE

1406 DAVE S. OFFSITE TO MEET W/ GLOBAL SUPPLY TRUCK.

1420 T. BRENT - C. FREEMAN ON-SITE TO CHECK ON THINGS. WANTED TO KNOW IF WE HAD PROBLEMS W/ CONCRETE TRUCK GETTING INTO SWIMM 13.

1433 T. BRENT - C. FREEMAN OFF-SITE.

1500 FINISHED ACCESSIBLE PADS. WILL TRY TO POUR THE 2 BY THE BUS STOP OUTSIDE OF SWIMM 13.

1515 HEAD OUTSIDE TO POUR THE LAST TWO PADS.

1760 BACK @ BLDG 3245. GO OVER DAILY ACTIVITY W/ DRILLERS

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Belknap DATE 4/10/03

WITNESS DATE

**TITLE** CRANE,

**PROJECT NO.** 4060
**BOOK** 2555

Work continued from Page

THURS 4/10/03

1720 LEAVE FOR FED EX

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Belknap DATE 4/10/03

WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 4060

**BOOK** 2555

Work continued from Page

FRI 4/11/03

0700 ARRIVE @ SITE

0710 DRILLERS ON SITE.

0743 @ SIMMONS.

0755 SET UP ON 16 MW TW2. W.L @ 16 MW TW3 = 25' BGS

0819 DOWN TO 13' WET @ 7 10.5'

0838 DOWN TO 16' WATER LEVEL @ 16' BGS. YOU CAN HEAR WATER RUNNING INTO THE HOLE. WILL SET WELL @ 18' TO STRADDLE THE 10' WET ZONE.

0854 WELL SET @ 18'
SAND TO 6'
BENT CHIPS TO 2'

0900 DRILLERS PULL OUT + HEAD TO DEUMI. THEY WILL MOB ~~BACK~~ BOBCAT USED TO SIMMONS TO FINISH DIGGING PADS.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkema DATE 4/11/03

WITNESS DATE



**TITLE** CRANE

**PROJECT NO.** 4060

**BOOK** 2555

Work continued from Page

FRI 4/11/03

1000 GEAR UP TO DEVELOP W/ TROJAHN

1815 LEAVE SITE. DRILLERS LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkema DATE 4/11/03

WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 4060
**BOOK** 2555

Work continued from Page Cont 45° Sunny

Sat. 4/12/03

0645 Arrive on-site

0640 Drillers on-site Concrete truck supposed to show up @ 0700 to pour pads @ Sumpy 13.

0650 Drillers go to meet concrete truck, will develop w/ T. Rutann Refer to logbook 1363 for development details

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Belknap
WITNESS

DATE 4/12/03
DATE

**TITLE** CRANE

**PROJECT NO.** 4060
**BOOK** 2555

Work continued from Page Cont 45°

Tues 4/22/03

0650 Arrive @ site. Gear up to collect GW samples

0755 Set up on 16MW101 to start sampling

0800 Start sampling 1

0807 Well dry unable to collect 4 VOCs.

0820 Set up on 16MW102

0828 Start pumping

0946 Sampled 16MW102.

1230 Set up on 16MW104.

1243 Start pumping

1437 Sampled 16MW104.

1612 16MW101 dry leave for

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Belknap
WITNESS

DATE 4/22/03
DATE

TITLE CRANE

PROJECT NO. 9060

BOOK 2555

Work continued from Page

TUES 4/22/03

BLDG 3245.

1730 CHECK CALIBRATION FOR YSI

1730 LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill DATE 4/22/03

WITNESS DATE



TITLE CRANE

PROJECT NO. 9060

BOOK 2555

Work continued from Page COLD 35°

WED 4/23/03

0630 ARRIVE @ SITE. DENNY UNABLE TO MAKE IT TODAY. WILL ARRIVE ON-SITE TOMORROW

0700 HOME

0720 SET UP ON WELL 14-4-83

0723 START PUMPING

0811 START SAMPLING 16MW0401

0920 HEAD TO BLDG. 3245 TO PROCESS SAMPLES DRILLERS SHOULD BE ON-SITE @ 1000.

1020 DRILLERS ARRIVE ON-SITE
JOHN KEFER
CHAD MAHAFFY
DENNIS STARK
GO OVER JSA + CONDUCT RIG INSPECTION.

1100 DRILLERS BREAK FOR LUNCH.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill DATE 4/23/03

WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 9060
**BOOK** 2555

Work continued from Page SUNNY - 60°

WED 4/23/03

1216 DRILLERS BACK + FINISH DECON.
HEAD TO SUMMIT B. WILL SET UP
ON 13 MWT13.

1230 SET UP ON 13MWT13.
WILL SPLIT SPOON TO REFUSAL
THEN ROLLER BIT.

1238 START DRILLING

1336 WATER @ 10'.
HIT SPOON REFUSAL @ 13'
WILL DRILL TO 18' + SET WELL

1350 ADVANCED TO 19' WILL SET WELL @ 18'.

1500 WELL SET @ 18'
SAND TO 6'
BENT TO 2'
6" HOLE 0-19'

1510 DRILLERS CLEAN UP + START TO
DRILL OUT PAD.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill DATE 4/23/03

WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 9060
**BOOK** 2555

Work continued from Page

WED 4/23/03

1600 DRILLERS OFF-SITE

1630 HEAD FOR FEDEX + GAS FOR VEHICLE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill DATE 4/23/03

WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 9060

**BOOK** 2555

Work continued from Page | Over 40's

THURS 4/24/03

0630 ARRIVE. TO MEET W/ DENNY TO OFF-LOAD PIPE

0900 ARRIVE BACK @ BLDG. 3245
T. JOHNSTON WANTS TO REINSTALL 16MW TOL.

0930 TALK W/ T. BOEHMER. WILL AGREE TO
SEND MORE SUPPLIES DOWN FOR AN ADDITIONAL
65 HR FOR 8 HOURS.

1000 HEAD TO SUMMIT 16. TO SET UP ON 16MW01B
REDRILL

1035 DRILLERS SET UP ON 16MW01B

1040 SET UP ON WES 14-02-83

1041 START PUMPING NEED 8.5L FOR 1 vol.

1055 CHECKED ON DRILLERS DOWN TO 13'
W/ HSA. HARD DRILLING AROUND 9'.

1122 DRILLERS DOWN TO 23'
HIT WET ZONE @ 9' THEN DRY AFTER
AROUND 16'

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Belkner DATE 4/24/03

WITNESS DATE



**TITLE** CRANE

**PROJECT NO.** 9060

**BOOK** 2555

Work continued from Page | 50's SLIGHT DRIZZLE

THURS 4/24/03

1130 DRILLERS BREAK

1201 START SAMPLING ~~16MW~~ 16MW01 201

1240 DRILLERS BACK. WILL CLEAN OUT
HOLE + WAIT FOR MORE AUGER FLIGHTS

1330 HOLE OPEN TO 23'.
WATER 5' BGS. NOT SURE WHY
1ST 16MW01 IS DRY.

1345 FINISHED SAMPLING

1430 SET UP ON WES-14-03-83

1433 START PUMPING

1510 TALKED W/ JOHNSTON HE WANTS TO
SET REDRILL 16MW01 @ 24'.

1515 DRILLERS AUGERED TO 25' W/ 4-25' AUGERS
WILL SET WELL @ 25' TO STRADDLE (16.5-17)

1630 WELL SET @ 25'

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Belkner DATE 4/24/03

WITNESS DATE

TITLE CRANE

PROJECT NO. 9060

BOOK 2555

Work continued from Page

THURS 4/24/03

SAND TO 13'
BENT TO 4'
- CHIPS TO 11'
- VOLCAN TO 4'

1632 START SAMPLING 16MW0301.

1719 DRILLERS HEAD OVER TO BLDG 3245 TO CLEAN UP. T. ROJAHN GOES OVER TO 16MW101 REDRILL TO FIGURE OUT HOW BIG A PAD WE CAN INSTALL.

1834 CLEAN UP & HEAD TO BLDG 3245-

1910 LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill DATE 4/24/03

WITNESS DATE



TITLE CRANE

PROJECT NO. 9060

BOOK 2555

Work continued from Page 45 - PATRONE

FRI 4/25/03

0630 ARRIVE @ SITE.

0720 HEAD FOR SWMU 13.

0800 SET UP ON 13MW726

0804 START PUMPING

0822 SAMPLING 13MW726

1105 SET UP ON 13MW725

1110 START PUMPING

1152 WELL PUMPED DOWN TO TURBINE INTAKE 3.25L PUMPED OUT 2L = 1 vol. WELL LOWER TURBINE AND PUMP OUT WELL. WELL DID NOT STABILIZE.

1210 WELL DRY - REMOVED 5.25L > 2vols. WILL MOVE ON TO 13MW721.

1230 SET UP ON 13MW721

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill DATE 4/25/03

WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 9060
**BOOK** 2555

Work continued from Page 50° + RAIN

FRI 4/25/03

1237 START PUMPING.

1346 START SAMPLING 13GW121101
COLLECT DUP FD04250301

1458 FINISHED SAMPLING

1730 HEAD TO FEDEX



Work continued to Page

SIGNATURE Robert Balkner DATE 4/25/03

WITNESS DATE



**TITLE** CRANE

**PROJECT NO.** 9060
**BOOK** 2555

Work continued from Page WARM 50's

SAT 4/26/03

0630 ARRIVE @ SITE. LOAD UP TO SAMPLE @ SWMU 13.

0718 BREAK @ 13MW125.
WL = 17.31' TD 18.02'
ORIGINAL WL = 14.76 22% RECOVERY
2 438 ml TO WELL.
WAIT TILL 1200 AND RE-CHECK

0740 SETUP ON 13MW103

0745 START PUMPING

0855 REMOVED INST. PARAMETERS NOT STABLE

1145 HAD TO PUMP FOR 4 HRS WELL NOT STABLE NTUS >10

1146 START SAMPLING 13GW103011

1226 END SAMPLING HEAD OVER TO 13MW125 TO CHECK ON WL



Work continued to Page

SIGNATURE Robert Balkner DATE 4/26/03

WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 4060

**BOOK** 2555

Work continued from Page HOT 70's

SAT 4/26/03

1228 WL @ 17.24' .07' RISE IN 5 HRS + 10 MIN.

1230 START SAMPLING FOR EXPLOSIVES.

1232 WELL DRY FILLED ≈ 1/2 L.
WILL HEAD TO 13MW102.

1246 START PUMPING ON 13MW102.

1535 END PURGE TURBIDITY <10 NTUS

1536 START SAMPLING

1546 WELL RAN DRY BEFORE SAMPLING COULD BE COMPLETE. WILL SLURP FOR RECHARGE.

1605 WL @ 13MW125 = 17.90'. WILL CHECK TOMORROW.

1700 HEAD OVER TO SWMU 16 TO DEWATER 16MW106.

1800 LEAVE SITE.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill DATE 4/26/03

WITNESS DATE



**TITLE** CRANE

**PROJECT NO.** 4060

**BOOK** 2555

Work continued from Page WARM 50's

SUN 4/27/03

0730 ARRIVE @ SITE

0825 21.35' = WL @ 13MW102
≈ 66' RECOVERY. WILL FINISH SAMPLING.

0830 RESUME SAMPLING. 6-0 NTUS

0940 SETUP ON 13MW104

0946 START PUMPING

1051 START SAMPLING 13MW104

1150 13MW140 + 13MW141 BOTH UNDER PRESSURE. J-PLUG ON 140 TIGHT
WL RISING ON BOTH. WILL COME BACK LATER.

1213 @ 13MW125 WL = 17.31'
WILL COLLECT [redacted] MORE VOL FOR EXP.

1320 WELL DRY. RETRIEVED ≈ 450 mls

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill DATE 4/27/03

WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 9060

**BOOK** 2555

Work continued from Page SUNNY 70°

SUN 4/27/03

1240 SET UP ON 13MWT11 WL STABLE.

1245 START PUMPING.

1505 END PURGE REMOVED 12.3L 2 HOURS

1506 START SAMPLING 13MWT11.

1556 SET UP ON 13MWT10.

1 START PUMPING

1811 SAMPLING 13GWT1001

1940 HAND OVER TO BLDG 3245

1932 LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bulkner DATE 4/27/03

WITNESS DATE



**TITLE** CRANE

**PROJECT NO.** 9060

**BOOK** 2555

Work continued from Page SUNNY 70°

MON 4/28/03

0630 ARRIVE @ SITE. GROUP TO GW SAMPLE.

START PUMPING @ 13MWT09

0911 SAMPLING 13MWT09 + FD042803 0301

1320 BACK @ 13MWT25. RESUME SAMPLING WL = 17.28'

1324 WELL DRY. REMOVED 2 WELL HOLD FOR METALS.

1305 SET UP ON 13MWT24

1311 START PUMPING

1456 START SAMPLING 13GWT2401.

1530 FINISHED SAMPLING

1537 RELEASE TEMP R. CONTINUE ON 13MWT20

1606 START SAMPLING 13GWT2001

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bulkner DATE 4/28/03

WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 4060
**BOOK** 2555

Work continued from Page PLANNING 60's.

MON 4/28/03

1740 FINISH SAMPLING

1745 SETUP TO SAMPLE 13MW103 WILL USE TO FILL METALS

1751 WELL DRY STARTED SAMPLING @ 1748
3 400 mls. WILL CHECK ON SURVEYORS.

1825 SURVEYORS FINISHED. LEAVE SUMMIT.
HEAD TO 3245 TO UNLOAD SAMPLES + EQUIP.

1900 LEAVE SITE.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill DATE 4/28/03
WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 4060
**BOOK** 2555

Work continued from Page FORMAN 50's

TUES. 4/29/03

0630 ARRIVE @ SITE. CHECK CHL. ON KSL

0750 SETUP ON 13MW114.

0755 START PUMPING.

0975 END PURGE. PARAMETERS STABLE

0926 SAMPLING 13GWT1401.

1023 BACK @ 13MW125. WL=17.38'
WILL CONTINUE TO SAMPLE METALS.

1032 WELL DRY. 2 400 mls RETRIEVED

1130 WILL WORK W/ T.P. DEVELOPING +
WELL RESTORATION

1630 LEAVE FOR FED-EX.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill DATE 4/29/03
WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 9060

**BOOK** 2555

Work continued from Page 60° · SUNNY

TUES 5/6/03

0600 ARRIVE @ SITE

0715 CAL YSI · LAMOTTE.

0730 HEAD TO SUMP 13 TO CONTINUE GW SAMPLING.

0748 START PUMPING ON 13MW116

0842 START SAMPLING 13GWT1601.

0930 SETUP ON 13MW118

0938 START PUMPING

1342 SAMPLING 13GWT1801. NEED FILTERED METALS

1440 @ 13MW125 WL: 17.20 FINISH SAMPLING AMMONIA.

1445 SET-UP - START PUMPING 13MW115.

1702 START SAMPLING 13GWT1501.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill DATE 5/6/03

WITNESS DATE



**TITLE** CRANE

**PROJECT NO.** 9060

**BOOK** 2555

Work continued from Page

TUES 5/6/03

1800 HEAD BACK TO BLDG 3245

1830 LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill DATE 5/6/03

WITNESS DATE

**TITLE** Crane

**PROJECT NO.** 4060

**BOOK** 2555

Work continued from Page 60' - Cloudy

WED 5/7/03

0640 Arrive @ Site

0705 Head over to Summit 13.

0720 Set up on 13MWT1B

0730 Start Pumping

0947 Start Sampling 13GWT1301 + Collect Dup FD05070301.

1100 Head over to Bldg 3245 to Drop off Samples

1150 Set-up on 13MWT19

1155 Start Pumping

1347 Sampling 13GWT1901.

1450 Head over to Bldg 3245-

1700 @ 13MWT06. For Diss. metals

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill

WITNESS

DATE 5/7/03

DATE

**TITLE** Crane

**PROJECT NO.** 4060

**BOOK** 2555

Work continued from Page

1730 Leave Site.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill

WITNESS

DATE 5/7/03

DATE

**TITLE** CRANE **PROJECT NO.** 9060
**BOOK** 2555

Work continued from Page 2555 + [redacted]

5/8/03 THURS

[redacted] ARRIVE @ HAL MART PICK-UP SUPPLIES.

0740 GET LOAD OF TOP SOIL FROM NURSERY W/ T.R.

0810 ARRIVE @ SITE WITH RESTORE WELL WATCHING + COLLECT REMAINING SW SAMPLES

1730 HEAD FOR FEDEX

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bulhner DATE 5/9/03
WITNESS DATE



**TITLE** CRANE **PROJECT NO.** 9060
**BOOK** 2555

Work continued from Page 2555 + PAGE

5/9/03 FRI.

0640 GEAR UP TO CONDUCT SLUG TESTS

0730 SET UP ON 13MW717.

0900 FINISHED

0917 @ 13MW726 WAITING FOR WL TO STABILIZE WL 9.09' INITIAL WL @ 8.7'

0938 @ 13MW715 INITIAL WL 12.50' 12.50' W/ X-DUR. WILL WAIT FOR STABILIZATION

0958 WL @ 8.85' ON 13MW726.

1002 @ 13MW711. WILL SET UP WL @ 7.28. INITIAL WL @ 7.6' WILL ALLOW WL TO STABILIZE

1018 WL @ 8.97' ON 13MW726

1103 @ 13MW726 WL 9.08' START FALLING HEAD TEST.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Bulhner DATE 5/9/03
WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 9060
**BOOK** 2555

Work continued from Page 205 + Hunter

5/9/03 5/9/03

1143 START 13MWUT15 FALLING HEAD TEST.

1208 START 13MWUT11 FALLING HEAD TEST

1235 FINISH FALLING HEAD TEST @ 13MWUT15

1240 START RISING HEAD TEST

1255 STOP FALLING HEAD TEST FOR 13MWUT11

1259 START RISING HEAD TEST FOR 13MWUT11.

1347 @ 13MWUT15.

1350 STOP TEST.

1400 CHECKING ON 13MWUT11

1406 STOP TEST WL= 7.78'

1436 END TEST ON 13MWUT26 97% RECOVERED
START RISING WL= 8.67'

1438 START RISING HEAD TEST.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill DATE 5/9/03
WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 9060
**BOOK** 2555

Work continued from Page 205 + CONLOY

FROM 5/9/03

1730 FINISH TEST. ACCIDENTLY TURNED OFF TEST

1735 SET XDUCERS ON 13MWUT08 + 13MWUT02
HEAD BACK TO BLDG 3245

1800 LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill DATE 5/9/03
WITNESS DATE

TITLE CRANE

PROJECT NO. 9060

BOOK 2555

Work continued from Page COOL 50's + RAINING

SAT 5/10/03

0200 ARRIVE @ SITE
CONTINUE TO RUN SLUG TESTS:

CONDUCTED FALLING HEAD TESTS FOR

- 13 MW720
- 13 MW702 - FROZEN 5/10/03
- 13 MW708
- 13 MW714

CONDUCTED RISING HEAD TESTS FOR
- 13 MW720
- 13 MW708
- 13 MW714

HELPED TIROSHAN W/ WELL RESTORATION THROUGH OUT THE DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balhure DATE 5/10/03

WITNESS DATE



TITLE CRANE

PROJECT NO. 9060

BOOK 2555

Work continued from Page

1800 LEAVE SITE. WILL CHECK ON 13MW702 TOMORROW

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balhure DATE 5/10/03

WITNESS DATE

**TITLE** CRANE **PROJECT NO.** 9060
**BOOK** 2555

Work continued from Page 60's WINDY + SUNNY

SUN 5/1/03

0640 ARRIVE @ SITE.
GEAR UP TO CONTINUE SLUG TESTS @ SUMMIT 6

0810 SET-UP + START FALLING HEAD TEST ON 16MW102

0816 END TEST

0817 START RISING HEAD TEST @ 16MW102

0835 SET UP + START FALLING HEAD TEST @ 16MW105.

0900 SET-UP @ 16MW104 WAIT FOR W/L TO STABILIZE.

0905 SET UP + START PUMPING ON 16MW105
NEED TO RE-SAMPLE SVOCs.

0924 START FALLING HEAD TEST @ 16MW104

0930 FALLING HEAD TEST FINISHED @ 16MW105

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill DATE 5/1/03
WITNESS DATE

**TITLE** CRANE **PROJECT NO.** 9060
**BOOK** 2555

Work continued from Page 60's + V. WINDY.

SUN 5/1/03

START RISING HEAD TEST

1005 FINISH FALLING HEAD TEST @ 16MW104
START RISING

1012 RISING HEAD TEST @ 16MW105 COMPLETE

1044 FINISH RISING HEAD TEST ON MW104
FINISH REMOVING FORMS AROUND PADS

1340 SAMPLING 16GW102
SVOCs ONLY

1330 HEAD OVER TO SUMMIT 13. TO HELP T.R. W/
W.L MEASUREMENTS.

1540 FINISH UP. HEAD TO SUMMIT 16 TO SET UP
ON WES - 14-02-03

1550 START PUMPING

1732 SAMPLING 16GW0202
SVOCs + METALS ONLY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkwill DATE 5/1/03
WITNESS DATE

**TITLE** CRANE

**PROJECT NO.** 4060

**BOOK** 2555

Work continued from Page

SUN 5/11/03

1838 LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkner

WITNESS

DATE 5/11/03

DATE



**TITLE** CRANE

**PROJECT NO.** 4060

**BOOK** 2555

Work continued from Page SUMMIT • WOZNY 60'S

MON 5/12/03

0630 ARRIVE @ SITE. START PARKING EQUIP

1000 GO W/ T.R TO FINISH RESTORATION

1630 BACK @ SUMMIT 13. NEED TO DO WELL REPAIR ON TO2 • TO3.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Robert Balkner

WITNESS

DATE 5/12/03

DATE

APPENDIX D.2.2
SWMU 13 AND SWMU 16
FIELD NOTEBOOK
ROUND 2

NSWC CRANE

N9060

CTO 0279

SUMUS 13 + 16

2555

DRILLING

START: 3/24/03

END:

TITLE SWMU 16 CRANE SWMU PM: RAIN 50's PROJECT NO. 9060

11-11-03 BOOK 2555

Work continued from Page

1700 JON K. CREW
- CLEAN UP AT SWMU 16 + SWMU 13
- TOP OFF BENTONITE AT DEEP WELLS @ SWMU 16
- MOVE CORE BOXES TO STORAGE NEAR FIELD OFFICE

FINAL CLEAN UP PREP TO DEPART AM TO-MORROW.

1830 FINAL LV SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott M Ramser DATE 11-11-03

WITNESS DATE



TITLE CRANE SWMU PM: SUNNY ≈ 60°F PROJECT NO. 9060

11/17/03 BOOK

Work continued from Page

1400 S. GRIER (TENNUS) ARRIVES ON SITE.

1530 S. GRIER + MATT COCHRAN (TENNUS) GO TO SWMU 13 ~~28~~ + DRIVE TO SET A ROTOSONIC ON 13MW28 TO CONTINUE FROM 40'

JOHN KEIFER + NICK POST SET UP ON (BOWSER MORNER)

1630 13MW28 + clean it out.

TODD WOLLENHAUPT + DENNIS SINK (BOWSER MORNER) SUPPORT JOHN KEIFER.

1700 JON KEIFER SETS RIG TO 40' + WE FINISH FOR THE DAY.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier DATE 11/17/03

WITNESS DATE

NSWC CRANE 7060

TITLE PROJECT NO.

TUE. 11/18/03 RAINY, ≈65°F BOOK

Work continued from Page

Scott GRIER (TENS) is

0700 ON SITE @ 0700.

S. GRIER CALIBRATES PID.

BOWSER MORNER CREW ARRIVES.

0815 S. GRIER, (TENS) J. KEIFER,

~~set up~~ RAIN WASHES OUT THE DRILLING.

1345 S. GRIER SETS UP ON 13 MWT 25.

USING THE PARASTOLTIC PUMP

initial $H_2O$ level = 15.68' produced total = 21

$H_2O$ was slightly turbid ≈ 25-40 ntu.

1355 S. GRIER FINISHES draying $H_2O$.

1530 S. GRIER SETS UP ON 13 MWT 34.

~~FOR~~

1730 S. GRIER + TERRI ROTHAN FINISH

~~DEVELOPMENT~~ ING 13 MTW 34.

1830 All personel leave site for the day.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier DATE 11/18/03

WITNESS DATE



NSWC CRANE 7060

TITLE PROJECT NO.

WED. 11/19/03 Cloudy, 50°F BOOK

Work continued from Page

0655 Scott GRIER (S.G.), Terri ROTHAN (TR)

MATT COCHRAN (MC), Jim Goeret (JG)

arrive onsite.

Personel calibrate eq. + prepare for

the days drilling activites.

0800 S. GRIER (SG TENS), J. KEIFER, D. SINK,

N. POST (BOWSER MORNER) SET UP ON 13 MTW 28

0830 1st Coring - 10

30' of coringing completed

blow out well + checking recovery for $H_2O$

1000 Water Level 77.0" @ 40' cored

1100 WATER LEVEL 76.95' S. GRIER (SG TENS)

+ J. KEIFER DECIDE TO TAKE 1 MORE 10'

CORING RUN + REMEASURE $H_2O$ level

1130 $H_2O$ level = 86' waiting for recovery

1230 $H_2O$ level = 85.5' S. GRIER + M. COCHRAN

DECIDE TO INSTALL THE WELL AT TOTAL DEPTH 88'

SCREENED INTERVAL 88'-78' with 3' of sand pack.

38' 88' 50' BR

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier DATE 11/19/03

WITNESS DATE

TITLE NDWC CRANE 1060 PROJECT NO.
11/19/03 BOOK

Work continued from Page

8

1300 S. GRIER (FENNS) J. KEIFER + D. SINK (BOWSER MORNER) INSTALL WELL 13 MWT 28.

1400 J. KEIFER, D. SINK + TODD WOLLENHORT COMPLETE WELL 13 MWT 28.

1430 RIG IS STUCK -

1530 RIG IS OUT.
S. GRIER BOXES CORING
13 MWT 27.

1800 S. GRIER + MATT COCHRAN LEAVE THE SITE.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier DATE 11/19/03

WITNESS DATE



TITLE NDWC CRANE 1060 PROJECT NO.
11/20/03 BOOK

Work continued from Page

0700 Scott GRIER (SG), Terri Rojahn (TR), MATT COCHRAN (MC) and JIM GOERET (JG) ARRIVE ONSITE.

0900 S. GRIER sets up on 13 MWT 45 for development.

0920 SG. BEGINS PURGING 13 MWT 45 WITH the

Loose valve in well.

1020 Get other valve + dry well

1209 S. GRIER FINISHES DEVELOPING 13 MWT 45.

TOTAL VOL. PURGED = 7.25 g
RECHARGE RATE = 0.08' per 10 min OR
" Δ = 0.48' per 60 min
see well devep. sheet for parameters + + other details

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE DATE

WITNESS DATE

TITLE NSWC CRANE 11/20/03 PROJECT NO. BOOK

Work continued from Page

1330 S. GRIER SETS UP ON 13 MWT 30.
The well dries in 3 minutes.
aprox. 5.25 gal.
The well is allowed to recharge
recharge is aprox 0.5 - 1.0 foot/10 min.
See monitoring well develop. sheet for details

1430 S. GRIER SURGES THE WELL WITH THE BLOCK

1455 S. GRIER PUMPS DRY AGAIN
13 MWT 31

1500 S. GRIER FINISHES DEVELOPMENT.

1544 S. GRIER SETS UP ON
13 MWT 30.

1550 SG BEGINS PUMPING
13 MWT 30.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier DATE 11/20/03

TITLE NSWC CRANE 11/20/03 PROJECT NO. BOOK

Work continued from Page

S.G. surges the well 2x (1606 + 1642)
total vol. purged = 7.5 g
See M.W. dev. sheet for details.

1655 S. GRIER ENDS
PURGING 13 MWT 30.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier DATE 11/20/03

NDWC: CRANE

TITLE 11/21/03 Clear, 58°F PROJECT NO. BOOK 9060

Work continued from Page

* WELL DRILLING *

→ 0700 S. GRIER, MATT COCHRAN, TERRI ROJAHN + JIM GOERDT ARRIVE ONSITE.

→ 0900 13 MWT 46 = casing set.

S. GRIER (TENOS) J. KEIFER, DSINE + TODD WOLLENHOPT (BOWER MORNER) set up on 13 MWT 46.

→ 0930 S.G + BOWER MORNER PERSONEL BEGIN DRILLING 13 MWT 46.

* SEE BORING LOG FOR DETAILS *

INSERTING CASING TO 39' BGS.

DRILLED TO ~~38'~~ ≈ 40'

1110 DRILLERS WENT TO LUNCH.

1230 DRILLERS RETURNED.

DRILLING ENDS TO GROUT CASING.

1400 GROUTING COMPLETE 13 MWT 46.

1530 S. GRIER HELPS T. ROJAHN + M. COCHRAN develop 16 MWT 13 + 16 MWT 15.

1830 All personal leave the site for the night.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier DATE 11/21/03

WITNESS DATE



NDWC: CRANE

TITLE 11/22/03 SUNNY, 68°F PROJECT NO. BOOK

Work continued from Page

0700 S. GRIER, T. ROJHAN, M. COCHRAN, + J. GOERDT ARRIVE ONSITE.

Personel calibrate eq. make activities report w/ drillers and plan the day activities.

1000 S. GRIER SETS UP ON 13 MWT 28 FOR DEVELOPMENT.

1000 S. GRIER DRIES THE WELL.

* see well development sheet for 13 MWT 28 for details.

1130 S. GRIER COMPLETES DEVELOPING 13 MWT 28. TOTAL PURGED = 3.25 g

1500 S. GRIER (THURS), J. KEIFER + TODD WOLLENHOPT

set on 13 MWT 46 for drilling.

Screen = 65' → 55'

Sand = 52'

bentonite chip = surface

1730 FINISHED INSTALLATION OF 13 MWT 46.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier DATE 11/22/03

WITNESS DATE

TITLE 11/24/03 NOWC CRANE PROJECT NO.

Cloudy, Windy BOOK

Work continued from Page

0650 S. GRIER ARRIVES ONSITE.
T. ROJAHN, J. GOERDT + M. COCHRAN ARRIVE.
ALL PERSONEL PREPAIR FOR THE DAY
ACTIVITIES (CAL, EQ, GO OVER LOGS, ETC.)

0910 S. GRIER + T. ROJAHN SET UP ON
16 MWT 16. development

1000 S. GRIER + T. ROJAHN set up on
13 MWT 34.

1330. S. GRIER SETS UP ON 13 MWT 08
FOR SAMPLING.

PID=4.02 ?

sample 13GWT08 taken @ 1515.
* See sampling log for details *

1900 S. GRIER leaves the site
to pick up 2 *(100' x 3/4") ROLLS
OF POLY TUBING.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier DATE 11/23/03

WITNESS DATE



TITLE 11/24/03 NOWC CRANE COLD, WINDY, 30°F PROJECT NO.

BOOK

Work continued from Page

0700 S. GRIER, T. ROJAHN, M. COCHRAN,
+ J. GOERDT ARRIVE ON SITE.

ALL Personel prepair for the days
activities.

0900. S. GRIER SETS UP ON 13MWT14.
→ 1115 S. GRIER SAMPLES 13 GWT 14.

* See low flow data + g.w. sample sheets
for details *

1400. S. GRIER SETS UP ON 13 MWT 30.

1615. S. GRIER SAMPLES 13 GWT 30.

1800 S. GRIER GOES TO FIND J. GOERDT
AND HELPS HIM FINISH 13 MWT.

1900 S. GRIER + J. GOERDT leave the
site for the day.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier DATE 11/24/03

WITNESS DATE

TITLE 11/25/03

PROJECT NO.

BOOK

Work continued from Page

0700 S. GRIER, T. ROJAHN, M. COCHRAN + J. GOERDT ARRIVE ONSITE.

ALL PERSONEL MAKE PREPARATIONS FOR THE DAYS ACTIVITIES.

0930 S. GRIER SETS UP ON 13 MWT 27.

1005 S. GRIER BEGINS PURGING 13 MWT 27.

1425 S. GRIER SAMPLES 13 MWT 27.

1600 Personel clean up office + decon pad.

2100 S. GRIER leaves the site for the day.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier

DATE 11/25/03

WITNESS

DATE



TITLE 12/03/03

PROJECT NO.

BOOK

Work continued from Page

1400 S. GRIER ARRIVES AT THE MAIN GATE AND GETS HIS PASS.

S. GRIER SAMPLES RINSATE BLANKS.

1815 S. GRIER LEAVES THE SITE FOR THE DAY.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier

DATE 12/03/03

WITNESS

DATE

TITLE NSWC CRANE PROJECT NO. 9060

12/04/03 Rainy, Cold 33°F BOOK

Work continued from Page

0650 S. GRIER (SG) T. ROTHAN (TR) + J. GOERTO (JG) ARRIVE ONSITE.

Personel prepair for the day's activities.

0900 S. GRIER SETS UP ON 13 MWT 43.

1050 S. GRIER SAMPLES 13 MWT 43.

1200 S. GRIER SETS UP ON 13 MWT 44.
PROBLEM WITH LIFT - HAVE H2O IN TUBING.

1430 S. GRIER BEGINS PURGING 13 MWT 44.

1700 S. GRIER SAMPLES 13 MWT 44.

1745 S. GRIER LEAVES THE SITE.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier DATE 12/4/03

WITNESS DATE



TITLE Rain, 36°F PROJECT NO. 9060

12/05/03 BOOK

Work continued from Page

0650 S. GRIER ARRIVES ONSITE.

0915 S. GRIER + T. ROTAHN BEGIN HAND AUGERING 16 SB 47

0940 S.G + T.R SAMPLE (SOIL) 16 SB 47

1000 SG + TR AUGER 16 SB 48.

1015 SG + TR SAMPLE 16 SB 48 0203.

1030 S.G. + T.R. AUGER 16 SB 49.

1050 SG + TR SAMPLE 16 SB 49 0405.

1130 SG + TR AUGER 16 SS 42
1155 SG + TR SAMPLE 16 SS 42 0002.

1205 SG + TR AUGER 16 SS 43
1210 SG + TR SAMPLE 16 SS 43 0002.
1215 SG + TR AUGER 16 SS 44.
1225 SG + TR SAMPLE 16 SS 44 0002
1237 SG + TR SAMPLE 16 SS 45 0002.
1255 SG + TR SAMPLE 16 SS 46 0002.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier DATE 12/5/03

WITNESS DATE

NSUC CRANE 124 0/03 - CONT.

TITLE 9060 SNOW 3 PROJECT NO. BOOK

Work continued from Page

1450 S-GRIER SETS UP ON 16 MWT 11.

1540 WATER LEVEL IN 16MWT 11 drops below pump intake.

1630 S-GRIER BANS 16 MWT 11 dry.

1700 S-GRIER CHECKS $H_2O$ level in 16 MWT 15.
$H_2O$ level = 53.36'

1800 S-GRIER LEAVES THE SITE FOR THE DAY.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier DATE 12/5/03

WITNESS DATE



TITLE 12/6/03 Clear, Lt Breeze 40°F PROJECT NO. BOOK

Work continued from Page

0655 S-GRIER ARRIVES ONSITE.

S-G + TR SAMPLE THE SUMPS AND 16 GWT 08.

1200 S-GRIER SETS UP ON 13 MWT 02.
S-G pump the well @ 80-100 mL/min.
S-G calculates the $H_2O$ level drop to be risky for enough water to purge + sample.

1345 S-G. pumps the well dry. (13 MWT 02)

1500 S-G set up on 13 MWT 06.

1628 S-G purges 13 MWT 06 dry.
Total volume purged = 2.0 g.

1715 S-G. LEAVES THE SITE FOR THE DAY.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier DATE 12/6/03

WITNESS DATE

NSWC CRANE

TITLE 12/7/03

PROJECT NO. Clear, ~~BOOK~~ BREEZE, 25°F

Work continued from Page

0655 S. GRIER ARRIVES ONSITE.

0900 S. GRIER SETS UP ON 13 MWT 28.

1500 WATER LEVEL DROPS BELOW PUMP INTAKE.

1510 SG + TR SET UP ON 13 MWT 45.

WHEN 13 MWT 45 WATER LEVEL 1755 DROPS BELOW INTAKE ON PUMP.

1830 SG LEAVES THE SITE.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier

DATE 12/7/03

WITNESS

DATE



NSWC CRANE

TITLE 12/8/03

PROJECT NO. Clear, ~~Cold~~, 25°F

Work continued from Page

0700 S. GRIER ARRIVES ONSITE.

S.G., T. ROTANN + J. GOERTD MAKE PREPARATIONS FOR THE DAYS ACTIVITIES. (SOIL + GW SAMPLING).

0830 SG + TR BEGIN HAND AUGERING @ SWMU 13.

13 SB 16 H2O in hole @ 2'

0'-1.5' loam (DK-BR)

1.5'-4.0' Silty Clay BR/LT BR/GR WET + COHESIVE

0002 INTERVAL SAMPLED @ 0848

0204 INT. SAMPLED @ 0900

13 SB 17

0002 sampled @ 0900

0204 sampled @ 0930

0'-1.5 DK BR LOAM

1.5-4.0 LT BR/GR SILTY CLAY

1.0-1.5 INC. CLAY + GR COLOR brown/ORANGE 3.0-4.0'

3.0-4.0 INC FINE SAND WHITE/

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier

DATE 12/8/03

WITNESS

DATE

TITLE

PROJECT NO.

BOOK

Work continued from Page

$H_2O$ @ 3.0'

13 SB 18 → 0002 sampled @ 0912

0-.5' DK BR LOAM

.5'-2.0'-3.0' BR SILTY CLAY 0204 sampled @ 0930

3.0'-4.0' OR/YELLOW FINE ~~SANDY~~ CLAYEY SANDY 70%

13 SB 19 → 0002 sampled @ 0920

0'-.5' DK BR LOAM

.5-1.0' LT BR SILTY CLAY 0203 sampled @ 0930

1.0'-2.0' BR LOAM W/ FILL + GRAVEL

2.0-3.0' DK BR SILTY CLAY

3.0- ~~FINE CLAY. DK BR~~

REFUSAL @ 3.0'

0002

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Gruel

DATE 12/8/03

WITNESS

DATE



TITLE

PROJECT NO.

BOOK

Work continued from Page

13 SB 20 0001 sampled @ 1005

0'-.5' DK BR LOAM/W ORGANICS

.5'-1.0' LT BR/OR ~~SILTY CLAY~~ CLAYEY FINE SAND W/ ROCKS + GRAVEL

REFUSAL @ 1.0

13 SB 21 0002 sampled @ 1004

0204 " - " 1019

0'-.5' DK BR LOAM

.5'-2.0' LT BR/OR SILTY CLAY W SAND 50/50

2.0-3.0 INC SAND + OR. COLOR FINE

3.0'-4.0' SANDY, SILTY CLAY 30%, 30%, 40%

13 SB 22 0002 sampled @ 1030

0204 " " 1045

0'-.5' DK BR/BLK LOAM W/ GRAVEL FILL

.5'-1.0' DK BR SILTY CLAY

1.0'-3.0' LT BR/OR CLAYEY SAND (FINE)

GRAVEL @ 2.0'

3.0'-~~4.0~~ 3.5' SANDY CLAY/(FINE) OR/GR./WHITE W GRAVEL

REFUSAL @ 3.5'

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Gruel

DATE 12/8/03

WITNESS

DATE

TITLE

PROJECT NO.

BOOK

13 SB 23 0'-5.0 DR GR SILTY LOAM w GRAVEL

0002 sampled @ 1034 1'-2' OR/BLK SANDY CLAY W BLK PATCHES OF ORGANIC MATTER

0204 sampled @ 1045 2'-4' CLAYEY SAND (FINE) OR SEMI COHESIVE

13 SB 24 0-.5 ~~GRY~~/BLK SANDY LOAM w/GRAVEL

0002-1110 .5'-1.0' OR. CLAYEY SAND (FINE) 70% SAND

0203-1120 1.0-2.0' OR/GR SANDY CLAY 70% clay

2.0-3.0' OR. SILTY SAND w/GRAVEL 70% SAND

REFUSAL @ 3.0

13 SB 25

0002-1104 0-.5' GR/BL SANDY ~~LOAM~~ w/GRAVEL

0204-1115 .5-4.0' OR. ~~CLAYEY~~ SILTY SAND (FINE) w/clay 70%

3.0-4.0 INCREASING CLAY 25-30% ~~30%~~

Scott Grier 11/8/03

NSWC CRANE 9060

TITLE 11/8/03

PROJECT NO.

BOOK

Work continued from Page

1500 ~~0650~~ S. GRIER ~~ARRIVE~~ SETS UP ON 13 MWT 28.

1530 S. GRIER GETS THE REMAINDER OF THE SAMPLES FOR 13GWT2901.

1540 S. GRIER SETS UP ON 13 MWT 45.

1558 S. GRIER SAMPLES 1½ AMBER BOTTLES BEFORE WATER LEVEL DROPS BELOW INTAKE OF PUMP.

1700 S. GRIER DOES BORING LOGS FOR ALL HAND AUGERING.

1820 S. GRIER LEAVES THE SITE.

Scott Grier 11/8/03

TITLE 12/9/03 PROJECT NO. Cloudy, Light Breeze, 51°F BOOK

Work continued from Page

0650 S. GRIER ARRIVES ONSITE.

0930 S. GRIER SETS UP ON 13 MWT 47.

1110 S. GRIER SAMPLES 13 MWT 47

* see GW sample sheet for details.

1400 S. GRIER CONSTRUCTS ~~WELL~~ SOIL BORING LOGS 13 SB16 → 13 SB25.

1500 S. GRIER LEAVES TO CLEAN RENTAL.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE Scott Grier DATE 12/9/03

WITNESS DATE



TITLE PROJECT NO. BOOK

Work continued from Page

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE DATE

WITNESS DATE

NSWC
CRANE

2565

10-21-63

## TABLE OF CONTENTS

| Subject | Page |
|---|---|

**TITLE** 10-21-03

**PROJECT NO.**

**BOOK**

Work continued from Page

0700 - ON SITE

TTNUS H+S TRAINING CONDUCTED.

DISCUSSED DUMPING DECON/WATER/
PURGE WATER AT SWMU 9 -
TOM BRENT TO GET
PERMISSION

ACCESS TO ADDITIONAL DRILL
LOCATIONS NEEDED - T ROSAHN
+ M.G. COCHRAN TO CHECK

0800 H+S TRAINING COMPLETED
GO TO CHECK DRILL LOCATIONS

1000 CHECK WITH P. WORKS
ON UTILITY CLEARANCE FOR
TRUCK MOUNTED RIG. NO
CLEARANCE GRANTED UNLESS
AN ACCESS ROAD CAN BE
BUILT TO CLEARED LOCS.
NO OTHER ACCESS
IS GRANTED AT THIS TIME
BASED ON DISCUSSION W/ P. WORKS

SCIENTIFIC BINDERY PRODUCTIONS · CHICAGO 60605

Work continued to Page

**SIGNATURE** **DATE**

**WITNESS** **DATE**

TITLE 10-21-03 (CONT.) PROJECT NO. BOOK

Work continued from Page

1100 - ~~1200~~ 1130 LUNCH.

1130 - RETURN FROM LUNCH.
INSTRUCTED DRILLERS TO
SET UP DECON PADS + BUILD
FORMS. MET W T. BRENT.
WILL MEET @ 2:00 TO
DISCUSS W FORESTER
POSSIBILITY OF BUILDING ROADS
FOR ACCESS TO DRILL LOCATIONS.

~~1400~~ 1200 MGC + F. WUDKWYCH. GO
TO CHECK FOR SEEPS @ SWMU 13

1400 RETURN TO OFFICE. DISCUSS
ACCESS ISSUES W T. BRENT +
B. GATES. ASKED PERMISSION
TO USE BULL DOZER TO
CLEAR LOCATIONS @ SWMU 13.

1500 T. BRENT INDICATES OK TO
CLEAR LOCATIONS W DOZER IF
TREES ≥ 5" Ø NOT TOUCHED
+ SHAG BARK HICKORY NOT
IMPACTED

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE [signature] DATE 10-21-03

WITNESS DATE



TITLE 10-21-03 PROJECT NO. BOOK

Work continued from Page

1515 MGC + FCW GO TO SWMU 13
TO DIG SEEP AREAS W B-M +
BACKHOE. DUG SEEPS AT
3 LOCATIONS -
1) 13 SW15
2) SEEP DOWNSTREAM OF 13 SW15
3) 13 SW 29
- ALL LOCATIONS WILL BE SAMPLED
TOMORROW @ SWMU 13 AFTER
LOCATIONS ARE ALLOWED TO
STABILIZE FROM DIGGING

1700 RETURN TO OFFICE.
PROVIDE UPDATE TO OFFICE.

1730 LEAVE SITE FOR
DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE [signature] DATE

WITNESS DATE

TITLE 10-22-03 PROJECT NO.

BOOK

Work continued from Page

0700 ON-SITE, SET UP TO START SAMPLING SURFACE WATER/SEDS @ SWMU 13, SAMPLED THRU A.M.

1100-1130 LUNCH

1130 RETURNED TO SWMU 13 TO CONTINUE SAMPLING

1630 RETURNED TO OFFICE TO PACK SAMPLES FOR DAY.

1800 LEAVE SITE FOR DAY - DRIVE TO FED EX. TO DROP OFF SAMPLES

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 10-23-03

DATE



TITLE 10-23-03 PROJECT NO.

BOOK

Work continued from Page

0700 ON SITE, SET UP TO CONTINUE SW/SD SAMPLING @ SWMU 13

0800 START SAMPLING ACTIVITIES

1130-1200 LUNCH

1200 CONTINUE SAMPLING @ SWMU 13

1600 QUIT SAMPLING FOR DAY. PACK SAMPLES

1700 LEAVE SITE FOR DAY. DRIVE TO FED EX TO DROP SAMPLES.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 10-24-03

DATE

TITLE 10-24-03 PROJECT NO. BOOK

Work continued from Page

0700 ON-SITE. PREP. TO SAMPLE SURFACE WATER SEDS.

0950 DISCUSSED POSSIBILITY OF DISCHARGING CUTTINGS/DRILL WATER TO WOODS NEAR DRILL LOCATIONS. TOM BRENT + MGL INDICATED THAT WOULD BE ACCEPTABLE:

- ~ 250 GALLONS $H_2O$ + 30 GALLONS OF WATER/CUTTINGS IS GENERATED FOR DEEP WELLS, LESS IS GENERATED FOR SHALLOW WELLS.

- DRILL WATER IS MOSTLY POTABLE THAT IS BEING DISCHARGED FROM HOLE.

0800 WENT TO SWMU 13 TO RESUME SAMPLING

0930 RETURN TO OFFICE, SET

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 10-24-03

DATE



TITLE 10-24-03 PROJECT NO. BOOK

Work continued from Page

UP TO START SAMPLING @ SWMU 16.

1000 WENT TO SWMU 16 TO START SAMPLING.

1145-1205 LUNCH

1205 RESUME SAMPLING ACTIVITIES

1600 STOP SAMPLING FOR DAY, START PACKING SAMPLES

1700 SAMPLES PACKED, MGL HELPS F. RAMSER PACK CORE BOXES T. ROJAN + F. WUDKWYCH TAKE SAMPLES TO FED EX.

1830 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 10-24-03

DATE

TITLE 10-25-03

PROJECT NO.

BOOK

Work continued from Page

0700 ON SITE

0800 MGC + FCW COLLECT REMAINDER OF SURFACE WATER / SED SAMPLES @ SWMU 16

1130 RETURN TO OFFICE W/ SAMPLES

1200-1230 LUNCH

1230 SETUP TO PERFORM GW SAMPLING AT SWMU 16

1400 GO TO SWMU 16 TO START GW SAMPLING

1730 COMPLETED SAMPLING FOR DAY, RETURN TO OFFICE

1830 QUIT FOR DAY, LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 10-26-03

WITNESS

DATE



TITLE 10-26-03

PROJECT NO.

BOOK

Work continued from Page

0700 ON SITE, SET UP TO CONTINUE GW SAMPLING.

0830 MGC SETS UP ON 16GW01 TO SAMPLE

1630 COMPLETED SAMPLING FOR DAY AT 16GW01. MGC HELPS F. WUDKWYCH W/ WELL SAMPLING

1730 RETURN TO OFFICE

1800 LEAVE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 10-26-03

WITNESS

DATE

TITLE 10-27-03 PROJECT NO.

BOOK

Work continued from Page

0700 ON-SITE SETUP TO COLLECT SURFACE WATER ~~[illegible]~~ mw SAMPLES AT SWMU 13.

0800 GO TO COLLECT SW SAMPLES @ SWMU 13

1130-1200 LUNCH

1230 RETURN TO ~~SAMPLING~~ OFFICE, DROP OFF SAMPLES, RETURN TO SWMU 13 TO COLLECT SW SAMPLES

1500 RETURN TO OFFICE, PACK SAMPLES FOR SHIPMENT.

1700 MGC CHECKS ON F. RAMSER.

1745 RETURN TO OFFICE.

1800 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 10-22-03

DATE



TITLE 10-28-03 PROJECT NO.

BOOK

Work continued from Page

0700 ON-SITE. SETUP EQUIPMENT

0800 SET UP TO SAMPLE @ SWMU 13. PURGED AND SAMPLED WELL 13 MWT24 IN THE A.M.

1200-1230 LUNCH

1230 RETURN. SET UP TO SAMPLE 13 MWT 19.

1700 13 MWT 19 SAMPLED. RETURN TO OFFICE TO UNPACK EQUIPMENT.

1815 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 10-28-03

DATE

TITLE 11-3-03 PROJECT NO. BOOK

Work continued from Page

1400 ON-SITE LOAD EQUIPMENT

1500 DRILLERS ON SITE FOR ATV RIG.

JAMES WALSH
JOSHUA DEAN

T ROJAHN PERFORMS H+S TRAINING

1545 TRAINING COMPLETED, SETUP TO FILL $H_2O$ TRUCK

1615 MOBILIZE TO DECON PAD TO CLEAN ATV RIG

1715 MOVE TO 13MWT29 TO SETUP.

1810 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-3-03

WITNESS

DATE



TITLE 11-4-03 PROJECT NO. 9060 BOOK

Work continued from Page

0700. ON-SITE.

0730 ON-SITE AT 13MWT29 TO START DRILLING

1030 13MWT29 DRILLED + INSTALLED, DRILLERS TEAR DOWN + GO TO DECON

1130-1200 LUNCH

1200 RETURN, DRILLERS GET EQUIPMENT FOR WELL INSTALLATION

1300 SETUP ON WELL 13MWT41

1730 QUIT DRILLING FOR DAY, DRILLERS PLAN ON GETTING LARGER COMPRESSOR TO REMOVE CUTTINGS MORE EFFICIENTLY

VOID

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-4-03

WITNESS

DATE

TITLE 11-5-03

PROJECT NO.

BOOK

Work continued from Page

0700 ON SITE PREP EQUIPMENT, + SET UP TO CONTINUE DRILLING.

0800 RESUME CORING @ 13MWT41

0900 LOST BIT IN HOLE, STARTED TO TEAR DOWN, WILL MOVE ROTASONIC ON HOLE TO OVERDRILL + FISH OUT BIT.

1000 SET UP ON WELL 13MWT36 TO DRILL + INSTALL.

1230 WELL 13MWT36 INSTALLED

1230-1300 LUNCH

1300 RETURN TO TAKE DOWN RIG + DECON

1400 DECON RIG

1430 MOVE ONTO LOCATION 13MWT31 TO START DRILLING

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-5-03

TITLE 11-5-03

PROJECT NO.

BOOK

Work continued from Page

1700 13MWT31 DRILLED + INSTALLED. DRILLERS TEAR DOWN + MOVE TO DECON. MGC RETURNS TO DO PAPERWORK IN OFFICE

1800 LEAVE SITE

VOID

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-5-03

WITNESS

DATE

TITLE 11-6-03 PROJECT NO.

BOOK

Work continued from Page

0700 ON SITE, SET UP EQUIPMENT & COMPLETE DAILY ACTIVITIES

0815 SET UP ON 13MWT33 TO START DRILLING

1130 13MWT33 DRILLED + INSTALLED TAKE LUNCH

1200 RETURN FROM LUNCH, DRILLERS DECON RIG

1330 MOVE ONTO LOCATION 13MWT30 TO START DRILLING

1345 PULLED OFF HOLE TO TOW ROTASONIC RIG OFF HOLE

1430 BACK AT 13MWT30 TO START DRILLING

1600 13MWT30 INSTALLED. MGC CHECKS ON SITE 16 CLEARANCE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-6-03

WITNESS

DATE



TITLE 11-6-03 PROJECT NO.

BOOK

Work continued from Page

1600 (CONT.) CHRIS FREEMAN INDICATED THAT UTILITY CLEARANCE IS MADE FOR SITE 16 DRILLERS DECON + WILL MOVE TO SITE 16 TO STAGE EQUIP. FOR A.M. START.

~~180~~

1700 DRILLERS MOVE TO OFFICE w/ EQUIPMENT

1800 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-6-03

WITNESS

DATE

TITLE 11-7-03 PROJECT NO. BOOK

Work continued from Page

0700 ON SITE, DISCUSS APPROACH FOR DRILLING SWMU 16

0730 MOB TO SWMU 16, SET UP ON WELL 16MWT14 TO START DRILLING

1030 16MWT14 DRILLED & INSTALLED DRILLERS TAKE RIG BACK TO DECON PAD TO FIX ANTIFREEZE LEAK & TO DECON AUGERS

1130 - 1200 LUNCH

1200 RETURN FROM LUNCH, DRILLERS WELD BIT.

1330 RETURN TO SWMU 16, SETUP ON 16MWT12 TO START DRILLING

1630 16MWT12 DRILLED & INSTALLED, GO TO DECON

1800 LEAVE SITE

SCIENTIFIC BINDERY PRODUCTS CHICAGO 60605

Work continued to Page

SIGNATURE [signature] DATE 11-7-03

WITNESS DATE



TITLE 11-8-03 PROJECT NO. BOOK

Work continued from Page

0700 ON SITE, PREP EQUIPMENT FOR DAY

0745 SET UP ON 16MWT09 TO DRILL + INSTALL WELL

1000 WELL INSTALLED, SET UP ON 16MWT17.

1200 - 1230 LUNCH

1230 RETURN FROM LUNCH, CONTINUE WELL INSTALLATION

1430 16MWT09 INSTALLED, RETURN TO DECON

1500 LEAK IN RADIATOR, DRILLER TO REPAIR WITH RADIATOR STOP LEAK.

1700 LEAK REPAIRED, MOVED ONTO LOCATION 16MWT10.

1800 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTS CHICAGO 60605

Work continued to Page

SIGNATURE [signature] DATE 11-8-03

WITNESS DATE

**TITLE** 11-9-03 **PROJECT NO.**

**BOOK**

Work continued from Page

0700 ON SITE, SET UP EQUIP. TO DRILL.

0730 MOB TO SWMU 16 16MWT10

0915 16MWT10 DRILLED, MOB TO 16MWT16 LOCATION TO DRILL WELL (NOTE: 16MWT14 IS DRY AT 25 FEET). IT WAS DECIDED TO INSTALL A DEEPER WELL AT THIS LOCATION TO MONITOR DEEPER GW.

1180 LUNCH

1200 RETURN FROM LUNCH, CONTINUE DRILLING @ 16MWT16

1530 16MWT16 INSTALLED, CLEAN UP SITE 16 AREA

1700 RETURN TO OFFICE

1800 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-9-03

WITNESS

DATE



**TITLE** 11-10-03 **PROJECT NO.**

**BOOK**

Work continued from Page

0700 ON SITE, SET UP EQUIPMENT.

0800 MOB TO SWMU 13 TO DRILL 13MWT44

1230 LUNCH

1300 RETURN FROM LUNCH, CONTINUE DRILLING 13MWT44

1800 WELL INSTALLED

1830 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-10-03

WITNESS

DATE

TITLE 11-11-03 PROJECT NO. BOOK

Work continued from Page

0700 ON SITE SETUP EQUIP. TO DRILL FOR DAY, WILL MOB TO SWMU 13 (13MWT34) TO DRILL SHALLOW WELL. MOVED EQUIP + RIG OFF OF 13MWT44 LOCATION.

1030 13MWT34 INSTALLED, MOB TO DECON

1100-1130 LUNCH

1300 MOB TO SWMU 16 TO DRILL 16MWT13

1500 16MWT13 COMPLETE, MOB TO 16MWT07 TO DRILL

1700 16MWT07 DRILLED, CLEAN UP AREA + RETURN TO OFFICE W/ PAPERWORK

1800 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-11-03

WITNESS

DATE



TITLE 11-17-03 PROJECT NO. BOOK

Work continued from Page

1400 ON SITE, SETUP EQUIPMENT TO START DRILLING

1545 MOB TO WELL 13MWT35 TO START CORING. CLEANED OUT HOLE TO START CORING

1700 QUIT FOR DAY

1800 LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-18-03

WITNESS

DATE

TITLE 11-18-03 PROJECT NO.
BOOK

Work continued from Page

0700 ON SITE, MOB EQUIP TO START DRILLING.

0800 SET UP AT 13MWT35. RAIN STEADY. DRILLERS WILL WAIT UNTIL RAIN DECREASES

1100 RAIN CONTINUES, DRILLERS DECIDE TO QUIT FOR DAY.

1100-1130 LUNCH

1130 RETURN FROM LUNCH, SETUP TO COLLECT SW & GW SAMPLES @ SWMU 13

1330 SETUP TO SAMPLE #13SW11

1430 13SW11 SAMPLED, SETUP TO DEVELOP 13MWT41.

1530 13MWT41 DEVELOPED, RETURN TO OFFICE TO PACK SAMPLES

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE [signature] DATE 11-19-03

WITNESS DATE



TITLE 11-18-03 PROJECT NO.
BOOK

Work continued from Page

1800 LEAVE SITE FOR DAY

VOID

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE [signature] DATE 11-19-03

WITNESS DATE

TITLE 11-19-03 PROJECT NO. BOOK

Work continued from Page

0700 ON-SITE, SET UP EQUIPMENT TO DRILL @ SWMU 13 13MWT35

1100 LUNCH

1130 RETURN FROM LUNCH, CONTINUE DRILLING 13MWT35

1330 WELL INSTALLED, DRILLERS DECON, MGC GETS TOW TRUCK AT MAINTENANCE TO PULL OUT STUCK ROTASONIC RIG

1430 ROTASONIC RIG PULLED OUT

1530 SET UP ON 13MWT47 TO START DRILLING

1730 QUIT FOR DAY

1800 LEAVE SITE



Work continued to Page

SIGNATURE

DATE 11-19-03

DATE

TITLE 11-20-03 PROJECT NO. BOOK

Work continued from Page

0700 ON-SITE, PREP EQUIPMENT.

0800 RESUME DRILLING 13MWT47

0900 13MWT47 INSTALLED, ~~[illegible]~~ CHECK ON DRILLERS INSTALLING PADS & PRO CASINGS

0930 MGC & T BOEMER (B-M) DRIVE TO MGBG TO SCOPE DRILL LOCATIONS

1030 RETURN TO SWMU 13. MGC GETS TOW TRUCK TO PULL OFF RIG FROM 13MWT47

1100-1130 LUNCH

1130 RETURN FROM LUNCH, ASSIST J. GOERPT WITH WELL SAMPLING

1330 CONCRETE TRUCK ARRIVES.



Work continued to Page

SIGNATURE

DATE 11-20-03

WITNESS

DATE

TITLE 11-20-03 PROJECT NO.

BOOK

Work continued from Page

START POURING PADS

1800 DONE FOR DAY

1830 LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE 11-20-03

DATE 11-20-03

WITNESS

DATE



TITLE 11-21-03 PROJECT NO.

BOOK

Work continued from Page

0700 ON SITE. SET UP EQUIPMENT

0800 MGC + S. GRIER GO TO WELL 13MWT46 TO AWAIT DRILLERS TO SET CASING.

0900 MGC + ATU DRILLERS GO TO WELL ~~B~~ 16 MWT14 TO ABANDON (WELL DRY TO DATE)

1000 16MWT14 ABANDONED. ~~B~~ PRODUCTION STAFF AT ~~BERMUDA~~ SWMU 16 INSTRUCTED ~~TTNUS~~ TO STAY AWAY FROM BUILDING PERIMETER. WE ARE ALLOWED TO WORK ON WELLS ALONG BOUNDARY. WE NEED TO LET THEM KNOW HOW MANY STAFF ARE WORKING IN THE AREA AT A TIME.

1130 - 1200 LUNCH.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-21-03

WITNESS

DATE

TITLE 11-21-03 PROJECT NO. BOOK

Work continued from Page

1200 RETURN FROM LUNCH, ASSIST T. ROSATINO IN WELL DEVELOPMENT

1340 START DEVELOPMENT WELLS 16MWT13 + 16MWT15

1800 LEAVE SITE FOR DAY

Work continued to Page

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

SIGNATURE

DATE 11-21-03

WITNESS

DATE



TITLE 11-22-03 PROJECT NO. BOOK

Work continued from Page

0700 ON SITE, PREPARE EQUIPMENT FOR SLUG TESTING

1000 START SLUG TESTING @ SWMW 16

1100 - 1130 LUNCH

1130 RETURN TO SWMW 16, CONTINUE SLUG TESTING (16MWT10)

1230 MOV TO SWMW 13 TO PERFORM SLUG TESTING (13MWT37 + 13MWT38)

1800 QUIT FOR DAY

1830 LEAVE SITE FOR DAY

Work continued to Page

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

SIGNATURE

DATE 11-22-03

WITNESS

DATE

TITLE 11-23-03 PROJECT NO.

BOOK

Work continued from Page

0700 ON SITE, DOWNLOAD ~~EO~~ DATA FROM SLUG TESTING
DO PAY ITEMS FOR DRILLING.

0900 MOB TO SWMU 16 FOR SLUG TESTING, TESTED 16MWT09, 17MT15

1330 RETURN TO OFFICE, DRILLERS PICK UP EQUIPMENT + LEAVE SITE

1345 DRIVE TO SWMU 13 TO SLUG TEST WELLS WHILE W.L. IN ~~16~~ WELL AT SWMU 16 RETURNS TO EQUILIBRIUM (16MWT15)

1400 MOC CLEANS UP ACCESS ROAD + CLEARS DITCHES OF H2O AT SWMU 13

1530 RETURN TO SWMU 16 TO CHECK WELL, STILL ~~DRAWN~~ RECOVERING (16MWT15)

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-23-03

WITNESS

DATE



TITLE 11-23-03 PROJECT NO.

BOOK

Work continued from Page

1600 SWMU 13. TESTED WELL 13MWT42

1800 RETURN TO SWMU 16. PULL EQUIP FROM WELL 16MWT15. (NOTE: HAD TO CLEAR AREA BEFORE A.M MONDAY)

1830 LEAVE SITE TO SHOP FOR EQUIP

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-23-03

WITNESS

DATE

TITLE 11-24-03 PROJECT NO. BOOK

Work continued from Page

0700 ON SITE, PREP EQUIP FOR SLUG TESTING

0830 AT WELL 13MWT33 TO SLUG TEST

1030 SETUP ON 13MWT30 WHILE 13MWT32 RECOVERS

1315 ~~PULLED~~ STOP TEST @ 13MWT33

1330 STOPPED TEST @ 13MWT30

1345 MOB TO 13MWT32 TO TEST

1500 13MWT32 TESTED.

1600 RETURN TO OFFICE, HELP PACK SAMPLES

1800 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE [signature] DATE 11-24-03

WITNESS DATE



TITLE 11-25-03 PROJECT NO. BOOK

Work continued from Page

0700 ON SITE, PREP EQUIPMENT FOR SLUG TESTING

0830 WENT TO SWMU 13, CHECKED WELL 13MWT45 & 13MWT28 FOR RECOVERY BACK TO STATIC COULD NOT TEST YET.

0900 AT WELL 13MWT34 TO TEST

1000 13MWT34 TESTED, MOVE TO 13MWT47 TO TEST

1345 MGC GOES TO MEET WITH JACOBY (SEEPING CONTRACTOR) TO DISCUSS LOCATIONS TO RESTORE

~~1600~~ 1530 RETURN TO 13MWT47, PULL TRANSDUCERS FROM WELL

1600 RETURN TO OFFICE TO DUMP DATA + PACK EQ + SAMPLES.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE DATE

WITNESS DATE

NSWC
CRANE

2565

10-21-03

## TABLE OF CONTENTS

| Subject | Page |
|---|---|
| | |

TITLE 10-21-03

PROJECT NO.

BOOK

Work continued from Page

0700 - ON SITE

TTNUS H+S TRAINING CONDUCTED.

DISCUSSED DUMPING DECON/WATER/ PURGE WATER AT SWMU 9 - TOM BRENT TO GET PERMISSION

ACCESS TO ADDITIONAL DRILL LOCATIONS NEEDED - T ROJAHN + M.G. COCKRAN TO CHECK

0800 H+S TRAINING COMPLETED GO TO CHECK DRILL LOCATIONS

1000 CHECK WITH P. WORKS ON UTILITY CLEARANCE FOR TRUCK MOUNTED RIG. NO CLEARANCE GRANTED UNLESS ANY ACCESS ROAD CAN BE BUILT TO CLEARED LOCS. NO OTHER ACCESS IS GRANTED AT THIS TIME BASED ON DISCUSSION W/ P. WORKS

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 10-21-03

WITNESS

DATE

TITLE 10-21-03 (CONT.) PROJECT NO.
BOOK

Work continued from Page

1100 - ~~1200~~ 1130 LUNCH.

1130 - RETURN FROM LUNCH.
INSTRUCTED DRILLERS TO
SET UP DECON PADS + BUILD
FORMS. MET W T. BRENT.
WILL MEET @ 2:00 TO
DISCUSS W FORESTER
POSSIBILITY OF BUILDING ROADS
FOR ACCESS TO DRILL LOCATIONS.

~~1400~~ 1200 MGC + F. WUDKWYCH. GO
TO CHECK FOR SEEPS @ SWMU 13

1400 RETURN TO OFFICE. DISCUSS
ACCESS ISSUES W T. BRENT +
B. GATES. ASKED PERMISSION
TO USE BULL DOZER TO
CLEAR LOCATIONS @ SWMU 13.

1500 T. BRENT INDICATES OK TO
CLEAR LOCATIONS W DOZER IF
TREES ≥ 5" Ø NOT TOUCHED
+ SHAG BARK HICKORY NOT
IMPACTED

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE [signature] DATE 10-21-03
WITNESS DATE



TITLE 10-21-03 PROJECT NO.
BOOK

Work continued from Page

1515 MGC + FCW GO TO SWMU 13
TO DIG SEEP AREAS W B-M +
BACKHOE. DUG SEEPS AT
3 LOCATIONS -
1) 13 SW15
2) SEEP DOWNSTREAM OF 13 SW15
3) 13 SW 29
- ALL LOCATIONS WILL BE SAMPLED
TOMORROW @ SWMU 13 AFTER
LOCATIONS ARE ALLOWED TO
STABILIZE FROM DIGGING

1700 RETURN TO OFFICE.
PROVIDE UPDATE TO OFFICE.

1730 LEAVE SITE FOR
DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE [signature] DATE
WITNESS DATE

TITLE 10-22-03 PROJECT NO. BOOK

Work continued from Page

0700 ON-SITE, SET UP TO START SAMPLING SURFACE WATER/SEDS @ SWMU 13, SAMPLED THRU A.M.

1100-1130 LUNCH

1130 RETURNED TO SWMU 13 TO CONTINUE SAMPLING

1630 RETURNED TO OFFICE TO PACK SAMPLES FOR DAY.

1800 LEAVE SITE FOR DAY - DRIVE TO FED EX TO DROP OFF SAMPLES

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 10-23-03

DATE



TITLE 10-23-03 PROJECT NO. BOOK

Work continued from Page

0700 ON SITE, SET UP TO CONTINUE SW/SD SAMPLING @ SWMU 13

0800 START SAMPLING ACTIVITIES

1130-1200 LUNCH

1200 CONTINUE SAMPLING @ SWMU 13

1600 QUIT SAMPLING FOR DAY. PACK SAMPLES

1700 LEAVE SITE FOR DAY. DRIVE TO FED EX TO DROP SAMPLES.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 10-24-03

DATE

TITLE 10-24-03 PROJECT NO.
BOOK

Work continued from Page

0700 ON-SITE. PREP. TO SAMPLE SURFACE WATER SEDS.

0850 DISCUSSED POSSIBILITY OF DISCHARGING CUTTINGS/DRILL WATER TO WOODS NEAR DRILL LOCATIONS TOM BRENT + MGC INDICATED THAT WOULD BE ACCEPTABLE:

- ~ 250 GALLONS $H_2O$ + 30 GALLONS OF WATER/CUTTINGS is GENERATED FOR DEEP WELLS, LESS IS GENERATED FOR SHALLOW WELLS.

- DRILL WATER IS MOSTLY POTABLE THAT IS BEING DISCHARGED FROM HOLE.

0800 WENT TO SWMU 13 TO RESUME SAMPLING

0930 RETURN TO OFFICE, SET

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 10-24-03

DATE



TITLE 10-24-03 PROJECT NO.
BOOK

Work continued from Page

UP TO START SAMPLING @ SWMU 16.

1000 WENT TO SWMU 16 TO START SAMPLING.

1145-1205 LUNCH

1205 RESUME SAMPLING ACTIVITIES

1600 STOP SAMPLING FOR DAY, START PACKING SAMPLES

1700 SAMPLES PACKED, MGC HELPS F. RAMSER PACK CORE BOXES T. ROJAN + F. WUDICWYCH TAKE SAMPLES TO FED EX.

1830 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 10-24-03

DATE

TITLE 10-25-03 PROJECT NO. BOOK

Work continued from Page

0700 ON SITE

0800 MGC + FCW COLLECT REMAINDER OF SURFACE WATER / SED SAMPLES @ SWMU 16

1130 RETURN TO OFFICE W/ SAMPLES

1200-1230 LUNCH

1230 SETUP TO PERFORM GW SAMPLING AT SWMU 16

1400 GO TO SWMU 16 TO START GW SAMPLING

1730 COMPLETED SAMPLING FOR DAY, RETURN TO OFFICE

1830 QUIT FOR DAY, LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 10-26-03

WITNESS

DATE



TITLE 10-26-03 PROJECT NO. BOOK

Work continued from Page

0700 ON SITE, SET UP TO CONTINUE GW SAMPLING.

0830 MGC SETS UP ON 16GW01 TO SAMPLE

1630 COMPLETED SAMPLING FOR DAY AT 16GW01. MGC HELPS F. WUDKWYCH W/ WELL SAMPLING

1730 RETURN TO OFFICE

1800 LEAVE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 10-26-03

WITNESS

DATE

TITLE 10-27-03 PROJECT NO.
BOOK

Work continued from Page

0700 ON-SITE. SETUP TO COLLECT SURFACE WATER / ~~SEDIMENT~~ men SAMPLES AT SWMU 13.

0800 GO TO COLLECT SW SAMPLES @ SWMU 13

1130-1200 LUNCH

1230 RETURN TO ~~SAMPLING~~ OFFICE, DROP OFF SAMPLES, RETURN TO SWMU 13 TO COLLECT SW SAMPLES

1500 RETURN TO OFFICE, PACK SAMPLES FOR SHIPMENT.

1700 MGC CHECKS ON F. RANGER.

1745 RETURN TO OFFICE.

1800 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 10-27-03

DATE



TITLE 10-28-03 PROJECT NO.
BOOK

Work continued from Page

0700 ON-SITE. SETUP EQUIPMENT

0800 SET UP TO SAMPLE @ SWMU 13. PURGED AND SAMPLED WELL 13 MWT24 IN THE A.M.

1200-1230 LUNCH

1230 RETURN. SET UP TO SAMPLE 13 MWT 19.

1700 13 MWT 19 SAMPLED. RETURN TO OFFICE TO UNPACK EQUIPMENT.

1815 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 10-28-03

DATE

TITLE 1-3-03 PROJECT NO. BOOK

Work continued from Page

1400 ON-SITE LOAD EQUIPMENT

1500 DRILLERS ON SITE FOR ATV RIG.

JAMES WALSH
JOSHUA DEAN

T ROJAHN PERFORMS H+S TRAINING

1545 TRAINING COMPLETED, SETUP TO FILL $H_2O$ TRUCK

1615 MOBILIZE TO DECON PAD TO CLEAN ATV RIG

1715 MOVE TO 13MWT29 TO SETUP.

1810 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 11-3-03

DATE



TITLE 11-4-03 PROJECT NO. 9060 BOOK

Work continued from Page

0700 ON-SITE.

0730 ON-SITE AT 13MWT29 TO START DRILLING

1030 13MWT29 DRILLED + INSTALLED, DRILLERS TEAR DOWN + GO TO DECON

1130-1200 LUNCH

1200 RETURN, DRILLERS GET EQUIPMENT FOR WELL INSTALLATION

1300 SETUP ON WELL 13MWT41

1730 QUIT DRILLING FOR DAY, DRILLERS PLAN ON GETTING LARGER COMPRESSOR TO REMOVE CUTTINGS MORE EFFICIENTLY

VOID

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 11-4-03

DATE

TITLE 11-5-03 PROJECT NO.

BOOK

Work continued from Page

0700 ON SITE PREP EQUIPMENT + SETUP TO CONTINUE DRILLING.

0800 RESUME CORING @ 13MWT41

0900 LOST BIT IN HOLE, STARTED TO TEAR DOWN, WILL MOVE ROTASONIC ON HOLE TO OVERDRILL + FISH OUT BIT.

1000 SETUP ON WELL 13MWT36 TO DRILL + INSTALL.

1230 WELL 13MWT36 INSTALLED

1230-1300 LUNCH

1300 RETURN TO TAKE DOWN RIG + DECON

1400 DECON RIG

1430 MOVE ONTO LOCATION 13MWT31 TO START DRILLING

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-5-03

WITNESS

DATE



TITLE 11-5-03 PROJECT NO.

BOOK

Work continued from Page

1700 13MWT31 DRILLED + INSTALLED. DRILLERS TEAR DOWN + MOVE TO DECON. MGC RETURNS TO DO PAPERWORK IN OFFICE

1800 LEAVE SITE

VOID

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-5-03

WITNESS

DATE

TITLE 11-6-03 PROJECT NO. BOOK

Work continued from Page

0700 ON SITE, SET UP EQUIPMENT + COMPLETE DAILY ACTIVITIES

0815 SET UP ON 13MWT33 TO START DRILLING

1130 13MWT33 DRILLED + INSTALLED TAKE LUNCH

1200 RETURN FROM LUNCH, DRILLERS DECON RIG

1330 MOVE ONTO LOCATION 13MWT30 TO START DRILLING

1345 PULLED OFF HOLE TO TOW ROTASONIC RIG OFF HOLE

1430 BACK AT 13MWT30 TO START DRILLING

1600 13MWT30 INSTALLED. MGC CHECKS ON SITE 16 CLEARANCE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-6-03

WITNESS

DATE



TITLE 11-6-03 PROJECT NO. BOOK

Work continued from Page

1600 (CONT.) CHRIS FREEMAN INDICATED THAT UTILITY CLEARANCE IS MADE FOR SITE 16 DRILLERS DECON + WILL MOVE TO SITE 16 TO STAGE EQUIP. FOR A.M. START.

~~180~~

1700 DRILLERS MOVE TO OFFICE w/ EQUIPMENT

1800 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-6-03

WITNESS

DATE

TITLE 11-7-03 PROJECT NO.

BOOK

Work continued from Page

0700 ON SITE, DISCUSS APPROACH FOR DRILLING SWMU 16

0730 MOB TO SWMU 16, SET UP ON WELL 16MWT14 TO START DRILLING

1030 16MWT14 DRILLED & INSTALLED DRILLERS TAKE RIG BACK TO DECON PAD TO FIX ANTIFREEZE LEAK + TO DECON AUGERS

1130 - 1200 LUNCH

1200 RETURN FROM LUNCH, DRILLERS WELD BIT.

1330 RETURN TO SWMU 16, SETUP ON 16MWT12 TO START DRILLING

1630 16MWT12 DRILLED + INSTALLED, GO TO DECON

1800 LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 11-7-03

DATE



TITLE 11-8-03 PROJECT NO.

BOOK

Work continued from Page

0700 ON SITE, PREP EQUIPMENT FOR DAY

0745 SET UP ON 16MWT09 TO DRILL + INSTALL WELL

1000 WELL INSTALLED, SET UP ON 16MWT17.

1200 - 1230 LUNCH

1230 RETURN FROM LUNCH, CONTINUE WELL INSTALLATION

1430 16MWT09 INSTALLED, RETURN TO DECON

1500 LEAK IN RADIATOR, DRILLER TO REPAIR WITH RADIATOR STOP LEAK.

1700 LEAK REPAIRED, MOVED ONTO LOCATION 16MWT10,

1800 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 11-8-03

DATE

TITLE 11-9-03 PROJECT NO. BOOK

Work continued from Page

0700 ON SITE, SET UP EQUIP. TO DRILL.

0730 MOB TO SWMU 16 16MWT10

0915 16MWT10 DRILLED, MOB TO 16MWT16 LOCATION TO DRILL WELL (NOTE: 16MWT16 IS DRY AT 25 FEET). IT WAS DECIDED TO INSTALL A DEEPER WELL AT THIS LOCATION TO MONITOR DEEPER GW.

1130 LUNCH

1200 RETURN FROM LUNCH, CONTINUE DRILLING @ 16MWT16

1530 16MWT16 INSTALLED, CLEAN UP SITE & AREA

1700 RETURN TO OFFICE

1800 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 11-9-03

DATE



TITLE 11-10-03 PROJECT NO. BOOK

Work continued from Page

0700 ON SITE, SET UP EQUIPMENT.

0800 MOB TO SWMU 13 TO DRILL 13MWT44

1230 LUNCH

1300 RETURN FROM LUNCH, CONTINUE DRILLING 13MWT44

1800 WELL INSTALLED

1830 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 11-10-03

DATE

TITLE 11-11-03 PROJECT NO.

BOOK

Work continued from Page

0700 ON SITE SETUP EQUIP. TO DRILL FOR DAY, WILL MOB TO SWMU 13 (13MWT34) TO DRILL SHALLOW WELL. MOVED EQUIP + RIG OFF OF 13MWT44 LOCATION.

1030 13MWT34 INSTALLED, MOB TO DECON

1100-1130 LUNCH

1300 MOB TO SWMU 16 TO DRILL 16MWT13

1500 16MWT13 COMPLETE, MOB TO 16MWT07 TO DRILL

1700 16MWT07 DRILLED, CLEAN UP AREA + RETURN TO OFFICE W/ PAPERWORK

1800 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 11-11-03

DATE



TITLE 11-17-03 PROJECT NO.

BOOK

Work continued from Page

1400 ON SITE, SETUP EQUIPMENT TO START DRILLING

1545 MOB TO WELL 13MWT35 TO START CORING. CLEANED OUT HOLE TO START CORING.

1700 QUIT FOR DAY

1800 LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 11-18-03

DATE

TITLE 11-18-03 PROJECT NO.
BOOK

Work continued from Page

0700 ON SITE, MOB EQUIP TO START DRILLING.

0800 SET UP AT 13MWT35, RAIN STEADY, DRILLERS WILL WAIT UNTIL RAIN DECREASES

1100 RAIN CONTINUED, DRILLERS DECIDE TO QUIT FOR DAY.

1100-1130 LUNCH

1130 RETURN FROM LUNCH, SETUP TO COLLECT SW & GW SAMPLES @ SWMU 13

1330 SETUP TO SAMPLE 13SW11

1430 13SW11 SAMPLED, SETUP TO DEVELOP 13MWT41.

1530 13MWT41 DEVELOPED, RETURN TO OFFICE TO PACK SAMPLES

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE [signature] DATE 11-19-03

WITNESS DATE



TITLE 11-18-03 PROJECT NO.
BOOK

Work continued from Page

1800 LEAVE SITE FOR DAY

VOID

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE [signature] DATE 11-19-03

WITNESS DATE

TITLE 11-19-03 PROJECT NO.
BOOK

Work continued from Page

0700 ON-SITE, SET UP EQUIPMENT TO DRILL @ SWMU 13 13MWT35

1100 LUNCH

1130 RETURN FROM LUNCH, CONTINUE DRILLING 13MWT35

1330 WELL INSTALLED, DRILLERS DELON, MGC GETS TOW TRUCK AT MAINTENANCE TO PULL OUT STUCK ROTASONIC RIG

1430 ROTASONIC RIG PULLED OUT

1530 SET UP ON 13MWT47 TO START DRILLING

1730 QUIT FOR DAY

1800 LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE [signature] DATE 11-19-03

WITNESS DATE



TITLE 11-20-03 PROJECT NO.
BOOK

Work continued from Page

0700 ON-SITE, PREP EQUIPMENT.

0800 RESUME DRILLING 13MWT47

0900 13MWT47 INSTALLED, ~~[illegible]~~ CHECK ON DRILLERS INSTALLING PADS & PRO CASINGS

0930 MGC & T BOEMER (B-M) DRIVE TO MGBG TO SCOPE DRILL LOCATIONS

1030 RETURN TO SWMU 13, MGC GETS TOW TRUCK TO PULL OFF RIG FROM 13MWT47

1100-1130 LUNCH

1130 RETURN FROM LUNCH, ASSIST J. GOERPT WITH WELL SAMPLING

1330 CONCRETE TRUCK ARRIVES.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE [signature] DATE 11-20-03

WITNESS DATE

TITLE 11-20-03 PROJECT NO. BOOK

Work continued from Page

START POURING PADS

1800 DONE FOR DAY

1830 LEAVE SITE

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE 11-20-03

WITNESS

DATE 11-20-03

DATE



TITLE 11-21-03 PROJECT NO. BOOK

Work continued from Page

0700 ON SITE, SET UP EQUIPMENT

0800 MGC + S. GRIER GO TO WELL 13 MWT46 TO AWAIT DRILLERS TO SET CASING.

0900 MGC + ATU DRILLERS GO TO WELL 16 MWT14 TO ABANDON (WELL DRY TO DATE)

1000 16 MWT14 ABANDONED. PRODUCTION STAFF AT SWMU 16 INSTRUCTED TO STAY AWAY FROM BUILDING PERIMETER WE ARE ALLOWED TO WORK ON WELLS ALONG BOUNDARY. WE NEED TO LET THEM KNOW HOW MANY STAFF ARE WORKING IN THE AREA AT A TIME.

1130 - 1200 LUNCH.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

WITNESS

DATE 11-21-03

DATE

TITLE 11-21-03 PROJECT NO.

BOOK

Work continued from Page

1200 RETURN FROM LUNCH.
ASSIST T. ROSATO IN WELL
DEVELOPMENT

1340 START DEVELOPMENT
WELLS 16MWT13 + 16MWT15

1800 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-21-03

WITNESS

DATE



TITLE 11-22-03 PROJECT NO.

BOOK

Work continued from Page

0700 ON SITE, PREPARE
EQUIPMENT FOR SLUG TESTING

1000 START SLUG TESTING @ SWMW 16

1100 - 1130 LUNCH

1130 RETURN TO SWMW 16,
CONTINUE SLUG TESTING (16MWT10)

1230 MOV TO SWMW 13 TO
PERFORM SLUG TESTING
(13MWT37 + 13MWT38)

1800 QUIT FOR DAY

1830 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-22-03

WITNESS

DATE

TITLE -23-03 PROJECT NO.

BOOK

Work continued from Page

0700 ON SITE, DOWNLOAD ~~EO~~ DATA FROM SLUG TESTING, DO PAY ITEMS FOR DRILLING

0900 MOB TO SWMU 16 FOR SLUG TESTING, TESTED 16MWT09, 17 & 15

1330 RETURN TO OFFICE, DRILLERS PICK UP EQUIPMENT & LEAVE SITE

1345 DRIVE TO SWMU 13 TO SLUG TEST WELLS WHILE W.L. IN ~~16~~ WELL AT SWMU 16 RETURNS TO EQUILIBRIUM (16MWT15)

1400 MOC CLEANS UP ACCESS ROAD + CLEARS DITCHES OF H2O AT SWMU 13

1530 RETURN TO SWMU 16 TO CHECK WELL, STILL ~~RECOVERING~~ RECOVERING (16MWT15)

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-23-03

WITNESS

DATE



TITLE 11-23-03 PROJECT NO.

BOOK

Work continued from Page

1600 SWMU 13. TESTED WELL 13MWT42

1800 RETURN TO SWMU 16. PULL EQUIP FROM WELL 16MWT15. (NOTE: HAD TO CLEAR AREA BEFORE A.M MONDAY)

1830 LEAVE SITE TO SHOP FOR EQUIP

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 11-23-03

WITNESS

DATE

TITLE 11-24-03 PROJECT NO. BOOK

Work continued from Page

0700 ON SITE, PREP EQUIP FOR SLUG TESTING

0830 AT WELL 13MWT33 TO SLUG TEST

1030 SETUP ON 13MWT30 WHILE 13MWT33 RECOVERS

1315 ~~PULLED~~ STOP TEST @ 13MWT33

1330 STOPPED TEST @ 13MWT30

1345 MOB TO 13MWT32 TO TEST.

1500 13MWT32 TESTED.

1600 RETURN TO OFFICE, HELP PACK SAMPLES

1800 LEAVE SITE FOR DAY

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE [signature] DATE 11-24-03

WITNESS DATE



TITLE 11-25-03 PROJECT NO. BOOK

Work continued from Page

0700 ON SITE, PREP EQUIPMENT FOR SLUG TESTING

0830 WENT TO SWMU 13, CHECKED WELL 13MWT45 & 13MWT28 FOR RECOVERY BACK TO STATIC. COULD NOT TEST YET.

0900 AT WELL 13MWT34 TO TEST

1000 13MWT34 TESTED, MOVE TO 13MWT47 TO TEST

1345 MGG GOES TO MEET WITH JACOBY (SEEPING CONTRACTOR) TO DISCUSS LOCATIONS TO RESTORE

~~1600~~ 1530 RETURN TO 13MWT47, PULL TRANSDUCER FROM WELL

1600 RETURN TO OFFICE TO DUMP DATA + PACK EQ + SAMPLES.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE [signature] DATE 11-25-03

WITNESS DATE

APPENDIX D.3.1
SWMU 13 AND SWMU 16
LAND SURVEY DATA
ROUND 1

SURVEY DATA FOR MINE FILL B (SWMU13)
NSWC CRANE
CRANE, INDIANA

| LOCATION | NORTHING | EASTING | GROUND SURFACE ELEVATION | TOP OF CASING ELEVATION | TOP OF PVC ELEVATION |
|---|---|---|---|---|---|
| MONITORING WELLS | | | | | |
| 13MWT01 | 490305.15300 | 572268.53800 | 713.10 | 715.91 | 715.34 |
| 13MWT02 | 490540.13400 | 571996.14500 | 702.10 | 705.28 | 704.72 |
| 13MWT03 | 490004.52900 | 572144.25400 | 718.34 | 721.60 | 721.10 |
| 13MWT04 | 490146.98000 | 571798.70700 | 704.37 | 707.32 | 706.84 |
| 13MWT05 | 490522.50900 | 571632.62300 | 693.61 | 697.12 | 696.44 |
| 13MWT06 | 489679.76400 | 571747.86000 | 715.30 | 718.47 | 717.93 |
| 13MWT07 | 490302.90700 | 571346.72500 | 684.38 | 687.70 | 687.22 |
| 13MWT08 | 490011.44600 | 571590.15400 | 698.42 | 701.11 | 700.56 |
| 13MWT09 | 489425.65800 | 571301.61900 | 703.29 | 706.37 | 705.90 |
| 13MWT10 | 489743.28300 | 571253.85400 | 697.77 | 700.64 | 700.15 |
| 13MWT11 | 489997.31100 | 571002.68200 | 679.76 | 682.82 | 682.29 |
| 13MWT12 | 489843.79900 | 570827.53900 | 679.96 | 682.66 | 682.12 |
| 13MWT13 | 489204.86300 | 571416.19200 | 699.28 | 702.40 | 701.98 |
| 13MWT14 | 488905.82800 | 571362.75200 | 703.15 | 705.98 | 705.50 |
| 13MWT15 | 489329.11300 | 570970.39200 | 694.27 | 697.16 | 696.65 |
| 13MWT16 | 489617.87100 | 570594.50800 | 682.13 | 684.83 | 684.35 |
| 13MWT17 | 489368.87000 | 570376.55700 | 690.68 | 693.68 | 693.01 |
| 13MWT18 | 489090.57900 | 570546.00400 | 700.05 | 703.43 | 702.92 |
| 13MWT19 | 488657.57000 | 571087.14800 | 703.10 | 706.32 | 705.82 |
| 13MWT20 | 488830.35700 | 570779.81800 | 699.33 | 702.65 | 702.07 |
| 13MWT21 | 489154.61000 | 570168.80700 | 688.37 | 691.26 | 690.74 |
| 13MWT22 | 488699.94300 | 570038.25800 | 669.53 | 672.38 | 671.96 |
| 13MWT23 | 488471.62000 | 570497.70000 | 696.66 | 699.69 | 699.14 |
| 13MWT24 | 488160.83900 | 570169.06500 | 691.33 | 694.39 | 693.93 |
| 13MWT25 | 488389.22600 | 569930.02700 | 678.87 | 682.00 | 681.57 |
| 13MWT26 | 487996.29700 | 569942.72200 | 684.86 | 687.92 | 687.49 |
| SOIL BORINGS | | | | | |
| 13SB01 | 489421.85300 | 571329.32300 | 701.65 | NA | NA |
| 13SB02 | 489396.70100 | 571297.96400 | 700.20 | NA | NA |
| 13SB03 | 489375.03300 | 571273.03400 | 700.58 | NA | NA |
| 13SB04 | 489385.84300 | 571330.45100 | 701.26 | NA | NA |
| 13SB05 | 489376.78300 | 571304.92500 | 699.79 | NA | NA |
| 13SB06 | 489352.52400 | 571292.62900 | 699.09 | NA | NA |
| 13SB07 | 488743.91300 | 570447.02600 | 689.03 | NA | NA |
| 13SB08 | 490012.98800 | 571588.35200 | 697.80 | NA | NA |
| 13SB09/15 | 488815.46300 | 570768.05300 | 697.30 | NA | NA |
| 13SB10 | 488836.34400 | 570767.42100 | 698.32 | NA | NA |
| 13SB11 | 488838.53000 | 570804.33700 | 700.14 | NA | NA |
| 13SB12 | 488864.33600 | 570835.20900 | 701.19 | NA | NA |
| 13SB13 | 488870.59400 | 570857.80800 | 702.11 | NA | NA |
| 13SB14 | 488731.63000 | 570710.62400 | 694.90 | NA | NA |

SURVEY DATA FOR MINE FILL B (SWMU13)
NSWC CRANE
CRANE, INDIANA

| LOCATION | NORTHING | EASTING | GROUND SURFACE ELEVATION | TOP OF CASING ELEVATION | TOP OF PVC ELEVATION |
|---|---|---|---|---|---|
| SURFACE WATER AND SEDIMENT | | | | | |
| 13SW/SD01 | 490596.61600 | 572020.84300 | 696.86 | NA | NA |
| 13SW/SD02 | 490504.19100 | 572103.57100 | 697.90 | NA | NA |
| 13SW/SD03 | 489732.34500 | 572333.87800 | 715.89 | NA | NA |
| 13SW/SD04 | 489349.74200 | 571689.14500 | 694.32 | NA | NA |
| 13SW/SD05 | 489242.08300 | 571570.04500 | 686.51 | NA | NA |
| 13SW/SD06 | 489107.59400 | 571437.21900 | 691.10 | NA | NA |
| 13SW/SD07 | 488755.84800 | 571101.89700 | 702.49 | NA | NA |
| 13SW/SD08 | 488280.24800 | 570580.34900 | 684.35 | NA | NA |
| 13SW/SD09 | 487926.41400 | 569874.59800 | 678.37 | NA | NA |
| 13SW/SD10 | 488609.31900 | 570001.82100 | 661.24 | NA | NA |
| 13SW11 | 489188.95100 | 570197.88400 | 687.59 | NA | NA |
| 13SD11 | 489233.71900 | 570161.02900 | 679.45 | NA | NA |
| 13SW/SD12 | 489711.54500 | 570582.67100 | 661.78 | NA | NA |
| 13SW/SD13 | 490163.75400 | 571029.10100 | 690.77 | NA | NA |
| 13SD14 | 489968.57900 | 569906.49400 | 575.25 | NA | NA |
| 13SD15 | 489884.66300 | 569754.91000 | 583.37 | NA | NA |
| 13SD16 | 489320.66700 | 569400.94800 | 575.81 | NA | NA |
| 13SD17 | 487816.46100 | 569751.53500 | 669.80 | NA | NA |
| 13SD18 | 487356.24200 | 569753.78600 | 633.40 | NA | NA |
| 13SD19 | 487904.93700 | 571123.18600 | 619.14 | NA | NA |
| 13SD20 | 487999.72700 | 571997.68800 | 578.15 | NA | NA |
| 13SD21 | 490202.93400 | 573035.24200 | 689.98 | NA | NA |
| 13SD22 | 490817.19800 | 571833.43900 | 666.78 | NA | NA |
| 13SD23 | 490638.06500 | 571834.51200 | 692.08 | NA | NA |
| STAFF GAUGES | | | | | |
| 13SG01 | 490600.47300 | 572024.03400 | 698.35 | NA | NA |
| 13SG02 | 490510.14500 | 572106.96400 | 701.95 | NA | NA |
| 13SG03 | 489349.29000 | 571689.47900 | 696.24 | NA | NA |
| 13SG04 | 489241.85000 | 571570.45100 | 688.99 | NA | NA |
| 13SG05 | 489105.05200 | 571437.99000 | 692.94 | NA | NA |
| 13SG06 | 488755.58000 | 571102.25900 | 704.88 | NA | NA |
| 13SG07 | 487927.86000 | 569874.64400 | 680.30 | NA | NA |
| 13SG08 | 488610.34100 | 569997.36300 | 665.95 | NA | NA |
| 13SG09 | 489632.20200 | 570664.74200 | 675.30 | NA | NA |
| 13SG10 | 490130.56400 | 571073.84300 | 676.10 | NA | NA |

SURVEY DATA FOR CAST HIGH EXPLOSIVES FILL/B146 INCINERATOR (SWMU 16)
NSWC CRANE
CRANE, INDIANA

| LOCATION | NORTHING | EASTING | GROUND SURFACE ELEVATION | TOP OF CASING ELEVATION | TOP OF PVC ELEVATION |
|---|---|---|---|---|---|
| MONITORING WELLS | | | | | |
| 16MWT01 | 500956.94100 | 580133.96900 | 762.02 | 765.00 | 764.50 |
| 16MWT02 | 500909.87500 | 579811.84400 | 757.60 | 760.98 | 760.36 |
| 16MWT03 | 500710.42400 | 579896.97300 | 761.95 | 764.96 | 764.41 |
| 16MWT04 | 500766.73500 | 580199.14800 | 763.88 | 766.71 | 766.14 |
| 16MWT05 | 500505.25000 | 580065.45200 | 764.50 | 767.45 | 766.88 |
| 16MWT06 | 500962.97200 | 580136.05700 | 761.77 | 764.85 | 764.44 |
| WES-14-01-83 | 500401.81100 | 579966.06200 | 763.87 | NO CASING | 766.67 |
| WES-14-02-83 | 501083.35200 | 579899.95500 | 763.69 | 766.69 | 766.54 |
| WES-14-03-83 | 500579.45900 | 580271.17500 | 761.51 | 764.16 | 763.93 |
| WES-14-04-83 | 500335.80200 | 580213.63700 | 760.42 | NO CASING | 762.99 |
| WES-14-05-83 | 500347.50800 | 580102.99900 | 766.60 | NO CASING | 769.40 |
| SOIL BORINGS | | | | | |
| 16SB01 | 500927.36800 | 580048.37100 | 764.79 | NA | NA |
| 16SB02 | 500880.36800 | 580065.41600 | 764.81 | NA | NA |
| 16SB03 | 500828.54900 | 580083.97700 | 764.72 | NA | NA |
| 16SB04 | 500781.81200 | 580100.11900 | 765.06 | NA | NA |
| 16SB05 | 500671.84000 | 580132.31900 | 764.89 | NA | NA |
| 16SB06 | 500629.65300 | 580142.08300 | 764.52 | NA | NA |
| 16SB07 | 500577.45600 | 580174.16900 | 763.92 | NA | NA |
| 16SB08 | 500532.35000 | 580178.35100 | 763.92 | NA | NA |
| 16SB09 | 500489.48100 | 580208.81300 | 764.14 | NA | NA |
| 16SB10 | 500442.54300 | 580222.37500 | 764.79 | NA | NA |
| 16SB11 | 500407.51600 | 580270.18800 | 763.23 | NA | NA |
| 16SB12 | 500366.11200 | 580301.93400 | 760.21 | NA | NA |
| 16SB13 | 500331.59800 | 580333.85900 | 752.84 | NA | NA |
| 16SB14 | 500513.65700 | 580129.87100 | 764.67 | NA | NA |
| 16SB15 | 500468.38800 | 580148.48200 | 765.76 | NA | NA |
| 16SB16 | 500419.19500 | 580172.81000 | 765.94 | NA | NA |
| 16SB17 | 500371.71000 | 580189.98200 | 761.99 | NA | NA |
| 16SB18 | 500327.69100 | 580210.26100 | 759.64 | NA | NA |
| 16SB19 | 500286.55000 | 580228.80100 | 757.77 | NA | NA |
| 16SB20 | 500498.26400 | 580092.86900 | 764.86 | NA | NA |
| 16SB21 | 500444.74200 | 580081.44300 | 765.01 | NA | NA |
| 16SB22 | 500402.45300 | 580069.09100 | 768.33 | NA | NA |
| 16SB23 | 500353.57000 | 580057.15300 | 768.16 | NA | NA |
| 16SB24 | 500306.18100 | 580042.92500 | 762.01 | NA | NA |
| 16SB25 | 500253.53700 | 580028.40500 | 757.25 | NA | NA |
| 16SB26 | 500507.35200 | 580068.72400 | 764.29 | NA | NA |
| 16SB27 | 500469.28000 | 580030.00900 | 763.71 | NA | NA |
| 16SB28 | 500427.17900 | 580003.26500 | 764.02 | NA | NA |
| 16SB29 | 500385.02500 | 579976.27200 | 766.34 | NA | NA |
| 16SB30 | 500343.49100 | 579949.49900 | 765.18 | NA | NA |
| 16SB31 | 500299.10400 | 579917.13700 | 761.78 | NA | NA |
| 16SB32 | 500522.23800 | 579977.72200 | 762.56 | NA | NA |
| 16SB33 | 500575.12100 | 579960.32800 | 762.34 | NA | NA |
| 16SB34 | 500622.85300 | 579945.89200 | 762.33 | NA | NA |
| 16SB35 | 500670.39100 | 579927.22700 | 762.21 | NA | NA |

SURVEY DATA FOR CAST HIGH EXPLOSIVES FILL/B146 INCINERATOR (SWMU 16)
NSWC CRANE
CRANE, INDIANA

| LOCATION | NORTHING | EASTING | GROUND SURFACE ELEVATION | TOP OF CASING ELEVATION | TOP OF PVC ELEVATION |
|---|---|---|---|---|---|
| SOIL BORINGS CONTINUED | | | | | |
| 16SB36 | 500710.58900 | 579896.40700 | 761.50 | NA | NA |
| 16SB37 | 500764.27300 | 579894.74500 | 762.09 | NA | NA |
| 16SB38 | 500811.80100 | 579879.75100 | 761.57 | NA | NA |
| 16SB39 | 500857.15800 | 579862.26600 | 760.55 | NA | NA |
| 16SB40 | 500898.88700 | 579805.82200 | 756.60 | NA | NA |
| 16SB41 | 500963.77300 | 580137.43900 | 761.39 | NA | NA |
| SURFACE WATER AND SEDIMENT | | | | | |
| 16SW01 | 501013.20500 | 579918.96600 | See North Sump | NA | NA |
| 16SW02 | 500967.62100 | 580129.31200 | See East Sump | NA | NA |
| 16SD02 | 500989.61200 | 580158.74100 | 757.44 | NA | NA |
| 16SD03 | 500756.23500 | 580191.49100 | 762.37 | NA | NA |
| 16SD04 | 500577.13200 | 580288.89900 | 757.63 | NA | NA |
| 16SD05 | 500514.30400 | 580264.17800 | 760.02 | NA | NA |
| 16SD06 | 500494.71900 | 580006.48800 | 760.75 | NA | NA |
| 16SW07 | 500896.66200 | 579814.59400 | See West Sump | NA | NA |
| 16SD08 | 500886.76700 | 579728.62700 | 730.79 | NA | NA |
| 16SD09 | 500472.40500 | 579905.64600 | 752.10 | NA | NA |
| 16SD10 | 500568.94700 | 580507.94100 | 722.84 | NA | NA |
| 16SD11 | 501160.25400 | 580067.04000 | 747.54 | NA | NA |
| SUMP INFORMATION | | | | | |
| **NORTH SUMP** | | | | | |
| SE-CORNER | 501011.05867 | 579924.95862 | 764.23 | NA | NA |
| SW-CORNER | 501007.66175 | 579915.84459 | 764.25 | NA | NA |
| NW-CORNER | 501015.36171 | 579912.97367 | 764.22 | NA | NA |
| NE-CORNER | 501018.74863 | 579922.08070 | 764.22 | NA | NA |
| **EAST SUMP** | | | | | |
| NW-CORNER | 500968.37184 | 580121.79606 | 761.45 | NA | NA |
| NE-CORNER | 500973.50573 | 580134.07211 | 761.45 | NA | NA |
| SE-CORNER | 500966.84076 | 580136.82704 | 761.46 | NA | NA |
| SW-CORNER | 500961.73587 | 580124.65000 | 761.45 | NA | NA |
| **WEST SUMP** | | | | | |
| SE-CORNER | 500894.01113 | 579821.66854 | 757.50 | NA | NA |
| SW-CORNER | 500892.13622 | 579808.57353 | 757.51 | NA | NA |
| NW-CORNER | 500899.20718 | 579807.51960 | 757.52 | NA | NA |
| NE-CORNER | 500901.18809 | 579820.61261 | 757.57 | NA | NA |

APPENDIX D.3.2
SWMU 13 AND SWMU 16
LAND SURVEY DATA
ROUND 2

SURVEY DATA FOR MINE FILL B (SWMU 13)
NSWC CRANE
CRANE, INDIANA

| LOCATION | Northing | Easting | Ground Surface Elevation | Top of Casing Elevation | Top of PVC Elevation |
|---|---|---|---|---|---|
| 13SB16 | 1309644.53 | 3024109.94 | 704.73 | NA | NA |
| 13SB17 | 1309603.41 | 3024091.61 | 703.67 | NA | NA |
| 13SB18 | 1309569.54 | 3024057.47 | 700.78 | NA | NA |
| 13SB19 | 1309569.11 | 3024032.95 | 699.65 | NA | NA |
| 13SB20 | 1309109.72 | 3023520.23 | 698.62 | NA | NA |
| 13SB21 | 1309143.49 | 3023643.96 | 705.44 | NA | NA |
| 13SB22 | 1309073.36 | 3023628.64 | 701.76 | NA | NA |
| 13SB23 | 1309004.34 | 3023563.33 | 700.41 | NA | NA |
| 13SB24 | 1308950.01 | 3023513.53 | 699.75 | NA | NA |
| 13SB25 | 1308938.63 | 3023443.64 | 697.49 | NA | NA |
| 13MWT27 | 1309786.55 | 3023829.07 | 696.09 | 698.18 | 698.13 |
| 13MWT28 | 1309678.62 | 3024066.67 | 703.54 | 705.53 | 705.55 |
| 13MWT29 | 1309538.75 | 3024290.72 | 698.10 | 700.50 | 700.44 |
| 13MWT30 | 1309174.84 | 3024237.45 | 696.57 | 698.97 | 698.94 |
| 13MWT31 | 1308631.83 | 3023583.85 | 693.56 | 696.15 | 696.21 |
| 13MWT32 | 1308214.11 | 3023162.00 | 693.62 | 696.06 | 696.04 |
| 13MWT33 | 1308749.27 | 3023868.77 | 700.14 | 702.05 | 701.97 |
| 13MWT34 | 1309304.31 | 3023084.25 | 693.35 | 695.83 | 695.93 |
| 13MWT35 | 1310254.91 | 3023773.29 | 679.51 | 681.73 | 681.73 |
| 13MWT36 | 1309053.39 | 3022677.86 | 664.91 | 667.17 | 667.21 |
| 13MWT37 | 1309402.93 | 3022617.27 | 659.96 | 662.38 | 662.29 |
| 13MWT38 | 1309376.76 | 3022619.53 | 659.03 | 661.03 | 661.04 |
| 13MWT39 | 1309804.48 | 3022589.03 | 652.42 | 654.39 | 654.44 |
| 13MWT40 | 1309622.33 | 3022833.33 | 664.93 | 667.27 | 667.18 |
| 13MWT41 | 1309645.20 | 3022819.00 | 663.65 | 665.81 | 665.67 |
| 13MWT42 | 1309862.28 | 3023113.22 | 668.05 | 670.35 | 670.31 |
| 13MWT43 | 1310558.56 | 3023939.45 | 688.88 | 690.96 | 690.90 |
| 13MWT44 | 1310621.14 | 3023530.33 | 682.11 | 684.06 | 683.82 |
| 13MWT45 | 1309373.68 | 3022901.38 | 688.76 | 690.54 | 690.59 |
| 13MWT46 | 1309812.02 | 3022565.94 | 651.64 | 653.68 | 653.61 |
| 13MWT47 | 1309389.47 | 3024437.45 | 675.41 | 677.32 | 677.23 |
| 13SP01 | 1309723.29 | 3021982.45 | 558.94 | NA | NA |
| 13SP02 | 1310315.90 | 3022574.54 | 567.87 | NA | NA |
| 13SP03 | 1311091.03 | 3022745.09 | 574.29 | NA | NA |
| 13SP04 | 1311053.97 | 3024465.59 | 660.80 | NA | NA |
| 13SW/SD24 | 1308767.99 | 3024782.09 | 612.91 | NA | NA |
| 13SW/SD25 | 1307717.82 | 3025181.47 | 550.41 | NA | NA |
| 13SW/SD26 | 1309927.94 | 3026328.70 | 588.77 | NA | NA |
| 13SW/SD27 | 1309923.03 | 3026476.80 | 583.08 | NA | NA |
| 13SW/SD28 | 1308827.77 | 3021144.45 | 555.68 | NA | NA |
| 13SW/SD29 | 1311065.29 | 3022760.50 | 572.40 | NA | NA |
| 13SW/SD30 | 1308982.53 | 3020612.39 | 528.14 | NA | NA |
| 13SW/SD31 | 1311321.27 | 3022611.01 | 569.16 | NA | NA |
| 13SW/SD32 | 1308877.82 | 3024614.15 | 623.48 | NA | NA |
| 13SG11 | 1309388.01 | 3024416.84 | 675.36 | (Top Guage) | NA |

SB = Soil Boring SW = Surface Water SG = Staff Gauge
MW = Monitoring Well SD = Sediment SP = Seep

SURVEY DATA FOR CAST HIGH EXPLOSIVES FILL/B146 INCINERATOR (SWMU 16)
NSWC CRANE
CRANE, INDIANA

| LOCATION | Northing | Easting | Ground Surface Elevation | Top of Casing Elevation | Top of PVC Elevation |
|---|---|---|---|---|---|
| 16SB42 | 1320695.93 | 3033088.62 | 752.50 | NA | NA |
| 16SB43 | 1320625.18 | 3033128.42 | 751.92 | NA | NA |
| 16SB44 | 1320573.49 | 3033158.25 | 744.26 | NA | NA |
| 16SB45 | 1320496.42 | 3033085.00 | 742.47 | NA | NA |
| 16SB46 | 1320451.82 | 3033020.17 | 749.06 | NA | NA |
| 16SB47 | 1321100.87 | 3032594.91 | 759.83 | NA | NA |
| 16SB48 | 1321081.68 | 3032601.85 | 760.26 | NA | NA |
| 16SB49 | 1321117.41 | 3032618.95 | 761.32 | NA | NA |
| 16SB50 | 1321088.19 | 3032626.34 | 761.50 | NA | NA |
| 16MWT07 | 1321176.93 | 3033001.57 | 760.54 | 762.91 | 762.87 |
| 16MWT08 | 1321179.45 | 3033009.24 | 759.57 | 761.62 | 761.56 |
| 16MWT09 | 1321068.49 | 3033041.44 | 762.43 | 764.47 | 764.28 |
| 16MWT10 | 1320936.05 | 3033074.74 | 761.93 | 764.48 | 764.43 |
| 16MWT11 | 1320934.64 | 3033062.79 | 763.23 | 765.47 | 765.24 |
| 16MWT12 | 1320729.14 | 3033074.92 | 753.23 | 755.54 | 755.45 |
| 16MWT13 | 1321125.78 | 3032562.41 | 757.62 | 759.66 | 759.57 |
| 16MWT14 | Abandoned | - | - | - | - |
| 16MWT15 | 1321120.81 | 3032563.53 | 757.73 | 759.77 | 759.69 |
| 16MWT16 | 1321059.41 | 3032814.52 | 764.98 | Flush Mt. | 764.74 |
| 16MWT17 | 1321235.88 | 3032675.07 | 764.79 | 766.52 | 766.53 |
| 16MWT18 | 1321068.96 | 3032807.84 | 764.99 | Flush Mt. | 764.44 |
| 16SW/SD12 | 1320984.27 | 3032193.49 | 681.09 | NA | NA |
| 16SW/SD13 | 1320296.86 | 3032110.65 | 639.33 | NA | NA |
| 16SW/SD14 | 1321752.05 | 3034042.95 | 625.32 | NA | NA |
| 16SW/SD15 | 1320773.46 | 3034509.17 | 595.51 | NA | NA |
| 16SW/SD16 | 1320361.12 | 3034191.41 | 597.61 | NA | NA |
| 16SW/SD17 | 1319010.15 | 3033272.07 | 585.01 | NA | NA |
| 16SW/SD18 | 1320758.36 | 3034589.83 | 595.44 | NA | NA |
| 16SW/SD19 | 1318678.18 | 3033398.54 | 578.89 | NA | NA |
| 16SW/SD20 | 1320338.90 | 3032013.81 | 642.09 | NA | NA |
| 16SW/SD21 | 1321738.16 | 3034075.17 | 623.94 | NA | NA |
| 16SW/SD22 | 1321416.93 | 3032998.48 | 713.03 | NA | NA |

SB = Soil Boring
MW = Monitoring Well
SW = Surface Water
SD = Sediment

# APPENDIX E
# AQUIFER CHARACTERISTICS, CALCULATIONS, AND RECORDS

# APPENDIX E.1
# SWMU 13
# AQUIFER CHARACTERISTICS, CALCULATIONS, AND RECORDS
# ROUND 1

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 13MWT02 |
| **Project No.:** | 9060.CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Falling Head | **Test Date:** | 10-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RmB 6/23/03

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 2.5 | = R |
| Length of Well Screen (ft.) : | 12 | = L |
| Time for 37% head change (min.) : | 435.00 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 2.70E-06 | ft./min. |
| 4.49E-08 | ft./sec. |
| 3.88E-03 | ft./day |
| 1.37E-06 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: CRANE WELL/BORING NO.: 13MW702

PROJECT NO.: 9060 CTO 0279 GEOLOGIST: BOB BAUKOVEC

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' / 29.54' T.D. TEST NO.:

STATIC WATER LEVEL (Depth/Elevation): 17.10 DATE: 5/10/03

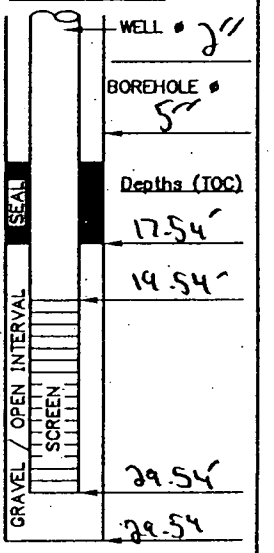
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: 1.25" x 61.5" SOLID SLUG PAGE ..... OF .....

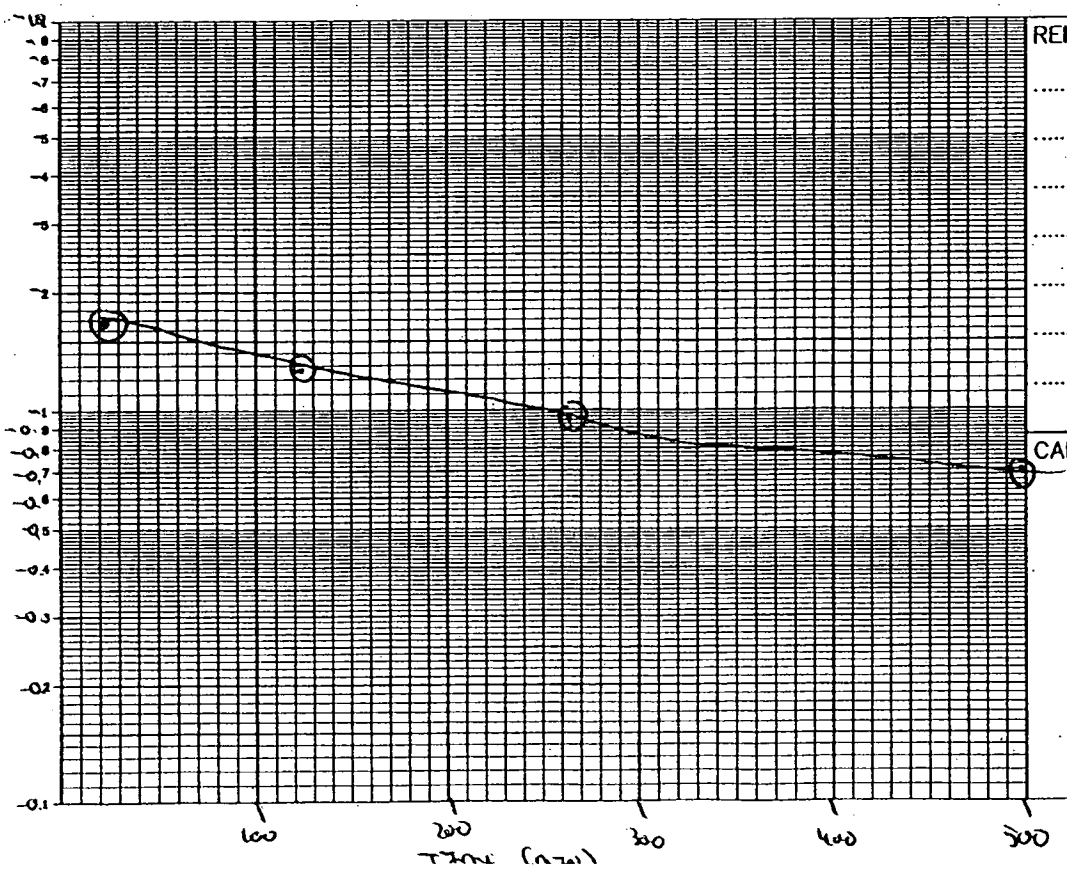
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30PSI

| ELAPSED TIME (min or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 10.437 | 0 | | | |
| 0.1 | 8.799 | -2.638 | | | |
| 0.21 | 9.065 | -1.872 | | | |
| 1.04 | 9.08 | -1.857 | | | |
| 7.035 | 9.154 | -1.783 | | | |
| 25.05 | 9.277 | -1.66 | | | |
| 79.35 | 9.522 | -1.415 | | | |
| 125.81 | 9.673 | -1.264 | | | |
| 265.98 | 9.977 | -0.96 | | | |
| 501.08 | 10.243 | -0.694 | | | |
| 744.21 | 10.424 | -0.513 | | | |
| | | | | | |

WELL SCHEMATIC



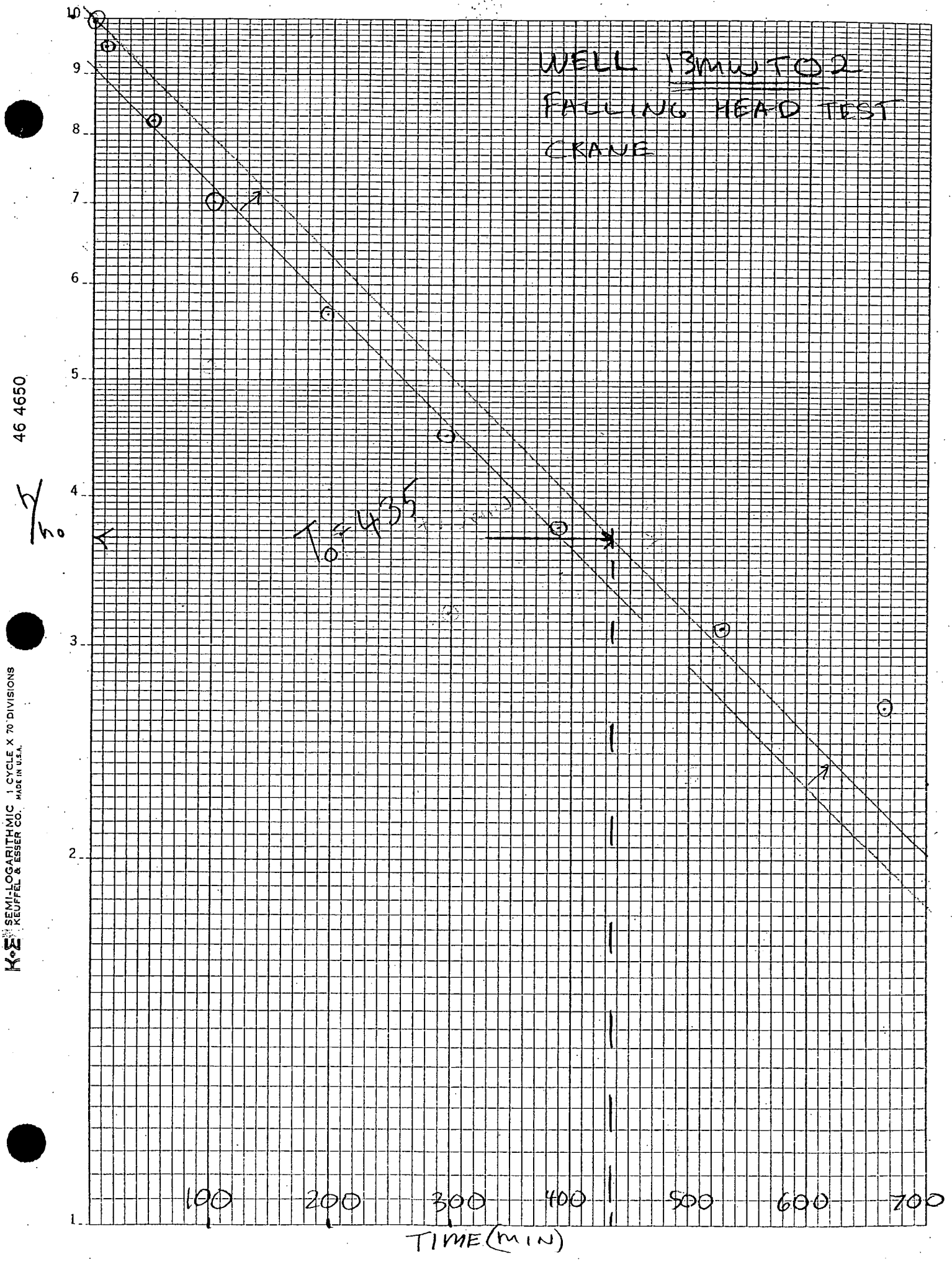

▽ Indicate SWL Depth on Drawing




REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL


WELL 13MW TO2
FALLING HEAD TEST
CRANE
$T_0 = 435$
$h/h_0$
10
9
8
7
6
5
4
3
2
1
100
200
300
400
500
600
700
TIME (MIN)
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 5/11/2003 16:15:41
Report from file: ...\SN09018 2003-05-10 090719 13MWT02 Falling.bin
Win-Situ Version 4.41

Serial number: 9018
Firmware Version 3.06
Unit name:

Test name: 13MWT02 Falling

Test defined on: 5/10/2003 9:06:57
Test started on: 5/10/2003 9:07:19
Test stopped on: N/A N/A
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time betw Seconds.
Number of data san 193

TOTAL DATA SAMPI 193

Channel number [1]
Measurement type: Temperature
Channel name: Temperature

Channel number [2]
Measurement type: Pressure
Channel name: Depth
Sensor Range: 30 PSIG.
Specific gravity: 1

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Displacement Feet | Adjusted time | h/ho | ho= 1.624 |
|---|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 9:07:19 | 0 | 0 | 55.38 | 10.774 | 0 | 0.065 | | |
| 5/10/2003 | 9:07:20 | 0.3 | 0.005 | 55.42 | 10.774 | 0 | | | |
| 5/10/2003 | 9:07:20 | 0.6 | 0.01 | 55.45 | 10.774 | 0 | | | |
| 5/10/2003 | 9:07:20 | 0.9 | 0.015 | 55.45 | 10.774 | 0 | | | |
| 5/10/2003 | 9:07:20 | 1.2 | 0.02 | 55.45 | 10.774 | 0 | | | |
| 5/10/2003 | 9:07:21 | 1.5 | 0.025 | 55.47 | 10.794 | 0.02 | | | |
| 5/10/2003 | 9:07:21 | 1.8 | 0.03 | 55.47 | 10.806 | 0.032 | | | |
| 5/10/2003 | 9:07:21 | 2.1 | 0.035 | 55.47 | 10.935 | 0.161 | | | |
| 5/10/2003 | 9:07:22 | 2.4 | 0.04 | 55.47 | 12.92 | 2.146 | | | |
| 5/10/2003 | 9:07:22 | 2.7 | 0.045 | 55.47 | 13.002 | 2.228 | | | |
| 5/10/2003 | 9:07:22 | 3 | 0.05 | 55.47 | 12.596 | 1.822 | | | |
| 5/10/2003 | 9:07:23 | 3.3 | 0.055 | 55.47 | 13.189 | 2.415 | | | |
| 5/10/2003 | 9:07:23 | 3.6 | 0.06 | 55.49 | 12.471 | 1.697 | | | |
| 5/10/2003 | 9:07:23 | 3.9 | 0.065 | 55.49 | 13.048 | 2.274 | | | |
| 5/10/2003 | 9:07:23 | 4.2 | 0.07 | 55.49 | 12.77 | 1.996 | | | |
| 5/10/2003 | 9:07:24 | 4.5 | 0.075 | 55.49 | 12.925 | 2.151 | | | |
| 5/10/2003 | 9:07:24 | 4.8 | 0.08 | 55.49 | 12.322 | 1.548 | | | |
| 5/10/2003 | 9:07:24 | 5.1 | 0.085 | 55.49 | 12.55 | 1.776 | | | |
| 5/10/2003 | 9:07:25 | 5.4 | 0.09 | 55.49 | 12.65 | 1.876 | | | |
| 5/10/2003 | 9:07:25 | 5.7 | 0.095 | 55.49 | 12.699 | 1.925 | | | |
| 5/10/2003 | 9:07:25 | 6 | 0.1 | 55.49 | 12.368 | 1.594 | | | |
| 5/10/2003 | 9:07:26 | 6.4 | 0.106667 | 55.49 | 12.507 | 1.733 | | | |
| 5/10/2003 | 9:07:26 | 6.7 | 0.111667 | 55.49 | 12.384 | 1.61 | | | |
| 5/10/2003 | 9:07:26 | 7.1 | 0.118333 | 55.49 | 12.504 | 1.73 | | | |
| 5/10/2003 | 9:07:27 | 7.5 | 0.125 | 55.49 | 12.463 | 1.689 | | | |
| 5/10/2003 | 9:07:27 | 8 | 0.133333 | 55.49 | 12.465 | 1.691 | | | |
| 5/10/2003 | 9:07:28 | 8.4 | 0.14 | 55.49 | 12.471 | 1.697 | | | |
| 5/10/2003 | 9:07:28 | 8.9 | 0.148333 | 55.49 | 12.467 | 1.693 | | | |
| 5/10/2003 | 9:07:29 | 9.5 | 0.158333 | 55.49 | 12.467 | 1.693 | | | |
| 5/10/2003 | 9:07:29 | 10 | 0.166667 | 55.47 | 12.465 | 1.691 | | | |
| 5/10/2003 | 9:07:30 | 10.6 | 0.176667 | 55.47 | 12.457 | 1.683 | | | |
| 5/10/2003 | 9:07:31 | 11.3 | 0.188333 | 55.47 | 12.459 | 1.685 | | | |
| 5/10/2003 | 9:07:31 | 11.9 | 0.198333 | 55.47 | 12.457 | 1.683 | | | |
| 5/10/2003 | 9:07:32 | 12.6 | 0.21 | 55.47 | 12.455 | 1.681 | | | |
| 5/10/2003 | 9:07:33 | 13.4 | 0.223333 | 55.45 | 12.455 | 1.681 | | | |
| 5/10/2003 | 9:07:33 | 14.2 | 0.236667 | 55.47 | 12.453 | 1.679 | | | |
| 5/10/2003 | 9:07:34 | 15 | 0.25 | 55.45 | 12.451 | 1.677 | | | |
| 5/10/2003 | 9:07:35 | 15.9 | 0.265 | 55.45 | 12.451 | 1.677 | | | |
| 5/10/2003 | 9:07:36 | 16.8 | 0.28 | 55.45 | 12.451 | 1.677 | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 9:07:37 | 17.8 | 0.296667 | 55.45 | 12.451 | 1.677 | | |
| 5/10/2003 | 9:07:38 | 18.9 | 0.315 | 55.45 | 12.447 | 1.673 | | |
| 5/10/2003 | 9:07:39 | 20 | 0.333333 | 55.45 | 12.447 | 1.673 | | |
| 5/10/2003 | 9:07:40 | 21.2 | 0.353333 | 55.45 | 12.447 | 1.673 | | |
| 5/10/2003 | 9:07:42 | 22.4 | 0.373333 | 55.45 | 12.445 | 1.671 | | |
| 5/10/2003 | 9:07:43 | 23.8 | 0.396667 | 55.45 | 12.445 | 1.671 | | |
| 5/10/2003 | 9:07:44 | 25.2 | 0.42 | 55.45 | 12.445 | 1.671 | | |
| 5/10/2003 | 9:07:46 | 26.7 | 0.445 | 55.45 | 12.441 | 1.667 | | |
| 5/10/2003 | 9:07:47 | 28.2 | 0.47 | 55.45 | 12.441 | 1.667 | | |
| 5/10/2003 | 9:07:49 | 29.8 | 0.496667 | 55.45 | 12.441 | 1.667 | | |
| 5/10/2003 | 9:07:51 | 31.5 | 0.525 | 55.45 | 12.439 | 1.665 | | |
| 5/10/2003 | 9:07:53 | 33.3 | 0.555 | 55.45 | 12.439 | 1.665 | | |
| 5/10/2003 | 9:07:54 | 35.2 | 0.586667 | 55.45 | 12.437 | 1.663 | | |
| 5/10/2003 | 9:07:57 | 37.3 | 0.621667 | 55.45 | 12.439 | 1.665 | | |
| 5/10/2003 | 9:07:59 | 39.5 | 0.658333 | 55.45 | 12.435 | 1.661 | | |
| 5/10/2003 | 9:08:01 | 41.8 | 0.696667 | 55.45 | 12.435 | 1.661 | | |
| 5/10/2003 | 9:08:04 | 44.3 | 0.738333 | 55.45 | 12.435 | 1.661 | | |
| 5/10/2003 | 9:08:06 | 46.9 | 0.781667 | 55.45 | 12.433 | 1.659 | | |
| 5/10/2003 | 9:08:09 | 49.7 | 0.828333 | 55.45 | 12.433 | 1.659 | | |
| 5/10/2003 | 9:08:12 | 52.6 | 0.876667 | 55.45 | 12.43 | 1.656 | | |
| 5/10/2003 | 9:08:15 | 55.7 | 0.928333 | 55.45 | 12.428 | 1.654 | | |
| 5/10/2003 | 9:08:18 | 59 | 0.983333 | 55.45 | 12.43 | 1.656 | | |
| 5/10/2003 | 9:08:22 | 62.5 | 1.041667 | 55.42 | 12.429 | 1.655 | | |
| 5/10/2003 | 9:08:25 | 66.2 | 1.103333 | 55.42 | 12.427 | 1.653 | | |
| 5/10/2003 | 9:08:29 | 70.1 | 1.168333 | 55.42 | 12.425 | 1.651 | | |
| 5/10/2003 | 9:08:34 | 74.3 | 1.238333 | 55.45 | 12.424 | 1.65 | | |
| 5/10/2003 | 9:08:38 | 78.7 | 1.311667 | 55.42 | 12.416 | 1.642 | | |
| 5/10/2003 | 9:08:43 | 83.4 | 1.39 | 55.45 | 12.428 | 1.654 | | |
| 5/10/2003 | 9:08:48 | 88.4 | 1.473333 | 55.45 | 12.433 | 1.659 | | |
| 5/10/2003 | 9:08:53 | 93.7 | 1.561667 | 55.47 | 12.432 | 1.658 | | |
| 5/10/2003 | 9:08:59 | 99.3 | 1.655 | 55.47 | 12.434 | 1.66 | | |
| 5/10/2003 | 9:09:04 | 105.2 | 1.753333 | 55.47 | 12.426 | 1.652 | | |
| 5/10/2003 | 9:09:11 | 111.5 | 1.858333 | 55.42 | 12.414 | 1.64 | | |
| 5/10/2003 | 9:09:17 | 118.1 | 1.968333 | 55.42 | 12.412 | 1.638 | | |
| 5/10/2003 | 9:09:24 | 125.1 | 2.085 | 55.42 | 12.41 | 1.636 | | |
| 5/10/2003 | 9:09:32 | 132.6 | 2.21 | 55.42 | 12.41 | 1.636 | | |
| 5/10/2003 | 9:09:40 | 140.5 | 2.341667 | 55.42 | 12.408 | 1.634 | | |
| 5/10/2003 | 9:09:48 | 148.9 | 2.481667 | 55.42 | 12.406 | 1.632 | | |
| 5/10/2003 | 9:09:57 | 157.8 | 2.63 | 55.42 | 12.406 | 1.632 | | |
| 5/10/2003 | 9:10:06 | 167.2 | 2.786667 | 55.42 | 12.402 | 1.628 | | |
| 5/10/2003 | 9:10:16 | 177.2 | 2.953333 | 55.42 | 12.4 | 1.626 | Adjusted time | h/ho |
| 5/10/2003 | 9:10:27 | 187.8 | 3.13 | 55.42 | 12.398 | 1.624 | 0.000 | 1.000 |
| 5/10/2003 | 9:10:38 | 199 | 3.316667 | 55.42 | 12.396 | 1.622 | 0.187 | 0.999 |
| 5/10/2003 | 9:10:50 | 210.9 | 3.515 | 55.42 | 12.396 | 1.622 | 0.385 | 0.999 |
| 5/10/2003 | 9:11:03 | 223.5 | 3.725 | 55.42 | 12.393 | 1.619 | 0.595 | 0.997 |
| 5/10/2003 | 9:11:16 | 236.8 | 3.946667 | 55.42 | 12.389 | 1.615 | 0.817 | 0.994 |
| 5/10/2003 | 9:11:30 | 250.9 | 4.181667 | 55.42 | 12.387 | 1.613 | 1.052 | 0.993 |
| 5/10/2003 | 9:11:45 | 265.8 | 4.43 | 55.42 | 12.385 | 1.611 | 1.300 | 0.992 |
| 5/10/2003 | 9:12:01 | 281.6 | 4.693333 | 55.42 | 12.381 | 1.607 | 1.563 | 0.990 |
| 5/10/2003 | 9:12:18 | 298.4 | 4.973333 | 55.4 | 12.379 | 1.605 | 1.843 | 0.988 |
| 5/10/2003 | 9:12:35 | 316.2 | 5.27 | 55.4 | 12.375 | 1.601 | 2.140 | 0.986 |
| 5/10/2003 | 9:12:54 | 335 | 5.583333 | 55.4 | 12.373 | 1.599 | 2.453 | 0.985 |
| 5/10/2003 | 9:13:14 | 354.9 | 5.915 | 55.4 | 12.369 | 1.595 | 2.785 | 0.982 |
| 5/10/2003 | 9:13:35 | 376 | 6.266667 | 55.4 | 12.365 | 1.591 | 3.137 | 0.980 |
| 5/10/2003 | 9:13:58 | 398.4 | 6.64 | 55.4 | 12.363 | 1.589 | 3.510 | 0.978 |
| 5/10/2003 | 9:14:21 | 422.1 | 7.035 | 55.38 | 12.361 | 1.587 | 3.905 | 0.977 |
| 5/10/2003 | 9:14:46 | 447.2 | 7.453333 | 55.38 | 12.355 | 1.581 | 4.323 | 0.974 |
| 5/10/2003 | 9:15:13 | 473.8 | 7.896667 | 55.38 | 12.353 | 1.579 | 4.767 | 0.972 |
| 5/10/2003 | 9:15:41 | 502 | 8.366667 | 55.38 | 12.349 | 1.575 | 5.237 | 0.970 |
| 5/10/2003 | 9:16:11 | 531.9 | 8.865 | 55.38 | 12.344 | 1.57 | 5.735 | 0.967 |
| 5/10/2003 | 9:16:43 | 563.5 | 9.391667 | 55.38 | 12.34 | 1.566 | 6.262 | 0.964 |
| 5/10/2003 | 9:17:16 | 597 | 9.95 | 55.38 | 12.336 | 1.562 | 6.820 | 0.962 |
| 5/10/2003 | 9:17:52 | 632.5 | 10.54167 | 55.38 | 12.332 | 1.558 | 7.412 | 0.959 |
| 5/10/2003 | 9:18:29 | 670.1 | 11.16833 | 55.36 | 12.326 | 1.552 | 8.038 | 0.956 |
| 5/10/2003 | 9:19:09 | 709.9 | 11.83167 | 55.36 | 12.322 | 1.548 | 8.702 | 0.953 |
| 5/10/2003 | 9:19:51 | 752.1 | 12.535 | 55.36 | 12.316 | 1.542 | 9.405 | 0.950 |
| 5/10/2003 | 9:20:36 | 796.8 | 13.28 | 55.36 | 12.312 | 1.538 | 10.150 | 0.947 |
| 5/10/2003 | 9:21:23 | 844.2 | 14.07 | 55.36 | 12.305 | 1.531 | 10.940 | 0.943 |
| 5/10/2003 | 9:22:14 | 894.4 | 14.90667 | 55.36 | 12.301 | 1.527 | 11.777 | 0.940 |
| 5/10/2003 | 9:23:07 | 947.5 | 15.79167 | 55.36 | 12.295 | 1.521 | 12.662 | 0.937 |
| 5/10/2003 | 9:24:03 | 1003.8 | 16.73 | 55.36 | 12.289 | 1.515 | 13.600 | 0.933 |
| 5/10/2003 | 9:25:03 | 1063.4 | 17.72333 | 55.36 | 12.282 | 1.508 | 14.593 | 0.929 |
| 5/10/2003 | 9:26:06 | 1126.6 | 18.77667 | 55.38 | 12.276 | 1.502 | 15.647 | 0.925 |
| 5/10/2003 | 9:27:13 | 1193.5 | 19.89167 | 55.38 | 12.27 | 1.496 | 16.762 | 0.921 |
| 5/10/2003 | 9:28:24 | 1264.4 | 21.07333 | 55.38 | 12.261 | 1.487 | 17.943 | 0.916 |
| 5/10/2003 | 9:29:39 | 1339.5 | 22.325 | 55.4 | 12.255 | 1.481 | 19.195 | 0.912 |
| 5/10/2003 | 9:30:58 | 1419 | 23.65 | 55.38 | 12.247 | 1.473 | 20.520 | 0.907 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 9:32:23 | 1503.3 | 25.055 | 55.38 | 12.239 | 1.465 | 21.925 | 0.902 |
| 5/10/2003 | 9:33:52 | 1592.6 | 26.54333 | 55.38 | 12.23 | 1.456 | 23.413 | 0.897 |
| 5/10/2003 | 9:35:26 | 1687.1 | 28.11833 | 55.38 | 12.222 | 1.448 | 24.988 | 0.892 |
| 5/10/2003 | 9:37:06 | 1787.2 | 29.78667 | 55.4 | 12.213 | 1.439 | 26.657 | 0.886 |
| 5/10/2003 | 9:38:53 | 1893.3 | 31.555 | 55.42 | 12.203 | 1.429 | 28.425 | 0.880 |
| 5/10/2003 | 9:40:45 | 2005.7 | 33.42833 | 55.42 | 12.194 | 1.42 | 30.298 | 0.874 |
| 5/10/2003 | 9:42:44 | 2124.7 | 35.41167 | 55.42 | 12.186 | 1.412 | 32.282 | 0.869 |
| 5/10/2003 | 9:44:50 | 2250.8 | 37.51333 | 55.45 | 12.175 | 1.401 | 34.383 | 0.863 |
| 5/10/2003 | 9:47:04 | 2384.4 | 39.74 | 55.47 | 12.165 | 1.391 | 36.610 | 0.857 |
| 5/10/2003 | 9:49:25 | 2525.9 | 42.09833 | 55.47 | 12.154 | 1.38 | 38.968 | 0.850 |
| 5/10/2003 | 9:51:55 | 2675.8 | 44.59667 | 55.49 | 12.144 | 1.37 | 41.467 | 0.844 |
| 5/10/2003 | 9:54:34 | 2834.6 | 47.24333 | 55.49 | 12.131 | 1.357 | 44.113 | 0.836 |
| 5/10/2003 | 9:57:22 | 3002.8 | 50.04667 | 55.49 | 12.119 | 1.345 | 46.917 | 0.828 |
| 5/10/2003 | 10:00:20 | 3180.9 | 53.015 | 55.47 | 12.107 | 1.333 | 49.885 | 0.821 |
| 5/10/2003 | 10:03:29 | 3369.6 | 56.16 | 55.47 | 12.092 | 1.318 | 53.030 | 0.812 |
| 5/10/2003 | 10:06:49 | 3569.5 | 59.49167 | 55.45 | 12.08 | 1.306 | 56.362 | 0.804 |
| 5/10/2003 | 10:10:20 | 3781.2 | 63.02 | 55.45 | 12.065 | 1.291 | 59.890 | 0.795 |
| 5/10/2003 | 10:14:05 | 4005.5 | 66.75833 | 55.45 | 12.051 | 1.277 | 63.628 | 0.786 |
| 5/10/2003 | 10:18:02 | 4243.1 | 70.71833 | 55.45 | 12.034 | 1.26 | 67.588 | 0.776 |
| 5/10/2003 | 10:22:14 | 4494.7 | 74.91167 | 55.49 | 12.019 | 1.245 | 71.782 | 0.767 |
| 5/10/2003 | 10:26:41 | 4761.3 | 79.355 | 55.49 | 12.003 | 1.229 | 76.225 | 0.757 |
| 5/10/2003 | 10:31:23 | 5043.7 | 84.06167 | 55.47 | 11.988 | 1.214 | 80.932 | 0.748 |
| 5/10/2003 | 10:36:22 | 5342.8 | 89.04667 | 55.47 | 11.97 | 1.196 | 85.917 | 0.736 |
| 5/10/2003 | 10:41:39 | 5659.6 | 94.32667 | 55.45 | 11.951 | 1.177 | 91.197 | 0.725 |
| 5/10/2003 | 10:47:14 | 5995.2 | 99.92 | 55.42 | 11.933 | 1.159 | 96.790 | 0.714 |
| 5/10/2003 | 10:53:10 | 6350.7 | 105.845 | 55.4 | 11.917 | 1.143 | 102.715 | 0.704 |
| 5/10/2003 | 10:59:26 | 6727.2 | 112.12 | 55.38 | 11.896 | 1.122 | 108.990 | 0.691 |
| 5/10/2003 | 11:06:05 | 7126.1 | 118.7683 | 55.38 | 11.88 | 1.106 | 115.638 | 0.681 |
| 5/10/2003 | 11:13:08 | 7548.6 | 125.81 | 55.36 | 11.861 | 1.087 | 122.680 | 0.669 |
| 5/10/2003 | 11:20:35 | 7996.1 | 133.2683 | 55.38 | 11.842 | 1.068 | 130.138 | 0.658 |
| 5/10/2003 | 11:28:29 | 8470.1 | 141.1683 | 55.38 | 11.82 | 1.046 | 138.038 | 0.644 |
| 5/10/2003 | 11:36:51 | 8972.2 | 149.5367 | 55.38 | 11.799 | 1.025 | 146.407 | 0.631 |
| 5/10/2003 | 11:45:43 | 9504.1 | 158.4017 | 55.36 | 11.778 | 1.004 | 155.272 | 0.618 |
| 5/10/2003 | 11:55:07 | 10067.5 | 167.7917 | 55.4 | 11.761 | 0.987 | 164.662 | 0.608 |
| 5/10/2003 | 12:05:04 | 10664.3 | 177.7383 | 55.38 | 11.739 | 0.965 | 174.608 | 0.594 |
| 5/10/2003 | 12:15:36 | 11296.5 | 188.275 | 55.4 | 11.718 | 0.944 | 185.145 | 0.581 |
| 5/10/2003 | 12:26:45 | 11966.1 | 199.435 | 55.38 | 11.695 | 0.921 | 196.305 | 0.567 |
| 5/10/2003 | 12:38:35 | 12675.4 | 211.2567 | 55.4 | 11.674 | 0.9 | 208.127 | 0.554 |
| 5/10/2003 | 12:51:06 | 13426.7 | 223.7783 | 55.36 | 11.646 | 0.872 | 220.648 | 0.537 |
| 5/10/2003 | 13:04:22 | 14222.6 | 237.0433 | 55.38 | 11.625 | 0.851 | 233.913 | 0.524 |
| 5/10/2003 | 13:18:25 | 15065.6 | 251.0933 | 55.38 | 11.591 | 0.817 | 247.963 | 0.503 |
| 5/10/2003 | 13:33:18 | 15958.6 | 265.9767 | 55.36 | 11.561 | 0.787 | 262.847 | 0.485 |
| 5/10/2003 | 13:49:04 | 16904.5 | 281.7417 | 55.36 | 11.536 | 0.762 | 278.612 | 0.469 |
| 5/10/2003 | 14:05:46 | 17906.4 | 298.44 | 55.4 | 11.508 | 0.734 | 295.310 | 0.452 |
| 5/10/2003 | 14:23:27 | 18967.7 | 316.1283 | 55.33 | 11.484 | 0.71 | 312.998 | 0.437 |
| 5/10/2003 | 14:42:11 | 20091.9 | 334.865 | 55.29 | 11.46 | 0.686 | 331.735 | 0.422 |
| 5/10/2003 | 15:02:02 | 21282.7 | 354.7117 | 55.31 | 11.435 | 0.661 | 351.582 | 0.407 |
| 5/10/2003 | 15:23:03 | 22544.1 | 375.735 | 55.29 | 11.414 | 0.64 | 372.605 | 0.394 |
| 5/10/2003 | 15:45:19 | 23880.2 | 398.0033 | 55.29 | 11.39 | 0.616 | 394.873 | 0.379 |
| 5/10/2003 | 16:08:55 | 25295.5 | 421.5917 | 55.33 | 11.37 | 0.596 | 418.462 | 0.367 |
| 5/10/2003 | 16:33:54 | 26794.7 | 446.5783 | 55.29 | 11.35 | 0.576 | 443.448 | 0.355 |
| 5/10/2003 | 17:00:22 | 28382.7 | 473.045 | 55.31 | 11.329 | 0.555 | 469.915 | 0.342 |
| 5/10/2003 | 17:28:24 | 30064.8 | 501.08 | 55.33 | 11.308 | 0.534 | 497.950 | 0.329 |
| 5/10/2003 | 17:58:06 | 31846.6 | 530.7767 | 55.33 | 11.283 | 0.509 | 527.647 | 0.313 |
| 5/10/2003 | 18:29:33 | 33734 | 562.2333 | 55.36 | 11.262 | 0.488 | 559.103 | 0.300 |
| 5/10/2003 | 19:02:52 | 35733.2 | 595.5533 | 55.36 | 11.243 | 0.469 | 592.423 | 0.289 |
| 5/10/2003 | 19:38:10 | 37850.9 | 630.8483 | 55.31 | 11.227 | 0.453 | 627.718 | 0.279 |
| 5/10/2003 | 20:15:33 | 40094 | 668.2333 | 55.33 | 11.208 | 0.434 | 665.103 | 0.267 |
| 5/10/2003 | 20:55:09 | 42470.1 | 707.835 | 55.36 | 11.187 | 0.413 | 704.705 | 0.254 |
| 5/10/2003 | 21:37:06 | 44987 | 749.7833 | 55.31 | 11.171 | 0.397 | 746.653 | 0.244 |
| 5/10/2003 | 22:21:32 | 47653 | 794.2167 | 55.33 | 11.157 | 0.383 | 791.087 | 0.236 |
| 5/10/2003 | 23:08:36 | 50477 | 841.2833 | 55.33 | 11.14 | 0.366 | 838.153 | 0.225 |
| 5/10/2003 | 23:58:28 | 53468.3 | 891.1383 | 55.36 | 11.144 | 0.37 | 888.008 | 0.228 |
| 5/11/2003 | 0:51:16 | 56636.8 | 943.9467 | 55.33 | 11.136 | 0.362 | 940.817 | 0.223 |
| 5/11/2003 | 1:47:12 | 59993.1 | 999.885 | 55.36 | 11.138 | 0.364 | 996.755 | 0.224 |
| 5/11/2003 | 2:46:28 | 63548.3 | 1059.138 | 55.22 | 11.137 | 0.363 | 1056.008 | 0.224 |
| 5/11/2003 | 3:46:28 | 67148.3 | 1119.138 | 55.29 | 11.124 | 0.35 | 1116.008 | 0.216 |
| 5/11/2003 | 4:46:28 | 70748.3 | 1179.138 | 55.31 | 11.115 | 0.341 | 1176.008 | 0.210 |
| 5/11/2003 | 5:46:28 | 74348.3 | 1239.138 | 55.31 | 11.103 | 0.329 | 1236.008 | 0.203 |
| 5/11/2003 | 6:46:28 | 77948.3 | 1299.138 | 55.33 | 11.078 | 0.304 | 1296.008 | 0.187 |
| 5/11/2003 | 7:46:28 | 81548.3 | 1359.138 | 55.36 | 11.053 | 0.279 | 1356.008 | 0.172 |
| 5/11/2003 | 8:46:28 | 85148.3 | 1419.138 | 55.33 | 11.028 | 0.254 | 1416.008 | 0.156 |
| 5/11/2003 | 9:46:28 | 88748.3 | 1479.138 | 55.33 | 11.003 | 0.229 | 1476.008 | 0.141 |
| 5/11/2003 | 10:46:28 | 92348.3 | 1539.138 | 55.36 | 10.98 | 0.206 | 1536.008 | 0.127 |
| 5/11/2003 | 11:46:28 | 95948.3 | 1599.138 | 55.33 | 10.957 | 0.183 | 1596.008 | 0.113 |
| 5/11/2003 | 12:46:28 | 99548.3 | 1659.138 | 55.33 | 10.943 | 0.169 | 1656.008 | 0.104 |
| 5/11/2003 | 13:46:28 | 103148.3 | 1719.138 | 55.33 | 10.926 | 0.152 | 1716.008 | 0.094 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 13MWT02 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Rising head | **Test Date:** | 10-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RMB 6/23/03

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 2.5 | = R |
| Length of Well Screen (ft.) : | 12 | = L |
| Time for 37% head change (min.) : | 560.00 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 2.09E-06 | ft./min. |
| 3.49E-08 | ft./sec. |
| 3.02E-03 | ft./day |
| 1.06E-06 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: CRANE WELL/BORING NO.: 13MW102

PROJECT NO.: 9060 CTO 0279 GEOLOGIST: BOB BALKOVEC

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' / 29.54' TOC TEST NO.:

STATIC WATER LEVEL (Depth/Elevation): 17.21' DATE: 5/10/03

TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

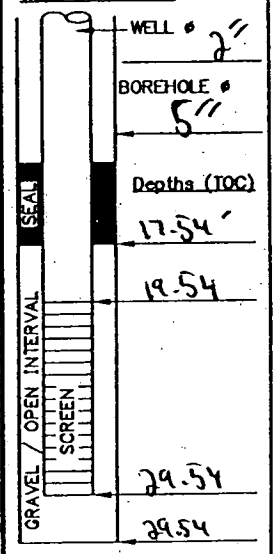
METHOD OF INDUCING WATER LEVEL CHANGE: 1.25" x 61.5" SOLID SLUG PAGE ..... OF .....

REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30 PSI

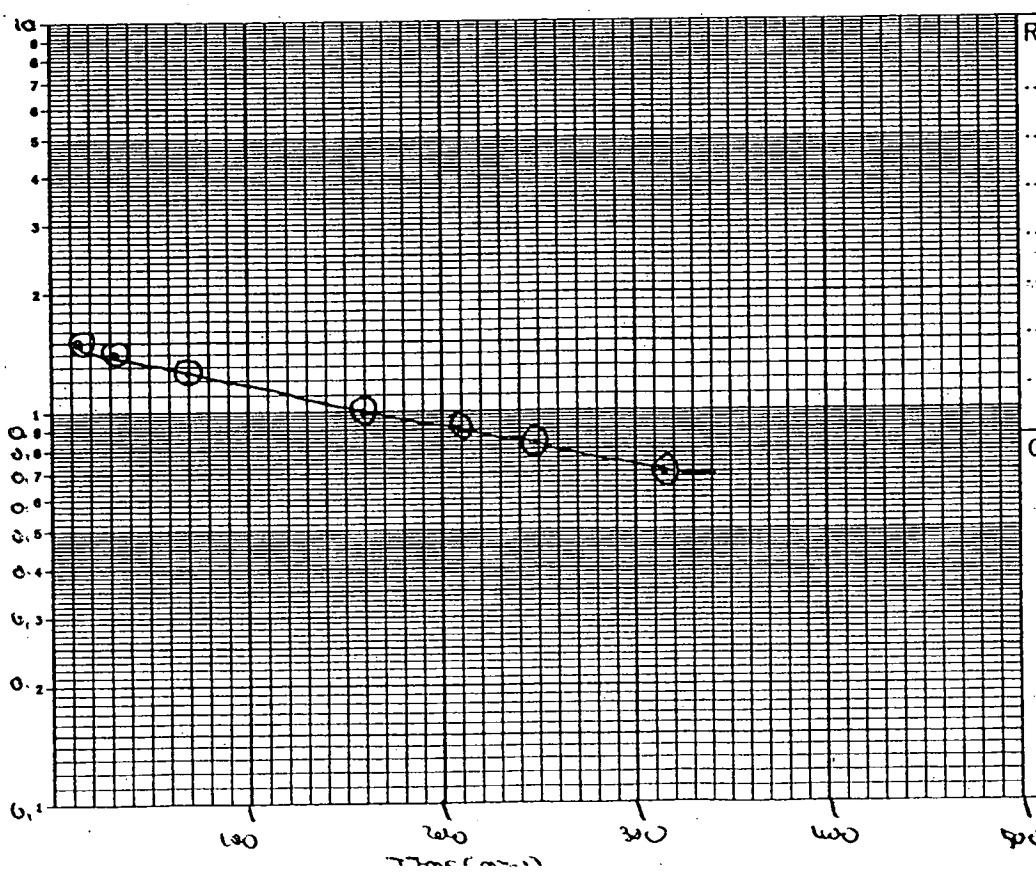
ACAD:FORM_HYDCONTST.dwg 07/06/99 INL

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 10.774 | 0 | 530.77 | 11.283 | +0.509 |
| 0.04 | 12.42 | +2.146 | 1714.13 | 10.926 | +0.152 |
| 0.055 | 13.189 | +2.415 | | | |
| 0.1 | 12.368 | +1.594 | | | |
| 0.21 | 12.455 | +1.681 | | | |
| 18.77 | 12.276 | +1.502 | | | |
| 33.43 | 12.194 | +1.42 | | | |
| 70.72 | 12.034 | +1.26 | | | |
| 158.4 | 11.778 | +1.004 | | | |
| 211.25 | 11.674 | +0.9 | | | |
| 251.0 | 11.541 | +0.817 | | | |
| 316.12 | 11.484 | +0.71 | | | |

WELL SCHEMATIC

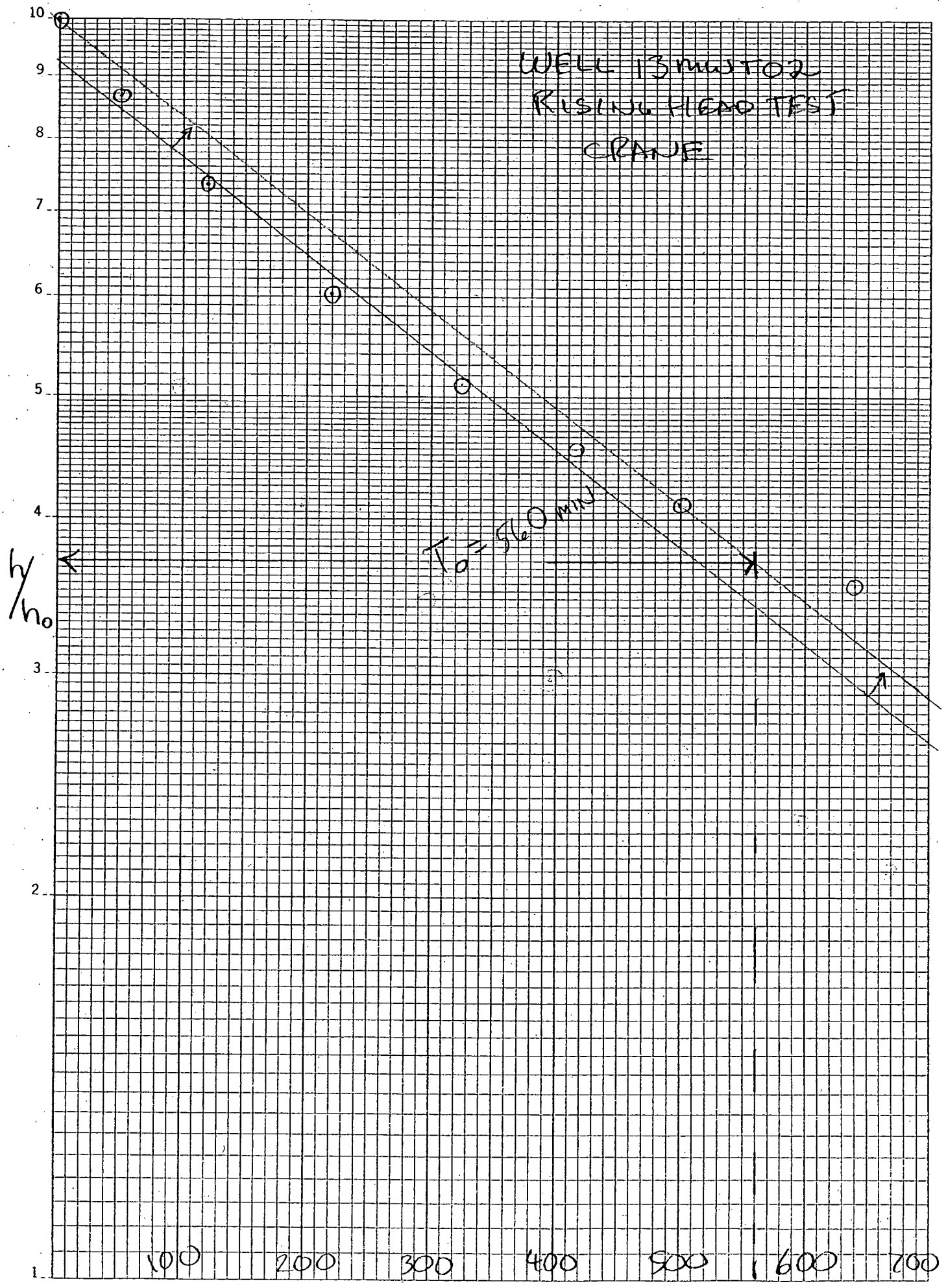



▽ Indicate SWL Depth on Drawing




REMARKS:

CALCS, SKETCH MAPS, ETC.:




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report gen 5/19/2003 11:10:19
Report fror ...\SN09018 2003-05-11 145001 13MWT02 Rising.bin
Win-Situ V 4.41

Serial num 9018
Firmware \ 3.06
Unit name:

Test name: 13MWT02 Riosing

Test define 5/11/2003 14:46:11
Test starte 5/11/2003 14:50:01
Test stopp N/A N/A
Test extrac N/A N/A

Data gathered using Logarithmic testing
Maximun Seconds.
Number ( 191

TOTAL DA 191

Channel number [1]
Measuren Temperature
Channel r Temperature

Channel number [2]
Measuren Pressure
Channel r Depth
Sensor R 30 PSIG.
Specific g 1

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Displacement Feet | time (min) | h/ho | ho= -1.632 |
|---|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 14:50:01 | 0 | 0 | 55.33 | 10.937 | 0 | | | |
| 5/11/2003 | 14:50:01 | 0.3 | 0.005 | 55.38 | 10.937 | 0 | | | |
| 5/11/2003 | 14:50:01 | 0.6 | 0.01 | 55.38 | 10.937 | 0 | | | |
| 5/11/2003 | 14:50:02 | 0.9 | 0.015 | 55.4 | 10.937 | 0 | | | |
| 5/11/2003 | 14:50:02 | 1.2 | 0.02 | 55.4 | 10.937 | 0 | | | |
| 5/11/2003 | 14:50:02 | 1.5 | 0.025 | 55.4 | 10.937 | 0 | | | |
| 5/11/2003 | 14:50:02 | 1.8 | 0.03 | 55.42 | 10.937 | 0 | | | |
| 5/11/2003 | 14:50:03 | 2.1 | 0.035 | 55.42 | 10.937 | 0 | | | |
| 5/11/2003 | 14:50:03 | 2.4 | 0.04 | 55.42 | 10.937 | 0 | | | |
| 5/11/2003 | 14:50:03 | 2.7 | 0.045 | 55.42 | 10.937 | 0 | | | |
| 5/11/2003 | 14:50:04 | 3 | 0.05 | 55.42 | 10.937 | 0 | | | |
| 5/11/2003 | 14:50:04 | 3.3 | 0.055 | 55.42 | 10.937 | 0 | | | |
| 5/11/2003 | 14:50:04 | 3.6 | 0.06 | 55.42 | 10.937 | 0 | | | |
| 5/11/2003 | 14:50:05 | 3.9 | 0.065 | 55.42 | 10.732 | -0.205 | | | |
| 5/11/2003 | 14:50:05 | 4.2 | 0.07 | 55.42 | 9.506 | -1.431 | | | |
| 5/11/2003 | 14:50:05 | 4.5 | 0.075 | 55.42 | 10.023 | -0.914 | | | |
| 5/11/2003 | 14:50:05 | 4.8 | 0.08 | 55.42 | 10.255 | -0.682 | | | |
| 5/11/2003 | 14:50:06 | 5.1 | 0.085 | 55.42 | 10.498 | -0.439 | | | |
| 5/11/2003 | 14:50:06 | 5.4 | 0.09 | 55.45 | 8.467 | -2.47 | | | |
| 5/11/2003 | 14:50:06 | 5.7 | 0.095 | 55.42 | 8.336 | -2.601 | | | |
| 5/11/2003 | 14:50:07 | 6 | 0.1 | 55.45 | 8.299 | -2.638 | | | |
| 5/11/2003 | 14:50:07 | 6.4 | 0.106667 | 55.42 | 8.645 | -2.292 | | | |
| 5/11/2003 | 14:50:07 | 6.7 | 0.111667 | 55.45 | 8.657 | -2.28 | | | |
| 5/11/2003 | 14:50:08 | 7.1 | 0.118333 | 55.45 | 9.014 | -1.923 | | | |
| 5/11/2003 | 14:50:08 | 7.5 | 0.125 | 55.45 | 9.011 | -1.926 | | | |
| 5/11/2003 | 14:50:09 | 8 | 0.133333 | 55.45 | 8.9 | -2.037 | | | |
| 5/11/2003 | 14:50:09 | 8.4 | 0.14 | 55.45 | 8.871 | -2.066 | | | |
| 5/11/2003 | 14:50:10 | 8.9 | 0.148333 | 55.45 | 9.041 | -1.896 | | | |
| 5/11/2003 | 14:50:10 | 9.5 | 0.158333 | 55.45 | 9.118 | -1.819 | | | |
| 5/11/2003 | 14:50:11 | 10 | 0.166667 | 55.42 | 9.112 | -1.825 | | | |
| 5/11/2003 | 14:50:11 | 10.6 | 0.176667 | 55.42 | 9.102 | -1.835 | | | |
| 5/11/2003 | 14:50:12 | 11.3 | 0.188333 | 55.4 | 9.081 | -1.856 | | | |
| 5/11/2003 | 14:50:13 | 11.9 | 0.198333 | 55.4 | 9.071 | -1.866 | | | |
| 5/11/2003 | 14:50:13 | 12.6 | 0.21 | 55.4 | 9.065 | -1.872 | | | |
| 5/11/2003 | 14:50:14 | 13.4 | 0.223333 | 55.4 | 9.048 | -1.889 | | | |
| 5/11/2003 | 14:50:15 | 14.2 | 0.236667 | 55.4 | 9.058 | -1.879 | | | |
| 5/11/2003 | 14:50:16 | 15 | 0.25 | 55.4 | 9.034 | -1.903 | | | |
| 5/11/2003 | 14:50:17 | 15.9 | 0.265 | 55.4 | 9.042 | -1.895 | | | |
| 5/11/2003 | 14:50:17 | 16.8 | 0.28 | 55.4 | 9.052 | -1.885 | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5/11/2003 | 14:50:18 | 17.8 | 0.296667 | 55.4 | 9.052 | -1.885 |
| 5/11/2003 | 14:50:20 | 18.9 | 0.315 | 55.4 | 9.061 | -1.876 |
| 5/11/2003 | 14:50:21 | 20 | 0.333333 | 55.38 | 9.065 | -1.872 |
| 5/11/2003 | 14:50:22 | 21.2 | 0.353333 | 55.4 | 9.063 | -1.874 |
| 5/11/2003 | 14:50:23 | 22.4 | 0.373333 | 55.38 | 9.071 | -1.866 |
| 5/11/2003 | 14:50:24 | 23.8 | 0.396667 | 55.38 | 9.067 | -1.87 |
| 5/11/2003 | 14:50:26 | 25.2 | 0.42 | 55.38 | 9.069 | -1.868 |
| 5/11/2003 | 14:50:27 | 26.7 | 0.445 | 55.38 | 9.067 | -1.87 |
| 5/11/2003 | 14:50:29 | 28.2 | 0.47 | 55.38 | 9.069 | -1.868 |
| 5/11/2003 | 14:50:30 | 29.8 | 0.496667 | 55.38 | 9.073 | -1.864 |
| 5/11/2003 | 14:50:32 | 31.5 | 0.525 | 55.38 | 9.071 | -1.866 |
| 5/11/2003 | 14:50:34 | 33.3 | 0.555 | 55.38 | 9.073 | -1.864 |
| 5/11/2003 | 14:50:36 | 35.2 | 0.586667 | 55.38 | 9.073 | -1.864 |
| 5/11/2003 | 14:50:38 | 37.3 | 0.621667 | 55.38 | 9.073 | -1.864 |
| 5/11/2003 | 14:50:40 | 39.5 | 0.658333 | 55.38 | 9.075 | -1.862 |
| 5/11/2003 | 14:50:42 | 41.8 | 0.696667 | 55.38 | 9.075 | -1.862 |
| 5/11/2003 | 14:50:45 | 44.3 | 0.738333 | 55.38 | 9.077 | -1.86 |
| 5/11/2003 | 14:50:48 | 46.9 | 0.781667 | 55.38 | 9.077 | -1.86 |
| 5/11/2003 | 14:50:50 | 49.7 | 0.828333 | 55.38 | 9.08 | -1.857 |
| 5/11/2003 | 14:50:53 | 52.6 | 0.876667 | 55.38 | 9.082 | -1.855 |
| 5/11/2003 | 14:50:56 | 55.7 | 0.928333 | 55.38 | 9.082 | -1.855 |
| 5/11/2003 | 14:51:00 | 59 | 0.983333 | 55.38 | 9.086 | -1.851 |
| 5/11/2003 | 14:51:03 | 62.5 | 1.041667 | 55.38 | 9.08 | -1.857 |
| 5/11/2003 | 14:51:07 | 66.2 | 1.103333 | 55.38 | 9.086 | -1.851 |
| 5/11/2003 | 14:51:11 | 70.1 | 1.168333 | 55.38 | 9.082 | -1.855 |
| 5/11/2003 | 14:51:15 | 74.3 | 1.238333 | 55.38 | 9.088 | -1.849 |
| 5/11/2003 | 14:51:19 | 78.7 | 1.311667 | 55.38 | 9.092 | -1.845 |
| 5/11/2003 | 14:51:24 | 83.4 | 1.39 | 55.36 | 9.09 | -1.847 |
| 5/11/2003 | 14:51:29 | 88.4 | 1.473333 | 55.36 | 9.096 | -1.841 |
| 5/11/2003 | 14:51:34 | 93.7 | 1.561667 | 55.36 | 9.096 | -1.841 |
| 5/11/2003 | 14:51:40 | 99.3 | 1.655 | 55.4 | 9.104 | -1.833 |
| 5/11/2003 | 14:51:46 | 105.2 | 1.753333 | 55.4 | 9.106 | -1.831 |
| 5/11/2003 | 14:51:52 | 111.5 | 1.858333 | 55.36 | 9.094 | -1.843 |
| 5/11/2003 | 14:51:59 | 118.1 | 1.968333 | 55.36 | 9.103 | -1.834 |
| 5/11/2003 | 14:52:06 | 125.1 | 2.085 | 55.36 | 9.094 | -1.843 |
| 5/11/2003 | 14:52:13 | 132.6 | 2.21 | 55.36 | 9.099 | -1.838 |
| 5/11/2003 | 14:52:21 | 140.5 | 2.341667 | 55.36 | 9.103 | -1.834 |
| 5/11/2003 | 14:52:30 | 148.9 | 2.481667 | 55.36 | 9.107 | -1.83 |
| 5/11/2003 | 14:52:38 | 157.8 | 2.63 | 55.36 | 9.105 | -1.832 |
| 5/11/2003 | 14:52:48 | 167.2 | 2.786667 | 55.36 | 9.109 | -1.828 |
| 5/11/2003 | 14:52:58 | 177.2 | 2.953333 | 55.36 | 9.105 | -1.832 |
| 5/11/2003 | 14:53:08 | 187.8 | 3.13 | 55.36 | 9.107 | -1.83 |
| 5/11/2003 | 14:53:20 | 199 | 3.316667 | 55.36 | 9.113 | -1.824 |
| 5/11/2003 | 14:53:32 | 210.9 | 3.515 | 55.36 | 9.117 | -1.82 |
| 5/11/2003 | 14:53:44 | 223.5 | 3.725 | 55.36 | 9.121 | -1.816 |
| 5/11/2003 | 14:53:57 | 236.8 | 3.946667 | 55.36 | 9.121 | -1.816 |
| 5/11/2003 | 14:54:12 | 250.9 | 4.181667 | 55.36 | 9.117 | -1.82 |
| 5/11/2003 | 14:54:26 | 265.8 | 4.43 | 55.36 | 9.132 | -1.805 |
| 5/11/2003 | 14:54:42 | 281.6 | 4.693333 | 55.36 | 9.132 | -1.805 |
| 5/11/2003 | 14:54:59 | 298.4 | 4.973333 | 55.36 | 9.132 | -1.805 |
| 5/11/2003 | 14:55:17 | 316.2 | 5.27 | 55.38 | 9.138 | -1.799 |
| 5/11/2003 | 14:55:36 | 335 | 5.583333 | 55.38 | 9.14 | -1.797 |
| 5/11/2003 | 14:55:56 | 354.9 | 5.915 | 55.38 | 9.148 | -1.789 |
| 5/11/2003 | 14:56:17 | 376 | 6.266667 | 55.38 | 9.146 | -1.791 |
| 5/11/2003 | 14:56:39 | 398.4 | 6.64 | 55.4 | 9.148 | -1.789 |
| 5/11/2003 | 14:57:03 | 422.1 | 7.035 | 55.4 | 9.154 | -1.783 |
| 5/11/2003 | 14:57:28 | 447.2 | 7.453333 | 55.4 | 9.156 | -1.781 |
| 5/11/2003 | 14:57:54 | 473.8 | 7.896667 | 55.4 | 9.158 | -1.779 |
| 5/11/2003 | 14:58:23 | 502 | 8.366667 | 55.4 | 9.162 | -1.775 |
| 5/11/2003 | 14:58:53 | 531.9 | 8.865 | 55.4 | 9.168 | -1.769 |
| 5/11/2003 | 14:59:24 | 563.5 | 9.391667 | 55.4 | 9.173 | -1.764 |
| 5/11/2003 | 14:59:58 | 597 | 9.95 | 55.42 | 9.176 | -1.761 |
| 5/11/2003 | 15:00:33 | 632.5 | 10.54167 | 55.42 | 9.183 | -1.754 |
| 5/11/2003 | 15:01:11 | 670.1 | 11.16833 | 55.45 | 9.186 | -1.751 |
| 5/11/2003 | 15:01:51 | 709.9 | 11.83167 | 55.45 | 9.191 | -1.746 |
| 5/11/2003 | 15:02:33 | 752.1 | 12.535 | 55.45 | 9.195 | -1.742 |
| 5/11/2003 | 15:03:17 | 796.8 | 13.28 | 55.45 | 9.201 | -1.736 |
| 5/11/2003 | 15:04:05 | 844.2 | 14.07 | 55.45 | 9.205 | -1.732 |
| 5/11/2003 | 15:04:55 | 894.4 | 14.90667 | 55.45 | 9.211 | -1.726 |
| 5/11/2003 | 15:05:48 | 947.5 | 15.79167 | 55.42 | 9.22 | -1.717 |
| 5/11/2003 | 15:06:44 | 1003.8 | 16.73 | 55.4 | 9.224 | -1.713 |
| 5/11/2003 | 15:07:44 | 1063.4 | 17.72333 | 55.4 | 9.231 | -1.706 |
| 5/11/2003 | 15:08:47 | 1126.6 | 18.77667 | 55.4 | 9.239 | -1.698 |
| 5/11/2003 | 15:09:54 | 1193.5 | 19.89167 | 55.38 | 9.248 | -1.689 |
| 5/11/2003 | 15:11:05 | 1264.4 | 21.07333 | 55.38 | 9.254 | -1.683 |
| 5/11/2003 | 15:12:20 | 1339.5 | 22.325 | 55.36 | 9.262 | -1.675 |
| 5/11/2003 | 15:13:40 | 1419 | 23.65 | 55.36 | 9.269 | -1.668 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 15:15:04 | 1503.3 | 25.055 | 55.36 | 9.277 | -1.66 | Plotted shaded data | |
| 5/11/2003 | 15:16:33 | 1592.6 | 26.54333 | 55.33 | 9.286 | -1.651 | | |
| 5/11/2003 | 15:18:08 | 1687.1 | 28.11833 | 55.31 | 9.294 | -1.643 | time (min) | h/ho |
| 5/11/2003 | 15:19:48 | 1787.2 | 29.78667 | 55.26 | 9.305 | -1.632 | 0.000 | 1.000 |
| 5/11/2003 | 15:21:34 | 1893.3 | 31.555 | 55.26 | 9.314 | -1.623 | 1.768 | 0.994 |
| 5/11/2003 | 15:23:26 | 2005.7 | 33.42833 | 55.26 | 9.324 | -1.613 | 3.642 | 0.988 |
| 5/11/2003 | 15:25:25 | 2124.7 | 35.41167 | 55.26 | 9.332 | -1.605 | 5.625 | 0.983 |
| 5/11/2003 | 15:27:31 | 2250.8 | 37.51333 | 55.29 | 9.344 | -1.593 | 7.727 | 0.976 |
| 5/11/2003 | 15:29:45 | 2384.4 | 39.74 | 55.26 | 9.355 | -1.582 | 9.953 | 0.969 |
| 5/11/2003 | 15:32:07 | 2525.9 | 42.09833 | 55.26 | 9.365 | -1.572 | 12.312 | 0.963 |
| 5/11/2003 | 15:34:36 | 2675.8 | 44.59667 | 55.26 | 9.376 | -1.561 | 14.810 | 0.956 |
| 5/11/2003 | 15:37:15 | 2834.6 | 47.24333 | 55.24 | 9.389 | -1.548 | 17.457 | 0.949 |
| 5/11/2003 | 15:40:03 | 3002.8 | 50.04667 | 55.26 | 9.405 | -1.532 | 20.260 | 0.939 |
| 5/11/2003 | 15:43:02 | 3180.9 | 53.015 | 55.24 | 9.415 | -1.522 | 23.228 | 0.933 |
| 5/11/2003 | 15:46:10 | 3369.6 | 56.16 | 55.22 | 9.428 | -1.509 | 26.373 | 0.925 |
| 5/11/2003 | 15:49:30 | 3569.5 | 59.49167 | 55.24 | 9.445 | -1.492 | 29.705 | 0.914 |
| 5/11/2003 | 15:53:02 | 3781.2 | 63.02 | 55.26 | 9.461 | -1.476 | 33.233 | 0.904 |
| 5/11/2003 | 15:56:46 | 4005.5 | 66.75833 | 55.26 | 9.475 | -1.462 | 36.972 | 0.896 |
| 5/11/2003 | 16:00:44 | 4243.1 | 70.71833 | 55.29 | 9.489 | -1.448 | 40.932 | 0.887 |
| 5/11/2003 | 16:04:55 | 4494.7 | 74.91167 | 55.29 | 9.504 | -1.433 | 45.125 | 0.878 |
| 5/11/2003 | 16:09:22 | 4761.3 | 79.355 | 55.31 | 9.522 | -1.415 | 49.568 | 0.867 |
| 5/11/2003 | 16:14:04 | 5043.7 | 84.06167 | 55.31 | 9.541 | -1.396 | 54.275 | 0.855 |
| 5/11/2003 | 16:19:03 | 5342.8 | 89.04667 | 55.26 | 9.556 | -1.381 | 59.260 | 0.846 |
| 5/11/2003 | 16:24:20 | 5659.6 | 94.32667 | 55.26 | 9.575 | -1.362 | 64.540 | 0.835 |
| 5/11/2003 | 16:29:56 | 5995.2 | 99.92 | 55.29 | 9.595 | -1.342 | 70.133 | 0.822 |
| 5/11/2003 | 16:35:51 | 6350.7 | 105.845 | 55.31 | 9.616 | -1.321 | 76.058 | 0.809 |
| 5/11/2003 | 16:42:08 | 6727.2 | 112.12 | 55.31 | 9.634 | -1.303 | 82.333 | 0.798 |
| 5/11/2003 | 16:48:47 | 7126.1 | 118.7683 | 55.29 | 9.651 | -1.286 | 88.982 | 0.788 |
| 5/11/2003 | 16:55:49 | 7548.6 | 125.81 | 55.24 | 9.673 | -1.264 | 96.023 | 0.775 |
| 5/11/2003 | 17:03:17 | 7996.1 | 133.2683 | 55.26 | 9.693 | -1.244 | 103.482 | 0.762 |
| 5/11/2003 | 17:11:11 | 8470.1 | 141.1683 | 55.26 | 9.718 | -1.219 | 111.382 | 0.747 |
| 5/11/2003 | 17:19:33 | 8972.2 | 149.5367 | 55.29 | 9.738 | -1.199 | 119.750 | 0.735 |
| 5/11/2003 | 17:28:25 | 9504.1 | 158.4017 | 55.29 | 9.761 | -1.176 | 128.615 | 0.721 |
| 5/11/2003 | 17:37:48 | 10067.5 | 167.7917 | 55.29 | 9.784 | -1.153 | 138.005 | 0.706 |
| 5/11/2003 | 17:47:45 | 10664.3 | 177.7383 | 55.26 | 9.809 | -1.128 | 147.952 | 0.691 |
| 5/11/2003 | 17:58:17 | 11296.5 | 188.275 | 55.29 | 9.832 | -1.105 | 158.488 | 0.677 |
| 5/11/2003 | 18:09:27 | 11966.1 | 199.435 | 55.24 | 9.855 | -1.082 | 169.648 | 0.663 |
| 5/11/2003 | 18:21:16 | 12675.4 | 211.2567 | 55.24 | 9.88 | -1.057 | 181.470 | 0.648 |
| 5/11/2003 | 18:33:47 | 13426.7 | 223.7783 | 55.26 | 9.903 | -1.034 | 193.992 | 0.634 |
| 5/11/2003 | 18:47:03 | 14222.6 | 237.0433 | 55.26 | 9.93 | -1.007 | 207.257 | 0.617 |
| 5/11/2003 | 19:01:06 | 15065.6 | 251.0933 | 55.29 | 9.952 | -0.985 | 221.307 | 0.604 |
| 5/11/2003 | 19:15:59 | 15958.6 | 265.9767 | 55.26 | 9.977 | -0.96 | 236.190 | 0.588 |
| 5/11/2003 | 19:31:45 | 16904.5 | 281.7417 | 55.29 | 10.004 | -0.933 | 251.955 | 0.572 |
| 5/11/2003 | 19:48:27 | 17906.4 | 298.44 | 55.26 | 10.029 | -0.908 | 268.653 | 0.556 |
| 5/11/2003 | 20:06:08 | 18967.7 | 316.1283 | 55.29 | 10.052 | -0.885 | 286.342 | 0.542 |
| 5/11/2003 | 20:24:53 | 20091.9 | 334.865 | 55.29 | 10.077 | -0.86 | 305.078 | 0.527 |
| 5/11/2003 | 20:44:43 | 21282.7 | 354.7117 | 55.22 | 10.102 | -0.835 | 324.925 | 0.512 |
| 5/11/2003 | 21:05:45 | 22544.1 | 375.735 | 55.24 | 10.125 | -0.812 | 345.948 | 0.498 |
| 5/11/2003 | 21:28:01 | 23880.2 | 398.0033 | 55.24 | 10.152 | -0.785 | 368.217 | 0.481 |
| 5/11/2003 | 21:51:36 | 25295.5 | 421.5917 | 55.24 | 10.171 | -0.766 | 391.805 | 0.469 |
| 5/11/2003 | 22:16:35 | 26794.7 | 446.5783 | 55.24 | 10.195 | -0.742 | 416.792 | 0.455 |
| 5/11/2003 | 22:43:03 | 28382.7 | 473.045 | 55.24 | 10.218 | -0.719 | 443.258 | 0.441 |
| 5/11/2003 | 23:11:05 | 30064.8 | 501.08 | 55.26 | 10.243 | -0.694 | 471.293 | 0.425 |
| 5/11/2003 | 23:40:47 | 31846.6 | 530.7767 | 55.22 | 10.266 | -0.671 | 500.990 | 0.411 |
| 5/12/2003 | 0:12:15 | 33734 | 562.2333 | 55.22 | 10.291 | -0.646 | 532.447 | 0.396 |
| 5/12/2003 | 0:45:34 | 35733.2 | 595.5533 | 55.24 | 10.316 | -0.621 | 565.767 | 0.381 |
| 5/12/2003 | 1:20:52 | 37850.9 | 630.8483 | 55.24 | 10.339 | -0.598 | 601.062 | 0.366 |
| 5/12/2003 | 1:58:15 | 40094 | 668.2333 | 55.24 | 10.361 | -0.576 | 638.447 | 0.353 |
| 5/12/2003 | 2:37:51 | 42470.1 | 707.835 | 55.22 | 10.382 | -0.555 | 678.048 | 0.340 |
| 5/12/2003 | 3:19:48 | 44987 | 749.7833 | 55.24 | 10.405 | -0.532 | 719.997 | 0.326 |
| 5/12/2003 | 4:04:14 | 47653 | 794.2167 | 55.24 | 10.424 | -0.513 | 764.430 | 0.314 |
| 5/12/2003 | 4:51:18 | 50477 | 841.2833 | 55.26 | 10.44 | -0.497 | 811.497 | 0.305 |
| 5/12/2003 | 5:41:09 | 53468.3 | 891.1383 | 55.24 | 10.455 | -0.482 | 861.352 | 0.295 |
| 5/12/2003 | 6:33:57 | 56636.8 | 943.9467 | 55.24 | 10.465 | -0.472 | 914.160 | 0.289 |
| 5/12/2003 | 7:29:54 | 59993.1 | 999.885 | 55.24 | 10.475 | -0.462 | 970.098 | 0.283 |
| 5/12/2003 | 8:29:09 | 63548.3 | 1059.138 | 55.26 | 10.481 | -0.456 | 1029.352 | 0.279 |
| 5/12/2003 | 9:29:09 | 67148.3 | 1119.138 | 55.22 | 10.482 | -0.455 | 1089.352 | 0.279 |
| 5/12/2003 | 10:29:09 | 70748.3 | 1179.138 | 55.24 | 10.482 | -0.455 | 1149.352 | 0.279 |
| 5/12/2003 | 11:29:09 | 74348.3 | 1239.138 | 55.22 | 10.48 | -0.457 | 1209.352 | 0.280 |
| 5/12/2003 | 12:29:09 | 77948.3 | 1299.138 | 55.24 | 10.484 | -0.453 | 1269.352 | 0.278 |
| 5/12/2003 | 13:29:09 | 81548.3 | 1359.138 | 55.29 | 10.485 | -0.452 | 1329.352 | 0.277 |
| 5/12/2003 | 14:29:09 | 85148.3 | 1419.138 | 55.24 | 10.488 | -0.449 | 1389.352 | 0.275 |
| 5/12/2003 | 15:29:09 | 88748.3 | 1479.138 | 55.24 | 10.492 | -0.445 | 1449.352 | 0.273 |
| 5/12/2003 | 16:29:09 | 92348.3 | 1539.138 | 55.22 | 10.492 | -0.445 | 1509.352 | 0.273 |
| 5/12/2003 | 17:29:09 | 95948.3 | 1599.138 | 55.24 | 10.502 | -0.435 | 1569.352 | 0.267 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 13MWT08 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Falling Head | **Test Date:** | 10-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RMB 6/23/03

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 1 | = R |
| Length of Well Screen (ft.) : | 10 | = L |
| Time for 37% head change (min.) : | 0.22 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 7.56E-03 | ft./min. |
| 1.26E-04 | ft./sec. |
| 1.09E+01 | ft./day |
| 3.84E-03 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: CRANE WELL/BORING NO.: 13MW108

PROJECT NO.: 9060 CTO 0279 GEOLOGIST: BOB BALKOVEC

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' / 17.50' T.O. TEST NO.:

STATIC WATER LEVEL (Depth/Elevation): 2.80' DATE: 5/10/03

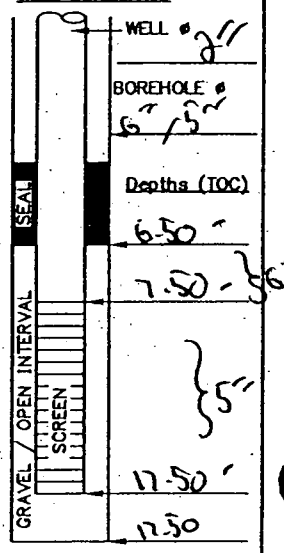
TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: 1.5" x 39" SOLID SLUG PAGE ..... OF .....

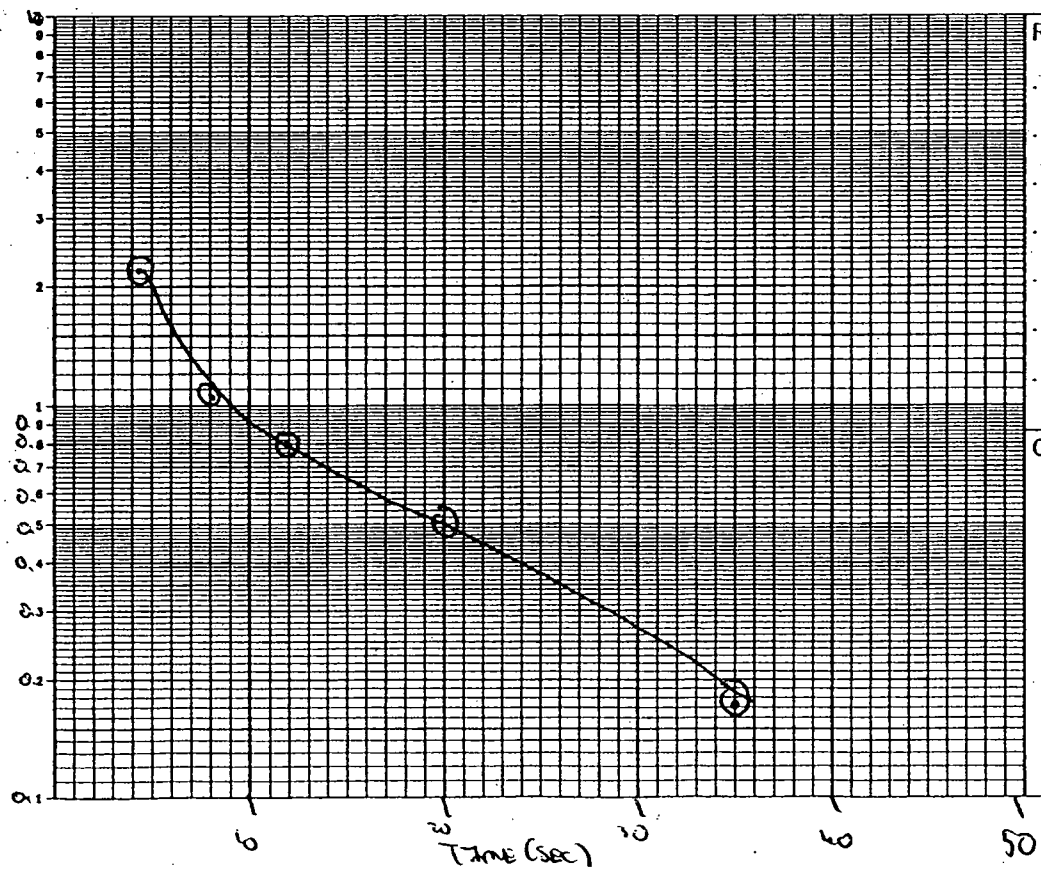
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30PSI

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 14.904 | 0 | | | |
| 3 | 14.954 | +0.05 | | | |
| 4.5 | 17.122 | +2.218 | | | |
| 6 | 16.705 | +1.801 | | | |
| 8 | 15.962 | +1.058 | | | |
| 11.9 | 15.705 | +0.801 | | | |
| 15.0 | 15.5 | +0.596 | | | |
| 20 | 15.406 | +0.502 | | | |
| 22.8 | 15.27 | +0.366 | | | |
| 35.2 | 15.074 | +0.17 | | | |
| 46.9 | 14.977 | 0.073 | | | |
| 59 | 14.904 | 0 | | | |

WELL SCHEMATIC



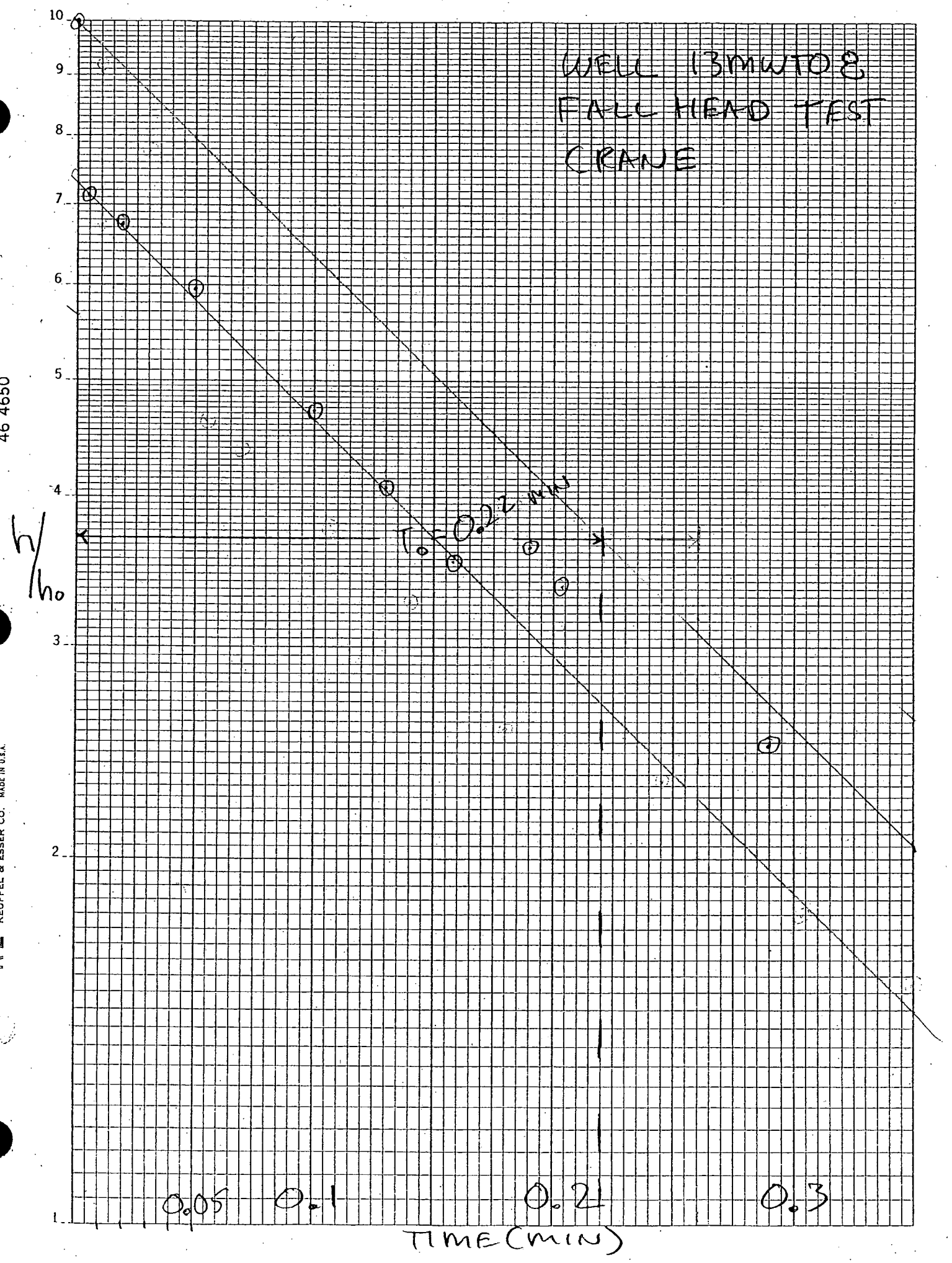

▽ Indicate SWL Depth on Drawing




REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL


WELL 13MW108
FALL HEAD TEST
CRANE
T = 0.22 min
h/ho
10
9
8
7
6
5
4
3
2
1
0.05
0.1
0.2
0.3
TIME (MIN)
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 5/11/2003 16:17:52
Report from file: ...\SN00824 2003-05-10 092231 13MWT08 Falling.bin
Win-Situ Version 4.41

Serial number: 824
Firmware Version 3.06
Unit name:

Test name: 13MWT08 Falling

Test defined on: 5/10/2003 9:21:51
Test started on: 5/10/2003 9:22:31
Test stopped on: N/A N/A
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time betwe Seconds.
Number of data sam 81

TOTAL DATA SAMPLI 81

Channel number [1]
Measurement type: Temperature
Channel name: Temperature

Channel number [2]
Measurement type: Pressure
Channel name: Depth
Sensor Range: 30 PSIG.
Specific gravity: 1

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Displacement Feet | | time (min) | h/ho |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Ho= 1.607 |
| 5/10/2003 | 9:22:31 | 0 | 0 | 50.76 | 14.904 | 0 | | | |
| 5/10/2003 | 9:22:31 | 0.3 | 0.005 | 50.81 | 14.904 | 0 | | | |
| 5/10/2003 | 9:22:32 | 0.6 | 0.01 | 50.83 | 14.904 | 0 | | | |
| 5/10/2003 | 9:22:32 | 0.9 | 0.015 | 50.83 | 14.904 | 0 | | | |
| 5/10/2003 | 9:22:32 | 1.2 | 0.02 | 50.83 | 14.904 | 0 | | | |
| 5/10/2003 | 9:22:33 | 1.5 | 0.025 | 50.83 | 14.904 | 0 | | | |
| 5/10/2003 | 9:22:33 | 1.8 | 0.03 | 50.86 | 14.904 | 0 | | | |
| 5/10/2003 | 9:22:33 | 2.1 | 0.035 | 50.86 | 14.904 | 0 | | | |
| 5/10/2003 | 9:22:33 | 2.4 | 0.04 | 50.86 | 14.904 | 0 | | | |
| 5/10/2003 | 9:22:34 | 2.7 | 0.045 | 50.86 | 14.904 | 0 | | | |
| 5/10/2003 | 9:22:34 | 3 | 0.05 | 50.86 | 14.954 | 0.05 | | | |
| 5/10/2003 | 9:22:34 | 3.3 | 0.055 | 50.86 | 15.021 | 0.117 | | | |
| 5/10/2003 | 9:22:35 | 3.6 | 0.06 | 50.86 | 15.404 | 0.5 | | | |
| 5/10/2003 | 9:22:35 | 3.9 | 0.065 | 50.86 | 16.379 | 1.475 | time (sec) | | |
| 5/10/2003 | 9:22:35 | 4.2 | 0.07 | 50.86 | 17.232 | 2.328 | 0 | | |
| 5/10/2003 | 9:22:36 | 4.5 | 0.075 | 50.86 | 17.122 | 2.218 | 0.3 | | |
| 5/10/2003 | 9:22:36 | 4.8 | 0.08 | 50.88 | 17.042 | 2.138 | 0.6 | | |
| 5/10/2003 | 9:22:36 | 5.1 | 0.085 | 50.88 | 16.978 | 2.074 | 0.9 | | |
| 5/10/2003 | 9:22:36 | 5.4 | 0.09 | 50.86 | 16.951 | 2.047 | 1.2 | | |
| 5/10/2003 | 9:22:37 | 5.7 | 0.095 | 50.88 | 16.832 | 1.928 | 1.5 | | |
| 5/10/2003 | 9:22:37 | 6 | 0.1 | 50.88 | 16.705 | 1.801 | 1.8 | time (min) | h/ho |
| 5/10/2003 | 9:22:37 | 6.4 | 0.106667 | 50.88 | 16.511 | 1.607 | 2.2 | 0.000 | 1.000 |
| 5/10/2003 | 9:22:38 | 6.7 | 0.111667 | 50.88 | 16.048 | 1.144 | 2.5 | 0.005 | 0.712 |
| 5/10/2003 | 9:22:38 | 7.1 | 0.118333 | 50.88 | 15.996 | 1.092 | 2.9 | 0.012 | 0.680 |
| 5/10/2003 | 9:22:39 | 7.5 | 0.125 | 50.88 | 15.983 | 1.079 | 3.3 | 0.018 | 0.671 |
| 5/10/2003 | 9:22:39 | 8 | 0.133333 | 50.88 | 15.962 | 1.058 | 3.8 | 0.027 | 0.658 |
| 5/10/2003 | 9:22:40 | 8.4 | 0.14 | 50.88 | 15.927 | 1.023 | 4.2 | 0.033 | 0.637 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 9:22:40 | 8.9 | 0.148333 | 50.88 | 15.895 | 0.991 | 4.7 | 0.042 | 0.617 |
| 5/10/2003 | 9:22:41 | 9.5 | 0.158333 | 50.88 | 15.863 | 0.959 | 5.3 | 0.052 | 0.597 |
| 5/10/2003 | 9:22:41 | 10 | 0.166667 | 50.86 | 15.821 | 0.917 | 5.8 | 0.060 | 0.571 |
| 5/10/2003 | 9:22:42 | 10.6 | 0.176667 | 50.83 | 15.782 | 0.878 | 6.4 | 0.070 | 0.546 |
| 5/10/2003 | 9:22:42 | 11.3 | 0.188333 | 50.83 | 15.742 | 0.838 | 7.1 | 0.082 | 0.521 |
| 5/10/2003 | 9:22:43 | 11.9 | 0.198333 | 50.83 | 15.705 | 0.801 | 7.7 | 0.092 | 0.498 |
| 5/10/2003 | 9:22:44 | 12.6 | 0.21 | 50.83 | 15.662 | 0.758 | 8.4 | 0.103 | 0.472 |
| 5/10/2003 | 9:22:44 | 13.4 | 0.223333 | 50.83 | 15.614 | 0.71 | 9.2 | 0.117 | 0.442 |
| 5/10/2003 | 9:22:45 | 14.2 | 0.236667 | 50.83 | 15.558 | 0.654 | 10 | 0.130 | 0.407 |
| 5/10/2003 | 9:22:46 | 15 | 0.25 | 50.83 | 15.5 | 0.596 | 10.8 | 0.143 | 0.371 |
| 5/10/2003 | 9:22:47 | 15.9 | 0.265 | 50.83 | 15.472 | 0.568 | 11.7 | 0.158 | 0.353 |
| 5/10/2003 | 9:22:48 | 16.8 | 0.28 | 50.83 | 15.524 | 0.62 | 12.6 | 0.173 | 0.386 |
| 5/10/2003 | 9:22:49 | 17.8 | 0.296667 | 50.83 | 15.488 | 0.584 | 13.6 | 0.190 | 0.363 |
| 5/10/2003 | 9:22:50 | 18.9 | 0.315 | 50.83 | 15.447 | 0.543 | 14.7 | 0.208 | 0.338 |
| 5/10/2003 | 9:22:51 | 20 | 0.333333 | 50.83 | 15.406 | 0.502 | 15.8 | 0.227 | 0.312 |
| 5/10/2003 | 9:22:52 | 21.2 | 0.353333 | 50.83 | 15.371 | 0.467 | 17 | 0.247 | 0.291 |
| 5/10/2003 | 9:22:54 | 22.4 | 0.373333 | 50.83 | 15.332 | 0.428 | 18.2 | 0.267 | 0.266 |
| 5/10/2003 | 9:22:55 | 23.8 | 0.396667 | 50.83 | 15.304 | 0.4 | 19.6 | 0.290 | 0.249 |
| 5/10/2003 | 9:22:56 | 25.2 | 0.42 | 50.83 | 15.27 | 0.366 | 21 | 0.313 | 0.228 |
| 5/10/2003 | 9:22:58 | 26.7 | 0.445 | 50.83 | 15.231 | 0.327 | 22.5 | 0.338 | 0.203 |
| 5/10/2003 | 9:22:59 | 28.2 | 0.47 | 50.81 | 15.196 | 0.292 | 24 | 0.363 | 0.182 |
| 5/10/2003 | 9:23:01 | 29.8 | 0.496667 | 50.81 | 15.164 | 0.26 | 25.6 | 0.390 | 0.162 |
| 5/10/2003 | 9:23:03 | 31.5 | 0.525 | 50.81 | 15.13 | 0.226 | 27.3 | 0.418 | 0.141 |
| 5/10/2003 | 9:23:04 | 33.3 | 0.555 | 50.81 | 15.102 | 0.198 | 29.1 | 0.448 | 0.123 |
| 5/10/2003 | 9:23:06 | 35.2 | 0.586667 | 50.81 | 15.074 | 0.17 | 31 | 0.480 | 0.106 |
| 5/10/2003 | 9:23:08 | 37.3 | 0.621667 | 50.81 | 15.065 | 0.161 | 33.1 | 0.515 | 0.100 |
| 5/10/2003 | 9:23:11 | 39.5 | 0.658333 | 50.81 | 15.041 | 0.137 | 35.3 | 0.552 | 0.085 |
| 5/10/2003 | 9:23:13 | 41.8 | 0.696667 | 50.81 | 15.016 | 0.112 | 37.6 | 0.590 | 0.070 |
| 5/10/2003 | 9:23:15 | 44.3 | 0.738333 | 50.81 | 14.996 | 0.092 | 40.1 | 0.632 | 0.057 |
| 5/10/2003 | 9:23:18 | 46.9 | 0.781667 | 50.81 | 14.977 | 0.073 | 42.7 | 0.675 | 0.045 |
| 5/10/2003 | 9:23:21 | 49.7 | 0.828333 | 50.81 | 14.957 | 0.053 | 45.5 | 0.722 | 0.033 |
| 5/10/2003 | 9:23:24 | 52.6 | 0.876667 | 50.81 | 14.938 | 0.034 | 48.4 | 0.770 | 0.021 |
| 5/10/2003 | 9:23:27 | 55.7 | 0.928333 | 50.81 | 14.919 | 0.015 | 51.5 | 0.822 | 0.009 |
| 5/10/2003 | 9:23:30 | 59 | 0.983333 | 50.81 | 14.904 | 0 | 54.8 | 0.877 | 0.000 |
| 5/10/2003 | 9:23:34 | 62.5 | 1.041667 | 50.81 | 14.904 | 0 | 58.3 | 0.935 | 0.000 |
| 5/10/2003 | 9:23:37 | 66.2 | 1.103333 | 50.81 | 14.904 | 0 | 62 | 0.997 | 0.000 |
| 5/10/2003 | 9:23:41 | 70.1 | 1.168333 | 50.79 | 14.904 | 0 | 65.9 | 1.062 | 0.000 |
| 5/10/2003 | 9:23:45 | 74.3 | 1.238333 | 50.79 | 14.904 | 0 | 70.1 | 1.132 | 0.000 |
| 5/10/2003 | 9:23:50 | 78.7 | 1.311667 | 50.79 | 14.904 | 0 | 74.5 | 1.205 | 0.000 |
| 5/10/2003 | 9:23:54 | 83.4 | 1.39 | 50.79 | 14.904 | 0 | 79.2 | 1.283 | 0.000 |
| 5/10/2003 | 9:23:59 | 88.4 | 1.473333 | 50.79 | 14.904 | 0 | 84.2 | 1.367 | 0.000 |
| 5/10/2003 | 9:24:05 | 93.7 | 1.561667 | 50.79 | 14.904 | 0 | 89.5 | 1.455 | 0.000 |
| 5/10/2003 | 9:24:10 | 99.3 | 1.655 | 50.79 | 14.904 | 0 | 95.1 | 1.548 | 0.000 |
| 5/10/2003 | 9:24:16 | 105.2 | 1.753333 | 50.79 | 14.904 | 0 | 101 | 1.647 | 0.000 |
| 5/10/2003 | 9:24:23 | 111.5 | 1.858333 | 50.79 | 14.904 | 0 | 107.3 | 1.752 | 0.000 |
| 5/10/2003 | 9:24:29 | 118.1 | 1.968333 | 50.76 | 14.904 | 0 | 113.9 | 1.862 | 0.000 |
| 5/10/2003 | 9:24:36 | 125.1 | 2.085 | 50.76 | 14.904 | 0 | 120.9 | 1.978 | 0.000 |
| 5/10/2003 | 9:24:44 | 132.6 | 2.21 | 50.76 | 14.904 | 0 | 128.4 | 2.103 | 0.000 |
| 5/10/2003 | 9:24:52 | 140.5 | 2.341667 | 50.76 | 14.904 | 0 | 136.3 | 2.235 | 0.000 |
| 5/10/2003 | 9:25:00 | 148.9 | 2.481667 | 50.76 | 14.904 | 0 | 144.7 | 2.375 | 0.000 |
| 5/10/2003 | 9:25:09 | 157.8 | 2.63 | 50.76 | 14.904 | 0 | 153.6 | 2.523 | 0.000 |
| 5/10/2003 | 9:25:18 | 167.2 | 2.786667 | 50.76 | 14.904 | 0 | 163 | 2.680 | 0.000 |
| 5/10/2003 | 9:25:28 | 177.2 | 2.953333 | 50.76 | 14.904 | 0 | 173 | 2.847 | 0.000 |
| 5/10/2003 | 9:25:39 | 187.8 | 3.13 | 50.76 | 14.904 | 0 | 183.6 | 3.023 | 0.000 |

**TETRA-TECH NUS**

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 13MWT08 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Rising Head | **Test Date:** | 10-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RMS 6/23/03

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 1 | = R |
| Length of Well Screen (ft.) : | 10 | = L |
| Time for 37% head change (min.) : | 1.11 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.50E-03 | ft./min. |
| 2.50E-05 | ft./sec. |
| 2.16E+00 | ft./day |
| 7.61E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: CRANE WELL/BORING NO.: 13MW108

PROJECT NO.: 9060 CTO 0279 GEOLOGIST:

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' / 17.50' TEST NO.:

STATIC WATER LEVEL (Depth/Elevation): 2.80' DATE: 5/10/03

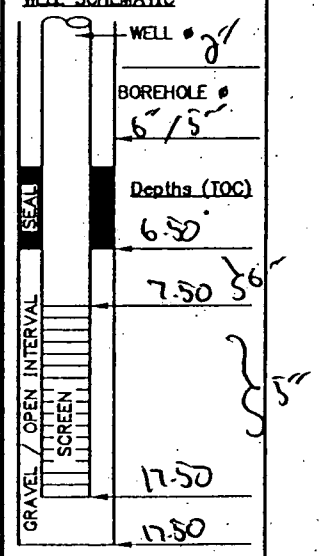
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: 1.5" x 39" SOLID SLUG PAGE ___ OF ___

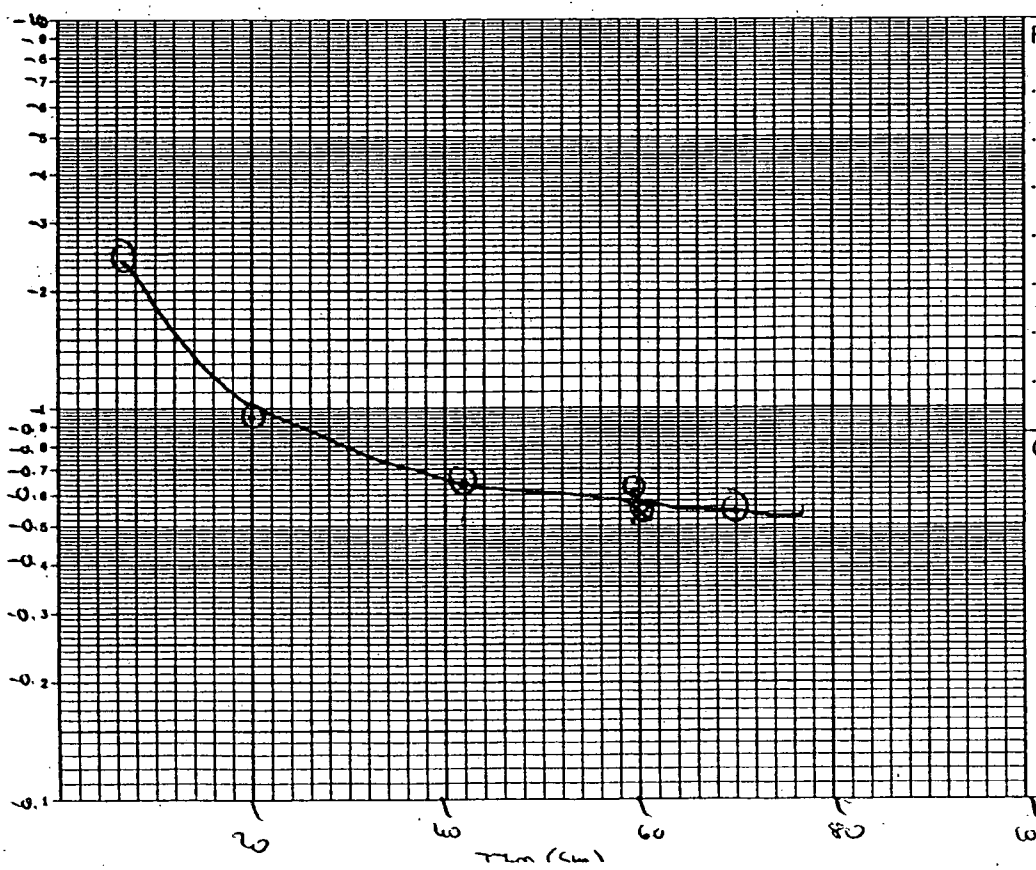
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30PSI

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 14.583 | 0 | 354.9 | 14.368 | -.215 |
| 3 | 14.598 | +0.015 | 547.0 | 14.573 | -0.01 |
| 6.7 | 12.198 | -2.385 | | | |
| 10 | 13.345 | -1.238 | | | |
| 15 | 13.561 | -1.022 | | | |
| 20 | 13.649 | -0.934 | | | |
| 31.5 | 13.875 | -0.708 | | | |
| 41.8 | 13.96 | -0.623 | | | |
| 59 | 14.031 | -0.552 | | | |
| 70.1 | 14.06 | -0.532 | | | |
| 140.5 | 14.143 | -0.44 | | | |
| 223.5 | 14.178 | -0.405 | | | |

WELL SCHEMATIC



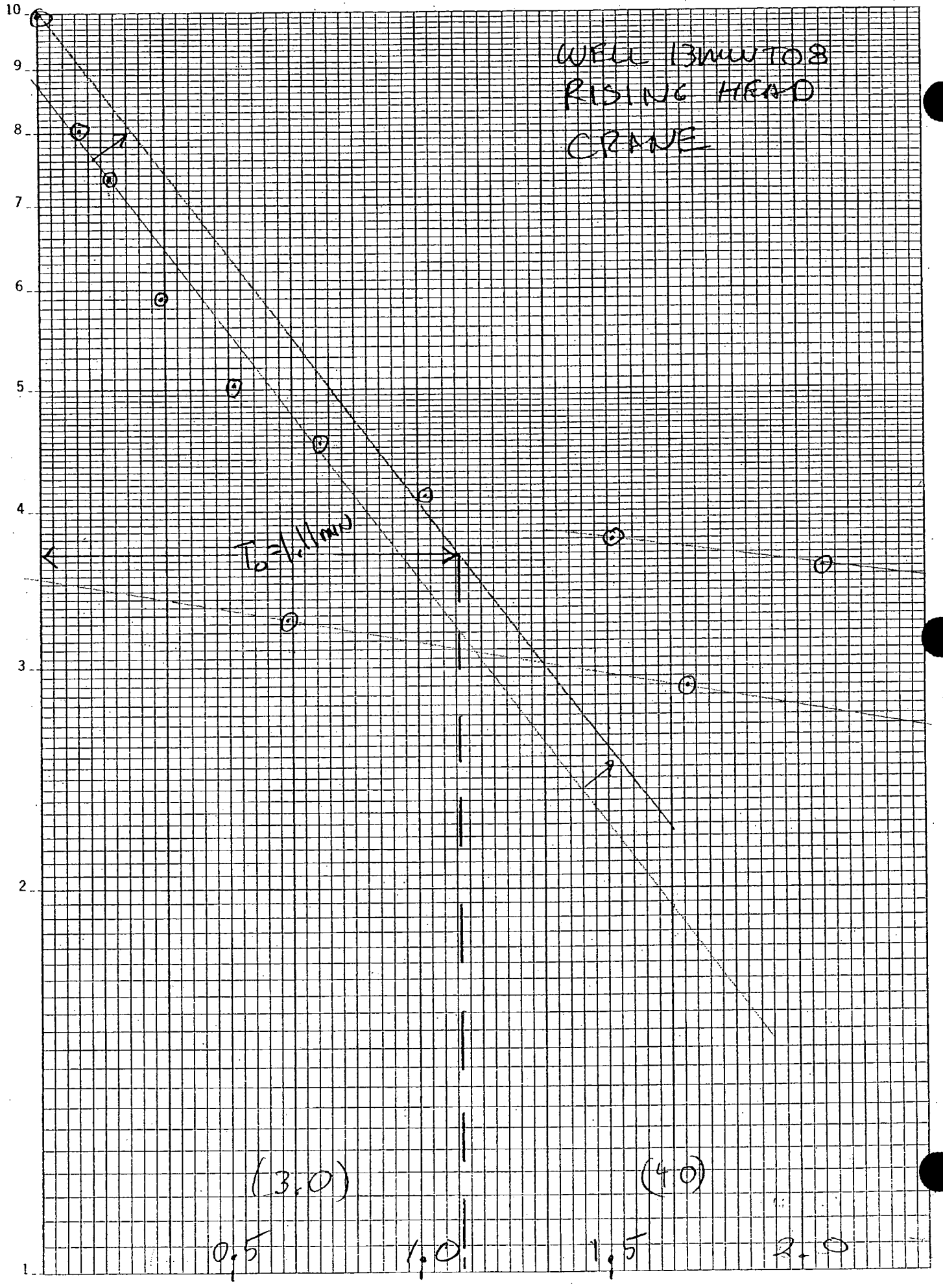

▽ Indicate SWL Depth on Drawing




REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 5/11/2003 16:19:11
Report from file: ...\SN00824 2003-05-10 092753 13MWT08 Rising.bin
Win-Situ Version 4.41

Serial number: 824
Firmware Version 3.06
Unit name:

Test name: 13MWT08 Rising

Test defined on: 5/10/2003 9:27:45
Test started on: 5/10/2003 9:27:53
Test stopped on: N/A N/A
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time betwe Seconds.
Number of data samp 106

TOTAL DATA SAMPLE 106

Channel number [1]
Measurement type: Temperature
Channel name: Temperature

Channel number [2]
Measurement type: Pressure
Channel name: Depth
Sensor Range: 30 PSIG.
Specific gravity: 1

ho= -1.269

| Date | Time | ET (sec) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Displacement Feet | time (min) | h/ho | adj time |
|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 9:27:53 | 0 | 50.74 | 14.583 | 0 | 0 | | |
| 5/10/2003 | 9:27:54 | 0.3 | 50.79 | 14.583 | 0 | 0.005 | | |
| 5/10/2003 | 9:27:54 | 0.6 | 50.81 | 14.583 | 0 | 0.01 | | |
| 5/10/2003 | 9:27:54 | 0.9 | 50.81 | 14.583 | 0 | 0.015 | | |
| 5/10/2003 | 9:27:55 | 1.2 | 50.83 | 14.583 | 0 | 0.02 | | |
| 5/10/2003 | 9:27:55 | 1.5 | 50.83 | 14.583 | 0 | 0.025 | | |
| 5/10/2003 | 9:27:55 | 1.8 | 50.83 | 14.583 | 0 | 0.03 | | |
| 5/10/2003 | 9:27:56 | 2.1 | 50.83 | 14.583 | 0 | 0.035 | | |
| 5/10/2003 | 9:27:56 | 2.4 | 50.83 | 14.583 | 0 | 0.04 | | |
| 5/10/2003 | 9:27:56 | 2.7 | 50.83 | 14.583 | 0 | 0.045 | | |
| 5/10/2003 | 9:27:56 | 3 | 50.83 | 14.598 | 0.015 | 0.05 | | |
| 5/10/2003 | 9:27:57 | 3.3 | 50.83 | 13.296 | -1.287 | 0.055 | | |
| 5/10/2003 | 9:27:57 | 3.6 | 50.83 | 13.783 | -0.8 | 0.06 | | |
| 5/10/2003 | 9:27:57 | 3.9 | 50.83 | 13.451 | -1.132 | 0.065 | | |
| 5/10/2003 | 9:27:58 | 4.2 | 50.86 | 13.497 | -1.086 | 0.07 | | |
| 5/10/2003 | 9:27:58 | 4.5 | 50.86 | 12.883 | -1.7 | 0.075 | | |
| 5/10/2003 | 9:27:58 | 4.8 | 50.86 | 12.711 | -1.872 | 0.08 | | |
| 5/10/2003 | 9:27:59 | 5.1 | 50.86 | 12.756 | -1.827 | 0.085 | | |
| 5/10/2003 | 9:27:59 | 5.4 | 50.86 | 12.678 | -1.905 | 0.09 | | |
| 5/10/2003 | 9:27:59 | 5.7 | 50.86 | 12.657 | -1.926 | 0.095 | | |
| 5/10/2003 | 9:27:59 | 6 | 50.86 | 12.618 | -1.965 | 0.1 | | |
| 5/10/2003 | 9:28:00 | 6.4 | 50.86 | 12.65 | -1.933 | 0.106667 | | |
| 5/10/2003 | 9:28:00 | 6.7 | 50.86 | 12.198 | -2.385 | 0.111667 | Plotted shaded values. | |
| 5/10/2003 | 9:28:01 | 7.1 | 50.86 | 12.605 | -1.978 | 0.118333 | | |
| 5/10/2003 | 9:28:01 | 7.5 | 50.86 | 13.501 | -1.082 | 0.125 | | |
| 5/10/2003 | 9:28:01 | 8 | 50.86 | 13.395 | -1.188 | 0.133333 | h/ho | adj time |
| 5/10/2003 | 9:28:02 | 8.4 | 50.86 | 13.314 | -1.269 | 0.14 | 1.0000 | 0.0000 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 9:28:02 | 8.9 | 50.86 | 13.313 | -1.27 | 0.148333 | 1.0008 | 0.0083 |
| 5/10/2003 | 9:28:03 | 9.5 | 50.86 | 13.32 | -1.263 | 0.158333 | 0.9953 | 0.0183 |
| 5/10/2003 | 9:28:04 | 10 | 50.83 | 13.345 | -1.238 | 0.166667 | 0.9756 | 0.0267 |
| 5/10/2003 | 9:28:04 | 10.6 | 50.83 | 13.376 | -1.207 | 0.176667 | 0.9511 | 0.0367 |
| 5/10/2003 | 9:28:05 | 11.3 | 50.83 | 13.427 | -1.156 | 0.188333 | 0.9110 | 0.0483 |
| 5/10/2003 | 9:28:05 | 11.9 | 50.81 | 13.47 | -1.113 | 0.198333 | 0.8771 | 0.0583 |
| 5/10/2003 | 9:28:06 | 12.6 | 50.81 | 13.485 | -1.098 | 0.21 | 0.8652 | 0.0700 |
| 5/10/2003 | 9:28:07 | 13.4 | 50.81 | 13.52 | -1.063 | 0.223333 | 0.8377 | 0.0833 |
| 5/10/2003 | 9:28:08 | 14.2 | 50.81 | 13.554 | -1.029 | 0.236667 | 0.8109 | 0.0967 |
| 5/10/2003 | 9:28:08 | 15 | 50.81 | 13.561 | -1.022 | 0.25 | 0.8054 | 0.1100 |
| 5/10/2003 | 9:28:09 | 15.9 | 50.81 | 13.587 | -0.996 | 0.265 | 0.7849 | 0.1250 |
| 5/10/2003 | 9:28:10 | 16.8 | 50.81 | 13.592 | -0.991 | 0.28 | 0.7809 | 0.1400 |
| 5/10/2003 | 9:28:11 | 17.8 | 50.81 | 13.556 | -1.027 | 0.296667 | 0.8093 | 0.1567 |
| 5/10/2003 | 9:28:12 | 18.9 | 50.81 | 13.608 | -0.975 | 0.315 | 0.7683 | 0.1750 |
| 5/10/2003 | 9:28:13 | 20 | 50.81 | 13.649 | -0.934 | 0.333333 | 0.7360 | 0.1933 |
| 5/10/2003 | 9:28:15 | 21.2 | 50.81 | 13.689 | -0.894 | 0.353333 | 0.7045 | 0.2133 |
| 5/10/2003 | 9:28:16 | 22.4 | 50.81 | 13.722 | -0.861 | 0.373333 | 0.6785 | 0.2333 |
| 5/10/2003 | 9:28:17 | 23.8 | 50.81 | 13.752 | -0.831 | 0.396667 | 0.6548 | 0.2567 |
| 5/10/2003 | 9:28:19 | 25.2 | 50.81 | 13.784 | -0.799 | 0.42 | 0.6296 | 0.2800 |
| 5/10/2003 | 9:28:20 | 26.7 | 50.81 | 13.81 | -0.773 | 0.445 | 0.6091 | 0.3050 |
| 5/10/2003 | 9:28:22 | 28.2 | 50.81 | 13.834 | -0.749 | 0.47 | 0.5902 | 0.3300 |
| 5/10/2003 | 9:28:23 | 29.8 | 50.81 | 13.855 | -0.728 | 0.496667 | 0.5737 | 0.3567 |
| 5/10/2003 | 9:28:25 | 31.5 | 50.81 | 13.875 | -0.708 | 0.525 | 0.5579 | 0.3850 |
| 5/10/2003 | 9:28:27 | 33.3 | 50.81 | 13.894 | -0.689 | 0.555 | 0.5429 | 0.4150 |
| 5/10/2003 | 9:28:29 | 35.2 | 50.81 | 13.913 | -0.67 | 0.586667 | 0.5280 | 0.4467 |
| 5/10/2003 | 9:28:31 | 37.3 | 50.81 | 13.929 | -0.654 | 0.621667 | 0.5154 | 0.4817 |
| 5/10/2003 | 9:28:33 | 39.5 | 50.79 | 13.945 | -0.638 | 0.658333 | 0.5028 | 0.5183 |
| 5/10/2003 | 9:28:35 | 41.8 | 50.79 | 13.96 | -0.623 | 0.696667 | 0.4909 | 0.5567 |
| 5/10/2003 | 9:28:38 | 44.3 | 50.79 | 13.975 | -0.608 | 0.738333 | 0.4791 | 0.5983 |
| 5/10/2003 | 9:28:40 | 46.9 | 50.79 | 13.988 | -0.595 | 0.781667 | 0.4689 | 0.6417 |
| 5/10/2003 | 9:28:43 | 49.7 | 50.79 | 13.999 | -0.584 | 0.828333 | 0.4602 | 0.6883 |
| 5/10/2003 | 9:28:46 | 52.6 | 50.79 | 14.008 | -0.575 | 0.876667 | 0.4531 | 0.7367 |
| 5/10/2003 | 9:28:49 | 55.7 | 50.79 | 14.019 | -0.564 | 0.928333 | 0.4444 | 0.7883 |
| 5/10/2003 | 9:28:52 | 59 | 50.79 | 14.031 | -0.552 | 0.983333 | 0.4350 | 0.8433 |
| 5/10/2003 | 9:28:56 | 62.5 | 50.79 | 14.042 | -0.541 | 1.041667 | 0.4263 | 0.9017 |
| 5/10/2003 | 9:29:00 | 66.2 | 50.79 | 14.049 | -0.534 | 1.103333 | 0.4208 | 0.9633 |
| 5/10/2003 | 9:29:04 | 70.1 | 50.79 | 14.06 | -0.523 | 1.168333 | 0.4121 | 1.0283 |
| 5/10/2003 | 9:29:08 | 74.3 | 50.79 | 14.068 | -0.515 | 1.238333 | 0.4058 | 1.0983 |
| 5/10/2003 | 9:29:12 | 78.7 | 50.79 | 14.077 | -0.506 | 1.311667 | 0.3987 | 1.1717 |
| 5/10/2003 | 9:29:17 | 83.4 | 50.79 | 14.083 | -0.5 | 1.39 | 0.3940 | 1.2500 |
| 5/10/2003 | 9:29:22 | 88.4 | 50.79 | 14.09 | -0.493 | 1.473333 | 0.3885 | 1.3333 |
| 5/10/2003 | 9:29:27 | 93.7 | 50.79 | 14.096 | -0.487 | 1.561667 | 0.3838 | 1.4217 |
| 5/10/2003 | 9:29:33 | 99.3 | 50.76 | 14.1 | -0.483 | 1.655 | 0.3806 | 1.5150 |
| 5/10/2003 | 9:29:39 | 105.2 | 50.76 | 14.107 | -0.476 | 1.753333 | 0.3751 | 1.6133 |
| 5/10/2003 | 9:29:45 | 111.5 | 50.76 | 14.111 | -0.472 | 1.858333 | 0.3719 | 1.7183 |
| 5/10/2003 | 9:29:52 | 118.1 | 50.76 | 14.117 | -0.466 | 1.968333 | 0.3672 | 1.8283 |
| 5/10/2003 | 9:29:59 | 125.1 | 50.76 | 14.12 | -0.463 | 2.085 | 0.3649 | 1.9450 |
| 5/10/2003 | 9:30:06 | 132.6 | 50.76 | 14.124 | -0.459 | 2.21 | 0.3617 | 2.0700 |
| 5/10/2003 | 9:30:14 | 140.5 | 50.76 | 14.143 | -0.44 | 2.341667 | 0.3467 | 2.2017 |
| 5/10/2003 | 9:30:22 | 148.9 | 50.81 | 14.159 | -0.424 | 2.481667 | 0.3341 | 2.3417 |
| 5/10/2003 | 9:30:31 | 157.8 | 50.81 | 14.163 | -0.42 | 2.63 | 0.3310 | 2.4900 |
| 5/10/2003 | 9:30:41 | 167.2 | 50.83 | 14.164 | -0.419 | 2.786667 | 0.3302 | 2.6467 |
| 5/10/2003 | 9:30:51 | 177.2 | 50.83 | 14.164 | -0.419 | 2.953333 | 0.3302 | 2.8133 |
| 5/10/2003 | 9:31:01 | 187.8 | 50.83 | 14.166 | -0.417 | 3.13 | 0.3286 | 2.9900 |
| 5/10/2003 | 9:31:12 | 199 | 50.83 | 14.166 | -0.417 | 3.316667 | 0.3286 | 3.1767 |
| 5/10/2003 | 9:31:24 | 210.9 | 50.79 | 14.168 | -0.415 | 3.515 | 0.3270 | 3.3750 |
| 5/10/2003 | 9:31:37 | 223.5 | 50.79 | 14.178 | -0.405 | 3.725 | 0.3191 | 3.5850 |
| 5/10/2003 | 9:31:50 | 236.8 | 50.81 | 14.191 | -0.392 | 3.946667 | 0.3089 | 3.8067 |
| 5/10/2003 | 9:32:04 | 250.9 | 50.81 | 14.205 | -0.378 | 4.181667 | 0.2979 | 4.0417 |
| 5/10/2003 | 9:32:19 | 265.8 | 50.81 | 14.209 | -0.374 | 4.43 | 0.2947 | 4.2900 |
| 5/10/2003 | 9:32:35 | 281.6 | 50.81 | 14.23 | -0.353 | 4.693333 | 0.2782 | 4.5533 |
| 5/10/2003 | 9:32:52 | 298.4 | 50.81 | 14.26 | -0.323 | 4.973333 | 0.2545 | 4.8333 |
| 5/10/2003 | 9:33:10 | 316.2 | 50.81 | 14.301 | -0.282 | 5.27 | 0.2222 | 5.1300 |
| 5/10/2003 | 9:33:28 | 335 | 50.81 | 14.32 | -0.263 | 5.583333 | 0.2072 | 5.4433 |
| 5/10/2003 | 9:33:48 | 354.9 | 50.81 | 14.368 | -0.215 | 5.915 | 0.1694 | 5.7750 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 9:34:09 | 376 | 50.79 | 14.395 | -0.188 | 6.266667 | 0.1481 | 6.1267 |
| 5/10/2003 | 9:34:32 | 398.4 | 50.79 | 14.402 | -0.181 | 6.64 | 0.1426 | 6.5000 |
| 5/10/2003 | 9:34:56 | 422.1 | 50.79 | 14.423 | -0.16 | 7.035 | 0.1261 | 6.8950 |
| 5/10/2003 | 9:35:21 | 447.2 | 50.79 | 14.456 | -0.127 | 7.453333 | 0.1001 | 7.3133 |
| 5/10/2003 | 9:35:47 | 473.8 | 50.76 | 14.489 | -0.094 | 7.896667 | 0.0741 | 7.7567 |
| 5/10/2003 | 9:36:15 | 502 | 50.76 | 14.499 | -0.084 | 8.366667 | 0.0662 | 8.2267 |
| 5/10/2003 | 9:36:45 | 531.9 | 50.76 | 14.52 | -0.063 | 8.865 | 0.0496 | 8.7250 |
| 5/10/2003 | 9:37:17 | 563.5 | 50.74 | 14.565 | -0.018 | 9.391667 | 0.0142 | 9.2517 |
| 5/10/2003 | 9:37:50 | 597 | 50.74 | 14.573 | -0.01 | 9.95 | 0.0079 | 9.8100 |
| 5/10/2003 | 9:38:26 | 632.5 | 50.74 | 14.583 | 0 | | | |
| 5/10/2003 | 9:39:04 | 670.1 | 50.74 | 14.583 | 0 | | | |
| 5/10/2003 | 9:39:43 | 709.9 | 50.74 | 14.583 | 0 | | | |
| 5/10/2003 | 9:40:26 | 752.1 | 50.74 | 14.583 | 0 | | | |
| 5/10/2003 | 9:41:10 | 796.8 | 50.74 | 14.583 | 0 | | | |

**TETRA-TECH NUS**

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 13MWT11 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Falling head | **Test Date:** | 9-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** 6/23/03 RMB

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 1 = R |
| Length of Well Screen (ft.) : | 10 = L |
| Time for 37% head change (min.) : | 6.15 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 2.70E-04 | ft./min. |
| 4.50E-06 | ft./sec. |
| 3.89E-01 | ft./day |
| 1.37E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

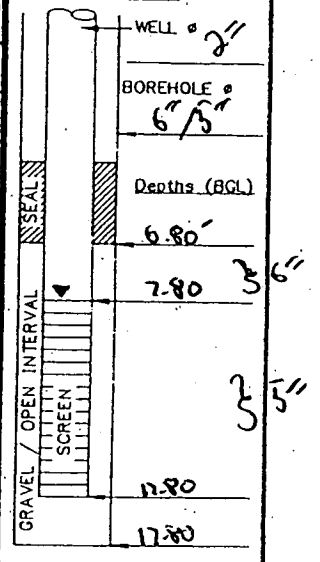
ADJUSTED SLUG TEST DATA ATTACHED

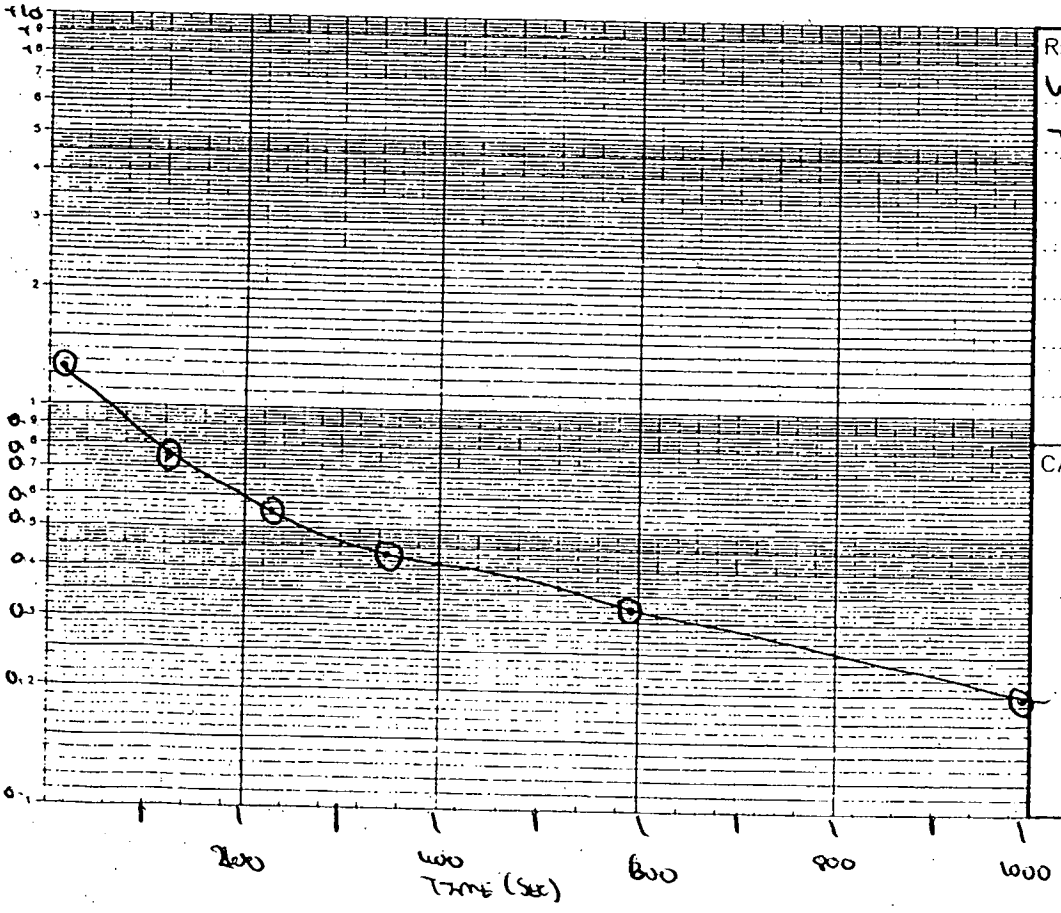
# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: CRANE
WELL/BORING NO.: 13MW114
PROJECT NO.: 9960 CW 0279
GEOLOGIST: BOB BAUCOVEE
WELL DIAMETER: 2" PVC
SCREEN LENGTH/DEPTH: 10' / 17.80'
TEST NO.: 5
STATIC WATER LEVEL (Depth/Elevation): 7.78'
DATE: 5/9/03
TEST TYPE (Rising/Falling/Constant Head): FALLING HEAD
CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: 1.25" x 61.5" LONG SLUG
PAGE ___ OF ___
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 3.052

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| STATIC → 4.8 | 8.773 | 0 | 177.2 | 9.436 | +0.663 |
| 5.1 | 9.213 | +0.44 | 236.8 | 9.358 | +0.585 |
| 5.4 | 12.345 | +3.572 | 354.9 | 9.247 | +0.474 |
| 10.0 | 10.142 | +1.369 | 547.0 | 9.108 | +0.335 |
| 20.0 | 10.010 | +1.237 | 1003.8 | 8.984 | +0.211 |
| 29.8 | 9.921 | +1.148 | 1503.3 | 8.913 | +0.14 |
| 41.8 | 9.836 | +1.063 | 2005.7 | 8.871 | +0.098 |
| 49.7 | 9.792 | +1.019 | 2525.9 | 8.846 | +0.073 |
| 59.0 | 9.745 | +0.972 | | | |
| 93.7 | 9.606 | +0.833 | | | |
| 111.5 | 9.558 | +0.785 | | | |
| 125.1 | 9.531 | +0.758 | | | |

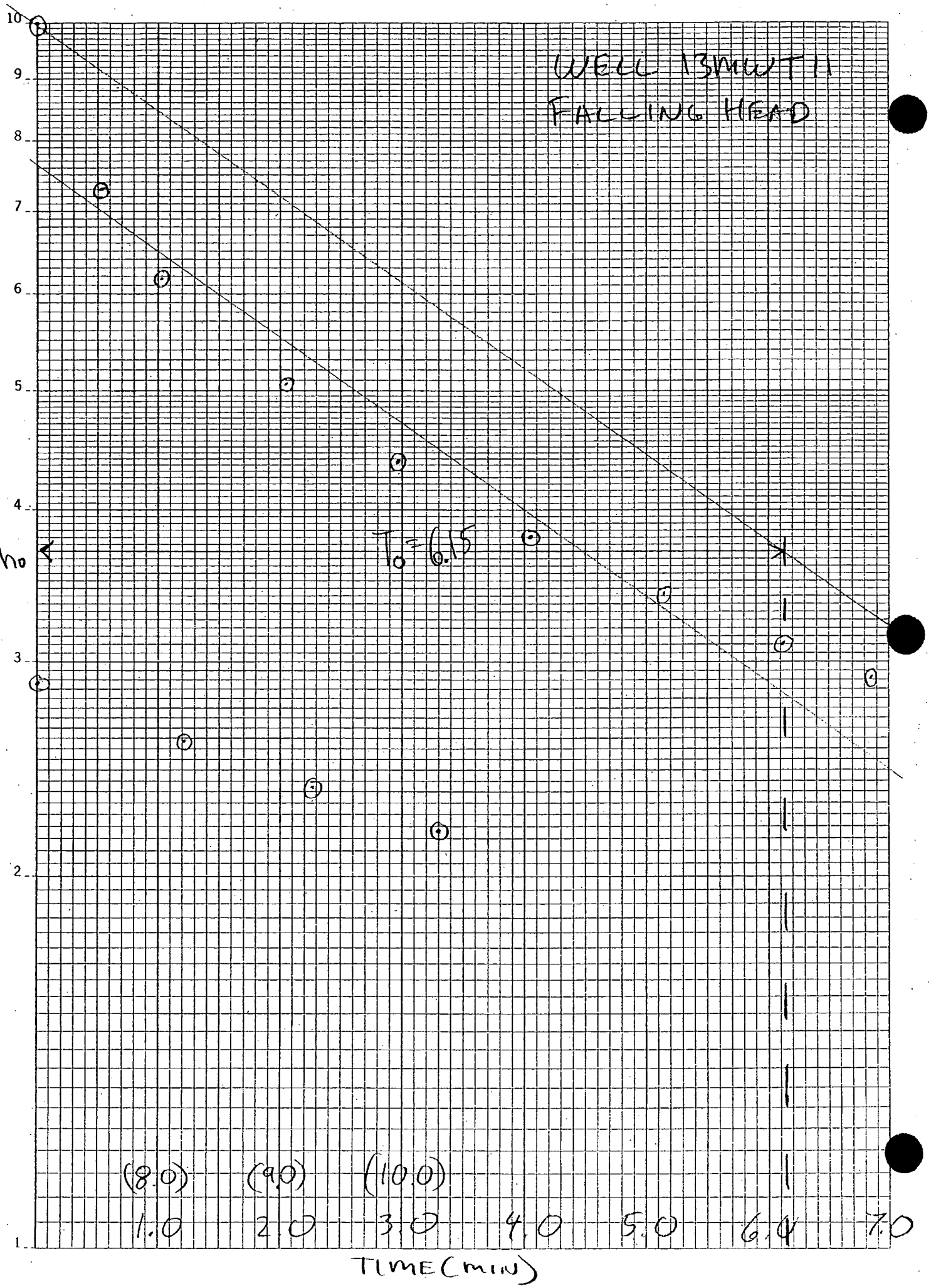
WELL SCHEMATIC




REMARKS:
WL 7.78
TD 17.80

CALCS, SKETCH MAPS, ETC.:


WELL 13MWT11
FALLING HEAD
$T_0 = 6.15$
h/h0
10
9
8
7
6
5
4
3
2
1
(8.0)
(9.0)
(10.0)
1.0
2.0
3.0
4.0
5.0
6.0
7.0
TIME (MIN)
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report gen 5/9/2003 13:21:57
Report fror ...\SN09018 2003-05-09 130833 13MWT11 Falling.bin
Win-Situ V. 4.41

Serial num 9018
Firmware \ 3.06
Unit name:

Test name: 13MWT11 Falling

Test define 5/9/2003 13:07:56
Test starte 5/9/2003 13:08:33
Test stopp N/A N/A
Test extrac N/A N/A

Data gathered using Logarithmic testing
Maximun Seconds.
Number 126

TOTAL DA 126

Channel number [1]
Measurer Temperature
Channel r Temperature

Channel number [2]
Measurer Pressure
Channel r Depth
Sensor R 30 PSIG.
Specific g 1

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Displacement Feet | adjusted time | h/ho | ho= 1.47 |
|---|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 13:08:33 | 0 | 0 | 54.1 | 8.773 | 0 | | | |
| 5/9/2003 | 13:08:33 | 0.3 | 0.005 | 54.15 | 8.773 | 0 | | | |
| 5/9/2003 | 13:08:34 | 0.6 | 0.01 | 54.15 | 8.773 | 0 | | | |
| 5/9/2003 | 13:08:34 | 0.9 | 0.015 | 54.15 | 8.773 | 0 | | | |
| 5/9/2003 | 13:08:34 | 1.2 | 0.02 | 54.17 | 8.773 | 0 | | | |
| 5/9/2003 | 13:08:35 | 1.5 | 0.025 | 54.17 | 8.773 | 0 | | | |
| 5/9/2003 | 13:08:35 | 1.8 | 0.03 | 54.17 | 8.773 | 0 | | | |
| 5/9/2003 | 13:08:35 | 2.1 | 0.035 | 54.17 | 8.773 | 0 | | | |
| 5/9/2003 | 13:08:35 | 2.4 | 0.04 | 54.19 | 8.773 | 0 | | | |
| 5/9/2003 | 13:08:36 | 2.7 | 0.045 | 54.17 | 8.773 | 0 | | | |
| 5/9/2003 | 13:08:36 | 3 | 0.05 | 54.19 | 8.773 | 0 | | | |
| 5/9/2003 | 13:08:36 | 3.3 | 0.055 | 54.19 | 8.773 | 0 | | | |
| 5/9/2003 | 13:08:37 | 3.6 | 0.06 | 54.19 | 8.773 | 0 | | | |
| 5/9/2003 | 13:08:37 | 3.9 | 0.065 | 54.19 | 8.773 | 0 | | | |
| 5/9/2003 | 13:08:37 | 4.2 | 0.07 | 54.19 | 8.773 | 0 | | | |
| 5/9/2003 | 13:08:38 | 4.5 | 0.075 | 54.19 | 8.773 | 0 | | | |
| 5/9/2003 | 13:08:38 | 4.8 | 0.08 | 54.19 | 8.773 | 0 | | | |
| 5/9/2003 | 13:08:38 | 5.1 | 0.085 | 54.19 | 9.213 | 0.44 | | | |
| 5/9/2003 | 13:08:38 | 5.4 | 0.09 | 54.19 | 12.345 | 3.572 | | | |
| 5/9/2003 | 13:08:39 | 5.7 | 0.095 | 54.19 | 10.76 | 1.987 | | | |
| 5/9/2003 | 13:08:39 | 6 | 0.1 | 54.19 | 9.984 | 1.211 | | | |
| 5/9/2003 | 13:08:39 | 6.4 | 0.106667 | 54.19 | 10.534 | 1.761 | | | |
| 5/9/2003 | 13:08:40 | 6.7 | 0.111667 | 54.19 | 9.922 | 1.149 | | | |
| 5/9/2003 | 13:08:40 | 7.1 | 0.118333 | 54.19 | 10.204 | 1.431 | Plotted shaded values. | | |
| 5/9/2003 | 13:08:41 | 7.5 | 0.125 | 54.22 | 10.283 | 1.51 | | | |
| 5/9/2003 | 13:08:41 | 8 | 0.133333 | 54.22 | 10.156 | 1.383 | | | |
| 5/9/2003 | 13:08:42 | 8.4 | 0.14 | 54.22 | 10.163 | 1.39 | adjusted time | h/ho | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 13:08:42 | 8.9 | 0.148333 | 54.22 | 10.243 | 1.47 | 0.000 | 1.000 |
| 5/9/2003 | 13:08:43 | 9.5 | 0.158333 | 54.22 | 10.125 | 1.352 | 0.010 | 0.920 |
| 5/9/2003 | 13:08:43 | 10 | 0.166667 | 54.19 | 10.142 | 1.369 | 0.018 | 0.931 |
| 5/9/2003 | 13:08:44 | 10.6 | 0.176667 | 54.17 | 10.126 | 1.353 | 0.028 | 0.920 |
| 5/9/2003 | 13:08:44 | 11.3 | 0.188333 | 54.17 | 10.116 | 1.343 | 0.040 | 0.914 |
| 5/9/2003 | 13:08:45 | 11.9 | 0.198333 | 54.17 | 10.105 | 1.332 | 0.050 | 0.906 |
| 5/9/2003 | 13:08:46 | 12.6 | 0.21 | 54.17 | 10.095 | 1.322 | 0.062 | 0.899 |
| 5/9/2003 | 13:08:46 | 13.4 | 0.223333 | 54.17 | 10.084 | 1.311 | 0.075 | 0.892 |
| 5/9/2003 | 13:08:47 | 14.2 | 0.236667 | 54.17 | 10.072 | 1.299 | 0.088 | 0.884 |
| 5/9/2003 | 13:08:48 | 15 | 0.25 | 54.17 | 10.062 | 1.289 | 0.102 | 0.877 |
| 5/9/2003 | 13:08:49 | 15.9 | 0.265 | 54.17 | 10.057 | 1.284 | 0.117 | 0.873 |
| 5/9/2003 | 13:08:50 | 16.8 | 0.28 | 54.17 | 10.043 | 1.27 | 0.132 | 0.864 |
| 5/9/2003 | 13:08:51 | 17.8 | 0.296667 | 54.17 | 10.033 | 1.26 | 0.148 | 0.857 |
| 5/9/2003 | 13:08:52 | 18.9 | 0.315 | 54.15 | 10.02 | 1.247 | 0.167 | 0.848 |
| 5/9/2003 | 13:08:53 | 20 | 0.333333 | 54.17 | 10.01 | 1.237 | 0.185 | 0.841 |
| 5/9/2003 | 13:08:54 | 21.2 | 0.353333 | 54.15 | 10 | 1.227 | 0.205 | 0.835 |
| 5/9/2003 | 13:08:56 | 22.4 | 0.373333 | 54.15 | 9.985 | 1.212 | 0.225 | 0.824 |
| 5/9/2003 | 13:08:57 | 23.8 | 0.396667 | 54.15 | 9.971 | 1.198 | 0.248 | 0.815 |
| 5/9/2003 | 13:08:58 | 25.2 | 0.42 | 54.15 | 9.956 | 1.183 | 0.272 | 0.805 |
| 5/9/2003 | 13:09:00 | 26.7 | 0.445 | 54.15 | 9.944 | 1.171 | 0.297 | 0.797 |
| 5/9/2003 | 13:09:01 | 28.2 | 0.47 | 54.15 | 9.933 | 1.16 | 0.322 | 0.789 |
| 5/9/2003 | 13:09:03 | 29.8 | 0.496667 | 54.15 | 9.921 | 1.148 | 0.348 | 0.781 |
| 5/9/2003 | 13:09:05 | 31.5 | 0.525 | 54.15 | 9.908 | 1.135 | 0.377 | 0.772 |
| 5/9/2003 | 13:09:06 | 33.3 | 0.555 | 54.15 | 9.896 | 1.123 | 0.407 | 0.764 |
| 5/9/2003 | 13:09:08 | 35.2 | 0.586667 | 54.15 | 9.881 | 1.108 | 0.438 | 0.754 |
| 5/9/2003 | 13:09:10 | 37.3 | 0.621667 | 54.15 | 9.867 | 1.094 | 0.473 | 0.744 |
| 5/9/2003 | 13:09:13 | 39.5 | 0.658333 | 54.15 | 9.852 | 1.079 | 0.510 | 0.734 |
| 5/9/2003 | 13:09:15 | 41.8 | 0.696667 | 54.15 | 9.836 | 1.063 | 0.548 | 0.723 |
| 5/9/2003 | 13:09:17 | 44.3 | 0.738333 | 54.15 | 9.823 | 1.05 | 0.590 | 0.714 |
| 5/9/2003 | 13:09:20 | 46.9 | 0.781667 | 54.15 | 9.807 | 1.034 | 0.633 | 0.703 |
| 5/9/2003 | 13:09:23 | 49.7 | 0.828333 | 54.15 | 9.792 | 1.019 | 0.680 | 0.693 |
| 5/9/2003 | 13:09:26 | 52.6 | 0.876667 | 54.15 | 9.778 | 1.005 | 0.728 | 0.684 |
| 5/9/2003 | 13:09:29 | 55.7 | 0.928333 | 54.12 | 9.764 | 0.991 | 0.780 | 0.674 |
| 5/9/2003 | 13:09:32 | 59 | 0.983333 | 54.15 | 9.745 | 0.972 | 0.835 | 0.661 |
| 5/9/2003 | 13:09:36 | 62.5 | 1.041667 | 54.15 | 9.728 | 0.955 | 0.893 | 0.650 |
| 5/9/2003 | 13:09:39 | 66.2 | 1.103333 | 54.12 | 9.712 | 0.939 | 0.955 | 0.639 |
| 5/9/2003 | 13:09:43 | 70.1 | 1.168333 | 54.12 | 9.697 | 0.924 | 1.020 | 0.629 |
| 5/9/2003 | 13:09:47 | 74.3 | 1.238333 | 54.12 | 9.681 | 0.908 | 1.090 | 0.618 |
| 5/9/2003 | 13:09:52 | 78.7 | 1.311667 | 54.12 | 9.664 | 0.891 | 1.163 | 0.606 |
| 5/9/2003 | 13:09:56 | 83.4 | 1.39 | 54.12 | 9.645 | 0.872 | 1.242 | 0.593 |
| 5/9/2003 | 13:10:01 | 88.4 | 1.473333 | 54.12 | 9.629 | 0.856 | 1.325 | 0.582 |
| 5/9/2003 | 13:10:07 | 93.7 | 1.561667 | 54.12 | 9.606 | 0.833 | 1.413 | 0.567 |
| 5/9/2003 | 13:10:12 | 99.3 | 1.655 | 54.12 | 9.589 | 0.816 | 1.507 | 0.555 |
| 5/9/2003 | 13:10:18 | 105.2 | 1.753333 | 54.12 | 9.575 | 0.802 | 1.605 | 0.546 |
| 5/9/2003 | 13:10:25 | 111.5 | 1.858333 | 54.12 | 9.558 | 0.785 | 1.710 | 0.534 |
| 5/9/2003 | 13:10:31 | 118.1 | 1.968333 | 54.12 | 9.546 | 0.773 | 1.820 | 0.526 |
| 5/9/2003 | 13:10:38 | 125.1 | 2.085 | 54.12 | 9.531 | 0.758 | 1.937 | 0.516 |
| 5/9/2003 | 13:10:46 | 132.6 | 2.21 | 54.1 | 9.517 | 0.744 | 2.062 | 0.506 |
| 5/9/2003 | 13:10:54 | 140.5 | 2.341667 | 54.1 | 9.5 | 0.727 | 2.193 | 0.495 |
| 5/9/2003 | 13:11:02 | 148.9 | 2.481667 | 54.12 | 9.479 | 0.706 | 2.333 | 0.480 |
| 5/9/2003 | 13:11:11 | 157.8 | 2.63 | 54.1 | 9.467 | 0.694 | 2.482 | 0.472 |
| 5/9/2003 | 13:11:20 | 167.2 | 2.786667 | 54.12 | 9.452 | 0.679 | 2.638 | 0.462 |
| 5/9/2003 | 13:11:30 | 177.2 | 2.953333 | 54.1 | 9.436 | 0.663 | 2.805 | 0.451 |
| 5/9/2003 | 13:11:41 | 187.8 | 3.13 | 54.1 | 9.419 | 0.646 | 2.982 | 0.439 |
| 5/9/2003 | 13:11:52 | 199 | 3.316667 | 54.1 | 9.405 | 0.632 | 3.168 | 0.430 |
| 5/9/2003 | 13:12:04 | 210.9 | 3.515 | 54.1 | 9.39 | 0.617 | 3.367 | 0.420 |
| 5/9/2003 | 13:12:17 | 223.5 | 3.725 | 54.1 | 9.374 | 0.601 | 3.577 | 0.409 |
| 5/9/2003 | 13:12:30 | 236.8 | 3.946667 | 54.08 | 9.358 | 0.585 | 3.798 | 0.398 |
| 5/9/2003 | 13:12:44 | 250.9 | 4.181667 | 54.08 | 9.341 | 0.568 | 4.033 | 0.386 |
| 5/9/2003 | 13:12:59 | 265.8 | 4.43 | 54.08 | 9.324 | 0.551 | 4.282 | 0.375 |
| 5/9/2003 | 13:13:15 | 281.6 | 4.693333 | 54.08 | 9.31 | 0.537 | 4.545 | 0.365 |
| 5/9/2003 | 13:13:31 | 298.4 | 4.973333 | 54.08 | 9.293 | 0.52 | 4.825 | 0.354 |
| 5/9/2003 | 13:13:49 | 316.2 | 5.27 | 54.08 | 9.277 | 0.504 | 5.122 | 0.343 |
| 5/9/2003 | 13:14:08 | 335 | 5.583333 | 54.1 | 9.26 | 0.487 | 5.435 | 0.331 |
| 5/9/2003 | 13:14:28 | 354.9 | 5.915 | 54.1 | 9.247 | 0.474 | 5.767 | 0.322 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 13:14:49 | 376 | 6.266667 | 54.12 | 9.23 | 0.457 | 6.118 | 0.311 |
| 5/9/2003 | 13:15:11 | 398.4 | 6.64 | 54.12 | 9.216 | 0.443 | 6.492 | 0.301 |
| 5/9/2003 | 13:15:35 | 422.1 | 7.035 | 54.12 | 9.201 | 0.428 | 6.887 | 0.291 |
| 5/9/2003 | 13:16:00 | 447.2 | 7.453333 | 54.15 | 9.184 | 0.411 | 7.305 | 0.280 |
| 5/9/2003 | 13:16:27 | 473.8 | 7.896667 | 54.19 | 9.167 | 0.394 | 7.748 | 0.268 |
| 5/9/2003 | 13:16:55 | 502 | 8.366667 | 54.22 | 9.154 | 0.381 | 8.218 | 0.259 |
| 5/9/2003 | 13:17:25 | 531.9 | 8.865 | 54.24 | 9.14 | 0.367 | 8.717 | 0.250 |
| 5/9/2003 | 13:17:57 | 563.5 | 9.391667 | 54.26 | 9.123 | 0.35 | 9.243 | 0.238 |
| 5/9/2003 | 13:18:30 | 597 | 9.95 | 54.26 | 9.108 | 0.335 | 9.802 | 0.228 |
| 5/9/2003 | 13:19:06 | 632.5 | 10.54167 | 54.28 | 9.093 | 0.32 | 10.393 | 0.218 |
| 5/9/2003 | 13:19:43 | 670.1 | 11.16833 | 54.28 | 9.079 | 0.306 | 11.020 | 0.208 |
| 5/9/2003 | 13:20:23 | 709.9 | 11.83167 | 54.31 | 9.064 | 0.291 | 11.683 | 0.198 |
| 5/9/2003 | 13:21:05 | 752.1 | 12.535 | 54.31 | 9.049 | 0.276 | 12.387 | 0.188 |
| 5/9/2003 | 13:21:50 | 796.8 | 13.28 | 54.31 | 9.035 | 0.262 | 13.132 | 0.178 |
| 5/9/2003 | 13:22:37 | 844.2 | 14.07 | 54.31 | 9.024 | 0.251 | 13.922 | 0.171 |
| 5/9/2003 | 13:23:27 | 894.4 | 14.90667 | 54.31 | 9.01 | 0.237 | 14.758 | 0.161 |
| 5/9/2003 | 13:24:21 | 947.5 | 15.79167 | 54.33 | 8.997 | 0.224 | 15.643 | 0.152 |
| 5/9/2003 | 13:25:17 | 1003.8 | 16.73 | 54.35 | 8.984 | 0.211 | 16.582 | 0.144 |
| 5/9/2003 | 13:26:16 | 1063.4 | 17.72333 | 54.35 | 8.974 | 0.201 | 17.575 | 0.137 |
| 5/9/2003 | 13:27:20 | 1126.6 | 18.77667 | 54.35 | 8.962 | 0.189 | 18.628 | 0.129 |
| 5/9/2003 | 13:28:27 | 1193.5 | 19.89167 | 54.38 | 8.953 | 0.18 | 19.743 | 0.122 |
| 5/9/2003 | 13:29:37 | 1264.4 | 21.07333 | 54.38 | 8.94 | 0.167 | 20.925 | 0.114 |
| 5/9/2003 | 13:30:53 | 1339.5 | 22.325 | 54.38 | 8.932 | 0.159 | 22.177 | 0.108 |
| 5/9/2003 | 13:32:12 | 1419 | 23.65 | 54.38 | 8.922 | 0.149 | 23.502 | 0.101 |
| 5/9/2003 | 13:33:36 | 1503.3 | 25.055 | 54.38 | 8.913 | 0.14 | 24.907 | 0.095 |
| 5/9/2003 | 13:35:06 | 1592.6 | 26.54333 | 54.35 | 8.903 | 0.13 | 26.395 | 0.088 |
| 5/9/2003 | 13:36:40 | 1687.1 | 28.11833 | 54.35 | 8.895 | 0.122 | 27.970 | 0.083 |
| 5/9/2003 | 13:38:20 | 1787.2 | 29.78667 | 54.35 | 8.887 | 0.114 | 29.638 | 0.078 |
| 5/9/2003 | 13:40:06 | 1893.3 | 31.555 | 54.33 | 8.879 | 0.106 | 31.407 | 0.072 |
| 5/9/2003 | 13:41:59 | 2005.7 | 33.42833 | 54.33 | 8.871 | 0.098 | 33.280 | 0.067 |
| 5/9/2003 | 13:43:58 | 2124.7 | 35.41167 | 54.33 | 8.864 | 0.091 | 35.263 | 0.062 |
| 5/9/2003 | 13:46:04 | 2250.8 | 37.51333 | 54.31 | 8.858 | 0.085 | 37.365 | 0.058 |
| 5/9/2003 | 13:48:17 | 2384.4 | 39.74 | 54.28 | 8.85 | 0.077 | 39.592 | 0.052 |
| 5/9/2003 | 13:50:39 | 2525.9 | 42.09833 | 54.28 | 8.846 | 0.073 | 41.950 | 0.050 |

**TETRA-TECH NUS**

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 13MWT11 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Rising head | **Test Date:** | 9-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RMB 6/23/03

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 1 = R |
| Length of Well Screen (ft.) : | 10 = L |
| Time for 37% head change (min.) : | 15.10 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.10E-04 | ft./min. |
| 1.83E-06 | ft./sec. |
| 1.59E-01 | ft./day |
| 5.59E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: CRANE

WELL/BORING NO.: 13MWTH

PROJECT NO.: 9060 C20 0279

GEOLOGIST: BOB BALLCOVEC

WELL DIAMETER: 2" PVC

SCREEN LENGTH/DEPTH: 10'

TEST NO.: 7

STATIC WATER LEVEL (Depth/Elevation): 7.78'

DATE: 5/9/03

TEST TYPE (Rising/Falling/Constant Head): RISING HEAD

CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: 1.25" x 61.5" LONG SLUG

PAGE OF

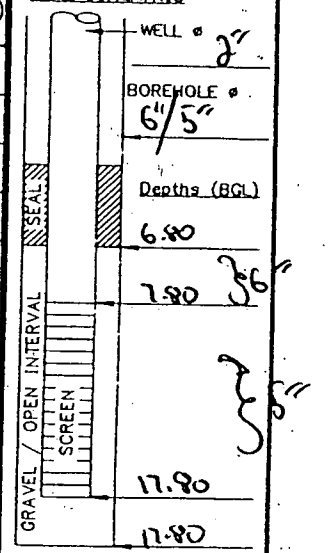
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30 PSI

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 2.7 | 8.854 | | 236.8 | 8.164 | -0.69 |
| 3.0 | 6.969 | -2.085 | 473.8 | 8.294 | -0.56 |
| 5.1 | 7.485 | -1.369 | 947.5 | 8.524 | -0.33 |
| 6.0 | 7.681 | -1.173 | 1787.2 | 8.651 | -0.203 |
| 7.1 | 7.806 | -1.048 | | | |
| 10.0 | 7.889 | -0.965 | | | |
| 15.0 | 7.925 | -0.929 | | | |
| 20.0 | 7.944 | -0.91 | | | |
| 29.8 | 7.966 | -0.888 | | | |
| 59.0 | 8.012 | -0.842 | | | |
| 93.7 | 8.054 | -0.8 | | | |
| 148.9 | 8.104 | -0.75 | | | |

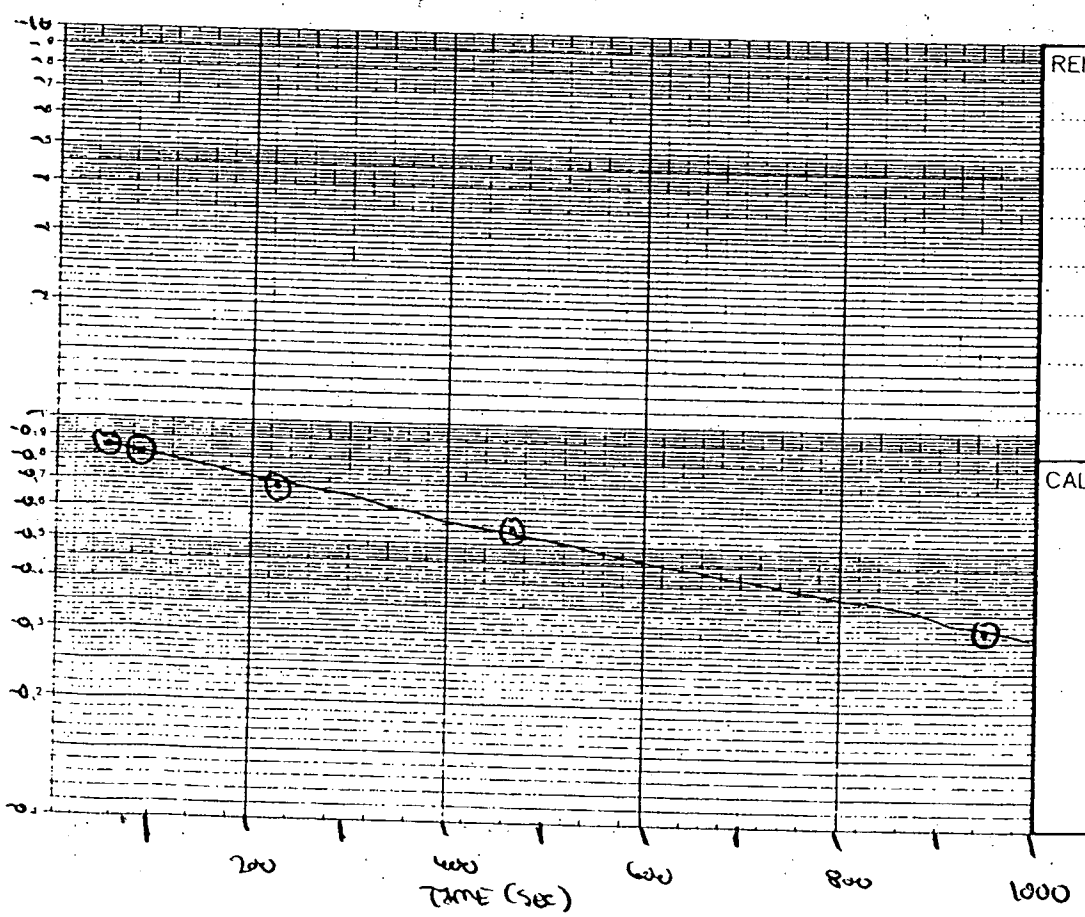
STATIC

START

WELL SCHEMATIC

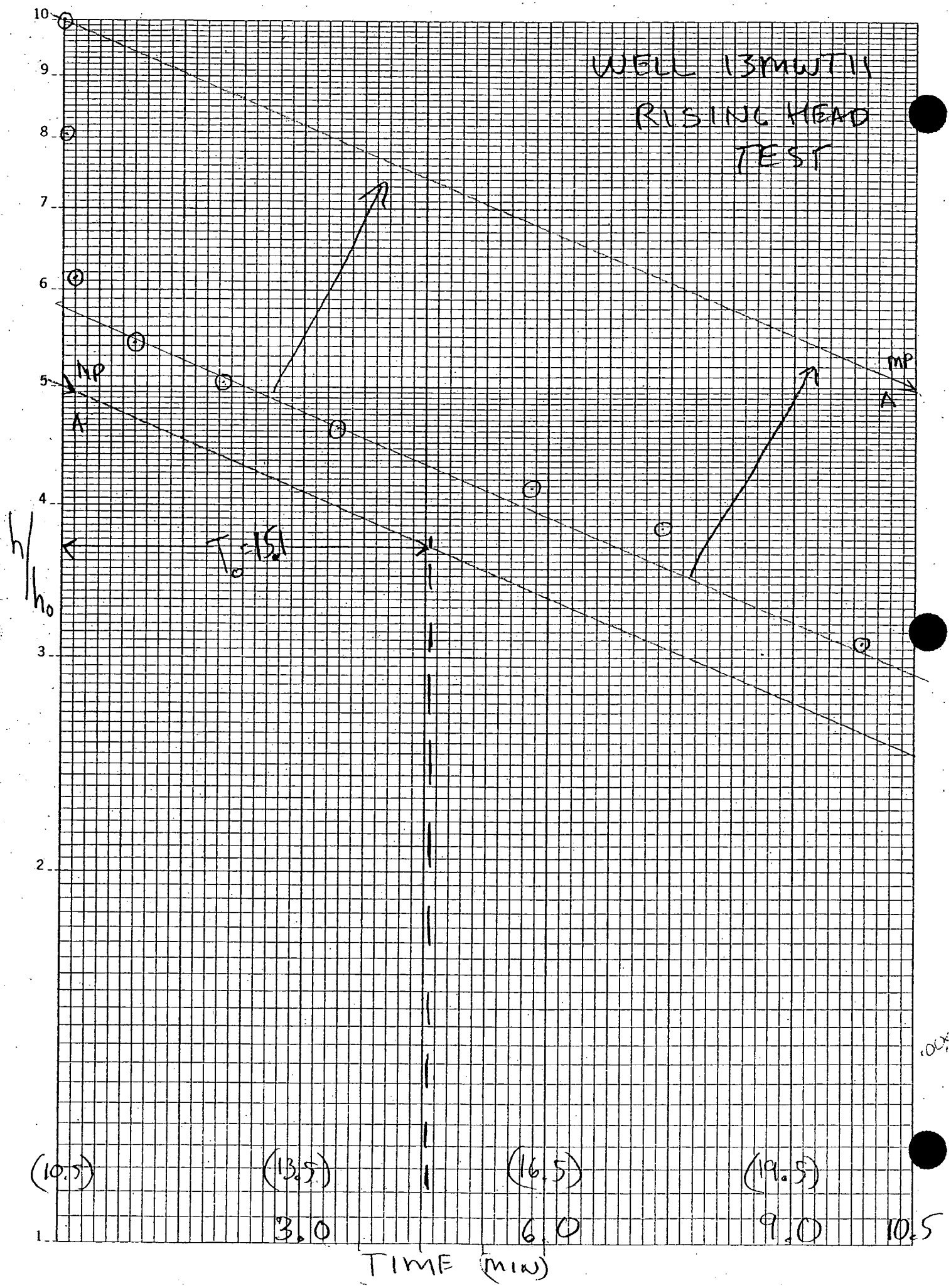



Indicate SWL Depth on Drawing




REMARKS:

CALCS, SKETCH MAPS, ETC.:




K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS KEUFFEL & ESSER CO. MADE IN U.S.A.
46 4650

In-Situ Inc. MiniTroll Pro

Report gen 5/9/2003 14:25:46
Report fror ...\SN09018 2003-05-09 135929 13MWT11 Rising.bin
Win-Situ V 4.41

Serial num 9018
Firmware \ 3.06
Unit name:

Test name: 13MWT11 Rising

Test define 5/9/2003 13:56:07
Test starte 5/9/2003 13:59:29
Test stopp N/A N/A
Test extrac N/A N/A

Data gathered using Logarithmic testing
Maximun Seconds.
Number 136

TOTAL DA 136

Channel number [1]
Measurer Temperature
Channel r Temperature

Channel number [2]
Measurer Pressure
Channel r Depth
Sensor R 30 PSIG.
Specific g 1

ho= -1.693

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | | adjusted time | h/ho |
|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 13:59:29 | 0 | 0 | 54.24 | 8.854 | 0 | | |
| 5/9/2003 | 13:59:29 | 0.3 | 0.005 | 54.28 | 8.854 | 0 | | |
| 5/9/2003 | 13:59:29 | 0.6 | 0.01 | 54.31 | 8.854 | 0 | | |
| 5/9/2003 | 13:59:29 | 0.9 | 0.015 | 54.31 | 8.854 | 0 | | |
| 5/9/2003 | 13:59:30 | 1.2 | 0.02 | 54.31 | 8.854 | 0 | | |
| 5/9/2003 | 13:59:30 | 1.5 | 0.025 | 54.33 | 8.854 | 0 | | |
| 5/9/2003 | 13:59:30 | 1.8 | 0.03 | 54.33 | 8.854 | 0 | | |
| 5/9/2003 | 13:59:31 | 2.1 | 0.035 | 54.33 | 8.854 | 0 | | |
| 5/9/2003 | 13:59:31 | 2.4 | 0.04 | 54.33 | 8.854 | 0 | | |
| 5/9/2003 | 13:59:31 | 2.7 | 0.045 | 54.33 | 8.854 | 0 | | |
| 5/9/2003 | 13:59:32 | 3 | 0.05 | 54.33 | 6.769 | -2.085 | | |
| 5/9/2003 | 13:59:32 | 3.3 | 0.055 | 54.33 | 6.993 | -1.861 | Plotted shaded values. | |
| 5/9/2003 | 13:59:32 | 3.6 | 0.06 | 54.33 | 7.161 | -1.693 | | |
| 5/9/2003 | 13:59:32 | 3.9 | 0.065 | 54.33 | 7.217 | -1.637 | | |
| 5/9/2003 | 13:59:33 | 4.2 | 0.07 | 54.33 | 7.157 | -1.697 | adjusted time | h/ho |
| 5/9/2003 | 13:59:33 | 4.5 | 0.075 | 54.33 | 7.323 | -1.531 | 0.000 | 1.000 |
| 5/9/2003 | 13:59:33 | 4.8 | 0.08 | 54.33 | 7.404 | -1.45 | 0.005 | 0.947 |
| 5/9/2003 | 13:59:34 | 5.1 | 0.085 | 54.33 | 7.485 | -1.369 | 0.010 | 0.894 |
| 5/9/2003 | 13:59:34 | 5.4 | 0.09 | 54.33 | 7.564 | -1.29 | 0.015 | 0.843 |
| 5/9/2003 | 13:59:34 | 5.7 | 0.095 | 54.35 | 7.625 | -1.229 | 0.020 | 0.803 |
| 5/9/2003 | 13:59:35 | 6 | 0.1 | 54.35 | 7.681 | -1.173 | 0.025 | 0.766 |
| 5/9/2003 | 13:59:35 | 6.4 | 0.106667 | 54.35 | 7.733 | -1.121 | 0.032 | 0.732 |
| 5/9/2003 | 13:59:35 | 6.7 | 0.111667 | 54.35 | 7.777 | -1.077 | 0.037 | 0.703 |
| 5/9/2003 | 13:59:36 | 7.1 | 0.118333 | 54.35 | 7.806 | -1.048 | 0.043 | 0.685 |
| 5/9/2003 | 13:59:36 | 7.5 | 0.125 | 54.35 | 7.825 | -1.029 | 0.050 | 0.672 |
| 5/9/2003 | 13:59:37 | 8 | 0.133333 | 54.35 | 7.852 | -1.002 | 0.058 | 0.654 |
| 5/9/2003 | 13:59:37 | 8.4 | 0.14 | 54.35 | 7.866 | -0.988 | 0.065 | 0.645 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 13:59:37 | 8.9 | 0.148333 | 54.35 | 7.879 | -0.975 | 0.073 | 0.637 |
| 5/9/2003 | 13:59:38 | 9.5 | 0.158333 | 54.35 | 7.887 | -0.967 | 0.083 | 0.632 |
| 5/9/2003 | 13:59:39 | 10 | 0.166667 | 54.33 | 7.889 | -0.965 | 0.092 | 0.630 |
| 5/9/2003 | 13:59:39 | 10.6 | 0.176667 | 54.33 | 7.895 | -0.959 | 0.102 | 0.626 |
| 5/9/2003 | 13:59:40 | 11.3 | 0.188333 | 54.33 | 7.902 | -0.952 | 0.113 | 0.622 |
| 5/9/2003 | 13:59:40 | 11.9 | 0.198333 | 54.33 | 7.906 | -0.948 | 0.123 | 0.619 |
| 5/9/2003 | 13:59:41 | 12.6 | 0.21 | 54.31 | 7.912 | -0.942 | 0.135 | 0.615 |
| 5/9/2003 | 13:59:42 | 13.4 | 0.223333 | 54.31 | 7.917 | -0.937 | 0.148 | 0.612 |
| 5/9/2003 | 13:59:43 | 14.2 | 0.236667 | 54.31 | 7.921 | -0.933 | 0.162 | 0.609 |
| 5/9/2003 | 13:59:44 | 15 | 0.25 | 54.31 | 7.925 | -0.929 | 0.175 | 0.607 |
| 5/9/2003 | 13:59:44 | 15.9 | 0.265 | 54.31 | 7.927 | -0.927 | 0.190 | 0.605 |
| 5/9/2003 | 13:59:45 | 16.8 | 0.28 | 54.31 | 7.931 | -0.923 | 0.205 | 0.603 |
| 5/9/2003 | 13:59:46 | 17.8 | 0.296667 | 54.31 | 7.937 | -0.917 | 0.222 | 0.599 |
| 5/9/2003 | 13:59:47 | 18.9 | 0.315 | 54.31 | 7.939 | -0.915 | 0.240 | 0.598 |
| 5/9/2003 | 13:59:49 | 20 | 0.333333 | 54.31 | 7.944 | -0.91 | 0.258 | 0.594 |
| 5/9/2003 | 13:59:50 | 21.2 | 0.353333 | 54.31 | 7.946 | -0.908 | 0.278 | 0.593 |
| 5/9/2003 | 13:59:51 | 22.4 | 0.373333 | 54.31 | 7.95 | -0.904 | 0.298 | 0.590 |
| 5/9/2003 | 13:59:52 | 23.8 | 0.396667 | 54.31 | 7.954 | -0.9 | 0.322 | 0.588 |
| 5/9/2003 | 13:59:54 | 25.2 | 0.42 | 54.31 | 7.956 | -0.898 | 0.345 | 0.587 |
| 5/9/2003 | 13:59:55 | 26.7 | 0.445 | 54.31 | 7.96 | -0.894 | 0.370 | 0.584 |
| 5/9/2003 | 13:59:57 | 28.2 | 0.47 | 54.31 | 7.964 | -0.89 | 0.395 | 0.581 |
| 5/9/2003 | 13:59:58 | 29.8 | 0.496667 | 54.31 | 7.966 | -0.888 | 0.422 | 0.580 |
| 5/9/2003 | 14:00:00 | 31.5 | 0.525 | 54.31 | 7.97 | -0.884 | 0.450 | 0.577 |
| 5/9/2003 | 14:00:02 | 33.3 | 0.555 | 54.31 | 7.975 | -0.879 | 0.480 | 0.574 |
| 5/9/2003 | 14:00:04 | 35.2 | 0.586667 | 54.31 | 7.977 | -0.877 | 0.512 | 0.573 |
| 5/9/2003 | 14:00:06 | 37.3 | 0.621667 | 54.31 | 7.981 | -0.873 | 0.547 | 0.570 |
| 5/9/2003 | 14:00:08 | 39.5 | 0.658333 | 54.28 | 7.985 | -0.869 | 0.583 | 0.568 |
| 5/9/2003 | 14:00:10 | 41.8 | 0.696667 | 54.28 | 7.989 | -0.865 | 0.622 | 0.565 |
| 5/9/2003 | 14:00:13 | 44.3 | 0.738333 | 54.28 | 7.992 | -0.862 | 0.663 | 0.563 |
| 5/9/2003 | 14:00:15 | 46.9 | 0.781667 | 54.28 | 7.996 | -0.858 | 0.707 | 0.560 |
| 5/9/2003 | 14:00:18 | 49.7 | 0.828333 | 54.28 | 8 | -0.854 | 0.753 | 0.558 |
| 5/9/2003 | 14:00:21 | 52.6 | 0.876667 | 54.28 | 8.004 | -0.85 | 0.802 | 0.555 |
| 5/9/2003 | 14:00:24 | 55.7 | 0.928333 | 54.28 | 8.008 | -0.846 | 0.853 | 0.553 |
| 5/9/2003 | 14:00:28 | 59 | 0.983333 | 54.28 | 8.012 | -0.842 | 0.908 | 0.550 |
| 5/9/2003 | 14:00:31 | 62.5 | 1.041667 | 54.28 | 8.019 | -0.835 | 0.967 | 0.545 |
| 5/9/2003 | 14:00:35 | 66.2 | 1.103333 | 54.28 | 8.023 | -0.831 | 1.028 | 0.543 |
| 5/9/2003 | 14:00:39 | 70.1 | 1.168333 | 54.28 | 8.029 | -0.825 | 1.093 | 0.539 |
| 5/9/2003 | 14:00:43 | 74.3 | 1.238333 | 54.28 | 8.033 | -0.821 | 1.163 | 0.536 |
| 5/9/2003 | 14:00:47 | 78.7 | 1.311667 | 54.26 | 8.038 | -0.816 | 1.237 | 0.533 |
| 5/9/2003 | 14:00:52 | 83.4 | 1.39 | 54.26 | 8.044 | -0.81 | 1.315 | 0.529 |
| 5/9/2003 | 14:00:57 | 88.4 | 1.473333 | 54.26 | 8.05 | -0.804 | 1.398 | 0.525 |
| 5/9/2003 | 14:01:02 | 93.7 | 1.561667 | 54.26 | 8.054 | -0.8 | 1.487 | 0.523 |
| 5/9/2003 | 14:01:08 | 99.3 | 1.655 | 54.26 | 8.06 | -0.794 | 1.580 | 0.519 |
| 5/9/2003 | 14:01:14 | 105.2 | 1.753333 | 54.26 | 8.067 | -0.787 | 1.678 | 0.514 |
| 5/9/2003 | 14:01:20 | 111.5 | 1.858333 | 54.26 | 8.073 | -0.781 | 1.783 | 0.510 |
| 5/9/2003 | 14:01:27 | 118.1 | 1.968333 | 54.26 | 8.077 | -0.777 | 1.893 | 0.508 |
| 5/9/2003 | 14:01:34 | 125.1 | 2.085 | 54.26 | 8.083 | -0.771 | 2.010 | 0.504 |
| 5/9/2003 | 14:01:41 | 132.6 | 2.21 | 54.24 | 8.092 | -0.762 | 2.135 | 0.498 |
| 5/9/2003 | 14:01:49 | 140.5 | 2.341667 | 54.24 | 8.098 | -0.756 | 2.267 | 0.494 |
| 5/9/2003 | 14:01:57 | 148.9 | 2.481667 | 54.24 | 8.104 | -0.75 | 2.407 | 0.490 |
| 5/9/2003 | 14:02:06 | 157.8 | 2.63 | 54.24 | 8.113 | -0.741 | 2.555 | 0.484 |
| 5/9/2003 | 14:02:16 | 167.2 | 2.786667 | 54.24 | 8.121 | -0.733 | 2.712 | 0.479 |
| 5/9/2003 | 14:02:26 | 177.2 | 2.953333 | 54.24 | 8.127 | -0.727 | 2.878 | 0.475 |
| 5/9/2003 | 14:02:36 | 187.8 | 3.13 | 54.24 | 8.131 | -0.723 | 3.055 | 0.472 |
| 5/9/2003 | 14:02:48 | 199 | 3.316667 | 54.24 | 8.142 | -0.712 | 3.242 | 0.465 |
| 5/9/2003 | 14:02:59 | 210.9 | 3.515 | 54.24 | 8.148 | -0.706 | 3.440 | 0.461 |
| 5/9/2003 | 14:03:12 | 223.5 | 3.725 | 54.24 | 8.158 | -0.696 | 3.650 | 0.455 |
| 5/9/2003 | 14:03:25 | 236.8 | 3.946667 | 54.24 | 8.164 | -0.69 | 3.872 | 0.451 |
| 5/9/2003 | 14:03:39 | 250.9 | 4.181667 | 54.24 | 8.173 | -0.681 | 4.107 | 0.445 |
| 5/9/2003 | 14:03:54 | 265.8 | 4.43 | 54.24 | 8.181 | -0.673 | 4.355 | 0.440 |
| 5/9/2003 | 14:04:10 | 281.6 | 4.693333 | 54.24 | 8.187 | -0.667 | 4.618 | 0.436 |
| 5/9/2003 | 14:04:27 | 298.4 | 4.973333 | 54.22 | 8.196 | -0.658 | 4.898 | 0.430 |
| 5/9/2003 | 14:04:45 | 316.2 | 5.27 | 54.22 | 8.206 | -0.648 | 5.195 | 0.423 |
| 5/9/2003 | 14:05:04 | 335 | 5.583333 | 54.22 | 8.212 | -0.642 | 5.508 | 0.419 |
| 5/9/2003 | 14:05:23 | 354.9 | 5.915 | 54.22 | 8.221 | -0.633 | 5.840 | 0.413 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 14:05:45 | 376 | 6.266667 | 54.22 | 8.229 | -0.625 | 6.192 | 0.408 |
| 5/9/2003 | 14:06:07 | 398.4 | 6.64 | 54.22 | 8.239 | -0.615 | 6.565 | 0.402 |
| 5/9/2003 | 14:06:31 | 422.1 | 7.035 | 54.22 | 8.248 | -0.606 | 6.960 | 0.396 |
| 5/9/2003 | 14:06:56 | 447.2 | 7.453333 | 54.22 | 8.266 | -0.588 | 7.378 | 0.384 |
| 5/9/2003 | 14:07:22 | 473.8 | 7.896667 | 54.19 | 8.294 | -0.56 | 7.822 | 0.366 |
| 5/9/2003 | 14:07:51 | 502 | 8.366667 | 54.19 | 8.319 | -0.535 | 8.292 | 0.349 |
| 5/9/2003 | 14:08:20 | 531.9 | 8.865 | 54.19 | 8.341 | -0.513 | 8.790 | 0.335 |
| 5/9/2003 | 14:08:52 | 563.5 | 9.391667 | 54.19 | 8.362 | -0.492 | 9.317 | 0.321 |
| 5/9/2003 | 14:09:26 | 597 | 9.95 | 54.19 | 8.383 | -0.471 | 9.875 | 0.308 |
| 5/9/2003 | 14:10:01 | 632.5 | 10.54167 | 54.19 | 8.402 | -0.452 | 10.467 | 0.295 |
| 5/9/2003 | 14:10:39 | 670.1 | 11.16833 | 54.19 | 8.422 | -0.432 | 11.093 | 0.282 |
| 5/9/2003 | 14:11:18 | 709.9 | 11.83167 | 54.19 | 8.443 | -0.411 | 11.757 | 0.268 |
| 5/9/2003 | 14:12:01 | 752.1 | 12.535 | 54.19 | 8.46 | -0.394 | 12.460 | 0.257 |
| 5/9/2003 | 14:12:45 | 796.8 | 13.28 | 54.19 | 8.478 | -0.376 | 13.205 | 0.246 |
| 5/9/2003 | 14:13:33 | 844.2 | 14.07 | 54.19 | 8.495 | -0.359 | 13.995 | 0.234 |
| 5/9/2003 | 14:14:23 | 894.4 | 14.90667 | 54.19 | 8.509 | -0.345 | 14.832 | 0.225 |
| 5/9/2003 | 14:15:16 | 947.5 | 15.79167 | 54.19 | 8.524 | -0.33 | 15.717 | 0.216 |
| 5/9/2003 | 14:16:12 | 1003.8 | 16.73 | 54.19 | 8.536 | -0.318 | 16.655 | 0.208 |
| 5/9/2003 | 14:17:12 | 1063.4 | 17.72333 | 54.19 | 8.553 | -0.301 | 17.648 | 0.197 |
| 5/9/2003 | 14:18:15 | 1126.6 | 18.77667 | 54.19 | 8.565 | -0.289 | 18.702 | 0.189 |
| 5/9/2003 | 14:19:22 | 1193.5 | 19.89167 | 54.19 | 8.576 | -0.278 | 19.817 | 0.182 |
| 5/9/2003 | 14:20:33 | 1264.4 | 21.07333 | 54.17 | 8.591 | -0.263 | 20.998 | 0.172 |
| 5/9/2003 | 14:21:48 | 1339.5 | 22.325 | 54.17 | 8.601 | -0.253 | 22.250 | 0.165 |
| 5/9/2003 | 14:23:08 | 1419 | 23.65 | 54.17 | 8.614 | -0.24 | 23.575 | 0.157 |
| 5/9/2003 | 14:24:32 | 1503.3 | 25.055 | 54.17 | 8.624 | -0.23 | 24.980 | 0.150 |
| 5/9/2003 | 14:26:01 | 1592.6 | 26.54333 | 54.17 | 8.63 | -0.224 | 26.468 | 0.146 |
| 5/9/2003 | 14:27:36 | 1687.1 | 28.11833 | 54.17 | 8.638 | -0.216 | 28.043 | 0.141 |
| 5/9/2003 | 14:29:16 | 1787.2 | 29.78667 | 54.15 | 8.651 | -0.203 | 29.712 | 0.133 |
| 5/9/2003 | 14:31:02 | 1893.3 | 31.555 | 54.15 | 8.662 | -0.192 | 31.480 | 0.125 |
| 5/9/2003 | 14:32:54 | 2005.7 | 33.42833 | 54.15 | 8.666 | -0.188 | 33.353 | 0.123 |
| 5/9/2003 | 14:34:53 | 2124.7 | 35.41167 | 54.15 | 8.672 | -0.182 | 35.337 | 0.119 |
| 5/9/2003 | 14:36:59 | 2250.8 | 37.51333 | 54.15 | 8.68 | -0.174 | 37.438 | 0.114 |
| 5/9/2003 | 14:39:13 | 2384.4 | 39.74 | 54.15 | 8.684 | -0.17 | 39.665 | 0.111 |
| 5/9/2003 | 14:41:34 | 2525.9 | 42.09833 | 54.12 | 8.691 | -0.163 | 42.023 | 0.106 |
| 5/9/2003 | 14:44:04 | 2675.8 | 44.59667 | 54.1 | 8.693 | -0.161 | 44.522 | 0.105 |
| 5/9/2003 | 14:46:43 | 2834.6 | 47.24333 | 54.08 | 8.696 | -0.158 | 47.168 | 0.103 |
| 5/9/2003 | 14:49:31 | 3002.8 | 50.04667 | 54.06 | 8.711 | -0.143 | 49.972 | 0.093 |
| 5/9/2003 | 14:52:29 | 3180.9 | 53.015 | 54.08 | 8.71 | -0.144 | 52.940 | 0.094 |
| 5/9/2003 | 14:55:38 | 3369.6 | 56.16 | 54.06 | 8.713 | -0.141 | 56.085 | 0.092 |
| 5/9/2003 | 14:58:58 | 3569.5 | 59.49167 | 54.06 | 8.719 | -0.135 | 59.417 | 0.088 |
| 5/9/2003 | 15:02:30 | 3781.2 | 63.02 | 54.08 | 8.721 | -0.133 | 62.945 | 0.087 |
| 5/9/2003 | 15:06:14 | 4005.5 | 66.75833 | 54.08 | 8.725 | -0.129 | 66.683 | 0.084 |
| 5/9/2003 | 15:10:12 | 4243.1 | 70.71833 | 54.06 | 8.731 | -0.123 | 70.643 | 0.080 |
| 5/9/2003 | 15:14:23 | 4494.7 | 74.91167 | 54.06 | 8.738 | -0.116 | 74.837 | 0.076 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 13MWT14 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Falling head | **Test Date:** | 10-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RMS 6/27/03

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 1 | = R |
| Length of Well Screen (ft.) : | 10 | = L |
| Time for 37% head change (min.) : | 1.43 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.16E-03 | ft./min. |
| 1.94E-05 | ft./sec. |
| 1.67E+00 | ft./day |
| 5.91E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: CRANE WELL/BORING NO.: BMWT14

PROJECT NO.: 9060 CO 0279 GEOLOGIST: BOB BALKOVEC

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' / 25.63' TOC TEST NO.:

STATIC WATER LEVEL (Depth/Elevation): 13.02' DATE: 5/10/03

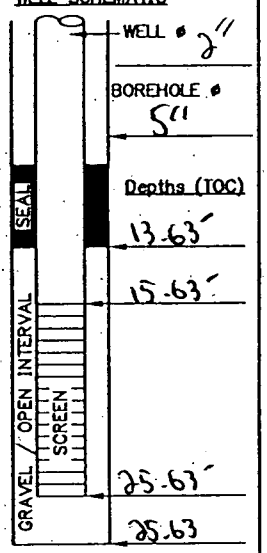
TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: 1.5" x 39" SOLID SLUG PAGE ..... OF .....

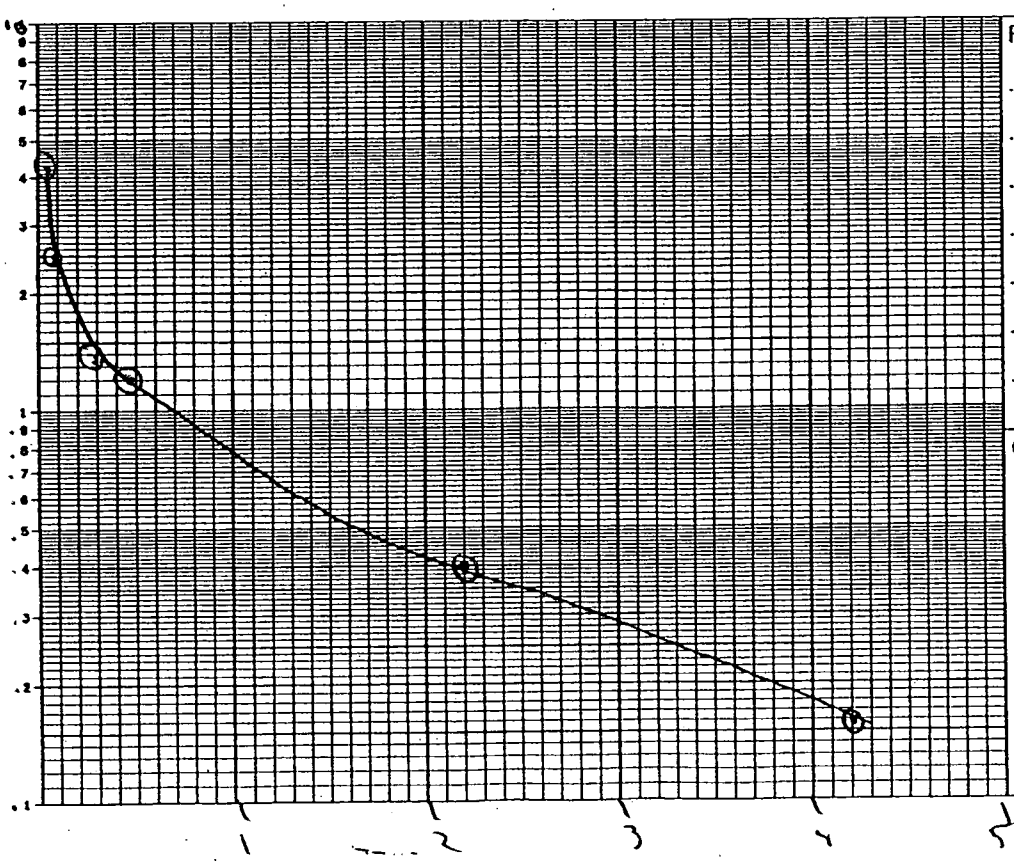
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30PSI

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 11.619 | 0 | 6.64 | 11.689 | 0.07 |
| 0.035 | 18.032 | +6.413 | | | |
| 0.04 | 16.573 | +4.954 | | | |
| 0.05 | 15.428 | +4.309 | | | |
| 0.08 | 14.124 | +2.505 | | | |
| 0.14 | 13.19 | +1.57 | | | |
| 0.28 | 13.017 | +1.398 | | | |
| 0.47 | 12.819 | +1.2 | | | |
| 0.78 | 12.573 | +0.954 | | | |
| 2.21 | 12.02 | +0.401 | | | |
| 2.78 | 11.916 | +0.297 | | | |
| 4.18 | 11.782 | +0.163 | | | |

WELL SCHEMATIC



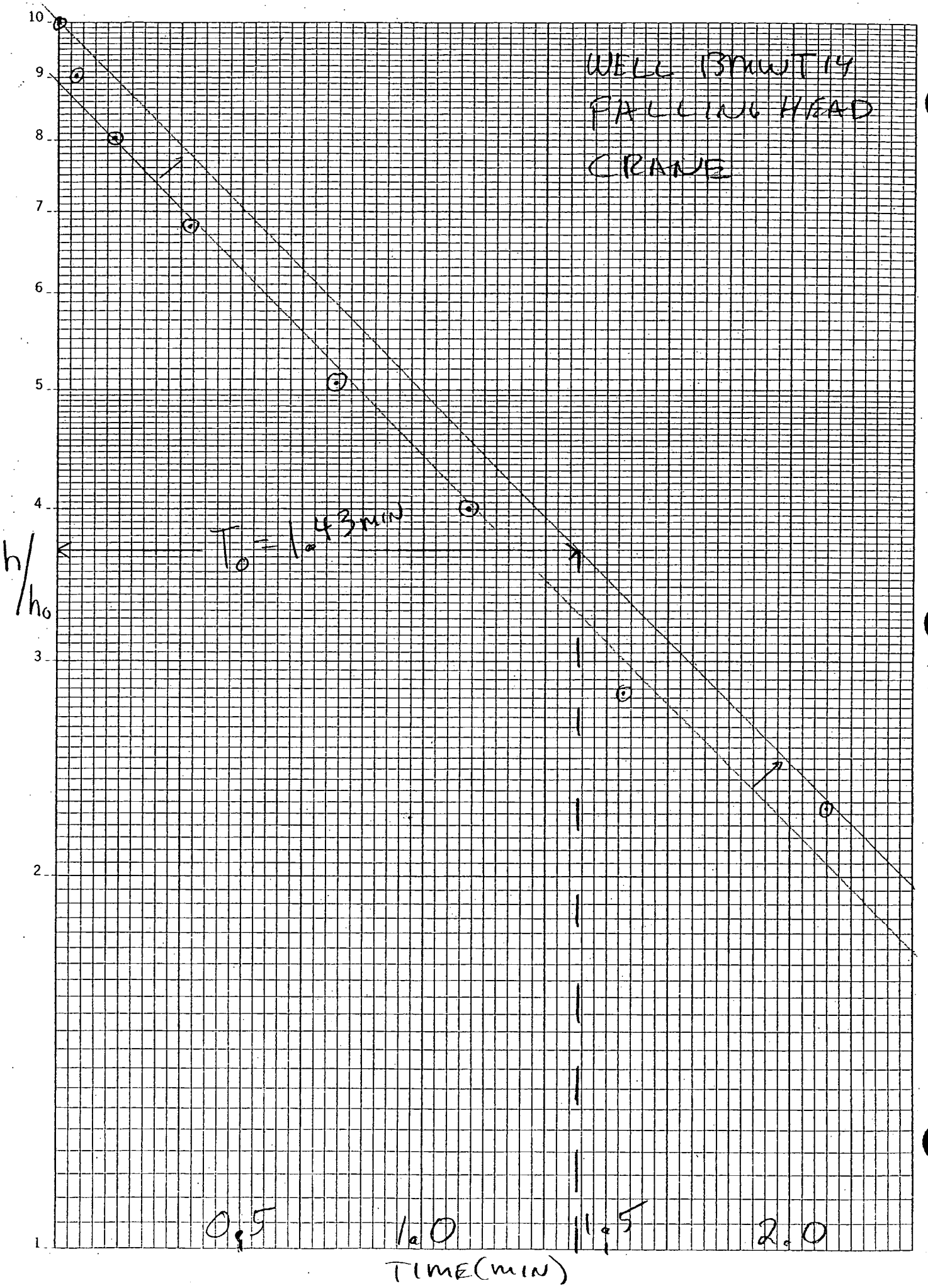

▽ Indicate SWL Depth on Drawing




REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/08/99 INL




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report gen 5/11/2003 16:20:49
Report fror ...\SN00824 2003-05-10 113006 13MWT14 Falling.bin
Win-Situ V 4.41

Serial num 824
Firmware \ 3.06
Unit name:

Test name: 13MWT14 Falling

Test define 5/10/2003 11:29:01
Test starte 5/10/2003 11:30:06
Test stopp N/A N/A
Test extrac N/A N/A

Data gathered using Logarithmic testing
Maximun Seconds.
Number 120

TOTAL DA 120

Channel number [1]
Measurer Temperature
Channel r Temperature

Channel number [2]
Measurer Pressure
Channel r Depth
Sensor R 30 PSIG.
Specific g 1

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Displacemen Feet | adjusted time | h/ho | ho= 1.764 |
|---|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 11:30:06 | 0 | 0 | 55.42 | 11.619 | 0 | | | |
| 5/10/2003 | 11:30:06 | 0.3 | 0.005 | 55.45 | 11.619 | 0 | | | |
| 5/10/2003 | 11:30:06 | 0.6 | 0.01 | 55.47 | 11.619 | 0 | | | |
| 5/10/2003 | 11:30:07 | 0.9 | 0.015 | 55.47 | 11.619 | 0 | | | |
| 5/10/2003 | 11:30:07 | 1.2 | 0.02 | 55.47 | 11.619 | 0 | | | |
| 5/10/2003 | 11:30:07 | 1.5 | 0.025 | 55.49 | 11.637 | 0.018 | | | |
| 5/10/2003 | 11:30:08 | 1.8 | 0.03 | 55.49 | 11.671 | 0.052 | | | |
| 5/10/2003 | 11:30:08 | 2.1 | 0.035 | 55.49 | 18.032 | 6.413 | | | |
| 5/10/2003 | 11:30:08 | 2.4 | 0.04 | 55.52 | 16.573 | 4.954 | | | |
| 5/10/2003 | 11:30:09 | 2.7 | 0.045 | 55.49 | 16.502 | 4.883 | | | |
| 5/10/2003 | 11:30:09 | 3 | 0.05 | 55.49 | 15.928 | 4.309 | | | |
| 5/10/2003 | 11:30:09 | 3.3 | 0.055 | 55.49 | 15.534 | 3.915 | | | |
| 5/10/2003 | 11:30:09 | 3.6 | 0.06 | 55.52 | 15.425 | 3.806 | | | |
| 5/10/2003 | 11:30:10 | 3.9 | 0.065 | 55.52 | 14.783 | 3.164 | | | |
| 5/10/2003 | 11:30:10 | 4.2 | 0.07 | 55.52 | 14.824 | 3.205 | | | |
| 5/10/2003 | 11:30:10 | 4.5 | 0.075 | 55.52 | 14.625 | 3.006 | | | |
| 5/10/2003 | 11:30:11 | 4.8 | 0.08 | 55.52 | 14.124 | 2.505 | | | |
| 5/10/2003 | 11:30:11 | 5.1 | 0.085 | 55.52 | 13.767 | 2.148 | | | |
| 5/10/2003 | 11:30:11 | 5.4 | 0.09 | 55.52 | 13.535 | 1.916 | Plotted shaded values. | | |
| 5/10/2003 | 11:30:12 | 5.7 | 0.095 | 55.52 | 13.338 | 1.719 | | | |
| 5/10/2003 | 11:30:12 | 6 | 0.1 | 55.52 | 13.093 | 1.474 | | | |
| 5/10/2003 | 11:30:12 | 6.4 | 0.106667 | 55.52 | 13.895 | 2.276 | adjusted time | h/ho | |
| 5/10/2003 | 11:30:13 | 6.7 | 0.111667 | 55.52 | 13.383 | 1.764 | 0.000 | 1.000 | |
| 5/10/2003 | 11:30:13 | 7.1 | 0.118333 | 55.52 | 13.258 | 1.639 | 0.007 | 0.929 | |
| 5/10/2003 | 11:30:13 | 7.5 | 0.125 | 55.52 | 13.185 | 1.566 | 0.013 | 0.888 | |
| 5/10/2003 | 11:30:14 | 8 | 0.133333 | 55.52 | 13.284 | 1.665 | 0.022 | 0.944 | |
| 5/10/2003 | 11:30:14 | 8.4 | 0.14 | 55.52 | 13.19 | 1.571 | 0.028 | 0.891 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 11:30:15 | 8.9 | 0.148333 | 55.52 | 13.2 | 1.581 | 0.037 | 0.896 |
| 5/10/2003 | 11:30:15 | 9.5 | 0.158333 | 55.52 | 13.207 | 1.588 | 0.047 | 0.900 |
| 5/10/2003 | 11:30:16 | 10 | 0.166667 | 55.49 | 13.161 | 1.542 | 0.055 | 0.874 |
| 5/10/2003 | 11:30:16 | 10.6 | 0.176667 | 55.49 | 13.163 | 1.544 | 0.065 | 0.875 |
| 5/10/2003 | 11:30:17 | 11.3 | 0.188333 | 55.49 | 13.138 | 1.519 | 0.077 | 0.861 |
| 5/10/2003 | 11:30:18 | 11.9 | 0.198333 | 55.49 | 13.116 | 1.497 | 0.087 | 0.849 |
| 5/10/2003 | 11:30:18 | 12.6 | 0.21 | 55.49 | 13.105 | 1.486 | 0.098 | 0.842 |
| 5/10/2003 | 11:30:19 | 13.4 | 0.223333 | 55.47 | 13.09 | 1.471 | 0.112 | 0.834 |
| 5/10/2003 | 11:30:20 | 14.2 | 0.236667 | 55.47 | 13.071 | 1.452 | 0.125 | 0.823 |
| 5/10/2003 | 11:30:21 | 15 | 0.25 | 55.49 | 13.051 | 1.432 | 0.138 | 0.812 |
| 5/10/2003 | 11:30:22 | 15.9 | 0.265 | 55.47 | 13.034 | 1.415 | 0.153 | 0.802 |
| 5/10/2003 | 11:30:23 | 16.8 | 0.28 | 55.47 | 13.017 | 1.398 | 0.168 | 0.793 |
| 5/10/2003 | 11:30:24 | 17.8 | 0.296667 | 55.47 | 12.997 | 1.378 | 0.185 | 0.781 |
| 5/10/2003 | 11:30:25 | 18.9 | 0.315 | 55.47 | 12.976 | 1.357 | 0.203 | 0.769 |
| 5/10/2003 | 11:30:26 | 20 | 0.333333 | 55.47 | 12.954 | 1.335 | 0.222 | 0.757 |
| 5/10/2003 | 11:30:27 | 21.2 | 0.353333 | 55.47 | 12.935 | 1.316 | 0.242 | 0.746 |
| 5/10/2003 | 11:30:28 | 22.4 | 0.373333 | 55.47 | 12.913 | 1.294 | 0.262 | 0.734 |
| 5/10/2003 | 11:30:30 | 23.8 | 0.396667 | 55.47 | 12.887 | 1.268 | 0.285 | 0.719 |
| 5/10/2003 | 11:30:31 | 25.2 | 0.42 | 55.47 | 13.002 | 1.383 | 0.308 | 0.784 |
| 5/10/2003 | 11:30:33 | 26.7 | 0.445 | 55.47 | 12.823 | 1.204 | 0.333 | 0.683 |
| 5/10/2003 | 11:30:34 | 28.2 | 0.47 | 55.47 | 12.819 | 1.2 | 0.358 | 0.680 |
| 5/10/2003 | 11:30:36 | 29.8 | 0.496667 | 55.47 | 12.797 | 1.178 | 0.385 | 0.668 |
| 5/10/2003 | 11:30:37 | 31.5 | 0.525 | 55.47 | 12.771 | 1.152 | 0.413 | 0.653 |
| 5/10/2003 | 11:30:39 | 33.3 | 0.555 | 55.47 | 12.743 | 1.124 | 0.443 | 0.637 |
| 5/10/2003 | 11:30:41 | 35.2 | 0.586667 | 55.47 | 12.718 | 1.099 | 0.475 | 0.623 |
| 5/10/2003 | 11:30:43 | 37.3 | 0.621667 | 55.47 | 12.69 | 1.071 | 0.510 | 0.607 |
| 5/10/2003 | 11:30:45 | 39.5 | 0.658333 | 55.47 | 12.661 | 1.042 | 0.547 | 0.591 |
| 5/10/2003 | 11:30:48 | 41.8 | 0.696667 | 55.47 | 12.634 | 1.015 | 0.585 | 0.575 |
| 5/10/2003 | 11:30:50 | 44.3 | 0.738333 | 55.47 | 12.605 | 0.986 | 0.627 | 0.559 |
| 5/10/2003 | 11:30:53 | 46.9 | 0.781667 | 55.47 | 12.573 | 0.954 | 0.670 | 0.541 |
| 5/10/2003 | 11:30:56 | 49.7 | 0.828333 | 55.47 | 12.543 | 0.924 | 0.717 | 0.524 |
| 5/10/2003 | 11:30:58 | 52.6 | 0.876667 | 55.45 | 12.515 | 0.896 | 0.765 | 0.508 |
| 5/10/2003 | 11:31:02 | 55.7 | 0.928333 | 55.45 | 12.483 | 0.864 | 0.817 | 0.490 |
| 5/10/2003 | 11:31:05 | 59 | 0.983333 | 55.45 | 12.452 | 0.833 | 0.872 | 0.472 |
| 5/10/2003 | 11:31:08 | 62.5 | 1.041667 | 55.45 | 12.42 | 0.801 | 0.930 | 0.454 |
| 5/10/2003 | 11:31:12 | 66.2 | 1.103333 | 55.45 | 12.388 | 0.769 | 0.992 | 0.436 |
| 5/10/2003 | 11:31:16 | 70.1 | 1.168333 | 55.45 | 12.356 | 0.737 | 1.057 | 0.418 |
| 5/10/2003 | 11:31:20 | 74.3 | 1.238333 | 55.42 | 12.325 | 0.706 | 1.127 | 0.400 |
| 5/10/2003 | 11:31:25 | 78.7 | 1.311667 | 55.42 | 12.293 | 0.674 | 1.200 | 0.382 |
| 5/10/2003 | 11:31:29 | 83.4 | 1.39 | 55.42 | 12.26 | 0.641 | 1.278 | 0.363 |
| 5/10/2003 | 11:31:34 | 88.4 | 1.473333 | 55.52 | 12.12 | 0.501 | 1.362 | 0.284 |
| 5/10/2003 | 11:31:40 | 93.7 | 1.561667 | 55.54 | 12.12 | 0.501 | 1.450 | 0.284 |
| 5/10/2003 | 11:31:45 | 99.3 | 1.655 | 55.54 | 12.118 | 0.499 | 1.543 | 0.283 |
| 5/10/2003 | 11:31:51 | 105.2 | 1.753333 | 55.54 | 12.116 | 0.497 | 1.642 | 0.282 |
| 5/10/2003 | 11:31:57 | 111.5 | 1.858333 | 55.54 | 12.115 | 0.496 | 1.747 | 0.281 |
| 5/10/2003 | 11:32:04 | 118.1 | 1.968333 | 55.47 | 12.078 | 0.459 | 1.857 | 0.260 |
| 5/10/2003 | 11:32:11 | 125.1 | 2.085 | 55.47 | 12.048 | 0.429 | 1.973 | 0.243 |
| 5/10/2003 | 11:32:18 | 132.6 | 2.21 | 55.49 | 12.02 | 0.401 | 2.098 | 0.227 |
| 5/10/2003 | 11:32:26 | 140.5 | 2.341667 | 55.52 | 11.993 | 0.374 | 2.230 | 0.212 |
| 5/10/2003 | 11:32:35 | 148.9 | 2.481667 | 55.52 | 11.965 | 0.346 | 2.370 | 0.196 |
| 5/10/2003 | 11:32:44 | 157.8 | 2.63 | 55.56 | 11.941 | 0.322 | 2.518 | 0.183 |
| 5/10/2003 | 11:32:53 | 167.2 | 2.786667 | 55.56 | 11.916 | 0.297 | 2.675 | 0.168 |
| 5/10/2003 | 11:33:03 | 177.2 | 2.953333 | 55.58 | 11.892 | 0.273 | 2.842 | 0.155 |
| 5/10/2003 | 11:33:14 | 187.8 | 3.13 | 55.61 | 11.871 | 0.252 | 3.018 | 0.143 |
| 5/10/2003 | 11:33:25 | 199 | 3.316667 | 55.61 | 11.85 | 0.231 | 3.205 | 0.131 |
| 5/10/2003 | 11:33:37 | 210.9 | 3.515 | 55.61 | 11.832 | 0.213 | 3.403 | 0.121 |
| 5/10/2003 | 11:33:49 | 223.5 | 3.725 | 55.61 | 11.813 | 0.194 | 3.613 | 0.110 |
| 5/10/2003 | 11:34:03 | 236.8 | 3.946667 | 55.61 | 11.796 | 0.177 | 3.835 | 0.100 |
| 5/10/2003 | 11:34:17 | 250.9 | 4.181667 | 55.56 | 11.782 | 0.163 | 4.070 | 0.092 |
| 5/10/2003 | 11:34:32 | 265.8 | 4.43 | 55.54 | 11.765 | 0.146 | 4.318 | 0.083 |
| 5/10/2003 | 11:34:47 | 281.6 | 4.693333 | 55.54 | 11.75 | 0.131 | 4.582 | 0.074 |
| 5/10/2003 | 11:35:04 | 298.4 | 4.973333 | 55.49 | 11.74 | 0.121 | 4.862 | 0.069 |
| 5/10/2003 | 11:35:22 | 316.2 | 5.27 | 55.47 | 11.727 | 0.108 | 5.158 | 0.061 |
| 5/10/2003 | 11:35:41 | 335 | 5.583333 | 55.42 | 11.716 | 0.097 | 5.472 | 0.055 |
| 5/10/2003 | 11:36:01 | 354.9 | 5.915 | 55.38 | 11.706 | 0.087 | 5.803 | 0.049 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 11:36:22 | 376 | 6.266667 | 55.33 | 11.697 | 0.078 | 6.155 | 0.044 |
| 5/10/2003 | 11:36:44 | 398.4 | 6.64 | 55.33 | 11.689 | 0.07 | 6.528 | 0.040 |
| 5/10/2003 | 11:37:08 | 422.1 | 7.035 | 55.31 | 11.682 | 0.063 | 6.923 | 0.036 |
| 5/10/2003 | 11:37:33 | 447.2 | 7.453333 | 55.31 | 11.677 | 0.058 | 7.342 | 0.033 |
| 5/10/2003 | 11:38:00 | 473.8 | 7.896667 | 55.29 | 11.669 | 0.05 | 7.785 | 0.028 |
| 5/10/2003 | 11:38:28 | 502 | 8.366667 | 55.24 | 11.664 | 0.045 | 8.255 | 0.026 |
| 5/10/2003 | 11:38:58 | 531.9 | 8.865 | 55.22 | 11.659 | 0.04 | 8.753 | 0.023 |
| 5/10/2003 | 11:39:29 | 563.5 | 9.391667 | 55.2 | 11.654 | 0.035 | 9.280 | 0.020 |
| 5/10/2003 | 11:40:03 | 597 | 9.95 | 55.15 | 11.649 | 0.03 | 9.838 | 0.017 |
| 5/10/2003 | 11:40:38 | 632.5 | 10.54167 | 55.15 | 11.645 | 0.026 | 10.430 | 0.015 |
| 5/10/2003 | 11:41:16 | 670.1 | 11.16833 | 55.13 | 11.641 | 0.022 | 11.057 | 0.012 |
| 5/10/2003 | 11:41:56 | 709.9 | 11.83167 | 55.13 | 11.639 | 0.02 | 11.720 | 0.011 |
| 5/10/2003 | 11:42:38 | 752.1 | 12.535 | 55.1 | 11.636 | 0.017 | 12.423 | 0.010 |
| 5/10/2003 | 11:43:23 | 796.8 | 13.28 | 55.1 | 11.632 | 0.013 | 13.168 | 0.007 |
| 5/10/2003 | 11:44:10 | 844.2 | 14.07 | 55.1 | 11.632 | 0.013 | 13.958 | 0.007 |
| 5/10/2003 | 11:45:00 | 894.4 | 14.90667 | 55.08 | 11.627 | 0.008 | 14.795 | 0.005 |
| 5/10/2003 | 11:45:53 | 947.5 | 15.79167 | 55.08 | 11.627 | 0.008 | 15.680 | 0.005 |
| 5/10/2003 | 11:46:50 | 1003.8 | 16.73 | 55.06 | 11.623 | 0.004 | 16.618 | 0.002 |
| 5/10/2003 | 11:47:49 | 1063.4 | 17.72333 | 55.06 | 11.622 | 0.003 | 17.612 | 0.002 |
| 5/10/2003 | 11:48:52 | 1126.6 | 18.77667 | 55.06 | 11.62 | 0.001 | 18.665 | 0.001 |
| 5/10/2003 | 11:49:59 | 1193.5 | 19.89167 | 55.04 | 11.618 | -0.001 | 19.780 | -0.001 |
| 5/10/2003 | 11:51:10 | 1264.4 | 21.07333 | 55.04 | 11.618 | -0.001 | 20.962 | -0.001 |
| 5/10/2003 | 11:52:25 | 1339.5 | 22.325 | 55.06 | 11.618 | -0.001 | 22.213 | -0.001 |
| 5/10/2003 | 11:53:45 | 1419 | 23.65 | 55.06 | 11.616 | -0.003 | 23.538 | -0.002 |
| 5/10/2003 | 11:55:09 | 1503.3 | 25.055 | 55.06 | 11.616 | -0.003 | 24.943 | -0.002 |
| 5/10/2003 | 11:56:38 | 1592.6 | 26.54333 | 55.08 | 11.616 | -0.003 | 26.432 | -0.002 |
| 5/10/2003 | 11:58:13 | 1687.1 | 28.11833 | 55.08 | 11.616 | -0.003 | 28.007 | -0.002 |
| 5/10/2003 | 11:59:53 | 1787.2 | 29.78667 | 55.08 | 11.618 | -0.001 | 29.675 | -0.001 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

**Project Name:** Crane IN
**Project No.:** 9060 CTO 0279
**Test Type:** Rising head

**Well/Boring No.:** 13MWT14
**Aquifer Type:** confined
**Test Date:** 10-May-03

**Done By:** Fred W. Ramser
**Checked By:** RMB 6/23/03

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 1 = R |
| Length of Well Screen (ft.) : | 10 = L |
| Time for 37% head change (min.) : | 1.90 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 8.75E-04 | ft./min. |
| 1.46E-05 | ft./sec. |
| 1.26E+00 | ft./day |
| 4.44E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: CRANE WELL/BORING NO.: 13MW714

PROJECT NO.: 9060 CLO 0279 GEOLOGIST: BOB BALKOVEC

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' / 25.63' T.D. TEST NO.:

STATIC WATER LEVEL (Depth/Elevation): 13.02' DATE: 5/10/03

TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

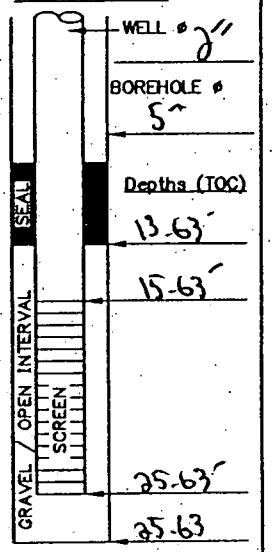
METHOD OF INDUCING WATER LEVEL CHANGE: 15" x 30" SOLID SLUG PAGE ..... OF .....

REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30PSI

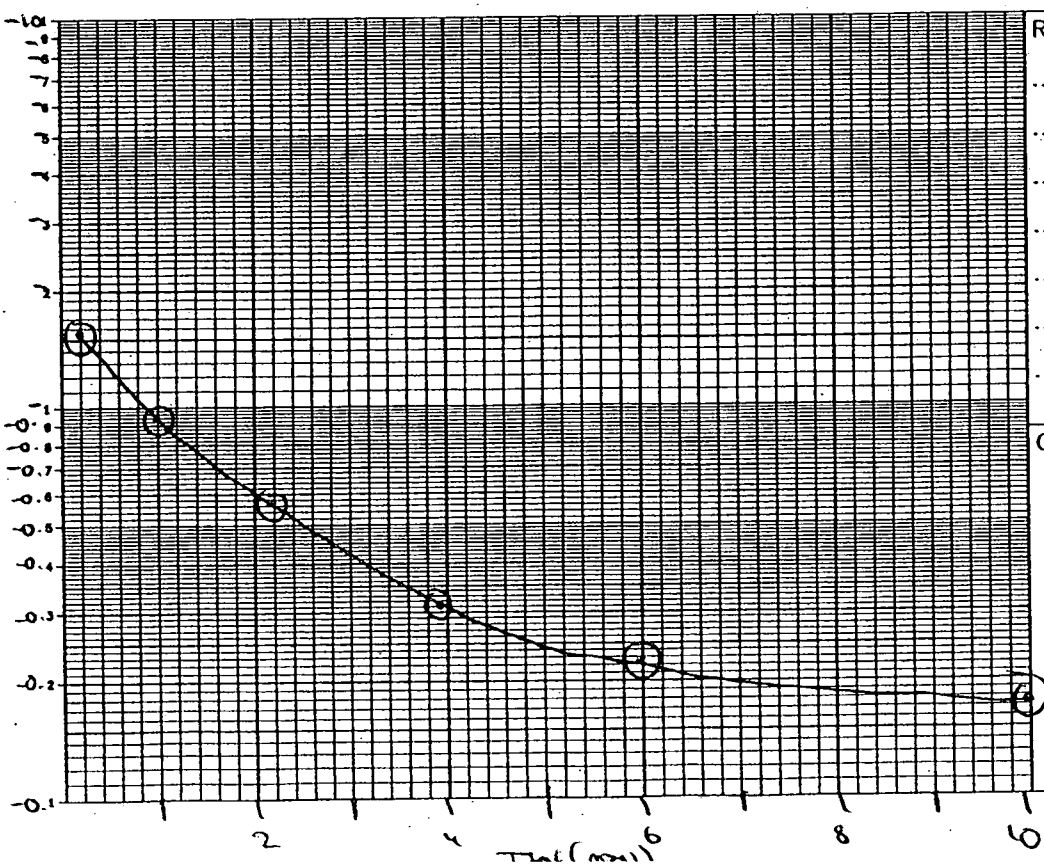
ACAD:FORM_HYDCONTST.dwg 07/06/99 INL

| ELAPSED TIME (min or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 11.633 | 0 | 1.75 | 11.032 | -0.601 |
| 0.02 | 7.743 | -3.89 | 2.21 | 11.093 | -0.54 |
| 0.045 | 8.75 | -2.883 | 2.95 | 11.221 | -0.412 |
| 0.065 | 9.79 | -1.843 | 3.94 | 11.32 | -0.313 |
| 0.085 | 9.898 | -1.735 | 5.915 | 11.403 | -0.23 |
| 0.125 | 9.943 | -1.69 | 9.95 | 11.463 | -0.173 |
| 0.21 | 10.063 | -1.57 | | | |
| 0.42 | 10.246 | -1.387 | | | |
| 0.658 | 10.427 | -1.206 | | | |
| 1.04 | 10.677 | -0.956 | | | |
| 1.31 | 10.805 | -0.828 | | | |
| 1.47 | 10.87 | -0.763 | | | |

WELL SCHEMATIC

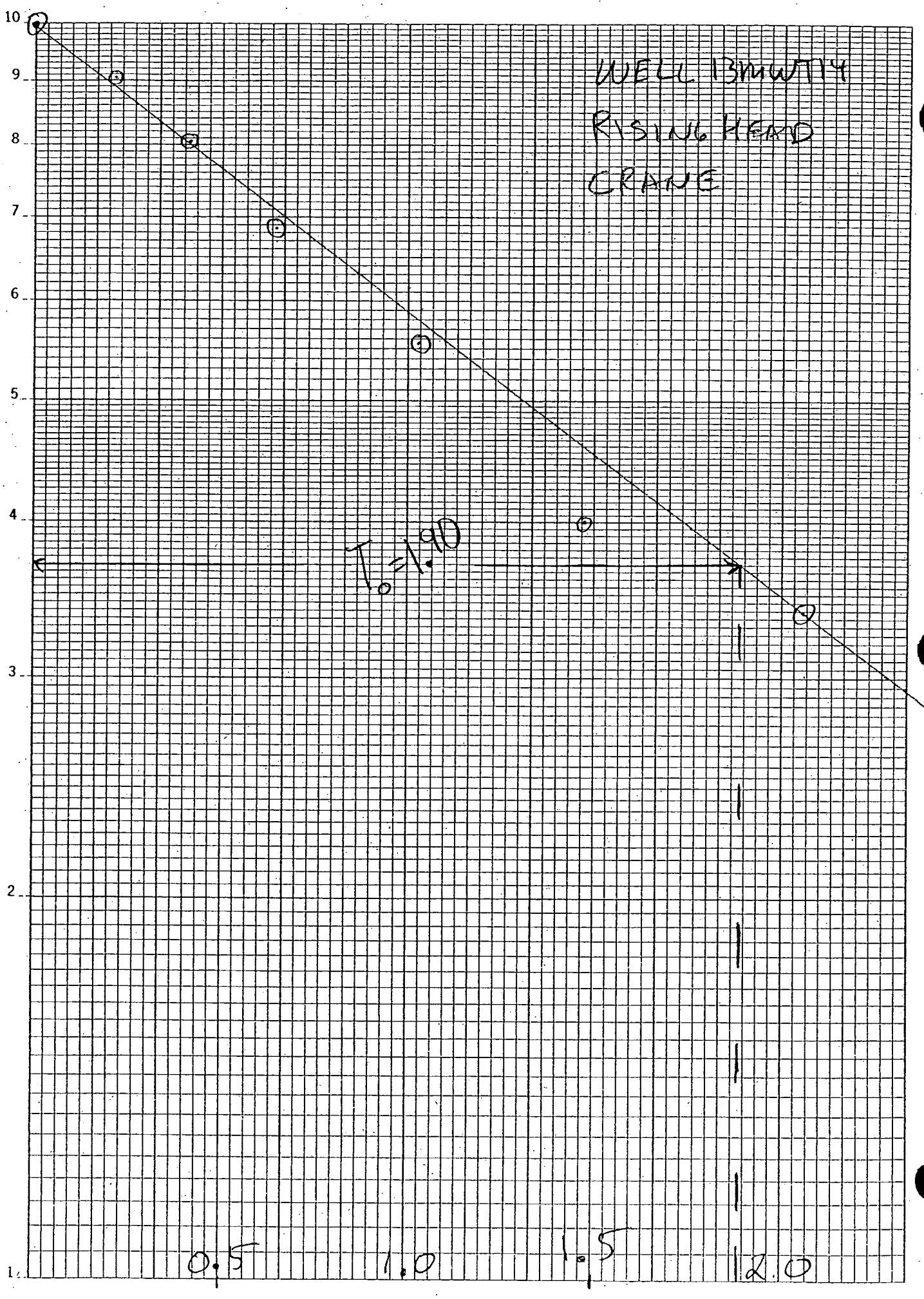



▽ Indicate SWL Depth on Drawing




REMARKS:

CALCS, SKETCH MAPS, ETC.:




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report gen 5/11/2003 16:21:44
Report fror ...\SN00824 2003-05-10 120155 13MWT14 Rising.bin
Win-Situ V 4.41

Serial num 824
Firmware \ 3.06
Unit name:

Test name: 13MWT14 Rising

Test define 5/10/2003 12:01:28
Test starte 5/10/2003 12:01:55
Test stopp N/A N/A
Test extrac N/A N/A

Data gathered using Logarithmic testing
Maximun Seconds.
Number 141

TOTAL DA 141

Channel number [1]
Measurer Temperature
Channel r Temperature

Channel number [2]
Measurer Pressure
Channel r Depth
Sensor R 30 PSIG.
Specific g 1

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Displacement Feet | adjusted time | h/ho | ho= -1.499 |
|---|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 12:01:55 | 0 | 0 | 55.15 | 11.633 | 0 | | | |
| 5/10/2003 | 12:01:55 | 0.3 | 0.005 | 55.17 | 11.633 | 0 | | | |
| 5/10/2003 | 12:01:55 | 0.6 | 0.01 | 55.17 | 11.633 | 0 | | | |
| 5/10/2003 | 12:01:56 | 0.9 | 0.015 | 55.2 | 11.633 | 0 | | | |
| 5/10/2003 | 12:01:56 | 1.2 | 0.02 | 55.2 | 7.743 | -3.89 | | | |
| 5/10/2003 | 12:01:56 | 1.5 | 0.025 | 55.2 | 8.46 | -3.173 | | | |
| 5/10/2003 | 12:01:56 | 1.8 | 0.03 | 55.2 | 8.544 | -3.089 | | | |
| 5/10/2003 | 12:01:57 | 2.1 | 0.035 | 55.2 | 8.981 | -2.652 | | | |
| 5/10/2003 | 12:01:57 | 2.4 | 0.04 | 55.22 | 8.789 | -2.844 | | | |
| 5/10/2003 | 12:01:57 | 2.7 | 0.045 | 55.22 | 8.75 | -2.883 | | | |
| 5/10/2003 | 12:01:58 | 3 | 0.05 | 55.22 | 9.178 | -2.455 | | | |
| 5/10/2003 | 12:01:58 | 3.3 | 0.055 | 55.22 | 9.491 | -2.142 | | | |
| 5/10/2003 | 12:01:58 | 3.6 | 0.06 | 55.22 | 9.9 | -1.733 | | | |
| 5/10/2003 | 12:01:59 | 3.9 | 0.065 | 55.22 | 9.79 | -1.843 | | | |
| 5/10/2003 | 12:01:59 | 4.2 | 0.07 | 55.22 | 9.795 | -1.838 | | | |
| 5/10/2003 | 12:01:59 | 4.8 | 0.08 | 55.22 | 9.805 | -1.828 | | | |
| 5/10/2003 | 12:02:00 | 5.1 | 0.085 | 55.22 | 9.898 | -1.735 | | | |
| 5/10/2003 | 12:02:00 | 5.4 | 0.09 | 55.22 | 9.848 | -1.785 | | | |
| 5/10/2003 | 12:02:00 | 5.7 | 0.095 | 55.22 | 9.906 | -1.727 | | | |
| 5/10/2003 | 12:02:01 | 6 | 0.1 | 55.22 | 9.883 | -1.75 | | | |
| 5/10/2003 | 12:02:01 | 6.4 | 0.106667 | 55.22 | 9.906 | -1.727 | | | |
| 5/10/2003 | 12:02:01 | 6.7 | 0.111667 | 55.24 | 9.92 | -1.713 | | | |
| 5/10/2003 | 12:02:02 | 7.1 | 0.118333 | 55.24 | 9.926 | -1.707 | | | |
| 5/10/2003 | 12:02:02 | 7.5 | 0.125 | 55.24 | 9.943 | -1.69 | | | |
| 5/10/2003 | 12:02:03 | 8 | 0.133333 | 55.24 | 9.959 | -1.674 | | | |
| 5/10/2003 | 12:02:03 | 8.4 | 0.14 | 55.24 | 9.971 | -1.662 | | | |
| 5/10/2003 | 12:02:04 | 8.9 | 0.148333 | 55.24 | 9.989 | -1.644 | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 12:02:04 | 9.5 | 0.158333 | 55.24 | 10 | -1.633 | | | |
| 5/10/2003 | 12:02:05 | 10 | 0.166667 | 55.22 | 10.01 | -1.623 | | | |
| 5/10/2003 | 12:02:05 | 10.6 | 0.176667 | 55.22 | 10.016 | -1.617 | | | |
| 5/10/2003 | 12:02:06 | 11.3 | 0.188333 | 55.22 | 10.029 | -1.604 | | | |
| 5/10/2003 | 12:02:07 | 11.9 | 0.198333 | 55.2 | 10.046 | -1.587 | | | |
| 5/10/2003 | 12:02:07 | 12.6 | 0.21 | 55.2 | 10.063 | -1.57 | | | |
| 5/10/2003 | 12:02:08 | 13.4 | 0.223333 | 55.2 | 10.087 | -1.546 | | | |
| 5/10/2003 | 12:02:09 | 14.2 | 0.236667 | 55.2 | 10.093 | -1.54 | Plotted shaded values. | | |
| 5/10/2003 | 12:02:10 | 15 | 0.25 | 55.2 | 10.1 | -1.533 | | | |
| 5/10/2003 | 12:02:11 | 15.9 | 0.265 | 55.2 | 10.119 | -1.514 | adjusted time | h/ho | |
| 5/10/2003 | 12:02:12 | 16.8 | 0.28 | 55.2 | 10.134 | -1.499 | 0.000 | 1.000 | |
| 5/10/2003 | 12:02:13 | 17.8 | 0.296667 | 55.2 | 10.149 | -1.484 | 0.017 | 0.990 | |
| 5/10/2003 | 12:02:14 | 18.9 | 0.315 | 55.2 | 10.156 | -1.477 | 0.035 | 0.985 | |
| 5/10/2003 | 12:02:15 | 20 | 0.333333 | 55.2 | 10.177 | -1.456 | 0.053 | 0.971 | |
| 5/10/2003 | 12:02:16 | 21.2 | 0.353333 | 55.2 | 10.193 | -1.44 | 0.073 | 0.961 | |
| 5/10/2003 | 12:02:17 | 22.4 | 0.373333 | 55.2 | 10.201 | -1.432 | 0.093 | 0.955 | |
| 5/10/2003 | 12:02:18 | 23.8 | 0.396667 | 55.2 | 10.223 | -1.41 | 0.117 | 0.941 | |
| 5/10/2003 | 12:02:20 | 25.2 | 0.42 | 55.2 | 10.246 | -1.387 | 0.140 | 0.925 | |
| 5/10/2003 | 12:02:21 | 26.7 | 0.445 | 55.2 | 10.248 | -1.385 | 0.165 | 0.924 | |
| 5/10/2003 | 12:02:23 | 28.2 | 0.47 | 55.2 | 10.253 | -1.38 | 0.190 | 0.921 | |
| 5/10/2003 | 12:02:24 | 29.8 | 0.496667 | 55.2 | 10.277 | -1.356 | 0.217 | 0.905 | |
| 5/10/2003 | 12:02:26 | 31.5 | 0.525 | 55.2 | 10.304 | -1.329 | 0.245 | 0.887 | |
| 5/10/2003 | 12:02:28 | 33.3 | 0.555 | 55.2 | 10.328 | -1.305 | 0.275 | 0.871 | |
| 5/10/2003 | 12:02:30 | 35.2 | 0.586667 | 55.2 | 10.365 | -1.268 | 0.307 | 0.846 | |
| 5/10/2003 | 12:02:32 | 37.3 | 0.621667 | 55.2 | 10.397 | -1.236 | 0.342 | 0.825 | |
| 5/10/2003 | 12:02:34 | 39.5 | 0.658333 | 55.2 | 10.427 | -1.206 | 0.378 | 0.805 | |
| 5/10/2003 | 12:02:36 | 41.8 | 0.696667 | 55.2 | 10.429 | -1.204 | 0.417 | 0.803 | |
| 5/10/2003 | 12:02:39 | 44.3 | 0.738333 | 55.2 | 10.487 | -1.146 | 0.458 | 0.765 | |
| 5/10/2003 | 12:02:42 | 46.9 | 0.781667 | 55.2 | 10.511 | -1.122 | 0.502 | 0.748 | |
| 5/10/2003 | 12:02:44 | 49.7 | 0.828333 | 55.17 | 10.543 | -1.09 | 0.548 | 0.727 | |
| 5/10/2003 | 12:02:47 | 52.6 | 0.876667 | 55.17 | 10.575 | -1.058 | 0.597 | 0.706 | |
| 5/10/2003 | 12:02:50 | 55.7 | 0.928333 | 55.17 | 10.608 | -1.025 | 0.648 | 0.684 | |
| 5/10/2003 | 12:02:54 | 59 | 0.983333 | 55.17 | 10.638 | -0.995 | 0.703 | 0.664 | |
| 5/10/2003 | 12:02:57 | 62.5 | 1.041667 | 55.17 | 10.677 | -0.956 | 0.762 | 0.638 | |
| 5/10/2003 | 12:03:01 | 66.2 | 1.103333 | 55.15 | 10.706 | -0.927 | 0.823 | 0.618 | |
| 5/10/2003 | 12:03:05 | 70.1 | 1.168333 | 55.15 | 10.737 | -0.896 | 0.888 | 0.598 | |
| 5/10/2003 | 12:03:09 | 74.3 | 1.238333 | 55.15 | 10.769 | -0.864 | 0.958 | 0.576 | |
| 5/10/2003 | 12:03:13 | 78.7 | 1.311667 | 55.13 | 10.805 | -0.828 | 1.032 | 0.552 | |
| 5/10/2003 | 12:03:18 | 83.4 | 1.39 | 55.13 | 10.838 | -0.795 | 1.110 | 0.530 | |
| 5/10/2003 | 12:03:23 | 88.4 | 1.473333 | 55.13 | 10.87 | -0.763 | 1.193 | 0.509 | |
| 5/10/2003 | 12:03:28 | 93.7 | 1.561667 | 55.1 | 11.012 | -0.621 | 1.282 | 0.414 | |
| 5/10/2003 | 12:03:34 | 99.3 | 1.655 | 55.13 | 11.027 | -0.606 | 1.375 | 0.404 | |
| 5/10/2003 | 12:03:40 | 105.2 | 1.753333 | 55.15 | 11.032 | -0.601 | 1.473 | 0.401 | |
| 5/10/2003 | 12:03:46 | 111.5 | 1.858333 | 55.15 | 11.034 | -0.599 | 1.578 | 0.400 | |
| 5/10/2003 | 12:03:53 | 118.1 | 1.968333 | 55.1 | 11.033 | -0.6 | 1.688 | 0.400 | |
| 5/10/2003 | 12:04:00 | 125.1 | 2.085 | 55.08 | 11.065 | -0.568 | 1.805 | 0.379 | |
| 5/10/2003 | 12:04:07 | 132.6 | 2.21 | 55.1 | 11.093 | -0.54 | 1.930 | 0.360 | |
| 5/10/2003 | 12:04:15 | 140.5 | 2.341667 | 55.1 | 11.121 | -0.512 | 2.062 | 0.342 | |
| 5/10/2003 | 12:04:24 | 148.9 | 2.481667 | 55.1 | 11.147 | -0.486 | 2.202 | 0.324 | |
| 5/10/2003 | 12:04:32 | 157.8 | 2.63 | 55.1 | 11.173 | -0.46 | 2.350 | 0.307 | |
| 5/10/2003 | 12:04:42 | 167.2 | 2.786667 | 55.1 | 11.201 | -0.432 | 2.507 | 0.288 | |
| 5/10/2003 | 12:04:52 | 177.2 | 2.953333 | 55.1 | 11.221 | -0.412 | 2.673 | 0.275 | |
| 5/10/2003 | 12:05:02 | 187.8 | 3.13 | 55.1 | 11.242 | -0.391 | 2.850 | 0.261 | |
| 5/10/2003 | 12:05:14 | 199 | 3.316667 | 55.1 | 11.264 | -0.369 | 3.037 | 0.246 | |
| 5/10/2003 | 12:05:26 | 210.9 | 3.515 | 55.13 | 11.285 | -0.348 | 3.235 | 0.232 | |
| 5/10/2003 | 12:05:38 | 223.5 | 3.725 | 55.1 | 11.304 | -0.329 | 3.445 | 0.219 | |
| 5/10/2003 | 12:05:51 | 236.8 | 3.946667 | 55.13 | 11.32 | -0.313 | 3.667 | 0.209 | |
| 5/10/2003 | 12:06:06 | 250.9 | 4.181667 | 55.13 | 11.335 | -0.298 | 3.902 | 0.199 | |
| 5/10/2003 | 12:06:20 | 265.8 | 4.43 | 55.13 | 11.346 | -0.287 | 4.150 | 0.191 | |
| 5/10/2003 | 12:06:36 | 281.6 | 4.693333 | 55.15 | 11.361 | -0.272 | 4.413 | 0.181 | |
| 5/10/2003 | 12:06:53 | 298.4 | 4.973333 | 55.15 | 11.372 | -0.261 | 4.693 | 0.174 | |
| 5/10/2003 | 12:07:11 | 316.2 | 5.27 | 55.15 | 11.385 | -0.248 | 4.990 | 0.165 | |
| 5/10/2003 | 12:07:30 | 335 | 5.583333 | 55.17 | 11.394 | -0.239 | 5.303 | 0.159 | |
| 5/10/2003 | 12:07:50 | 354.9 | 5.915 | 55.2 | 11.403 | -0.23 | 5.635 | 0.153 | |
| 5/10/2003 | 12:08:11 | 376 | 6.266667 | 55.2 | 11.413 | -0.22 | 5.987 | 0.147 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 12:08:33 | 398.4 | 6.64 | 55.22 | 11.42 | -0.213 | 6.360 | 0.142 |
| 5/10/2003 | 12:08:57 | 422.1 | 7.035 | 55.24 | 11.427 | -0.206 | 6.755 | 0.137 |
| 5/10/2003 | 12:09:22 | 447.2 | 7.453333 | 55.26 | 11.434 | -0.199 | 7.173 | 0.133 |
| 5/10/2003 | 12:09:48 | 473.8 | 7.896667 | 55.26 | 11.438 | -0.195 | 7.617 | 0.130 |
| 5/10/2003 | 12:10:17 | 502 | 8.366667 | 55.29 | 11.445 | -0.188 | 8.087 | 0.125 |
| 5/10/2003 | 12:10:47 | 531.9 | 8.865 | 55.31 | 11.451 | -0.182 | 8.585 | 0.121 |
| 5/10/2003 | 12:11:18 | 563.5 | 9.391667 | 55.31 | 11.454 | -0.179 | 9.112 | 0.119 |
| 5/10/2003 | 12:11:52 | 597 | 9.95 | 55.33 | 11.46 | -0.173 | 9.670 | 0.115 |
| 5/10/2003 | 12:12:27 | 632.5 | 10.54167 | 55.36 | 11.463 | -0.17 | 10.262 | 0.113 |
| 5/10/2003 | 12:13:05 | 670.1 | 11.16833 | 55.36 | 11.467 | -0.166 | 10.888 | 0.111 |
| 5/10/2003 | 12:13:45 | 709.9 | 11.83167 | 55.38 | 11.47 | -0.163 | 11.552 | 0.109 |
| 5/10/2003 | 12:14:27 | 752.1 | 12.535 | 55.4 | 11.474 | -0.159 | 12.255 | 0.106 |
| 5/10/2003 | 12:15:11 | 796.8 | 13.28 | 55.42 | 11.475 | -0.158 | 13.000 | 0.105 |
| 5/10/2003 | 12:15:59 | 844.2 | 14.07 | 55.45 | 11.481 | -0.152 | 13.790 | 0.101 |
| 5/10/2003 | 12:16:49 | 894.4 | 14.90667 | 55.42 | 11.483 | -0.15 | 14.627 | 0.100 |
| 5/10/2003 | 12:17:42 | 947.5 | 15.79167 | 55.4 | 11.485 | -0.148 | 15.512 | 0.099 |
| 5/10/2003 | 12:18:38 | 1003.8 | 16.73 | 55.4 | 11.487 | -0.146 | 16.450 | 0.097 |
| 5/10/2003 | 12:19:38 | 1063.4 | 17.72333 | 55.4 | 11.489 | -0.144 | 17.443 | 0.096 |
| 5/10/2003 | 12:20:41 | 1126.6 | 18.77667 | 55.42 | 11.49 | -0.143 | 18.497 | 0.095 |
| 5/10/2003 | 12:21:48 | 1193.5 | 19.89167 | 55.42 | 11.494 | -0.139 | 19.612 | 0.093 |
| 5/10/2003 | 12:22:59 | 1264.4 | 21.07333 | 55.4 | 11.492 | -0.141 | 20.793 | 0.094 |
| 5/10/2003 | 12:24:14 | 1339.5 | 22.325 | 55.36 | 11.497 | -0.136 | 22.045 | 0.091 |
| 5/10/2003 | 12:25:34 | 1419 | 23.65 | 55.33 | 11.501 | -0.132 | 23.370 | 0.088 |
| 5/10/2003 | 12:26:58 | 1503.3 | 25.055 | 55.31 | 11.499 | -0.134 | 24.775 | 0.089 |
| 5/10/2003 | 12:28:27 | 1592.6 | 26.54333 | 55.22 | 11.5 | -0.133 | 26.263 | 0.089 |
| 5/10/2003 | 12:30:02 | 1687.1 | 28.11833 | 55.15 | 11.503 | -0.13 | 27.838 | 0.087 |
| 5/10/2003 | 12:31:42 | 1787.2 | 29.78667 | 55.22 | 11.506 | -0.127 | 29.507 | 0.085 |
| 5/10/2003 | 12:33:28 | 1893.3 | 31.555 | 55.22 | 11.504 | -0.129 | 31.275 | 0.086 |
| 5/10/2003 | 12:35:20 | 2005.7 | 33.42833 | 55.24 | 11.506 | -0.127 | 33.148 | 0.085 |
| 5/10/2003 | 12:37:19 | 2124.7 | 35.41167 | 55.24 | 11.507 | -0.126 | 35.132 | 0.084 |
| 5/10/2003 | 12:39:25 | 2250.8 | 37.51333 | 55.24 | 11.509 | -0.124 | 37.233 | 0.083 |
| 5/10/2003 | 12:41:39 | 2384.4 | 39.74 | 55.15 | 11.51 | -0.123 | 39.460 | 0.082 |
| 5/10/2003 | 12:44:01 | 2525.9 | 42.09833 | 55.08 | 11.513 | -0.12 | 41.818 | 0.080 |
| 5/10/2003 | 12:46:30 | 2675.8 | 44.59667 | 55.06 | 11.51 | -0.123 | 44.317 | 0.082 |
| 5/10/2003 | 12:49:09 | 2834.6 | 47.24333 | 55.1 | 11.511 | -0.122 | 46.963 | 0.081 |
| 5/10/2003 | 12:51:57 | 3002.8 | 50.04667 | 55.15 | 11.51 | -0.123 | 49.767 | 0.082 |
| 5/10/2003 | 12:54:56 | 3180.9 | 53.015 | 55.08 | 11.513 | -0.12 | 52.735 | 0.080 |
| 5/10/2003 | 12:58:04 | 3369.6 | 56.16 | 54.94 | 11.515 | -0.118 | 55.880 | 0.079 |
| 5/10/2003 | 13:01:24 | 3569.5 | 59.49167 | 54.94 | 11.517 | -0.116 | 59.212 | 0.077 |
| 5/10/2003 | 13:04:56 | 3781.2 | 63.02 | 54.94 | 11.515 | -0.118 | 62.740 | 0.079 |
| 5/10/2003 | 13:08:40 | 4005.5 | 66.75833 | 54.97 | 11.514 | -0.119 | 66.478 | 0.079 |
| 5/10/2003 | 13:12:38 | 4243.1 | 70.71833 | 54.9 | 11.511 | -0.122 | 70.438 | 0.081 |
| 5/10/2003 | 13:16:49 | 4494.7 | 74.91167 | 54.88 | 11.51 | -0.123 | 74.632 | 0.082 |
| 5/10/2003 | 13:21:16 | 4761.3 | 79.355 | 54.97 | 11.503 | -0.13 | 79.075 | 0.087 |
| 5/10/2003 | 13:25:58 | 5043.7 | 84.06167 | 54.99 | 11.499 | -0.134 | 83.782 | 0.089 |
| 5/10/2003 | 13:30:57 | 5342.8 | 89.04667 | 55.06 | 11.5 | -0.133 | 88.767 | 0.089 |
| 5/10/2003 | 13:36:14 | 5659.6 | 94.32667 | 55.01 | 11.501 | -0.132 | 94.047 | 0.088 |
| 5/10/2003 | 13:41:50 | 5995.2 | 99.92 | 54.94 | 11.502 | -0.131 | 99.640 | 0.087 |

**TETRA-TECH NUS**

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 13MWT15 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Falling Head | **Test Date:** | 9-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RMB 6/23/03

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 1 | = R |
| Length of Well Screen (ft.) : | 10 | = L |
| Time for 37% head change (min.) : | 12.30 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.35E-04 | ft./min. |
| 2.25E-06 | ft./sec. |
| 1.95E-01 | ft./day |
| 6.87E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: CRANE

WELL/BORING NO.: 13MW215

PROJECT NO.: 9060 CO 0279

GEOLOGIST:

WELL DIAMETER: 2"

SCREEN LENGTH/DEPTH: 10' / 27.72'

TEST NO.: 4

STATIC WATER LEVEL (Depth/Elevation): 12.80'

DATE: 5/9/03

TEST TYPE (Rising/Falling/Constant Head): FALLING

CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: 1.25" x 42" SOLID SLUG

PAGE ... OF

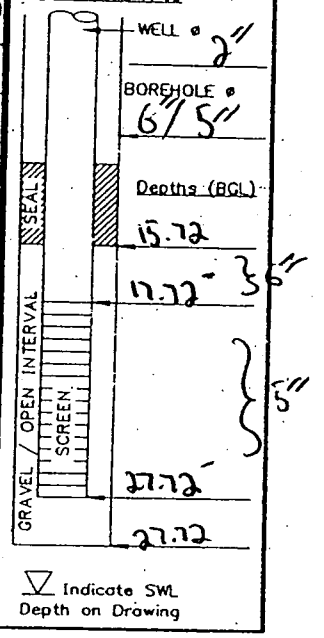
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30PSI

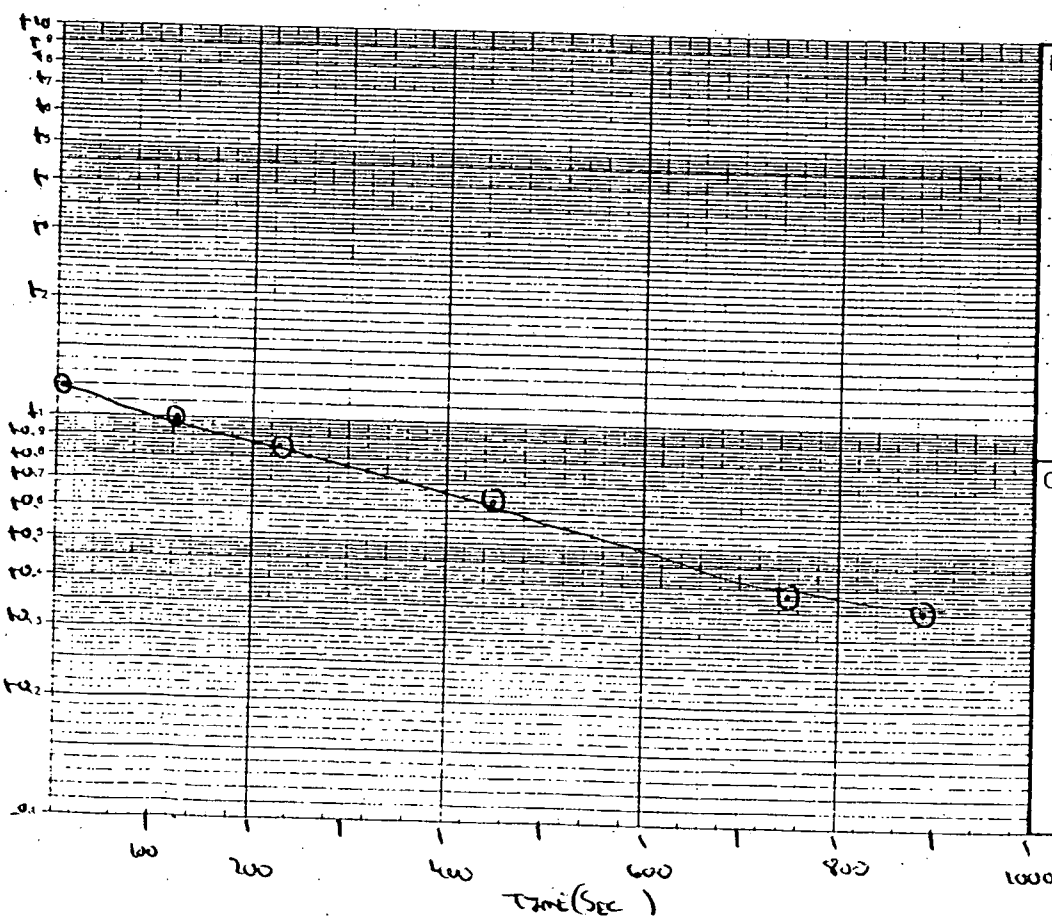
| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 6.0 | 13.5761 | 0 | 335.0 | 14.749 | +0.755 |
| 8.4 | 15.262 | +1.788 | 447.2 | 14.644 | +0.644 |
| 15.0 | 15.210 | +1.236 | 632.5 | 14.493 | +0.519 |
| 20.0 | 15.196 | +1.222 | 709.9 | 14.440 | +0.466 |
| 29.8 | 15.171 | +1.197 | 752.1 | 14.415 | +0.441 |
| 39.5 | 15.149 | +1.175 | 796.8 | 14.387 | +0.413 |
| 49.7 | 15.130 | +1.156 | 844.2 | 14.362 | +0.388 |
| 59.0 | 15.113 | +1.139 | 894.4 | 14.336 | +0.362 |
| 125.1 | 15.007 | +1.033 | 947.5 | 14.311 | +0.337 |
| 177.2 | 14.935 | +0.961 | 1003.8 | 14.286 | +0.312 |
| 236.8 | 14.859 | +0.885 | 2005.7 | 14.047 | +0.073 |
| 298.4 | 14.789 | +0.815 | 3002.8 | 13.985 | +0.011 |

Start →

Start

WELL SCHEMATIC



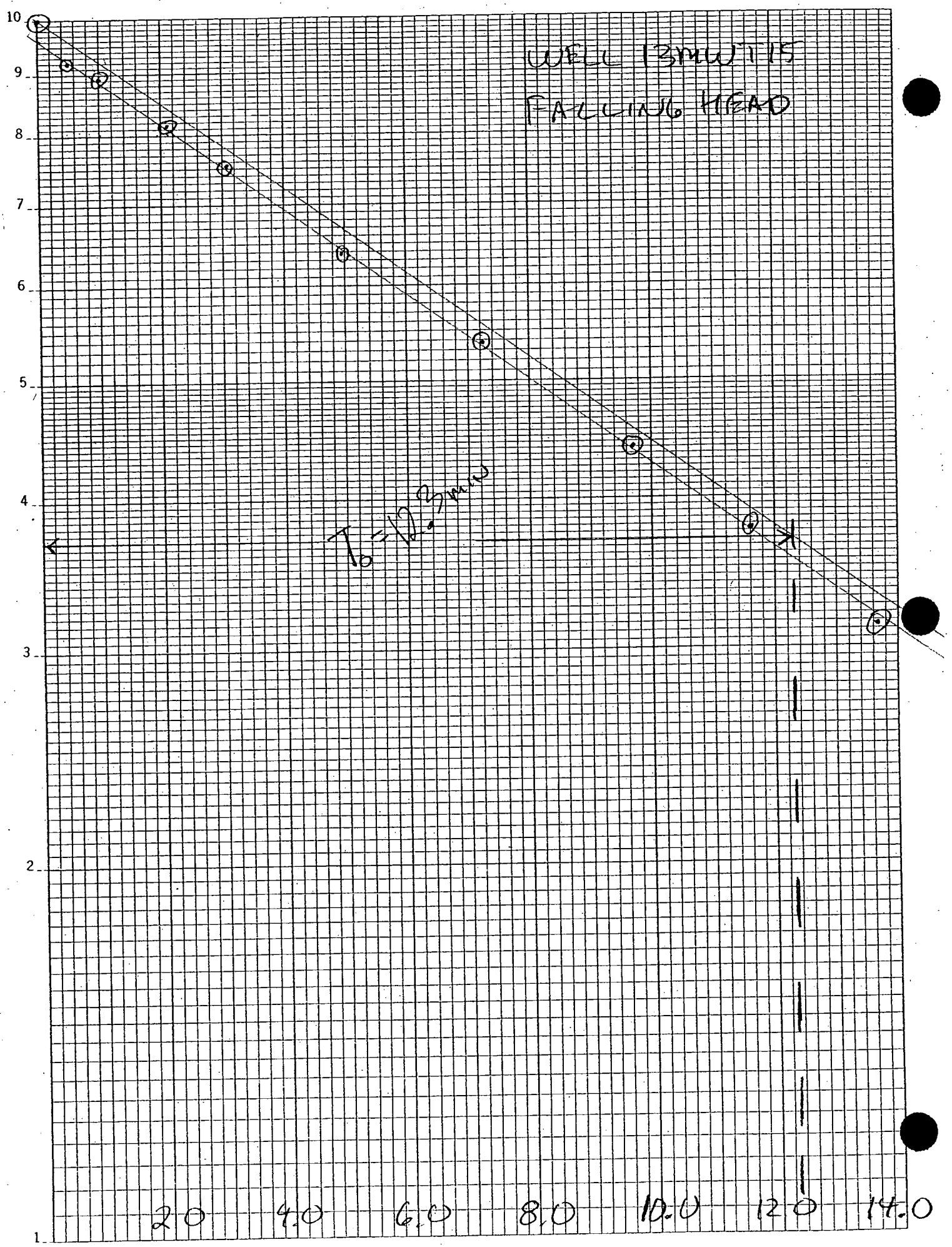




REMARKS:

WL = 12.80

TD = 27.72

CALCS, SKETCH MAPS, ETC.:




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 5/9/2003 13:23:25
Report from file: ...\SN09015 2003-05-09 124252 13MWT15 Falling.bin
Win-Situ Version 4.41

Serial number: 9015
Firmware Version 3.04
Unit name: MW-14FW

Test name: 13MWT15 Falling

Test defined on: 5/9/2003 12:41:50
Test started on: 5/9/2003 12:42:52
Test stopped on: 5/9/2003 13:35:29
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time bet Seconds.
Number of data sa 129

TOTAL DATA SAMF 129

Channel number [1]
Measurement type: Temperature
Channel name: OnBoard Temp

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSIG.
Specific gravity: 1

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | adjusted time | h/ho | ho= -1.24 |
|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 12:42:52 | 0 | 0 | 54.91 | 13.952 | | | |
| 5/9/2003 | 12:42:52 | 0.3 | 0.005 | 54.95 | 13.963 | | | |
| 5/9/2003 | 12:42:53 | 0.6 | 0.01 | 54.95 | 13.967 | | | |
| 5/9/2003 | 12:42:53 | 0.9 | 0.015 | 54.98 | 13.969 | | | |
| 5/9/2003 | 12:42:53 | 1.2 | 0.02 | 54.98 | 13.971 | | | |
| 5/9/2003 | 12:42:54 | 1.5 | 0.025 | 54.98 | 13.973 | | | |
| 5/9/2003 | 12:42:54 | 1.8 | 0.03 | 55 | 13.972 | | | |
| 5/9/2003 | 12:42:54 | 2.1 | 0.035 | 55 | 13.972 | | | |
| 5/9/2003 | 12:42:54 | 2.4 | 0.04 | 55 | 13.972 | displacement | | |
| 5/9/2003 | 12:42:55 | 2.7 | 0.045 | 55 | 13.972 | | | |
| 5/9/2003 | 12:42:55 | 3 | 0.05 | 55 | 13.974 | 0 | | |
| 5/9/2003 | 12:42:55 | 3.3 | 0.055 | 55 | 13.974 | 0 | | |
| 5/9/2003 | 12:42:56 | 3.6 | 0.06 | 55 | 13.974 | 0 | | |
| 5/9/2003 | 12:42:56 | 3.9 | 0.065 | 55 | 13.974 | 0 | | |
| 5/9/2003 | 12:42:56 | 4.2 | 0.07 | 55 | 13.974 | 0 | | |
| 5/9/2003 | 12:42:57 | 4.5 | 0.075 | 55 | 13.974 | 0 | | |
| 5/9/2003 | 12:42:57 | 4.8 | 0.08 | 55 | 13.974 | 0 | | |
| 5/9/2003 | 12:42:57 | 5.1 | 0.085 | 55 | 13.974 | 0 | | |
| 5/9/2003 | 12:42:57 | 5.4 | 0.09 | 55.02 | 13.974 | 0 | | |
| 5/9/2003 | 12:42:58 | 5.7 | 0.095 | 55.02 | 13.974 | 0 | | |
| 5/9/2003 | 12:42:58 | 6 | 0.1 | 55.02 | 13.976 | -0.002 | | |
| 5/9/2003 | 12:42:58 | 6.4 | 0.106667 | 55.02 | 13.98 | -0.006 | | |
| 5/9/2003 | 12:42:59 | 6.7 | 0.111667 | 55.02 | 15.936 | -1.962 | | |
| 5/9/2003 | 12:42:59 | 7.1 | 0.118333 | 55.02 | 14.653 | -0.679 | | |
| 5/9/2003 | 12:43:00 | 7.5 | 0.125 | 55.02 | 15.19 | -1.216 | | |
| 5/9/2003 | 12:43:00 | 8 | 0.133333 | 55.02 | 15.52 | -1.546 | | |
| 5/9/2003 | 12:43:00 | 8.4 | 0.14 | 55.02 | 15.762 | -1.788 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 12:43:01 | 8.9 | 0.148333 | 55.02 | 15.114 | -1.14 | | |
| 5/9/2003 | 12:43:02 | 9.5 | 0.158333 | 55.02 | 15.219 | -1.245 | | |
| 5/9/2003 | 12:43:02 | 10 | 0.166667 | 55 | 15.233 | -1.259 | | |
| 5/9/2003 | 12:43:03 | 10.6 | 0.176667 | 55 | 15.233 | -1.259 | | |
| 5/9/2003 | 12:43:03 | 11.3 | 0.188333 | 55 | 15.225 | -1.251 | | |
| 5/9/2003 | 12:43:04 | 11.9 | 0.198333 | 55 | 15.221 | -1.247 | Plotted shaded values. | |
| 5/9/2003 | 12:43:05 | 12.6 | 0.21 | 55 | 15.219 | -1.245 | | |
| 5/9/2003 | 12:43:05 | 13.4 | 0.223333 | 54.98 | 15.218 | -1.244 | adjusted time | h/ho |
| 5/9/2003 | 12:43:06 | 14.2 | 0.236667 | 55 | 15.214 | -1.24 | 0.000 | 1.000 |
| 5/9/2003 | 12:43:07 | 15 | 0.25 | 54.98 | 15.21 | -1.236 | 0.013 | 0.997 |
| 5/9/2003 | 12:43:08 | 15.9 | 0.265 | 54.98 | 15.208 | -1.234 | 0.028 | 0.995 |
| 5/9/2003 | 12:43:09 | 16.8 | 0.28 | 54.98 | 15.206 | -1.232 | 0.043 | 0.994 |
| 5/9/2003 | 12:43:10 | 17.8 | 0.296667 | 54.98 | 15.204 | -1.23 | 0.060 | 0.992 |
| 5/9/2003 | 12:43:11 | 18.9 | 0.315 | 54.98 | 15.2 | -1.226 | 0.078 | 0.989 |
| 5/9/2003 | 12:43:12 | 20 | 0.333333 | 54.98 | 15.196 | -1.222 | 0.097 | 0.985 |
| 5/9/2003 | 12:43:13 | 21.2 | 0.353333 | 54.98 | 15.192 | -1.218 | 0.117 | 0.982 |
| 5/9/2003 | 12:43:14 | 22.4 | 0.373333 | 54.98 | 15.188 | -1.214 | 0.137 | 0.979 |
| 5/9/2003 | 12:43:16 | 23.8 | 0.396667 | 54.98 | 15.186 | -1.212 | 0.160 | 0.977 |
| 5/9/2003 | 12:43:17 | 25.2 | 0.42 | 54.98 | 15.183 | -1.209 | 0.183 | 0.975 |
| 5/9/2003 | 12:43:19 | 26.7 | 0.445 | 54.95 | 15.179 | -1.205 | 0.208 | 0.972 |
| 5/9/2003 | 12:43:20 | 28.2 | 0.47 | 54.95 | 15.175 | -1.201 | 0.233 | 0.969 |
| 5/9/2003 | 12:43:22 | 29.8 | 0.496667 | 54.95 | 15.171 | -1.197 | 0.260 | 0.965 |
| 5/9/2003 | 12:43:24 | 31.5 | 0.525 | 54.98 | 15.167 | -1.193 | 0.288 | 0.962 |
| 5/9/2003 | 12:43:25 | 33.3 | 0.555 | 54.95 | 15.163 | -1.189 | 0.318 | 0.959 |
| 5/9/2003 | 12:43:27 | 35.2 | 0.586667 | 54.98 | 15.159 | -1.185 | 0.350 | 0.956 |
| 5/9/2003 | 12:43:29 | 37.3 | 0.621667 | 54.95 | 15.155 | -1.181 | 0.385 | 0.952 |
| 5/9/2003 | 12:43:32 | 39.5 | 0.658333 | 54.98 | 15.149 | -1.175 | 0.422 | 0.948 |
| 5/9/2003 | 12:43:34 | 41.8 | 0.696667 | 54.95 | 15.146 | -1.172 | 0.460 | 0.945 |
| 5/9/2003 | 12:43:36 | 44.3 | 0.738333 | 54.95 | 15.14 | -1.166 | 0.502 | 0.940 |
| 5/9/2003 | 12:43:39 | 46.9 | 0.781667 | 54.95 | 15.136 | -1.162 | 0.545 | 0.937 |
| 5/9/2003 | 12:43:42 | 49.7 | 0.828333 | 54.95 | 15.13 | -1.156 | 0.592 | 0.932 |
| 5/9/2003 | 12:43:45 | 52.6 | 0.876667 | 54.95 | 15.126 | -1.152 | 0.640 | 0.929 |
| 5/9/2003 | 12:43:48 | 55.7 | 0.928333 | 54.95 | 15.118 | -1.144 | 0.692 | 0.923 |
| 5/9/2003 | 12:43:51 | 59 | 0.983333 | 54.95 | 15.113 | -1.139 | 0.747 | 0.919 |
| 5/9/2003 | 12:43:55 | 62.5 | 1.041667 | 54.95 | 15.107 | -1.133 | 0.805 | 0.914 |
| 5/9/2003 | 12:43:58 | 66.2 | 1.103333 | 54.95 | 15.101 | -1.127 | 0.867 | 0.909 |
| 5/9/2003 | 12:44:02 | 70.1 | 1.168333 | 54.95 | 15.095 | -1.121 | 0.932 | 0.904 |
| 5/9/2003 | 12:44:06 | 74.3 | 1.238333 | 54.93 | 15.087 | -1.113 | 1.002 | 0.898 |
| 5/9/2003 | 12:44:11 | 78.7 | 1.311667 | 54.93 | 15.08 | -1.106 | 1.075 | 0.892 |
| 5/9/2003 | 12:44:15 | 83.4 | 1.39 | 54.93 | 15.07 | -1.096 | 1.153 | 0.884 |
| 5/9/2003 | 12:44:20 | 88.4 | 1.473333 | 54.93 | 15.064 | -1.09 | 1.237 | 0.879 |
| 5/9/2003 | 12:44:26 | 93.7 | 1.561667 | 54.93 | 15.054 | -1.08 | 1.325 | 0.871 |
| 5/9/2003 | 12:44:31 | 99.3 | 1.655 | 54.93 | 15.046 | -1.072 | 1.418 | 0.865 |
| 5/9/2003 | 12:44:37 | 105.2 | 1.753333 | 54.93 | 15.037 | -1.063 | 1.517 | 0.857 |
| 5/9/2003 | 12:44:44 | 111.5 | 1.858333 | 54.93 | 15.027 | -1.053 | 1.622 | 0.849 |
| 5/9/2003 | 12:44:50 | 118.1 | 1.968333 | 54.93 | 15.017 | -1.043 | 1.732 | 0.841 |
| 5/9/2003 | 12:44:57 | 125.1 | 2.085 | 54.93 | 15.007 | -1.033 | 1.848 | 0.833 |
| 5/9/2003 | 12:45:05 | 132.6 | 2.21 | 54.91 | 14.996 | -1.022 | 1.973 | 0.824 |
| 5/9/2003 | 12:45:13 | 140.5 | 2.341667 | 54.91 | 14.986 | -1.012 | 2.105 | 0.816 |
| 5/9/2003 | 12:45:21 | 148.9 | 2.481667 | 54.91 | 14.972 | -0.998 | 2.245 | 0.805 |
| 5/9/2003 | 12:45:30 | 157.8 | 2.63 | 54.91 | 14.961 | -0.987 | 2.393 | 0.796 |
| 5/9/2003 | 12:45:39 | 167.2 | 2.786667 | 54.91 | 14.949 | -0.975 | 2.550 | 0.786 |
| 5/9/2003 | 12:45:49 | 177.2 | 2.953333 | 54.91 | 14.935 | -0.961 | 2.717 | 0.775 |
| 5/9/2003 | 12:46:00 | 187.8 | 3.13 | 54.91 | 14.922 | -0.948 | 2.893 | 0.765 |
| 5/9/2003 | 12:46:11 | 199 | 3.316667 | 54.89 | 14.906 | -0.932 | 3.080 | 0.752 |
| 5/9/2003 | 12:46:23 | 210.9 | 3.515 | 54.89 | 14.891 | -0.917 | 3.278 | 0.740 |
| 5/9/2003 | 12:46:36 | 223.5 | 3.725 | 54.89 | 14.877 | -0.903 | 3.488 | 0.728 |
| 5/9/2003 | 12:46:49 | 236.8 | 3.946667 | 54.89 | 14.859 | -0.885 | 3.710 | 0.714 |
| 5/9/2003 | 12:47:03 | 250.9 | 4.181667 | 54.89 | 14.842 | -0.868 | 3.945 | 0.700 |
| 5/9/2003 | 12:47:18 | 265.8 | 4.43 | 54.89 | 14.826 | -0.852 | 4.193 | 0.687 |
| 5/9/2003 | 12:47:34 | 281.6 | 4.693333 | 54.89 | 14.809 | -0.835 | 4.457 | 0.673 |
| 5/9/2003 | 12:47:50 | 298.4 | 4.973333 | 54.89 | 14.789 | -0.815 | 4.737 | 0.657 |
| 5/9/2003 | 12:48:08 | 316.2 | 5.27 | 54.86 | 14.77 | -0.796 | 5.033 | 0.642 |
| 5/9/2003 | 12:48:27 | 335 | 5.583333 | 54.86 | 14.748 | -0.774 | 5.347 | 0.624 |
| 5/9/2003 | 12:48:47 | 354.9 | 5.915 | 54.86 | 14.729 | -0.755 | 5.678 | 0.609 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 12:49:08 | 376 | 6.266667 | 54.86 | 14.707 | -0.733 | 6.030 | 0.591 |
| 5/9/2003 | 12:49:30 | 398.4 | 6.64 | 54.86 | 14.686 | -0.712 | 6.403 | 0.574 |
| 5/9/2003 | 12:49:54 | 422.1 | 7.035 | 54.86 | 14.661 | -0.687 | 6.798 | 0.554 |
| 5/9/2003 | 12:50:19 | 447.2 | 7.453333 | 54.86 | 14.641 | -0.667 | 7.217 | 0.538 |
| 5/9/2003 | 12:50:46 | 473.8 | 7.896667 | 54.86 | 14.618 | -0.644 | 7.660 | 0.519 |
| 5/9/2003 | 12:51:14 | 502 | 8.366667 | 54.84 | 14.594 | -0.62 | 8.130 | 0.500 |
| 5/9/2003 | 12:51:44 | 531.9 | 8.865 | 54.84 | 14.571 | -0.597 | 8.628 | 0.481 |
| 5/9/2003 | 12:52:16 | 563.5 | 9.391667 | 54.84 | 14.546 | -0.572 | 9.155 | 0.461 |
| 5/9/2003 | 12:52:49 | 597 | 9.95 | 54.84 | 14.52 | -0.546 | 9.713 | 0.440 |
| 5/9/2003 | 12:53:25 | 632.5 | 10.54167 | 54.84 | 14.493 | -0.519 | 10.305 | 0.419 |
| 5/9/2003 | 12:54:02 | 670.1 | 11.16833 | 54.86 | 14.465 | -0.491 | 10.932 | 0.396 |
| 5/9/2003 | 12:54:42 | 709.9 | 11.83167 | 54.86 | 14.44 | -0.466 | 11.595 | 0.376 |
| 5/9/2003 | 12:55:24 | 752.1 | 12.535 | 54.86 | 14.415 | -0.441 | 12.298 | 0.356 |
| 5/9/2003 | 12:56:09 | 796.8 | 13.28 | 54.86 | 14.387 | -0.413 | 13.043 | 0.333 |
| 5/9/2003 | 12:56:56 | 844.2 | 14.07 | 54.86 | 14.362 | -0.388 | 13.833 | 0.313 |
| 5/9/2003 | 12:57:46 | 894.4 | 14.90667 | 54.89 | 14.336 | -0.362 | 14.670 | 0.292 |
| 5/9/2003 | 12:58:40 | 947.5 | 15.79167 | 54.89 | 14.311 | -0.337 | 15.555 | 0.272 |
| 5/9/2003 | 12:59:36 | 1003.8 | 16.73 | 54.89 | 14.286 | -0.312 | 16.493 | 0.252 |
| 5/9/2003 | 13:00:35 | 1063.4 | 17.72333 | 54.89 | 14.26 | -0.286 | 17.487 | 0.231 |
| 5/9/2003 | 13:01:39 | 1126.6 | 18.77667 | 54.91 | 14.237 | -0.263 | 18.540 | 0.212 |
| 5/9/2003 | 13:02:46 | 1193.5 | 19.89167 | 54.91 | 14.213 | -0.239 | 19.655 | 0.193 |
| 5/9/2003 | 13:03:56 | 1264.4 | 21.07333 | 54.91 | 14.192 | -0.218 | 20.837 | 0.176 |
| 5/9/2003 | 13:05:12 | 1339.5 | 22.325 | 54.91 | 14.17 | -0.196 | 22.088 | 0.158 |
| 5/9/2003 | 13:06:31 | 1419 | 23.65 | 54.91 | 14.149 | -0.175 | 23.413 | 0.141 |
| 5/9/2003 | 13:07:55 | 1503.3 | 25.055 | 54.91 | 14.129 | -0.155 | 24.818 | 0.125 |
| 5/9/2003 | 13:09:25 | 1592.6 | 26.54333 | 54.91 | 14.11 | -0.136 | 26.307 | 0.110 |
| 5/9/2003 | 13:10:59 | 1687.1 | 28.11833 | 54.91 | 14.092 | -0.118 | 27.882 | 0.095 |
| 5/9/2003 | 13:12:39 | 1787.2 | 29.78667 | 54.91 | 14.077 | -0.103 | 29.550 | 0.083 |
| 5/9/2003 | 13:14:25 | 1893.3 | 31.555 | 54.93 | 14.061 | -0.087 | 31.318 | 0.070 |
| 5/9/2003 | 13:16:18 | 2005.7 | 33.42833 | 54.93 | 14.047 | -0.073 | 33.192 | 0.059 |
| 5/9/2003 | 13:18:17 | 2124.7 | 35.41167 | 54.93 | 14.035 | -0.061 | 35.175 | 0.049 |
| 5/9/2003 | 13:20:23 | 2250.8 | 37.51333 | 54.93 | 14.024 | -0.05 | 37.277 | 0.040 |
| 5/9/2003 | 13:22:36 | 2384.4 | 39.74 | 54.91 | 14.014 | -0.04 | 39.503 | 0.032 |
| 5/9/2003 | 13:24:58 | 2525.9 | 42.09833 | 54.91 | 14.004 | -0.03 | 41.862 | 0.024 |
| 5/9/2003 | 13:27:28 | 2675.8 | 44.59667 | 54.91 | 13.997 | -0.023 | 44.360 | 0.019 |
| 5/9/2003 | 13:30:07 | 2834.6 | 47.24333 | 54.86 | 13.989 | -0.015 | 47.007 | 0.012 |
| 5/9/2003 | 13:32:55 | 3002.8 | 50.04667 | 54.86 | 13.985 | -0.011 | 49.810 | 0.009 |

**TETRA-TECH NUS**

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 13MWT15 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Rising Head | **Test Date:** | 9-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RMB 6/23/03

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 1 = R |
| Length of Well Screen (ft.) : | 10 = L |
| Time for 37% head change (min.) : | 18.70 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 8.89E-05 | ft./min. |
| 1.48E-06 | ft./sec. |
| 1.28E-01 | ft./day |
| 4.52E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: CRANE WELL/BORING NO.: BAW115

PROJECT NO.: 9060 GW 0279 GEOLOGIST: BOB BALKOVEC

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' / 22.72' TEST NO.: 6

STATIC WATER LEVEL (Depth/Elevation): 12.80' DATE: 5/9/03

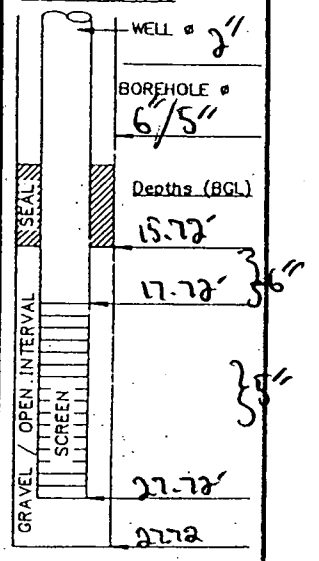
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: 1.25" x 42" SOLID SLUG PAGE OF

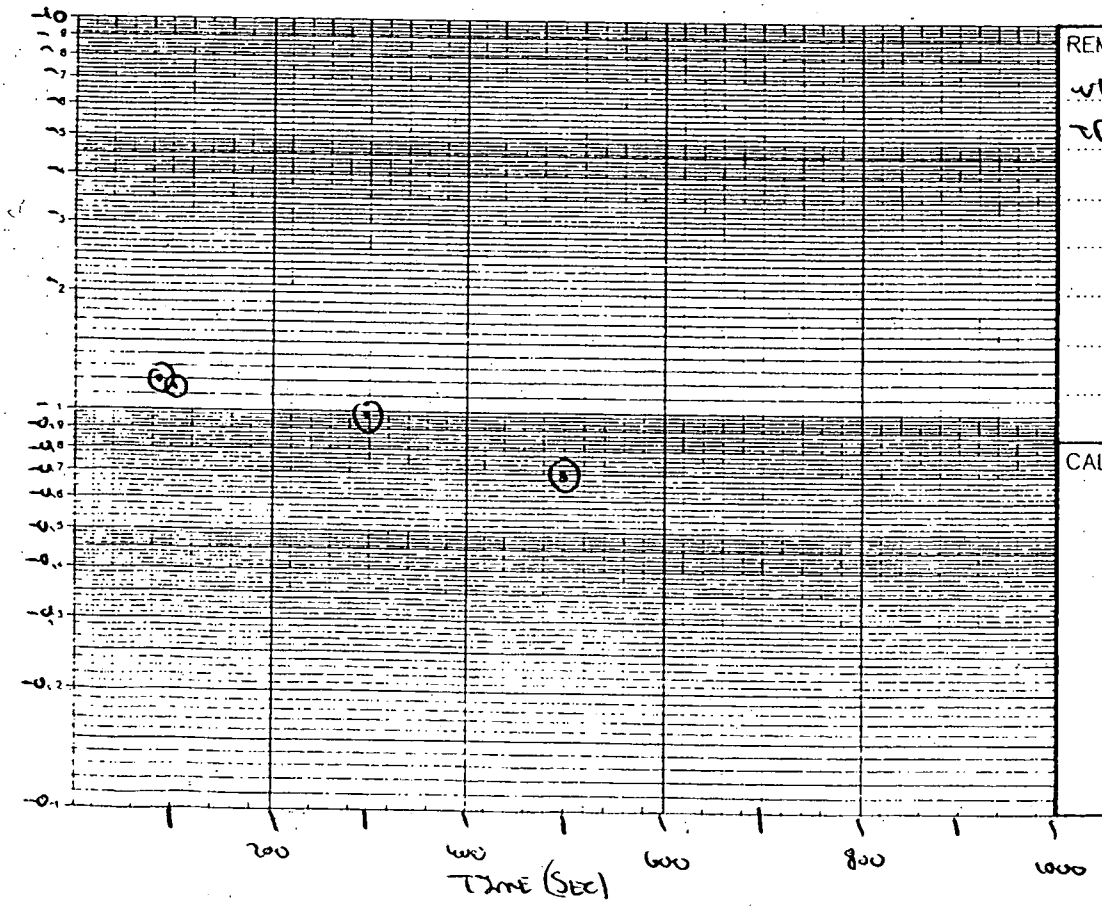
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30 PSI

| | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|---|
| STATIC → | 4.2 | 13.991 | | 298.4 | 12.979 | -1.012 |
| START → | 6.7 | 12.593 | -1.398 | 709.9 | 13.291 | -0.7 |
| | 10.0 | 12.679 | -1.312 | 1126.6 | 13.496 | -0.495 |
| | 20.0 | 12.695 | -1.296 | 2250.8 | 13.784 | -0.202 |
| | 29.8 | 12.713 | -1.278 | 3569.5 | 13.901 | -0.09 |
| | 39.5 | 12.726 | -1.265 | | | |
| | 49.7 | 12.738 | -1.253 | | | |
| | 59.0 | 12.750 | -1.241 | | | |
| | 70.1 | 12.764 | -1.227 | | | |
| | 78.7 | 12.773 | -1.218 | | | |
| | 93.7 | 12.791 | -1.20 | | | |
| | 105.2 | 12.803 | -1.188 | | | |

WELL SCHEMATIC




▽ Indicate SWL Depth on Drawing



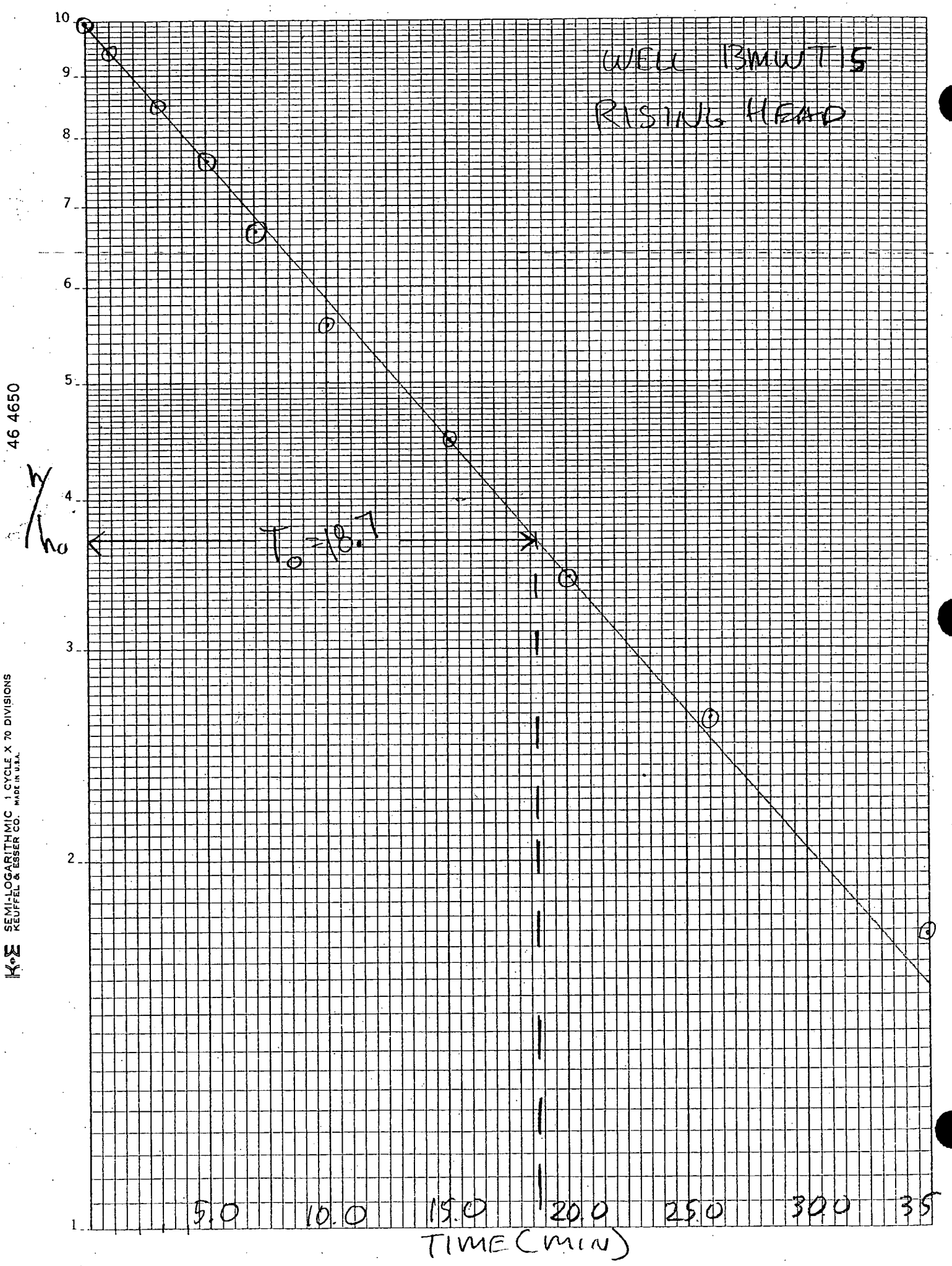

REMARKS:

WL 12.80

TD: 22.72

CALCS, SKETCH MAPS, ETC.:

04


WELL 13MWT15
RISING HEAD
h/h0
T0 = 18.7
10
9
8
7
6
5
4
3
2
1
5.0
10.0
15.0
20.0
25.0
30.0
35
TIME (MIN)
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 5/9/2003 14:24:21
Report from file: ...\SN09015 2003-05-09 134024 13MWT15 Rising.bin
Win-Situ Version 4.41

Serial number: 9015
Firmware Version 3.04
Unit name: MW-14FW

Test name: 13MWT15 Rising

Test defined on: 5/9/2003 13:39:58
Test started on: 5/9/2003 13:40:24
Test stopped on: N/A N/A
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time between Seconds.
Number of data samples 134

TOTAL DATA SAMPLES 134

Channel number [1]
Measurement type: Temperature
Channel name: OnBoard Temp

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSIG
Specific gravity: 1

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Displacement Feet | adjusted time | h/ho | ho= -1.3 |
|---|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 13:40:24 | 0 | 0 | 54.82 | 13.991 | 0 | | | |
| 5/9/2003 | 13:40:25 | 0.3 | 0.005 | 54.84 | 13.991 | 0 | | | |
| 5/9/2003 | 13:40:25 | 0.6 | 0.01 | 54.86 | 13.991 | 0 | | | |
| 5/9/2003 | 13:40:25 | 0.9 | 0.015 | 54.86 | 13.991 | 0 | | | |
| 5/9/2003 | 13:40:25 | 1.2 | 0.02 | 54.86 | 13.991 | 0 | | | |
| 5/9/2003 | 13:40:26 | 1.5 | 0.025 | 54.89 | 13.991 | 0 | | | |
| 5/9/2003 | 13:40:26 | 1.8 | 0.03 | 54.89 | 13.991 | 0 | | | |
| 5/9/2003 | 13:40:26 | 2.1 | 0.035 | 54.89 | 13.991 | 0 | | | |
| 5/9/2003 | 13:40:27 | 2.4 | 0.04 | 54.89 | 13.991 | 0 | | | |
| 5/9/2003 | 13:40:27 | 2.7 | 0.045 | 54.89 | 13.991 | 0 | | | |
| 5/9/2003 | 13:40:27 | 3 | 0.05 | 54.89 | 13.991 | 0 | | | |
| 5/9/2003 | 13:40:28 | 3.3 | 0.055 | 54.89 | 13.991 | 0 | | | |
| 5/9/2003 | 13:40:28 | 3.6 | 0.06 | 54.91 | 13.991 | 0 | | | |
| 5/9/2003 | 13:40:28 | 3.9 | 0.065 | 54.91 | 13.991 | 0 | | | |
| 5/9/2003 | 13:40:28 | 4.2 | 0.07 | 54.89 | 13.991 | 0 | | | |
| 5/9/2003 | 13:40:29 | 4.5 | 0.075 | 54.91 | 13.579 | -0.412 | | | |
| 5/9/2003 | 13:40:29 | 4.8 | 0.08 | 54.91 | 11.691 | -2.3 | | | |
| 5/9/2003 | 13:40:29 | 5.1 | 0.085 | 54.91 | 13.589 | -0.402 | | | |
| 5/9/2003 | 13:40:30 | 5.4 | 0.09 | 54.91 | 13.007 | -0.984 | | | |
| 5/9/2003 | 13:40:30 | 5.7 | 0.095 | 54.91 | 11.902 | -2.089 | | | |
| 5/9/2003 | 13:40:30 | 6 | 0.1 | 54.91 | 13.06 | -0.931 | | | |
| 5/9/2003 | 13:40:31 | 6.4 | 0.106667 | 54.91 | 12.712 | -1.279 | | | |
| 5/9/2003 | 13:40:31 | 6.7 | 0.111667 | 54.91 | 12.593 | -1.398 | | | |
| 5/9/2003 | 13:40:31 | 7.1 | 0.118333 | 54.91 | 12.654 | -1.337 | | | |
| 5/9/2003 | 13:40:32 | 7.5 | 0.125 | 54.91 | 12.693 | -1.298 | | | |
| 5/9/2003 | 13:40:32 | 8 | 0.133333 | 54.91 | 12.697 | -1.294 | | | |
| 5/9/2003 | 13:40:33 | 8.4 | 0.14 | 54.91 | 12.699 | -1.292 | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 13:40:33 | 8.9 | 0.148333 | 54.91 | 12.691 | -1.3 | | |
| 5/9/2003 | 13:40:34 | 9.5 | 0.158333 | 54.91 | 12.703 | -1.288 | | |
| 5/9/2003 | 13:40:34 | 10 | 0.166667 | 54.91 | 12.679 | -1.312 | | |
| 5/9/2003 | 13:40:35 | 10.6 | 0.176667 | 54.89 | 12.67 | -1.321 | | |
| 5/9/2003 | 13:40:35 | 11.3 | 0.188333 | 54.89 | 12.658 | -1.333 | | |
| 5/9/2003 | 13:40:36 | 11.9 | 0.198333 | 54.89 | 12.638 | -1.353 | | |
| 5/9/2003 | 13:40:37 | 12.6 | 0.21 | 54.89 | 12.636 | -1.355 | | |
| 5/9/2003 | 13:40:38 | 13.4 | 0.223333 | 54.89 | 12.648 | -1.343 | | |
| 5/9/2003 | 13:40:38 | 14.2 | 0.236667 | 54.89 | 12.664 | -1.327 | | |
| 5/9/2003 | 13:40:39 | 15 | 0.25 | 54.89 | 12.689 | -1.302 | | |
| 5/9/2003 | 13:40:40 | 15.9 | 0.265 | 54.86 | 12.689 | -1.302 | | |
| 5/9/2003 | 13:40:41 | 16.8 | 0.28 | 54.89 | 12.689 | -1.302 | | |
| 5/9/2003 | 13:40:42 | 17.8 | 0.296667 | 54.86 | 12.691 | -1.3 | | |
| 5/9/2003 | 13:40:43 | 18.9 | 0.315 | 54.86 | 12.693 | -1.298 | Plotted shaded values. | |
| 5/9/2003 | 13:40:44 | 20 | 0.333333 | 54.86 | 12.695 | -1.296 | | |
| 5/9/2003 | 13:40:45 | 21.2 | 0.353333 | 54.86 | 12.699 | -1.292 | | |
| 5/9/2003 | 13:40:47 | 22.4 | 0.373333 | 54.86 | 12.701 | -1.29 | | |
| 5/9/2003 | 13:40:48 | 23.8 | 0.396667 | 54.86 | 12.703 | -1.288 | | |
| 5/9/2003 | 13:40:49 | 25.2 | 0.42 | 54.86 | 12.705 | -1.286 | | |
| 5/9/2003 | 13:40:51 | 26.7 | 0.445 | 54.86 | 12.707 | -1.284 | adjusted time | h/ho |
| 5/9/2003 | 13:40:52 | 28.2 | 0.47 | 54.86 | 12.711 | -1.28 | 0.000 | 1.000 |
| 5/9/2003 | 13:40:54 | 29.8 | 0.496667 | 54.86 | 12.713 | -1.278 | 0.027 | 0.998 |
| 5/9/2003 | 13:40:56 | 31.5 | 0.525 | 54.86 | 12.715 | -1.276 | 0.055 | 0.997 |
| 5/9/2003 | 13:40:57 | 33.3 | 0.555 | 54.86 | 12.719 | -1.272 | 0.085 | 0.994 |
| 5/9/2003 | 13:40:59 | 35.2 | 0.586667 | 54.86 | 12.72 | -1.271 | 0.117 | 0.993 |
| 5/9/2003 | 13:41:01 | 37.3 | 0.621667 | 54.86 | 12.724 | -1.267 | 0.152 | 0.990 |
| 5/9/2003 | 13:41:04 | 39.5 | 0.658333 | 54.86 | 12.726 | -1.265 | 0.188 | 0.988 |
| 5/9/2003 | 13:41:06 | 41.8 | 0.696667 | 54.86 | 12.728 | -1.263 | 0.227 | 0.987 |
| 5/9/2003 | 13:41:08 | 44.3 | 0.738333 | 54.86 | 12.732 | -1.259 | 0.268 | 0.984 |
| 5/9/2003 | 13:41:11 | 46.9 | 0.781667 | 54.86 | 12.736 | -1.255 | 0.312 | 0.980 |
| 5/9/2003 | 13:41:14 | 49.7 | 0.828333 | 54.86 | 12.738 | -1.253 | 0.358 | 0.979 |
| 5/9/2003 | 13:41:17 | 52.6 | 0.876667 | 54.86 | 12.742 | -1.249 | 0.407 | 0.976 |
| 5/9/2003 | 13:41:20 | 55.7 | 0.928333 | 54.84 | 12.746 | -1.245 | 0.458 | 0.973 |
| 5/9/2003 | 13:41:23 | 59 | 0.983333 | 54.84 | 12.75 | -1.241 | 0.513 | 0.970 |
| 5/9/2003 | 13:41:27 | 62.5 | 1.041667 | 54.84 | 12.754 | -1.237 | 0.572 | 0.966 |
| 5/9/2003 | 13:41:30 | 66.2 | 1.103333 | 54.84 | 12.76 | -1.231 | 0.633 | 0.962 |
| 5/9/2003 | 13:41:34 | 70.1 | 1.168333 | 54.84 | 12.764 | -1.227 | 0.698 | 0.959 |
| 5/9/2003 | 13:41:38 | 74.3 | 1.238333 | 54.84 | 12.767 | -1.224 | 0.768 | 0.956 |
| 5/9/2003 | 13:41:43 | 78.7 | 1.311667 | 54.84 | 12.773 | -1.218 | 0.842 | 0.952 |
| 5/9/2003 | 13:41:48 | 83.4 | 1.39 | 54.82 | 12.777 | -1.214 | 0.920 | 0.948 |
| 5/9/2003 | 13:41:53 | 88.4 | 1.473333 | 54.82 | 12.785 | -1.206 | 1.003 | 0.942 |
| 5/9/2003 | 13:41:58 | 93.7 | 1.561667 | 54.82 | 12.791 | -1.2 | 1.092 | 0.937 |
| 5/9/2003 | 13:42:03 | 99.3 | 1.655 | 54.82 | 12.797 | -1.194 | 1.185 | 0.933 |
| 5/9/2003 | 13:42:09 | 105.2 | 1.753333 | 54.82 | 12.803 | -1.188 | 1.283 | 0.928 |
| 5/9/2003 | 13:42:16 | 111.5 | 1.858333 | 54.82 | 12.811 | -1.18 | 1.388 | 0.922 |
| 5/9/2003 | 13:42:22 | 118.1 | 1.968333 | 54.8 | 12.815 | -1.176 | 1.498 | 0.919 |
| 5/9/2003 | 13:42:29 | 125.1 | 2.085 | 54.8 | 12.823 | -1.168 | 1.615 | 0.912 |
| 5/9/2003 | 13:42:37 | 132.6 | 2.21 | 54.8 | 12.83 | -1.161 | 1.740 | 0.907 |
| 5/9/2003 | 13:42:45 | 140.5 | 2.341667 | 54.8 | 12.838 | -1.153 | 1.872 | 0.901 |
| 5/9/2003 | 13:42:53 | 148.9 | 2.481667 | 54.8 | 12.846 | -1.145 | 2.012 | 0.895 |
| 5/9/2003 | 13:43:02 | 157.8 | 2.63 | 54.77 | 12.854 | -1.137 | 2.160 | 0.888 |
| 5/9/2003 | 13:43:11 | 167.2 | 2.786667 | 54.77 | 12.864 | -1.127 | 2.317 | 0.880 |
| 5/9/2003 | 13:43:21 | 177.2 | 2.953333 | 54.77 | 12.871 | -1.12 | 2.483 | 0.875 |
| 5/9/2003 | 13:43:32 | 187.8 | 3.13 | 54.77 | 12.883 | -1.108 | 2.660 | 0.866 |
| 5/9/2003 | 13:43:43 | 199 | 3.316667 | 54.77 | 12.893 | -1.098 | 2.847 | 0.858 |
| 5/9/2003 | 13:43:55 | 210.9 | 3.515 | 54.77 | 12.903 | -1.088 | 3.045 | 0.850 |
| 5/9/2003 | 13:44:08 | 223.5 | 3.725 | 54.77 | 12.914 | -1.077 | 3.255 | 0.841 |
| 5/9/2003 | 13:44:21 | 236.8 | 3.946667 | 54.77 | 12.926 | -1.065 | 3.477 | 0.832 |
| 5/9/2003 | 13:44:35 | 250.9 | 4.181667 | 54.77 | 12.94 | -1.051 | 3.712 | 0.821 |
| 5/9/2003 | 13:44:50 | 265.8 | 4.43 | 54.75 | 12.952 | -1.039 | 3.960 | 0.812 |
| 5/9/2003 | 13:45:06 | 281.6 | 4.693333 | 54.75 | 12.965 | -1.026 | 4.223 | 0.802 |
| 5/9/2003 | 13:45:23 | 298.4 | 4.973333 | 54.75 | 12.979 | -1.012 | 4.503 | 0.791 |
| 5/9/2003 | 13:45:40 | 316.2 | 5.27 | 54.75 | 12.993 | -0.998 | 4.800 | 0.780 |
| 5/9/2003 | 13:45:59 | 335 | 5.583333 | 54.75 | 13.008 | -0.983 | 5.113 | 0.768 |
| 5/9/2003 | 13:46:19 | 354.9 | 5.915 | 54.75 | 13.024 | -0.967 | 5.445 | 0.755 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 13:46:40 | 376 | 6.266667 | 54.77 | 13.041 | -0.95 | 5.797 | 0.742 |
| 5/9/2003 | 13:47:03 | 398.4 | 6.64 | 54.77 | 13.059 | -0.932 | 6.170 | 0.728 |
| 5/9/2003 | 13:47:26 | 422.1 | 7.035 | 54.77 | 13.104 | -0.887 | 6.565 | 0.693 |
| 5/9/2003 | 13:47:51 | 447.2 | 7.453333 | 54.77 | 13.121 | -0.87 | 6.983 | 0.680 |
| 5/9/2003 | 13:48:18 | 473.8 | 7.896667 | 54.77 | 13.141 | -0.85 | 7.427 | 0.664 |
| 5/9/2003 | 13:48:46 | 502 | 8.366667 | 54.8 | 13.16 | -0.831 | 7.897 | 0.649 |
| 5/9/2003 | 13:49:16 | 531.9 | 8.865 | 54.8 | 13.182 | -0.809 | 8.395 | 0.632 |
| 5/9/2003 | 13:49:48 | 563.5 | 9.391667 | 54.8 | 13.201 | -0.79 | 8.922 | 0.617 |
| 5/9/2003 | 13:50:21 | 597 | 9.95 | 54.8 | 13.223 | -0.768 | 9.480 | 0.600 |
| 5/9/2003 | 13:50:57 | 632.5 | 10.54167 | 54.8 | 13.246 | -0.745 | 10.072 | 0.582 |
| 5/9/2003 | 13:51:34 | 670.1 | 11.16833 | 54.77 | 13.268 | -0.723 | 10.698 | 0.565 |
| 5/9/2003 | 13:52:14 | 709.9 | 11.83167 | 54.77 | 13.291 | -0.7 | 11.362 | 0.547 |
| 5/9/2003 | 13:52:56 | 752.1 | 12.535 | 54.8 | 13.314 | -0.677 | 12.065 | 0.529 |
| 5/9/2003 | 13:53:41 | 796.8 | 13.28 | 54.8 | 13.34 | -0.651 | 12.810 | 0.509 |
| 5/9/2003 | 13:54:28 | 844.2 | 14.07 | 54.8 | 13.365 | -0.626 | 13.600 | 0.489 |
| 5/9/2003 | 13:55:19 | 894.4 | 14.90667 | 54.8 | 13.39 | -0.601 | 14.437 | 0.470 |
| 5/9/2003 | 13:56:12 | 947.5 | 15.79167 | 54.77 | 13.416 | -0.575 | 15.322 | 0.449 |
| 5/9/2003 | 13:57:08 | 1003.8 | 16.73 | 54.77 | 13.443 | -0.548 | 16.260 | 0.428 |
| 5/9/2003 | 13:58:08 | 1063.4 | 17.72333 | 54.75 | 13.469 | -0.522 | 17.253 | 0.408 |
| 5/9/2003 | 13:59:11 | 1126.6 | 18.77667 | 54.73 | 13.496 | -0.495 | 18.307 | 0.387 |
| 5/9/2003 | 14:00:18 | 1193.5 | 19.89167 | 54.7 | 13.522 | -0.469 | 19.422 | 0.366 |
| 5/9/2003 | 14:01:29 | 1264.4 | 21.07333 | 54.7 | 13.549 | -0.442 | 20.603 | 0.345 |
| 5/9/2003 | 14:02:44 | 1339.5 | 22.325 | 54.73 | 13.575 | -0.416 | 21.855 | 0.325 |
| 5/9/2003 | 14:04:03 | 1419 | 23.65 | 54.73 | 13.602 | -0.389 | 23.180 | 0.304 |
| 5/9/2003 | 14:05:27 | 1503.3 | 25.055 | 54.73 | 13.627 | -0.364 | 24.585 | 0.284 |
| 5/9/2003 | 14:06:57 | 1592.6 | 26.54333 | 54.73 | 13.653 | -0.338 | 26.073 | 0.264 |
| 5/9/2003 | 14:08:31 | 1687.1 | 28.11833 | 54.7 | 13.678 | -0.313 | 27.648 | 0.245 |
| 5/9/2003 | 14:10:11 | 1787.2 | 29.78667 | 54.7 | 13.702 | -0.289 | 29.317 | 0.226 |
| 5/9/2003 | 14:11:57 | 1893.3 | 31.555 | 54.73 | 13.725 | -0.266 | 31.085 | 0.208 |
| 5/9/2003 | 14:13:50 | 2005.7 | 33.42833 | 54.73 | 13.746 | -0.245 | 32.958 | 0.191 |
| 5/9/2003 | 14:15:49 | 2124.7 | 35.41167 | 54.7 | 13.768 | -0.223 | 34.942 | 0.174 |
| 5/9/2003 | 14:17:55 | 2250.8 | 37.51333 | 54.7 | 13.789 | -0.202 | 37.043 | 0.158 |
| 5/9/2003 | 14:20:09 | 2384.4 | 39.74 | 54.68 | 13.807 | -0.184 | 39.270 | 0.144 |
| 5/9/2003 | 14:22:30 | 2525.9 | 42.09833 | 54.68 | 13.825 | -0.166 | 41.628 | 0.130 |
| 5/9/2003 | 14:25:00 | 2675.8 | 44.59667 | 54.68 | 13.84 | -0.151 | 44.127 | 0.118 |
| 5/9/2003 | 14:27:39 | 2834.6 | 47.24333 | 54.66 | 13.856 | -0.135 | 46.773 | 0.105 |
| 5/9/2003 | 14:30:27 | 3002.8 | 50.04667 | 54.66 | 13.87 | -0.121 | 49.577 | 0.095 |
| 5/9/2003 | 14:33:25 | 3180.9 | 53.015 | 54.66 | 13.882 | -0.109 | 52.545 | 0.085 |
| 5/9/2003 | 14:36:34 | 3369.6 | 56.16 | 54.66 | 13.893 | -0.098 | 55.690 | 0.077 |
| 5/9/2003 | 14:39:54 | 3569.5 | 59.49167 | 54.64 | 13.901 | -0.09 | 59.022 | 0.070 |
| 5/9/2003 | 14:43:25 | 3781.2 | 63.02 | 54.64 | 13.905 | -0.086 | 62.550 | 0.067 |
| 5/9/2003 | 14:47:10 | 4005.5 | 66.75833 | 54.61 | 13.919 | -0.072 | 66.288 | 0.056 |

## TETRA-TECH NUS

### HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 13MWT17 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Falling Head | **Test Date:** | 9-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RMB 6/23/03

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 1 = R |
| Length of Well Screen (ft.) : | 10 = L |
| Time for 37% head change (min.) : | 0.23 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 7.39E-03 | ft./min. |
| 1.23E-04 | ft./sec. |
| 1.06E+01 | ft./day |
| 3.75E-03 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: CRANE

WELL/BORING NO.: 13MW717

PROJECT NO.: 9060 GO 0274

GEOLOGIST: BOB BALLOVEC

WELL DIAMETER: 2" PVC

SCREEN LENGTH/DEPTH: 10' / 20-30' TD.

TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 8.34' /

DATE: 5/9/03

TEST TYPE (Rising/Falling/Constant Head): FALLING

CHECKED:

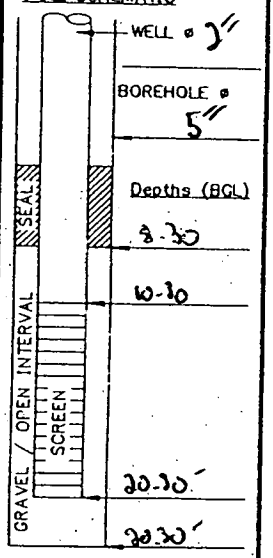
METHOD OF INDUCING WATER LEVEL CHANGE: 1.5" DIAM X 56.5" LONG SLUG.

PAGE OF

REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): 30 PSI X-DCR

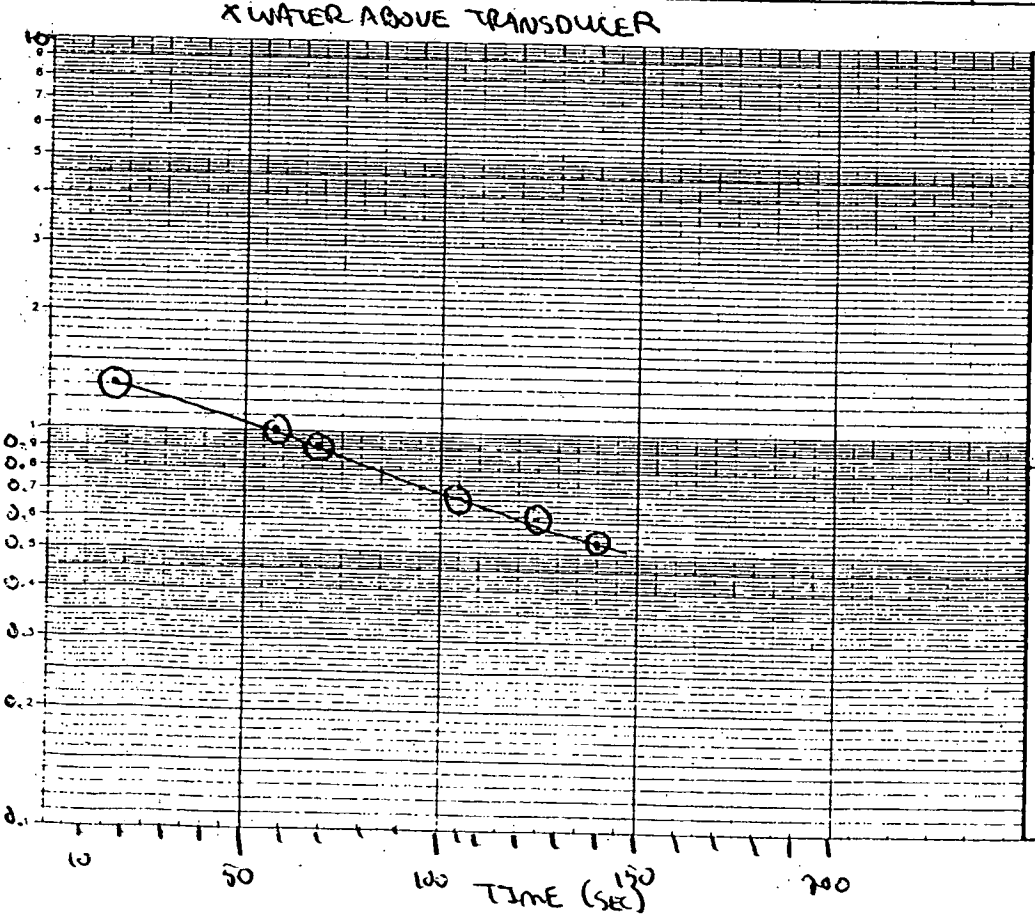
| ELAPSED TIME (min. or sec.) | * MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| START → 10 | 10.871 | 0 | 140.5 | 10.924 | +0.054 |
| START 0812 10.6 | 12.186 | +1.315 | 281.6 | 10.901 | +0.031 |
| 11.9 | 12.438 | +1.567 | 354.9 | 10.894 | +0.024 |
| 20 | 11.211 | +0.341 | 422.1 | 10.890 | +0.02 |
| 31.5 | 11.057 | +0.187 | 502.0 | 10.888 | +0.018 |
| 41.8 | 11.088 | +0.138 | 531.9 | 10.886 | +0.016 |
| 49.7 | 10.989 | +0.119 | 563.5 | 10.886 | +0.016 |
| 59.0 | 10.975 | +0.105 | 620.1 | 10.883 | +0.013 |
| 70.0 | 10.961 | +0.090 | 709.9 | 10.881 | +0.011 |
| 83.4 | 10.951 | +0.082 | 796.8 | 10.878 | +0.008 |
| 105.2 | 10.939 | +0.069 | | | |
| 125.1 | 10.932 | +0.062 | | | |

WELL SCHEMATIC




▽ Indicate SWL Depth on Drawing

* WATER ABOVE TRANSDUCER

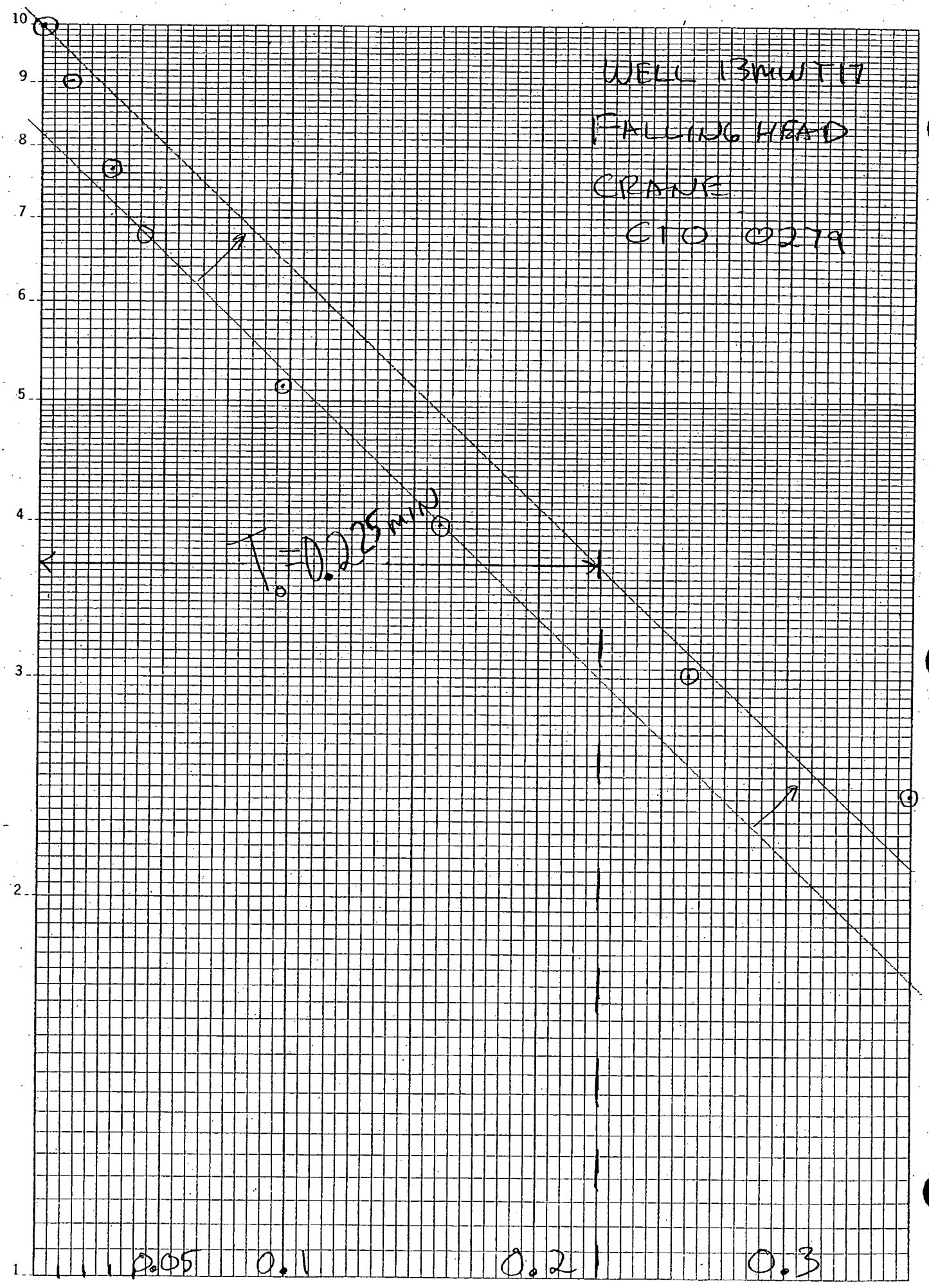



REMARKS:

WL = 8.34' T.O.C

TD = 20.30' TOC

CALCS, SKETCH MAPS, ETC.:




46 4650
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report gen 5/9/2003 8:48:21
Report fror ...\SN00824 2003-05-09 091206 13MWT17 Falling.bin
Win-Situ V 4.41

Serial num 824
Firmware \ 3.06
Unit name:

Test name: 13MWT17 Falling

Test define 5/9/2003 9:07:26
Test starte 5/9/2003 9:12:06
Test stopp 5/9/2003 9:27:32
Test extrac N/A N/A

Data gathered using Logarithmic testing
Maximun Seconds.
Number 108

TOTAL DA 108

Channel number [1]
Measurer Temperature
Channel r Temperature

Channel number [2]
Measurer Pressure
Channel r Depth
Sensor R 30 PSIG.
Specific g 1

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Displacement Feet | adjusted time | h/ho | ho= 0.666 |
|---|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 9:12:06 | 0 | 0 | 54.01 | 10.852 | | | | |
| 5/9/2003 | 9:12:07 | 0.3 | 0.005 | 54.03 | 10.862 | | | | |
| 5/9/2003 | 9:12:07 | 0.6 | 0.01 | 54.03 | 10.868 | | | | |
| 5/9/2003 | 9:12:07 | 0.9 | 0.015 | 54.05 | 10.87 | | | | |
| 5/9/2003 | 9:12:08 | 1.2 | 0.02 | 54.05 | 10.872 | | | | |
| 5/9/2003 | 9:12:08 | 1.5 | 0.025 | 54.05 | 10.873 | | | | |
| 5/9/2003 | 9:12:08 | 1.8 | 0.03 | 54.05 | 10.873 | | | | |
| 5/9/2003 | 9:12:08 | 2.1 | 0.035 | 54.08 | 10.873 | | | | |
| 5/9/2003 | 9:12:09 | 2.4 | 0.04 | 54.08 | 10.875 | | | | |
| 5/9/2003 | 9:12:09 | 2.7 | 0.045 | 54.08 | 10.875 | | | | |
| 5/9/2003 | 9:12:09 | 3 | 0.05 | 54.08 | 10.877 | | | | |
| 5/9/2003 | 9:12:10 | 3.3 | 0.055 | 54.08 | 10.875 | | | | |
| 5/9/2003 | 9:12:10 | 3.6 | 0.06 | 54.08 | 10.875 | | | | |
| 5/9/2003 | 9:12:10 | 3.9 | 0.065 | 54.08 | 10.875 | | | | |
| 5/9/2003 | 9:12:11 | 4.2 | 0.07 | 54.08 | 10.877 | | | | |
| 5/9/2003 | 9:12:11 | 4.5 | 0.075 | 54.08 | 10.879 | | | | |
| 5/9/2003 | 9:12:11 | 4.8 | 0.08 | 54.08 | 10.877 | | | | |
| 5/9/2003 | 9:12:11 | 5.1 | 0.085 | 54.08 | 10.877 | | | | |
| 5/9/2003 | 9:12:12 | 5.4 | 0.09 | 54.08 | 10.877 | | | | |
| 5/9/2003 | 9:12:12 | 5.7 | 0.095 | 54.08 | 10.877 | | | | |
| 5/9/2003 | 9:12:12 | 6 | 0.1 | 54.08 | 10.877 | | | | |
| 5/9/2003 | 9:12:13 | 6.4 | 0.106667 | 54.08 | 10.879 | | | | |
| 5/9/2003 | 9:12:13 | 6.7 | 0.111667 | 54.1 | 10.877 | | | | |
| 5/9/2003 | 9:12:13 | 7.1 | 0.118333 | 54.08 | 10.879 | | | | |
| 5/9/2003 | 9:12:14 | 7.5 | 0.125 | 54.1 | 10.878 | | | | |
| 5/9/2003 | 9:12:14 | 8 | 0.133333 | 54.1 | 10.878 | | | | |
| 5/9/2003 | 9:12:15 | 8.4 | 0.14 | 54.1 | 10.878 | Displacement | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5/9/2003 | 9:12:15 | 8.9 | 0.148333 | 54.1 | 10.877 Feet | | |
| 5/9/2003 | 9:12:16 | 9.5 | 0.158333 | 54.1 | 10.878 ---------- | | |
| 5/9/2003 | 9:12:16 | 10 | 0.166667 | 54.08 | 10.871 | 10.87 Static | |
| 5/9/2003 | 9:12:17 | 10.6 | 0.176667 | 54.08 | 12.186 | 1.316 | Plotted shaded values. |
| 5/9/2003 | 9:12:18 | 11.3 | 0.188333 | 54.05 | 12.789 | 1.919 | |
| 5/9/2003 | 9:12:18 | 11.9 | 0.198333 | 54.05 | 12.438 | 1.568 | |
| 5/9/2003 | 9:12:19 | 12.6 | 0.21 | 54.05 | 11.52 | 0.65 | |
| 5/9/2003 | 9:12:20 | 13.4 | 0.223333 | 54.05 | 11.503 | 0.633 | |
| 5/9/2003 | 9:12:21 | 14.2 | 0.236667 | 54.05 | 11.536 | 0.666 | |
| 5/9/2003 | 9:12:21 | 15 | 0.25 | 54.05 | 11.473 | 0.603 | |
| 5/9/2003 | 9:12:22 | 15.9 | 0.265 | 54.05 | 11.381 | 0.511 | |
| 5/9/2003 | 9:12:23 | 16.8 | 0.28 | 54.05 | 11.323 | 0.453 | |
| 5/9/2003 | 9:12:24 | 17.8 | 0.296667 | 54.05 | 11.282 | 0.412 | |
| 5/9/2003 | 9:12:25 | 18.9 | 0.315 | 54.03 | 11.247 | 0.377 | |
| 5/9/2003 | 9:12:26 | 20 | 0.333333 | 54.05 | 11.211 | 0.341 | |
| 5/9/2003 | 9:12:28 | 21.2 | 0.353333 | 54.05 | 11.183 | 0.313 | |
| 5/9/2003 | 9:12:29 | 22.4 | 0.373333 | 54.05 | 11.159 | 0.289 | |
| 5/9/2003 | 9:12:30 | 23.8 | 0.396667 | 54.05 | 11.135 | 0.265 | |
| 5/9/2003 | 9:12:32 | 25.2 | 0.42 | 54.03 | 11.116 | 0.246 | |
| 5/9/2003 | 9:12:33 | 26.7 | 0.445 | 54.05 | 11.097 | 0.227 | |
| 5/9/2003 | 9:12:35 | 28.2 | 0.47 | 54.03 | 11.083 | 0.213 | |
| 5/9/2003 | 9:12:36 | 29.8 | 0.496667 | 54.05 | 11.071 | 0.201 | |
| 5/9/2003 | 9:12:38 | 31.5 | 0.525 | 54.03 | 11.057 | 0.187 | |
| 5/9/2003 | 9:12:40 | 33.3 | 0.555 | 54.03 | 11.044 | 0.174 | |
| 5/9/2003 | 9:12:42 | 35.2 | 0.586667 | 54.03 | 11.032 | 0.162 | |
| 5/9/2003 | 9:12:44 | 37.3 | 0.621667 | 54.03 | 11.023 | 0.153 | |
| 5/9/2003 | 9:12:46 | 39.5 | 0.658333 | 54.03 | 11.016 | 0.146 | |
| 5/9/2003 | 9:12:48 | 41.8 | 0.696667 | 54.03 | 11.008 | 0.138 | |
| 5/9/2003 | 9:12:51 | 44.3 | 0.738333 | 54.03 | 11.001 | 0.131 | |
| 5/9/2003 | 9:12:53 | 46.9 | 0.781667 | 54.03 | 10.997 | 0.127 | |
| 5/9/2003 | 9:12:56 | 49.7 | 0.828333 | 54.03 | 10.989 | 0.119 | |
| 5/9/2003 | 9:12:59 | 52.6 | 0.876667 | 54.03 | 10.984 | 0.114 | |
| 5/9/2003 | 9:13:02 | 55.7 | 0.928333 | 54.03 | 10.98 | 0.11 | |
| 5/9/2003 | 9:13:05 | 59 | 0.983333 | 54.03 | 10.975 | 0.105 | |
| 5/9/2003 | 9:13:09 | 62.5 | 1.041667 | 54.03 | 10.971 | 0.101 | |
| 5/9/2003 | 9:13:13 | 66.2 | 1.103333 | 54.03 | 10.967 | 0.097 | |
| 5/9/2003 | 9:13:16 | 70.1 | 1.168333 | 54.03 | 10.961 | 0.091 | |
| 5/9/2003 | 9:13:21 | 74.3 | 1.238333 | 54.03 | 10.958 | 0.088 | |
| 5/9/2003 | 9:13:25 | 78.7 | 1.311667 | 54.01 | 10.956 | 0.086 | |
| 5/9/2003 | 9:13:30 | 83.4 | 1.39 | 54.01 | 10.952 | 0.082 | |
| 5/9/2003 | 9:13:35 | 88.4 | 1.473333 | 54.01 | 10.951 | 0.081 | |
| 5/9/2003 | 9:13:40 | 93.7 | 1.561667 | 54.01 | 10.945 | 0.075 | |
| 5/9/2003 | 9:13:46 | 99.3 | 1.655 | 54.01 | 10.941 | 0.071 | |
| 5/9/2003 | 9:13:52 | 105.2 | 1.753333 | 54.01 | 10.939 | 0.069 | |
| 5/9/2003 | 9:13:58 | 111.5 | 1.858333 | 54.01 | 10.934 | 0.064 | |
| 5/9/2003 | 9:14:04 | 118.1 | 1.968333 | 54.01 | 10.934 | 0.064 | |
| 5/9/2003 | 9:14:11 | 125.1 | 2.085 | 54.01 | 10.932 | 0.062 | |
| 5/9/2003 | 9:14:19 | 132.6 | 2.21 | 54.01 | 10.926 | 0.056 | |
| 5/9/2003 | 9:14:27 | 140.5 | 2:341667 | 54.01 | 10.924 | 0.054 | |
| 5/9/2003 | 9:14:35 | 148.9 | 2.481667 | 54.01 | 10.921 | 0.051 | |
| 5/9/2003 | 9:14:44 | 157.8 | 2.63 | 54.01 | 10.919 | 0.049 | |
| 5/9/2003 | 9:14:54 | 167.2 | 2.786667 | 53.99 | 10.917 | 0.047 | |
| 5/9/2003 | 9:15:04 | 177.2 | 2.953333 | 53.99 | 10.915 | 0.045 | |
| 5/9/2003 | 9:15:14 | 187.8 | 3.13 | 53.99 | 10.912 | 0.042 | |
| 5/9/2003 | 9:15:25 | 199 | 3.316667 | 53.96 | 10.91 | 0.04 | |
| 5/9/2003 | 9:15:37 | 210.9 | 3.515 | 53.96 | 10.908 | 0.038 | |
| 5/9/2003 | 9:15:50 | 223.5 | 3.725 | 53.96 | 10.904 | 0.034 | |
| 5/9/2003 | 9:16:03 | 236.8 | 3.946667 | 53.96 | 10.904 | 0.034 | |
| 5/9/2003 | 9:16:17 | 250.9 | 4.181667 | 53.94 | 10.903 | 0.033 | |
| 5/9/2003 | 9:16:32 | 265.8 | 4.43 | 53.94 | 10.901 | 0.031 | |
| 5/9/2003 | 9:16:48 | 281.6 | 4.693333 | 53.94 | 10.901 | 0.031 | |
| 5/9/2003 | 9:17:05 | 298.4 | 4.973333 | 53.94 | 10.897 | 0.027 | |
| 5/9/2003 | 9:17:23 | 316.2 | 5.27 | 53.92 | 10.896 | 0.026 | |
| 5/9/2003 | 9:17:41 | 335 | 5.583333 | 53.92 | 10.894 | 0.024 | |
| 5/9/2003 | 9:18:01 | 354.9 | 5.915 | 53.92 | 10.894 | 0.024 | |

| | |
|---|---|
| 0.000 | 1.000 |
| 0.013 | 0.905 |
| 0.028 | 0.767 |
| 0.043 | 0.680 |
| 0.060 | 0.619 |
| 0.078 | 0.566 |
| 0.097 | 0.512 |
| 0.117 | 0.470 |
| 0.137 | 0.434 |
| 0.160 | 0.398 |
| 0.183 | 0.369 |
| 0.208 | 0.341 |
| 0.233 | 0.320 |
| 0.260 | 0.302 |
| 0.288 | 0.281 |
| 0.318 | 0.261 |
| 0.350 | 0.243 |
| 0.385 | 0.230 |
| 0.422 | 0.219 |
| 0.460 | 0.207 |
| 0.502 | 0.197 |
| 0.545 | 0.191 |
| 0.592 | 0.179 |
| 0.640 | 0.171 |
| 0.692 | 0.165 |
| 0.747 | 0.158 |
| 0.805 | 0.152 |
| 0.867 | 0.146 |
| 0.932 | 0.137 |
| 1.002 | 0.132 |
| 1.075 | 0.129 |
| 1.153 | 0.123 |
| 1.237 | 0.122 |
| 1.325 | 0.113 |
| 1.418 | 0.107 |
| 1.517 | 0.104 |
| 1.622 | 0.096 |
| 1.732 | 0.096 |
| 1.848 | 0.093 |
| 1.973 | 0.084 |
| 2.105 | 0.081 |
| 2.245 | 0.077 |
| 2.393 | 0.074 |
| 2.550 | 0.071 |
| 2.717 | 0.068 |
| 2.893 | 0.063 |
| 3.080 | 0.060 |
| 3.278 | 0.057 |
| 3.488 | 0.051 |
| 3.710 | 0.051 |
| 3.945 | 0.050 |
| 4.193 | 0.047 |
| 4.457 | 0.047 |
| 4.737 | 0.041 |
| 5.033 | 0.039 |
| 5.347 | 0.036 |
| 5.678 | 0.036 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 9:18:22 | 376 | 6.266667 | 53.92 | 10.892 | 0.022 | 6.030 | 0.033 |
| 5/9/2003 | 9:18:45 | 398.4 | 6.64 | 53.89 | 10.89 | 0.02 | 6.403 | 0.030 |
| 5/9/2003 | 9:19:08 | 422.1 | 7.035 | 53.92 | 10.89 | 0.02 | 6.798 | 0.030 |
| 5/9/2003 | 9:19:34 | 447.2 | 7.453333 | 53.92 | 10.89 | 0.02 | 7.217 | 0.030 |
| 5/9/2003 | 9:20:00 | 473.8 | 7.896667 | 53.92 | 10.888 | 0.018 | 7.660 | 0.027 |
| 5/9/2003 | 9:20:28 | 502 | 8.366667 | 53.92 | 10.888 | 0.018 | 8.130 | 0.027 |
| 5/9/2003 | 9:20:58 | 531.9 | 8.865 | 53.89 | 10.886 | 0.016 | 8.628 | 0.024 |
| 5/9/2003 | 9:21:30 | 563.5 | 9.391667 | 53.89 | 10.886 | 0.016 | 9.155 | 0.024 |
| 5/9/2003 | 9:22:03 | 597 | 9.95 | 53.89 | 10.885 | 0.015 | 9.713 | 0.023 |
| 5/9/2003 | 9:22:39 | 632.5 | 10.54167 | 53.89 | 10.885 | 0.015 | 10.305 | 0.023 |
| 5/9/2003 | 9:23:16 | 670.1 | 11.16833 | 53.87 | 10.883 | 0.013 | 10.932 | 0.020 |
| 5/9/2003 | 9:23:56 | 709.9 | 11.83167 | 53.85 | 10.881 | 0.011 | 11.595 | 0.017 |
| 5/9/2003 | 9:24:38 | 752.1 | 12.535 | 53.85 | 10.88 | 0.01 | 12.298 | 0.015 |
| 5/9/2003 | 9:25:23 | 796.8 | 13.28 | 53.85 | 10.878 | 0.008 | 13.043 | 0.012 |
| 5/9/2003 | 9:26:11 | 844.2 | 14.07 | 53.83 | 10.876 | 0.006 | 13.833 | 0.009 |
| 5/9/2003 | 9:27:01 | 894.4 | 14.90667 | 53.85 | 10.876 | 0.006 | 14.670 | 0.009 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 13MWT17 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Rising Head | **Test Date:** | 9-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RMB 6/23/03

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 1 = R |
| Length of Well Screen (ft.) : | 10 = L |
| Time for 37% head change (min.) : | 0.14 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.20E-02 | ft./min. |
| 2.01E-04 | ft./sec. |
| 1.73E+01 | ft./day |
| 6.12E-03 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: CRANE

WELL/BORING NO.: 13MW717

PROJECT NO.: 9060 CW 0279

GEOLOGIST: BOB BALKOVEC

WELL DIAMETER: 2" PVC

SCREEN LENGTH/DEPTH: 10' / 20-30'

TEST NO.: 2

STATIC WATER LEVEL (Depth/Elevation): 8.34'

DATE: 5/9/03

TEST TYPE (Rising/Falling/Constant Head): RISING

CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: 1.5" DIAM ~ 56.5" LONG SLUG

PAGE OF

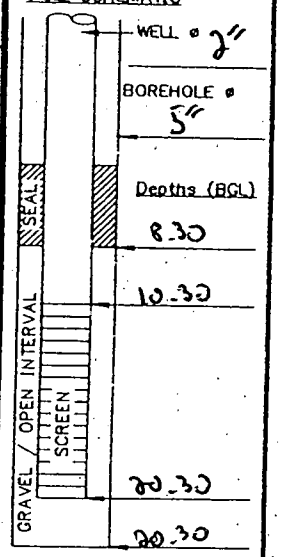
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): 30 PST X-DER

| ELAPSED TIME (min. or sec.) | * MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 3.3 | 10.896 | 0 | 52.6 | 10.754 | -0.232 |
| 3.9 | 8.533 | -2.453 | 70.1 | 10.718 | -0.208 |
| 4.8 | 9.639 | -1.347 | 105.2 | 10.794 | -0.192 |
| 5.7 | 9.944 | -0.992 | 140.5 | 10.807 | -0.179 |
| 6.0 | 10.055 | -0.931 | 199.0 | 10.820 | -0.166 |
| 10.0 | 10.425 | -0.561 | | | |
| 12.0 | 10.515 | -0.471 | | | |
| 15.0 | 10.564 | -0.417 | | | |
| 20.0 | 10.634 | -0.352 | | | |
| 25.2 | 10.676 | -0.31 | | | |
| 31.5 | 10.705 | -0.281 | | | |
| 39.5 | 10.730 | -0.256 | | | |

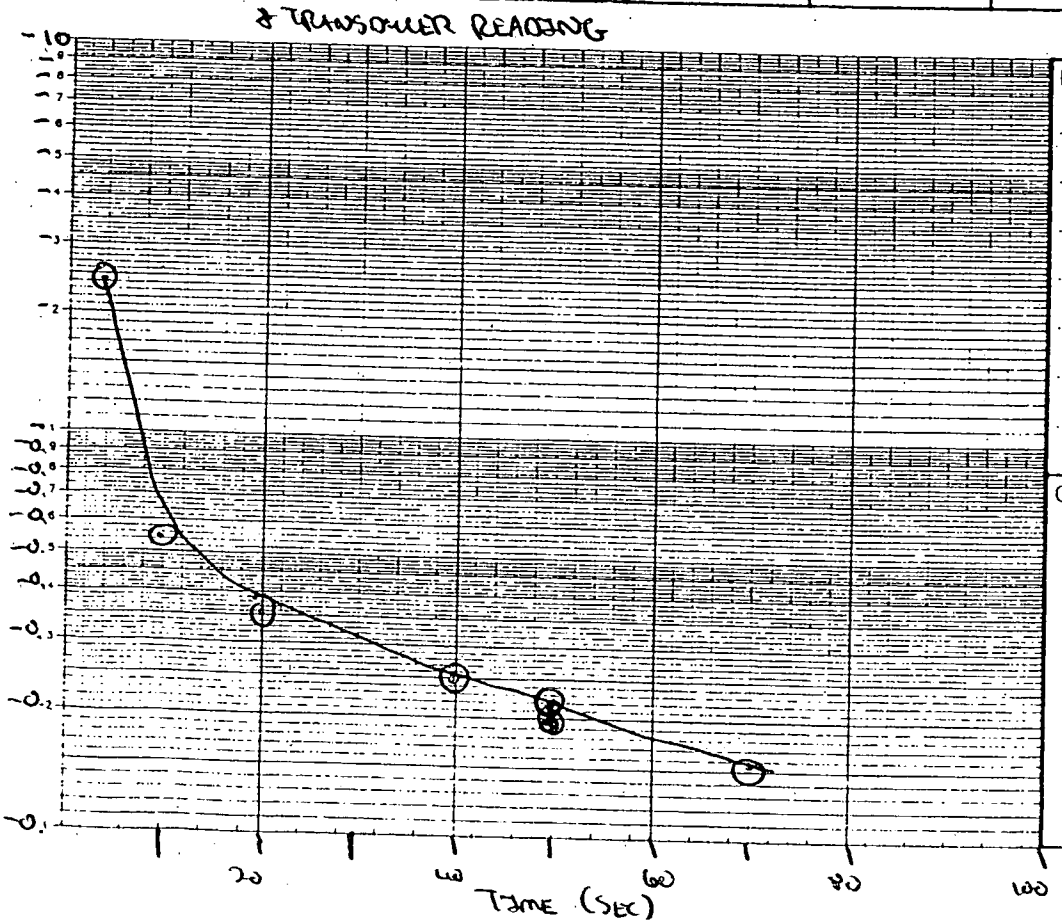
STATIC →

START →

WELL SCHEMATIC



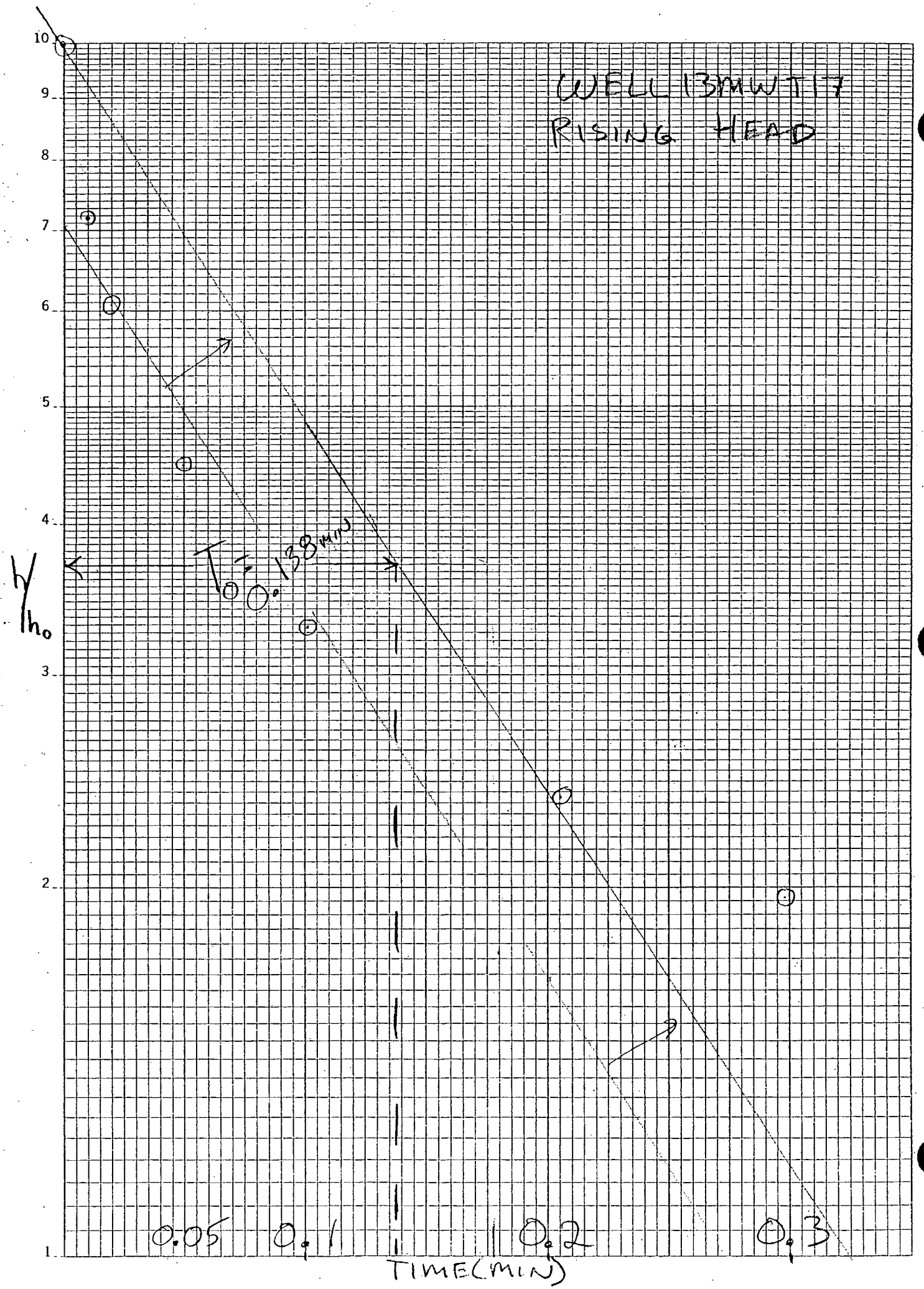

* TRANSDUCER READING




REMARKS:

W.L.=8.34'

CALCS, SKETCH MAPS, ETC.:




K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 4650

In-Situ Inc. MiniTroll Pro

Report gen 5/9/2003 8:49:43
Report fror ...\SN00824 2003-05-09 092853 13MWT17 Rising.bin
Win-Situ V 4.41

Serial num 824
Firmware \ 3.06
Unit name:

Test name: 13MWT17 Rising

Test define 5/9/2003 9:28:12
Test starte 5/9/2003 9:28:53
Test stopp N/A N/A
Test extrac N/A N/A

Data gathered using Logarithmic testing
Maximun Seconds.
Number 105

TOTAL DA 105

Channel number [1]
Measurer Temperature
Channel r Temperature

Channel number [2]
Measurer Pressure
Channel r Depth
Sensor R 30 PSIG.
Specific g 1

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | | adjusted time | h/ho | ho= -1.637 |
|---|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 9:28:53 | 0 | 0.0000 | 53.83 | 10.874 | | | | |
| 5/9/2003 | 9:28:53 | 0.3 | 0.0050 | 53.87 | 10.885 | | | | |
| 5/9/2003 | 9:28:53 | 0.6 | 0.0100 | 53.87 | 10.889 | | | | |
| 5/9/2003 | 9:28:54 | 0.9 | 0.0150 | 53.89 | 10.89 | | | | |
| 5/9/2003 | 9:28:54 | 1.2 | 0.0200 | 53.89 | 10.892 | | | | |
| 5/9/2003 | 9:28:54 | 1.5 | 0.0250 | 53.89 | 10.894 | | | | |
| 5/9/2003 | 9:28:55 | 1.8 | 0.0300 | 53.92 | 10.894 | | | | |
| 5/9/2003 | 9:28:55 | 2.1 | 0.0350 | 53.89 | 10.894 | | | | |
| 5/9/2003 | 9:28:55 | 2.4 | 0.0400 | 53.89 | 10.896 | 10.896 Static | Plotted shaded values. | | |
| 5/9/2003 | 9:28:56 | 2.7 | 0.0450 | 53.92 | 10.896 | | | | |
| 5/9/2003 | 9:28:56 | 3 | 0.0500 | 53.92 | 10.896 | Displacement | | | |
| 5/9/2003 | 9:28:56 | 3.3 | 0.0550 | 53.92 | 10.896 | Feet | | | |
| 5/9/2003 | 9:28:56 | 3.6 | 0.0600 | 53.92 | 10.445 | -0.541 | | | |
| 5/9/2003 | 9:28:57 | 3.9 | 0.0650 | 53.92 | 8.533 | -2.453 | | | |
| 5/9/2003 | 9:28:57 | 4.2 | 0.0700 | 53.92 | 9.022 | -1.964 | | | |
| 5/9/2003 | 9:28:57 | 4.5 | 0.0750 | 53.92 | 9.349 | -1.637 | 0.000 | 1.000 | |
| 5/9/2003 | 9:28:58 | 4.8 | 0.0800 | 53.92 | 9.639 | -1.347 | 0.005 | 0.823 | |
| 5/9/2003 | 9:28:58 | 5.1 | 0.0850 | 53.92 | 9.816 | -1.17 | 0.010 | 0.715 | |
| 5/9/2003 | 9:28:58 | 5.4 | 0.0900 | 53.92 | 9.921 | -1.065 | 0.015 | 0.651 | |
| 5/9/2003 | 9:28:59 | 5.7 | 0.0950 | 53.92 | 9.994 | -0.992 | 0.020 | 0.606 | |
| 5/9/2003 | 9:28:59 | 6 | 0.1000 | 53.92 | 10.055 | -0.931 | 0.025 | 0.569 | |
| 5/9/2003 | 9:28:59 | 6.4 | 0.1067 | 53.92 | 10.111 | -0.875 | 0.032 | 0.535 | |
| 5/9/2003 | 9:29:00 | 6.7 | 0.1117 | 53.92 | 10.167 | -0.819 | 0.037 | 0.500 | |
| 5/9/2003 | 9:29:00 | 7.1 | 0.1183 | 53.92 | 10.216 | -0.77 | 0.043 | 0.470 | |
| 5/9/2003 | 9:29:00 | 7.5 | 0.1250 | 53.92 | 10.255 | -0.731 | 0.050 | 0.447 | |
| 5/9/2003 | 9:29:01 | 8 | 0.1333 | 53.92 | 10.287 | -0.699 | 0.058 | 0.427 | |
| 5/9/2003 | 9:29:01 | 8.4 | 0.1400 | 53.92 | 10.326 | -0.66 | 0.065 | 0.403 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 9:29:02 | 8.9 | 0.1483 | 53.92 | 10.373 | -0.613 | 0.073 | 0.374 |
| 5/9/2003 | 9:29:02 | 9.5 | 0.1583 | 53.92 | 10.404 | -0.582 | 0.083 | 0.356 |
| 5/9/2003 | 9:29:03 | 10 | 0.1667 | 53.89 | 10.425 | -0.561 | 0.092 | 0.343 |
| 5/9/2003 | 9:29:03 | 10.6 | 0.1767 | 53.89 | 10.449 | -0.537 | 0.102 | 0.328 |
| 5/9/2003 | 9:29:04 | 11.3 | 0.1883 | 53.89 | 10.474 | -0.512 | 0.113 | 0.313 |
| 5/9/2003 | 9:29:05 | 11.9 | 0.1983 | 53.89 | 10.494 | -0.492 | 0.123 | 0.301 |
| 5/9/2003 | 9:29:05 | 12.6 | 0.2100 | 53.89 | 10.515 | -0.471 | 0.135 | 0.288 |
| 5/9/2003 | 9:29:06 | 13.4 | 0.2233 | 53.89 | 10.534 | -0.452 | 0.148 | 0.276 |
| 5/9/2003 | 9:29:07 | 14.2 | 0.2367 | 53.89 | 10.552 | -0.434 | 0.162 | 0.265 |
| 5/9/2003 | 9:29:08 | 15 | 0.2500 | 53.89 | 10.569 | -0.417 | 0.175 | 0.255 |
| 5/9/2003 | 9:29:09 | 15.9 | 0.2650 | 53.89 | 10.59 | -0.396 | 0.190 | 0.242 |
| 5/9/2003 | 9:29:10 | 16.8 | 0.2800 | 53.89 | 10.597 | -0.389 | 0.205 | 0.238 |
| 5/9/2003 | 9:29:11 | 17.8 | 0.2967 | 53.87 | 10.61 | -0.376 | 0.222 | 0.230 |
| 5/9/2003 | 9:29:12 | 18.9 | 0.3150 | 53.87 | 10.622 | -0.364 | 0.240 | 0.222 |
| 5/9/2003 | 9:29:13 | 20 | 0.3333 | 53.89 | 10.634 | -0.352 | 0.258 | 0.215 |
| 5/9/2003 | 9:29:14 | 21.2 | 0.3533 | 53.89 | 10.647 | -0.339 | 0.278 | 0.207 |
| 5/9/2003 | 9:29:15 | 22.4 | 0.3733 | 53.87 | 10.665 | -0.321 | 0.298 | 0.196 |
| 5/9/2003 | 9:29:17 | 23.8 | 0.3967 | 53.87 | 10.668 | -0.318 | 0.322 | 0.194 |
| 5/9/2003 | 9:29:18 | 25.2 | 0.4200 | 53.87 | 10.676 | -0.31 | 0.345 | 0.189 |
| 5/9/2003 | 9:29:20 | 26.7 | 0.4450 | 53.89 | 10.685 | -0.301 | 0.370 | 0.184 |
| 5/9/2003 | 9:29:21 | 28.2 | 0.4700 | 53.87 | 10.693 | -0.293 | 0.395 | 0.179 |
| 5/9/2003 | 9:29:23 | 29.8 | 0.4967 | 53.87 | 10.7 | -0.286 | 0.422 | 0.175 |
| 5/9/2003 | 9:29:24 | 31.5 | 0.5250 | 53.89 | 10.705 | -0.281 | 0.450 | 0.172 |
| 5/9/2003 | 9:29:26 | 33.3 | 0.5550 | 53.87 | 10.711 | -0.275 | 0.480 | 0.168 |
| 5/9/2003 | 9:29:28 | 35.2 | 0.5867 | 53.87 | 10.719 | -0.267 | 0.512 | 0.163 |
| 5/9/2003 | 9:29:30 | 37.3 | 0.6217 | 53.87 | 10.724 | -0.262 | 0.547 | 0.160 |
| 5/9/2003 | 9:29:32 | 39.5 | 0.6583 | 53.87 | 10.73 | -0.256 | 0.583 | 0.156 |
| 5/9/2003 | 9:29:35 | 41.8 | 0.6967 | 53.87 | 10.734 | -0.252 | 0.622 | 0.154 |
| 5/9/2003 | 9:29:37 | 44.3 | 0.7383 | 53.87 | 10.739 | -0.247 | 0.663 | 0.151 |
| 5/9/2003 | 9:29:40 | 46.9 | 0.7817 | 53.87 | 10.745 | -0.241 | 0.707 | 0.147 |
| 5/9/2003 | 9:29:43 | 49.7 | 0.8283 | 53.87 | 10.75 | -0.236 | 0.753 | 0.144 |
| 5/9/2003 | 9:29:45 | 52.6 | 0.8767 | 53.87 | 10.754 | -0.232 | 0.802 | 0.142 |
| 5/9/2003 | 9:29:49 | 55.7 | 0.9283 | 53.87 | 10.758 | -0.228 | 0.853 | 0.139 |
| 5/9/2003 | 9:29:52 | 59 | 0.9833 | 53.87 | 10.762 | -0.224 | 0.908 | 0.137 |
| 5/9/2003 | 9:29:55 | 62.5 | 1.0417 | 53.87 | 10.765 | -0.221 | 0.967 | 0.135 |
| 5/9/2003 | 9:29:59 | 66.2 | 1.1033 | 53.87 | 10.771 | -0.215 | 1.028 | 0.131 |
| 5/9/2003 | 9:30:03 | 70.1 | 1.1683 | 53.87 | 10.778 | -0.208 | 1.093 | 0.127 |
| 5/9/2003 | 9:30:07 | 74.3 | 1.2383 | 53.87 | 10.775 | -0.211 | 1.163 | 0.129 |
| 5/9/2003 | 9:30:12 | 78.7 | 1.3117 | 53.87 | 10.78 | -0.206 | 1.237 | 0.126 |
| 5/9/2003 | 9:30:16 | 83.4 | 1.3900 | 53.87 | 10.784 | -0.202 | 1.315 | 0.123 |
| 5/9/2003 | 9:30:21 | 88.4 | 1.4733 | 53.87 | 10.786 | -0.2 | 1.398 | 0.122 |
| 5/9/2003 | 9:30:27 | 93.7 | 1.5617 | 53.87 | 10.788 | -0.198 | 1.487 | 0.121 |
| 5/9/2003 | 9:30:32 | 99.3 | 1.6550 | 53.87 | 10.79 | -0.196 | 1.580 | 0.120 |
| 5/9/2003 | 9:30:38 | 105.2 | 1.7533 | 53.85 | 10.794 | -0.192 | 1.678 | 0.117 |
| 5/9/2003 | 9:30:44 | 111.5 | 1.8583 | 53.85 | 10.799 | -0.187 | 1.783 | 0.114 |
| 5/9/2003 | 9:30:51 | 118.1 | 1.9683 | 53.87 | 10.801 | -0.185 | 1.893 | 0.113 |
| 5/9/2003 | 9:30:58 | 125.1 | 2.0850 | 53.87 | 10.801 | -0.185 | 2.010 | 0.113 |
| 5/9/2003 | 9:31:05 | 132.6 | 2.2100 | 53.85 | 10.805 | -0.181 | 2.135 | 0.111 |
| 5/9/2003 | 9:31:13 | 140.5 | 2.3417 | 53.85 | 10.807 | -0.179 | 2.267 | 0.109 |
| 5/9/2003 | 9:31:22 | 148.9 | 2.4817 | 53.85 | 10.809 | -0.177 | 2.407 | 0.108 |
| 5/9/2003 | 9:31:31 | 157.8 | 2.6300 | 53.85 | 10.812 | -0.174 | 2.555 | 0.106 |
| 5/9/2003 | 9:31:40 | 167.2 | 2.7867 | 53.85 | 10.816 | -0.17 | 2.712 | 0.104 |
| 5/9/2003 | 9:31:50 | 177.2 | 2.9533 | 53.85 | 10.816 | -0.17 | 2.878 | 0.104 |
| 5/9/2003 | 9:32:01 | 187.8 | 3.1300 | 53.85 | 10.818 | -0.168 | 3.055 | 0.103 |
| 5/9/2003 | 9:32:12 | 199 | 3.3167 | 53.83 | 10.82 | -0.166 | 3.242 | 0.101 |
| 5/9/2003 | 9:32:24 | 210.9 | 3.5150 | 53.85 | 10.822 | -0.164 | 3.440 | 0.100 |
| 5/9/2003 | 9:32:36 | 223.5 | 3.7250 | 53.85 | 10.825 | -0.161 | 3.650 | 0.098 |
| 5/9/2003 | 9:32:50 | 236.8 | 3.9467 | 53.85 | 10.825 | -0.161 | 3.872 | 0.098 |
| 5/9/2003 | 9:33:04 | 250.9 | 4.1817 | 53.83 | 10.828 | -0.158 | 4.107 | 0.097 |
| 5/9/2003 | 9:33:19 | 265.8 | 4.4300 | 53.83 | 10.828 | -0.158 | 4.355 | 0.097 |
| 5/9/2003 | 9:33:34 | 281.6 | 4.6933 | 53.83 | 10.831 | -0.155 | 4.618 | 0.095 |
| 5/9/2003 | 9:33:51 | 298.4 | 4.9733 | 53.83 | 10.833 | -0.153 | 4.898 | 0.093 |
| 5/9/2003 | 9:34:09 | 316.2 | 5.2700 | 53.83 | 10.835 | -0.151 | 5.195 | 0.092 |
| 5/9/2003 | 9:34:28 | 335 | 5.5833 | 53.83 | 10.837 | -0.149 | 5.508 | 0.091 |
| 5/9/2003 | 9:34:48 | 354.9 | 5.9150 | 53.83 | 10.837 | -0.149 | 5.840 | 0.091 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 13MWT20 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Falling Head | **Test Date:** | 10-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RMB 6/23/03

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 1 = R |
| Length of Well Screen (ft.) : | 10 = L |
| Time for 37% head change (min.) : | 17.70 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 9.39E-05 | ft./min. |
| 1.57E-06 | ft./sec. |
| 1.35E-01 | ft./day |
| 4.77E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: CRANE WELL/BORING NO.: BMW720

PROJECT NO.: 9060 CTO 0279 GEOLOGIST: BOB BALKOVEC

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' 22.83' T.D. TEST NO.:

STATIC WATER LEVEL (Depth/Elevation): 4.18' DATE: 5/10/03

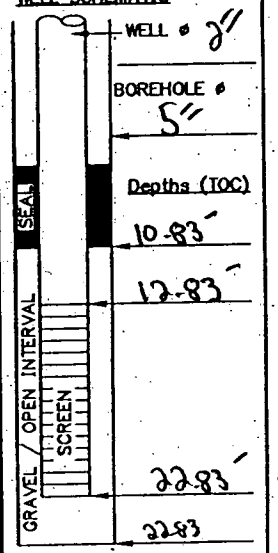
TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: 1.25" x 42" SOLID SLUG PAGE 1 OF 1

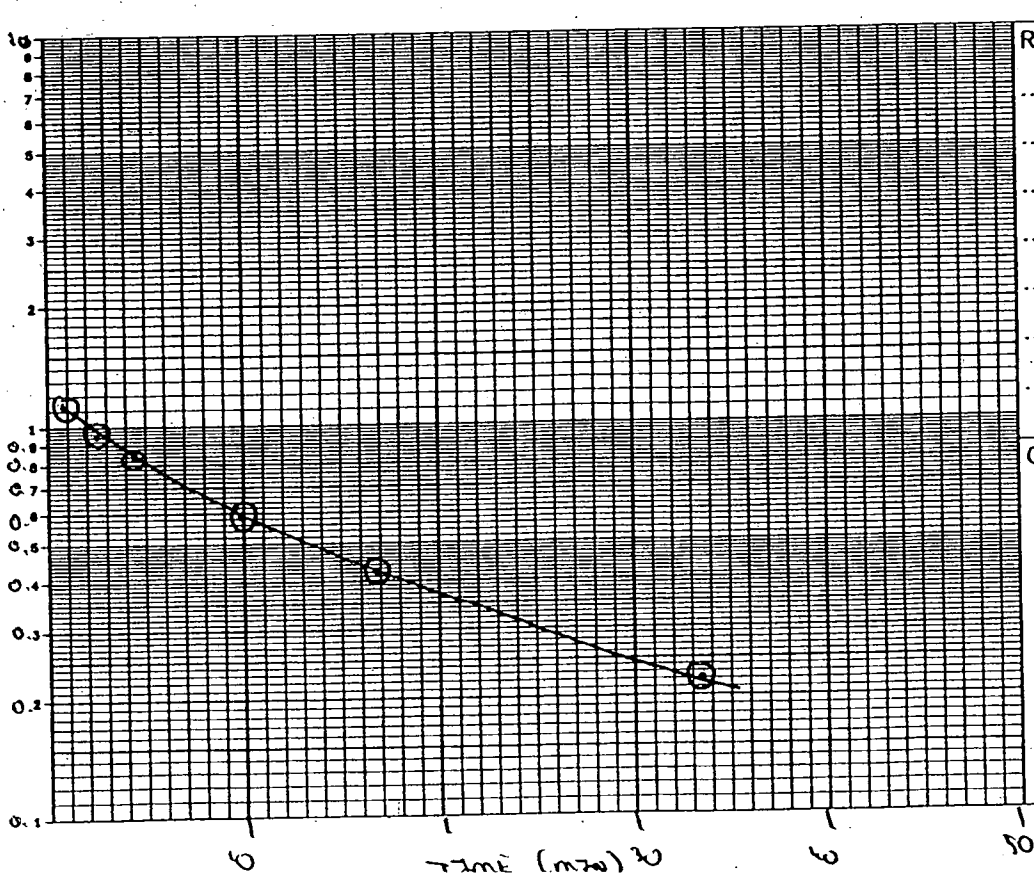
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30PSI

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 18.404 | 0 | 17.72 | 18.576 | 0.432 |
| 0.035 | 20.04 | +1.936 | 23.65 | 18.444 | 0.34 |
| 0.085 | 19.546 | +1.442 | 33.42 | 18.374 | 0.27 |
| 0.1 | 19.423 | +1.319 | 59.49 | 18.284 | 0.18 |
| 0.21 | 19.365 | +1.261 | | | |
| 0.28 | 19.347 | +1.243 | | | |
| 0.42 | 19.316 | +1.212 | | | |
| 1.04 | 19.232 | +1.128 | | | |
| 2.63 | 19.082 | 0.978 | | | |
| 4.69 | 18.944 | 0.84 | | | |
| 7.45 | 18.807 | 0.703 | | | |
| 10.5 | 18.694 | 0.59 | | | |

WELL SCHEMATIC



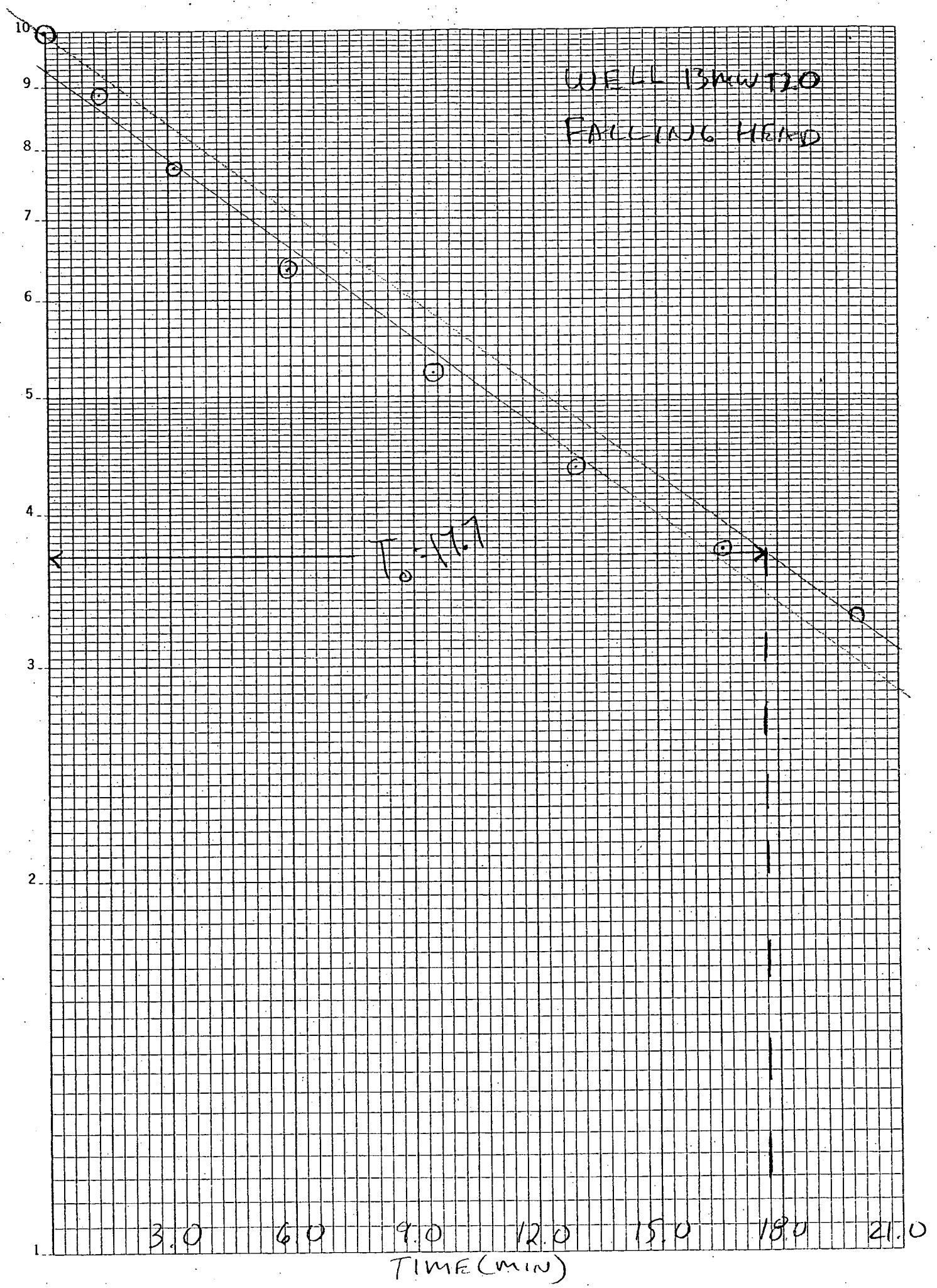

▽ Indicate SWL Depth on Drawing




REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 5/11/2003 13:27:58
Report from file: ...\SN09015 2003-05-10 084709 13MWT20 Falling.bin
Win-Situ Version 4.41

Serial number: 9015
Firmware Version 3.04
Unit name: MW-14FW

Test name: 13MWT20 Falling

Test defined on: 5/10/2003 8:46:53
Test started on: 5/10/2003 8:47:09
Test stopped on: N/A N/A
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time betw Seconds.
Number of data sam 153

TOTAL DATA SAMPLI 153

Channel number [1]
Measurement type: Temperature
Channel name: OnBoard Temp

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSIG.
Specific gravity: 1

ho= 1.128

| Date | Time | ET (sec) | ET ((min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Displacement Feet | adjusted time | h/ho |
|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 8:47:09 | 0 | 0 | 54.02 | 18.104 | 0 | | |
| 5/10/2003 | 8:47:09 | 0.3 | 0.005 | 54.07 | 18.104 | 0 | | |
| 5/10/2003 | 8:47:10 | 0.6 | 0.01 | 54.09 | 18.104 | 0 | | |
| 5/10/2003 | 8:47:10 | 0.9 | 0.015 | 54.09 | 18.104 | 0 | | |
| 5/10/2003 | 8:47:10 | 1.2 | 0.02 | 54.09 | 18.104 | 0 | | |
| 5/10/2003 | 8:47:11 | 1.5 | 0.025 | 54.11 | 18.104 | 0 | | |
| 5/10/2003 | 8:47:11 | 1.8 | 0.03 | 54.11 | 20.016 | 1.912 | | |
| 5/10/2003 | 8:47:11 | 2.1 | 0.035 | 54.11 | 20.04 | 1.936 | | |
| 5/10/2003 | 8:47:12 | 2.4 | 0.04 | 54.11 | 20.15 | 2.046 | | |
| 5/10/2003 | 8:47:12 | 2.7 | 0.045 | 54.11 | 20.174 | 2.07 | | |
| 5/10/2003 | 8:47:12 | 3 | 0.05 | 54.11 | 19.571 | 1.467 | | |
| 5/10/2003 | 8:47:12 | 3.3 | 0.055 | 54.11 | 18.578 | 0.474 | | |
| 5/10/2003 | 8:47:13 | 3.6 | 0.06 | 54.14 | 19.593 | 1.489 | | |
| 5/10/2003 | 8:47:13 | 3.9 | 0.065 | 54.14 | 19.483 | 1.379 | | |
| 5/10/2003 | 8:47:13 | 4.2 | 0.07 | 54.14 | 19.339 | 1.235 | | |
| 5/10/2003 | 8:47:14 | 4.5 | 0.075 | 54.14 | 19.358 | 1.254 | | |
| 5/10/2003 | 8:47:14 | 4.8 | 0.08 | 54.14 | 19.403 | 1.299 | | |
| 5/10/2003 | 8:47:14 | 5.1 | 0.085 | 54.14 | 19.546 | 1.442 | | |
| 5/10/2003 | 8:47:15 | 5.4 | 0.09 | 54.14 | 19.388 | 1.284 | | |
| 5/10/2003 | 8:47:15 | 5.7 | 0.095 | 54.14 | 19.362 | 1.258 | | |
| 5/10/2003 | 8:47:15 | 6 | 0.1 | 54.14 | 19.423 | 1.319 | | |
| 5/10/2003 | 8:47:15 | 6.4 | 0.106667 | 54.14 | 19.405 | 1.301 | | |
| 5/10/2003 | 8:47:16 | 6.7 | 0.111667 | 54.14 | 19.392 | 1.288 | | |
| 5/10/2003 | 8:47:16 | 7.1 | 0.118333 | 54.14 | 19.403 | 1.299 | | |
| 5/10/2003 | 8:47:17 | 7.5 | 0.125 | 54.14 | 19.407 | 1.303 | | |
| 5/10/2003 | 8:47:17 | 8 | 0.133333 | 54.14 | 19.405 | 1.301 | | |
| 5/10/2003 | 8:47:18 | 8.4 | 0.14 | 54.14 | 19.386 | 1.282 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 8:47:18 | 8.9 | 0.148333 | 54.14 | 19.393 | 1.289 | | |
| 5/10/2003 | 8:47:19 | 9.5 | 0.158333 | 54.16 | 19.389 | 1.285 | | |
| 5/10/2003 | 8:47:19 | 10 | 0.166667 | 54.11 | 19.376 | 1.272 | | |
| 5/10/2003 | 8:47:20 | 10.6 | 0.176667 | 54.11 | 19.374 | 1.27 | | |
| 5/10/2003 | 8:47:20 | 11.3 | 0.188333 | 54.11 | 19.37 | 1.266 | | |
| 5/10/2003 | 8:47:21 | 11.9 | 0.198333 | 54.11 | 19.366 | 1.262 | | |
| 5/10/2003 | 8:47:22 | 12.6 | 0.21 | 54.09 | 19.365 | 1.261 | | |
| 5/10/2003 | 8:47:22 | 13.4 | 0.223333 | 54.09 | 19.361 | 1.257 | | |
| 5/10/2003 | 8:47:23 | 14.2 | 0.236667 | 54.09 | 19.357 | 1.253 | | |
| 5/10/2003 | 8:47:24 | 15 | 0.25 | 54.09 | 19.355 | 1.251 | | |
| 5/10/2003 | 8:47:25 | 15.9 | 0.265 | 54.09 | 19.349 | 1.245 | | |
| 5/10/2003 | 8:47:26 | 16.8 | 0.28 | 54.09 | 19.347 | 1.243 | | |
| 5/10/2003 | 8:47:27 | 17.8 | 0.296667 | 54.09 | 19.341 | 1.237 | | |
| 5/10/2003 | 8:47:28 | 18.9 | 0.315 | 54.09 | 19.339 | 1.235 | | |
| 5/10/2003 | 8:47:29 | 20 | 0.333333 | 54.09 | 19.335 | 1.231 | | |
| 5/10/2003 | 8:47:30 | 21.2 | 0.353333 | 54.09 | 19.331 | 1.227 | | |
| 5/10/2003 | 8:47:32 | 22.4 | 0.373333 | 54.09 | 19.328 | 1.224 | | |
| 5/10/2003 | 8:47:33 | 23.8 | 0.396667 | 54.09 | 19.331 | 1.227 | | |
| 5/10/2003 | 8:47:34 | 25.2 | 0.42 | 54.09 | 19.316 | 1.212 | | |
| 5/10/2003 | 8:47:36 | 26.7 | 0.445 | 54.09 | 19.324 | 1.22 | | |
| 5/10/2003 | 8:47:37 | 28.2 | 0.47 | 54.09 | 19.328 | 1.224 | | |
| 5/10/2003 | 8:47:39 | 29.8 | 0.496667 | 54.09 | 19.304 | 1.2 | | |
| 5/10/2003 | 8:47:41 | 31.5 | 0.525 | 54.09 | 19.302 | 1.198 | | |
| 5/10/2003 | 8:47:42 | 33.3 | 0.555 | 54.09 | 19.296 | 1.192 | | |
| 5/10/2003 | 8:47:44 | 35.2 | 0.586667 | 54.09 | 19.292 | 1.188 | | |
| 5/10/2003 | 8:47:46 | 37.3 | 0.621667 | 54.07 | 19.287 | 1.183 | | |
| 5/10/2003 | 8:47:49 | 39.5 | 0.658333 | 54.07 | 19.283 | 1.179 | | |
| 5/10/2003 | 8:47:51 | 41.8 | 0.696667 | 54.07 | 19.277 | 1.173 | | |
| 5/10/2003 | 8:47:53 | 44.3 | 0.738333 | 54.07 | 19.271 | 1.167 | Plotted shaded values. | |
| 5/10/2003 | 8:47:56 | 46.9 | 0.781667 | 54.07 | 19.265 | 1.161 | | |
| 5/10/2003 | 8:47:59 | 49.7 | 0.828333 | 54.07 | 19.257 | 1.153 | | |
| 5/10/2003 | 8:48:02 | 52.6 | 0.876667 | 54.07 | 19.252 | 1.148 | | |
| 5/10/2003 | 8:48:05 | 55.7 | 0.928333 | 54.07 | 19.246 | 1.142 | adjusted time | h/ho |
| 5/10/2003 | 8:48:08 | 59 | 0.983333 | 54.07 | 19.238 | 1.134 | | |
| 5/10/2003 | 8:48:12 | 62.5 | 1.041667 | 54.07 | 19.232 | 1.128 | 0.000 | 1.000 |
| 5/10/2003 | 8:48:15 | 66.2 | 1.103333 | 54.2 | 19.207 | 1.103 | 0.062 | 0.978 |
| 5/10/2003 | 8:48:19 | 70.1 | 1.168333 | 54.2 | 19.206 | 1.102 | 0.127 | 0.977 |
| 5/10/2003 | 8:48:23 | 74.3 | 1.238333 | 54.2 | 19.206 | 1.102 | 0.197 | 0.977 |
| 5/10/2003 | 8:48:28 | 78.7 | 1.311667 | 54.2 | 19.204 | 1.1 | 0.270 | 0.975 |
| 5/10/2003 | 8:48:32 | 83.4 | 1.39 | 54.2 | 19.204 | 1.1 | 0.348 | 0.975 |
| 5/10/2003 | 8:48:37 | 88.4 | 1.473333 | 54.2 | 19.204 | 1.1 | 0.432 | 0.975 |
| 5/10/2003 | 8:48:43 | 93.7 | 1.561667 | 54.11 | 19.177 | 1.073 | 0.520 | 0.951 |
| 5/10/2003 | 8:48:48 | 99.3 | 1.655 | 54.11 | 19.167 | 1.063 | 0.613 | 0.942 |
| 5/10/2003 | 8:48:54 | 105.2 | 1.753333 | 54.09 | 19.158 | 1.054 | 0.712 | 0.934 |
| 5/10/2003 | 8:49:01 | 111.5 | 1.858333 | 54.09 | 19.148 | 1.044 | 0.817 | 0.926 |
| 5/10/2003 | 8:49:07 | 118.1 | 1.968333 | 54.09 | 19.136 | 1.032 | 0.927 | 0.915 |
| 5/10/2003 | 8:49:14 | 125.1 | 2.085 | 54.09 | 19.127 | 1.023 | 1.043 | 0.907 |
| 5/10/2003 | 8:49:22 | 132.6 | 2.21 | 54.09 | 19.115 | 1.011 | 1.168 | 0.896 |
| 5/10/2003 | 8:49:30 | 140.5 | 2.341667 | 54.07 | 19.105 | 1.001 | 1.300 | 0.887 |
| 5/10/2003 | 8:49:38 | 148.9 | 2.481667 | 54.07 | 19.096 | 0.992 | 1.440 | 0.879 |
| 5/10/2003 | 8:49:47 | 157.8 | 2.63 | 54.07 | 19.082 | 0.978 | 1.588 | 0.867 |
| 5/10/2003 | 8:49:56 | 167.2 | 2.786667 | 54.07 | 19.07 | 0.966 | 1.745 | 0.856 |
| 5/10/2003 | 8:50:06 | 177.2 | 2.953333 | 54.07 | 19.058 | 0.954 | 1.912 | 0.846 |
| 5/10/2003 | 8:50:17 | 187.8 | 3.13 | 54.07 | 19.047 | 0.943 | 2.088 | 0.836 |
| 5/10/2003 | 8:50:28 | 199 | 3.316667 | 54.05 | 19.035 | 0.931 | 2.275 | 0.825 |
| 5/10/2003 | 8:50:40 | 210.9 | 3.515 | 54.05 | 19.02 | 0.916 | 2.473 | 0.812 |
| 5/10/2003 | 8:50:53 | 223.5 | 3.725 | 54.05 | 19.006 | 0.902 | 2.683 | 0.800 |
| 5/10/2003 | 8:51:06 | 236.8 | 3.946667 | 54.05 | 18.992 | 0.888 | 2.905 | 0.787 |
| 5/10/2003 | 8:51:20 | 250.9 | 4.181667 | 54.05 | 18.977 | 0.873 | 3.140 | 0.774 |
| 5/10/2003 | 8:51:35 | 265.8 | 4.43 | 54.05 | 18.961 | 0.857 | 3.388 | 0.760 |
| 5/10/2003 | 8:51:51 | 281.6 | 4.693333 | 54.02 | 18.944 | 0.84 | 3.652 | 0.745 |
| 5/10/2003 | 8:52:07 | 298.4 | 4.973333 | 54.02 | 18.93 | 0.826 | 3.932 | 0.732 |
| 5/10/2003 | 8:52:25 | 316.2 | 5.27 | 54.02 | 18.914 | 0.81 | 4.228 | 0.718 |
| 5/10/2003 | 8:52:44 | 335 | 5.583333 | 54.02 | 18.895 | 0.791 | 4.542 | 0.701 |
| 5/10/2003 | 8:53:04 | 354.9 | 5.915 | 54.02 | 18.879 | 0.775 | 4.873 | 0.687 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 8:53:25 | 376 | 6.266667 | 54.02 | 18.862 | 0.758 | 5.225 | 0.672 |
| 5/10/2003 | 8:53:47 | 398.4 | 6.64 | 54.02 | 18.844 | 0.74 | 5.598 | 0.656 |
| 5/10/2003 | 8:54:11 | 422.1 | 7.035 | 54.02 | 18.825 | 0.721 | 5.993 | 0.639 |
| 5/10/2003 | 8:54:36 | 447.2 | 7.453333 | 54.02 | 18.807 | 0.703 | 6.412 | 0.623 |
| 5/10/2003 | 8:55:03 | 473.8 | 7.896667 | 54 | 18.788 | 0.684 | 6.855 | 0.606 |
| 5/10/2003 | 8:55:31 | 502 | 8.366667 | 54 | 18.768 | 0.664 | 7.325 | 0.589 |
| 5/10/2003 | 8:56:01 | 531.9 | 8.865 | 54.02 | 18.75 | 0.646 | 7.823 | 0.573 |
| 5/10/2003 | 8:56:33 | 563.5 | 9.391667 | 54 | 18.731 | 0.627 | 8.350 | 0.556 |
| 5/10/2003 | 8:57:06 | 597 | 9.95 | 54 | 18.712 | 0.608 | 8.908 | 0.539 |
| 5/10/2003 | 8:57:42 | 632.5 | 10.54167 | 54 | 18.694 | 0.59 | 9.500 | 0.523 |
| 5/10/2003 | 8:58:19 | 670.1 | 11.16833 | 54 | 18.673 | 0.569 | 10.127 | 0.504 |
| 5/10/2003 | 8:58:59 | 709.9 | 11.83167 | 54 | 18.655 | 0.551 | 10.790 | 0.488 |
| 5/10/2003 | 8:59:41 | 752.1 | 12.535 | 54 | 18.636 | 0.532 | 11.493 | 0.472 |
| 5/10/2003 | 9:00:26 | 796.8 | 13.28 | 54 | 18.616 | 0.512 | 12.238 | 0.454 |
| 5/10/2003 | 9:01:13 | 844.2 | 14.07 | 54 | 18.597 | 0.493 | 13.028 | 0.437 |
| 5/10/2003 | 9:02:03 | 894.4 | 14.90667 | 54 | 18.579 | 0.475 | 13.865 | 0.421 |
| 5/10/2003 | 9:02:57 | 947.5 | 15.79167 | 54 | 18.561 | 0.457 | 14.750 | 0.405 |
| 5/10/2003 | 9:03:53 | 1003.8 | 16.73 | 54 | 18.542 | 0.438 | 15.688 | 0.388 |
| 5/10/2003 | 9:04:52 | 1063.4 | 17.72333 | 54 | 18.526 | 0.422 | 16.682 | 0.374 |
| 5/10/2003 | 9:05:56 | 1126.6 | 18.77667 | 54 | 18.507 | 0.403 | 17.735 | 0.357 |
| 5/10/2003 | 9:07:03 | 1193.5 | 19.89167 | 54 | 18.491 | 0.387 | 18.850 | 0.343 |
| 5/10/2003 | 9:08:13 | 1264.4 | 21.07333 | 54 | 18.476 | 0.372 | 20.032 | 0.330 |
| 5/10/2003 | 9:09:29 | 1339.5 | 22.325 | 54 | 18.46 | 0.356 | 21.283 | 0.316 |
| 5/10/2003 | 9:10:48 | 1419 | 23.65 | 54 | 18.444 | 0.34 | 22.608 | 0.301 |
| 5/10/2003 | 9:12:12 | 1503.3 | 25.055 | 54 | 18.431 | 0.327 | 24.013 | 0.290 |
| 5/10/2003 | 9:13:42 | 1592.6 | 26.54333 | 54 | 18.415 | 0.311 | 25.502 | 0.276 |
| 5/10/2003 | 9:15:16 | 1687.1 | 28.11833 | 54 | 18.403 | 0.299 | 27.077 | 0.265 |
| 5/10/2003 | 9:16:56 | 1787.2 | 29.78667 | 54 | 18.395 | 0.291 | 28.745 | 0.258 |
| 5/10/2003 | 9:18:42 | 1893.3 | 31.555 | 54 | 18.386 | 0.282 | 30.513 | 0.250 |
| 5/10/2003 | 9:20:35 | 2005.7 | 33.42833 | 54 | 18.374 | 0.27 | 32.387 | 0.239 |
| 5/10/2003 | 9:22:34 | 2124.7 | 35.41167 | 54 | 18.36 | 0.256 | 34.370 | 0.227 |
| 5/10/2003 | 9:24:40 | 2250.8 | 37.51333 | 54 | 18.347 | 0.243 | 36.472 | 0.215 |
| 5/10/2003 | 9:26:53 | 2384.4 | 39.74 | 54 | 18.337 | 0.233 | 38.698 | 0.207 |
| 5/10/2003 | 9:29:15 | 2525.9 | 42.09833 | 54 | 18.329 | 0.225 | 41.057 | 0.199 |
| 5/10/2003 | 9:31:45 | 2675.8 | 44.59667 | 54 | 18.321 | 0.217 | 43.555 | 0.192 |
| 5/10/2003 | 9:34:24 | 2834.6 | 47.24333 | 54 | 18.31 | 0.206 | 46.202 | 0.183 |
| 5/10/2003 | 9:37:12 | 3002.8 | 50.04667 | 54 | 18.306 | 0.202 | 49.005 | 0.179 |
| 5/10/2003 | 9:40:10 | 3180.9 | 53.015 | 54 | 18.298 | 0.194 | 51.973 | 0.172 |
| 5/10/2003 | 9:43:19 | 3369.6 | 56.16 | 54 | 18.292 | 0.188 | 55.118 | 0.167 |
| 5/10/2003 | 9:46:39 | 3569.5 | 59.49167 | 54 | 18.284 | 0.18 | 58.450 | 0.160 |
| 5/10/2003 | 9:50:10 | 3781.2 | 63.02 | 54 | 18.271 | 0.167 | 61.978 | 0.148 |
| 5/10/2003 | 9:53:55 | 4005.5 | 66.75833 | 54 | 18.267 | 0.163 | 65.717 | 0.145 |
| 5/10/2003 | 9:57:52 | 4243.1 | 70.71833 | 54 | 18.261 | 0.157 | 69.677 | 0.139 |
| 5/10/2003 | 10:02:04 | 4494.7 | 74.91167 | 54 | 18.257 | 0.153 | 73.870 | 0.136 |
| 5/10/2003 | 10:06:30 | 4761.3 | 79.355 | 54 | 18.255 | 0.151 | 78.313 | 0.134 |
| 5/10/2003 | 10:11:13 | 5043.7 | 84.06167 | 54 | 18.251 | 0.147 | 83.020 | 0.130 |
| 5/10/2003 | 10:16:12 | 5342.8 | 89.04667 | 54 | 18.247 | 0.143 | 88.005 | 0.127 |
| 5/10/2003 | 10:21:29 | 5659.6 | 94.32667 | 54 | 18.241 | 0.137 | 93.285 | 0.121 |
| 5/10/2003 | 10:27:04 | 5995.2 | 99.92 | 54 | 18.239 | 0.135 | 98.878 | 0.120 |
| 5/10/2003 | 10:33:00 | 6350.7 | 105.845 | 54 | 18.235 | 0.131 | 104.803 | 0.116 |
| 5/10/2003 | 10:39:16 | 6727.2 | 112.12 | 54 | 18.232 | 0.128 | 111.078 | 0.113 |
| 5/10/2003 | 10:45:55 | 7126.1 | 118.7683 | 54 | 18.228 | 0.124 | 117.727 | 0.110 |
| 5/10/2003 | 10:52:58 | 7548.6 | 125.81 | 54 | 18.228 | 0.124 | 124.768 | 0.110 |
| 5/10/2003 | 11:00:25 | 7996.1 | 133.2683 | 54 | 18.228 | 0.124 | 132.227 | 0.110 |
| 5/10/2003 | 11:08:19 | 8470.1 | 141.1683 | 54 | 18.232 | 0.128 | 140.127 | 0.113 |
| 5/10/2003 | 11:16:41 | 8972.2 | 149.5367 | 54 | 18.235 | 0.131 | 148.495 | 0.116 |
| 5/10/2003 | 11:25:33 | 9504.1 | 158.4017 | 54.02 | 18.235 | 0.131 | 157.360 | 0.116 |
| 5/10/2003 | 11:34:57 | 10067.5 | 167.7917 | 54 | 18.235 | 0.131 | 166.750 | 0.116 |
| 5/10/2003 | 11:44:53 | 10664.3 | 177.7383 | 54 | 18.237 | 0.133 | 176.697 | 0.118 |
| 5/10/2003 | 11:55:26 | 11296.5 | 188.275 | 54.02 | 18.247 | 0.143 | 187.233 | 0.127 |
| 5/10/2003 | 12:06:35 | 11966.1 | 199.435 | 54.02 | 18.253 | 0.149 | 198.393 | 0.132 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 13MWT20 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Rising Head | **Test Date:** | 10-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RMB 6/23/03

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 1 = R |
| Length of Well Screen (ft.) : | 10 = L |
| Time for 37% head change (min.) : | 18.30 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 9.08E-05 | ft./min. |
| 1.51E-06 | ft./sec. |
| 1.31E-01 | ft./day |
| 4.61E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: CRANE WELL/BORING NO.: BMW120

PROJECT NO.: 9060 CTO 0279 GEOLOGIST: BOB BALKOVEC

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' 22.83' TD TEST NO.:

STATIC WATER LEVEL (Depth/Elevation): 4.17' DATE: 5/10/03

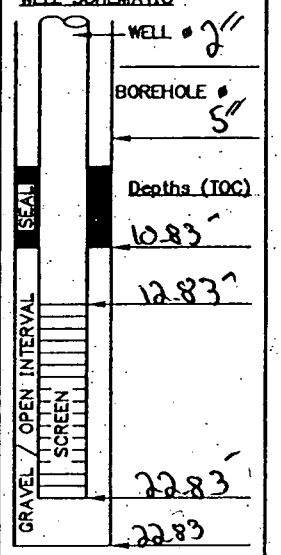
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: 1.25" x 42" SOLID SLUG PAGE 1 OF 1

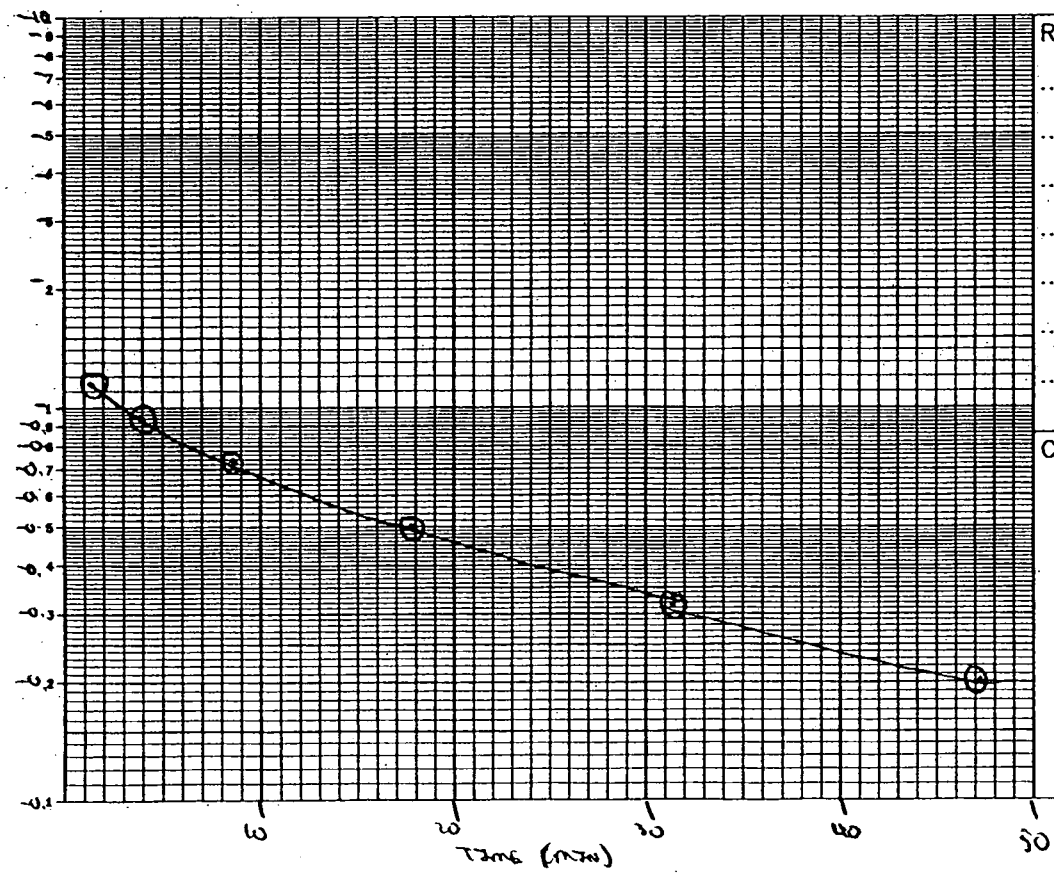
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30 PSI

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 18.253 | 0 | | | |
| 0.03 | 16.111 | -2.142 | | | |
| 0.075 | 16.913 | -1.34 | | | |
| 0.265 | 16.952 | -1.301 | | | |
| 0.62 | 17.003 | -1.25 | | | |
| 1.56 | 17.103 | -1.15 | | | |
| 4.18 | 17.293 | -0.96 | | | |
| 8.8 | 17.513 | -0.74 | | | |
| 17.72 | 17.753 | -0.5 | | | |
| 31.55 | 17.939 | -0.314 | | | |
| 47.24 | 18.044 | -0.209 | | | |
| 63.02 | 18.083 | -0.17 | | | |

WELL SCHEMATIC



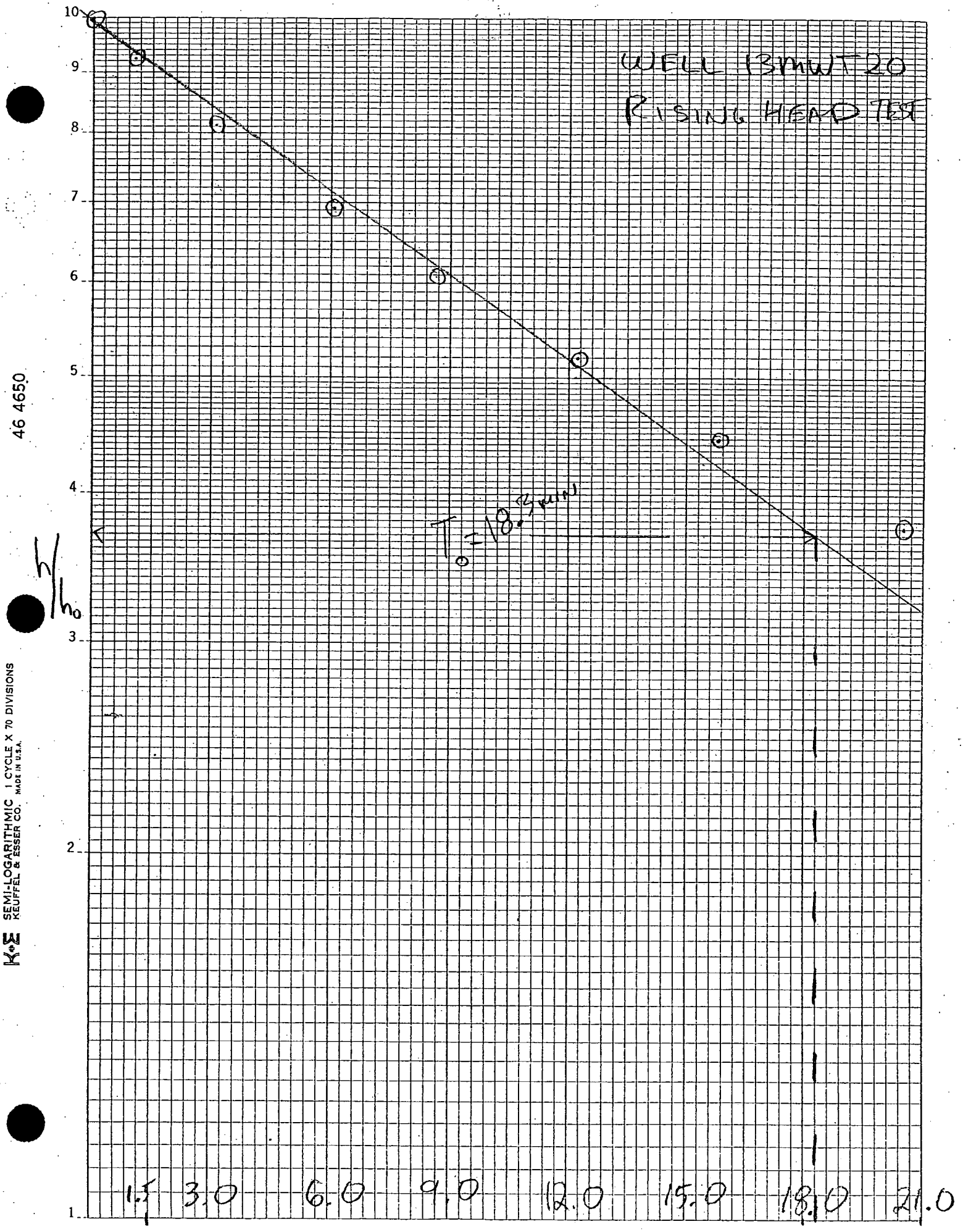

▽ Indicate SWL Depth on Drawing




REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL


WELL 13MWT20
RISING HEAD TEST
$T_0 = 18.$ min
h/h0
10
9
8
7
6
5
4
3
2
1
1.5
3.0
6.0
9.0
12.0
15.0
18.0
21.0
46 4650
SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 5/11/2003 13:28:54
Report from file: ...\SN09015 2003-05-10 121934 13MWT20 Rising.bin
Win-Situ Version 4.41

Serial number: 9015
Firmware Version 3.04
Unit name: MW-14FW

Test name: 13MWT20 Rising

Test defined on: 5/10/2003 12:19:15
Test started on: 5/10/2003 12:19:34
Test stopped on: N/A N/A
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time bet Seconds.
Number of data sa 149

TOTAL DATA SAMF 149

Channel number [1]
Measurement type: Temperature
Channel name: OnBoard Temp

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSIG.
Specific gravity: 1

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Displacement Feet | ho= -1.124 adjusted time | h/ho |
|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 12:19:34 | 0 | 0 | 54.02 | 18.253 | 0 | | |
| 5/10/2003 | 12:19:35 | 0.3 | 0.005 | 54.05 | 18.253 | 0 | | |
| 5/10/2003 | 12:19:35 | 0.6 | 0.01 | 54.07 | 18.253 | 0 | | |
| 5/10/2003 | 12:19:35 | 0.9 | 0.015 | 54.07 | 18.253 | 0 | | |
| 5/10/2003 | 12:19:36 | 1.2 | 0.02 | 54.07 | 18.129 | -0.124 | | |
| 5/10/2003 | 12:19:36 | 1.5 | 0.025 | 54.09 | 16.925 | -1.328 | | |
| 5/10/2003 | 12:19:36 | 1.8 | 0.03 | 54.09 | 16.111 | -2.142 | | |
| 5/10/2003 | 12:19:37 | 2.1 | 0.035 | 54.09 | 16.423 | -1.83 | | |
| 5/10/2003 | 12:19:37 | 2.4 | 0.04 | 54.09 | 16.759 | -1.494 | | |
| 5/10/2003 | 12:19:37 | 2.7 | 0.045 | 54.09 | 16.74 | -1.513 | | |
| 5/10/2003 | 12:19:37 | 3 | 0.05 | 54.11 | 17.062 | -1.191 | | |
| 5/10/2003 | 12:19:38 | 3.3 | 0.055 | 54.11 | 16.818 | -1.435 | | |
| 5/10/2003 | 12:19:38 | 3.6 | 0.06 | 54.11 | 16.878 | -1.375 | | |
| 5/10/2003 | 12:19:38 | 3.9 | 0.065 | 54.11 | 16.954 | -1.299 | | |
| 5/10/2003 | 12:19:39 | 4.2 | 0.07 | 54.11 | 16.88 | -1.373 | | |
| 5/10/2003 | 12:19:39 | 4.5 | 0.075 | 54.11 | 16.913 | -1.34 | | |
| 5/10/2003 | 12:19:39 | 4.8 | 0.08 | 54.11 | 16.927 | -1.326 | | |
| 5/10/2003 | 12:19:40 | 5.1 | 0.085 | 54.11 | 16.905 | -1.348 | | |
| 5/10/2003 | 12:19:40 | 5.4 | 0.09 | 54.11 | 16.923 | -1.33 | | |
| 5/10/2003 | 12:19:40 | 5.7 | 0.095 | 54.11 | 16.923 | -1.33 | | |
| 5/10/2003 | 12:19:40 | 6 | 0.1 | 54.11 | 16.921 | -1.332 | | |
| 5/10/2003 | 12:19:41 | 6.4 | 0.106667 | 54.11 | 16.927 | -1.326 | | |
| 5/10/2003 | 12:19:41 | 6.7 | 0.111667 | 54.11 | 16.927 | -1.326 | | |
| 5/10/2003 | 12:19:42 | 7.1 | 0.118333 | 54.11 | 16.931 | -1.322 | | |
| 5/10/2003 | 12:19:42 | 7.5 | 0.125 | 54.11 | 16.933 | -1.32 | | |
| 5/10/2003 | 12:19:42 | 8 | 0.133333 | 54.11 | 16.935 | -1.318 | | |
| 5/10/2003 | 12:19:43 | 8.4 | 0.14 | 54.11 | 16.937 | -1.316 | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 12:19:43 | 8.9 | 0.148333 | 54.11 | 16.941 | -1.312 | | | |
| 5/10/2003 | 12:19:44 | 9.5 | 0.158333 | 54.14 | 16.942 | -1.311 | | | |
| 5/10/2003 | 12:19:44 | 10 | 0.166667 | 54.11 | 16.937 | -1.316 | | | |
| 5/10/2003 | 12:19:45 | 10.6 | 0.176667 | 54.09 | 16.939 | -1.314 | | | |
| 5/10/2003 | 12:19:46 | 11.3 | 0.188333 | 54.09 | 16.939 | -1.314 | | | |
| 5/10/2003 | 12:19:46 | 11.9 | 0.198333 | 54.09 | 16.941 | -1.312 | | | |
| 5/10/2003 | 12:19:47 | 12.6 | 0.21 | 54.09 | 16.943 | -1.31 | | | |
| 5/10/2003 | 12:19:48 | 13.4 | 0.223333 | 54.09 | 16.945 | -1.308 | | | |
| 5/10/2003 | 12:19:49 | 14.2 | 0.236667 | 54.09 | 16.949 | -1.304 | | | |
| 5/10/2003 | 12:19:49 | 15 | 0.25 | 54.09 | 16.951 | -1.302 | | | |
| 5/10/2003 | 12:19:50 | 15.9 | 0.265 | 54.09 | 16.952 | -1.301 | | | |
| 5/10/2003 | 12:19:51 | 16.8 | 0.28 | 54.09 | 16.954 | -1.299 | | | |
| 5/10/2003 | 12:19:52 | 17.8 | 0.296667 | 54.07 | 16.957 | -1.296 | | | |
| 5/10/2003 | 12:19:53 | 18.9 | 0.315 | 54.07 | 16.96 | -1.293 | | | |
| 5/10/2003 | 12:19:54 | 20 | 0.333333 | 54.07 | 16.962 | -1.291 | | | |
| 5/10/2003 | 12:19:56 | 21.2 | 0.353333 | 54.07 | 16.966 | -1.287 | | | |
| 5/10/2003 | 12:19:57 | 22.4 | 0.373333 | 54.07 | 16.97 | -1.283 | | | |
| 5/10/2003 | 12:19:58 | 23.8 | 0.396667 | 54.07 | 16.972 | -1.281 | | | |
| 5/10/2003 | 12:20:00 | 25.2 | 0.42 | 54.07 | 16.976 | -1.277 | | | |
| 5/10/2003 | 12:20:01 | 26.7 | 0.445 | 54.07 | 16.98 | -1.273 | | | |
| 5/10/2003 | 12:20:03 | 28.2 | 0.47 | 54.07 | 16.984 | -1.269 | | | |
| 5/10/2003 | 12:20:04 | 29.8 | 0.496667 | 54.07 | 16.988 | -1.265 | | | |
| 5/10/2003 | 12:20:06 | 31.5 | 0.525 | 54.07 | 16.992 | -1.261 | | | |
| 5/10/2003 | 12:20:08 | 33.3 | 0.555 | 54.07 | 16.996 | -1.257 | | | |
| 5/10/2003 | 12:20:10 | 35.2 | 0.586667 | 54.07 | 16.999 | -1.254 | | | |
| 5/10/2003 | 12:20:12 | 37.3 | 0.621667 | 54.07 | 17.003 | -1.25 | | | |
| 5/10/2003 | 12:20:14 | 39.5 | 0.658333 | 54.07 | 17.009 | -1.244 | | | |
| 5/10/2003 | 12:20:16 | 41.8 | 0.696667 | 54.07 | 17.013 | -1.24 | | | |
| 5/10/2003 | 12:20:19 | 44.3 | 0.738333 | 54.07 | 17.019 | -1.234 | | | |
| 5/10/2003 | 12:20:21 | 46.9 | 0.781667 | 54.07 | 17.023 | -1.23 | | | |
| 5/10/2003 | 12:20:24 | 49.7 | 0.828333 | 54.05 | 17.06 | -1.193 | | | |
| 5/10/2003 | 12:20:27 | 52.6 | 0.876667 | 54.07 | 17.074 | -1.179 | | | |
| 5/10/2003 | 12:20:30 | 55.7 | 0.928333 | 54.09 | 17.075 | -1.178 | | | |
| 5/10/2003 | 12:20:33 | 59 | 0.983333 | 54.09 | 17.077 | -1.176 | | | |
| 5/10/2003 | 12:20:37 | 62.5 | 1.041667 | 54.11 | 17.079 | -1.174 | | | |
| 5/10/2003 | 12:20:41 | 66.2 | 1.103333 | 54.11 | 17.081 | -1.172 | | | |
| 5/10/2003 | 12:20:44 | 70.1 | 1.168333 | 54.09 | 17.072 | -1.181 | | | |
| 5/10/2003 | 12:20:49 | 74.3 | 1.238333 | 54.05 | 17.072 | -1.181 | | | |
| 5/10/2003 | 12:20:53 | 78.7 | 1.311667 | 54.05 | 17.08 | -1.173 | | | |
| 5/10/2003 | 12:20:58 | 83.4 | 1.39 | 54.05 | 17.088 | -1.165 | | | |
| 5/10/2003 | 12:21:03 | 88.4 | 1.473333 | 54.05 | 17.095 | -1.158 | Plotted shaded values. | | |
| 5/10/2003 | 12:21:08 | 93.7 | 1.561667 | 54.05 | 17.103 | -1.15 | | | |
| 5/10/2003 | 12:21:14 | 99.3 | 1.655 | 54.05 | 17.113 | -1.14 | | | |
| 5/10/2003 | 12:21:20 | 105.2 | 1.753333 | 54.05 | 17.121 | -1.132 | adjusted time | h/ho | |
| 5/10/2003 | 12:21:26 | 111.5 | 1.858333 | 54.05 | 17.129 | -1.124 | | 0.000 | 1.000 |
| 5/10/2003 | 12:21:32 | 118.1 | 1.968333 | 54.05 | 17.138 | -1.115 | | 0.110 | 0.992 |
| 5/10/2003 | 12:21:39 | 125.1 | 2.085 | 54.05 | 17.148 | -1.105 | | 0.227 | 0.983 |
| 5/10/2003 | 12:21:47 | 132.6 | 2.21 | 54.05 | 17.158 | -1.095 | | 0.352 | 0.974 |
| 5/10/2003 | 12:21:55 | 140.5 | 2.341667 | 54.05 | 17.169 | -1.084 | | 0.483 | 0.964 |
| 5/10/2003 | 12:22:03 | 148.9 | 2.481667 | 54.05 | 17.179 | -1.074 | | 0.623 | 0.956 |
| 5/10/2003 | 12:22:12 | 157.8 | 2.63 | 54.05 | 17.191 | -1.062 | | 0.772 | 0.945 |
| 5/10/2003 | 12:22:22 | 167.2 | 2.786667 | 54.05 | 17.203 | -1.05 | | 0.928 | 0.934 |
| 5/10/2003 | 12:22:32 | 177.2 | 2.953333 | 54.05 | 17.214 | -1.039 | | 1.095 | 0.924 |
| 5/10/2003 | 12:22:42 | 187.8 | 3.13 | 54.05 | 17.226 | -1.027 | | 1.272 | 0.914 |
| 5/10/2003 | 12:22:53 | 199 | 3.316667 | 54.05 | 17.238 | -1.015 | | 1.458 | 0.903 |
| 5/10/2003 | 12:23:05 | 210.9 | 3.515 | 54.02 | 17.252 | -1.001 | | 1.657 | 0.891 |
| 5/10/2003 | 12:23:18 | 223.5 | 3.725 | 54.02 | 17.265 | -0.988 | | 1.867 | 0.879 |
| 5/10/2003 | 12:23:31 | 236.8 | 3.946667 | 54.02 | 17.279 | -0.974 | | 2.088 | 0.867 |
| 5/10/2003 | 12:23:45 | 250.9 | 4.181667 | 54.02 | 17.293 | -0.96 | | 2.323 | 0.854 |
| 5/10/2003 | 12:24:00 | 265.8 | 4.43 | 54.02 | 17.308 | -0.945 | | 2.572 | 0.841 |
| 5/10/2003 | 12:24:16 | 281.6 | 4.693333 | 54.02 | 17.322 | -0.931 | | 2.835 | 0.828 |
| 5/10/2003 | 12:24:33 | 298.4 | 4.973333 | 54.02 | 17.339 | -0.914 | | 3.115 | 0.813 |
| 5/10/2003 | 12:24:51 | 316.2 | 5.27 | 54.02 | 17.355 | -0.898 | | 3.412 | 0.799 |
| 5/10/2003 | 12:25:09 | 335 | 5.583333 | 54.02 | 17.371 | -0.882 | | 3.725 | 0.785 |
| 5/10/2003 | 12:25:29 | 354.9 | 5.915 | 54.02 | 17.386 | -0.867 | | 4.057 | 0.771 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 12:25:50 | 376 | 6.266667 | 54.02 | 17.404 | -0.849 | 4.408 | 0.755 |
| 5/10/2003 | 12:26:13 | 398.4 | 6.64 | 54.02 | 17.419 | -0.834 | 4.782 | 0.742 |
| 5/10/2003 | 12:26:36 | 422.1 | 7.035 | 54.02 | 17.439 | -0.814 | 5.177 | 0.724 |
| 5/10/2003 | 12:27:02 | 447.2 | 7.453333 | 54.02 | 17.457 | -0.796 | 5.595 | 0.708 |
| 5/10/2003 | 12:27:28 | 473.8 | 7.896667 | 54.02 | 17.474 | -0.779 | 6.038 | 0.693 |
| 5/10/2003 | 12:27:56 | 502 | 8.366667 | 54.02 | 17.494 | -0.759 | 6.508 | 0.675 |
| 5/10/2003 | 12:28:26 | 531.9 | 8.865 | 54.02 | 17.513 | -0.74 | 7.007 | 0.658 |
| 5/10/2003 | 12:28:58 | 563.5 | 9.391667 | 54.02 | 17.531 | -0.722 | 7.533 | 0.642 |
| 5/10/2003 | 12:29:31 | 597 | 9.95 | 54.02 | 17.55 | -0.703 | 8.092 | 0.625 |
| 5/10/2003 | 12:30:07 | 632.5 | 10.54167 | 54.02 | 17.57 | -0.683 | 8.683 | 0.608 |
| 5/10/2003 | 12:30:44 | 670.1 | 11.16833 | 54.02 | 17.589 | -0.664 | 9.310 | 0.591 |
| 5/10/2003 | 12:31:24 | 709.9 | 11.83167 | 54.02 | 17.609 | -0.644 | 9.973 | 0.573 |
| 5/10/2003 | 12:32:06 | 752.1 | 12.535 | 54.02 | 17.63 | -0.623 | 10.677 | 0.554 |
| 5/10/2003 | 12:32:51 | 796.8 | 13.28 | 54.02 | 17.65 | -0.603 | 11.422 | 0.536 |
| 5/10/2003 | 12:33:39 | 844.2 | 14.07 | 54.02 | 17.669 | -0.584 | 12.212 | 0.520 |
| 5/10/2003 | 12:34:29 | 894.4 | 14.90667 | 54.02 | 17.693 | -0.56 | 13.048 | 0.498 |
| 5/10/2003 | 12:35:22 | 947.5 | 15.79167 | 54.02 | 17.712 | -0.541 | 13.933 | 0.481 |
| 5/10/2003 | 12:36:18 | 1003.8 | 16.73 | 54.02 | 17.732 | -0.521 | 14.872 | 0.464 |
| 5/10/2003 | 12:37:18 | 1063.4 | 17.72333 | 54.02 | 17.753 | -0.5 | 15.865 | 0.445 |
| 5/10/2003 | 12:38:21 | 1126.6 | 18.77667 | 54.02 | 17.773 | -0.48 | 16.918 | 0.427 |
| 5/10/2003 | 12:39:28 | 1193.5 | 19.89167 | 54.02 | 17.792 | -0.461 | 18.033 | 0.410 |
| 5/10/2003 | 12:40:39 | 1264.4 | 21.07333 | 54.02 | 17.812 | -0.441 | 19.215 | 0.392 |
| 5/10/2003 | 12:41:54 | 1339.5 | 22.325 | 54.02 | 17.831 | -0.422 | 20.467 | 0.375 |
| 5/10/2003 | 12:43:13 | 1419 | 23.65 | 54.02 | 17.851 | -0.402 | 21.792 | 0.358 |
| 5/10/2003 | 12:44:38 | 1503.3 | 25.055 | 54.02 | 17.868 | -0.385 | 23.197 | 0.343 |
| 5/10/2003 | 12:46:07 | 1592.6 | 26.54333 | 54.02 | 17.884 | -0.369 | 24.685 | 0.328 |
| 5/10/2003 | 12:47:41 | 1687.1 | 28.11833 | 54.02 | 17.902 | -0.351 | 26.260 | 0.312 |
| 5/10/2003 | 12:49:22 | 1787.2 | 29.78667 | 54.02 | 17.921 | -0.332 | 27.928 | 0.295 |
| 5/10/2003 | 12:51:08 | 1893.3 | 31.555 | 54.02 | 17.939 | -0.314 | 29.697 | 0.279 |
| 5/10/2003 | 12:53:00 | 2005.7 | 33.42833 | 54.02 | 17.954 | -0.299 | 31.570 | 0.266 |
| 5/10/2003 | 12:54:59 | 2124.7 | 35.41167 | 54.02 | 17.97 | -0.283 | 33.553 | 0.252 |
| 5/10/2003 | 12:57:05 | 2250.8 | 37.51333 | 54.02 | 17.985 | -0.268 | 35.655 | 0.238 |
| 5/10/2003 | 12:59:19 | 2384.4 | 39.74 | 54.02 | 18.001 | -0.252 | 37.882 | 0.224 |
| 5/10/2003 | 13:01:40 | 2525.9 | 42.09833 | 54.02 | 18.017 | -0.236 | 40.240 | 0.210 |
| 5/10/2003 | 13:04:10 | 2675.8 | 44.59667 | 54.02 | 18.032 | -0.221 | 42.738 | 0.197 |
| 5/10/2003 | 13:06:49 | 2834.6 | 47.24333 | 54 | 18.044 | -0.209 | 45.385 | 0.186 |
| 5/10/2003 | 13:09:37 | 3002.8 | 50.04667 | 54 | 18.056 | -0.197 | 48.188 | 0.175 |
| 5/10/2003 | 13:12:35 | 3180.9 | 53.015 | 54 | 18.066 | -0.187 | 51.157 | 0.166 |
| 5/10/2003 | 13:15:44 | 3369.6 | 56.16 | 54 | 18.07 | -0.183 | 54.302 | 0.163 |
| 5/10/2003 | 13:19:04 | 3569.5 | 59.49167 | 54 | 18.077 | -0.176 | 57.633 | 0.157 |
| 5/10/2003 | 13:22:36 | 3781.2 | 63.02 | 54 | 18.083 | -0.17 | 61.162 | 0.151 |
| 5/10/2003 | 13:26:20 | 4005.5 | 66.75833 | 54 | 18.085 | -0.168 | 64.900 | 0.149 |
| 5/10/2003 | 13:30:17 | 4243.1 | 70.71833 | 54.02 | 18.093 | -0.16 | 68.860 | 0.142 |
| 5/10/2003 | 13:34:29 | 4494.7 | 74.91167 | 54.02 | 18.101 | -0.152 | 73.053 | 0.135 |
| 5/10/2003 | 13:38:56 | 4761.3 | 79.355 | 54.02 | 18.108 | -0.145 | 77.497 | 0.129 |
| 5/10/2003 | 13:43:38 | 5043.7 | 84.06167 | 54.02 | 18.116 | -0.137 | 82.203 | 0.122 |
| 5/10/2003 | 13:48:37 | 5342.8 | 89.04667 | 54.02 | 18.124 | -0.129 | 87.188 | 0.115 |
| 5/10/2003 | 13:53:54 | 5659.6 | 94.32667 | 54.02 | 18.134 | -0.119 | 92.468 | 0.106 |
| 5/10/2003 | 13:59:30 | 5995.2 | 99.92 | 54.02 | 18.142 | -0.111 | 98.062 | 0.099 |
| 5/10/2003 | 14:05:25 | 6350.7 | 105.845 | 54.02 | 18.145 | -0.108 | 103.987 | 0.096 |
| 5/10/2003 | 14:11:42 | 6727.2 | 112.12 | 54.02 | 18.153 | -0.1 | 110.262 | 0.089 |
| 5/10/2003 | 14:18:20 | 7126.1 | 118.7683 | 54.02 | 18.159 | -0.094 | 116.910 | 0.084 |
| 5/10/2003 | 14:25:23 | 7548.6 | 125.81 | 54.02 | 18.165 | -0.088 | 123.952 | 0.078 |
| 5/10/2003 | 14:32:50 | 7996.1 | 133.2683 | 54.02 | 18.173 | -0.08 | 131.410 | 0.071 |
| 5/10/2003 | 14:40:44 | 8470.1 | 141.1683 | 54.02 | 18.181 | -0.072 | 139.310 | 0.064 |
| 5/10/2003 | 14:49:07 | 8972.2 | 149.5367 | 54.02 | 18.188 | -0.065 | 147.678 | 0.058 |
| 5/10/2003 | 14:57:58 | 9504.1 | 158.4017 | 54 | 18.196 | -0.057 | 156.543 | 0.051 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

**Project Name:** Crane IN
**Project No.:** 9060 CTO 0279
**Test Type:** Falling head

**Well/Boring No.:** 13MWT26
**Aquifer Type:** confined
**Test Date:** 9-May-03

**Done By:** Fred W. Ramser
**Checked By:** RMB 6/23/03

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 2.5 = R |
| Length of Well Screen (ft.) : | 12 = L |
| Time for 37% head change (min.) : | 91.00 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.29E-05 | ft./min. |
| 2.15E-07 | ft./sec. |
| 1.86E-02 | ft./day |
| 6.55E-06 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: CRANE WELL/BORING NO.: 13MW726

PROJECT NO.: 9060 Co 0279 GEOLOGIST: BOB BALKOVEC

WELL DIAMETER: 2" PVC SCREEN LENGTH/DEPTH: 10' / 22.24' TEST NO.: 3

STATIC WATER LEVEL (Depth/Elevation): 9.09' DATE: 5/9/03

TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: 1.5" x 56.5" LONG SLUG PAGE OF

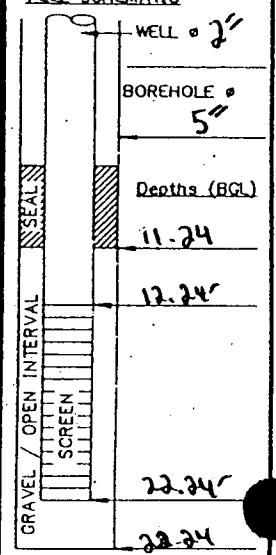
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30 PSI

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 8.0 | 12.530 | | 709.9 | 14.603 | +2.073 |
| 11.3 | 14.358 | +2.228 | 1419 | 14.26 | +1.73 |
| 15.0 | 15.216 | +2.686 | 2525.9 | 13.882 | +1.352 |
| 20.0 | 15.229 | +2.699 | 3569.5 | 13.676 | +1.146 |
| 29.8 | 15.204 | +2.674 | 5043.7 | 13.382 | +0.852 |
| 41.8 | 15.178 | +2.648 | 7548.6 | 13.118 | +0.588 |
| 59.0 | 15.150 | +2.62 | 9504.1 | 12.986 | +0.456 |
| 125.1 | 15.063 | +2.533 | 11296.5 | 12.902 | +0.372 |
| 210.9 | 14.978 | +2.448 | | | |
| 335.0 | 14.868 | 2.338 | | | |
| 422.1 | 14.791 | 2.261 | | | |
| 502 | 14.738 | 2.208 | | | |

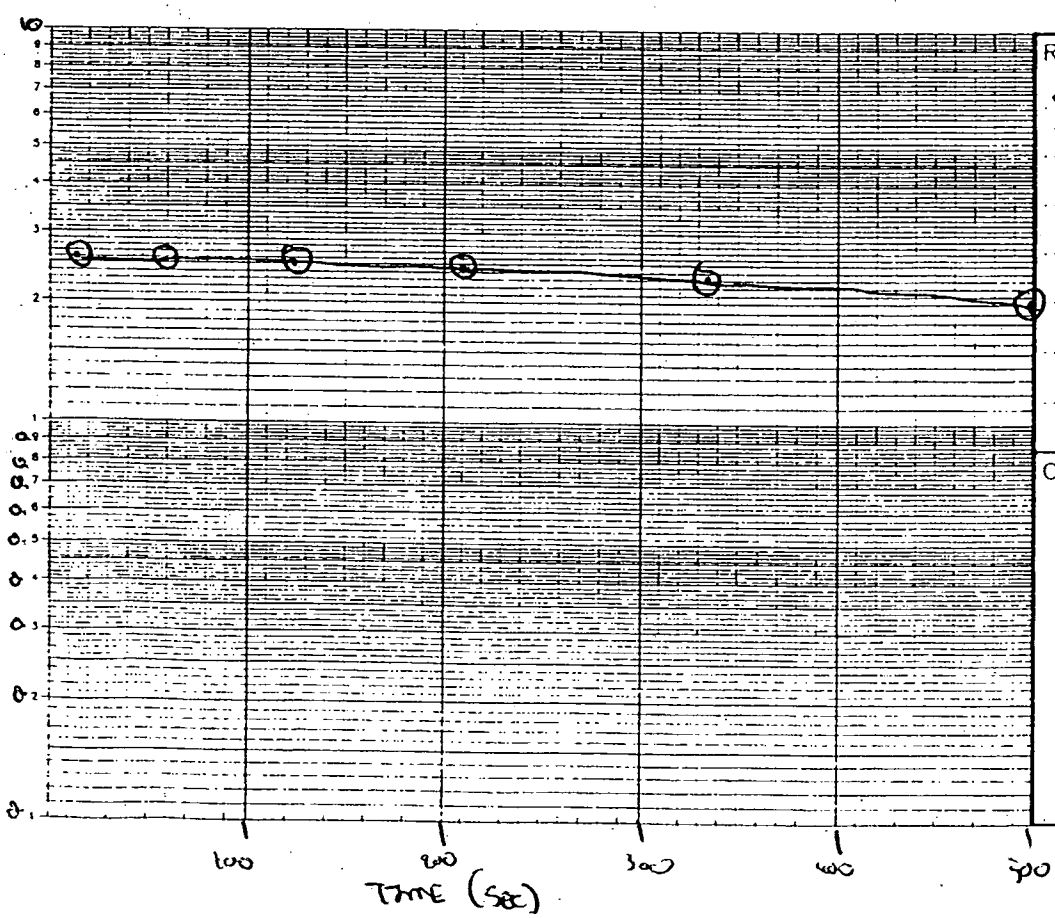
STATIC

START

WELL SCHEMATIC




Indicate SWL Depth on Drawing

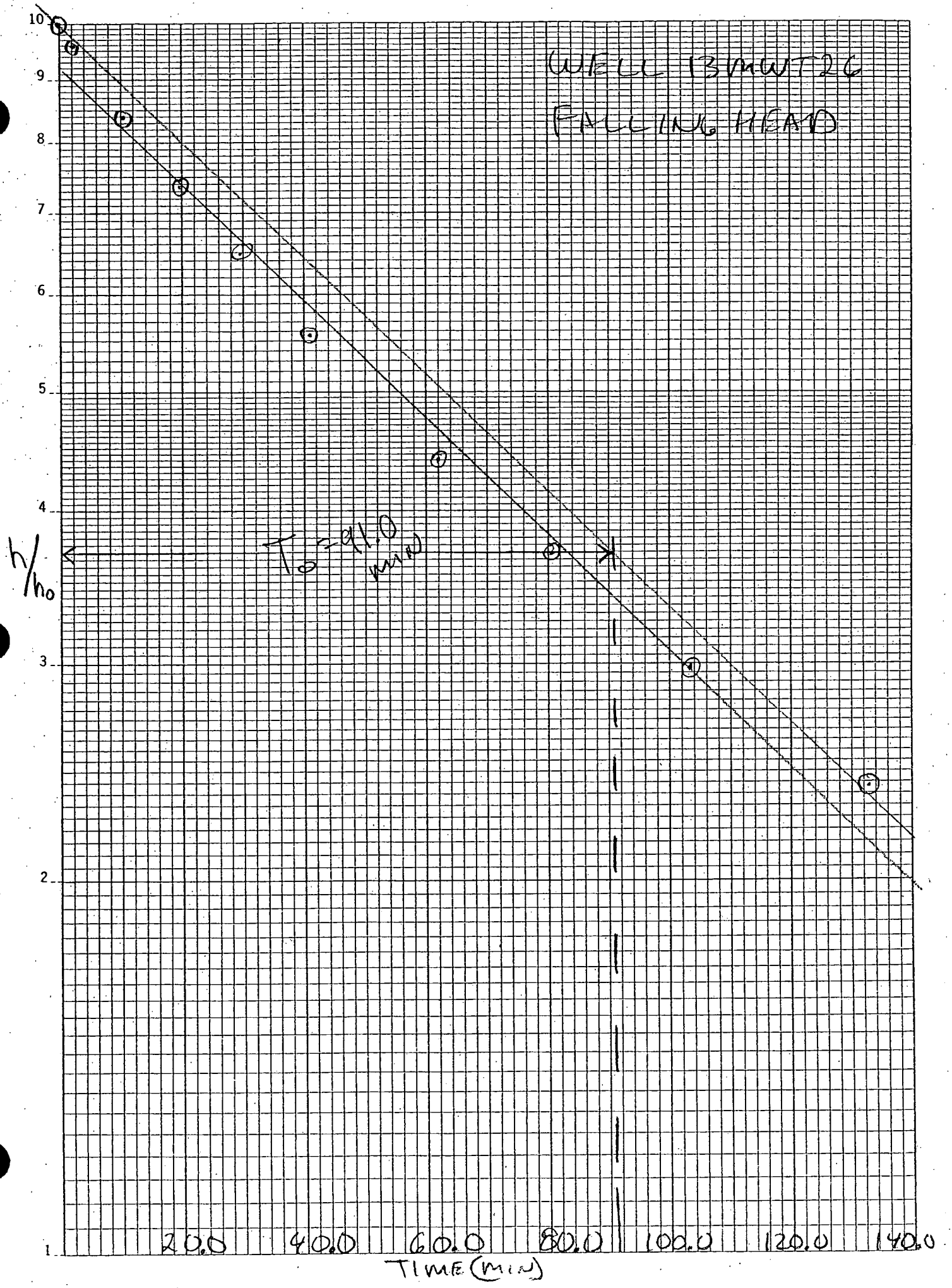



REMARKS:

WL = 9.09'

TD = 22.24'

CALCS, SKETCH MAPS, ETC.:




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 5/9/2003 16:52:07
Report from file: ...\SN00824 2003-05-09 120314 13MWT26 Falling.bin
Win-Situ Version 4.41

Serial number: 824
Firmware Version 3.06
Unit name:

Test name: 13MWT26 Falling

Test defined on: 5/9/2003 12:01:49
Test started on: 5/9/2003 12:03:14
Test stopped on: N/A N/A
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time betv Seconds.
Number of data sar 154

TOTAL DATA SAMPI 154

Channel number [1]
Measurement type: Temperature
Channel name: Temperature

Channel number [2]
Measurement type: Pressure
Channel name: Depth
Sensor Range: 30 PSIG.
Specific gravity: 1

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | adjusted time Displacement | h/ho | ho= 2.208 |
|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 12:03:14 | 0 | 0 | 53.32 | 12.507 | Feet | | |
| 5/9/2003 | 12:03:15 | 0.3 | 0.005 | 53.35 | 12.518 | | | |
| 5/9/2003 | 12:03:15 | 0.6 | 0.01 | 53.37 | 12.523 | | | |
| 5/9/2003 | 12:03:15 | 0.9 | 0.015 | 53.37 | 12.525 | | | |
| 5/9/2003 | 12:03:16 | 1.2 | 0.02 | 53.39 | 12.526 | | | |
| 5/9/2003 | 12:03:16 | 1.5 | 0.025 | 53.39 | 12.528 | | | |
| 5/9/2003 | 12:03:16 | 1.8 | 0.03 | 53.39 | 12.528 | | | |
| 5/9/2003 | 12:03:16 | 2.1 | 0.035 | 53.39 | 12.526 | 12.53 Static | | |
| 5/9/2003 | 12:03:17 | 2.4 | 0.04 | 53.39 | 12.53 | 0 | | |
| 5/9/2003 | 12:03:17 | 2.7 | 0.045 | 53.39 | 12.53 | 0 | | |
| 5/9/2003 | 12:03:17 | 3 | 0.05 | 53.39 | 12.53 | 0 | | |
| 5/9/2003 | 12:03:18 | 3.3 | 0.055 | 53.39 | 12.53 | 0 | | |
| 5/9/2003 | 12:03:18 | 3.6 | 0.06 | 53.39 | 12.53 | 0 | | |
| 5/9/2003 | 12:03:18 | 3.9 | 0.065 | 53.39 | 12.53 | 0 | | |
| 5/9/2003 | 12:03:19 | 4.2 | 0.07 | 53.39 | 12.53 | 0 | | |
| 5/9/2003 | 12:03:19 | 4.5 | 0.075 | 53.39 | 12.53 | 0 | | |
| 5/9/2003 | 12:03:19 | 4.8 | 0.08 | 53.39 | 12.53 | 0 | | |
| 5/9/2003 | 12:03:19 | 5.1 | 0.085 | 53.39 | 12.53 | 0 | | |
| 5/9/2003 | 12:03:20 | 5.4 | 0.09 | 53.41 | 12.532 | 0.002 | | |
| 5/9/2003 | 12:03:20 | 5.7 | 0.095 | 53.41 | 12.532 | 0.002 | | |
| 5/9/2003 | 12:03:20 | 6 | 0.1 | 53.41 | 12.532 | 0.002 | | |
| 5/9/2003 | 12:03:21 | 6.4 | 0.106667 | 53.41 | 12.53 | 0 | | |
| 5/9/2003 | 12:03:21 | 6.7 | 0.111667 | 53.41 | 12.53 | 0 | | |
| 5/9/2003 | 12:03:21 | 7.1 | 0.118333 | 53.41 | 12.53 | 0 | | |
| 5/9/2003 | 12:03:22 | 7.5 | 0.125 | 53.41 | 12.53 | 0 | | |
| 5/9/2003 | 12:03:22 | 8 | 0.133333 | 53.41 | 12.532 | 0.002 | | |
| 5/9/2003 | 12:03:23 | 8.4 | 0.14 | 53.41 | 12.532 | 0.002 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5/9/2003 | 12:03:23 | 8.9 | 0.148333 | 53.41 | 12.534 | 0.004 |
| 5/9/2003 | 12:03:24 | 9.5 | 0.158333 | 53.41 | 12.534 | 0.004 |
| 5/9/2003 | 12:03:24 | 10 | 0.166667 | 53.39 | 12.528 | -0.002 |
| 5/9/2003 | 12:03:25 | 10.6 | 0.176667 | 53.39 | 12.622 | 0.092 |
| 5/9/2003 | 12:03:26 | 11.3 | 0.188333 | 53.37 | 14.758 | 2.228 |
| 5/9/2003 | 12:03:26 | 11.9 | 0.198333 | 53.37 | 16.502 | 3.972 |
| 5/9/2003 | 12:03:27 | 12.6 | 0.21 | 53.37 | 16.58 | 4.05 |
| 5/9/2003 | 12:03:28 | 13.4 | 0.223333 | 53.37 | 16.171 | 3.641 |
| 5/9/2003 | 12:03:28 | 14.2 | 0.236667 | 53.37 | 14.616 | 2.086 |
| 5/9/2003 | 12:03:29 | 15 | 0.25 | 53.37 | 15.216 | 2.686 |
| 5/9/2003 | 12:03:30 | 15.9 | 0.265 | 53.37 | 15.229 | 2.699 |
| 5/9/2003 | 12:03:31 | 16.8 | 0.28 | 53.37 | 15.236 | 2.706 |
| 5/9/2003 | 12:03:32 | 17.8 | 0.296667 | 53.37 | 15.236 | 2.706 |
| 5/9/2003 | 12:03:33 | 18.9 | 0.315 | 53.37 | 15.238 | 2.708 |
| 5/9/2003 | 12:03:34 | 20 | 0.333333 | 53.37 | 15.229 | 2.699 |
| 5/9/2003 | 12:03:36 | 21.2 | 0.353333 | 53.37 | 15.227 | 2.697 |
| 5/9/2003 | 12:03:37 | 22.4 | 0.373333 | 53.37 | 15.221 | 2.691 |
| 5/9/2003 | 12:03:38 | 23.8 | 0.396667 | 53.37 | 15.219 | 2.689 |
| 5/9/2003 | 12:03:40 | 25.2 | 0.42 | 53.37 | 15.214 | 2.684 |
| 5/9/2003 | 12:03:41 | 26.7 | 0.445 | 53.37 | 15.212 | 2.682 |
| 5/9/2003 | 12:03:43 | 28.2 | 0.47 | 53.35 | 15.21 | 2.68 |
| 5/9/2003 | 12:03:44 | 29.8 | 0.496667 | 53.37 | 15.204 | 2.674 |
| 5/9/2003 | 12:03:46 | 31.5 | 0.525 | 53.35 | 15.199 | 2.669 |
| 5/9/2003 | 12:03:48 | 33.3 | 0.555 | 53.35 | 15.195 | 2.665 |
| 5/9/2003 | 12:03:50 | 35.2 | 0.586667 | 53.35 | 15.192 | 2.662 |
| 5/9/2003 | 12:03:52 | 37.3 | 0.621667 | 53.35 | 15.188 | 2.658 |
| 5/9/2003 | 12:03:54 | 39.5 | 0.658333 | 53.35 | 15.184 | 2.654 |
| 5/9/2003 | 12:03:56 | 41.8 | 0.696667 | 53.35 | 15.178 | 2.648 |
| 5/9/2003 | 12:03:59 | 44.3 | 0.738333 | 53.35 | 15.175 | 2.645 |
| 5/9/2003 | 12:04:01 | 46.9 | 0.781667 | 53.35 | 15.171 | 2.641 |
| 5/9/2003 | 12:04:04 | 49.7 | 0.828333 | 53.35 | 15.165 | 2.635 |
| 5/9/2003 | 12:04:07 | 52.6 | 0.876667 | 53.35 | 15.162 | 2.632 |
| 5/9/2003 | 12:04:10 | 55.7 | 0.928333 | 53.35 | 15.158 | 2.628 |
| 5/9/2003 | 12:04:13 | 59 | 0.983333 | 53.35 | 15.15 | 2.62 |
| 5/9/2003 | 12:04:17 | 62.5 | 1.041667 | 53.32 | 15.145 | 2.615 |
| 5/9/2003 | 12:04:21 | 66.2 | 1.103333 | 53.32 | 15.141 | 2.611 |
| 5/9/2003 | 12:04:24 | 70.1 | 1.168333 | 53.32 | 15.136 | 2.606 |
| 5/9/2003 | 12:04:29 | 74.3 | 1.238333 | 53.32 | 15.136 | 2.606 |
| 5/9/2003 | 12:04:33 | 78.7 | 1.311667 | 53.32 | 15.125 | 2.595 |
| 5/9/2003 | 12:04:38 | 83.4 | 1.39 | 53.32 | 15.117 | 2.587 |
| 5/9/2003 | 12:04:43 | 88.4 | 1.473333 | 53.32 | 15.11 | 2.58 |
| 5/9/2003 | 12:04:48 | 93.7 | 1.561667 | 53.32 | 15.102 | 2.572 |
| 5/9/2003 | 12:04:54 | 99.3 | 1.655 | 53.32 | 15.095 | 2.565 |
| 5/9/2003 | 12:05:00 | 105.2 | 1.753333 | 53.32 | 15.089 | 2.559 |
| 5/9/2003 | 12:05:06 | 111.5 | 1.858333 | 53.3 | 15.082 | 2.552 |
| 5/9/2003 | 12:05:12 | 118.1 | 1.968333 | 53.3 | 15.073 | 2.543 |
| 5/9/2003 | 12:05:19 | 125.1 | 2.085 | 53.3 | 15.063 | 2.533 |
| 5/9/2003 | 12:05:27 | 132.6 | 2.21 | 53.3 | 15.056 | 2.526 |
| 5/9/2003 | 12:05:35 | 140.5 | 2.341667 | 53.3 | 15.046 | 2.516 |
| 5/9/2003 | 12:05:43 | 148.9 | 2.481667 | 53.3 | 15.039 | 2.509 |
| 5/9/2003 | 12:05:52 | 157.8 | 2.63 | 53.3 | 15.028 | 2.498 |
| 5/9/2003 | 12:06:02 | 167.2 | 2.786667 | 53.3 | 15.018 | 2.488 |
| 5/9/2003 | 12:06:12 | 177.2 | 2.953333 | 53.3 | 15.011 | 2.481 |
| 5/9/2003 | 12:06:22 | 187.8 | 3.13 | 53.28 | 15 | 2.47 |
| 5/9/2003 | 12:06:33 | 199 | 3.316667 | 53.28 | 14.987 | 2.457 |
| 5/9/2003 | 12:06:45 | 210.9 | 3.515 | 53.28 | 14.978 | 2.448 |
| 5/9/2003 | 12:06:58 | 223.5 | 3.725 | 53.28 | 14.963 | 2.433 |
| 5/9/2003 | 12:07:11 | 236.8 | 3.946667 | 53.28 | 14.951 | 2.421 |
| 5/9/2003 | 12:07:25 | 250.9 | 4.181667 | 53.28 | 14.94 | 2.41 |
| 5/9/2003 | 12:07:40 | 265.8 | 4.43 | 53.28 | 14.927 | 2.397 |
| 5/9/2003 | 12:07:56 | 281.6 | 4.693333 | 53.28 | 14.912 | 2.382 |
| 5/9/2003 | 12:08:13 | 298.4 | 4.973333 | 53.25 | 14.901 | 2.371 |
| 5/9/2003 | 12:08:31 | 316.2 | 5.27 | 53.25 | 14.886 | 2.356 |
| 5/9/2003 | 12:08:49 | 335 | 5.583333 | 53.25 | 14.868 | 2.338 |
| 5/9/2003 | 12:09:09 | 354.9 | 5.915 | 53.25 | 14.845 | 2.315 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 12:09:30 | 376 | 6.266667 | 53.23 | 14.827 | 2.297 | | |
| 5/9/2003 | 12:09:53 | 398.4 | 6.64 | 53.23 | 14.81 | 2.28 | Plotted shaded values. | |
| 5/9/2003 | 12:10:16 | 422.1 | 7.035 | 53.23 | 14.791 | 2.261 | | |
| 5/9/2003 | 12:10:42 | 447.2 | 7.453333 | 53.23 | 14.775 | 2.245 | | |
| 5/9/2003 | 12:11:08 | 473.8 | 7.896667 | 53.21 | 14.76 | 2.23 | adjusted time | h/ho |
| 5/9/2003 | 12:11:36 | 502 | 8.366667 | 53.21 | 14.738 | 2.208 | 0.0000 | 1.0000 |
| 5/9/2003 | 12:12:06 | 531.9 | 8.865 | 53.21 | 14.717 | 2.187 | 0.4983 | 0.9905 |
| 5/9/2003 | 12:12:38 | 563.5 | 9.391667 | 53.21 | 14.695 | 2.165 | 1.0250 | 0.9805 |
| 5/9/2003 | 12:13:11 | 597 | 9.95 | 53.21 | 14.674 | 2.144 | 1.5833 | 0.9710 |
| 5/9/2003 | 12:13:47 | 632.5 | 10.54167 | 53.21 | 14.657 | 2.127 | 2.1750 | 0.9633 |
| 5/9/2003 | 12:14:24 | 670.1 | 11.16833 | 53.21 | 14.627 | 2.097 | 2.8017 | 0.9497 |
| 5/9/2003 | 12:15:04 | 709.9 | 11.83167 | 53.21 | 14.603 | 2.073 | 3.4650 | 0.9389 |
| 5/9/2003 | 12:15:46 | 752.1 | 12.535 | 53.21 | 14.581 | 2.051 | 4.1683 | 0.9289 |
| 5/9/2003 | 12:16:31 | 796.8 | 13.28 | 53.21 | 14.555 | 2.025 | 4.9133 | 0.9171 |
| 5/9/2003 | 12:17:19 | 844.2 | 14.07 | 53.19 | 14.531 | 2.001 | 5.7033 | 0.9063 |
| 5/9/2003 | 12:18:09 | 894.4 | 14.90667 | 53.19 | 14.503 | 1.973 | 6.5400 | 0.8936 |
| 5/9/2003 | 12:19:02 | 947.5 | 15.79167 | 53.19 | 14.473 | 1.943 | 7.4250 | 0.8800 |
| 5/9/2003 | 12:19:58 | 1003.8 | 16.73 | 53.19 | 14.448 | 1.918 | 8.3633 | 0.8687 |
| 5/9/2003 | 12:20:58 | 1063.4 | 17.72333 | 53.19 | 14.415 | 1.885 | 9.3567 | 0.8537 |
| 5/9/2003 | 12:22:01 | 1126.6 | 18.77667 | 53.16 | 14.383 | 1.853 | 10.4100 | 0.8392 |
| 5/9/2003 | 12:23:08 | 1193.5 | 19.89167 | 53.16 | 14.352 | 1.822 | 11.5250 | 0.8252 |
| 5/9/2003 | 12:24:19 | 1264.4 | 21.07333 | 53.16 | 14.322 | 1.792 | 12.7067 | 0.8116 |
| 5/9/2003 | 12:25:34 | 1339.5 | 22.325 | 53.14 | 14.288 | 1.758 | 13.9583 | 0.7962 |
| 5/9/2003 | 12:26:53 | 1419 | 23.65 | 53.16 | 14.26 | 1.73 | 15.2833 | 0.7835 |
| 5/9/2003 | 12:28:18 | 1503.3 | 25.055 | 53.14 | 14.225 | 1.695 | 16.6883 | 0.7677 |
| 5/9/2003 | 12:29:47 | 1592.6 | 26.54333 | 53.14 | 14.189 | 1.659 | 18.1767 | 0.7514 |
| 5/9/2003 | 12:31:21 | 1687.1 | 28.11833 | 53.14 | 14.154 | 1.624 | 19.7517 | 0.7355 |
| 5/9/2003 | 12:33:02 | 1787.2 | 29.78667 | 53.14 | 14.115 | 1.585 | 21.4200 | 0.7178 |
| 5/9/2003 | 12:34:48 | 1893.3 | 31.555 | 53.14 | 14.079 | 1.549 | 23.1883 | 0.7015 |
| 5/9/2003 | 12:36:40 | 2005.7 | 33.42833 | 53.14 | 14.036 | 1.506 | 25.0617 | 0.6821 |
| 5/9/2003 | 12:38:39 | 2124.7 | 35.41167 | 53.12 | 14.003 | 1.473 | 27.0450 | 0.6671 |
| 5/9/2003 | 12:40:45 | 2250.8 | 37.51333 | 53.12 | 13.964 | 1.434 | 29.1467 | 0.6495 |
| 5/9/2003 | 12:42:59 | 2384.4 | 39.74 | 53.12 | 13.921 | 1.391 | 31.3733 | 0.6300 |
| 5/9/2003 | 12:45:20 | 2525.9 | 42.09833 | 53.12 | 13.882 | 1.352 | 33.7317 | 0.6123 |
| 5/9/2003 | 12:47:50 | 2675.8 | 44.59667 | 53.12 | 13.842 | 1.312 | 36.2300 | 0.5942 |
| 5/9/2003 | 12:50:29 | 2834.6 | 47.24333 | 53.12 | 13.799 | 1.269 | 38.8767 | 0.5747 |
| 5/9/2003 | 12:53:17 | 3002.8 | 50.04667 | 53.14 | 13.758 | 1.228 | 41.6800 | 0.5562 |
| 5/9/2003 | 12:56:15 | 3180.9 | 53.015 | 53.14 | 13.717 | 1.187 | 44.6483 | 0.5376 |
| 5/9/2003 | 12:59:24 | 3369.6 | 56.16 | 53.14 | 13.676 | 1.146 | 47.7933 | 0.5190 |
| 5/9/2003 | 13:02:44 | 3569.5 | 59.49167 | 53.14 | 13.637 | 1.107 | 51.1250 | 0.5014 |
| 5/9/2003 | 13:06:16 | 3781.2 | 63.02 | 53.14 | 13.592 | 1.062 | 54.6533 | 0.4810 |
| 5/9/2003 | 13:10:00 | 4005.5 | 66.75833 | 53.16 | 13.549 | 1.019 | 58.3917 | 0.4615 |
| 5/9/2003 | 13:13:57 | 4243.1 | 70.71833 | 53.16 | 13.508 | 0.978 | 62.3517 | 0.4429 |
| 5/9/2003 | 13:18:09 | 4494.7 | 74.91167 | 53.16 | 13.466 | 0.936 | 66.5450 | 0.4239 |
| 5/9/2003 | 13:22:36 | 4761.3 | 79.355 | 53.16 | 13.425 | 0.895 | 70.9883 | 0.4053 |
| 5/9/2003 | 13:27:18 | 5043.7 | 84.06167 | 53.16 | 13.382 | 0.852 | 75.6950 | 0.3859 |
| 5/9/2003 | 13:32:17 | 5342.8 | 89.04667 | 53.16 | 13.345 | 0.815 | 80.6800 | 0.3691 |
| 5/9/2003 | 13:37:34 | 5659.6 | 94.32667 | 53.16 | 13.304 | 0.774 | 85.9600 | 0.3505 |
| 5/9/2003 | 13:43:10 | 5995.2 | 99.92 | 53.16 | 13.267 | 0.737 | 91.5533 | 0.3338 |
| 5/9/2003 | 13:49:05 | 6350.7 | 105.845 | 53.19 | 13.227 | 0.697 | 97.4783 | 0.3157 |
| 5/9/2003 | 13:55:22 | 6727.2 | 112.12 | 53.19 | 13.19 | 0.66 | 103.7533 | 0.2989 |
| 5/9/2003 | 14:02:00 | 7126.1 | 118.7683 | 53.19 | 13.152 | 0.622 | 110.4017 | 0.2817 |
| 5/9/2003 | 14:09:03 | 7548.6 | 125.81 | 53.25 | 13.118 | 0.588 | 117.4433 | 0.2663 |
| 5/9/2003 | 14:16:30 | 7996.1 | 133.2683 | 53.21 | 13.083 | 0.553 | 124.9017 | 0.2505 |
| 5/9/2003 | 14:24:24 | 8470.1 | 141.1683 | 53.21 | 13.05 | 0.52 | 132.8017 | 0.2355 |
| 5/9/2003 | 14:32:47 | 8972.2 | 149.5367 | 53.23 | 13.006 | 0.476 | 141.1700 | 0.2156 |
| 5/9/2003 | 14:41:38 | 9504.1 | 158.4017 | 53.23 | 12.986 | 0.456 | 150.0350 | 0.2065 |
| 5/9/2003 | 14:51:02 | 10067.5 | 167.7917 | 53.23 | 12.956 | 0.426 | 159.4250 | 0.1929 |
| 5/9/2003 | 15:00:59 | 10664.3 | 177.7383 | 53.23 | 12.926 | 0.396 | 169.3717 | 0.1793 |
| 5/9/2003 | 15:11:31 | 11296.5 | 188.275 | 53.23 | 12.902 | 0.372 | 179.9083 | 0.1685 |
| 5/9/2003 | 15:22:40 | 11966.1 | 199.435 | 53.25 | 12.875 | 0.345 | 191.0683 | 0.1563 |
| 5/9/2003 | 15:34:30 | 12675.4 | 211.2567 | 53.25 | 12.851 | 0.321 | 202.8900 | 0.1454 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 13MWT26 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Rising Head | **Test Date:** | 9-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RMB 6/23/03

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 2.5 = R |
| Length of Well Screen (ft.) : | 12 = L |
| Time for 37% head change (min.) : | 128.25 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 9.15E-06 | ft./min. |
| 1.52E-07 | ft./sec. |
| 1.32E-02 | ft./day |
| 4.65E-06 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: CRANE

WELL/BORING NO.: 13MW126

PROJECT NO.: 9060 CO 0279

GEOLOGIST: BOB BALLOVET

WELL DIAMETER: 2" PVC

SCREEN LENGTH/DEPTH: 10' / 22.24'

TEST NO.: 8

STATIC WATER LEVEL (Depth/Elevation): 8.67'

DATE: 5/9/03

TEST TYPE (Rising/Falling/Constant Head): RISING HEAD

CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: 1.5" x 56.5" LONG SLUG

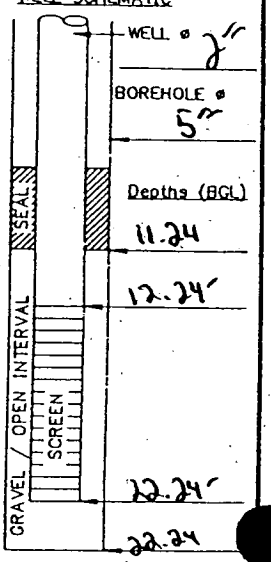
PAGE ... OF ...

REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30 PSI

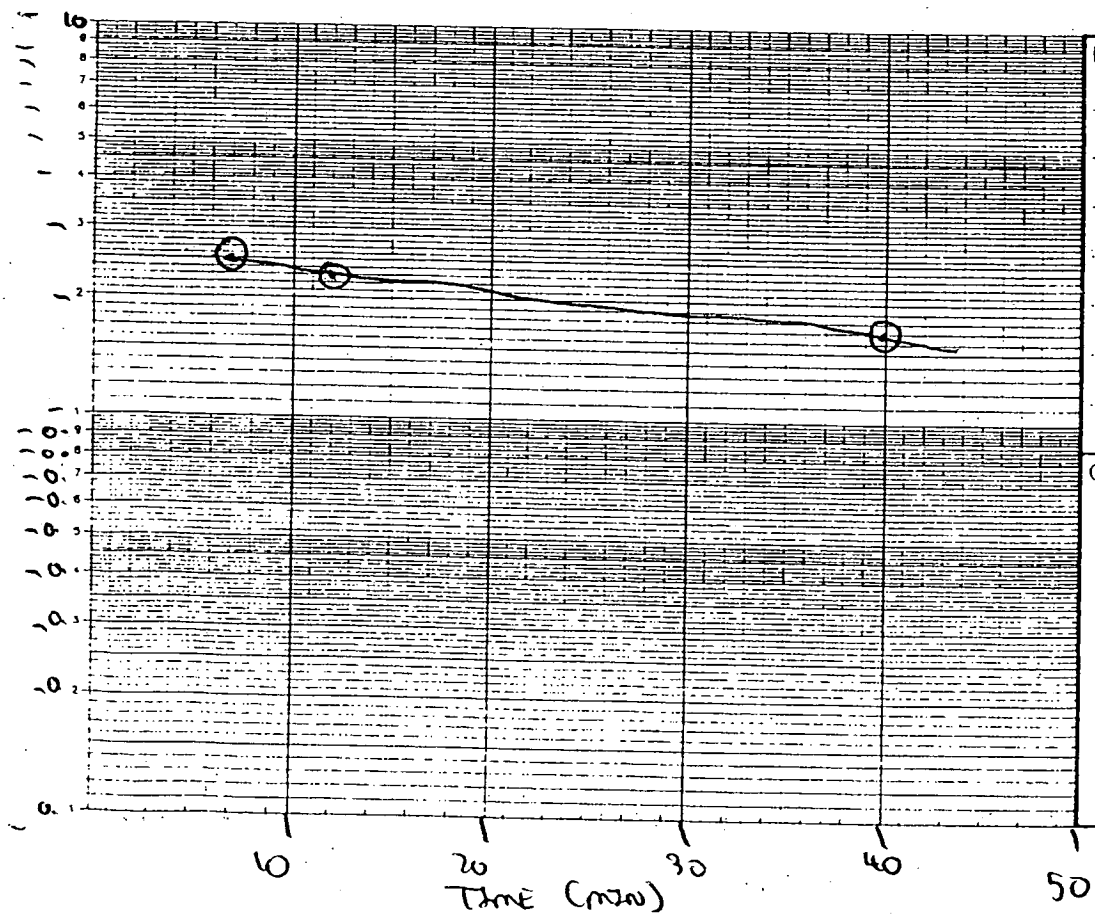
| ELAPSED TIME (min or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 12.863 | | 12.535 | 10.548 | -2.315 |
| 0.035 | 7.068 | -5.795 | 39.74 | 11.183 | -1.68 |
| 0.055 | 9.496 | -3.367 | 53.015 | 11.38 | -1.483 |
| 0.065 | 9.978 | -2.885 | 79.355 | 11.658 | -1.205 |
| 0.075 | 9.75 | -3.113 | 89.046 | 11.736 | -1.127 |
| 0.1 | 9.731 | -3.132 | 99.92 | 11.813 | -1.05 |
| 0.21 | 9.933 | -2.924 | 112.12 | 11.891 | -0.972 |
| 0.525 | 9.976 | -2.887 | 138.82 | 12.023 | -0.84 |
| 1.63 | 10.031 | -2.832 | 146.39 | 12.057 | -0.806 |
| 1.39 | 10.077 | -2.786 | 165.48 | 12.126 | -0.737 |
| 2.21 | 10.109 | -2.754 | 177.213 | 12.16 | -0.703 |
| 7.035 | 10.345 | -2.518 | | | |

START

WELL SCHEMATIC

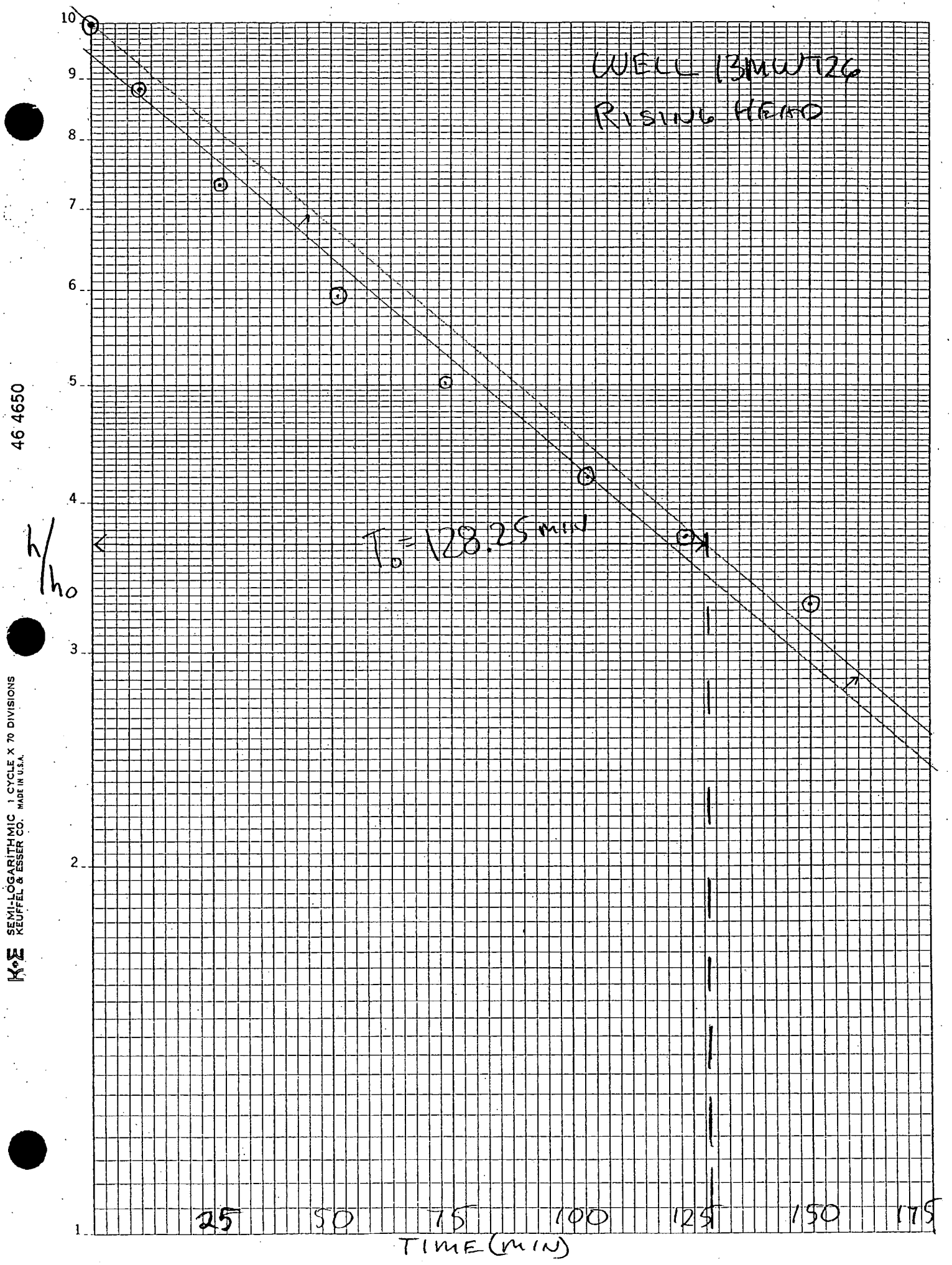



▽ Indicate SWL Depth on Drawing




REMARKS:

CALCS, SKETCH MAPS, ETC.:


WELL 13MW126
RISING HEAD
$T_o = 128.25$ min
h/ho
10
9
8
7
6
5
4
3
2
1
25
50
75
100
125
150
175
TIME (MIN)
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 5/9/2003 16:50:26
Report from file: ...\SN00824 2003-05-09 153832 13MWT26 Rising.bin
Win-Situ Version 4.41

Serial number: 824
Firmware Version 3.06
Unit name:

Test name: 13MWT26 Rising

Test defined on: 5/9/2003 15:36:43
Test started on: 5/9/2003 15:38:32
Test stopped on: N/A N/A
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time betwee Seconds.
Number of data sampl 145

TOTAL DATA SAMPLES 145

Channel number [1]
Measurement type: Temperature
Channel name: Temperature

Channel number [2]
Measurement type: Pressure
Channel name: Depth
Sensor Range: 30 PSIG.
Specific gravity: 1

slug = 2.2 ft of H2O

ho= -2.24

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenhei | Chan[2] Feet H2O | | Delta S | adjusted time | h/ho |
|---|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 15:38:32 | 0 | 0 | 53.25 | 12.863 | | 0 | | |
| 5/9/2003 | 15:38:33 | 0.3 | 0.005 | 53.3 | 12.863 | | 0 | | |
| 5/9/2003 | 15:38:33 | 0.6 | 0.01 | 53.32 | 12.863 | | 0 | | |
| 5/9/2003 | 15:38:33 | 0.9 | 0.015 | 53.32 | 12.863 | | 0 | | |
| 5/9/2003 | 15:38:34 | 1.2 | 0.02 | 53.32 | 12.863 | | 0 | | |
| 5/9/2003 | 15:38:34 | 1.5 | 0.025 | 53.32 | 12.865 | | 0.002 | | |
| 5/9/2003 | 15:38:34 | 1.8 | 0.03 | 53.32 | 12.843 | Time | -0.02 | | |
| 5/9/2003 | 15:38:35 | 2.1 | 0.035 | 53.32 | 7.068 | 0 | -5.795 | | |
| 5/9/2003 | 15:38:35 | 2.4 | 0.04 | 53.32 | 9.509 | 0.005 | -3.354 | | |
| 5/9/2003 | 15:38:35 | 2.7 | 0.045 | 53.32 | 11.041 | 0.01 | -1.822 | | |
| 5/9/2003 | 15:38:35 | 3 | 0.05 | 53.32 | 10.241 | 0.015 | -2.622 | | |
| 5/9/2003 | 15:38:36 | 3.3 | 0.055 | 53.35 | 9.496 | 0.02 | -3.367 | | |
| 5/9/2003 | 15:38:36 | 3.6 | 0.06 | 53.35 | 9.651 | 0.025 | -3.212 | | |
| 5/9/2003 | 15:38:36 | 3.9 | 0.065 | 53.35 | 9.978 | 0.03 | -2.885 | | |
| 5/9/2003 | 15:38:37 | 4.2 | 0.07 | 53.35 | 9.927 | 0.035 | -2.936 | | |
| 5/9/2003 | 15:38:37 | 4.5 | 0.075 | 53.35 | 9.75 | 0.04 | -3.113 | | |
| 5/9/2003 | 15:38:37 | 4.8 | 0.08 | 53.35 | 9.8 | 0.045 | -3.063 | | |
| 5/9/2003 | 15:38:38 | 5.1 | 0.085 | 53.35 | 9.862 | 0.05 | -3.001 | | |
| 5/9/2003 | 15:38:38 | 5.4 | 0.09 | 53.35 | 9.759 | 0.055 | -3.104 | | |
| 5/9/2003 | 15:38:38 | 5.7 | 0.095 | 53.35 | 9.748 | 0.06 | -3.115 | | |
| 5/9/2003 | 15:38:38 | 6 | 0.1 | 53.35 | 9.731 | 0.065 | -3.132 | | |
| 5/9/2003 | 15:38:39 | 6.4 | 0.106666667 | 53.35 | 9.739 | 0.071667 | -3.124 | | |
| 5/9/2003 | 15:38:39 | 6.7 | 0.111666667 | 53.35 | 9.742 | 0.076667 | -3.121 | | |
| 5/9/2003 | 15:38:40 | 7.1 | 0.118333333 | 53.35 | 9.748 | 0.083333 | -3.115 | | |
| 5/9/2003 | 15:38:40 | 7.5 | 0.125 | 53.35 | 9.756 | 0.09 | -3.107 | | |
| 5/9/2003 | 15:38:40 | 8 | 0.133333333 | 53.35 | 9.761 | 0.098333 | -3.102 | | |
| 5/9/2003 | 15:38:41 | 8.4 | 0.14 | 53.35 | 9.765 | 0.105 | -3.098 | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5/9/2003 | 15:38:41 | 8.9 | 0.148333333 | 53.35 | 9.767 | 0.113333 | -3.096 |
| 5/9/2003 | 15:38:42 | 9.5 | 0.158333333 | 53.35 | 9.834 | 0.123333 | -3.029 |
| 5/9/2003 | 15:38:42 | 10 | 0.166666667 | 53.35 | 9.888 | 0.131667 | -2.975 |
| 5/9/2003 | 15:38:43 | 10.6 | 0.176666667 | 53.32 | 9.944 | 0.141667 | -2.919 |
| 5/9/2003 | 15:38:44 | 11.3 | 0.188333333 | 53.32 | 9.928 | 0.153333 | -2.935 |
| 5/9/2003 | 15:38:44 | 11.9 | 0.198333333 | 53.32 | 9.931 | 0.163333 | -2.932 |
| 5/9/2003 | 15:38:45 | 12.6 | 0.21 | 53.32 | 9.933 | 0.175 | -2.93 |
| 5/9/2003 | 15:38:46 | 13.4 | 0.223333333 | 53.32 | 9.939 | 0.188333 | -2.924 |
| 5/9/2003 | 15:38:47 | 14.2 | 0.236666667 | 53.32 | 9.939 | 0.201667 | -2.924 |
| 5/9/2003 | 15:38:47 | 15 | 0.25 | 53.32 | 9.941 | 0.215 | -2.922 |
| 5/9/2003 | 15:38:48 | 15.9 | 0.265 | 53.3 | 9.95 | 0.23 | -2.913 |
| 5/9/2003 | 15:38:49 | 16.8 | 0.28 | 53.3 | 9.943 | 0.245 | -2.92 |
| 5/9/2003 | 15:38:50 | 17.8 | 0.296666667 | 53.3 | 9.948 | 0.261667 | -2.915 |
| 5/9/2003 | 15:38:51 | 18.9 | 0.315 | 53.3 | 9.948 | 0.28 | -2.915 |
| 5/9/2003 | 15:38:52 | 20 | 0.333333333 | 53.3 | 9.954 | 0.298333 | -2.909 |
| 5/9/2003 | 15:38:54 | 21.2 | 0.353333333 | 53.3 | 9.958 | 0.318333 | -2.905 |
| 5/9/2003 | 15:38:55 | 22.4 | 0.373333333 | 53.3 | 9.96 | 0.338333 | -2.903 |
| 5/9/2003 | 15:38:56 | 23.8 | 0.396666667 | 53.3 | 9.962 | 0.361667 | -2.901 |
| 5/9/2003 | 15:38:58 | 25.2 | 0.42 | 53.3 | 9.965 | 0.385 | -2.898 |
| 5/9/2003 | 15:38:59 | 26.7 | 0.445 | 53.3 | 9.967 | 0.41 | -2.896 |
| 5/9/2003 | 15:39:01 | 28.2 | 0.47 | 53.3 | 9.969 | 0.435 | -2.894 |
| 5/9/2003 | 15:39:02 | 29.8 | 0.496666667 | 53.3 | 9.973 | 0.461667 | -2.89 |
| 5/9/2003 | 15:39:04 | 31.5 | 0.525 | 53.3 | 9.976 | 0.49 | -2.887 |
| 5/9/2003 | 15:39:06 | 33.3 | 0.555 | 53.3 | 9.98 | 0.52 | -2.883 |
| 5/9/2003 | 15:39:08 | 35.2 | 0.586666667 | 53.3 | 9.98 | 0.551667 | -2.883 |
| 5/9/2003 | 15:39:10 | 37.3 | 0.621666667 | 53.3 | 9.986 | 0.586667 | -2.877 |
| 5/9/2003 | 15:39:12 | 39.5 | 0.658333333 | 53.3 | 9.99 | 0.623333 | -2.873 |
| 5/9/2003 | 15:39:14 | 41.8 | 0.696666667 | 53.3 | 9.991 | 0.661667 | -2.872 |
| 5/9/2003 | 15:39:17 | 44.3 | 0.738333333 | 53.3 | 9.997 | 0.703333 | -2.866 |
| 5/9/2003 | 15:39:19 | 46.9 | 0.781666667 | 53.3 | 10.001 | 0.746667 | -2.862 |
| 5/9/2003 | 15:39:22 | 49.7 | 0.828333333 | 53.3 | 10.006 | 0.793333 | -2.857 |
| 5/9/2003 | 15:39:25 | 52.6 | 0.876666667 | 53.3 | 10.008 | 0.841667 | -2.855 |
| 5/9/2003 | 15:39:28 | 55.7 | 0.928333333 | 53.3 | 10.014 | 0.893333 | -2.849 |
| 5/9/2003 | 15:39:31 | 59 | 0.983333333 | 53.28 | 10.018 | 0.948333 | -2.845 |
| 5/9/2003 | 15:39:35 | 62.5 | 1.041666667 | 53.28 | 10.022 | 1.006667 | -2.841 |
| 5/9/2003 | 15:39:39 | 66.2 | 1.103333333 | 53.28 | 10.031 | 1.068333 | -2.832 |
| 5/9/2003 | 15:39:43 | 70.1 | 1.168333333 | 53.28 | 10.059 | 1.133333 | -2.804 |
| 5/9/2003 | 15:39:47 | 74.3 | 1.238333333 | 53.3 | 10.072 | 1.203333 | -2.791 |
| 5/9/2003 | 15:39:51 | 78.7 | 1.311666667 | 53.3 | 10.074 | 1.276667 | -2.789 |
| 5/9/2003 | 15:39:56 | 83.4 | 1.39 | 53.32 | 10.077 | 1.355 | -2.786 |
| 5/9/2003 | 15:40:01 | 88.4 | 1.473333333 | 53.32 | 10.077 | 1.438333 | -2.786 |
| 5/9/2003 | 15:40:06 | 93.7 | 1.561666667 | 53.3 | 10.062 | 1.526667 | -2.801 |
| 5/9/2003 | 15:40:12 | 99.3 | 1.655 | 53.28 | 10.07 | 1.62 | -2.793 |
| 5/9/2003 | 15:40:18 | 105.2 | 1.753333333 | 53.28 | 10.076 | 1.718333 | -2.787 |
| 5/9/2003 | 15:40:24 | 111.5 | 1.858333333 | 53.28 | 10.081 | 1.823333 | -2.782 |
| 5/9/2003 | 15:40:31 | 118.1 | 1.968333333 | 53.28 | 10.089 | 1.933333 | -2.774 |
| 5/9/2003 | 15:40:38 | 125.1 | 2.085 | 53.28 | 10.098 | 2.05 | -2.765 |
| 5/9/2003 | 15:40:45 | 132.6 | 2.21 | 53.28 | 10.109 | 2.175 | -2.754 |
| 5/9/2003 | 15:40:53 | 140.5 | 2.341666667 | 53.28 | 10.119 | 2.306667 | -2.744 |
| 5/9/2003 | 15:41:01 | 148.9 | 2.481666667 | 53.28 | 10.126 | 2.446667 | -2.737 |
| 5/9/2003 | 15:41:10 | 157.8 | 2.63 | 53.28 | 10.135 | 2.595 | -2.728 |
| 5/9/2003 | 15:41:20 | 167.2 | 2.786666667 | 53.3 | 10.146 | 2.751667 | -2.717 |
| 5/9/2003 | 15:41:30 | 177.2 | 2.953333333 | 53.28 | 10.154 | 2.918333 | -2.709 |
| 5/9/2003 | 15:41:40 | 187.8 | 3.13 | 53.28 | 10.165 | 3.095 | -2.698 |
| 5/9/2003 | 15:41:51 | 199 | 3.316666667 | 53.28 | 10.175 | 3.281667 | -2.688 |
| 5/9/2003 | 15:42:03 | 210.9 | 3.515 | 53.28 | 10.184 | 3.48 | -2.679 |
| 5/9/2003 | 15:42:16 | 223.5 | 3.725 | 53.28 | 10.193 | 3.69 | -2.67 |
| 5/9/2003 | 15:42:29 | 236.8 | 3.946666667 | 53.28 | 10.208 | 3.911667 | -2.655 |
| 5/9/2003 | 15:42:43 | 250.9 | 4.181666667 | 53.28 | 10.218 | 4.146667 | -2.645 |
| 5/9/2003 | 15:42:58 | 265.8 | 4.43 | 53.28 | 10.229 | 4.395 | -2.634 |
| 5/9/2003 | 15:43:14 | 281.6 | 4.693333333 | 53.28 | 10.242 | 4.658333 | -2.621 |
| 5/9/2003 | 15:43:31 | 298.4 | 4.973333333 | 53.28 | 10.255 | 4.938333 | -2.608 |
| 5/9/2003 | 15:43:49 | 316.2 | 5.27 | 53.28 | 10.27 | 5.235 | -2.593 |
| 5/9/2003 | 15:44:07 | 335 | 5.583333333 | 53.25 | 10.283 | 5.548333 | -2.58 |
| 5/9/2003 | 15:44:27 | 354.9 | 5.915 | 53.25 | 10.296 | 5.88 | -2.567 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5/9/2003 | 15:44:48 | 376 | 6.266666667 | 53.25 | 10.313 | 6.231667 | -2.55 | | |
| 5/9/2003 | 15:45:11 | 398.4 | 6.64 | 53.25 | 10.33 | 6.605 | -2.533 | | |
| 5/9/2003 | 15:45:35 | 422.1 | 7.035 | 53.25 | 10.345 | 7 | -2.518 | | |
| 5/9/2003 | 15:46:00 | 447.2 | 7.453333333 | 53.25 | 10.364 | 7.418333 | -2.499 | | |
| 5/9/2003 | 15:46:26 | 473.8 | 7.896666667 | 53.25 | 10.382 | 7.861667 | -2.481 | | |
| 5/9/2003 | 15:46:54 | 502 | 8.366666667 | 53.25 | 10.401 | 8.331667 | -2.462 | | |
| 5/9/2003 | 15:47:24 | 531.9 | 8.865 | 53.25 | 10.425 | 8.83 | -2.438 | | |
| 5/9/2003 | 15:47:56 | 563.5 | 9.391666667 | 53.25 | 10.44 | 9.356667 | -2.423 | | |
| 5/9/2003 | 15:48:29 | 597 | 9.95 | 53.25 | 10.459 | 9.915 | -2.404 | | |
| 5/9/2003 | 15:49:05 | 632.5 | 10.54166667 | 53.25 | 10.481 | 10.50667 | -2.382 | | |
| 5/9/2003 | 15:49:43 | 670.1 | 11.16833333 | 53.25 | 10.502 | 11.13333 | -2.361 | | |
| 5/9/2003 | 15:50:22 | 709.9 | 11.83166667 | 53.25 | 10.524 | 11.79667 | -2.339 | | |
| 5/9/2003 | 15:51:05 | 752.1 | 12.535 | 53.25 | 10.548 | 12.5 | -2.315 | | |
| 5/9/2003 | 15:51:49 | 796.8 | 13.28 | 53.25 | 10.573 | 13.245 | -2.29 | Plotted shaded values. | |
| 5/9/2003 | 15:52:37 | 844.2 | 14.07 | 53.25 | 10.599 | 14.035 | -2.264 | adjusted time | h/ho |
| 5/9/2003 | 15:53:27 | 894.4 | 14.90666667 | 53.25 | 10.623 | 14.87167 | -2.24 | 0.000 | 1.000 |
| 5/9/2003 | 15:54:20 | 947.5 | 15.79166667 | 53.25 | 10.649 | 15.75667 | -2.214 | 0.885 | 0.988 |
| 5/9/2003 | 15:55:16 | 1003.8 | 16.73 | 53.25 | 10.675 | 16.695 | -2.188 | 1.823 | 0.977 |
| 5/9/2003 | 15:56:16 | 1063.4 | 17.72333333 | 53.25 | 10.705 | 17.68833 | -2.158 | 2.817 | 0.963 |
| 5/9/2003 | 15:57:19 | 1126.6 | 18.77666667 | 53.25 | 10.733 | 18.74167 | -2.13 | 3.870 | 0.951 |
| 5/9/2003 | 15:58:26 | 1193.5 | 19.89166667 | 53.25 | 10.763 | 19.85667 | -2.1 | 4.985 | 0.938 |
| 5/9/2003 | 15:59:37 | 1264.4 | 21.07333333 | 53.25 | 10.793 | 21.03833 | -2.07 | 6.167 | 0.924 |
| 5/9/2003 | 16:00:52 | 1339.5 | 22.325 | 53.25 | 10.827 | 22.29 | -2.036 | 7.418 | 0.909 |
| 5/9/2003 | 16:02:11 | 1419 | 23.65 | 53.25 | 10.858 | 23.615 | -2.005 | 8.743 | 0.895 |
| 5/9/2003 | 16:03:36 | 1503.3 | 25.055 | 53.25 | 10.892 | 25.02 | -1.971 | 10.148 | 0.880 |
| 5/9/2003 | 16:05:05 | 1592.6 | 26.54333333 | 53.25 | 10.926 | 26.50833 | -1.937 | 11.637 | 0.865 |
| 5/9/2003 | 16:06:40 | 1687.1 | 28.11833333 | 53.25 | 10.961 | 28.08333 | -1.902 | 13.212 | 0.849 |
| 5/9/2003 | 16:08:20 | 1787.2 | 29.78666667 | 53.28 | 10.996 | 29.75167 | -1.867 | 14.880 | 0.833 |
| 5/9/2003 | 16:10:06 | 1893.3 | 31.555 | 53.25 | 11.032 | 31.52 | -1.831 | 16.648 | 0.817 |
| 5/9/2003 | 16:11:58 | 2005.7 | 33.42833333 | 53.25 | 11.068 | 33.39333 | -1.795 | 18.522 | 0.801 |
| 5/9/2003 | 16:13:57 | 2124.7 | 35.41166667 | 53.25 | 11.105 | 35.37667 | -1.758 | 20.505 | 0.785 |
| 5/9/2003 | 16:16:03 | 2250.8 | 37.51333333 | 53.25 | 11.146 | 37.47833 | -1.717 | 22.607 | 0.767 |
| 5/9/2003 | 16:18:17 | 2384.4 | 39.74 | 53.25 | 11.183 | 39.705 | -1.68 | 24.833 | 0.750 |
| 5/9/2003 | 16:20:38 | 2525.9 | 42.09833333 | 53.25 | 11.223 | 42.06333 | -1.64 | 27.192 | 0.732 |
| 5/9/2003 | 16:23:08 | 2675.8 | 44.59666667 | 53.25 | 11.264 | 44.56167 | -1.599 | 29.690 | 0.714 |
| 5/9/2003 | 16:25:47 | 2834.6 | 47.24333333 | 53.25 | 11.299 | 47.20833 | -1.564 | 32.337 | 0.698 |
| 5/9/2003 | 16:28:35 | 3002.8 | 50.04666667 | 53.25 | 11.338 | 50.01167 | -1.525 | 35.140 | 0.681 |
| 5/9/2003 | 16:31:33 | 3180.9 | 53.015 | 53.25 | 11.38 | 52.98 | -1.483 | 38.108 | 0.662 |
| 5/9/2003 | 16:34:42 | 3369.6 | 56.16 | 53.25 | 11.419 | 56.125 | -1.444 | 41.253 | 0.645 |
| 5/9/2003 | 16:38:02 | 3569.5 | 59.49166667 | 53.25 | 11.46 | 59.45667 | -1.403 | 44.585 | 0.626 |
| 5/9/2003 | 16:41:34 | 3781.2 | 63.02 | 53.25 | 11.499 | 62.985 | -1.364 | 48.113 | 0.609 |
| 5/9/2003 | 16:45:18 | 4005.5 | 66.75833333 | 53.25 | 11.54 | 66.72333 | -1.323 | 51.852 | 0.591 |
| 5/9/2003 | 16:49:16 | 4243.1 | 70.71833333 | 53.25 | 11.576 | 70.68333 | -1.287 | 55.812 | 0.575 |
| 5/9/2003 | 16:53:27 | 4494.7 | 74.91166667 | 53.28 | 11.618 | 74.87667 | -1.245 | 60.005 | 0.556 |
| 5/9/2003 | 16:57:54 | 4761.3 | 79.355 | 53.25 | 11.658 | 79.32 | -1.205 | 64.448 | 0.538 |
| 5/9/2003 | 17:02:36 | 5043.7 | 84.06166667 | 53.25 | 11.697 | 84.02667 | -1.166 | 69.155 | 0.521 |
| 5/9/2003 | 17:07:35 | 5342.8 | 89.04666667 | 53.25 | 11.736 | 89.01167 | -1.127 | 74.140 | 0.503 |
| 5/9/2003 | 17:12:52 | 5659.6 | 94.32666667 | 53.25 | 11.774 | 94.29167 | -1.089 | 79.420 | 0.486 |
| 5/9/2003 | 17:18:28 | 5995.2 | 99.92 | 53.23 | 11.813 | 99.885 | -1.05 | 85.013 | 0.469 |
| 5/9/2003 | 17:24:23 | 6350.7 | 105.845 | 53.25 | 11.848 | 105.81 | -1.015 | 90.938 | 0.453 |
| 5/9/2003 | 17:30:40 | 6727.2 | 112.12 | 53.25 | 11.891 | 112.085 | -0.972 | 97.213 | 0.434 |
| 5/9/2003 | 17:37:19 | 7126.1 | 118.7683333 | 53.23 | 11.918 | 118.7333 | -0.945 | 103.862 | 0.422 |
| 5/9/2003 | 17:43:48 | 7548.6 | 125.81 | 53.25 | 11.953 | 125.775 | -0.91 | 110.903 | 0.406 |
| 5/9/2003 | 17:50:19 | 7939.7 | 132.3283333 | 53.23 | 11.988 | 132.2933 | -0.875 | 117.422 | 0.391 |
| 5/9/2003 | 17:56:49 | 8329.2 | 138.82 | 53.25 | 12.023 | 138.785 | -0.84 | 123.913 | 0.375 |
| 5/9/2003 | 18:03:23 | 8783.4 | 146.39 | 53.23 | 12.057 | 146.355 | -0.806 | 131.483 | 0.360 |
| 5/9/2003 | 18:12:28 | 9328.8 | 155.48 | 53.25 | 12.092 | 155.445 | -0.771 | 140.573 | 0.344 |
| 5/9/2003 | 18:22:40 | 9940.8 | 165.68 | 53.23 | 12.126 | 165.645 | -0.737 | 150.773 | 0.329 |
| 5/9/2003 | 18:34:12 | 10632.8 | 177.2133333 | 53.25 | 12.16 | 177.1783 | -0.703 | 162.307 | 0.314 |

APPENDIX E.2
SWMU 13
AQUIFER CHARACTERISTICS, CALCULATIONS, AND RECORDS
ROUND 2

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT30 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Falling head | **Test Date:** | 24-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 2 = R |
| Length of Well Screen (ft.) : | 13 = L |
| Time for 37% head change (min.) : | 19.20 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 6.06E-05 | ft./min. |
| 1.01E-06 | ft./sec. |
| 8.73E-02 | ft./day |
| 3.08E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 13MWT30

PROJECT NO.: 9060 GEOLOGIST: M. G. COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 11.91 TOC DATE: 11-24-03

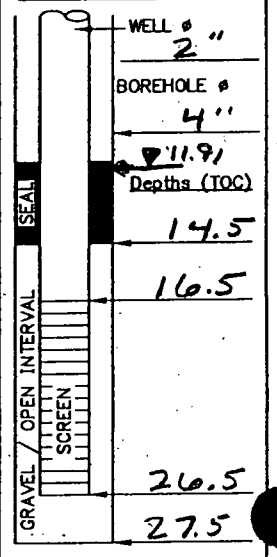
TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: SOLID SLUG PAGE 1 OF 1

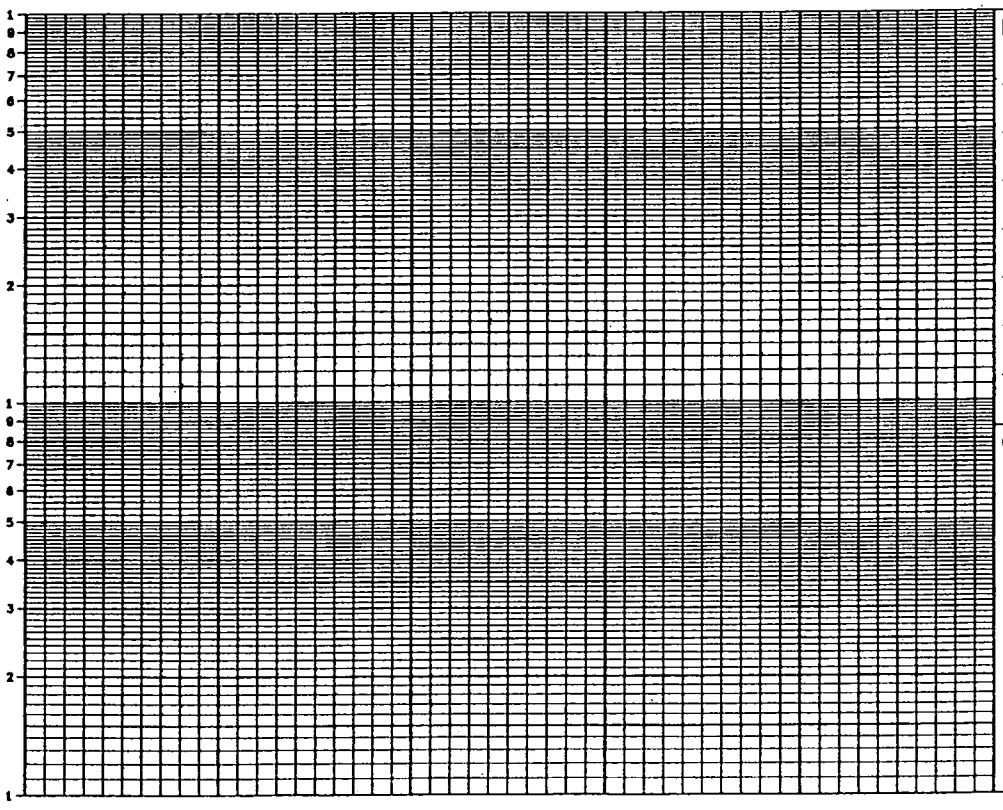
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC, ZERO AT SWL + START

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 0 | | 3.0 | 1.631 | |
| .1 | 2.726 | | 4.0 | 1.522 | |
| .2 | 2.480 | | 5.0 | 1.435 | |
| .3 | 2.410 | | 8.0 | 1.211 | |
| .4 | 2.348 | | 10.0 | 1.106 | |
| .5 | 2.291 | | 15.0 | .888 | |
| .6 | 2.240 | | 20.0 | .719 | |
| .7 | 2.186 | | 25.0 | .577 | |
| .8 | 2.144 | | 30.0 | .461 | |
| .9 | 2.104 | | 35.0 | .369 | |
| 1.0 | 2.062 | | 40.0 | .297 | |
| 2.0 | 1.773 | | 45.0 | .234 | |

WELL SCHEMATIC



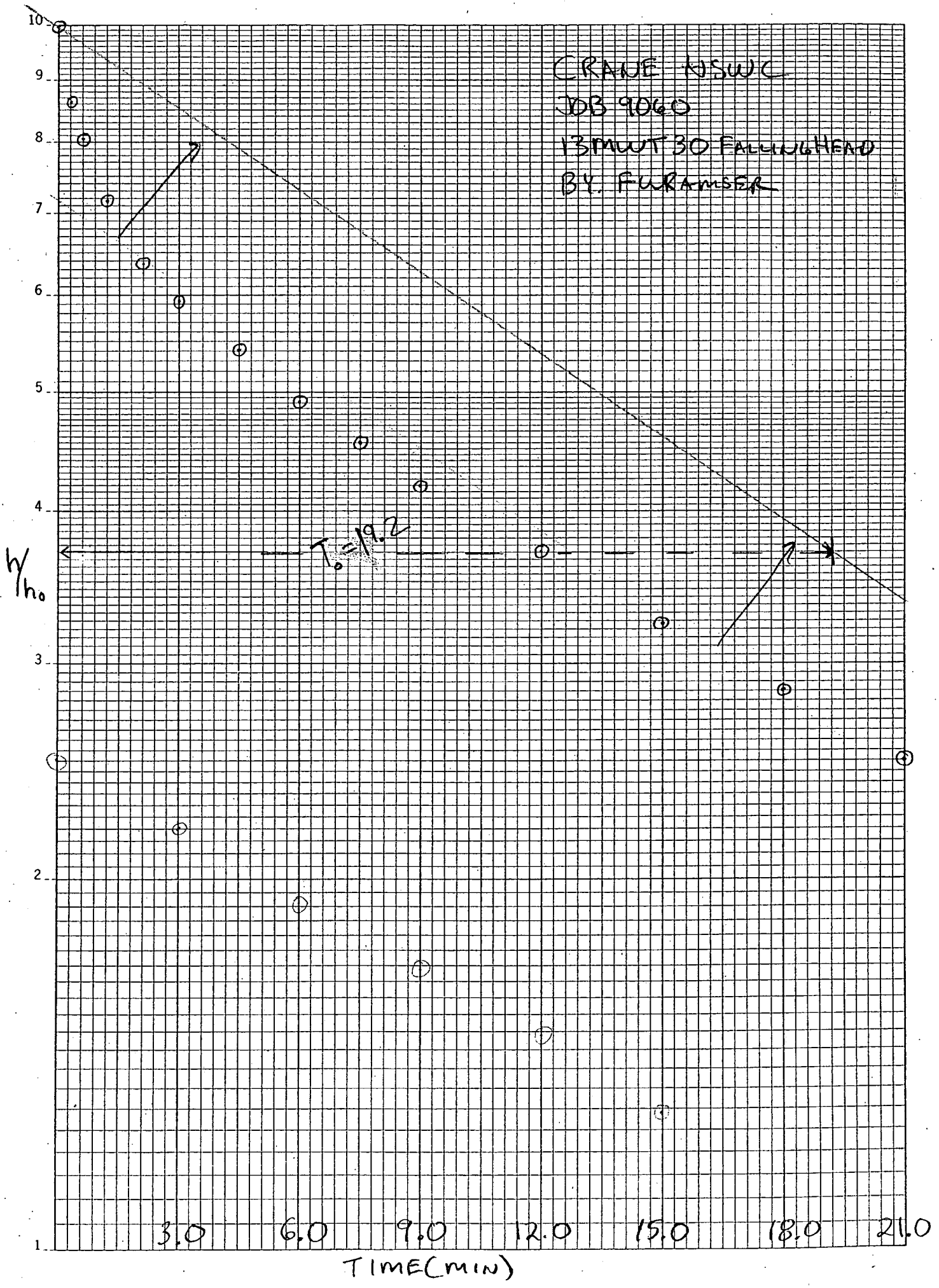

▽ Indicate SWL Depth on Drawing



REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD: FORM_HYDCONTST.dwg 07/06/99 INL




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 12/4/2003 9:54:57
Report from file: C:\Win-Situ\Data\SN00916 2003-11-24 105718 13MWT30falling#1.bin
DataMgr Version 3.68

Serial number: 916
Firmware Version 3.07
Unit name:

Test name: 13MWT30falling#1

Test defined on: 11/24/2003 10:54:07
Test started on: 11/24/2003 10:57:18
Test stopped on: 11/24/2003 11:43:48
Test extracted on: N/A

Data gathered using Linear testing
Time between data points: Minutes.
Number of data samples: 465

TOTAL DATA SAMPLES 465

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at reference: 14.787 Feet H2O

• = PLOTTED DATA

ho = 2.726

| Date | Time | ET (min) | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho |
|---|---|---|---|---|---|
| 11/24/2003 | 10:57 | 0 | 0 | | |
| 11/24/2003 | 10:57 | 0.1 | 2.726 | 0 | 1.000 • |
| 11/24/2003 | 10:57 | 0.2 | 2.48 | 0.1 | 0.910 |
| 11/24/2003 | 10:57 | 0.3 | 2.41 | 0.2 | 0.884 |
| 11/24/2003 | 10:57 | 0.4 | 2.348 | 0.3 | 0.861 • |
| 11/24/2003 | 10:57 | 0.5 | 2.291 | 0.4 | 0.840 |
| 11/24/2003 | 10:57 | 0.6 | 2.24 | 0.5 | 0.822 |
| 11/24/2003 | 10:58 | 0.7 | 2.186 | 0.6 | 0.802 • |
| 11/24/2003 | 10:58 | 0.8 | 2.144 | 0.7 | 0.787 |
| 11/24/2003 | 10:58 | 0.9 | 2.104 | 0.8 | 0.772 |
| 11/24/2003 | 10:58 | 1 | 2.062 | 0.9 | 0.756 |
| 11/24/2003 | 10:58 | 1.1 | 2.022 | 1 | 0.742 |
| 11/24/2003 | 10:58 | 1.2 | 1.988 | 1.1 | 0.729 |
| 11/24/2003 | 10:58 | 1.3 | 1.955 | 1.2 | 0.717 • |
| 11/24/2003 | 10:58 | 1.4 | 1.924 | 1.3 | 0.706 |
| 11/24/2003 | 10:58 | 1.5 | 1.895 | 1.4 | 0.695 |
| 11/24/2003 | 10:58 | 1.6 | 1.87 | 1.5 | 0.686 |
| 11/24/2003 | 10:59 | 1.7 | 1.846 | 1.6 | 0.677 |
| 11/24/2003 | 10:59 | 1.8 | 1.822 | 1.7 | 0.668 |
| 11/24/2003 | 10:59 | 1.9 | 1.797 | 1.8 | 0.659 |
| 11/24/2003 | 10:59 | 2 | 1.773 | 1.9 | 0.650 |

| | | | | |
|---|---|---|---|---|
| 11/24/2003 10:59 | 2.1 | 1.755 | 2 | 0.644 |
| 11/24/2003 10:59 | 2.2 | 1.739 | 2.1 | 0.638 |
| 11/24/2003 10:59 | 2.3 | 1.719 | 2.2 | 0.631 |
| 11/24/2003 10:59 | 2.4 | 1.708 | 2.3 | 0.627 |
| 11/24/2003 10:59 | 2.5 | 1.691 | 2.4 | 0.620 |
| 11/24/2003 10:59 | 2.6 | 1.677 | 2.5 | 0.615 |
| 11/24/2003 11:00 | 2.7 | 1.666 | 2.6 | 0.611 |
| 11/24/2003 11:00 | 2.8 | 1.653 | 2.7 | 0.606 |
| 11/24/2003 11:00 | 2.9 | 1.642 | 2.8 | 0.602 |
| 11/24/2003 11:00 | 3 | 1.631 | 2.9 | 0.598 |
| 11/24/2003 11:00 | 3.1 | 1.617 | 3 | 0.593 |
| 11/24/2003 11:00 | 3.2 | 1.606 | 3.1 | 0.589 |
| 11/24/2003 11:00 | 3.3 | 1.593 | 3.2 | 0.584 |
| 11/24/2003 11:00 | 3.4 | 1.582 | 3.3 | 0.580 |
| 11/24/2003 11:00 | 3.5 | 1.573 | 3.4 | 0.577 |
| 11/24/2003 11:00 | 3.6 | 1.562 | 3.5 | 0.573 |
| 11/24/2003 11:01 | 3.7 | 1.553 | 3.6 | 0.570 |
| 11/24/2003 11:01 | 3.8 | 1.542 | 3.7 | 0.566 |
| 11/24/2003 11:01 | 3.9 | 1.533 | 3.8 | 0.562 |
| 11/24/2003 11:01 | 4 | 1.522 | 3.9 | 0.558 |
| 11/24/2003 11:01 | 4.1 | 1.515 | 4 | 0.556 |
| 11/24/2003 11:01 | 4.2 | 1.506 | 4.1 | 0.552 |
| 11/24/2003 11:01 | 4.3 | 1.495 | 4.2 | 0.548 |
| 11/24/2003 11:01 | 4.4 | 1.486 | 4.3 | 0.545 |
| 11/24/2003 11:01 | 4.5 | 1.477 | 4.4 | 0.542 |
| 11/24/2003 11:01 | 4.6 | 1.471 | 4.5 | 0.540 |
| 11/24/2003 11:02 | 4.7 | 1.459 | 4.6 | 0.535 |
| 11/24/2003 11:02 | 4.8 | 1.448 | 4.7 | 0.531 |
| 11/24/2003 11:02 | 4.9 | 1.444 | 4.8 | 0.530 |
| 11/24/2003 11:02 | 5 | 1.435 | 4.9 | 0.526 |
| 11/24/2003 11:02 | 5.1 | 1.426 | 5 | 0.523 |
| 11/24/2003 11:02 | 5.2 | 1.417 | 5.1 | 0.520 |
| 11/24/2003 11:02 | 5.3 | 1.404 | 5.2 | 0.515 |
| 11/24/2003 11:02 | 5.4 | 1.399 | 5.3 | 0.513 |
| 11/24/2003 11:02 | 5.5 | 1.393 | 5.4 | 0.511 |
| 11/24/2003 11:02 | 5.6 | 1.382 | 5.5 | 0.507 |
| 11/24/2003 11:03 | 5.7 | 1.375 | 5.6 | 0.504 |
| 11/24/2003 11:03 | 5.8 | 1.366 | 5.7 | 0.501 |
| 11/24/2003 11:03 | 5.9 | 1.355 | 5.8 | 0.497 |
| 11/24/2003 11:03 | 6 | 1.348 | 5.9 | 0.494 |
| 11/24/2003 11:03 | 6.1 | 1.342 | 6 | 0.492 |
| 11/24/2003 11:03 | 6.2 | 1.333 | 6.1 | 0.489 |
| 11/24/2003 11:03 | 6.3 | 1.326 | 6.2 | 0.486 |
| 11/24/2003 11:03 | 6.4 | 1.319 | 6.3 | 0.484 |
| 11/24/2003 11:03 | 6.5 | 1.313 | 6.4 | 0.482 |
| 11/24/2003 11:03 | 6.6 | 1.306 | 6.5 | 0.479 |
| 11/24/2003 11:04 | 6.7 | 1.297 | 6.6 | 0.476 |
| 11/24/2003 11:04 | 6.8 | 1.293 | 6.7 | 0.474 |
| 11/24/2003 11:04 | 6.9 | 1.286 | 6.8 | 0.472 |
| 11/24/2003 11:04 | 7 | 1.277 | 6.9 | 0.468 |
| 11/24/2003 11:04 | 7.1 | 1.271 | 7 | 0.466 |
| 11/24/2003 11:04 | 7.2 | 1.264 | 7.1 | 0.464 |
| 11/24/2003 11:04 | 7.3 | 1.257 | 7.2 | 0.461 |
| 11/24/2003 11:04 | 7.4 | 1.253 | 7.3 | 0.460 |
| 11/24/2003 11:04 | 7.5 | 1.244 | 7.4 | 0.456 |
| 11/24/2003 11:04 | 7.6 | 1.239 | 7.5 | 0.455 |
| 11/24/2003 11:05 | 7.7 | 1.233 | 7.6 | 0.452 |
| 11/24/2003 11:05 | 7.8 | 1.224 | 7.7 | 0.449 |
| 11/24/2003 11:05 | 7.9 | 1.217 | 7.8 | 0.446 |
| 11/24/2003 11:05 | 8 | 1.211 | 7.9 | 0.444 |

| | | | | |
|---|---|---|---|---|
| 11/24/2003 11:05 | 8.1 | 1.206 | 8 | 0.442 |
| 11/24/2003 11:05 | 8.2 | 1.202 | 8.1 | 0.441 |
| 11/24/2003 11:05 | 8.3 | 1.195 | 8.2 | 0.438 |
| 11/24/2003 11:05 | 8.4 | 1.184 | 8.3 | 0.434 |
| 11/24/2003 11:05 | 8.5 | 1.173 | 8.4 | 0.430 |
| 11/24/2003 11:05 | 8.6 | 1.175 | 8.5 | 0.431 |
| 11/24/2003 11:06 | 8.7 | 1.173 | 8.6 | 0.430 |
| 11/24/2003 11:06 | 8.8 | 1.168 | 8.7 | 0.428 |
| 11/24/2003 11:06 | 8.9 | 1.162 | 8.8 | 0.426 |
| 11/24/2003 11:06 | 9 | 1.157 | 8.9 | 0.424 |
| 11/24/2003 11:06 | 9.1 | 1.151 | 9 | 0.422 |
| 11/24/2003 11:06 | 9.2 | 1.146 | 9.1 | 0.420 |
| 11/24/2003 11:06 | 9.3 | 1.142 | 9.2 | 0.419 |
| 11/24/2003 11:06 | 9.4 | 1.135 | 9.3 | 0.416 |
| 11/24/2003 11:06 | 9.5 | 1.131 | 9.4 | 0.415 |
| 11/24/2003 11:06 | 9.6 | 1.126 | 9.5 | 0.413 |
| 11/24/2003 11:07 | 9.7 | 1.122 | 9.6 | 0.412 |
| 11/24/2003 11:07 | 9.8 | 1.115 | 9.7 | 0.409 |
| 11/24/2003 11:07 | 9.9 | 1.11 | 9.8 | 0.407 |
| 11/24/2003 11:07 | 10 | 1.106 | 9.9 | 0.406 |
| 11/24/2003 11:07 | 10.1 | 1.1 | 10 | 0.404 |
| 11/24/2003 11:08 | 11.1 | 1.055 | 11 | 0.387 |
| 11/24/2003 11:09 | 12.1 | 1.011 | 12 | 0.371 |
| 11/24/2003 11:10 | 13.1 | 0.966 | 13 | 0.354 |
| 11/24/2003 11:11 | 14.1 | 0.919 | 14 | 0.337 |
| 11/24/2003 11:12 | 15.1 | 0.881 | 15 | 0.323 |
| 11/24/2003 11:13 | 16.1 | 0.846 | 16 | 0.310 |
| 11/24/2003 11:14 | 17.1 | 0.808 | 17 | 0.296 |
| 11/24/2003 11:15 | 18.1 | 0.777 | 18 | 0.285 |
| 11/24/2003 11:16 | 19.1 | 0.746 | 19 | 0.274 |
| 11/24/2003 11:17 | 20.1 | 0.712 | 20 | 0.261 |
| 11/24/2003 11:18 | 21.1 | 0.681 | 21 | 0.250 |
| 11/24/2003 11:19 | 22.1 | 0.655 | 22 | 0.240 |
| 11/24/2003 11:20 | 23.1 | 0.626 | 23 | 0.230 |
| 11/24/2003 11:21 | 24.1 | 0.601 | 24 | 0.220 |
| 11/24/2003 11:22 | 25.1 | 0.575 | 25 | 0.211 |
| 11/24/2003 11:23 | 26.1 | 0.546 | 26 | 0.200 |
| 11/24/2003 11:24 | 27.1 | 0.521 | 27 | 0.191 |
| 11/24/2003 11:25 | 28.1 | 0.499 | 28 | 0.183 |
| 11/24/2003 11:26 | 29.1 | 0.481 | 29 | 0.176 |
| 11/24/2003 11:27 | 30.1 | 0.459 | 30 | 0.168 |
| 11/24/2003 11:28 | 31.1 | 0.439 | 31 | 0.161 |
| 11/24/2003 11:29 | 32.1 | 0.423 | 32 | 0.155 |
| 11/24/2003 11:30 | 33.1 | 0.406 | 33 | 0.149 |
| 11/24/2003 11:31 | 34.1 | 0.382 | 34 | 0.140 |
| 11/24/2003 11:32 | 35.1 | 0.369 | 35 | 0.135 |
| 11/24/2003 11:33 | 36.1 | 0.352 | 36 | 0.129 |
| 11/24/2003 11:34 | 37.1 | 0.338 | 37 | 0.124 |
| 11/24/2003 11:35 | 38.1 | 0.325 | 38 | 0.119 |
| 11/24/2003 11:36 | 39.1 | 0.312 | 39 | 0.114 |
| 11/24/2003 11:37 | 40.1 | 0.299 | 40 | 0.110 |
| 11/24/2003 11:38 | 41.1 | 0.285 | 41 | 0.105 |
| 11/24/2003 11:39 | 42.1 | 0.27 | 42 | 0.099 |
| 11/24/2003 11:40 | 43.1 | 0.254 | 43 | 0.093 |
| 11/24/2003 11:41 | 44.1 | 0.245 | 44 | 0.090 |
| 11/24/2003 11:42 | 45.1 | 0.234 | 45 | 0.086 |
| 11/24/2003 11:43 | 46.1 | 0.221 | 46 | 0.081 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

**Project Name:** Crane NSWC
**Project No.:** 9060
**Test Type:** Falling head

**Well/Boring No.:** 13MWT30
**Aquifer Type:** Bedrock
**Test Date:** 24-Nov-03

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083" | 1 = r |
| Effective Radius of Well Screen (in.) : | .166" | 2 = R |
| Length of Well Screen (ft.) : | | 13 = L |
| Time for 37% head change (min.) : | | 19.20 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 6.06E-05 | ft./min. |
| 1.01E-06 | ft./sec. |
| 8.73E-02 | ft./day |
| 3.08E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(13/.166)}{2 \times 13 \times 19.20} =$$

6.02 x 10-5 Ft/min

CHECKED

2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

**Project Name:** Crane NSWC
**Project No.:** 9060
**Test Type:** Rising head

**Well/Boring No.:** 13MWT30
**Aquifer Type:** Bedrock
**Test Date:** 24-Nov-03

**Done By:** FWRamser
**Checked By:**

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 2 = R |
| Length of Well Screen (ft.) : | 13 = L |
| Time for 37% head change (min.) : | 27.60 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 4.22E-05 | ft./min. |
| 7.03E-07 | ft./sec. |
| 6.07E-02 | ft./day |
| 2.14E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 13MWT30

PROJECT NO.: 9060 GEOLOGIST: M. G. COCHRAN

WELL DIAMETER: SCREEN LENGTH/DEPTH: 10' TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 11.91 TOC DATE: 11-24-03

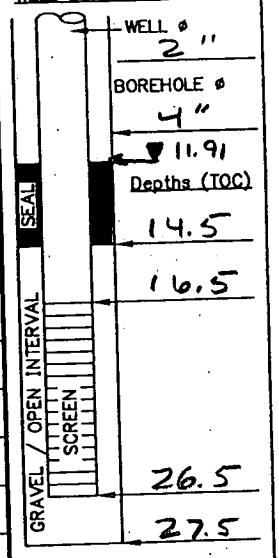
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: SOLID SLUG PAGE 1 OF 1

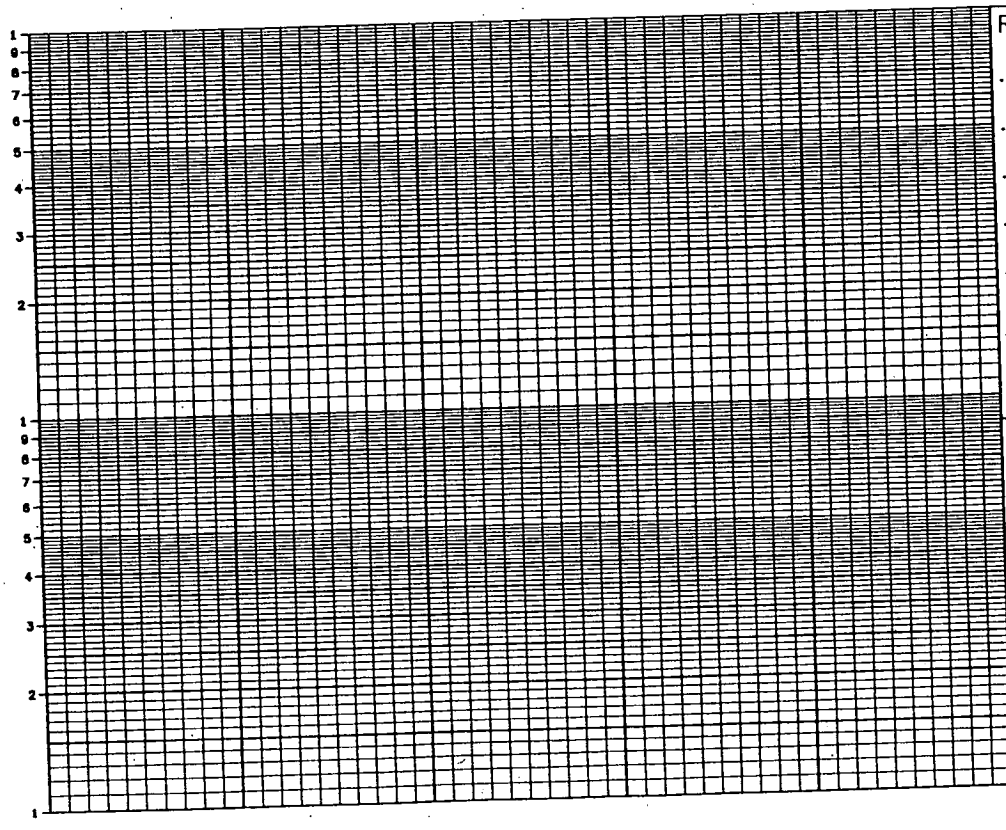
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC, ZERO AT SWL + START

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 0 | | 3.0 | -1.670 | |
| .1 | -2.633 | | 4.0 | -1.594 | |
| .2 | -2.509 | | 5.0 | -1.532 | |
| .3 | -2.418 | | 8.0 | -1.369 | |
| .4 | -2.345 | | 10.0 | -1.278 | |
| .5 | -2.282 | | 20 | -.980 | |
| .6 | -2.227 | | 30 | -.800 | |
| .7 | -2.171 | | 40 | -.672 | |
| .8 | -2.127 | | 50 | -.581 | |
| .9 | -2.082 | | 60 | -.521 | |
| 1.0 | -2.049 | | 70 | -.470 | |
| 2.0 | -1.799 | | 72 | -.464 | |

WELL SCHEMATIC



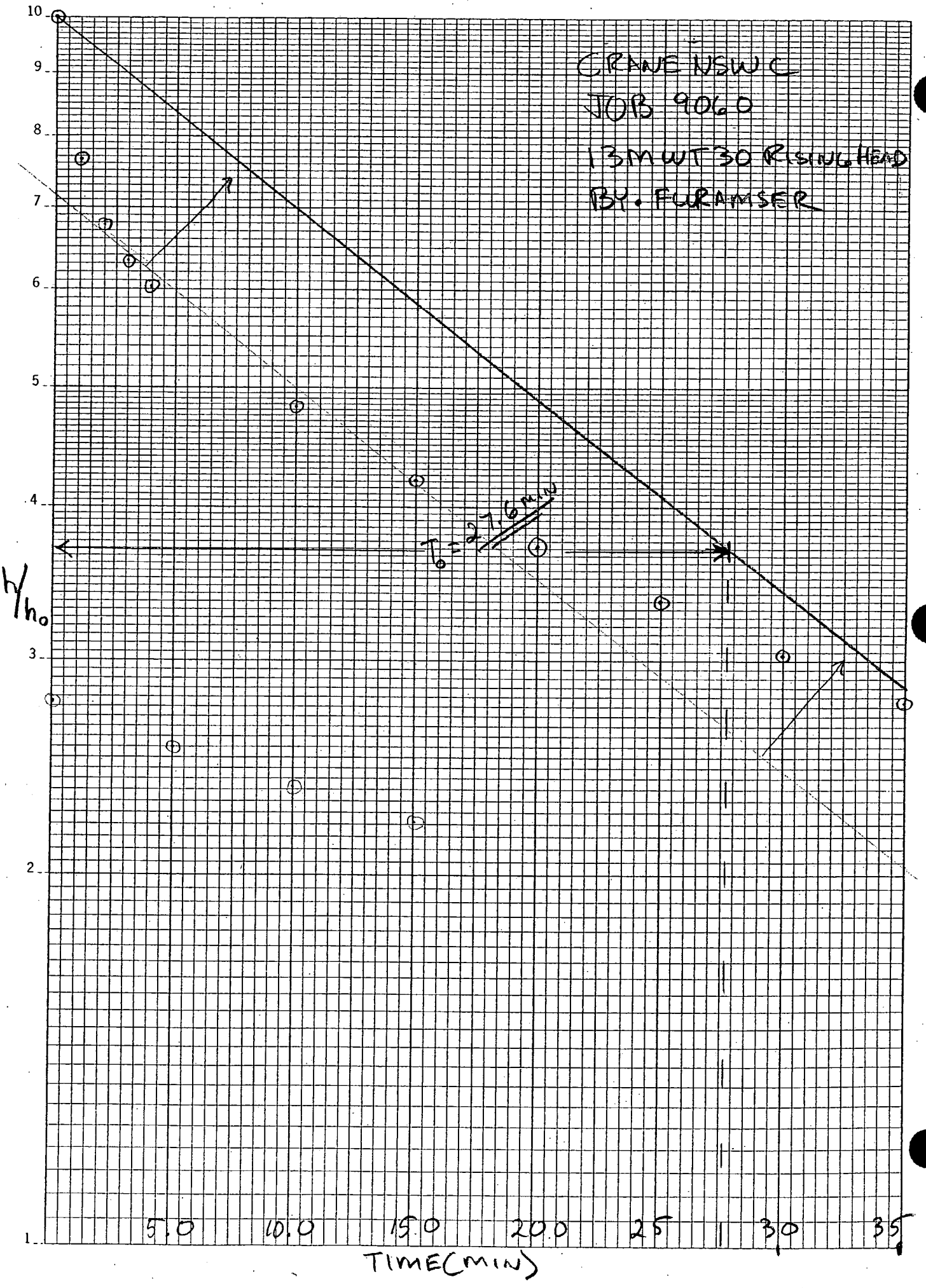

▽ Indicate SWL Depth on Drawing



REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD: FORM_HYDCONTST.dwg 07/06/99 INL




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 12/4/2003 9:57:27
Report from file: C:\Win-Situ\Data\SN00916 2003-11-24 114516 13MWT30rising#1.bin
DataMgr Version 3.68

Serial number: 916
Firmware Version 3.07
Unit name:

Test name: 13MWT30rising#1

Test defined on: 11/24/2003 11:44:46
Test started on: 11/24/2003 11:45:16
Test stopped on: 11/24/2003 12:57:17
Test extracted on: N/A

Data gathered using Linear testing
Time between data points: 0.10 Minutes.
Number of data samples: 721

TOTAL DATA SAMPLES 721

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at reference: 14.991 Feet H2O

• = PLOTTED DATA

| Date | Time | ET (min) | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho | ho = -2.633 |
|---|---|---|---|---|---|---|
| 11/24/2003 | 11:45 | 0 | 0 | | | |
| 11/24/2003 | 11:45 | 0.1 | -2.633 | 0 | 1.000 | • |
| 11/24/2003 | 11:45 | 0.2 | -2.509 | 0.1 | 0.953 | |
| 11/24/2003 | 11:45 | 0.3 | -2.418 | 0.2 | 0.918 | |
| 11/24/2003 | 11:45 | 0.4 | -2.345 | 0.3 | 0.891 | |
| 11/24/2003 | 11:45 | 0.5 | -2.282 | 0.4 | 0.867 | |
| 11/24/2003 | 11:45 | 0.6 | -2.227 | 0.5 | 0.846 | |
| 11/24/2003 | 11:45 | 0.7 | -2.171 | 0.6 | 0.825 | |
| 11/24/2003 | 11:46 | 0.8 | -2.127 | 0.7 | 0.808 | |
| 11/24/2003 | 11:46 | 0.9 | -2.082 | 0.8 | 0.791 | |
| 11/24/2003 | 11:46 | 1 | -2.049 | 0.9 | 0.778 | |
| 11/24/2003 | 11:46 | 1.1 | -2.009 | 1 | 0.763 | • |
| 11/24/2003 | 11:46 | 1.2 | -1.973 | 1.1 | 0.749 | |
| 11/24/2003 | 11:46 | 1.3 | -1.945 | 1.2 | 0.739 | |
| 11/24/2003 | 11:46 | 1.4 | -1.918 | 1.3 | 0.728 | |
| 11/24/2003 | 11:46 | 1.5 | -1.813 | 1.4 | 0.689 | |
| 11/24/2003 | 11:46 | 1.6 | -1.805 | 1.5 | 0.686 | |
| 11/24/2003 | 11:46 | 1.7 | -1.803 | 1.6 | 0.685 | |
| 11/24/2003 | 11:47 | 1.8 | -1.801 | 1.7 | 0.684 | |
| 11/24/2003 | 11:47 | 1.9 | -1.801 | 1.8 | 0.684 | |
| 11/24/2003 | 11:47 | 2 | -1.799 | 1.9 | 0.683 | |
| 11/24/2003 | 11:47 | 2.1 | -1.787 | 2 | 0.679 | • |
| 11/24/2003 | 11:47 | 2.2 | -1.769 | 2.1 | 0.672 | |
| 11/24/2003 | 11:47 | 2.3 | -1.754 | 2.2 | 0.666 | |
| 11/24/2003 | 11:47 | 2.4 | -1.743 | 2.3 | 0.662 | |
| 11/24/2003 | 11:47 | 2.5 | -1.73 | 2.4 | 0.657 | |
| 11/24/2003 | 11:47 | 2.6 | -1.721 | 2.5 | 0.654 | |
| 11/24/2003 | 11:47 | 2.7 | -1.705 | 2.6 | 0.648 | |
| 11/24/2003 | 11:48 | 2.8 | -1.694 | 2.7 | 0.643 | |

| | | | | |
|---|---|---|---|---|
| 11/24/2003 11:48 | 2.9 | -1.681 | 2.8 | 0.638 |
| 11/24/2003 11:48 | 3 | -1.67 | 2.9 | 0.634 |
| 11/24/2003 11:48 | 3.1 | -1.663 | 3 | 0.632 |
| 11/24/2003 11:48 | 3.2 | -1.652 | 3.1 | 0.627 |
| 11/24/2003 11:48 | 3.3 | -1.647 | 3.2 | 0.626 |
| 11/24/2003 11:48 | 3.4 | -1.638 | 3.3 | 0.622 |
| 11/24/2003 11:48 | 3.5 | -1.627 | 3.4 | 0.618 |
| 11/24/2003 11:48 | 3.6 | -1.621 | 3.5 | 0.616 |
| 11/24/2003 11:48 | 3.7 | -1.614 | 3.6 | 0.613 |
| 11/24/2003 11:49 | 3.8 | -1.607 | 3.7 | 0.610 |
| 11/24/2003 11:49 | 3.9 | -1.6 | 3.8 | 0.608 |
| 11/24/2003 11:49 | 4 | -1.594 | 3.9 | 0.605 |
| 11/24/2003 11:49 | 4.1 | -1.589 | 4 | 0.603 |
| 11/24/2003 11:49 | 4.2 | -1.583 | 4.1 | 0.601 |
| 11/24/2003 11:49 | 4.3 | -1.576 | 4.2 | 0.599 |
| 11/24/2003 11:49 | 4.4 | -1.569 | 4.3 | 0.596 |
| 11/24/2003 11:49 | 4.5 | -1.563 | 4.4 | 0.594 |
| 11/24/2003 11:49 | 4.6 | -1.558 | 4.5 | 0.592 |
| 11/24/2003 11:49 | 4.7 | -1.549 | 4.6 | 0.588 |
| 11/24/2003 11:50 | 4.8 | -1.545 | 4.7 | 0.587 |
| 11/24/2003 11:50 | 4.9 | -1.536 | 4.8 | 0.583 |
| 11/24/2003 11:50 | 5 | -1.532 | 4.9 | 0.582 |
| 11/24/2003 11:50 | 5.1 | -1.525 | 5 | 0.579 |
| 11/24/2003 11:50 | 5.2 | -1.52 | 5.1 | 0.577 |
| 11/24/2003 11:50 | 5.3 | -1.514 | 5.2 | 0.575 |
| 11/24/2003 11:50 | 5.4 | -1.507 | 5.3 | 0.572 |
| 11/24/2003 11:50 | 5.5 | -1.498 | 5.4 | 0.569 |
| 11/24/2003 11:50 | 5.6 | -1.494 | 5.5 | 0.567 |
| 11/24/2003 11:50 | 5.7 | -1.489 | 5.6 | 0.566 |
| 11/24/2003 11:51 | 5.8 | -1.483 | 5.7 | 0.563 |
| 11/24/2003 11:51 | 5.9 | -1.476 | 5.8 | 0.561 |
| 11/24/2003 11:51 | 6 | -1.473 | 5.9 | 0.559 |
| 11/24/2003 11:51 | 6.1 | -1.467 | 6 | 0.557 |
| 11/24/2003 11:51 | 6.2 | -1.462 | 6.1 | 0.555 |
| 11/24/2003 11:51 | 6.3 | -1.458 | 6.2 | 0.554 |
| 11/24/2003 11:51 | 6.4 | -1.452 | 6.3 | 0.551 |
| 11/24/2003 11:51 | 6.5 | -1.447 | 6.4 | 0.550 |
| 11/24/2003 11:51 | 6.6 | -1.44 | 6.5 | 0.547 |
| 11/24/2003 11:51 | 6.7 | -1.433 | 6.6 | 0.544 |
| 11/24/2003 11:52 | 6.8 | -1.431 | 6.7 | 0.543 |
| 11/24/2003 11:52 | 6.9 | -1.425 | 6.8 | 0.541 |
| 11/24/2003 11:52 | 7 | -1.42 | 6.9 | 0.539 |
| 11/24/2003 11:52 | 7.1 | -1.416 | 7 | 0.538 |
| 11/24/2003 11:52 | 7.2 | -1.409 | 7.1 | 0.535 |
| 11/24/2003 11:52 | 7.3 | -1.405 | 7.2 | 0.534 |
| 11/24/2003 11:52 | 7.4 | -1.398 | 7.3 | 0.531 |
| 11/24/2003 11:52 | 7.5 | -1.393 | 7.4 | 0.529 |
| 11/24/2003 11:52 | 7.6 | -1.387 | 7.5 | 0.527 |
| 11/24/2003 11:52 | 7.7 | -1.385 | 7.6 | 0.526 |
| 11/24/2003 11:53 | 7.8 | -1.38 | 7.7 | 0.524 |
| 11/24/2003 11:53 | 7.9 | -1.373 | 7.8 | 0.521 |
| 11/24/2003 11:53 | 8 | -1.369 | 7.9 | 0.520 |
| 11/24/2003 11:53 | 8.1 | -1.365 | 8 | 0.518 |
| 11/24/2003 11:53 | 8.2 | -1.358 | 8.1 | 0.516 |
| 11/24/2003 11:53 | 8.3 | -1.351 | 8.2 | 0.513 |
| 11/24/2003 11:53 | 8.4 | -1.347 | 8.3 | 0.512 |
| 11/24/2003 11:53 | 8.5 | -1.342 | 8.4 | 0.510 |
| 11/24/2003 11:53 | 8.6 | -1.34 | 8.5 | 0.509 |
| 11/24/2003 11:53 | 8.7 | -1.336 | 8.6 | 0.507 |
| 11/24/2003 11:54 | 8.8 | -1.329 | 8.7 | 0.505 |
| 11/24/2003 11:54 | 8.9 | -1.327 | 8.8 | 0.504 |
| 11/24/2003 11:54 | 9 | -1.322 | 8.9 | 0.502 |
| 11/24/2003 11:54 | 9.1 | -1.316 | 9 | 0.500 |
| 11/24/2003 11:54 | 9.2 | -1.311 | 9.1 | 0.498 |
| 11/24/2003 11:54 | 9.3 | -1.309 | 9.2 | 0.497 |
| 11/24/2003 11:54 | 9.4 | -1.302 | 9.3 | 0.494 |
| 11/24/2003 11:54 | 9.5 | -1.3 | 9.4 | 0.494 |
| 11/24/2003 11:54 | 9.6 | -1.296 | 9.5 | 0.492 |

| | | | | |
|---|---|---|---|---|
| 11/24/2003 11:54 | 9.7 | -1.293 | 9.6 | 0.491 |
| 11/24/2003 11:55 | 9.8 | -1.289 | 9.7 | 0.490 |
| 11/24/2003 11:55 | 9.9 | -1.282 | 9.8 | 0.487 |
| 11/24/2003 11:55 | 10 | -1.278 | 9.9 | 0.485 |
| 11/24/2003 11:55 | 10.1 | -1.273 | 10 | 0.483• |
| 11/24/2003 11:56 | 11.1 | -1.238 | 11 | 0.470 |
| 11/24/2003 11:57 | 12.1 | -1.202 | 12 | 0.457 |
| 11/24/2003 11:58 | 13.1 | -1.171 | 13 | 0.445 |
| 11/24/2003 11:59 | 14.1 | -1.14 | 14 | 0.433 |
| 11/24/2003 12:00 | 15.1 | -1.109 | 15 | 0.421 |
| 11/24/2003 12:01 | 16.1 | -1.082 | 16 | 0.411 |
| 11/24/2003 12:02 | 17.1 | -1.054 | 17 | 0.400 |
| 11/24/2003 12:03 | 18.1 | -1.031 | 18 | 0.392 |
| 11/24/2003 12:04 | 19.1 | -1 | 19 | 0.380 |
| 11/24/2003 12:05 | 20.1 | -0.978 | 20 | 0.371 |
| 11/24/2003 12:06 | 21.1 | -0.96 | 21 | 0.365 |
| 11/24/2003 12:07 | 22.1 | -0.938 | 22 | 0.356 |
| 11/24/2003 12:08 | 23.1 | -0.916 | 23 | 0.348 |
| 11/24/2003 12:09 | 24.1 | -0.898 | 24 | 0.341 |
| 11/24/2003 12:10 | 25.1 | -0.883 | 25 | 0.335• |
| 11/24/2003 12:11 | 26.1 | -0.863 | 26 | 0.328 |
| 11/24/2003 12:12 | 27.1 | -0.847 | 27 | 0.322 |
| 11/24/2003 12:13 | 28.1 | -0.832 | 28 | 0.316 |
| 11/24/2003 12:14 | 29.1 | -0.812 | 29 | 0.308 |
| 11/24/2003 12:15 | 30.1 | -0.798 | 30 | 0.303• |
| 11/24/2003 12:16 | 31.1 | -0.783 | 31 | 0.297 |
| 11/24/2003 12:17 | 32.1 | -0.767 | 32 | 0.291 |
| 11/24/2003 12:18 | 33.1 | -0.754 | 33 | 0.286 |
| 11/24/2003 12:19 | 34.1 | -0.743 | 34 | 0.282 |
| 11/24/2003 12:20 | 35.1 | -0.727 | 35 | 0.276 |
| 11/24/2003 12:21 | 36.1 | -0.714 | 36 | 0.271 |
| 11/24/2003 12:22 | 37.1 | -0.705 | 37 | 0.268 |
| 11/24/2003 12:23 | 38.1 | -0.692 | 38 | 0.263 |
| 11/24/2003 12:24 | 39.1 | -0.683 | 39 | 0.259 |
| 11/24/2003 12:25 | 40.1 | -0.672 | 40 | 0.255 |
| 11/24/2003 12:26 | 41.1 | -0.661 | 41 | 0.251 |
| 11/24/2003 12:27 | 42.1 | -0.652 | 42 | 0.248 |
| 11/24/2003 12:28 | 43.1 | -0.641 | 43 | 0.243 |
| 11/24/2003 12:29 | 44.1 | -0.629 | 44 | 0.239 |
| 11/24/2003 12:30 | 45.1 | -0.621 | 45 | 0.236 |
| 11/24/2003 12:31 | 46.1 | -0.612 | 46 | 0.232 |
| 11/24/2003 12:32 | 47.1 | -0.605 | 47 | 0.230 |
| 11/24/2003 12:33 | 48.1 | -0.596 | 48 | 0.226 |
| 11/24/2003 12:34 | 49.1 | -0.589 | 49 | 0.224 |
| 11/24/2003 12:35 | 50.1 | -0.581 | 50 | 0.221 |
| 11/24/2003 12:36 | 51.1 | -0.574 | 51 | 0.218 |
| 11/24/2003 12:37 | 52.1 | -0.565 | 52 | 0.215 |
| 11/24/2003 12:38 | 53.1 | -0.561 | 53 | 0.213 |
| 11/24/2003 12:39 | 54.1 | -0.552 | 54 | 0.210 |
| 11/24/2003 12:40 | 55.1 | -0.545 | 55 | 0.207 |
| 11/24/2003 12:41 | 56.1 | -0.538 | 56 | 0.204 |
| 11/24/2003 12:42 | 57.1 | -0.531 | 57 | 0.202 |
| 11/24/2003 12:43 | 58.1 | -0.529 | 58 | 0.201 |
| 11/24/2003 12:44 | 59.1 | -0.522 | 59 | 0.198 |
| 11/24/2003 12:45 | 60.1 | -0.518 | 60 | 0.197 |
| 11/24/2003 12:46 | 61.1 | -0.509 | 61 | 0.193 |
| 11/24/2003 12:47 | 62.1 | -0.507 | 62 | 0.193 |
| 11/24/2003 12:48 | 63.1 | -0.501 | 63 | 0.190 |
| 11/24/2003 12:49 | 64.1 | -0.496 | 64 | 0.188 |
| 11/24/2003 12:50 | 65.1 | -0.489 | 65 | 0.186 |
| 11/24/2003 12:51 | 66.1 | -0.485 | 66 | 0.184 |
| 11/24/2003 12:52 | 67.1 | -0.482 | 67 | 0.183 |
| 11/24/2003 12:53 | 68.1 | -0.478 | 68 | 0.182 |
| 11/24/2003 12:54 | 69.1 | -0.476 | 69 | 0.181 |
| 11/24/2003 12:55 | 70.1 | -0.472 | 70 | 0.179 |
| 11/24/2003 12:56 | 71.1 | -0.471 | 71 | 0.179 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT30 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 24-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .166' | 2 = R |
| Length of Well Screen (ft.) : | 13 | = L |
| Time for 37% head change (min.) : | 27.60 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 4.22E-05 | ft./min. |
| 7.03E-07 | ft./sec. |
| 6.07E-02 | ft./day |
| 2.14E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083 \times LN(13/.166)}{2 \times 13 \times 27.60} =$$

$4.19 \times 10^{-5}$ Ft/min

CHECKED

2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT32 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Falling head | **Test Date:** | 24-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 2.5 | = R |
| Length of Well Screen (ft.) : | 12.62 | = L |
| Time for 37% head change (min.) : | 5.37 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 2.10E-04 | ft./min. |
| 3.50E-06 | ft./sec. |
| 3.03E-01 | ft./day |
| 1.07E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 13 MINT 32

PROJECT NO.: 9060 GEOLOGIST: M. G. COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 9.88 TOC DATE: 11-24-03

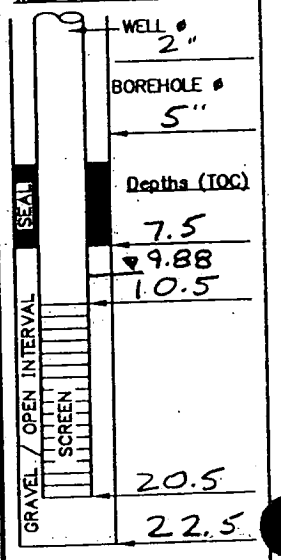
TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: SOLID SLUG PAGE 1 OF 1

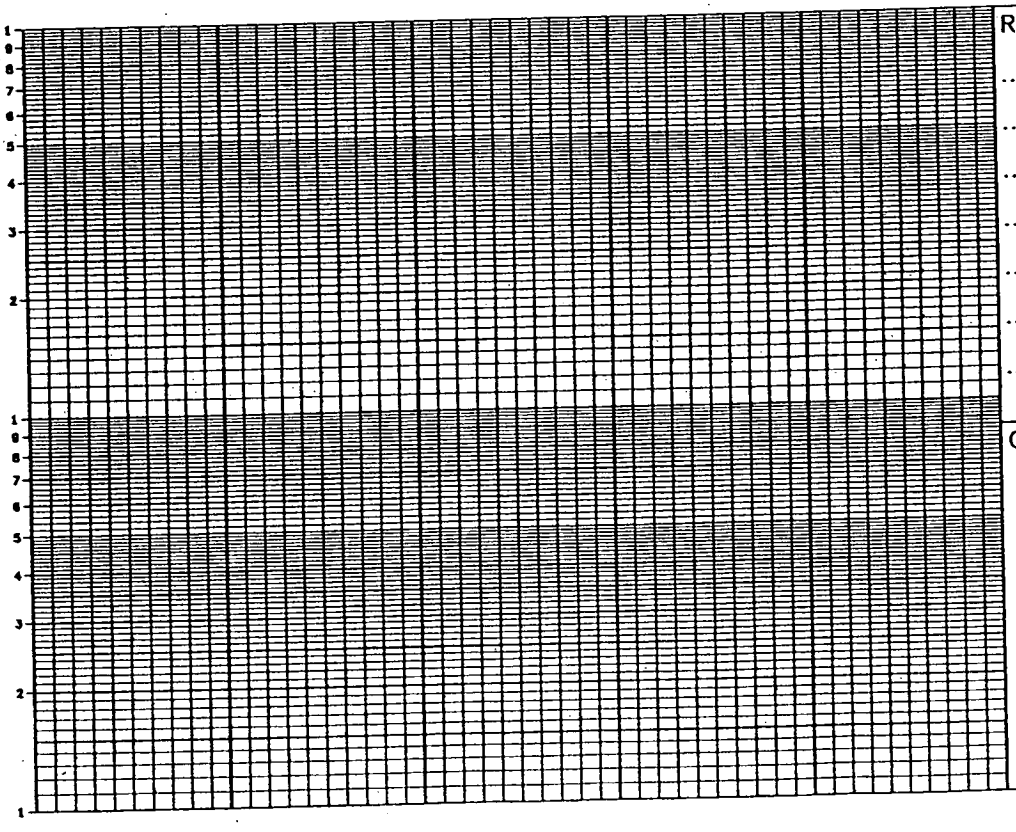
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC, ZERO AT SWL + START

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 0 | | 3 | 1.390 | |
| .1 | 5.271 | | 4 | 1.152 | |
| .2 | 2.422 | | 6 | .797 | |
| .3 | 2.364 | | 7 | .664 | |
| .4 | 2.307 | | 8 | .551 | |
| .5 | 2.249 | | 10 | .381 | |
| .6 | 2.211 | | 12 | .269 | |
| .7 | 2.162 | | 13 | .222 | |
| .8 | 2.120 | | 15 | .158 | |
| .9 | 2.077 | | 18 | .094 | |
| 1.0 | 2.039 | | | | |
| 2.0 | 1.678 | | | | |

WELL SCHEMATIC



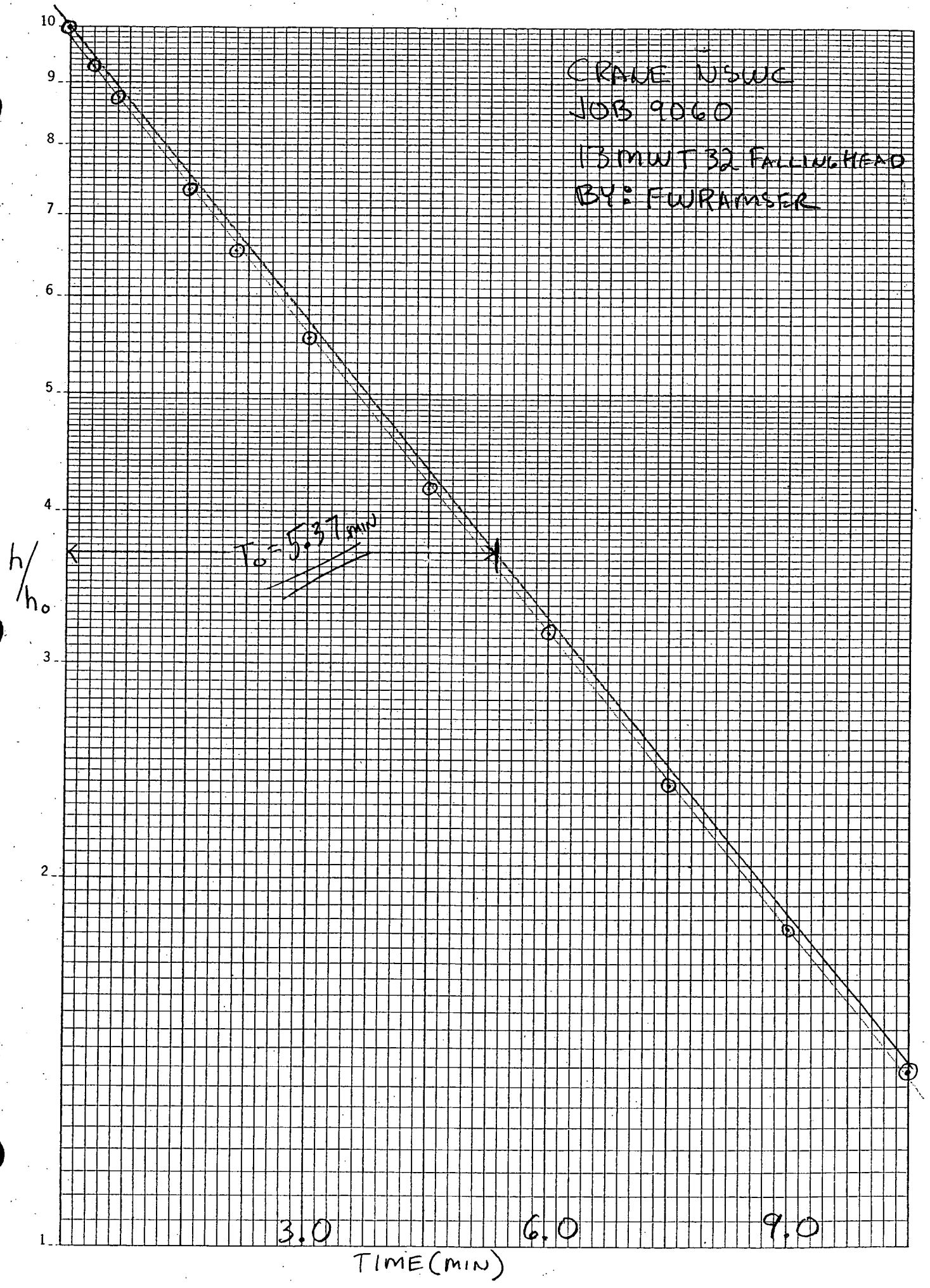

▽ Indicate SWL Depth on Drawing



REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD: FORM_HYDCONTST.dwg 07/06/99 INL




K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS KEUFFEL & ESSER CO. MADE IN U.S.A.
46 4650

In-Situ Inc. MiniTroll Pro

Report generated: 12/9/2003 12:17:38
Report from file: H:\Crane IN\SWMU13_16\MGC slug tests 03\site 13\SN06899 2003-11-24 134546
DataMgr Version 3.68 13MWT32falling#1.bin

Serial number: 6899
Firmware Version 3.07
Unit name:

Test name: 13MWT32falling#1

Test defined on: 11/24/2003 13:43:21
Test started on: 11/24/2003 13:45:46
Test stopped on: 11/24/2003 14:04:40
Test extracted on: N/A

Data gathered using Linear testing
Time between da Minutes.
Number of data s 189

TOTAL DATA SAM 189

Channel number [2]
Measurement typ Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1.
Mode: Surface
User-defined refe 0 Feet H2O
Referenced on: test start
Pressure head at 10.808 Feet H2O

• = PLOTTED DATA

ho = 2.422

| Date | Time | ET (min) | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho | |
|---|---|---|---|---|---|---|
| 11/24/2003 | 13:45 | 0 | 0 | | | |
| 11/24/2003 | 13:45 | 0.1 | 5.271 | | | |
| 11/24/2003 | 13:45 | 0.2 | 2.422 | 0 | 1.000 | • |
| 11/24/2003 | 13:46 | 0.3 | 2.364 | 0.1 | 0.976 | |
| 11/24/2003 | 13:46 | 0.4 | 2.307 | 0.2 | 0.953 | |
| 11/24/2003 | 13:46 | 0.5 | 2.249 | 0.3 | 0.929 | • |
| 11/24/2003 | 13:46 | 0.6 | 2.211 | 0.4 | 0.913 | |
| 11/24/2003 | 13:46 | 0.7 | 2.162 | 0.5 | 0.893 | |
| 11/24/2003 | 13:46 | 0.8 | 2.12 | 0.6 | 0.875 | • |
| 11/24/2003 | 13:46 | 0.9 | 2.077 | 0.7 | 0.858 | |
| 11/24/2003 | 13:46 | 1 | 2.039 | 0.8 | 0.842 | |
| 11/24/2003 | 13:46 | 1.1 | 1.997 | 0.9 | 0.825 | |
| 11/24/2003 | 13:46 | 1.2 | 1.953 | 1 | 0.806 | |
| 11/24/2003 | 13:47 | 1.3 | 1.92 | 1.1 | 0.793 | |
| 11/24/2003 | 13:47 | 1.4 | 1.88 | 1.2 | 0.776 | |
| 11/24/2003 | 13:47 | 1.5 | 1.846 | 1.3 | 0.762 | |
| 11/24/2003 | 13:47 | 1.6 | 1.805 | 1.4 | 0.745 | |
| 11/24/2003 | 13:47 | 1.7 | 1.775 | 1.5 | 0.733 | • |
| 11/24/2003 | 13:47 | 1.8 | 1.741 | 1.6 | 0.719 | |
| 11/24/2003 | 13:47 | 1.9 | 1.713 | 1.7 | 0.707 | |
| 11/24/2003 | 13:47 | 2 | 1.678 | 1.8 | 0.693 | |

| | | | | |
|---|---|---|---|---|
| 11/24/2003 13:47 | 2.1 | 1.644 | 1.9 | 0.679 |
| 11/24/2003 13:47 | 2.2 | 1.614 | 2 | 0.666 |
| 11/24/2003 13:48 | 2.3 | 1.586 | 2.1 | 0.655 |
| 11/24/2003 13:48 | 2.4 | 1.559 | 2.2 | 0.644 |
| 11/24/2003 13:48 | 2.5 | 1.527 | 2.3 | 0.630 |
| 11/24/2003 13:48 | 2.6 | 1.495 | 2.4 | 0.617 |
| 11/24/2003 13:48 | 2.7 | 1.466 | 2.5 | 0.605 |
| 11/24/2003 13:48 | 2.8 | 1.44 | 2.6 | 0.595 |
| 11/24/2003 13:48 | 2.9 | 1.416 | 2.7 | 0.585 |
| 11/24/2003 13:48 | 3 | 1.39 | 2.8 | 0.574 |
| 11/24/2003 13:48 | 3.1 | 1.363 | 2.9 | 0.563 |
| 11/24/2003 13:48 | 3.2 | 1.339 | 3 | 0.553 |
| 11/24/2003 13:49 | 3.3 | 1.313 | 3.1 | 0.542 |
| 11/24/2003 13:49 | 3.4 | 1.289 | 3.2 | 0.532 |
| 11/24/2003 13:49 | 3.5 | 1.265 | 3.3 | 0.522 |
| 11/24/2003 13:49 | 3.6 | 1.243 | 3.4 | 0.513 |
| 11/24/2003 13:49 | 3.7 | 1.218 | 3.5 | 0.503 |
| 11/24/2003 13:49 | 3.8 | 1.196 | 3.6 | 0.494 |
| 11/24/2003 13:49 | 3.9 | 1.174 | 3.7 | 0.485 |
| 11/24/2003 13:49 | 4 | 1.152 | 3.8 | 0.476 |
| 11/24/2003 13:49 | 4.1 | 1.136 | 3.9 | 0.469 |
| 11/24/2003 13:49 | 4.2 | 1.112 | 4 | 0.459 |
| 11/24/2003 13:50 | 4.3 | 1.091 | 4.1 | 0.450 |
| 11/24/2003 13:50 | 4.4 | 1.071 | 4.2 | 0.442 |
| 11/24/2003 13:50 | 4.5 | 1.053 | 4.3 | 0.435 |
| 11/24/2003 13:50 | 4.6 | 1.033 | 4.4 | 0.427 |
| 11/24/2003 13:50 | 4.7 | 1.013 | 4.5 | 0.418 |
| 11/24/2003 13:50 | 4.8 | 0.994 | 4.6 | 0.410 |
| 11/24/2003 13:50 | 4.9 | 0.976 | 4.7 | 0.403 |
| 11/24/2003 13:50 | 5 | 0.958 | 4.8 | 0.396 |
| 11/24/2003 13:50 | 5.1 | 0.938 | 4.9 | 0.387 |
| 11/24/2003 13:50 | 5.2 | 0.922 | 5 | 0.381 |
| 11/24/2003 13:51 | 5.3 | 0.908 | 5.1 | 0.375 |
| 11/24/2003 13:51 | 5.4 | 0.892 | 5.2 | 0.368 |
| 11/24/2003 13:51 | 5.5 | 0.876 | 5.3 | 0.362 |
| 11/24/2003 13:51 | 5.6 | 0.861 | 5.4 | 0.355 |
| 11/24/2003 13:51 | 5.7 | 0.839 | 5.5 | 0.346 |
| 11/24/2003 13:51 | 5.8 | 0.831 | 5.6 | 0.343 |
| 11/24/2003 13:51 | 5.9 | 0.813 | 5.7 | 0.336 |
| 11/24/2003 13:51 | 6 | 0.797 | 5.8 | 0.329 |
| 11/24/2003 13:51 | 6.1 | 0.783 | 5.9 | 0.323 |
| 11/24/2003 13:51 | 6.2 | 0.771 | 6 | 0.318 |
| 11/24/2003 13:52 | 6.3 | 0.754 | 6.1 | 0.311 |
| 11/24/2003 13:52 | 6.4 | 0.742 | 6.2 | 0.306 |
| 11/24/2003 13:52 | 6.5 | 0.726 | 6.3 | 0.300 |
| 11/24/2003 13:52 | 6.6 | 0.714 | 6.4 | 0.295 |
| 11/24/2003 13:52 | 6.7 | 0.702 | 6.5 | 0.290 |
| 11/24/2003 13:52 | 6.8 | 0.686 | 6.6 | 0.283 |
| 11/24/2003 13:52 | 6.9 | 0.678 | 6.7 | 0.280 |
| 11/24/2003 13:52 | 7 | 0.664 | 6.8 | 0.274 |
| 11/24/2003 13:52 | 7.1 | 0.652 | 6.9 | 0.269 |
| 11/24/2003 13:52 | 7.2 | 0.638 | 7 | 0.263 |
| 11/24/2003 13:53 | 7.3 | 0.627 | 7.1 | 0.259 |
| 11/24/2003 13:53 | 7.4 | 0.617 | 7.2 | 0.255 |
| 11/24/2003 13:53 | 7.5 | 0.605 | 7.3 | 0.250 |
| 11/24/2003 13:53 | 7.6 | 0.593 | 7.4 | 0.245 |
| 11/24/2003 13:53 | 7.7 | 0.579 | 7.5 | 0.239 |
| 11/24/2003 13:53 | 7.8 | 0.571 | 7.6 | 0.236 |
| 11/24/2003 13:53 | 7.9 | 0.561 | 7.7 | 0.232 |
| 11/24/2003 13:53 | 8 | 0.551 | 7.8 | 0.227 |

| | | | | |
|---|---|---|---|---|
| 11/24/2003 13:53 | 8.1 | 0.541 | 7.9 | 0.223 |
| 11/24/2003 13:53 | 8.2 | 0.531 | 8 | 0.219 |
| 11/24/2003 13:54 | 8.3 | 0.522 | 8.1 | 0.216 |
| 11/24/2003 13:54 | 8.4 | 0.51 | 8.2 | 0.211 |
| 11/24/2003 13:54 | 8.5 | 0.502 | 8.3 | 0.207 |
| 11/24/2003 13:54 | 8.6 | 0.494 | 8.4 | 0.204 |
| 11/24/2003 13:54 | 8.7 | 0.486 | 8.5 | 0.201 |
| 11/24/2003 13:54 | 8.8 | 0.476 | 8.6 | 0.197 |
| 11/24/2003 13:54 | 8.9 | 0.468 | 8.7 | 0.193 |
| 11/24/2003 13:54 | 9 | 0.46 | 8.8 | 0.190 |
| 11/24/2003 13:54 | 9.1 | 0.452 | 8.9 | 0.187 |
| 11/24/2003 13:54 | 9.2 | 0.442 | 9 | 0.182 |
| 11/24/2003 13:55 | 9.3 | 0.434 | 9.1 | 0.179 |
| 11/24/2003 13:55 | 9.4 | 0.426 | 9.2 | 0.176 |
| 11/24/2003 13:55 | 9.5 | 0.416 | 9.3 | 0.172 |
| 11/24/2003 13:55 | 9.6 | 0.412 | 9.4 | 0.170 |
| 11/24/2003 13:55 | 9.7 | 0.4 | 9.5 | 0.165 |
| 11/24/2003 13:55 | 9.8 | 0.397 | 9.6 | 0.164 |
| 11/24/2003 13:55 | 9.9 | 0.386 | 9.7 | 0.159 |
| 11/24/2003 13:55 | 10 | 0.381 | 9.8 | 0.157 |
| 11/24/2003 13:55 | 10.1 | 0.373 | 9.9 | 0.154 |
| 11/24/2003 13:55 | 10.2 | 0.367 | 10 | 0.152 |
| 11/24/2003 13:56 | 10.3 | 0.363 | 10.1 | 0.150 |
| 11/24/2003 13:56 | 10.4 | 0.355 | 10.2 | 0.147 |
| 11/24/2003 13:56 | 10.5 | 0.349 | 10.3 | 0.144 |
| 11/24/2003 13:56 | 10.6 | 0.341 | 10.4 | 0.141 |
| 11/24/2003 13:56 | 10.7 | 0.337 | 10.5 | 0.139 |
| 11/24/2003 13:56 | 10.8 | 0.329 | 10.6 | 0.136 |
| 11/24/2003 13:56 | 10.9 | 0.325 | 10.7 | 0.134 |
| 11/24/2003 13:56 | 11 | 0.317 | 10.8 | 0.131 |
| 11/24/2003 13:56 | 11.1 | 0.311 | 10.9 | 0.128 |
| 11/24/2003 13:56 | 11.2 | 0.307 | 11 | 0.127 |
| 11/24/2003 13:57 | 11.3 | 0.301 | 11.1 | 0.124 |
| 11/24/2003 13:57 | 11.4 | 0.295 | 11.2 | 0.122 |
| 11/24/2003 13:57 | 11.5 | 0.291 | 11.3 | 0.120 |
| 11/24/2003 13:57 | 11.6 | 0.285 | 11.4 | 0.118 |
| 11/24/2003 13:57 | 11.7 | 0.281 | 11.5 | 0.116 |
| 11/24/2003 13:57 | 11.8 | 0.275 | 11.6 | 0.114 |
| 11/24/2003 13:57 | 11.9 | 0.271 | 11.7 | 0.112 |
| 11/24/2003 13:57 | 12 | 0.269 | 11.8 | 0.111 |
| 11/24/2003 13:57 | 12.1 | 0.263 | 11.9 | 0.109 |
| 11/24/2003 13:57 | 12.2 | 0.259 | 12 | 0.107 |
| 11/24/2003 13:58 | 12.3 | 0.251 | 12.1 | 0.104 |
| 11/24/2003 13:58 | 12.4 | 0.247 | 12.2 | 0.102 |
| 11/24/2003 13:58 | 12.5 | 0.242 | 12.3 | 0.100 |
| 11/24/2003 13:58 | 12.6 | 0.24 | 12.4 | 0.099 |
| 11/24/2003 13:58 | 12.7 | 0.236 | 12.5 | 0.097 |
| 11/24/2003 13:58 | 12.8 | 0.23 | 12.6 | 0.095 |
| 11/24/2003 13:58 | 12.9 | 0.226 | 12.7 | 0.093 |
| 11/24/2003 13:58 | 13 | 0.222 | 12.8 | 0.092 |
| 11/24/2003 13:58 | 13.1 | 0.218 | 12.9 | 0.090 |
| 11/24/2003 13:58 | 13.2 | 0.216 | 13 | 0.089 |
| 11/24/2003 13:59 | 13.3 | 0.21 | 13.1 | 0.087 |
| 11/24/2003 13:59 | 13.4 | 0.208 | 13.2 | 0.086 |
| 11/24/2003 13:59 | 13.5 | 0.206 | 13.3 | 0.085 |
| 11/24/2003 13:59 | 13.6 | 0.2 | 13.4 | 0.083 |
| 11/24/2003 13:59 | 13.7 | 0.196 | 13.5 | 0.081 |
| 11/24/2003 13:59 | 13.8 | 0.194 | 13.6 | 0.080 |
| 11/24/2003 13:59 | 13.9 | 0.192 | 13.7 | 0.079 |
| 11/24/2003 13:59 | 14 | 0.186 | 13.8 | 0.077 |

| | | | | |
|---|---|---|---|---|
| 11/24/2003 13:59 | 14.1 | 0.178 | 13.9 | 0.073 |
| 11/24/2003 13:59 | 14.2 | 0.182 | 14 | 0.075 |
| 11/24/2003 14:00 | 14.3 | 0.18 | 14.1 | 0.074 |
| 11/24/2003 14:00 | 14.4 | 0.174 | 14.2 | 0.072 |
| 11/24/2003 14:00 | 14.5 | 0.176 | 14.3 | 0.073 |
| 11/24/2003 14:00 | 14.6 | 0.168 | 14.4 | 0.069 |
| 11/24/2003 14:00 | 14.7 | 0.168 | 14.5 | 0.069 |
| 11/24/2003 14:00 | 14.8 | 0.162 | 14.6 | 0.067 |
| 11/24/2003 14:00 | 14.9 | 0.16 | 14.7 | 0.066 |
| 11/24/2003 14:00 | 15 | 0.158 | 14.8 | 0.065 |
| 11/24/2003 14:00 | 15.1 | 0.154 | 14.9 | 0.064 |
| 11/24/2003 14:00 | 15.2 | 0.152 | 15 | 0.063 |
| 11/24/2003 14:01 | 15.3 | 0.15 | 15.1 | 0.062 |
| 11/24/2003 14:01 | 15.4 | 0.148 | 15.2 | 0.061 |
| 11/24/2003 14:01 | 15.5 | 0.144 | 15.3 | 0.059 |
| 11/24/2003 14:01 | 15.6 | 0.142 | 15.4 | 0.059 |
| 11/24/2003 14:01 | 15.7 | 0.138 | 15.5 | 0.057 |
| 11/24/2003 14:01 | 15.8 | 0.14 | 15.6 | 0.058 |
| 11/24/2003 14:01 | 15.9 | 0.134 | 15.7 | 0.055 |
| 11/24/2003 14:01 | 16 | 0.132 | 15.8 | 0.055 |
| 11/24/2003 14:01 | 16.1 | 0.132 | 15.9 | 0.055 |
| 11/24/2003 14:01 | 16.2 | 0.128 | 16 | 0.053 |
| 11/24/2003 14:02 | 16.3 | 0.126 | 16.1 | 0.052 |
| 11/24/2003 14:02 | 16.4 | 0.124 | 16.2 | 0.051 |
| 11/24/2003 14:02 | 16.5 | 0.122 | 16.3 | 0.050 |
| 11/24/2003 14:02 | 16.6 | 0.116 | 16.4 | 0.048 |
| 11/24/2003 14:02 | 16.7 | 0.118 | 16.5 | 0.049 |
| 11/24/2003 14:02 | 16.8 | 0.114 | 16.6 | 0.047 |
| 11/24/2003 14:02 | 16.9 | 0.114 | 16.7 | 0.047 |
| 11/24/2003 14:02 | 17 | 0.112 | 16.8 | 0.046 |
| 11/24/2003 14:02 | 17.1 | 0.11 | 16.9 | 0.045 |
| 11/24/2003 14:02 | 17.2 | 0.108 | 17 | 0.045 |
| 11/24/2003 14:03 | 17.3 | 0.108 | 17.1 | 0.045 |
| 11/24/2003 14:03 | 17.4 | 0.104 | 17.2 | 0.043 |
| 11/24/2003 14:03 | 17.5 | 0.102 | 17.3 | 0.042 |
| 11/24/2003 14:03 | 17.6 | 0.1 | 17.4 | 0.041 |
| 11/24/2003 14:03 | 17.7 | 0.098 | 17.5 | 0.040 |
| 11/24/2003 14:03 | 17.8 | 0.098 | 17.6 | 0.040 |
| 11/24/2003 14:03 | 17.9 | 0.096 | 17.7 | 0.040 |
| 11/24/2003 14:03 | 18 | 0.094 | 17.8 | 0.039 |
| 11/24/2003 14:03 | 18.1 | 0.092 | 17.9 | 0.038 |
| 11/24/2003 14:03 | 18.2 | 0.09 | 18 | 0.037 |
| 11/24/2003 14:04 | 18.3 | 0.085 | 18.1 | 0.035 |
| 11/24/2003 14:04 | 18.4 | 0.087 | 18.2 | 0.036 |
| 11/24/2003 14:04 | 18.5 | 0.083 | 18.3 | 0.034 |
| 11/24/2003 14:04 | 18.6 | 0.085 | 18.4 | 0.035 |
| 11/24/2003 14:04 | 18.7 | 0.083 | 18.5 | 0.034 |
| 11/24/2003 14:04 | 18.8 | 0.083 | 18.6 | 0.034 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT32 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Falling head | **Test Date:** | 24-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .208' | 2.5 = R |
| Length of Well Screen (ft.) : | | 12.62 = L |
| Time for 37% head change (min.) : | | 5.37 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 2.10E-04 | ft./min. |
| 3.50E-06 | ft./sec. |
| 3.03E-01 | ft./day |
| 1.07E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(12.62/.208)}{2 \times 12.62 \times 5.37} =$$

$2.09 \times 10^{-4}$ Ft/MIN

CHECKED

2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

**Project Name:** Crane NSWC
**Project No.:** 9060
**Test Type:** Rising head

**Well/Boring No.:** 13MWT32
**Aquifer Type:** Bedrock
**Test Date:** 24-Nov-03

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 2.5 | = R |
| Length of Well Screen (ft.) : | 12.62 | = L |
| Time for 37% head change (min.) : | 7.05 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.60E-04 | ft./min. |
| 2.67E-06 | ft./sec. |
| 2.31E-01 | ft./day |
| 8.14E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 13MWT32

PROJECT NO.: 9060 GEOLOGIST: M. G. COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 9.88' TOC DATE: 11-24-03

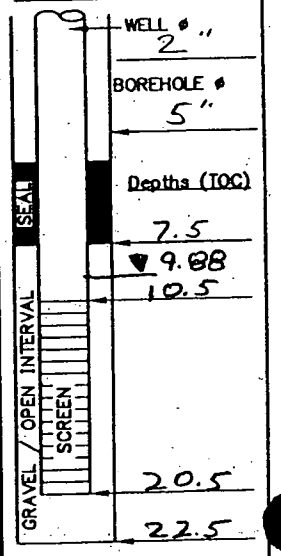
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: SOLID SLUG PAGE 1 OF 1

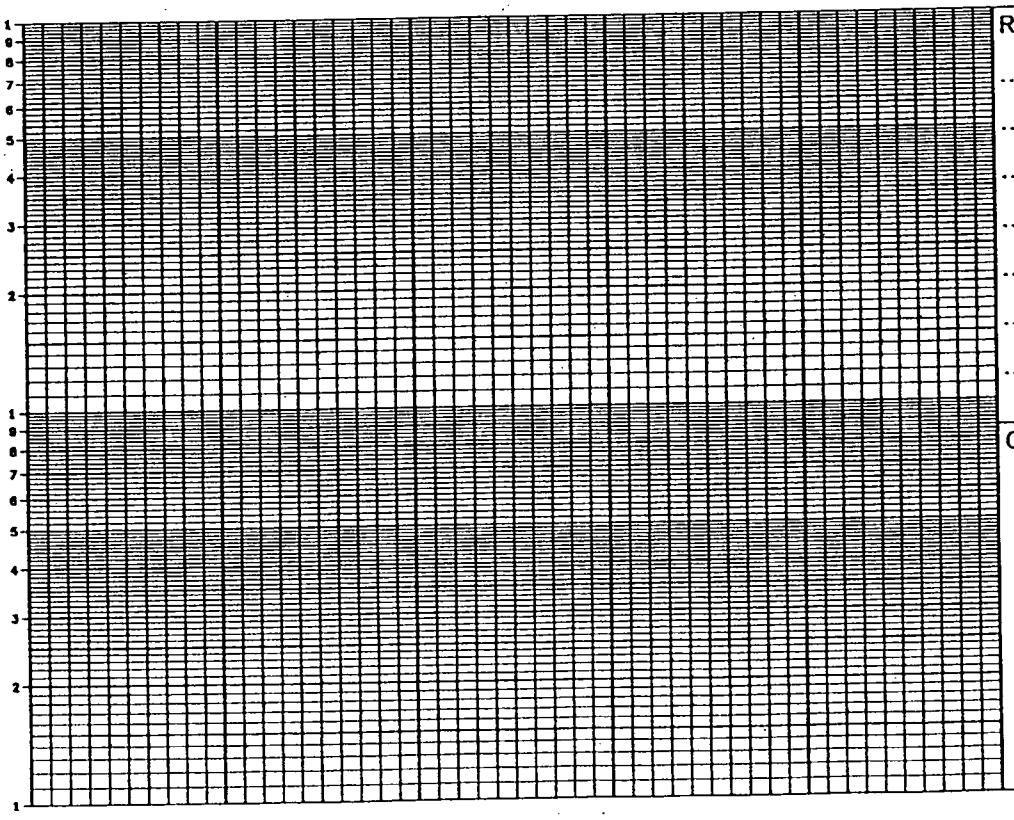
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC, ZERO AT SWL + START

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 0 | | 3 | -1.259 | |
| .1 | -2.597 | | 4 | -1.163 | |
| .2 | -2.115 | | 5 | -1.080 | |
| .3 | -1.877 | | 6 | -.961 | |
| .4 | -1.756 | | 7 | -.836 | |
| .5 | -1.685 | | 8 | -.730 | |
| .6 | -1.643 | | 10 | -.566 | |
| .7 | -1.606 | | 11 | -.502 | |
| .8 | -1.578 | | 12 | -.441 | |
| .9 | -1.558 | | 15 | -.308 | |
| 1.0 | -1.536 | | 18 | -.232 | |
| 2.0 | -1.374 | | 25 | -.133 | |

WELL SCHEMATIC



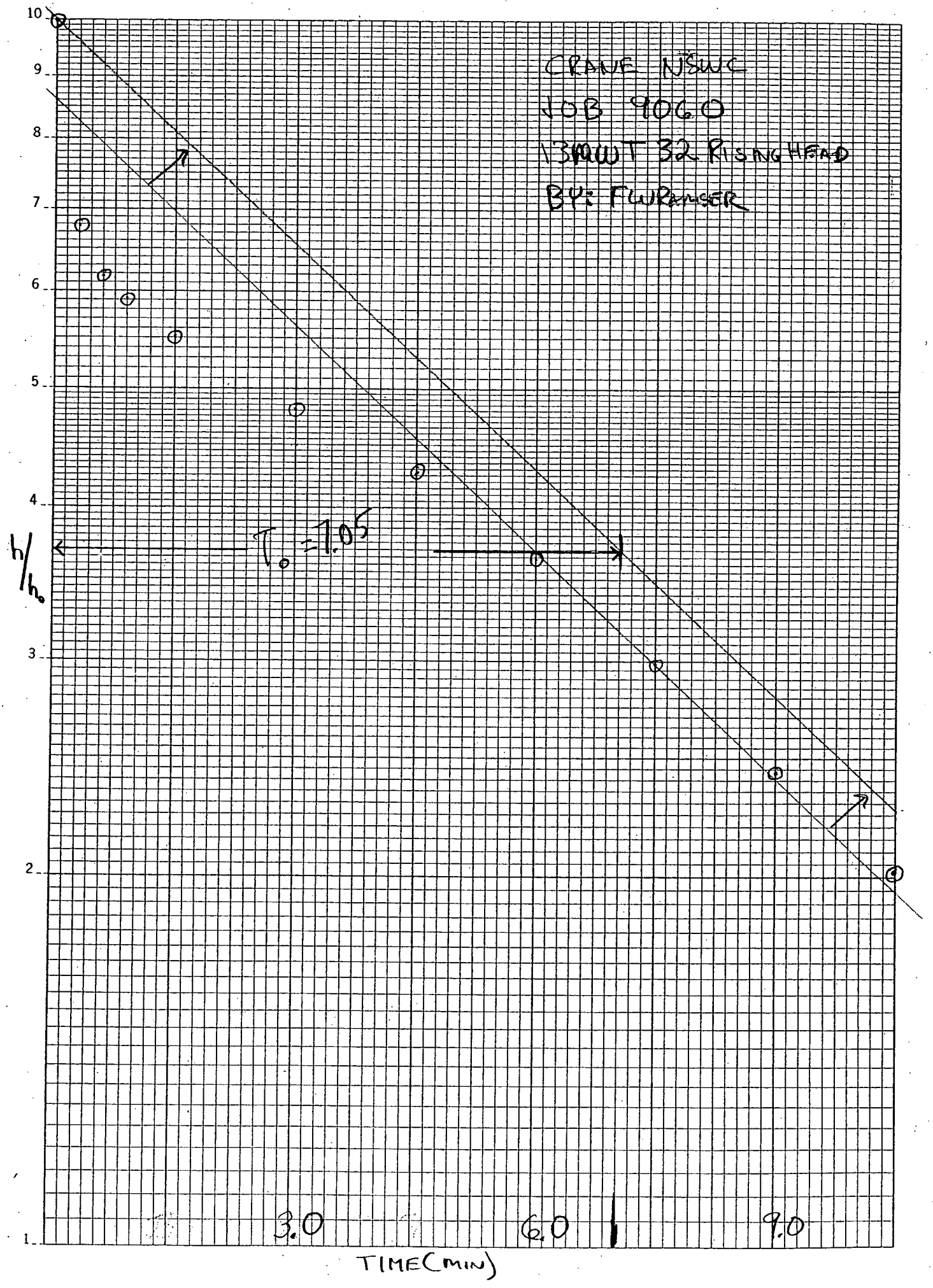

▽ Indicate SWL Depth on Drawing



REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 12/9/2003 12:31:41
Report from file: H:\Crane IN\SWMU13_16\MGC slug tests 03\site 13\SN06899 2003-11-24 141208 13MWT32rising#1.bin
DataMgr Version 3.68

Serial number: 6899
Firmware Version 3.07
Unit name:

Test name: 13MWT32rising#1

Test defined on: 11/24/2003 14:11:36
Test started on: 11/24/2003 14:12:08
Test stopped on: 11/24/2003 14:38:08
Test extracted on: N/A

Data gathered using Linear testing
Time between data poin Minutes.
Number of data samples 260

TOTAL DATA SAMPLES 260

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at referen 10.836 Feet H2O

• = PLOTTED DATA

ho = -2.597

| Date | Time | ET (min) | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho |
|---|---|---|---|---|---|
| | 11/24/2003 14:12 | 0 | 0 | | |
| | 11/24/2003 14:12 | 0.1 | -2.597 | 0 | 1.000 • |
| | 11/24/2003 14:12 | 0.2 | -2.115 | 0.1 | 0.814 |
| | 11/24/2003 14:12 | 0.3 | -1.877 | 0.2 | 0.723 |
| | 11/24/2003 14:12 | 0.4 | -1.756 | 0.3 | 0.676 • |
| | 11/24/2003 14:12 | 0.5 | -1.685 | 0.4 | 0.649 |
| | 11/24/2003 14:12 | 0.6 | -1.643 | 0.5 | 0.633 |
| | 11/24/2003 14:12 | 0.7 | -1.606 | 0.6 | 0.618 • |
| | 11/24/2003 14:12 | 0.8 | -1.578 | 0.7 | 0.608 |
| | 11/24/2003 14:13 | 0.9 | -1.558 | 0.8 | 0.600 |
| | 11/24/2003 14:13 | 1 | -1.536 | 0.9 | 0.591 • |
| | 11/24/2003 14:13 | 1.1 | -1.514 | 1 | 0.583 |
| | 11/24/2003 14:13 | 1.2 | -1.496 | 1.1 | 0.576 |
| | 11/24/2003 14:13 | 1.3 | -1.479 | 1.2 | 0.570 |
| | 11/24/2003 14:13 | 1.4 | -1.463 | 1.3 | 0.563 |
| | 11/24/2003 14:13 | 1.5 | -1.445 | 1.4 | 0.556 |
| | 11/24/2003 14:13 | 1.6 | -1.431 | 1.5 | 0.551 • |
| | 11/24/2003 14:13 | 1.7 | -1.415 | 1.6 | 0.545 |
| | 11/24/2003 14:13 | 1.8 | -1.401 | 1.7 | 0.539 |
| | 11/24/2003 14:14 | 1.9 | -1.389 | 1.8 | 0.535 |
| | 11/24/2003 14:14 | 2 | -1.374 | 1.9 | 0.529 |
| | 11/24/2003 14:14 | 2.1 | -1.362 | 2 | 0.524 |
| | 11/24/2003 14:14 | 2.2 | -1.35 | 2.1 | 0.520 |
| | 11/24/2003 14:14 | 2.3 | -1.338 | 2.2 | 0.515 |
| | 11/24/2003 14:14 | 2.4 | -1.326 | 2.3 | 0.511 |
| | 11/24/2003 14:14 | 2.5 | -1.314 | 2.4 | 0.506 |
| | 11/24/2003 14:14 | 2.6 | -1.304 | 2.5 | 0.502 |
| | 11/24/2003 14:14 | 2.7 | -1.292 | 2.6 | 0.497 |
| | 11/24/2003 14:14 | 2.8 | -1.282 | 2.7 | 0.494 |
| | 11/24/2003 14:15 | 2.9 | -1.27 | 2.8 | 0.489 |
| | 11/24/2003 14:15 | 3 | -1.259 | 2.9 | 0.485 |
| | 11/24/2003 14:15 | 3.1 | -1.249 | 3 | 0.481 • |
| | 11/24/2003 14:15 | 3.2 | -1.239 | 3.1 | 0.477 |
| | 11/24/2003 14:15 | 3.3 | -1.229 | 3.2 | 0.473 |
| | 11/24/2003 14:15 | 3.4 | -1.217 | 3.3 | 0.469 |
| | 11/24/2003 14:15 | 3.5 | -1.209 | 3.4 | 0.466 |
| | 11/24/2003 14:15 | 3.6 | -1.199 | 3.5 | 0.462 |
| | 11/24/2003 14:15 | 3.7 | -1.191 | 3.6 | 0.459 |
| | 11/24/2003 14:15 | 3.8 | -1.181 | 3.7 | 0.455 |
| | 11/24/2003 14:16 | 3.9 | -1.171 | 3.8 | 0.451 |

| | | | | |
|---|---|---|---|---|
| 11/24/2003 14:16 | 4 | -1.163 | 3.9 | 0.448 |
| 11/24/2003 14:16 | 4.1 | -1.155 | 4 | 0.445 |
| 11/24/2003 14:16 | 4.2 | -1.145 | 4.1 | 0.441 |
| 11/24/2003 14:16 | 4.3 | -1.139 | 4.2 | 0.439 |
| 11/24/2003 14:16 | 4.4 | -1.126 | 4.3 | 0.434 |
| 11/24/2003 14:16 | 4.5 | -1.12 | 4.4 | 0.431 |
| 11/24/2003 14:16 | 4.6 | -1.112 | 4.5 | 0.428 |
| 11/24/2003 14:16 | 4.7 | -1.104 | 4.6 | 0.425 |
| 11/24/2003 14:16 | 4.8 | -1.092 | 4.7 | 0.420 |
| 11/24/2003 14:17 | 4.9 | -1.088 | 4.8 | 0.419 |
| 11/24/2003 14:17 | 5 | -1.08 | 4.9 | 0.416 |
| 11/24/2003 14:17 | 5.1 | -1.07 | 5 | 0.412 |
| 11/24/2003 14:17 | 5.2 | -1.062 | 5.1 | 0.409 |
| 11/24/2003 14:17 | 5.3 | -1.056 | 5.2 | 0.407 |
| 11/24/2003 14:17 | 5.4 | -1.044 | 5.3 | 0.402 |
| 11/24/2003 14:17 | 5.5 | -1.03 | 5.4 | 0.397 |
| 11/24/2003 14:17 | 5.6 | -1.016 | 5.5 | 0.391 |
| 11/24/2003 14:17 | 5.7 | -1.001 | 5.6 | 0.385 |
| 11/24/2003 14:17 | 5.8 | -0.987 | 5.7 | 0.380 |
| 11/24/2003 14:18 | 5.9 | -0.973 | 5.8 | 0.375 |
| 11/24/2003 14:18 | 6 | -0.961 | 5.9 | 0.370 |
| 11/24/2003 14:18 | 6.1 | -0.945 | 6 | 0.364 |
| 11/24/2003 14:18 | 6.2 | -0.935 | 6.1 | 0.360 |
| 11/24/2003 14:18 | 6.3 | -0.925 | 6.2 | 0.356 |
| 11/24/2003 14:18 | 6.4 | -0.911 | 6.3 | 0.351 |
| 11/24/2003 14:18 | 6.5 | -0.897 | 6.4 | 0.345 |
| 11/24/2003 14:18 | 6.6 | -0.885 | 6.5 | 0.341 |
| 11/24/2003 14:18 | 6.7 | -0.872 | 6.6 | 0.336 |
| 11/24/2003 14:18 | 6.8 | -0.862 | 6.7 | 0.332 |
| 11/24/2003 14:19 | 6.9 | -0.848 | 6.8 | 0.327 |
| 11/24/2003 14:19 | 7 | -0.836 | 6.9 | 0.322 |
| 11/24/2003 14:19 | 7.1 | -0.828 | 7 | 0.319 |
| 11/24/2003 14:19 | 7.2 | -0.814 | 7.1 | 0.313 |
| 11/24/2003 14:19 | 7.3 | -0.806 | 7.2 | 0.310 |
| 11/24/2003 14:19 | 7.4 | -0.794 | 7.3 | 0.306 |
| 11/24/2003 14:19 | 7.5 | -0.782 | 7.4 | 0.301 |
| 11/24/2003 14:19 | 7.6 | -0.776 | 7.5 | 0.299 |
| 11/24/2003 14:19 | 7.7 | -0.762 | 7.6 | 0.293 |
| 11/24/2003 14:19 | 7.8 | -0.75 | 7.7 | 0.289 |
| 11/24/2003 14:20 | 7.9 | -0.742 | 7.8 | 0.286 |
| 11/24/2003 14:20 | 8 | -0.729 | 7.9 | 0.281 |
| 11/24/2003 14:20 | 8.1 | -0.721 | 8 | 0.278 |
| 11/24/2003 14:20 | 8.2 | -0.713 | 8.1 | 0.275 |
| 11/24/2003 14:20 | 8.3 | -0.705 | 8.2 | 0.271 |
| 11/24/2003 14:20 | 8.4 | -0.693 | 8.3 | 0.267 |
| 11/24/2003 14:20 | 8.5 | -0.685 | 8.4 | 0.264 |
| 11/24/2003 14:20 | 8.6 | -0.675 | 8.5 | 0.260 |
| 11/24/2003 14:20 | 8.7 | -0.667 | 8.6 | 0.257 |
| 11/24/2003 14:20 | 8.8 | -0.657 | 8.7 | 0.253 |
| 11/24/2003 14:21 | 8.9 | -0.651 | 8.8 | 0.251 |
| 11/24/2003 14:21 | 9 | -0.641 | 8.9 | 0.247 |
| 11/24/2003 14:21 | 9.1 | -0.633 | 9 | 0.244 |
| 11/24/2003 14:21 | 9.2 | -0.625 | 9.1 | 0.241 |
| 11/24/2003 14:21 | 9.3 | -0.619 | 9.2 | 0.238 |
| 11/24/2003 14:21 | 9.4 | -0.611 | 9.3 | 0.235 |
| 11/24/2003 14:21 | 9.5 | -0.605 | 9.4 | 0.233 |
| 11/24/2003 14:21 | 9.6 | -0.596 | 9.5 | 0.229 |
| 11/24/2003 14:21 | 9.7 | -0.586 | 9.6 | 0.226 |
| 11/24/2003 14:21 | 9.8 | -0.58 | 9.7 | 0.223 |
| 11/24/2003 14:22 | 9.9 | -0.572 | 9.8 | 0.220 |
| 11/24/2003 14:22 | 10 | -0.566 | 9.9 | 0.218 |
| 11/24/2003 14:22 | 10.1 | -0.558 | 10 | 0.215 |
| 11/24/2003 14:22 | 10.2 | -0.55 | 10.1 | 0.212 |
| 11/24/2003 14:22 | 10.3 | -0.544 | 10.2 | 0.209 |
| 11/24/2003 14:22 | 10.4 | -0.538 | 10.3 | 0.207 |
| 11/24/2003 14:22 | 10.5 | -0.53 | 10.4 | 0.204 |
| 11/24/2003 14:22 | 10.6 | -0.524 | 10.5 | 0.202 |
| 11/24/2003 14:22 | 10.7 | -0.518 | 10.6 | 0.199 |
| 11/24/2003 14:22 | 10.8 | -0.51 | 10.7 | 0.196 |
| 11/24/2003 14:23 | 10.9 | -0.504 | 10.8 | 0.194 |
| 11/24/2003 14:23 | 11 | -0.502 | 10.9 | 0.193 |
| 11/24/2003 14:23 | 11.1 | -0.496 | 11 | 0.191 |
| 11/24/2003 14:23 | 11.2 | -0.49 | 11.1 | 0.189 |
| 11/24/2003 14:23 | 11.3 | -0.482 | 11.2 | 0.186 |
| 11/24/2003 14:23 | 11.4 | -0.48 | 11.3 | 0.185 |
| 11/24/2003 14:23 | 11.5 | -0.471 | 11.4 | 0.181 |
| 11/24/2003 14:23 | 11.6 | -0.461 | 11.5 | 0.178 |
| 11/24/2003 14:23 | 11.7 | -0.455 | 11.6 | 0.175 |
| 11/24/2003 14:23 | 11.8 | -0.453 | 11.7 | 0.174 |

| | | | | |
|---|---|---|---|---|
| 11/24/2003 14:24 | 11.9 | -0.445 | 11.8 | 0.171 |
| 11/24/2003 14:24 | 12 | -0.441 | 11.9 | 0.170 |
| 11/24/2003 14:24 | 12.1 | -0.435 | 12 | 0.168 |
| 11/24/2003 14:24 | 12.2 | -0.431 | 12.1 | 0.166 |
| 11/24/2003 14:24 | 12.3 | -0.427 | 12.2 | 0.164 |
| 11/24/2003 14:24 | 12.4 | -0.423 | 12.3 | 0.163 |
| 11/24/2003 14:24 | 12.5 | -0.419 | 12.4 | 0.161 |
| 11/24/2003 14:24 | 12.6 | -0.411 | 12.5 | 0.158 |
| 11/24/2003 14:24 | 12.7 | -0.409 | 12.6 | 0.157 |
| 11/24/2003 14:24 | 12.8 | -0.401 | 12.7 | 0.154 |
| 11/24/2003 14:25 | 12.9 | -0.395 | 12.8 | 0.152 |
| 11/24/2003 14:25 | 13 | -0.395 | 12.9 | 0.152 |
| 11/24/2003 14:25 | 13.1 | -0.395 | 13 | 0.152 |
| 11/24/2003 14:25 | 13.2 | -0.385 | 13.1 | 0.148 |
| 11/24/2003 14:25 | 13.3 | -0.381 | 13.2 | 0.147 |
| 11/24/2003 14:25 | 13.4 | -0.373 | 13.3 | 0.144 |
| 11/24/2003 14:25 | 13.5 | -0.367 | 13.4 | 0.141 |
| 11/24/2003 14:25 | 13.6 | -0.367 | 13.5 | 0.141 |
| 11/24/2003 14:25 | 13.7 | -0.361 | 13.6 | 0.139 |
| 11/24/2003 14:25 | 13.8 | -0.355 | 13.7 | 0.137 |
| 11/24/2003 14:26 | 13.9 | -0.353 | 13.8 | 0.136 |
| 11/24/2003 14:26 | 14 | -0.347 | 13.9 | 0.134 |
| 11/24/2003 14:26 | 14.1 | -0.341 | 14 | 0.131 |
| 11/24/2003 14:26 | 14.2 | -0.345 | 14.1 | 0.133 |
| 11/24/2003 14:26 | 14.3 | -0.339 | 14.2 | 0.131 |
| 11/24/2003 14:26 | 14.4 | -0.333 | 14.3 | 0.128 |
| 11/24/2003 14:26 | 14.5 | -0.327 | 14.4 | 0.126 |
| 11/24/2003 14:26 | 14.6 | -0.323 | 14.5 | 0.124 |
| 11/24/2003 14:26 | 14.7 | -0.323 | 14.6 | 0.124 |
| 11/24/2003 14:26 | 14.8 | -0.318 | 14.7 | 0.122 |
| 11/24/2003 14:27 | 14.9 | -0.316 | 14.8 | 0.122 |
| 11/24/2003 14:27 | 15 | -0.308 | 14.9 | 0.119 |
| 11/24/2003 14:27 | 15.1 | -0.31 | 15 | 0.119 |
| 11/24/2003 14:27 | 15.2 | -0.304 | 15.1 | 0.117 |
| 11/24/2003 14:27 | 15.3 | -0.296 | 15.2 | 0.114 |
| 11/24/2003 14:27 | 15.4 | -0.294 | 15.3 | 0.113 |
| 11/24/2003 14:27 | 15.5 | -0.292 | 15.4 | 0.112 |
| 11/24/2003 14:27 | 15.6 | -0.292 | 15.5 | 0.112 |
| 11/24/2003 14:27 | 15.7 | -0.288 | 15.6 | 0.111 |
| 11/24/2003 14:27 | 15.8 | -0.288 | 15.7 | 0.111 |
| 11/24/2003 14:28 | 15.9 | -0.284 | 15.8 | 0.109 |
| 11/24/2003 14:28 | 16 | -0.282 | 15.9 | 0.109 |
| 11/24/2003 14:28 | 16.1 | -0.272 | 16 | 0.105 |
| 11/24/2003 14:28 | 16.2 | -0.274 | 16.1 | 0.106 |
| 11/24/2003 14:28 | 16.3 | -0.274 | 16.2 | 0.106 |
| 11/24/2003 14:28 | 16.4 | -0.268 | 16.3 | 0.103 |
| 11/24/2003 14:28 | 16.5 | -0.262 | 16.4 | 0.101 |
| 11/24/2003 14:28 | 16.6 | -0.262 | 16.5 | 0.101 |
| 11/24/2003 14:28 | 16.7 | -0.262 | 16.6 | 0.101 |
| 11/24/2003 14:28 | 16.8 | -0.256 | 16.7 | 0.099 |
| 11/24/2003 14:29 | 16.9 | -0.258 | 16.8 | 0.099 |
| 11/24/2003 14:29 | 17 | -0.252 | 16.9 | 0.097 |
| 11/24/2003 14:29 | 17.1 | -0.252 | 17 | 0.097 |
| 11/24/2003 14:29 | 17.2 | -0.248 | 17.1 | 0.095 |
| 11/24/2003 14:29 | 17.3 | -0.246 | 17.2 | 0.095 |
| 11/24/2003 14:29 | 17.4 | -0.244 | 17.3 | 0.094 |
| 11/24/2003 14:29 | 17.5 | -0.24 | 17.4 | 0.092 |
| 11/24/2003 14:29 | 17.6 | -0.238 | 17.5 | 0.092 |
| 11/24/2003 14:29 | 17.7 | -0.238 | 17.6 | 0.092 |
| 11/24/2003 14:29 | 17.8 | -0.234 | 17.7 | 0.090 |
| 11/24/2003 14:30 | 17.9 | -0.232 | 17.8 | 0.089 |
| 11/24/2003 14:30 | 18 | -0.232 | 17.9 | 0.089 |
| 11/24/2003 14:30 | 18.1 | -0.226 | 18 | 0.087 |
| 11/24/2003 14:30 | 18.2 | -0.224 | 18.1 | 0.086 |
| 11/24/2003 14:30 | 18.3 | -0.224 | 18.2 | 0.086 |
| 11/24/2003 14:30 | 18.4 | -0.222 | 18.3 | 0.085 |
| 11/24/2003 14:30 | 18.5 | -0.224 | 18.4 | 0.086 |
| 11/24/2003 14:30 | 18.6 | -0.216 | 18.5 | 0.083 |
| 11/24/2003 14:30 | 18.7 | -0.216 | 18.6 | 0.083 |
| 11/24/2003 14:30 | 18.8 | -0.214 | 18.7 | 0.082 |
| 11/24/2003 14:31 | 18.9 | -0.212 | 18.8 | 0.082 |
| 11/24/2003 14:31 | 19 | -0.21 | 18.9 | 0.081 |
| 11/24/2003 14:31 | 19.1 | -0.208 | 19 | 0.080 |
| 11/24/2003 14:31 | 19.2 | -0.208 | 19.1 | 0.080 |
| 11/24/2003 14:31 | 19.3 | -0.204 | 19.2 | 0.079 |
| 11/24/2003 14:31 | 19.4 | -0.206 | 19.3 | 0.079 |
| 11/24/2003 14:31 | 19.5 | -0.206 | 19.4 | 0.079 |
| 11/24/2003 14:31 | 19.6 | -0.2 | 19.5 | 0.077 |
| 11/24/2003 14:31 | 19.7 | -0.2 | 19.6 | 0.077 |

| | | | | |
|---|---|---|---|---|
| 11/24/2003 14:31 | 19.8 | -0.194 | 19.7 | 0.075 |
| 11/24/2003 14:32 | 19.9 | -0.196 | 19.8 | 0.075 |
| 11/24/2003 14:32 | 20 | -0.196 | 19.9 | 0.075 |
| 11/24/2003 14:32 | 20.1 | -0.192 | 20 | 0.074 |
| 11/24/2003 14:32 | 20.2 | -0.19 | 20.1 | 0.073 |
| 11/24/2003 14:32 | 20.3 | -0.188 | 20.2 | 0.072 |
| 11/24/2003 14:32 | 20.4 | -0.186 | 20.3 | 0.072 |
| 11/24/2003 14:32 | 20.5 | -0.188 | 20.4 | 0.072 |
| 11/24/2003 14:32 | 20.6 | -0.186 | 20.5 | 0.072 |
| 11/24/2003 14:32 | 20.7 | -0.182 | 20.6 | 0.070 |
| 11/24/2003 14:32 | 20.8 | -0.18 | 20.7 | 0.069 |
| 11/24/2003 14:33 | 20.9 | -0.182 | 20.8 | 0.070 |
| 11/24/2003 14:33 | 21 | -0.178 | 20.9 | 0.069 |
| 11/24/2003 14:33 | 21.1 | -0.176 | 21 | 0.068 |
| 11/24/2003 14:33 | 21.2 | -0.176 | 21.1 | 0.068 |
| 11/24/2003 14:33 | 21.3 | -0.172 | 21.2 | 0.066 |
| 11/24/2003 14:33 | 21.4 | -0.168 | 21.3 | 0.065 |
| 11/24/2003 14:33 | 21.5 | -0.17 | 21.4 | 0.065 |
| 11/24/2003 14:33 | 21.6 | -0.17 | 21.5 | 0.065 |
| 11/24/2003 14:33 | 21.7 | -0.17 | 21.6 | 0.065 |
| 11/24/2003 14:33 | 21.8 | -0.17 | 21.7 | 0.065 |
| 11/24/2003 14:34 | 21.9 | -0.17 | 21.8 | 0.065 |
| 11/24/2003 14:34 | 22 | -0.17 | 21.9 | 0.065 |
| 11/24/2003 14:34 | 22.1 | -0.165 | 22 | 0.064 |
| 11/24/2003 14:34 | 22.2 | -0.163 | 22.1 | 0.063 |
| 11/24/2003 14:34 | 22.3 | -0.163 | 22.2 | 0.063 |
| 11/24/2003 14:34 | 22.4 | -0.161 | 22.3 | 0.062 |
| 11/24/2003 14:34 | 22.5 | -0.157 | 22.4 | 0.060 |
| 11/24/2003 14:34 | 22.6 | -0.159 | 22.5 | 0.061 |
| 11/24/2003 14:34 | 22.7 | -0.157 | 22.6 | 0.060 |
| 11/24/2003 14:34 | 22.8 | -0.157 | 22.7 | 0.060 |
| 11/24/2003 14:35 | 22.9 | -0.155 | 22.8 | 0.060 |
| 11/24/2003 14:35 | 23 | -0.155 | 22.9 | 0.060 |
| 11/24/2003 14:35 | 23.1 | -0.153 | 23 | 0.059 |
| 11/24/2003 14:35 | 23.2 | -0.153 | 23.1 | 0.059 |
| 11/24/2003 14:35 | 23.3 | -0.152 | 23.2 | 0.059 |
| 11/24/2003 14:35 | 23.4 | -0.151 | 23.3 | 0.058 |
| 11/24/2003 14:35 | 23.5 | -0.153 | 23.4 | 0.059 |
| 11/24/2003 14:35 | 23.6 | -0.149 | 23.5 | 0.057 |
| 11/24/2003 14:35 | 23.7 | -0.149 | 23.6 | 0.057 |
| 11/24/2003 14:35 | 23.8 | -0.149 | 23.7 | 0.057 |
| 11/24/2003 14:36 | 23.9 | -0.147 | 23.8 | 0.057 |
| 11/24/2003 14:36 | 24 | -0.149 | 23.9 | 0.057 |
| 11/24/2003 14:36 | 24.1 | -0.143 | 24 | 0.055 |
| 11/24/2003 14:36 | 24.2 | -0.143 | 24.1 | 0.055 |
| 11/24/2003 14:36 | 24.3 | -0.139 | 24.2 | 0.054 |
| 11/24/2003 14:36 | 24.4 | -0.141 | 24.3 | 0.054 |
| 11/24/2003 14:36 | 24.5 | -0.139 | 24.4 | 0.054 |
| 11/24/2003 14:36 | 24.6 | -0.139 | 24.5 | 0.054 |
| 11/24/2003 14:36 | 24.7 | -0.141 | 24.6 | 0.054 |
| 11/24/2003 14:36 | 24.8 | -0.139 | 24.7 | 0.054 |
| 11/24/2003 14:37 | 24.9 | -0.139 | 24.8 | 0.054 |
| 11/24/2003 14:37 | 25 | -0.135 | 24.9 | 0.052 |
| 11/24/2003 14:37 | 25.1 | -0.133 | 25 | 0.051 |
| 11/24/2003 14:37 | 25.2 | -0.135 | 25.1 | 0.052 |
| 11/24/2003 14:37 | 25.3 | -0.137 | 25.2 | 0.053 |
| 11/24/2003 14:37 | 25.4 | -0.135 | 25.3 | 0.052 |
| 11/24/2003 14:37 | 25.5 | -0.133 | 25.4 | 0.051 |
| 11/24/2003 14:37 | 25.6 | -0.133 | 25.5 | 0.051 |
| 11/24/2003 14:37 | 25.7 | -0.131 | 25.6 | 0.050 |
| 11/24/2003 14:37 | 25.8 | -0.131 | 25.7 | 0.050 |
| 11/24/2003 14:38 | 25.9 | -0.129 | 25.8 | 0.050 |

TETRA-TECH NUS

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT32 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 24-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .208' | 2.5 = R |
| Length of Well Screen (ft.) : | | 12.62 = L |
| Time for 37% head change (min.) : | | 7.05 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.60E-04 | ft./min. |
| 2.67E-06 | ft./sec. |
| 2.31E-01 | ft./day |
| 8.14E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(12.62/.208)}{2 \times 12.62 \times 7.05}$$

$1.59 \times 10^{-4}$ Ft/min

CHECKED

2-18-04

OK
FWR

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

**Project Name:** Crane NSWC
**Project No.:** 9060
**Test Type:** Rising head

**Well/Boring No.:** 13MWT33
**Aquifer Type:** Bedrock
**Test Date:** 24-Nov-03

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 2 | = R |
| Length of Well Screen (ft.) : | 9.09 | = L |
| Time for 37% head change (min.) : | 149.25 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.02E-05 | ft./min. |
| 1.71E-07 | ft./sec. |
| 1.47E-02 | ft./day |
| 5.20E-06 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 13MWT33

PROJECT NO.: 9060 GEOLOGIST: M.G. COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 13.41 TOC DATE: 11-24-03

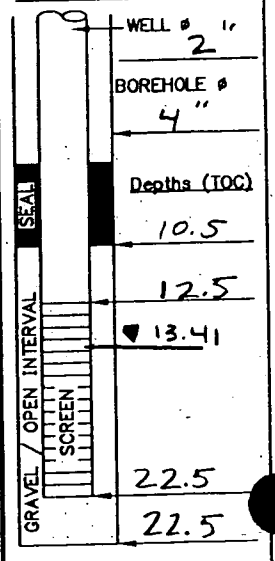
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: BAILER PAGE 1 OF 1

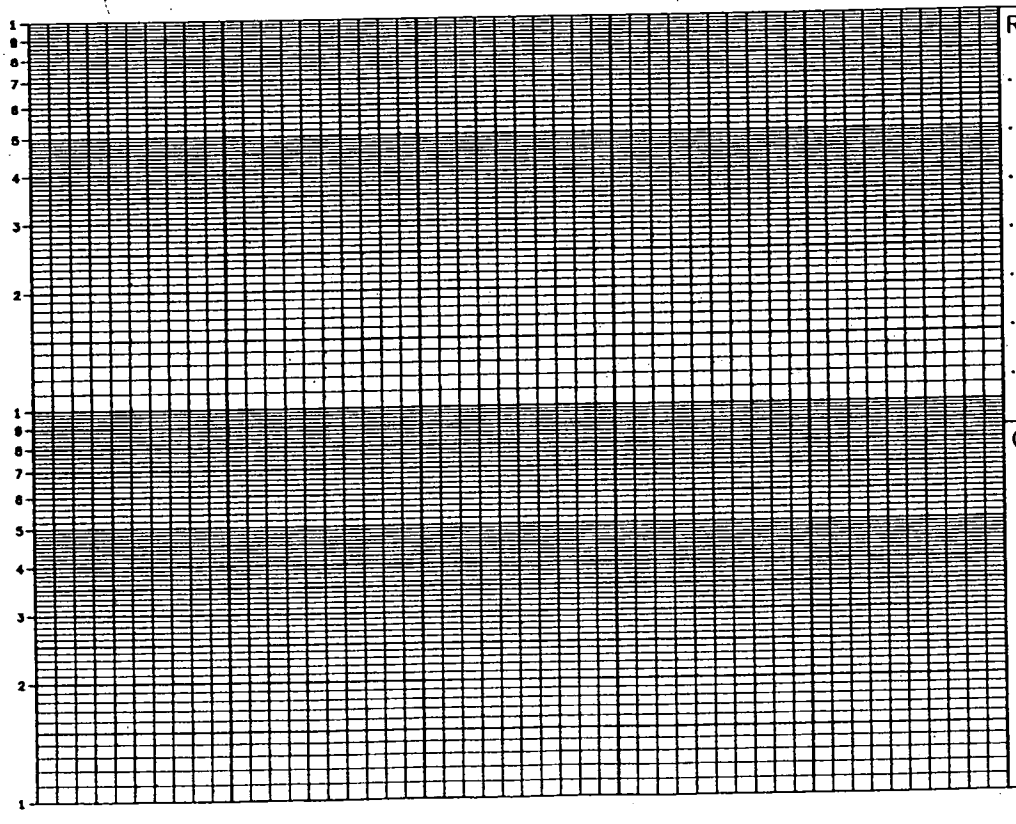
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC, ZERO AT SWL + START

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 0 | | 90 | -.456 | |
| .1 | -1.194 | | 100 | -.440 | |
| .5 | -.998 | | 110 | -.428 | |
| 1 | -.916 | | 120 | -.416 | |
| 10 | -.756 | | 130 | -.406 | |
| 20 | -.690 | | 140 | -.394 | |
| 30 | -.626 | | 150 | -.392 | |
| 40 | -.580 | | 160 | -.386 | |
| 50 | -.549 | | 170 | -.378 | |
| 60 | -.519 | | 180 | -.372 | |
| 70 | -.495 | | 190 | -.366 | |
| 80 | -.473 | | 200 | -.345 | |

WELL SCHEMATIC



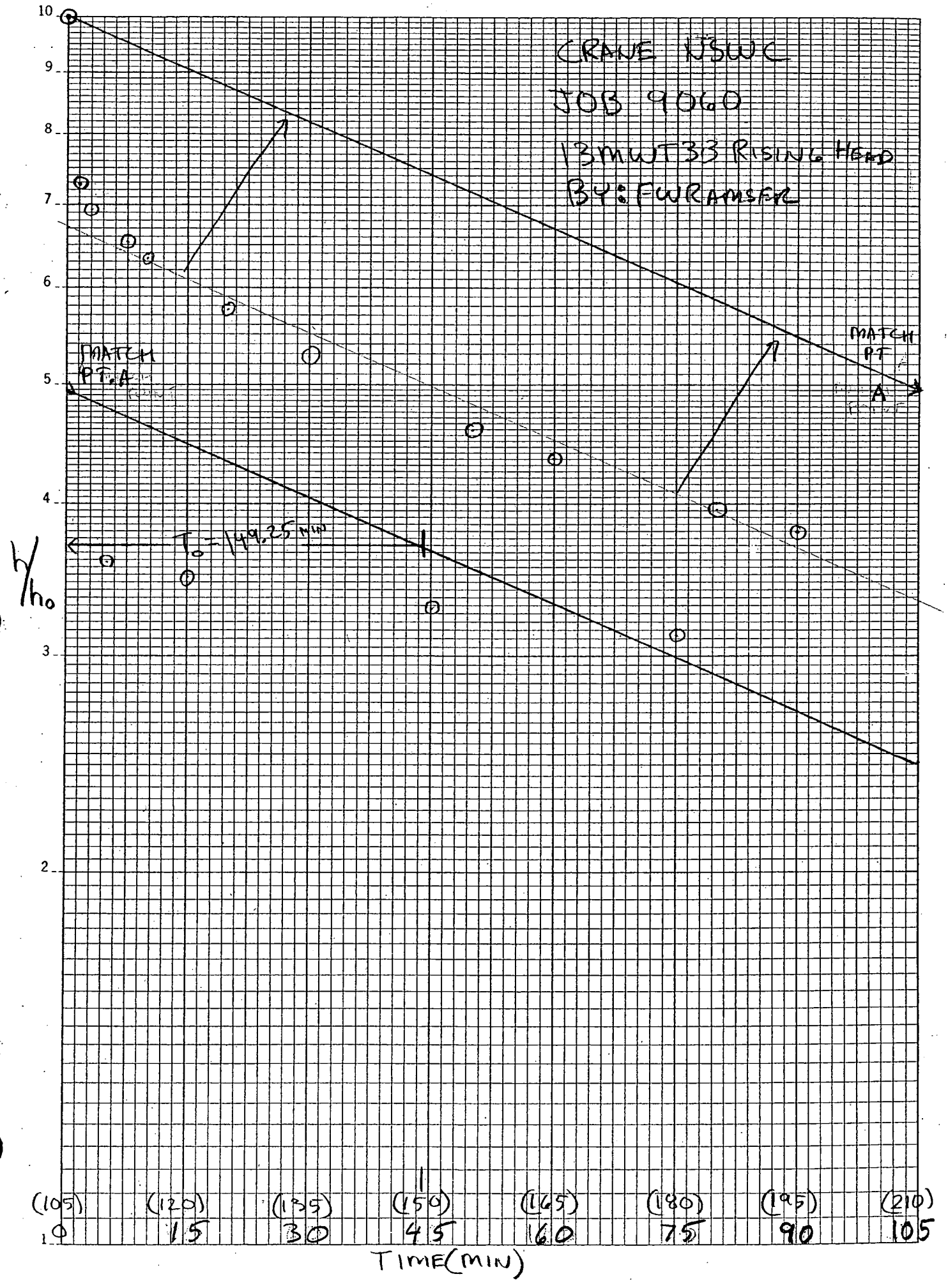

▽ Indicate SWL Depth on Drawing



REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 12/9/2003 11:26:23
Report from file: H:\Crane IN\SWMU13_16\MGC slug tests 03\site 13\SN06899 2003-11-24 095156 13MWT33rising#1.bin
DataMgr Version 3.68

Serial number: 6899
Firmware Version 3.07
Unit name:

Test name: 13MWT33rising#1

Test defined on: 11/24/2003 9:20:18
Test started on: 11/24/2003 9:51:56
Test stopped on: 11/24/2003 13:17:31
Test extracted on: N/A

Data gathered using Linear testing
Time between data points: Minutes.
Number of data samples: 2056

TOTAL DATA SAMPLES 2056

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined reference: 0 Feet H2O
Referenced on: test start.
Pressure head at reference: 8.519 Feet H2O

| Date Time | ET (min) | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho | ho = -1.194 |
|---|---|---|---|---|---|
| 11/24/2003 9:51 | 0 | 0 | | | |
| 11/24/2003 9:52 | 0.1 | -1.194 | 0 | 1.000 | |
| 11/24/2003 9:52 | 0.2 | -1.115 | 0.1 | 0.934 | |
| 11/24/2003 9:52 | 0.3 | -1.065 | 0.2 | 0.892 | |
| 11/24/2003 9:52 | 0.4 | -1.026 | 0.3 | 0.859 | |
| 11/24/2003 9:52 | 0.5 | -0.998 | 0.4 | 0.836 | |
| 11/24/2003 9:52 | 0.6 | -0.974 | 0.5 | 0.816 | |
| 11/24/2003 9:52 | 0.7 | -0.954 | 0.6 | 0.799 | |
| 11/24/2003 9:52 | 0.8 | -0.94 | 0.7 | 0.787 | |
| 11/24/2003 9:52 | 0.9 | -0.926 | 0.8 | 0.776 | |
| 11/24/2003 9:52 | 1 | -0.916 | 0.9 | 0.767 | |
| 11/24/2003 9:53 | 1.1 | -0.905 | 1 | 0.758 | |
| 11/24/2003 9:53 | 1.2 | -0.897 | 1.1 | 0.751 | |
| 11/24/2003 9:53 | 1.3 | -0.887 | 1.2 | 0.743 | |
| 11/24/2003 9:53 | 1.4 | -0.881 | 1.3 | 0.738 | |
| 11/24/2003 9:53 | 1.5 | -0.875 | 1.4 | 0.733 | |
| 11/24/2003 9:53 | 1.6 | -0.871 | 1.5 | 0.729 | |
| 11/24/2003 9:53 | 1.7 | -0.865 | 1.6 | 0.724 | |
| 11/24/2003 9:53 | 1.8 | -0.863 | 1.7 | 0.723 | |
| 11/24/2003 9:53 | 1.9 | -0.857 | 1.8 | 0.718 | |
| 11/24/2003 9:53 | 2 | -0.853 | 1.9 | 0.714 | |
| 11/24/2003 9:54 | 2.1 | -0.851 | 2 | 0.713 | |
| 11/24/2003 9:54 | 2.2 | -0.849 | 2.1 | 0.711 | |
| 11/24/2003 9:54 | 2.3 | -0.847 | 2.2 | 0.709 | |
| 11/24/2003 9:54 | 2.4 | -0.843 | 2.3 | 0.706 | |
| 11/24/2003 9:54 | 2.5 | -0.841 | 2.4 | 0.704 | |
| 11/24/2003 9:54 | 2.6 | -0.839 | 2.5 | 0.703 | |
| 11/24/2003 9:54 | 2.7 | -0.837 | 2.6 | 0.701 | |
| 11/24/2003 9:54 | 2.8 | -0.835 | 2.7 | 0.699 | |
| 11/24/2003 9:54 | 2.9 | -0.833 | 2.8 | 0.698 | |
| 11/24/2003 9:54 | 3 | -0.833 | 2.9 | 0.698 | |
| 11/24/2003 9:55 | 3.1 | -0.829 | 3 | 0.694 | |
| 11/24/2003 9:55 | 3.2 | -0.829 | 3.1 | 0.694 | |
| 11/24/2003 9:55 | 3.3 | -0.827 | 3.2 | 0.693 | |
| 11/24/2003 9:55 | 3.4 | -0.825 | 3.3 | 0.691 | |

| | | | | |
|---|---|---|---|---|
| 11/24/2003 9:55 | 3.5 | -0.823 | 3.4 | 0.689 |
| 11/24/2003 9:55 | 3.6 | -0.821 | 3.5 | 0.688 |
| 11/24/2003 9:55 | 3.7 | -0.819 | 3.6 | 0.686 |
| 11/24/2003 9:55 | 3.8 | -0.819 | 3.7 | 0.686 |
| 11/24/2003 9:55 | 3.9 | -0.819 | 3.8 | 0.686 |
| 11/24/2003 9:55 | 4 | -0.817 | 3.9 | 0.684 |
| 11/24/2003 9:56 | 4.1 | -0.817 | 4 | 0.684 |
| 11/24/2003 9:56 | 4.2 | -0.809 | 4.1 | 0.678 |
| 11/24/2003 9:56 | 4.3 | -0.795 | 4.2 | 0.666 |
| 11/24/2003 9:56 | 4.4 | -0.793 | 4.3 | 0.664 |
| 11/24/2003 9:56 | 4.5 | -0.789 | 4.4 | 0.661 |
| 11/24/2003 9:56 | 4.6 | -0.787 | 4.5 | 0.659 |
| 11/24/2003 9:56 | 4.7 | -0.789 | 4.6 | 0.661 |
| 11/24/2003 9:56 | 4.8 | -0.805 | 4.7 | 0.674 |
| 11/24/2003 9:56 | 4.9 | -0.805 | 4.8 | 0.674 |
| 11/24/2003 9:56 | 5 | -0.805 | 4.9 | 0.674 |
| 11/24/2003 9:57 | 5.1 | -0.805 | 5 | 0.674 |
| 11/24/2003 9:57 | 5.2 | -0.803 | 5.1 | 0.673 |
| 11/24/2003 9:57 | 5.3 | -0.803 | 5.2 | 0.673 |
| 11/24/2003 9:57 | 5.4 | -0.801 | 5.3 | 0.671 |
| 11/24/2003 9:57 | 5.5 | -0.803 | 5.4 | 0.673 |
| 11/24/2003 9:57 | 5.6 | -0.801 | 5.5 | 0.671 |
| 11/24/2003 9:57 | 5.7 | -0.797 | 5.6 | 0.668 |
| 11/24/2003 9:57 | 5.8 | -0.797 | 5.7 | 0.668 |
| 11/24/2003 9:57 | 5.9 | -0.795 | 5.8 | 0.666 |
| 11/24/2003 9:57 | 6 | -0.795 | 5.9 | 0.666 |
| 11/24/2003 9:58 | 6.1 | -0.795 | 6 | 0.666 |
| 11/24/2003 9:58 | 6.2 | -0.793 | 6.1 | 0.664 |
| 11/24/2003 9:58 | 6.3 | -0.791 | 6.2 | 0.662 |
| 11/24/2003 9:58 | 6.4 | -0.791 | 6.3 | 0.662 |
| 11/24/2003 9:58 | 6.5 | -0.791 | 6.4 | 0.662 |
| 11/24/2003 9:58 | 6.6 | -0.789 | 6.5 | 0.661 |
| 11/24/2003 9:58 | 6.7 | -0.787 | 6.6 | 0.659 |
| 11/24/2003 9:58 | 6.8 | -0.787 | 6.7 | 0.659 |
| 11/24/2003 9:58 | 6.9 | -0.785 | 6.8 | 0.657 |
| 11/24/2003 9:58 | 7 | -0.785 | 6.9 | 0.657 |
| 11/24/2003 9:59 | 7.1 | -0.783 | 7 | 0.656 |
| 11/24/2003 9:59 | 7.2 | -0.783 | 7.1 | 0.656 |
| 11/24/2003 9:59 | 7.3 | -0.785 | 7.2 | 0.657 |
| 11/24/2003 9:59 | 7.4 | -0.783 | 7.3 | 0.656 |
| 11/24/2003 9:59 | 7.5 | -0.781 | 7.4 | 0.654 |
| 11/24/2003 9:59 | 7.6 | -0.779 | 7.5 | 0.652 |
| 11/24/2003 9:59 | 7.7 | -0.779 | 7.6 | 0.652 |
| 11/24/2003 9:59 | 7.8 | -0.779 | 7.7 | 0.652 |
| 11/24/2003 9:59 | 7.9 | -0.777 | 7.8 | 0.651 |
| 11/24/2003 9:59 | 8 | -0.777 | 7.9 | 0.651 |
| 11/24/2003 10:00 | 8.1 | -0.777 | 8 | 0.651 |
| 11/24/2003 10:00 | 8.2 | -0.775 | 8.1 | 0.649 |
| 11/24/2003 10:00 | 8.3 | -0.773 | 8.2 | 0.647 |
| 11/24/2003 10:00 | 8.4 | -0.771 | 8.3 | 0.646 |
| 11/24/2003 10:00 | 8.5 | -0.773 | 8.4 | 0.647 |
| 11/24/2003 10:00 | 8.6 | -0.773 | 8.5 | 0.647 |
| 11/24/2003 10:00 | 8.7 | -0.771 | 8.6 | 0.646 |
| 11/24/2003 10:00 | 8.8 | -0.771 | 8.7 | 0.646 |
| 11/24/2003 10:00 | 8.9 | -0.771 | 8.8 | 0.646 |
| 11/24/2003 10:00 | 9 | -0.766 | 8.9 | 0.642 |
| 11/24/2003 10:01 | 9.1 | -0.766 | 9 | 0.642 |
| 11/24/2003 10:01 | 9.2 | -0.764 | 9.1 | 0.640 |
| 11/24/2003 10:01 | 9.3 | -0.766 | 9.2 | 0.642 |
| 11/24/2003 10:01 | 9.4 | -0.762 | 9.3 | 0.638 |
| 11/24/2003 10:01 | 9.5 | -0.762 | 9.4 | 0.638 |
| 11/24/2003 10:01 | 9.6 | -0.762 | 9.5 | 0.638 |
| 11/24/2003 10:01 | 9.7 | -0.76 | 9.6 | 0.637 |
| 11/24/2003 10:01 | 9.8 | -0.758 | 9.7 | 0.635 |
| 11/24/2003 10:01 | 9.9 | -0.758 | 9.8 | 0.635 |
| 11/24/2003 10:01 | 10 | -0.756 | 9.9 | 0.633 |
| 11/24/2003 10:02 | 10.1 | -0.756 | 10 | 0.633 |
| 11/24/2003 10:12 | 20.1 | -0.688 | 20 | 0.576 |
| 11/24/2003 10:22 | 30.1 | -0.626 | 30 | 0.524 |
| 11/24/2003 10:32 | 40.1 | -0.578 | 40 | 0.484 |
| 11/24/2003 10:42 | 50.1 | -0.549 | 50 | 0.460 |
| 11/24/2003 10:52 | 60.1 | -0.519 | 60 | 0.435 |
| 11/24/2003 11:02 | 70.1 | -0.495 | 70 | 0.415 |
| 11/24/2003 11:12 | 80.1 | -0.473 | 80 | 0.396 |

| | | | | |
|---|---|---|---|---|
| 11/24/2003 11:22 | 90.1 | -0.454 | 90 | 0.380 |
| 11/24/2003 11:32 | 100.1 | -0.44 | 100 | 0.369 |
| 11/24/2003 11:42 | 110.1 | -0.428 | 110 | 0.358 |
| 11/24/2003 11:52 | 120.1 | -0.416 | 120 | 0.348 |
| 11/24/2003 12:02 | 130.1 | -0.406 | 130 | 0.340 |
| 11/24/2003 12:12 | 140.1 | -0.4 | 140 | 0.335 |
| 11/24/2003 12:22 | 150.1 | -0.392 | 150 | 0.328 |
| 11/24/2003 12:32 | 160.1 | -0.386 | 160 | 0.323 |
| 11/24/2003 12:42 | 170.1 | -0.38 | 170 | 0.318 |
| 11/24/2003 12:52 | 180.1 | -0.374 | 180 | 0.313 |
| 11/24/2003 13:02 | 190.1 | -0.362 | 190 | 0.303 |
| 11/24/2003 13:12 | 200.1 | -0.347 | 200 | 0.291 |

L
OK
PWR

TETRA-TECH NUS

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT33 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 24-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .166 | 2 = R |
| Length of Well Screen (ft.) : | 9.09 | = L |
| Time for 37% head change (min.) : | 149.25 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.02E-05 | ft./min. |
| 1.71E-07 | ft./sec. |
| 1.47E-02 | ft./day |
| 5.20E-06 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(9.09/.166)}{2 \times 9.09 \times 149.25} =$$

$1.02 \times 10^{-5}$ Ft/min

CHECKED
MLeman
2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

**Project Name:** Crane NSWC
**Project No.:** 9060
**Test Type:** Falling head

**Well/Boring No.:** 13MWT34
**Aquifer Type:** Bedrock
**Test Date:** 25-Nov-03

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 2 | = R |
| Length of Well Screen (ft.) : | 12.5 | = L |
| Time for 37% head change (min.) : | 8.70 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.38E-04 | ft./min. |
| 2.30E-06 | ft./sec. |
| 1.99E-01 | ft./day |
| 7.00E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

Tetra Tech NUS, Inc.

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 13MWT34

PROJECT NO.: 9060 GEOLOGIST: M.G. COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 6.11 TOC DATE: 11-25-03

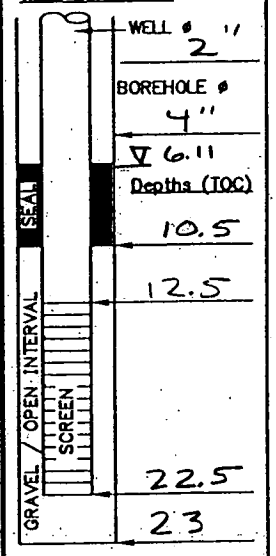
TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: SOLID SLUG PAGE 1 OF 1

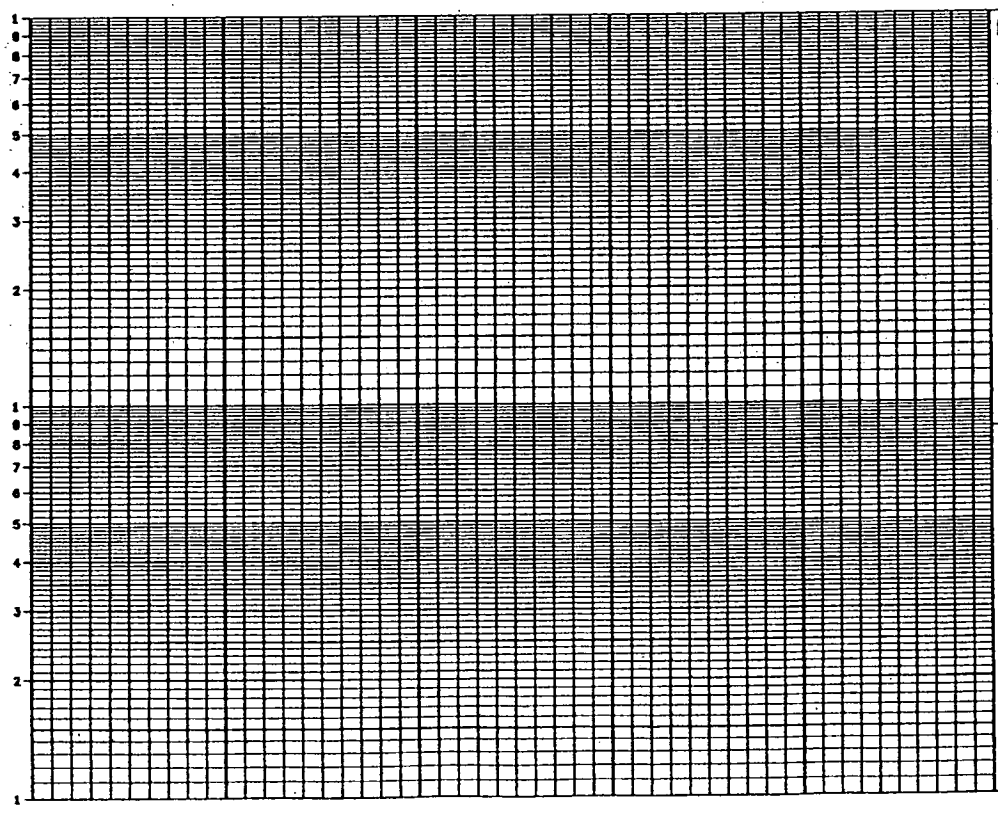
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC, ZERO AT STATIC+START

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 0 | | 2.0 | 2.020 | |
| .1 | .800 | | 3.0 | 1.792 | |
| .2 | 2.588 | | 4.0 | 1.593 | |
| .3 | 2.537 | | 5.0 | 1.421 | |
| .4 | 2.497 | | 6.0 | 1.270 | |
| .5 | 2.459 | | 8.0 | 1.016 | |
| .6 | 2.423 | | 10.0 | .816 | |
| .7 | 2.388 | | 12.0 | .659 | |
| .8 | 2.356 | | 14.0 | .538 | |
| .9 | 2.324 | | 18.0 | .361 | |
| 1.0 | 2.292 | | 20.0 | .298 | |
| 1.5 | 2.151 | | 25 | .186 | |

WELL SCHEMATIC



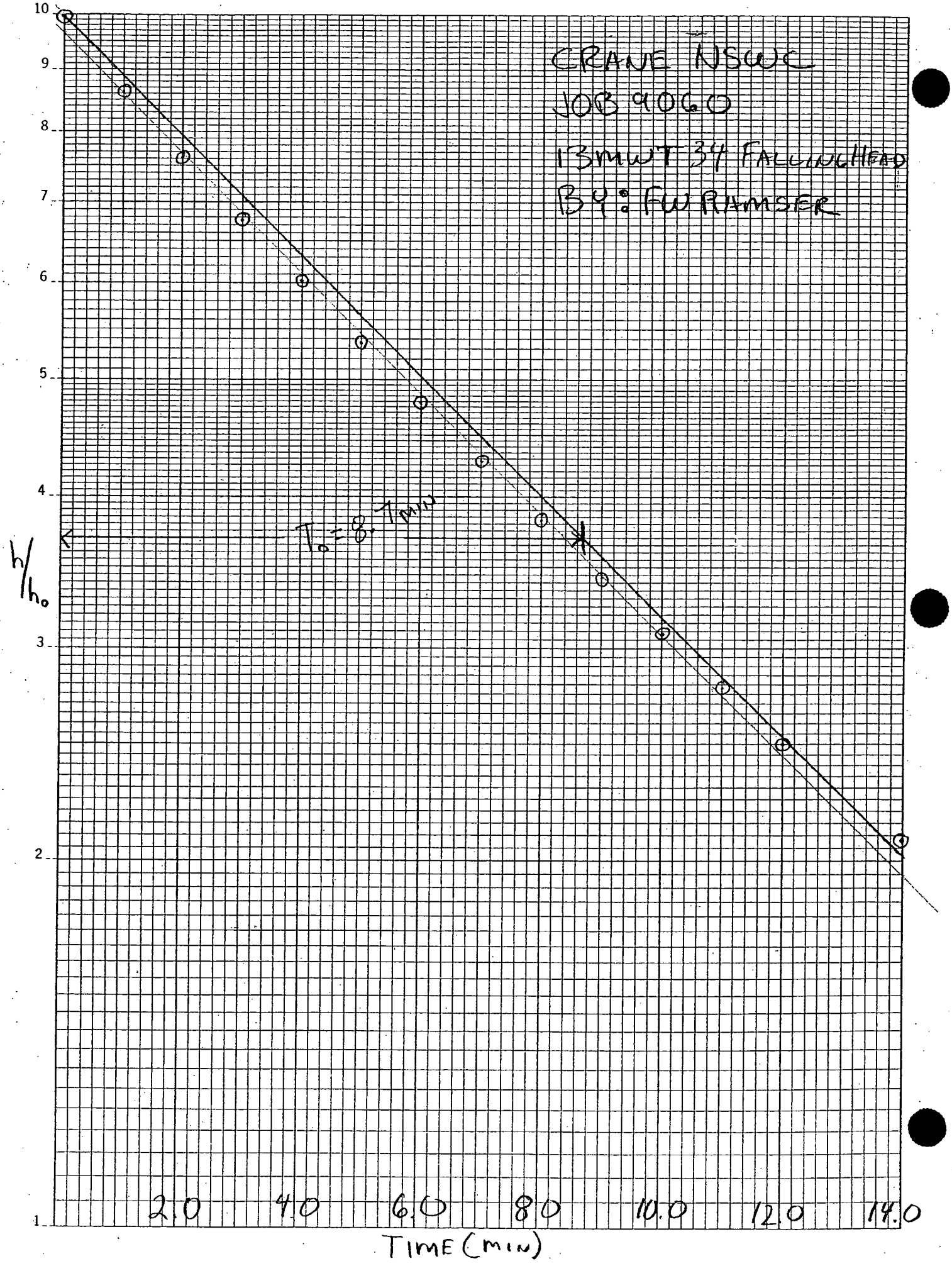

▽ Indicate SWL Depth on Drawing



REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL




K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 4650

In-Situ Inc. MiniTroll Pro

Report generated: 12/9/2003 12:48:45
Report from file: H:\Crane IN\SWMU13_16\MGC slug tests 03\site 13\SN06899 2003-11-25 094711 13MWT34falling#1.bin
DataMgr Version 3.68

Serial number: 6899
Firmware Version 3.07
Unit name:

Test name: 13MWT34falling#1

Test defined on: 11/25/2003 9:19:41
Test started on: 11/25/2003 9:47:11
Test stopped on: 11/25/2003 10:14:09
Test extracted on: N/A

Data gathered using Linear testing
Time between data poi Minutes.
Number of data sampl 270

TOTAL DATA SAMPLES 270

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined reference 0 Feet H2O
Referenced on: test start
Pressure head at refere 16.902 Feet H2O

| Date | Time | ET (min) | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho | ho = 2.588 |
|---|---|---|---|---|---|---|
| | 11/25/2003 9:47 | 0 | 0 | | | |
| | 11/25/2003 9:47 | 0.1 | 0.8 | | | |
| | 11/25/2003 9:47 | 0.2 | 2.588 | 0 | 1.000 | ● |
| | 11/25/2003 9:47 | 0.3 | 2.537 | 0.1 | 0.980 | |
| | 11/25/2003 9:47 | 0.4 | 2.497 | 0.2 | 0.965 | |
| | 11/25/2003 9:47 | 0.5 | 2.459 | 0.3 | 0.950 | |
| | 11/25/2003 9:47 | 0.6 | 2.423 | 0.4 | 0.936 | |
| | 11/25/2003 9:47 | 0.7 | 2.388 | 0.5 | 0.923 | |
| | 11/25/2003 9:47 | 0.8 | 2.356 | 0.6 | 0.910 | |
| | 11/25/2003 9:48 | 0.9 | 2.324 | 0.7 | 0.898 | |
| | 11/25/2003 9:48 | 1 | 2.292 | 0.8 | 0.886 | |
| | 11/25/2003 9:48 | 1.1 | 2.262 | 0.9 | 0.874 | |
| | 11/25/2003 9:48 | 1.2 | 2.233 | 1 | 0.863 | ● |
| | 11/25/2003 9:48 | 1.3 | 2.205 | 1.1 | 0.852 | |
| | 11/25/2003 9:48 | 1.4 | 2.177 | 1.2 | 0.841 | |
| | 11/25/2003 9:48 | 1.5 | 2.151 | 1.3 | 0.831 | |
| | 11/25/2003 9:48 | 1.6 | 2.123 | 1.4 | 0.820 | |
| | 11/25/2003 9:48 | 1.7 | 2.096 | 1.5 | 0.810 | |
| | 11/25/2003 9:48 | 1.8 | 2.07 | 1.6 | 0.800 | |
| | 11/25/2003 9:49 | 1.9 | 2.046 | 1.7 | 0.791 | |
| | 11/25/2003 9:49 | 2 | 2.02 | 1.8 | 0.781 | |
| | 11/25/2003 9:49 | 2.1 | 1.996 | 1.9 | 0.771 | |
| | 11/25/2003 9:49 | 2.2 | 1.971 | 2 | 0.762 | ● |
| | 11/25/2003 9:49 | 2.3 | 1.947 | 2.1 | 0.752 | |
| | 11/25/2003 9:49 | 2.4 | 1.923 | 2.2 | 0.743 | |
| | 11/25/2003 9:49 | 2.5 | 1.901 | 2.3 | 0.735 | |
| | 11/25/2003 9:49 | 2.6 | 1.879 | 2.4 | 0.726 | |
| | 11/25/2003 9:49 | 2.7 | 1.857 | 2.5 | 0.718 | |
| | 11/25/2003 9:49 | 2.8 | 1.834 | 2.6 | 0.709 | |
| | 11/25/2003 9:50 | 2.9 | 1.812 | 2.7 | 0.700 | |
| | 11/25/2003 9:50 | 3 | 1.792 | 2.8 | 0.692 | |
| | 11/25/2003 9:50 | 3.1 | 1.772 | 2.9 | 0.685 | |
| | 11/25/2003 9:50 | 3.2 | 1.75 | 3 | 0.676 | ● |
| | 11/25/2003 9:50 | 3.3 | 1.728 | 3.1 | 0.668 | |
| | 11/25/2003 9:50 | 3.4 | 1.71 | 3.2 | 0.661 | |
| | 11/25/2003 9:50 | 3.5 | 1.689 | 3.3 | 0.653 | |
| | 11/25/2003 9:50 | 3.6 | 1.669 | 3.4 | 0.645 | |
| | 11/25/2003 9:50 | 3.7 | 1.651 | 3.5 | 0.638 | |
| | 11/25/2003 9:50 | 3.8 | 1.631 | 3.6 | 0.630 | |
| | 11/25/2003 9:51 | 3.9 | 1.613 | 3.7 | 0.623 | |

| | | | | |
|---|---|---|---|---|
| 11/25/2003 9:51 | 4 | 1.593 | 3.8 | 0.616 |
| 11/25/2003 9:51 | 4.1 | 1.575 | 3.9 | 0.609 |
| 11/25/2003 9:51 | 4.2 | 1.556 | 4 | 0.601 |
| 11/25/2003 9:51 | 4.3 | 1.54 | 4.1 | 0.595 |
| 11/25/2003 9:51 | 4.4 | 1.522 | 4.2 | 0.588 |
| 11/25/2003 9:51 | 4.5 | 1.504 | 4.3 | 0.581 |
| 11/25/2003 9:51 | 4.6 | 1.488 | 4.4 | 0.575 |
| 11/25/2003 9:51 | 4.7 | 1.472 | 4.5 | 0.569 |
| 11/25/2003 9:51 | 4.8 | 1.454 | 4.6 | 0.562 |
| 11/25/2003 9:52 | 4.9 | 1.435 | 4.7 | 0.554 |
| 11/25/2003 9:52 | 5 | 1.421 | 4.8 | 0.549 |
| 11/25/2003 9:52 | 5.1 | 1.405 | 4.9 | 0.543 |
| 11/25/2003 9:52 | 5.2 | 1.389 | 5 | 0.537 |
| 11/25/2003 9:52 | 5.3 | 1.373 | 5.1 | 0.531 |
| 11/25/2003 9:52 | 5.4 | 1.359 | 5.2 | 0.525 |
| 11/25/2003 9:52 | 5.5 | 1.343 | 5.3 | 0.519 |
| 11/25/2003 9:52 | 5.6 | 1.328 | 5.4 | 0.513 |
| 11/25/2003 9:52 | 5.7 | 1.312 | 5.5 | 0.507 |
| 11/25/2003 9:52 | 5.8 | 1.298 | 5.6 | 0.502 |
| 11/25/2003 9:53 | 5.9 | 1.284 | 5.7 | 0.496 |
| 11/25/2003 9:53 | 6 | 1.27 | 5.8 | 0.491 |
| 11/25/2003 9:53 | 6.1 | 1.256 | 5.9 | 0.485 |
| 11/25/2003 9:53 | 6.2 | 1.24 | 6 | 0.479 |
| 11/25/2003 9:53 | 6.3 | 1.228 | 6.1 | 0.474 |
| 11/25/2003 9:53 | 6.4 | 1.213 | 6.2 | 0.469 |
| 11/25/2003 9:53 | 6.5 | 1.199 | 6.3 | 0.463 |
| 11/25/2003 9:53 | 6.6 | 1.187 | 6.4 | 0.459 |
| 11/25/2003 9:53 | 6.7 | 1.171 | 6.5 | 0.452 |
| 11/25/2003 9:53 | 6.8 | 1.159 | 6.6 | 0.448 |
| 11/25/2003 9:54 | 6.9 | 1.149 | 6.7 | 0.444 |
| 11/25/2003 9:54 | 7 | 1.135 | 6.8 | 0.439 |
| 11/25/2003 9:54 | 7.1 | 1.123 | 6.9 | 0.434 |
| 11/25/2003 9:54 | 7.2 | 1.111 | 7 | 0.429 |
| 11/25/2003 9:54 | 7.3 | 1.098 | 7.1 | 0.424 |
| 11/25/2003 9:54 | 7.4 | 1.086 | 7.2 | 0.420 |
| 11/25/2003 9:54 | 7.5 | 1.074 | 7.3 | 0.415 |
| 11/25/2003 9:54 | 7.6 | 1.062 | 7.4 | 0.410 |
| 11/25/2003 9:54 | 7.7 | 1.05 | 7.5 | 0.406 |
| 11/25/2003 9:54 | 7.8 | 1.038 | 7.6 | 0.401 |
| 11/25/2003 9:55 | 7.9 | 1.028 | 7.7 | 0.397 |
| 11/25/2003 9:55 | 8 | 1.016 | 7.8 | 0.393 |
| 11/25/2003 9:55 | 8.1 | 1.004 | 7.9 | 0.388 |
| 11/25/2003 9:55 | 8.2 | 0.992 | 8 | 0.383 |
| 11/25/2003 9:55 | 8.3 | 0.981 | 8.1 | 0.379 |
| 11/25/2003 9:55 | 8.4 | 0.973 | 8.2 | 0.376 |
| 11/25/2003 9:55 | 8.5 | 0.961 | 8.3 | 0.371 |
| 11/25/2003 9:55 | 8.6 | 0.951 | 8.4 | 0.367 |
| 11/25/2003 9:55 | 8.7 | 0.941 | 8.5 | 0.364 |
| 11/25/2003 9:55 | 8.8 | 0.931 | 8.6 | 0.360 |
| 11/25/2003 9:56 | 8.9 | 0.921 | 8.7 | 0.356 |
| 11/25/2003 9:56 | 9 | 0.911 | 8.8 | 0.352 |
| 11/25/2003 9:56 | 9.1 | 0.901 | 8.9 | 0.348 |
| 11/25/2003 9:56 | 9.2 | 0.891 | 9 | 0.344 |
| 11/25/2003 9:56 | 9.3 | 0.883 | 9.1 | 0.341 |
| 11/25/2003 9:56 | 9.4 | 0.873 | 9.2 | 0.337 |
| 11/25/2003 9:56 | 9.5 | 0.865 | 9.3 | 0.334 |
| 11/25/2003 9:56 | 9.6 | 0.855 | 9.4 | 0.330 |
| 11/25/2003 9:56 | 9.7 | 0.845 | 9.5 | 0.327 |
| 11/25/2003 9:56 | 9.8 | 0.836 | 9.6 | 0.323 |
| 11/25/2003 9:57 | 9.9 | 0.826 | 9.7 | 0.319 |
| 11/25/2003 9:57 | 10 | 0.818 | 9.8 | 0.316 |
| 11/25/2003 9:57 | 10.1 | 0.808 | 9.9 | 0.312 |
| 11/25/2003 9:57 | 10.2 | 0.8 | 10 | 0.309 |
| 11/25/2003 9:57 | 10.3 | 0.792 | 10.1 | 0.306 |
| 11/25/2003 9:57 | 10.4 | 0.782 | 10.2 | 0.302 |
| 11/25/2003 9:57 | 10.5 | 0.776 | 10.3 | 0.300 |
| 11/25/2003 9:57 | 10.6 | 0.766 | 10.4 | 0.296 |
| 11/25/2003 9:57 | 10.7 | 0.758 | 10.5 | 0.293 |
| 11/25/2003 9:57 | 10.8 | 0.75 | 10.6 | 0.290 |
| 11/25/2003 9:58 | 10.9 | 0.742 | 10.7 | 0.287 |
| 11/25/2003 9:58 | 11 | 0.734 | 10.8 | 0.284 |
| 11/25/2003 9:58 | 11.1 | 0.728 | 10.9 | 0.281 |
| 11/25/2003 9:58 | 11.2 | 0.72 | 11 | 0.278 |
| 11/25/2003 9:58 | 11.3 | 0.712 | 11.1 | 0.275 |
| 11/25/2003 9:58 | 11.4 | 0.704 | 11.2 | 0.272 |
| 11/25/2003 9:58 | 11.5 | 0.697 | 11.3 | 0.269 |
| 11/25/2003 9:58 | 11.6 | 0.689 | 11.4 | 0.266 |
| 11/25/2003 9:58 | 11.7 | 0.681 | 11.5 | 0.263 |
| 11/25/2003 9:58 | 11.8 | 0.673 | 11.6 | 0.260 |

| | | | | |
|---|---|---|---|---|
| 11/25/2003 9:59 | 11.9 | 0.667 | 11.7 | 0.258 |
| 11/25/2003 9:59 | 12 | 0.659 | 11.8 | 0.255 |
| 11/25/2003 9:59 | 12.1 | 0.655 | 11.9 | 0.253 |
| 11/25/2003 9:59 | 12.2 | 0.647 | 12 | 0.250 |
| 11/25/2003 9:59 | 12.3 | 0.641 | 12.1 | 0.248 |
| 11/25/2003 9:59 | 12.4 | 0.635 | 12.2 | 0.245 |
| 11/25/2003 9:59 | 12.5 | 0.627 | 12.3 | 0.242 |
| 11/25/2003 9:59 | 12.6 | 0.621 | 12.4 | 0.240 |
| 11/25/2003 9:59 | 12.7 | 0.615 | 12.5 | 0.238 |
| 11/25/2003 9:59 | 12.8 | 0.609 | 12.6 | 0.235 |
| 11/25/2003 10:00 | 12.9 | 0.603 | 12.7 | 0.233 |
| 11/25/2003 10:00 | 13 | 0.597 | 12.8 | 0.231 |
| 11/25/2003 10:00 | 13.1 | 0.591 | 12.9 | 0.228 |
| 11/25/2003 10:00 | 13.2 | 0.584 | 13 | 0.226 |
| 11/25/2003 10:00 | 13.3 | 0.578 | 13.1 | 0.223 |
| 11/25/2003 10:00 | 13.4 | 0.572 | 13.2 | 0.221 |
| 11/25/2003 10:00 | 13.5 | 0.566 | 13.3 | 0.219 |
| 11/25/2003 10:00 | 13.6 | 0.558 | 13.4 | 0.216 |
| 11/25/2003 10:00 | 13.7 | 0.554 | 13.5 | 0.214 |
| 11/25/2003 10:00 | 13.8 | 0.548 | 13.6 | 0.212 |
| 11/25/2003 10:01 | 13.9 | 0.544 | 13.7 | 0.210 |
| 11/25/2003 10:01 | 14 | 0.538 | 13.8 | 0.208 |
| 11/25/2003 10:01 | 14.1 | 0.532 | 13.9 | 0.206 |
| 11/25/2003 10:01 | 14.2 | 0.528 | 14 | 0.204 |
| 11/25/2003 10:01 | 14.3 | 0.522 | 14.1 | 0.202 |
| 11/25/2003 10:01 | 14.4 | 0.516 | 14.2 | 0.199 |
| 11/25/2003 10:01 | 14.5 | 0.512 | 14.3 | 0.198 |
| 11/25/2003 10:01 | 14.6 | 0.506 | 14.4 | 0.196 |
| 11/25/2003 10:01 | 14.7 | 0.502 | 14.5 | 0.194 |
| 11/25/2003 10:01 | 14.8 | 0.496 | 14.6 | 0.192 |
| 11/25/2003 10:02 | 14.9 | 0.492 | 14.7 | 0.190 |
| 11/25/2003 10:02 | 15 | 0.486 | 14.8 | 0.188 |
| 11/25/2003 10:02 | 15.1 | 0.482 | 14.9 | 0.186 |
| 11/25/2003 10:02 | 15.2 | 0.476 | 15 | 0.184 |
| 11/25/2003 10:02 | 15.3 | 0.472 | 15.1 | 0.182 |
| 11/25/2003 10:02 | 15.4 | 0.466 | 15.2 | 0.180 |
| 11/25/2003 10:02 | 15.5 | 0.462 | 15.3 | 0.179 |
| 11/25/2003 10:02 | 15.6 | 0.458 | 15.4 | 0.177 |
| 11/25/2003 10:02 | 15.7 | 0.454 | 15.5 | 0.175 |
| 11/25/2003 10:02 | 15.8 | 0.45 | 15.6 | 0.174 |
| 11/25/2003 10:03 | 15.9 | 0.444 | 15.7 | 0.172 |
| 11/25/2003 10:03 | 16 | 0.439 | 15.8 | 0.170 |
| 11/25/2003 10:03 | 16.1 | 0.435 | 15.9 | 0.168 |
| 11/25/2003 10:03 | 16.2 | 0.431 | 16 | 0.167 |
| 11/25/2003 10:03 | 16.3 | 0.429 | 16.1 | 0.166 |
| 11/25/2003 10:03 | 16.4 | 0.421 | 16.2 | 0.163 |
| 11/25/2003 10:03 | 16.5 | 0.417 | 16.3 | 0.161 |
| 11/25/2003 10:03 | 16.6 | 0.413 | 16.4 | 0.160 |
| 11/25/2003 10:03 | 16.7 | 0.409 | 16.5 | 0.158 |
| 11/25/2003 10:03 | 16.8 | 0.405 | 16.6 | 0.156 |
| 11/25/2003 10:04 | 16.9 | 0.401 | 16.7 | 0.155 |
| 11/25/2003 10:04 | 17 | 0.397 | 16.8 | 0.153 |
| 11/25/2003 10:04 | 17.1 | 0.395 | 16.9 | 0.153 |
| 11/25/2003 10:04 | 17.2 | 0.391 | 17 | 0.151 |
| 11/25/2003 10:04 | 17.3 | 0.387 | 17.1 | 0.150 |
| 11/25/2003 10:04 | 17.4 | 0.383 | 17.2 | 0.148 |
| 11/25/2003 10:04 | 17.5 | 0.379 | 17.3 | 0.146 |
| 11/25/2003 10:04 | 17.6 | 0.375 | 17.4 | 0.145 |
| 11/25/2003 10:04 | 17.7 | 0.371 | 17.5 | 0.143 |
| 11/25/2003 10:04 | 17.8 | 0.369 | 17.6 | 0.143 |
| 11/25/2003 10:05 | 17.9 | 0.363 | 17.7 | 0.140 |
| 11/25/2003 10:05 | 18 | 0.361 | 17.8 | 0.139 |
| 11/25/2003 10:05 | 18.1 | 0.357 | 17.9 | 0.138 |
| 11/25/2003 10:05 | 18.2 | 0.353 | 18 | 0.136 |
| 11/25/2003 10:05 | 18.3 | 0.351 | 18.1 | 0.136 |
| 11/25/2003 10:05 | 18.4 | 0.347 | 18.2 | 0.134 |
| 11/25/2003 10:05 | 18.5 | 0.343 | 18.3 | 0.133 |
| 11/25/2003 10:05 | 18.6 | 0.341 | 18.4 | 0.132 |
| 11/25/2003 10:05 | 18.7 | 0.337 | 18.5 | 0.130 |
| 11/25/2003 10:05 | 18.8 | 0.333 | 18.6 | 0.129 |
| 11/25/2003 10:06 | 18.9 | 0.331 | 18.7 | 0.128 |
| 11/25/2003 10:06 | 19 | 0.327 | 18.8 | 0.126 |
| 11/25/2003 10:06 | 19.1 | 0.325 | 18.9 | 0.126 |
| 11/25/2003 10:06 | 19.2 | 0.321 | 19 | 0.124 |
| 11/25/2003 10:06 | 19.3 | 0.317 | 19.1 | 0.122 |
| 11/25/2003 10:06 | 19.4 | 0.315 | 19.2 | 0.122 |
| 11/25/2003 10:06 | 19.5 | 0.311 | 19.3 | 0.120 |
| 11/25/2003 10:06 | 19.6 | 0.309 | 19.4 | 0.119 |
| 11/25/2003 10:06 | 19.7 | 0.307 | 19.5 | 0.119 |

| | | | | |
|---|---|---|---|---|
| 11/25/2003 10:06 | 19.8 | 0.303 | 19.6 | 0.117 |
| 11/25/2003 10:07 | 19.9 | 0.301 | 19.7 | 0.116 |
| 11/25/2003 10:07 | 20 | 0.298 | 19.8 | 0.115 |
| 11/25/2003 10:07 | 20.1 | 0.294 | 19.9 | 0.114 |
| 11/25/2003 10:07 | 20.2 | 0.29 | 20 | 0.112 |
| 11/25/2003 10:07 | 20.3 | 0.288 | 20.1 | 0.111 |
| 11/25/2003 10:07 | 20.4 | 0.284 | 20.2 | 0.110 |
| 11/25/2003 10:07 | 20.5 | 0.282 | 20.3 | 0.109 |
| 11/25/2003 10:07 | 20.6 | 0.28 | 20.4 | 0.108 |
| 11/25/2003 10:07 | 20.7 | 0.278 | 20.5 | 0.107 |
| 11/25/2003 10:07 | 20.8 | 0.274 | 20.6 | 0.106 |
| 11/25/2003 10:08 | 20.9 | 0.272 | 20.7 | 0.105 |
| 11/25/2003 10:08 | 21 | 0.27 | 20.8 | 0.104 |
| 11/25/2003 10:08 | 21.1 | 0.266 | 20.9 | 0.103 |
| 11/25/2003 10:08 | 21.2 | 0.264 | 21 | 0.102 |
| 11/25/2003 10:08 | 21.3 | 0.262 | 21.1 | 0.101 |
| 11/25/2003 10:08 | 21.4 | 0.26 | 21.2 | 0.100 |
| 11/25/2003 10:08 | 21.5 | 0.258 | 21.3 | 0.100 |
| 11/25/2003 10:08 | 21.6 | 0.256 | 21.4 | 0.099 |
| 11/25/2003 10:08 | 21.7 | 0.252 | 21.5 | 0.097 |
| 11/25/2003 10:08 | 21.8 | 0.25 | 21.6 | 0.097 |
| 11/25/2003 10:09 | 21.9 | 0.248 | 21.7 | 0.096 |
| 11/25/2003 10:09 | 22 | 0.246 | 21.8 | 0.095 |
| 11/25/2003 10:09 | 22.1 | 0.244 | 21.9 | 0.094 |
| 11/25/2003 10:09 | 22.2 | 0.24 | 22 | 0.093 |
| 11/25/2003 10:09 | 22.3 | 0.24 | 22.1 | 0.093 |
| 11/25/2003 10:09 | 22.4 | 0.238 | 22.2 | 0.092 |
| 11/25/2003 10:09 | 22.5 | 0.236 | 22.3 | 0.091 |
| 11/25/2003 10:09 | 22.6 | 0.234 | 22.4 | 0.090 |
| 11/25/2003 10:09 | 22.7 | 0.23 | 22.5 | 0.089 |
| 11/25/2003 10:09 | 22.8 | 0.228 | 22.6 | 0.088 |
| 11/25/2003 10:10 | 22.9 | 0.228 | 22.7 | 0.088 |
| 11/25/2003 10:10 | 23 | 0.224 | 22.8 | 0.087 |
| 11/25/2003 10:10 | 23.1 | 0.222 | 22.9 | 0.086 |
| 11/25/2003 10:10 | 23.2 | 0.22 | 23 | 0.085 |
| 11/25/2003 10:10 | 23.3 | 0.218 | 23.1 | 0.084 |
| 11/25/2003 10:10 | 23.4 | 0.216 | 23.2 | 0.083 |
| 11/25/2003 10:10 | 23.5 | 0.214 | 23.3 | 0.083 |
| 11/25/2003 10:10 | 23.6 | 0.212 | 23.4 | 0.082 |
| 11/25/2003 10:10 | 23.7 | 0.212 | 23.5 | 0.082 |
| 11/25/2003 10:10 | 23.8 | 0.21 | 23.6 | 0.081 |
| 11/25/2003 10:11 | 23.9 | 0.206 | 23.7 | 0.080 |
| 11/25/2003 10:11 | 24 | 0.204 | 23.8 | 0.079 |
| 11/25/2003 10:11 | 24.1 | 0.202 | 23.9 | 0.078 |
| 11/25/2003 10:11 | 24.2 | 0.2 | 24 | 0.077 |
| 11/25/2003 10:11 | 24.3 | 0.198 | 24.1 | 0.077 |
| 11/25/2003 10:11 | 24.4 | 0.198 | 24.2 | 0.077 |
| 11/25/2003 10:11 | 24.5 | 0.196 | 24.3 | 0.076 |
| 11/25/2003 10:11 | 24.6 | 0.194 | 24.4 | 0.075 |
| 11/25/2003 10:11 | 24.7 | 0.19 | 24.5 | 0.073 |
| 11/25/2003 10:11 | 24.8 | 0.19 | 24.6 | 0.073 |
| 11/25/2003 10:12 | 24.9 | 0.186 | 24.7 | 0.072 |
| 11/25/2003 10:12 | 25 | 0.186 | 24.8 | 0.072 |
| 11/25/2003 10:12 | 25.1 | 0.184 | 24.9 | 0.071 |
| 11/25/2003 10:12 | 25.2 | 0.182 | 25 | 0.070 |
| 11/25/2003 10:12 | 25.3 | 0.182 | 25.1 | 0.070 |
| 11/25/2003 10:12 | 25.4 | 0.18 | 25.2 | 0.070 |
| 11/25/2003 10:12 | 25.5 | 0.178 | 25.3 | 0.069 |
| 11/25/2003 10:12 | 25.6 | 0.176 | 25.4 | 0.068 |
| 11/25/2003 10:12 | 25.7 | 0.176 | 25.5 | 0.068 |
| 11/25/2003 10:12 | 25.8 | 0.172 | 25.6 | 0.066 |
| 11/25/2003 10:13 | 25.9 | 0.17 | 25.7 | 0.066 |
| 11/25/2003 10:13 | 26 | 0.17 | 25.8 | 0.066 |
| 11/25/2003 10:13 | 26.1 | 0.168 | 25.9 | 0.065 |
| 11/25/2003 10:13 | 26.2 | 0.168 | 26 | 0.065 |
| 11/25/2003 10:13 | 26.3 | 0.166 | 26.1 | 0.064 |
| 11/25/2003 10:13 | 26.4 | 0.164 | 26.2 | 0.063 |
| 11/25/2003 10:13 | 26.5 | 0.162 | 26.3 | 0.063 |
| 11/25/2003 10:13 | 26.6 | 0.16 | 26.4 | 0.062 |
| 11/25/2003 10:13 | 26.7 | 0.157 | 26.5 | 0.061 |
| 11/25/2003 10:13 | 26.8 | 0.155 | 26.6 | 0.060 |
| 11/25/2003 10:14 | 26.9 | 0.155 | 26.7 | 0.060 |

TETRA-TECH NUS

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT34 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Falling head | **Test Date:** | 25-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083 | 1 = r |
| Effective Radius of Well Screen (in.) : | .166 | 2 = R |
| Length of Well Screen (ft.) : | 12.5 | = L |
| Time for 37% head change (min.) : | 8.70 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.38E-04 | ft./min. |
| 2.30E-06 | ft./sec. |
| 1.99E-01 | ft./day |
| 7.00E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(12.5/.166)}{2 \times 12.5 \times 8.70} =$$

$1.37 \times 10^{-4}$ Ft/min

CHECKED
2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

**Project Name:** Crane NSWC
**Project No.:** 9060
**Test Type:** Rising head

**Well/Boring No.:** 13MWT34
**Aquifer Type:** Bedrock
**Test Date:** 25-Nov-03

**Done By:** FWRamser
**Checked By:**

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 2 = R |
| Length of Well Screen (ft.) : | 12.5 = L |
| Time for 37% head change (min.) : | 10.60 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.13E-04 | ft./min. |
| 1.89E-06 | ft./sec. |
| 1.63E-01 | ft./day |
| 5.75E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 13MWT34

PROJECT NO.: 9060 GEOLOGIST: MG COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 6.11 TOC DATE: 11-25-03

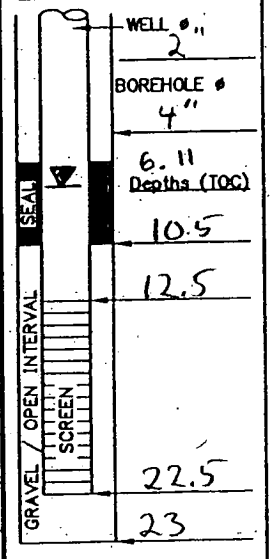
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: SOLID SLUG PAGE ..... OF .....

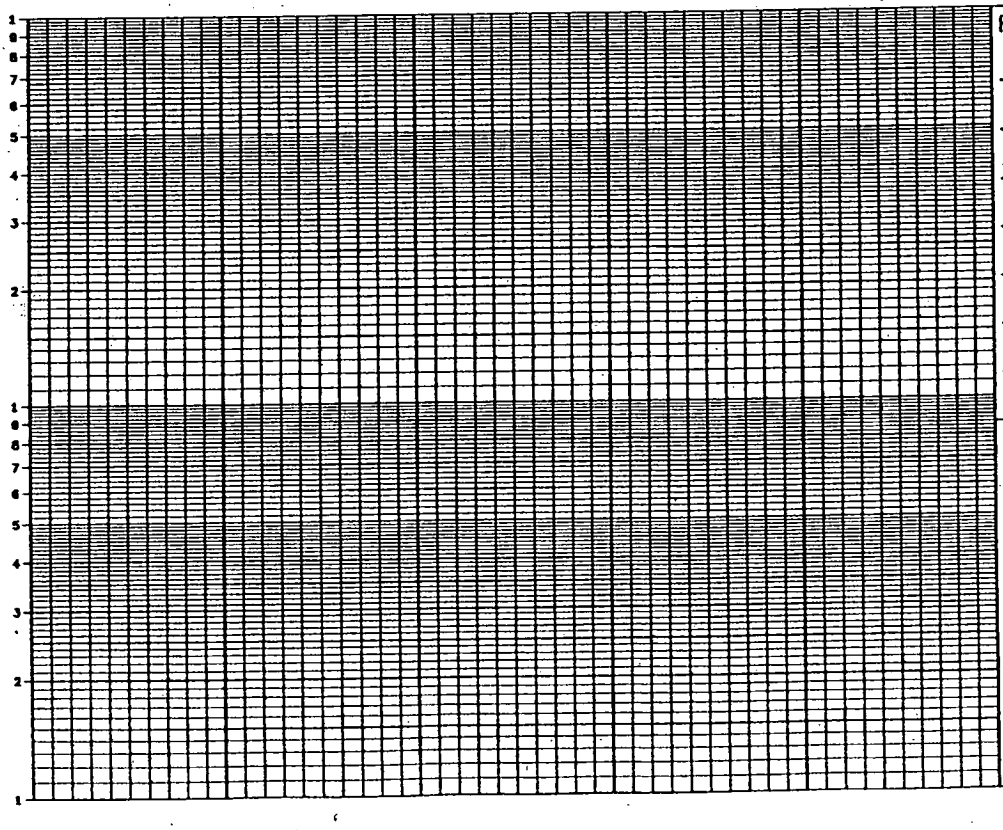
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC, ZERO AT STATIC+START

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 0 | | 2.0 | -2.119 | |
| .1 | -2.709 | | 3.0 | -1.928 | |
| .2 | -2.593 | | 4.0 | -1.753 | |
| .3 | -2.548 | | 5.0 | -1.596 | |
| .4 | -2.514 | | 6.0 | -1.453 | |
| .5 | -2.484 | | 8.0 | -1.211 | |
| .6 | -2.456 | | 10.0 | -1.014 | |
| .7 | -2.427 | | 12.0 | -.852 | |
| .8 | -2.401 | | 14.0 | -.720 | |
| .9 | -2.373 | | 18.0 | -.524 | |
| 1.0 | -2.349 | | 20.0 | -.452 | |
| 1.5 | -2.228 | | 25.0 | -.327 | |
| | | | 30 | -.194 | |

WELL SCHEMATIC



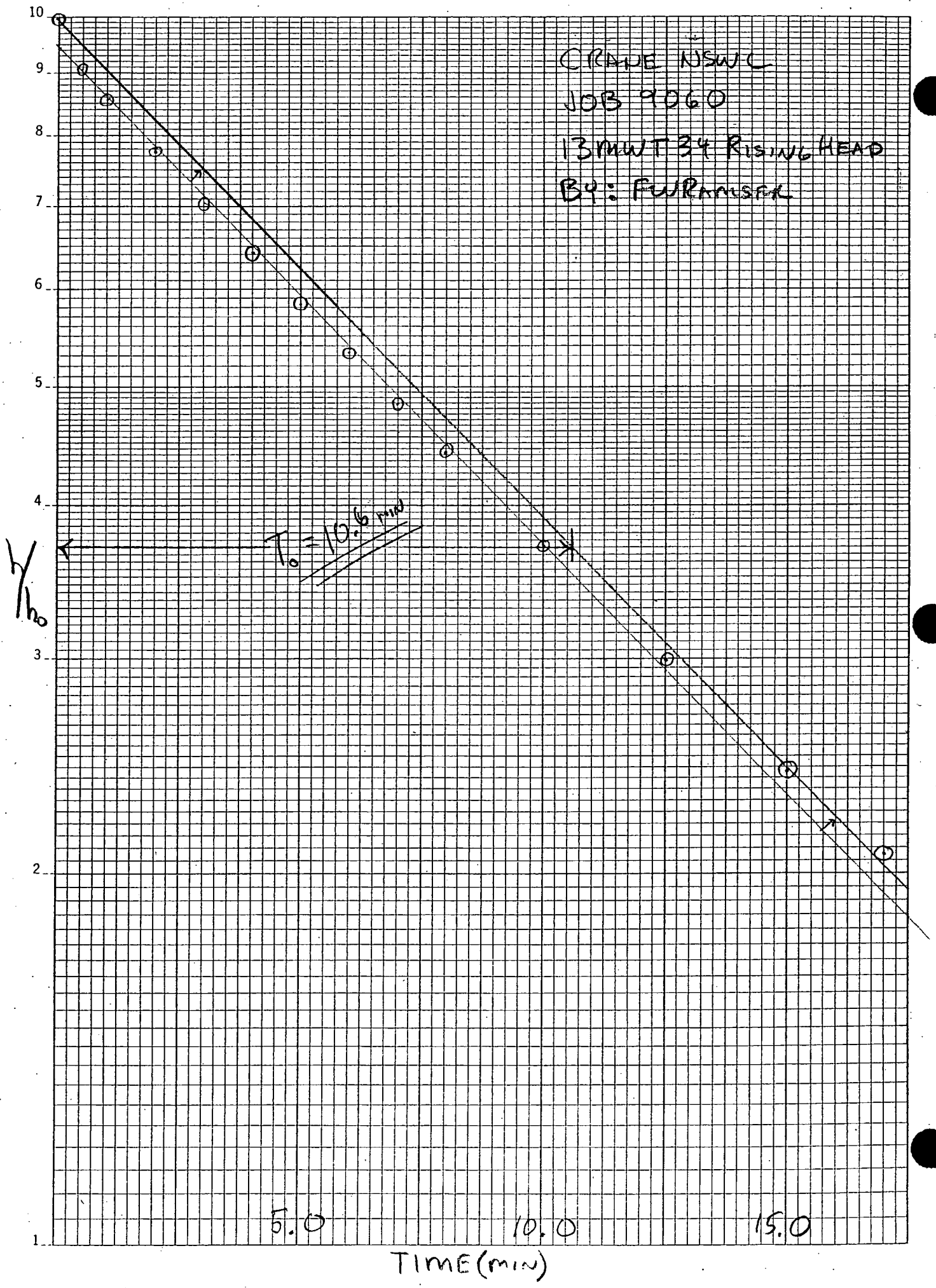

▽ Indicate SWL Depth on Drawing



REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/08/99 INL




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 12/9/2003 12:53:16
Report from file: H:\Crane IN\SWMU13_16\MGC slug tests 03\site 13\SN06899 2003-11-25 101615
DataMgr Version 3.68 13MWT34rising#1.bin

Serial number: 6899
Firmware Version 3.07
Unit name:

Test name: 13MWT34rising#1

Test defined on: 11/25/2003 10:15:44
Test started on: 11/25/2003 10:16:15
Test stopped on: 11/25/2003 10:54:20
Test extracted on: N/A

Data gathered using Linear testing
Time between data points: Minutes.
Number of data samples: 381

TOTAL DATA SAMPLES 381

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at reference 17.029 Feet H2O

• = PLOTTED DATA

| Date | Time | ET (min) | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho |
|---|---|---|---|---|---|
| | 11/25/2003 10:16 | 0 | 0 | | |
| | 11/25/2003 10:16 | 0.1 | -2.709 | 0 | 1.000 • |
| | 11/25/2003 10:16 | 0.2 | -2.593 | 0.1 | 0.957 |
| | 11/25/2003 10:16 | 0.3 | -2.548 | 0.2 | 0.941 |
| | 11/25/2003 10:16 | 0.4 | -2.514 | 0.3 | 0.928 |
| | 11/25/2003 10:16 | 0.5 | -2.484 | 0.4 | 0.917 |
| | 11/25/2003 10:16 | 0.6 | -2.456 | 0.5 | 0.907 • |
| | 11/25/2003 10:16 | 0.7 | -2.427 | 0.6 | 0.896 |
| | 11/25/2003 10:17 | 0.8 | -2.401 | 0.7 | 0.886 |
| | 11/25/2003 10:17 | 0.9 | -2.373 | 0.8 | 0.876 |
| | 11/25/2003 10:17 | 1 | -2.349 | 0.9 | 0.867 |
| | 11/25/2003 10:17 | 1.1 | -2.323 | 1 | 0.858 • |
| | 11/25/2003 10:17 | 1.2 | -2.298 | 1.1 | 0.848 |
| | 11/25/2003 10:17 | 1.3 | -2.274 | 1.2 | 0.839 |
| | 11/25/2003 10:17 | 1.4 | -2.252 | 1.3 | 0.831 |
| | 11/25/2003 10:17 | 1.5 | -2.228 | 1.4 | 0.822 |
| | 11/25/2003 10:17 | 1.6 | -2.208 | 1.5 | 0.815 |
| | 11/25/2003 10:17 | 1.7 | -2.184 | 1.6 | 0.806 |
| | 11/25/2003 10:18 | 1.8 | -2.161 | 1.7 | 0.798 |
| | 11/25/2003 10:18 | 1.9 | -2.141 | 1.8 | 0.790 |
| | 11/25/2003 10:18 | 2 | -2.119 | 1.9 | 0.782 |
| | 11/25/2003 10:18 | 2.1 | -2.099 | 2 | 0.775 • |
| | 11/25/2003 10:18 | 2.2 | -2.079 | 2.1 | 0.767 |
| | 11/25/2003 10:18 | 2.3 | -2.059 | 2.2 | 0.760 |
| | 11/25/2003 10:18 | 2.4 | -2.039 | 2.3 | 0.753 |
| | 11/25/2003 10:18 | 2.5 | -2.018 | 2.4 | 0.745 |
| | 11/25/2003 10:18 | 2.6 | -2 | 2.5 | 0.738 |
| | 11/25/2003 10:18 | 2.7 | -1.982 | 2.6 | 0.732 |
| | 11/25/2003 10:19 | 2.8 | -1.964 | 2.7 | 0.725 |
| | 11/25/2003 10:19 | 2.9 | -1.946 | 2.8 | 0.718 |
| | 11/25/2003 10:19 | 3 | -1.928 | 2.9 | 0.712 |
| | 11/25/2003 10:19 | 3.1 | -1.908 | 3 | 0.704 • |
| | 11/25/2003 10:19 | 3.2 | -1.892 | 3.1 | 0.698 |
| | 11/25/2003 10:19 | 3.3 | -1.874 | 3.2 | 0.692 |
| | 11/25/2003 10:19 | 3.4 | -1.855 | 3.3 | 0.685 |
| | 11/25/2003 10:19 | 3.5 | -1.837 | 3.4 | 0.678 |
| | 11/25/2003 10:19 | 3.6 | -1.821 | 3.5 | 0.672 |
| | 11/25/2003 10:19 | 3.7 | -1.803 | 3.6 | 0.666 |
| | 11/25/2003 10:20 | 3.8 | -1.787 | 3.7 | 0.660 |
| | 11/25/2003 10:20 | 3.9 | -1.769 | 3.8 | 0.653 |

ho = -2.709

| | | | | |
|---|---|---|---|---|
| 11/25/2003 10:20 | 4 | -1.753 | 3.9 | 0.647 |
| 11/25/2003 10:20 | 4.1 | -1.737 | 4 | 0.641 |
| 11/25/2003 10:20 | 4.2 | -1.72 | 4.1 | 0.635 |
| 11/25/2003 10:20 | 4.3 | -1.704 | 4.2 | 0.629 |
| 11/25/2003 10:20 | 4.4 | -1.688 | 4.3 | 0.623 |
| 11/25/2003 10:20 | 4.5 | -1.672 | 4.4 | 0.617 |
| 11/25/2003 10:20 | 4.6 | -1.656 | 4.5 | 0.611 |
| 11/25/2003 10:20 | 4.7 | -1.64 | 4.6 | 0.605 |
| 11/25/2003 10:21 | 4.8 | -1.624 | 4.7 | 0.599 |
| 11/25/2003 10:21 | 4.9 | -1.61 | 4.8 | 0.594 |
| 11/25/2003 10:21 | 5 | -1.596 | 4.9 | 0.589 |
| 11/25/2003 10:21 | 5.1 | -1.579 | 5 | 0.583 |
| 11/25/2003 10:21 | 5.2 | -1.565 | 5.1 | 0.578 |
| 11/25/2003 10:21 | 5.3 | -1.551 | 5.2 | 0.573 |
| 11/25/2003 10:21 | 5.4 | -1.537 | 5.3 | 0.567 |
| 11/25/2003 10:21 | 5.5 | -1.523 | 5.4 | 0.562 |
| 11/25/2003 10:21 | 5.6 | -1.509 | 5.5 | 0.557 |
| 11/25/2003 10:21 | 5.7 | -1.493 | 5.6 | 0.551 |
| 11/25/2003 10:22 | 5.8 | -1.481 | 5.7 | 0.547 |
| 11/25/2003 10:22 | 5.9 | -1.467 | 5.8 | 0.542 |
| 11/25/2003 10:22 | 6 | -1.453 | 5.9 | 0.536 |
| 11/25/2003 10:22 | 6.1 | -1.441 | 6 | 0.532 |
| 11/25/2003 10:22 | 6.2 | -1.427 | 6.1 | 0.527 |
| 11/25/2003 10:22 | 6.3 | -1.414 | 6.2 | 0.522 |
| 11/25/2003 10:22 | 6.4 | -1.4 | 6.3 | 0.517 |
| 11/25/2003 10:22 | 6.5 | -1.388 | 6.4 | 0.512 |
| 11/25/2003 10:22 | 6.6 | -1.376 | 6.5 | 0.508 |
| 11/25/2003 10:22 | 6.7 | -1.362 | 6.6 | 0.503 |
| 11/25/2003 10:23 | 6.8 | -1.35 | 6.7 | 0.498 |
| 11/25/2003 10:23 | 6.9 | -1.338 | 6.8 | 0.494 |
| 11/25/2003 10:23 | 7 | -1.326 | 6.9 | 0.489 |
| 11/25/2003 10:23 | 7.1 | -1.314 | 7 | 0.485 |
| 11/25/2003 10:23 | 7.2 | -1.302 | 7.1 | 0.481 |
| 11/25/2003 10:23 | 7.3 | -1.29 | 7.2 | 0.476 |
| 11/25/2003 10:23 | 7.4 | -1.277 | 7.3 | 0.471 |
| 11/25/2003 10:23 | 7.5 | -1.265 | 7.4 | 0.467 |
| 11/25/2003 10:23 | 7.6 | -1.255 | 7.5 | 0.463 |
| 11/25/2003 10:23 | 7.7 | -1.245 | 7.6 | 0.460 |
| 11/25/2003 10:24 | 7.8 | -1.233 | 7.7 | 0.455 |
| 11/25/2003 10:24 | 7.9 | -1.221 | 7.8 | 0.451 |
| 11/25/2003 10:24 | 8 | -1.211 | 7.9 | 0.447 |
| 11/25/2003 10:24 | 8.1 | -1.199 | 8 | 0.443 |
| 11/25/2003 10:24 | 8.2 | -1.189 | 8.1 | 0.439 |
| 11/25/2003 10:24 | 8.3 | -1.179 | 8.2 | 0.435 |
| 11/25/2003 10:24 | 8.4 | -1.167 | 8.3 | 0.431 |
| 11/25/2003 10:24 | 8.5 | -1.157 | 8.4 | 0.427 |
| 11/25/2003 10:24 | 8.6 | -1.147 | 8.5 | 0.423 |
| 11/25/2003 10:24 | 8.7 | -1.136 | 8.6 | 0.419 |
| 11/25/2003 10:25 | 8.8 | -1.126 | 8.7 | 0.416 |
| 11/25/2003 10:25 | 8.9 | -1.116 | 8.8 | 0.412 |
| 11/25/2003 10:25 | 9 | -1.106 | 8.9 | 0.408 |
| 11/25/2003 10:25 | 9.1 | -1.096 | 9 | 0.405 |
| 11/25/2003 10:25 | 9.2 | -1.086 | 9.1 | 0.401 |
| 11/25/2003 10:25 | 9.3 | -1.078 | 9.2 | 0.398 |
| 11/25/2003 10:25 | 9.4 | -1.068 | 9.3 | 0.394 |
| 11/25/2003 10:25 | 9.5 | -1.058 | 9.4 | 0.391 |
| 11/25/2003 10:25 | 9.6 | -1.048 | 9.5 | 0.387 |
| 11/25/2003 10:25 | 9.7 | -1.04 | 9.6 | 0.384 |
| 11/25/2003 10:26 | 9.8 | -1.03 | 9.7 | 0.380 |
| 11/25/2003 10:26 | 9.9 | -1.024 | 9.8 | 0.378 |
| 11/25/2003 10:26 | 10 | -1.014 | 9.9 | 0.374 |
| 11/25/2003 10:26 | 10.1 | -1.004 | 10 | 0.371 |
| 11/25/2003 10:26 | 10.2 | -0.995 | 10.1 | 0.367 |
| 11/25/2003 10:26 | 10.3 | -0.987 | 10.2 | 0.364 |
| 11/25/2003 10:26 | 10.4 | -0.979 | 10.3 | 0.361 |
| 11/25/2003 10:26 | 10.5 | -0.969 | 10.4 | 0.358 |
| 11/25/2003 10:26 | 10.6 | -0.961 | 10.5 | 0.355 |
| 11/25/2003 10:26 | 10.7 | -0.951 | 10.6 | 0.351 |
| 11/25/2003 10:27 | 10.8 | -0.943 | 10.7 | 0.348 |
| 11/25/2003 10:27 | 10.9 | -0.935 | 10.8 | 0.345 |
| 11/25/2003 10:27 | 11 | -0.927 | 10.9 | 0.342 |
| 11/25/2003 10:27 | 11.1 | -0.921 | 11 | 0.340 |
| 11/25/2003 10:27 | 11.2 | -0.913 | 11.1 | 0.337 |
| 11/25/2003 10:27 | 11.3 | -0.905 | 11.2 | 0.334 |
| 11/25/2003 10:27 | 11.4 | -0.897 | 11.3 | 0.331 |
| 11/25/2003 10:27 | 11.5 | -0.889 | 11.4 | 0.328 |
| 11/25/2003 10:27 | 11.6 | -0.881 | 11.5 | 0.325 |
| 11/25/2003 10:27 | 11.7 | -0.873 | 11.6 | 0.322 |
| 11/25/2003 10:28 | 11.8 | -0.867 | 11.7 | 0.320 |

| | | | | |
|---|---|---|---|---|
| 11/25/2003 10:28 | 11.9 | -0.858 | 11.8 | 0.317 |
| 11/25/2003 10:28 | 12 | -0.852 | 11.9 | 0.315 |
| 11/25/2003 10:28 | 12.1 | -0.846 | 12 | 0.312 |
| 11/25/2003 10:28 | 12.2 | -0.838 | 12.1 | 0.309 |
| 11/25/2003 10:28 | 12.3 | -0.83 | 12.2 | 0.306 |
| 11/25/2003 10:28 | 12.4 | -0.824 | 12.3 | 0.304 |
| 11/25/2003 10:28 | 12.5 | -0.816 | 12.4 | 0.301 |
| 11/25/2003 10:28 | 12.6 | -0.81 | 12.5 | 0.299 |
| 11/25/2003 10:28 | 12.7 | -0.802 | 12.6 | 0.296 |
| 11/25/2003 10:29 | 12.8 | -0.796 | 12.7 | 0.294 |
| 11/25/2003 10:29 | 12.9 | -0.788 | 12.8 | 0.291 |
| 11/25/2003 10:29 | 13 | -0.784 | 12.9 | 0.289 |
| 11/25/2003 10:29 | 13.1 | -0.776 | 13 | 0.286 |
| 11/25/2003 10:29 | 13.2 | -0.77 | 13.1 | 0.284 |
| 11/25/2003 10:29 | 13.3 | -0.764 | 13.2 | 0.282 |
| 11/25/2003 10:29 | 13.4 | -0.756 | 13.3 | 0.279 |
| 11/25/2003 10:29 | 13.5 | -0.75 | 13.4 | 0.277 |
| 11/25/2003 10:29 | 13.6 | -0.746 | 13.5 | 0.275 |
| 11/25/2003 10:29 | 13.7 | -0.738 | 13.6 | 0.272 |
| 11/25/2003 10:30 | 13.8 | -0.73 | 13.7 | 0.269 |
| 11/25/2003 10:30 | 13.9 | -0.726 | 13.8 | 0.268 |
| 11/25/2003 10:30 | 14 | -0.72 | 13.9 | 0.266 |
| 11/25/2003 10:30 | 14.1 | -0.713 | 14 | 0.263 |
| 11/25/2003 10:30 | 14.2 | -0.707 | 14.1 | 0.261 |
| 11/25/2003 10:30 | 14.3 | -0.701 | 14.2 | 0.259 |
| 11/25/2003 10:30 | 14.4 | -0.695 | 14.3 | 0.257 |
| 11/25/2003 10:30 | 14.5 | -0.687 | 14.4 | 0.254 |
| 11/25/2003 10:30 | 14.6 | -0.685 | 14.5 | 0.253 |
| 11/25/2003 10:30 | 14.7 | -0.679 | 14.6 | 0.251 |
| 11/25/2003 10:31 | 14.8 | -0.675 | 14.7 | 0.249 |
| 11/25/2003 10:31 | 14.9 | -0.667 | 14.8 | 0.246 |
| 11/25/2003 10:31 | 15 | -0.663 | 14.9 | 0.245 |
| 11/25/2003 10:31 | 15.1 | -0.657 | 15 | 0.243 |
| 11/25/2003 10:31 | 15.2 | -0.651 | 15.1 | 0.240 |
| 11/25/2003 10:31 | 15.3 | -0.647 | 15.2 | 0.239 |
| 11/25/2003 10:31 | 15.4 | -0.643 | 15.3 | 0.237 |
| 11/25/2003 10:31 | 15.5 | -0.637 | 15.4 | 0.235 |
| 11/25/2003 10:31 | 15.6 | -0.633 | 15.5 | 0.234 |
| 11/25/2003 10:31 | 15.7 | -0.627 | 15.6 | 0.231 |
| 11/25/2003 10:32 | 15.8 | -0.623 | 15.7 | 0.230 |
| 11/25/2003 10:32 | 15.9 | -0.617 | 15.8 | 0.228 |
| 11/25/2003 10:32 | 16 | -0.613 | 15.9 | 0.226 |
| 11/25/2003 10:32 | 16.1 | -0.607 | 16 | 0.224 |
| 11/25/2003 10:32 | 16.2 | -0.603 | 16.1 | 0.223 |
| 11/25/2003 10:32 | 16.3 | -0.599 | 16.2 | 0.221 |
| 11/25/2003 10:32 | 16.4 | -0.595 | 16.3 | 0.220 |
| 11/25/2003 10:32 | 16.5 | -0.589 | 16.4 | 0.217 |
| 11/25/2003 10:32 | 16.6 | -0.585 | 16.5 | 0.216 |
| 11/25/2003 10:32 | 16.7 | -0.581 | 16.6 | 0.214 |
| 11/25/2003 10:33 | 16.8 | -0.574 | 16.7 | 0.212 |
| 11/25/2003 10:33 | 16.9 | -0.57 | 16.8 | 0.210 |
| 11/25/2003 10:33 | 17 | -0.564 | 16.9 | 0.208 |
| 11/25/2003 10:33 | 17.1 | -0.562 | 17 | 0.207 |
| 11/25/2003 10:33 | 17.2 | -0.558 | 17.1 | 0.206 |
| 11/25/2003 10:33 | 17.3 | -0.552 | 17.2 | 0.204 |
| 11/25/2003 10:33 | 17.4 | -0.548 | 17.3 | 0.202 |
| 11/25/2003 10:33 | 17.5 | -0.544 | 17.4 | 0.201 |
| 11/25/2003 10:33 | 17.6 | -0.54 | 17.5 | 0.199 |
| 11/25/2003 10:33 | 17.7 | -0.536 | 17.6 | 0.198 |
| 11/25/2003 10:34 | 17.8 | -0.532 | 17.7 | 0.196 |
| 11/25/2003 10:34 | 17.9 | -0.528 | 17.8 | 0.195 |
| 11/25/2003 10:34 | 18 | -0.524 | 17.9 | 0.193 |
| 11/25/2003 10:34 | 18.1 | -0.52 | 18 | 0.192 |
| 11/25/2003 10:34 | 18.2 | -0.516 | 18.1 | 0.190 |
| 11/25/2003 10:34 | 18.3 | -0.512 | 18.2 | 0.189 |
| 11/25/2003 10:34 | 18.4 | -0.51 | 18.3 | 0.188 |
| 11/25/2003 10:34 | 18.5 | -0.506 | 18.4 | 0.187 |
| 11/25/2003 10:34 | 18.6 | -0.502 | 18.5 | 0.185 |
| 11/25/2003 10:34 | 18.7 | -0.498 | 18.6 | 0.184 |
| 11/25/2003 10:35 | 18.8 | -0.494 | 18.7 | 0.182 |
| 11/25/2003 10:35 | 18.9 | -0.49 | 18.8 | 0.181 |
| 11/25/2003 10:35 | 19 | -0.486 | 18.9 | 0.179 |
| 11/25/2003 10:35 | 19.1 | -0.482 | 19 | 0.178 |
| 11/25/2003 10:35 | 19.2 | -0.48 | 19.1 | 0.177 |
| 11/25/2003 10:35 | 19.3 | -0.476 | 19.2 | 0.176 |
| 11/25/2003 10:35 | 19.4 | -0.472 | 19.3 | 0.174 |
| 11/25/2003 10:35 | 19.5 | -0.47 | 19.4 | 0.173 |
| 11/25/2003 10:35 | 19.6 | -0.466 | 19.5 | 0.172 |
| 11/25/2003 10:35 | 19.7 | -0.464 | 19.6 | 0.171 |

| | | | | |
|---|---|---|---|---|
| 11/25/2003 10:36 | 19.8 | -0.46 | 19.7 | 0.170 |
| 11/25/2003 10:36 | 19.9 | -0.458 | 19.8 | 0.169 |
| 11/25/2003 10:36 | 20 | -0.452 | 19.9 | 0.167 |
| 11/25/2003 10:36 | 20.1 | -0.45 | 20 | 0.166 |
| 11/25/2003 10:36 | 20.2 | -0.446 | 20.1 | 0.165 |
| 11/25/2003 10:36 | 20.3 | -0.442 | 20.2 | 0.163 |
| 11/25/2003 10:36 | 20.4 | -0.44 | 20.3 | 0.162 |
| 11/25/2003 10:36 | 20.5 | -0.435 | 20.4 | 0.161 |
| 11/25/2003 10:36 | 20.6 | -0.433 | 20.5 | 0.160 |
| 11/25/2003 10:36 | 20.7 | -0.431 | 20.6 | 0.159 |
| 11/25/2003 10:37 | 20.8 | -0.427 | 20.7 | 0.158 |
| 11/25/2003 10:37 | 20.9 | -0.425 | 20.8 | 0.157 |
| 11/25/2003 10:37 | 21 | -0.421 | 20.9 | 0.155 |
| 11/25/2003 10:37 | 21.1 | -0.419 | 21 | 0.155 |
| 11/25/2003 10:37 | 21.2 | -0.417 | 21.1 | 0.154 |
| 11/25/2003 10:37 | 21.3 | -0.413 | 21.2 | 0.152 |
| 11/25/2003 10:37 | 21.4 | -0.411 | 21.3 | 0.152 |
| 11/25/2003 10:37 | 21.5 | -0.407 | 21.4 | 0.150 |
| 11/25/2003 10:37 | 21.6 | -0.405 | 21.5 | 0.150 |
| 11/25/2003 10:37 | 21.7 | -0.403 | 21.6 | 0.149 |
| 11/25/2003 10:38 | 21.8 | -0.399 | 21.7 | 0.147 |
| 11/25/2003 10:38 | 21.9 | -0.397 | 21.8 | 0.147 |
| 11/25/2003 10:38 | 22 | -0.395 | 21.9 | 0.146 |
| 11/25/2003 10:38 | 22.1 | -0.393 | 22 | 0.145 |
| 11/25/2003 10:38 | 22.2 | -0.389 | 22.1 | 0.144 |
| 11/25/2003 10:38 | 22.3 | -0.385 | 22.2 | 0.142 |
| 11/25/2003 10:38 | 22.4 | -0.385 | 22.3 | 0.142 |
| 11/25/2003 10:38 | 22.5 | -0.381 | 22.4 | 0.141 |
| 11/25/2003 10:38 | 22.6 | -0.379 | 22.5 | 0.140 |
| 11/25/2003 10:38 | 22.7 | -0.377 | 22.6 | 0.139 |
| 11/25/2003 10:39 | 22.8 | -0.375 | 22.7 | 0.138 |
| 11/25/2003 10:39 | 22.9 | -0.373 | 22.8 | 0.138 |
| 11/25/2003 10:39 | 23 | -0.369 | 22.9 | 0.136 |
| 11/25/2003 10:39 | 23.1 | -0.367 | 23 | 0.135 |
| 11/25/2003 10:39 | 23.2 | -0.365 | 23.1 | 0.135 |
| 11/25/2003 10:39 | 23.3 | -0.363 | 23.2 | 0.134 |
| 11/25/2003 10:39 | 23.4 | -0.361 | 23.3 | 0.133 |
| 11/25/2003 10:39 | 23.5 | -0.357 | 23.4 | 0.132 |
| 11/25/2003 10:39 | 23.6 | -0.357 | 23.5 | 0.132 |
| 11/25/2003 10:39 | 23.7 | -0.355 | 23.6 | 0.131 |
| 11/25/2003 10:40 | 23.8 | -0.351 | 23.7 | 0.130 |
| 11/25/2003 10:40 | 23.9 | -0.349 | 23.8 | 0.129 |
| 11/25/2003 10:40 | 24 | -0.347 | 23.9 | 0.128 |
| 11/25/2003 10:40 | 24.1 | -0.345 | 24 | 0.127 |
| 11/25/2003 10:40 | 24.2 | -0.343 | 24.1 | 0.127 |
| 11/25/2003 10:40 | 24.3 | -0.339 | 24.2 | 0.125 |
| 11/25/2003 10:40 | 24.4 | -0.339 | 24.3 | 0.125 |
| 11/25/2003 10:40 | 24.5 | -0.337 | 24.4 | 0.124 |
| 11/25/2003 10:40 | 24.6 | -0.335 | 24.5 | 0.124 |
| 11/25/2003 10:40 | 24.7 | -0.333 | 24.6 | 0.123 |
| 11/25/2003 10:41 | 24.8 | -0.331 | 24.7 | 0.122 |
| 11/25/2003 10:41 | 24.9 | -0.329 | 24.8 | 0.121 |
| 11/25/2003 10:41 | 25 | -0.327 | 24.9 | 0.121 |
| 11/25/2003 10:42 | 26 | -0.309 | 25.9 | 0.114 |
| 11/25/2003 10:43 | 27 | -0.292 | 26.9 | 0.108 |
| 11/25/2003 10:44 | 28 | -0.276 | 27.9 | 0.102 |
| 11/25/2003 10:45 | 29 | -0.264 | 28.9 | 0.097 |
| 11/25/2003 10:46 | 30 | -0.25 | 29.9 | 0.092 |
| 11/25/2003 10:47 | 31 | -0.24 | 30.9 | 0.089 |
| 11/25/2003 10:48 | 32 | -0.23 | 31.9 | 0.085 |
| 11/25/2003 10:49 | 33 | -0.222 | 32.9 | 0.082 |
| 11/25/2003 10:50 | 34 | -0.212 | 33.9 | 0.078 |
| 11/25/2003 10:51 | 35 | -0.206 | 34.9 | 0.076 |
| 11/25/2003 10:52 | 36 | -0.2 | 35.9 | 0.074 |
| 11/25/2003 10:53 | 37 | -0.194 | 36.9 | 0.072 |
| 11/25/2003 10:54 | 38 | -0.19 | 37.9 | 0.070 |

TETRA-TECH NUS

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT34 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 25-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .166' | 2 = R |
| Length of Well Screen (ft.) : | 12.5 | = L |
| Time for 37% head change (min.) : | 10.60 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.13E-04 | ft./min. |
| 1.89E-06 | ft./sec. |
| 1.63E-01 | ft./day |
| 5.75E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(12.5/.166)}{2 \times 12.5 \times 10.60} =$$

$1.12 \times 10^{-4}$ FT/MIN

CHECKED
MH
2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

**Project Name:** Crane NSWC
**Project No.:** 9060
**Test Type:** Falling head

**Well/Boring No.:** 13MWT37
**Aquifer Type:** Bedrock
**Test Date:** 22-Nov-03

**Done By:** FWRamser
**Checked By:**

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 2.5 = R |
| Length of Well Screen (ft.) : | 13.5 = L |
| Time for 37% head change (min.) : | 1.13 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 9.49E-04 | ft./min. |
| 1.58E-05 | ft./sec. |
| 1.37E+00 | ft./day |
| 4.82E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 13MWT37

PROJECT NO.: 9060 GEOLOGIST: M.G. COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 14.06 DATE: 11-22-03

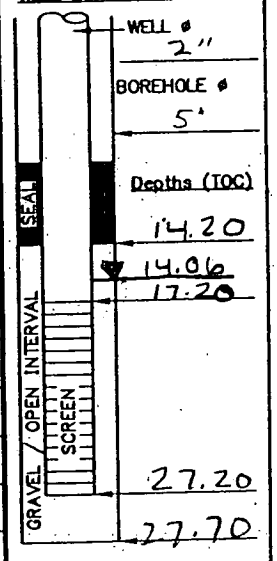
TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: SOLID SLUG PAGE 1 OF 1

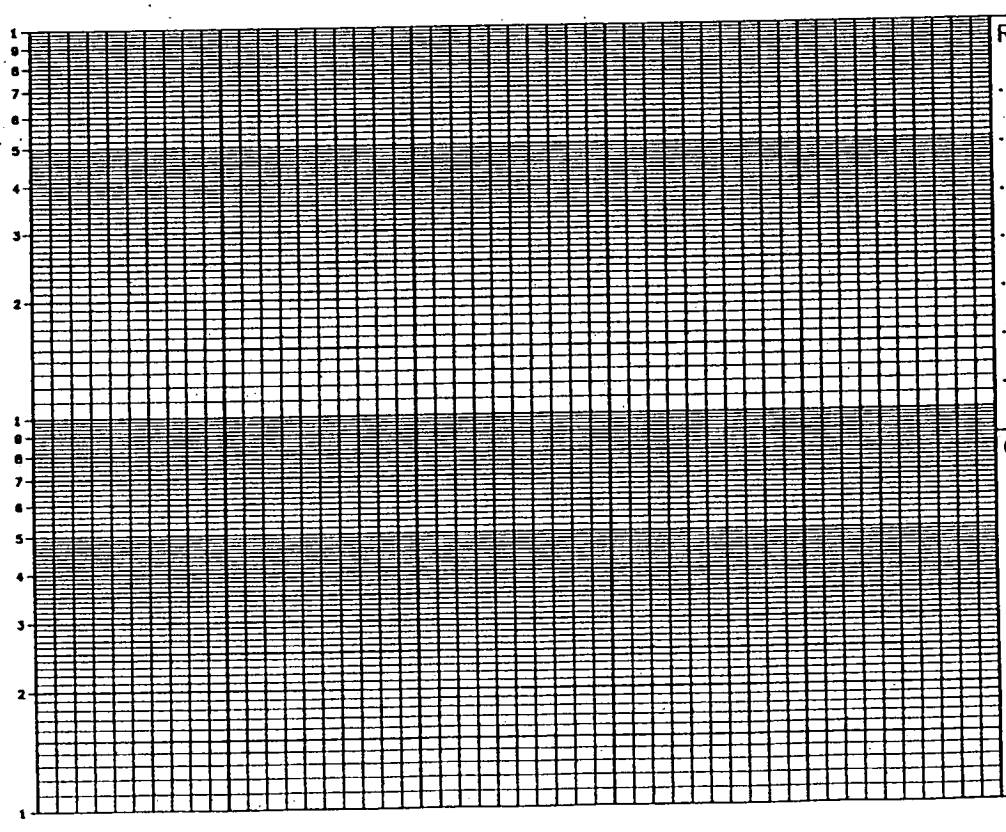
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC ZERO AT SWL

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | .009 | | 3 | .676 | |
| .1 | 2.783 | | 5 | .555 | |
| .2 | 2.169 | | 8 | .447 | |
| .3 | 1.895 | | 10 | .396 | |
| .4 | 1.677 | | 15 | .290 | |
| .5 | 1.506 | | 18 | .258 | |
| .6 | 1.381 | | 20 | .238 | |
| .7 | 1.266 | | 25 | .197 | |
| .8 | 1.183 | | 30 | .162 | |
| .9 | 1.118 | | 35 | .138 | |
| 1 | 1.062 | | 40 | .119 | |
| 2 | .802 | | 47 | .101 | |

WELL SCHEMATIC



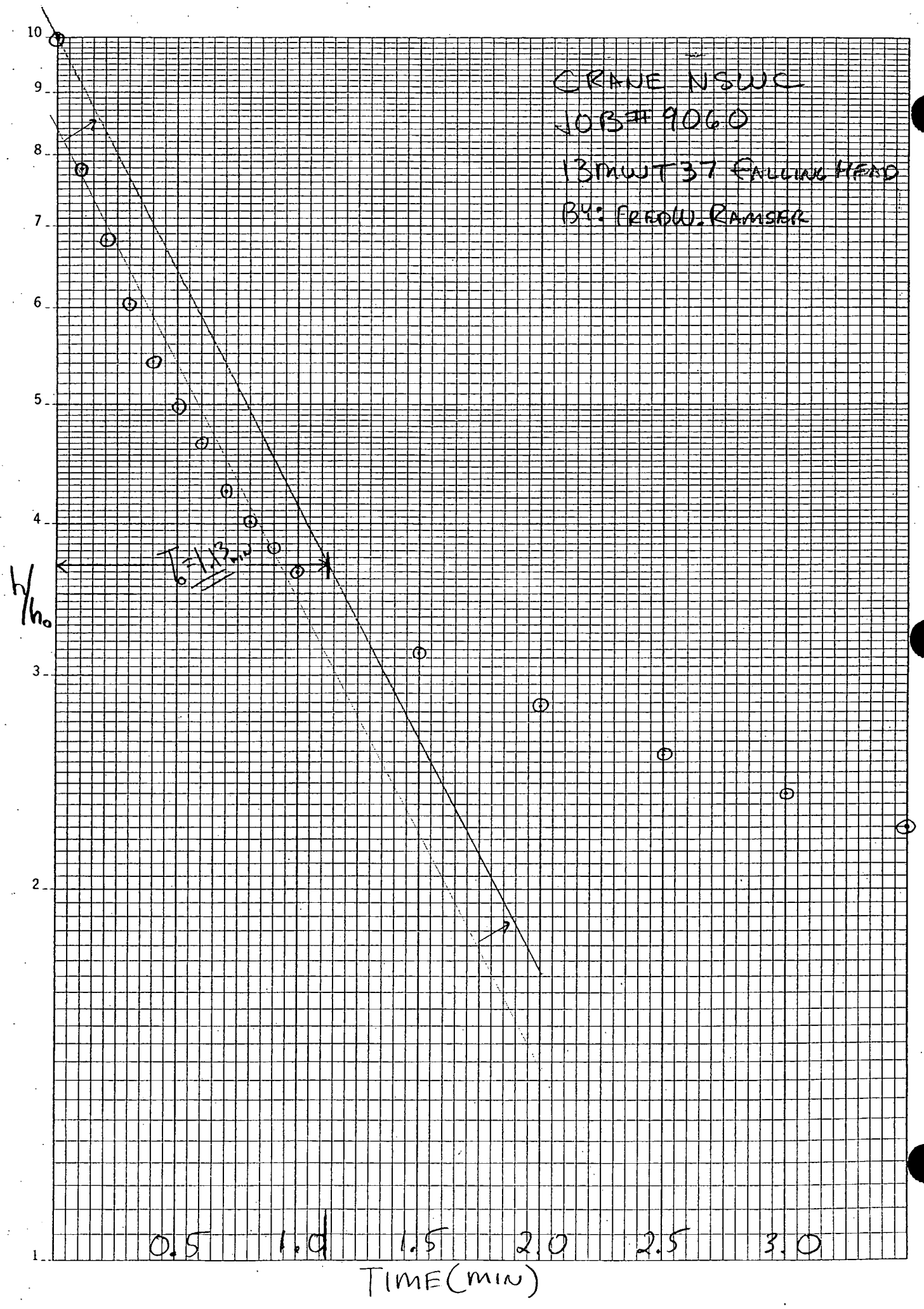

▽ Indicate SWL Depth on Drawing



REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/08/99 INL


CRANE NSWC
JOB # 9060
13 MUT 37 FALLING HEAD
BY: FRED W. RAMSER
$T_o = 1.13$ min
$h/h_o$
10
9
8
7
6
5
4
3
2
1
0.5
1.0
1.5
2.0
2.5
3.0
TIME (min)
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 12/9/2003 9:54:42
Report from file: H:\Crane IN\SWMU13_16\MGC slug tests 03\site 13\SN06899 2003-11-22 145844
DataMgr Version 3.68 13MWT37falling#1.bin

Serial number: 6899
Firmware Version 3.07
Unit name:

Test name: 13MWT37falling#1

Test defined on: 11/22/2003 14:54:55
Test started on: 11/22/2003 14:58:44
Test stopped on: 11/22/2003 15:46:16
Test extracted on: N/A

Data gathered using Linear testing
Time between data Minutes.
Number of data sam 476

TOTAL DATA SAMPL 476

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined referen 0 Feet H2O
Referenced on: channel definition.
Pressure head at ref 13.213 Feet H2O

• = PLOTTED DATA

| Date | Time | ET (min) | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho |
|---|---|---|---|---|---|
| 11/22/2003 | 14:58 | 0 | 0.009 | | |
| 11/22/2003 | 14:58 | 0.1 | 2.783 | 0 | 1.000 • |
| 11/22/2003 | 14:58 | 0.2 | 2.169 | 0.1 | 0.779 • |
| 11/22/2003 | 14:59 | 0.3 | 1.895 | 0.2 | 0.681 • |
| 11/22/2003 | 14:59 | 0.4 | 1.677 | 0.3 | 0.603 • |
| 11/22/2003 | 14:59 | 0.5 | 1.506 | 0.4 | 0.541 • |
| 11/22/2003 | 14:59 | 0.6 | 1.381 | 0.5 | 0.496 • |
| 11/22/2003 | 14:59 | 0.7 | 1.266 | 0.6 | 0.455 • |
| 11/22/2003 | 14:59 | 0.8 | 1.183 | 0.7 | 0.425 • |
| 11/22/2003 | 14:59 | 0.9 | 1.118 | 0.8 | 0.402 • |
| 11/22/2003 | 14:59 | 1 | 1.062 | 0.9 | 0.382 |
| 11/22/2003 | 14:59 | 1.1 | 1.015 | 1 | 0.365 • |
| 11/22/2003 | 14:59 | 1.2 | 0.977 | 1.1 | 0.351 |
| 11/22/2003 | 15:00 | 1.3 | 0.944 | 1.2 | 0.339 |
| 11/22/2003 | 15:00 | 1.4 | 0.916 | 1.3 | 0.329 |
| 11/22/2003 | 15:00 | 1.5 | 0.894 | 1.4 | 0.321 |
| 11/22/2003 | 15:00 | 1.6 | 0.871 | 1.5 | 0.313 |
| 11/22/2003 | 15:00 | 1.7 | 0.851 | 1.6 | 0.306 |
| 11/22/2003 | 15:00 | 1.8 | 0.834 | 1.7 | 0.300 |

ho = 2.783

| | | | | |
|---|---|---|---|---|
| 11/22/2003 15:00 | 1.9 | 0.818 | 1.8 | 0.294 |
| 11/22/2003 15:00 | 2 | 0.802 | 1.9 | 0.288 |
| 11/22/2003 15:00 | 2.1 | 0.788 | 2 | 0.283 |
| 11/22/2003 15:00 | 2.2 | 0.771 | 2.1 | 0.277 |
| 11/22/2003 15:01 | 2.3 | 0.757 | 2.2 | 0.272 |
| 11/22/2003 15:01 | 2.4 | 0.745 | 2.3 | 0.268 |
| 11/22/2003 15:01 | 2.5 | 0.733 | 2.4 | 0.263 |
| 11/22/2003 15:01 | 2.6 | 0.718 | 2.5 | 0.258 |
| 11/22/2003 15:01 | 2.7 | 0.706 | 2.6 | 0.254 |
| 11/22/2003 15:01 | 2.8 | 0.696 | 2.7 | 0.250 |
| 11/22/2003 15:01 | 2.9 | 0.686 | 2.8 | 0.246 |
| 11/22/2003 15:01 | 3 | 0.675 | 2.9 | 0.243 |
| 11/22/2003 15:01 | 3.1 | 0.667 | 3 | 0.240 |
| 11/22/2003 15:01 | 3.2 | 0.657 | 3.1 | 0.236 |
| 11/22/2003 15:02 | 3.3 | 0.649 | 3.2 | 0.233 |
| 11/22/2003 15:02 | 3.4 | 0.643 | 3.3 | 0.231 |
| 11/22/2003 15:02 | 3.5 | 0.635 | 3.4 | 0.228 |
| 11/22/2003 15:02 | 3.6 | 0.627 | 3.5 | 0.225 |
| 11/22/2003 15:02 | 3.7 | 0.622 | 3.6 | 0.223 |
| 11/22/2003 15:02 | 3.8 | 0.614 | 3.7 | 0.221 |
| 11/22/2003 15:02 | 3.9 | 0.61 | 3.8 | 0.219 |
| 11/22/2003 15:02 | 4 | 0.604 | 3.9 | 0.217 |
| 11/22/2003 15:02 | 4.1 | 0.598 | 4 | 0.215 |
| 11/22/2003 15:02 | 4.2 | 0.594 | 4.1 | 0.213 |
| 11/22/2003 15:03 | 4.3 | 0.588 | 4.2 | 0.211 |
| 11/22/2003 15:03 | 4.4 | 0.584 | 4.3 | 0.210 |
| 11/22/2003 15:03 | 4.5 | 0.577 | 4.4 | 0.207 |
| 11/22/2003 15:03 | 4.6 | 0.571 | 4.5 | 0.205 |
| 11/22/2003 15:03 | 4.7 | 0.567 | 4.6 | 0.204 |
| 11/22/2003 15:03 | 4.8 | 0.563 | 4.7 | 0.202 |
| 11/22/2003 15:03 | 4.9 | 0.559 | 4.8 | 0.201 |
| 11/22/2003 15:03 | 5 | 0.555 | 4.9 | 0.199 |
| 11/22/2003 15:03 | 5.1 | 0.549 | 5 | 0.197 |
| 11/22/2003 15:03 | 5.2 | 0.549 | 5.1 | 0.197 |
| 11/22/2003 15:04 | 5.3 | 0.543 | 5.2 | 0.195 |
| 11/22/2003 15:04 | 5.4 | 0.537 | 5.3 | 0.193 |
| 11/22/2003 15:04 | 5.5 | 0.534 | 5.4 | 0.192 |
| 11/22/2003 15:04 | 5.6 | 0.532 | 5.5 | 0.191 |
| 11/22/2003 15:04 | 5.7 | 0.528 | 5.6 | 0.190 |
| 11/22/2003 15:04 | 5.8 | 0.524 | 5.7 | 0.188 |
| 11/22/2003 15:04 | 5.9 | 0.52 | 5.8 | 0.187 |
| 11/22/2003 15:04 | 6 | 0.516 | 5.9 | 0.185 |
| 11/22/2003 15:04 | 6.1 | 0.512 | 6 | 0.184 |
| 11/22/2003 15:04 | 6.2 | 0.51 | 6.1 | 0.183 |
| 11/22/2003 15:05 | 6.3 | 0.506 | 6.2 | 0.182 |
| 11/22/2003 15:05 | 6.4 | 0.502 | 6.3 | 0.180 |
| 11/22/2003 15:05 | 6.5 | 0.482 | 6.4 | 0.173 |
| 11/22/2003 15:05 | 6.6 | 0.497 | 6.5 | 0.179 |
| 11/22/2003 15:05 | 6.7 | 0.503 | 6.6 | 0.181 |
| 11/22/2003 15:05 | 6.8 | 0.505 | 6.7 | 0.181 |
| 11/22/2003 15:05 | 6.9 | 0.488 | 6.8 | 0.175 |
| 11/22/2003 15:05 | 7 | 0.481 | 6.9 | 0.173 |
| 11/22/2003 15:05 | 7.1 | 0.477 | 7 | 0.171 |
| 11/22/2003 15:05 | 7.2 | 0.473 | 7.1 | 0.170 |
| 11/22/2003 15:06 | 7.3 | 0.469 | 7.2 | 0.169 |
| 11/22/2003 15:06 | 7.4 | 0.467 | 7.3 | 0.168 |
| 11/22/2003 15:06 | 7.5 | 0.461 | 7.4 | 0.166 |
| 11/22/2003 15:06 | 7.6 | 0.459 | 7.5 | 0.165 |

| | | | | |
|---|---|---|---|---|
| 11/22/2003 15:06 | 7.7 | 0.457 | 7.6 | 0.164 |
| 11/22/2003 15:06 | 7.8 | 0.451 | 7.7 | 0.162 |
| 11/22/2003 15:06 | 7.9 | 0.449 | 7.8 | 0.161 |
| 11/22/2003 15:06 | 8 | 0.447 | 7.9 | 0.161 |
| 11/22/2003 15:06 | 8.1 | 0.445 | 8 | 0.160 |
| 11/22/2003 15:06 | 8.2 | 0.441 | 8.1 | 0.158 |
| 11/22/2003 15:07 | 8.3 | 0.439 | 8.2 | 0.158 |
| 11/22/2003 15:07 | 8.4 | 0.435 | 8.3 | 0.156 |
| 11/22/2003 15:07 | 8.5 | 0.433 | 8.4 | 0.156 |
| 11/22/2003 15:07 | 8.6 | 0.433 | 8.5 | 0.156 |
| 11/22/2003 15:07 | 8.7 | 0.429 | 8.6 | 0.154 |
| 11/22/2003 15:07 | 8.8 | 0.427 | 8.7 | 0.153 |
| 11/22/2003 15:07 | 8.9 | 0.425 | 8.8 | 0.153 |
| 11/22/2003 15:07 | 9 | 0.421 | 8.9 | 0.151 |
| 11/22/2003 15:07 | 9.1 | 0.419 | 9 | 0.151 |
| 11/22/2003 15:07 | 9.2 | 0.417 | 9.1 | 0.150 |
| 11/22/2003 15:08 | 9.3 | 0.413 | 9.2 | 0.148 |
| 11/22/2003 15:08 | 9.4 | 0.409 | 9.3 | 0.147 |
| 11/22/2003 15:08 | 9.5 | 0.407 | 9.4 | 0.146 |
| 11/22/2003 15:08 | 9.6 | 0.404 | 9.5 | 0.145 |
| 11/22/2003 15:08 | 9.7 | 0.404 | 9.6 | 0.145 |
| 11/22/2003 15:08 | 9.8 | 0.402 | 9.7 | 0.144 |
| 11/22/2003 15:08 | 9.9 | 0.398 | 9.8 | 0.143 |
| 11/22/2003 15:08 | 10 | 0.396 | 9.9 | 0.142 |
| 11/22/2003 15:08 | 10.1 | 0.395 | 10 | 0.142 |
| 11/22/2003 15:08 | 10.2 | 0.393 | 10.1 | 0.141 |
| 11/22/2003 15:09 | 10.3 | 0.389 | 10.2 | 0.140 |
| 11/22/2003 15:09 | 10.4 | 0.387 | 10.3 | 0.139 |
| 11/22/2003 15:09 | 10.5 | 0.385 | 10.4 | 0.138 |
| 11/22/2003 15:09 | 10.6 | 0.383 | 10.5 | 0.138 |
| 11/22/2003 15:09 | 10.7 | 0.381 | 10.6 | 0.137 |
| 11/22/2003 15:09 | 10.8 | 0.379 | 10.7 | 0.136 |
| 11/22/2003 15:09 | 10.9 | 0.374 | 10.8 | 0.134 |
| 11/22/2003 15:09 | 11 | 0.374 | 10.9 | 0.134 |
| 11/22/2003 15:09 | 11.1 | 0.372 | 11 | 0.134 |
| 11/22/2003 15:09 | 11.2 | 0.37 | 11.1 | 0.133 |
| 11/22/2003 15:10 | 11.3 | 0.366 | 11.2 | 0.132 |
| 11/22/2003 15:10 | 11.4 | 0.364 | 11.3 | 0.131 |
| 11/22/2003 15:10 | 11.5 | 0.362 | 11.4 | 0.130 |
| 11/22/2003 15:10 | 11.6 | 0.362 | 11.5 | 0.130 |

TETRA-TECH NUS

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT37 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Falling head | **Test Date:** | 22-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083 | 1 = r |
| Effective Radius of Well Screen (in.) : | .208 | 2.5 = R |
| Length of Well Screen (ft.) : | | 13.5 = L |
| Time for 37% head change (min.) : | | 1.13 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 9.49E-04 | ft./min. |
| 1.58E-05 | ft./sec. |
| 1.37E+00 | ft./day |
| 4.82E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(13.5/.208)}{2 \times 13.5 \times 1.13} =$$

$9.42 \times 10^{-4}$ Ft / min.

CHECKED
MLR
2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT37 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 22-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 2.5 = R |
| Length of Well Screen (ft.) : | 13.5 = L |
| Time for 37% head change (min.) : | 1.50 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 7.15E-04 | ft./min. |
| 1.19E-05 | ft./sec. |
| 1.03E+00 | ft./day |
| 3.63E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: NWSC CRANE WELL/BORING NO.: 13MWT37

PROJECT NO.: 9060 GEOLOGIST: M. G. COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 14.06 DATE: 11-22-03

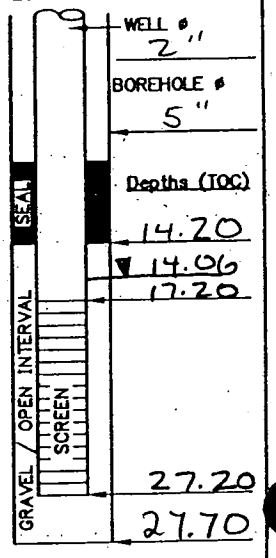
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: SOLID SLUG PAGE 1 OF 1

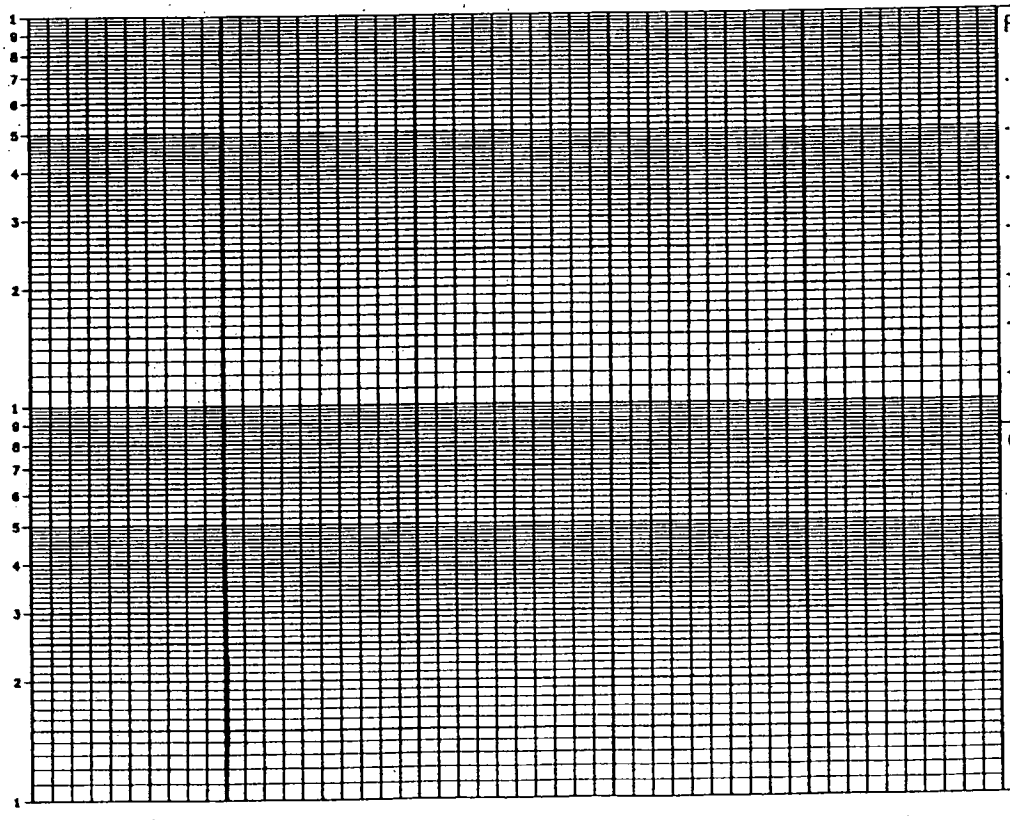
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC, ZERO AT SWL

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 0 | | 3 | -.807 | |
| .1 | -2.868 | | 5 | -.652 | |
| .2 | -2.346 | | 8 | -.504 | |
| .3 | -2.044 | | 10 | -.440 | |
| .4 | -1.814 | | 15 | -.330 | |
| .5 | -1.637 | | 18 | -.290 | |
| .6 | -1.504 | | 20 | -.268 | |
| .7 | -1.397 | | 25 | -.227 | |
| .8 | -1.320 | | 30 | -.199 | |
| .9 | -1.254 | | 35 | -.179 | |
| 1.0 | -1.202 | | 40 | -.164 | |
| 2.0 | -.932 | | 45 | -.154 | |

WELL SCHEMATIC



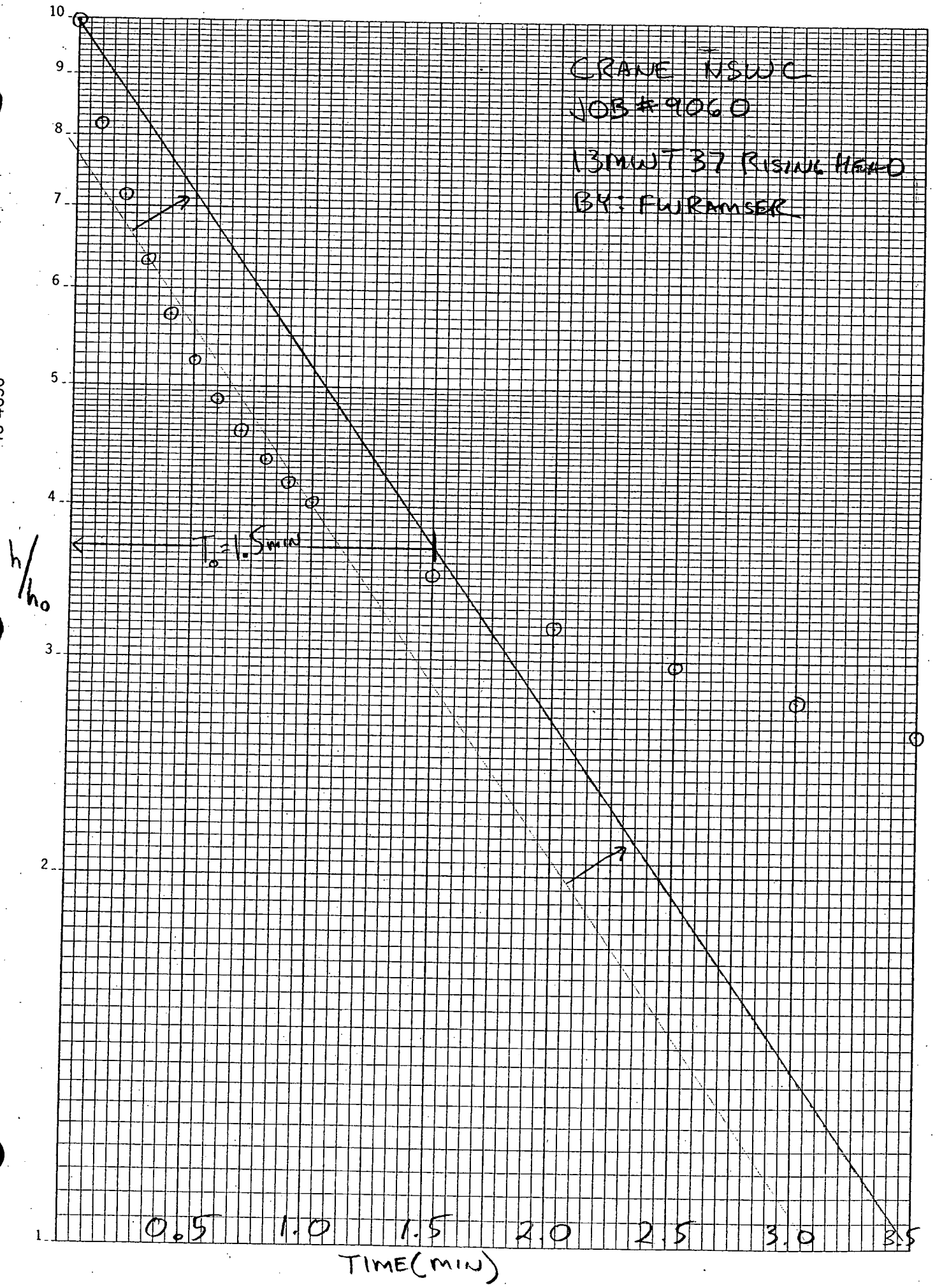

▽ Indicate SWL Depth on Drawing



REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL


CRANE NSWC
JOB # 9060
13MWT 37 RISING HEAD
BY: FWRAMSER
$T_o = 1.5$ min
h/h₀
10
9
8
7
6
5
4
3
2
1
0.5
1.0
1.5
2.0
2.5
3.0
3.5
TIME (MIN)
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| In-Situ Inc. | MiniTroll Pro | | | | | | |
| | | | | | | | |
| Report generated: | 12/9/2003 | 10:06:22 | | | | | |
| Report from file: | H:\Crane IN\SWMU13_16\MGC slug tests 03\site 13\SN06899 2003-11-22 154857 | | | | | | |
| DataMgr Version | 3.68 | | | | | 13MWT37rising#1.bin | |
| | | | | | | | |
| Serial number: | 6899 | | | | | | |
| Firmware Version | 3.07 | | | | | | |
| Unit name: | | | | | | | |
| | | | | | | | |
| Test name: | | 13MWT37rising#1 | | | | | |
| | | | | | | | |
| Test defined on: | 11/22/2003 | 15:47:51 | | | | | |
| Test started on: | 11/22/2003 | 15:48:57 | | | | | |
| Test stopped on: | 11/22/2003 | 16:36:48 | | | | | |
| Test extracted on: N/A | | | | | | | |
| | | | | | | | |
| Data gathered using Linear testing | | | | | | | |
| Time between data points: | Minutes. | | | | | | |
| Number of data samples: | 479 | | | | | | |
| | | | | | | | |
| | | | | | | | |
| TOTAL DATA SAMPLES | 479 | | | | | | |
| | | | | | | | |
| Channel number [2] | | | | | | | |
| Measurement type: | Pressure | | | | | | |
| Channel name: | | | | | | | |
| Sensor Range: | 30 PSI. | | | | | | |
| Specific gravity: | 1 | | | | | | |
| Mode: | Surface | | | | | | |
| User-defined reference: | 0 | Feet H2O | | | | | |
| Referenced on: | test start | | | | | | |
| Pressure head at reference: | 13.305 | Feet H2O | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | Chan[2] | | | | | |
| Date Time | ET (min) | Feet H2O | Adjusted ET. (min) | h/ho | ho = | -2.868 | |
| -------- -------- | ---------- | ---------- | | | | | |
| 11/22/2003 15:48 | 0 | 0 | | | | | |
| 11/22/2003 15:49 | 0.1 | -2.868 | 0 | 1.000 | | | |
| 11/22/2003 15:49 | 0.2 | -2.346 | 0.1 | 0.818 | | | |
| 11/22/2003 15:49 | 0.3 | -2.044 | 0.2 | 0.713 | | | |
| 11/22/2003 15:49 | 0.4 | -1.814 | 0.3 | 0.632 | | | |
| 11/22/2003 15:49 | 0.5 | -1.637 | 0.4 | 0.571 | | | |
| 11/22/2003 15:49 | 0.6 | -1.504 | 0.5 | 0.524 | | | |
| 11/22/2003 15:49 | 0.7 | -1.397 | 0.6 | 0.487 | | | |
| 11/22/2003 15:49 | 0.8 | -1.32 | 0.7 | 0.460 | | | |
| 11/22/2003 15:49 | 0.9 | -1.254 | 0.8 | 0.437 | | | |
| 11/22/2003 15:49 | 1 | -1.202 | 0.9 | 0.419 | | | |
| 11/22/2003 15:50 | 1.1 | -1.157 | 1 | 0.403 | | | |
| 11/22/2003 15:50 | 1.2 | -1.119 | 1.1 | 0.390 | | | |
| 11/22/2003 15:50 | 1.3 | -1.087 | 1.2 | 0.379 | | | |
| 11/22/2003 15:50 | 1.4 | -1.059 | 1.3 | 0.369 | | | |
| 11/22/2003 15:50 | 1.5 | -1.03 | 1.4 | 0.359 | | | |
| 11/22/2003 15:50 | 1.6 | -1.008 | 1.5 | 0.351 | | | |
| 11/22/2003 15:50 | 1.7 | -0.984 | 1.6 | 0.343 | | | |
| 11/22/2003 15:50 | 1.8 | -0.964 | 1.7 | 0.336 | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 11/22/2003 15:50 | 1.9 | -0.948 | 1.8 | 0.331 | | | |
| 11/22/2003 15:50 | 2 | -0.932 | 1.9 | 0.325 | | | |
| 11/22/2003 15:51 | 2.1 | -0.916 | 2 | 0.319 | | | |
| 11/22/2003 15:51 | 2.2 | -0.902 | 2.1 | 0.315 | | | |
| 11/22/2003 15:51 | 2.3 | -0.887 | 2.2 | 0.309 | | | |
| 11/22/2003 15:51 | 2.4 | -0.875 | 2.3 | 0.305 | | | |
| 11/22/2003 15:51 | 2.5 | -0.861 | 2.4 | 0.300 | | | |
| 11/22/2003 15:51 | 2.6 | -0.849 | 2.5 | 0.296 | | | |
| 11/22/2003 15:51 | 2.7 | -0.837 | 2.6 | 0.292 | | | |
| 11/22/2003 15:51 | 2.8 | -0.827 | 2.7 | 0.288 | | | |
| 11/22/2003 15:51 | 2.9 | -0.817 | 2.8 | 0.285 | | | |
| 11/22/2003 15:51 | 3 | -0.807 | 2.9 | 0.281 | | | |
| 11/22/2003 15:52 | 3.1 | -0.797 | 3 | 0.278 | | | |
| 11/22/2003 15:52 | 3.2 | -0.785 | 3.1 | 0.274 | | | |
| 11/22/2003 15:52 | 3.3 | -0.776 | 3.2 | 0.271 | | | |
| 11/22/2003 15:52 | 3.4 | -0.768 | 3.3 | 0.268 | | | |
| 11/22/2003 15:52 | 3.5 | -0.758 | 3.4 | 0.264 | | | |
| 11/22/2003 15:52 | 3.6 | -0.75 | 3.5 | 0.262 | | | |
| 11/22/2003 15:52 | 3.7 | -0.742 | 3.6 | 0.259 | | | |
| 11/22/2003 15:52 | 3.8 | -0.734 | 3.7 | 0.256 | | | |
| 11/22/2003 15:52 | 3.9 | -0.726 | 3.8 | 0.253 | | | |
| 11/22/2003 15:52 | 4 | -0.718 | 3.9 | 0.250 | | | |
| 11/22/2003 15:53 | 4.1 | -0.71 | 4 | 0.248 | | | |
| 11/22/2003 15:53 | 4.2 | -0.704 | 4.1 | 0.245 | | | |
| 11/22/2003 15:53 | 4.3 | -0.696 | 4.2 | 0.243 | | | |
| 11/22/2003 15:53 | 4.4 | -0.69 | 4.3 | 0.241 | | | |
| 11/22/2003 15:53 | 4.5 | -0.684 | 4.4 | 0.238 | | | |
| 11/22/2003 15:53 | 4.6 | -0.676 | 4.5 | 0.236 | | | |
| 11/22/2003 15:53 | 4.7 | -0.67 | 4.6 | 0.234 | | | |
| 11/22/2003 15:53 | 4.8 | -0.664 | 4.7 | 0.232 | | | |
| 11/22/2003 15:53 | 4.9 | -0.658 | 4.8 | 0.229 | | | |
| 11/22/2003 15:53 | 5 | -0.652 | 4.9 | 0.227 | | | |
| 11/22/2003 15:54 | 5.1 | -0.643 | 5 | 0.224 | | | |
| 11/22/2003 15:54 | 5.2 | -0.637 | 5.1 | 0.222 | | | |
| 11/22/2003 15:54 | 5.3 | -0.631 | 5.2 | 0.220 | | | |
| 11/22/2003 15:54 | 5.4 | -0.625 | 5.3 | 0.218 | | | |
| 11/22/2003 15:54 | 5.5 | -0.619 | 5.4 | 0.216 | | | |
| 11/22/2003 15:54 | 5.6 | -0.613 | 5.5 | 0.214 | | | |
| 11/22/2003 15:54 | 5.7 | -0.609 | 5.6 | 0.212 | | | |
| 11/22/2003 15:54 | 5.8 | -0.603 | 5.7 | 0.210 | | | |
| 11/22/2003 15:54 | 5.9 | -0.599 | 5.8 | 0.209 | | | |
| 11/22/2003 15:54 | 6 | -0.593 | 5.9 | 0.207 | | | |
| 11/22/2003 15:55 | 6.1 | -0.587 | 6 | 0.205 | | | |
| 11/22/2003 15:55 | 6.2 | -0.583 | 6.1 | 0.203 | | | |
| 11/22/2003 15:55 | 6.3 | -0.577 | 6.2 | 0.201 | | | |
| 11/22/2003 15:55 | 6.4 | -0.573 | 6.3 | 0.200 | | | |
| 11/22/2003 15:55 | 6.5 | -0.567 | 6.4 | 0.198 | | | |
| 11/22/2003 15:55 | 6.6 | -0.561 | 6.5 | 0.196 | | | |
| 11/22/2003 15:55 | 6.7 | -0.559 | 6.6 | 0.195 | | | |
| 11/22/2003 15:55 | 6.8 | -0.549 | 6.7 | 0.191 | | | |
| 11/22/2003 15:55 | 6.9 | -0.551 | 6.8 | 0.192 | | | |
| 11/22/2003 15:55 | 7 | -0.545 | 6.9 | 0.190 | | | |
| 11/22/2003 15:56 | 7.1 | -0.54 | 7 | 0.188 | | | |
| 11/22/2003 15:56 | 7.2 | -0.536 | 7.1 | 0.187 | | | |
| 11/22/2003 15:56 | 7.3 | -0.532 | 7.2 | 0.185 | | | |
| 11/22/2003 15:56 | 7.4 | -0.528 | 7.3 | 0.184 | | | |
| 11/22/2003 15:56 | 7.5 | -0.524 | 7.4 | 0.183 | | | |
| 11/22/2003 15:56 | 7.6 | -0.52 | 7.5 | 0.181 | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 11/22/2003 15:56 | 7.7 | -0.516 | 7.6 | 0.180 | | | |
| 11/22/2003 15:56 | 7.8 | -0.512 | 7.7 | 0.179 | | | |
| 11/22/2003 15:56 | 7.9 | -0.508 | 7.8 | 0.177 | | | |
| 11/22/2003 15:56 | 8 | -0.504 | 7.9 | 0.176 | | | |
| 11/22/2003 15:57 | 8.1 | -0.502 | 8 | 0.175 | | | |
| 11/22/2003 15:57 | 8.2 | -0.498 | 8.1 | 0.174 | | | |
| 11/22/2003 15:57 | 8.3 | -0.492 | 8.2 | 0.172 | | | |
| 11/22/2003 15:57 | 8.4 | -0.49 | 8.3 | 0.171 | | | |
| 11/22/2003 15:57 | 8.5 | -0.486 | 8.4 | 0.169 | | | |
| 11/22/2003 15:57 | 8.6 | -0.484 | 8.5 | 0.169 | | | |
| 11/22/2003 15:57 | 8.7 | -0.48 | 8.6 | 0.167 | | | |
| 11/22/2003 15:57 | 8.8 | -0.476 | 8.7 | 0.166 | | | |
| 11/22/2003 15:57 | 8.9 | -0.474 | 8.8 | 0.165 | | | |
| 11/22/2003 15:57 | 9 | -0.47 | 8.9 | 0.164 | | | |
| 11/22/2003 15:58 | 9.1 | -0.468 | 9 | 0.163 | | | |
| 11/22/2003 15:58 | 9.2 | -0.464 | 9.1 | 0.162 | | | |
| 11/22/2003 15:58 | 9.3 | -0.462 | 9.2 | 0.161 | | | |
| 11/22/2003 15:58 | 9.4 | -0.458 | 9.3 | 0.160 | | | |
| 11/22/2003 15:58 | 9.5 | -0.454 | 9.4 | 0.158 | | | |
| 11/22/2003 15:58 | 9.6 | -0.45 | 9.5 | 0.157 | | | |
| 11/22/2003 15:58 | 9.7 | -0.446 | 9.6 | 0.156 | | | |
| 11/22/2003 15:58 | 9.8 | -0.446 | 9.7 | 0.156 | | | |
| 11/22/2003 15:58 | 9.9 | -0.442 | 9.8 | 0.154 | | | |
| 11/22/2003 15:58 | 10 | -0.44 | 9.9 | 0.153 | | | |
| 11/22/2003 15:59 | 10.1 | -0.436 | 10 | 0.152 | | | |
| 11/22/2003 15:59 | 10.2 | -0.433 | 10.1 | 0.151 | | | |
| 11/22/2003 15:59 | 10.3 | -0.43 | 10.2 | 0.150 | | | |
| 11/22/2003 15:59 | 10.4 | -0.425 | 10.3 | 0.148 | | | |
| 11/22/2003 15:59 | 10.5 | -0.425 | 10.4 | 0.148 | | | |
| 11/22/2003 15:59 | 10.6 | -0.421 | 10.5 | 0.147 | | | |
| 11/22/2003 15:59 | 10.7 | -0.419 | 10.6 | 0.146 | | | |
| 11/22/2003 15:59 | 10.8 | -0.417 | 10.7 | 0.145 | | | |
| 11/22/2003 15:59 | 10.9 | -0.411 | 10.8 | 0.143 | | | |
| 11/22/2003 15:59 | 11 | -0.409 | 10.9 | 0.143 | | | |
| 11/22/2003 16:00 | 11.1 | -0.409 | 11 | 0.143 | | | |
| 11/22/2003 16:00 | 11.2 | -0.405 | 11.1 | 0.141 | | | |
| 11/22/2003 16:00 | 11.3 | -0.403 | 11.2 | 0.141 | | | |
| 11/22/2003 16:00 | 11.4 | -0.399 | 11.3 | 0.139 | | | |
| 11/22/2003 16:00 | 11.5 | -0.397 | 11.4 | 0.138 | | | |
| 11/22/2003 16:00 | 11.6 | -0.395 | 11.5 | 0.138 | | | |
| 11/22/2003 16:00 | 11.7 | -0.393 | 11.6 | 0.137 | | | |
| 11/22/2003 16:00 | 11.8 | -0.391 | 11.7 | 0.136 | | | |
| 11/22/2003 16:00 | 11.9 | -0.387 | 11.8 | 0.135 | | | |
| 11/22/2003 16:00 | 12 | -0.385 | 11.9 | 0.134 | | | |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT37 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 22-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .208' | 2.5 = R |
| Length of Well Screen (ft.) : | | 13.5 = L |
| Time for 37% head change (min.) : | | 1.50 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 7.15E-04 | ft./min. |
| 1.19E-05 | ft./sec. |
| 1.03E+00 | ft./day |
| 3.63E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(13.5/.208)}{2 \times 13.5 \times 1.50} =$$

$7.10 \times 10^{-4}$ Ft/Min

CHECKED
MRa
2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

**Project Name:** Crane NSWC
**Project No.:** 9060
**Test Type:** Rising head

**Well/Boring No.:** 13MWT35
**Aquifer Type:** Bedrock
**Test Date:** 20-Jan-04

**Done By:** FWRamser
**Checked By:**

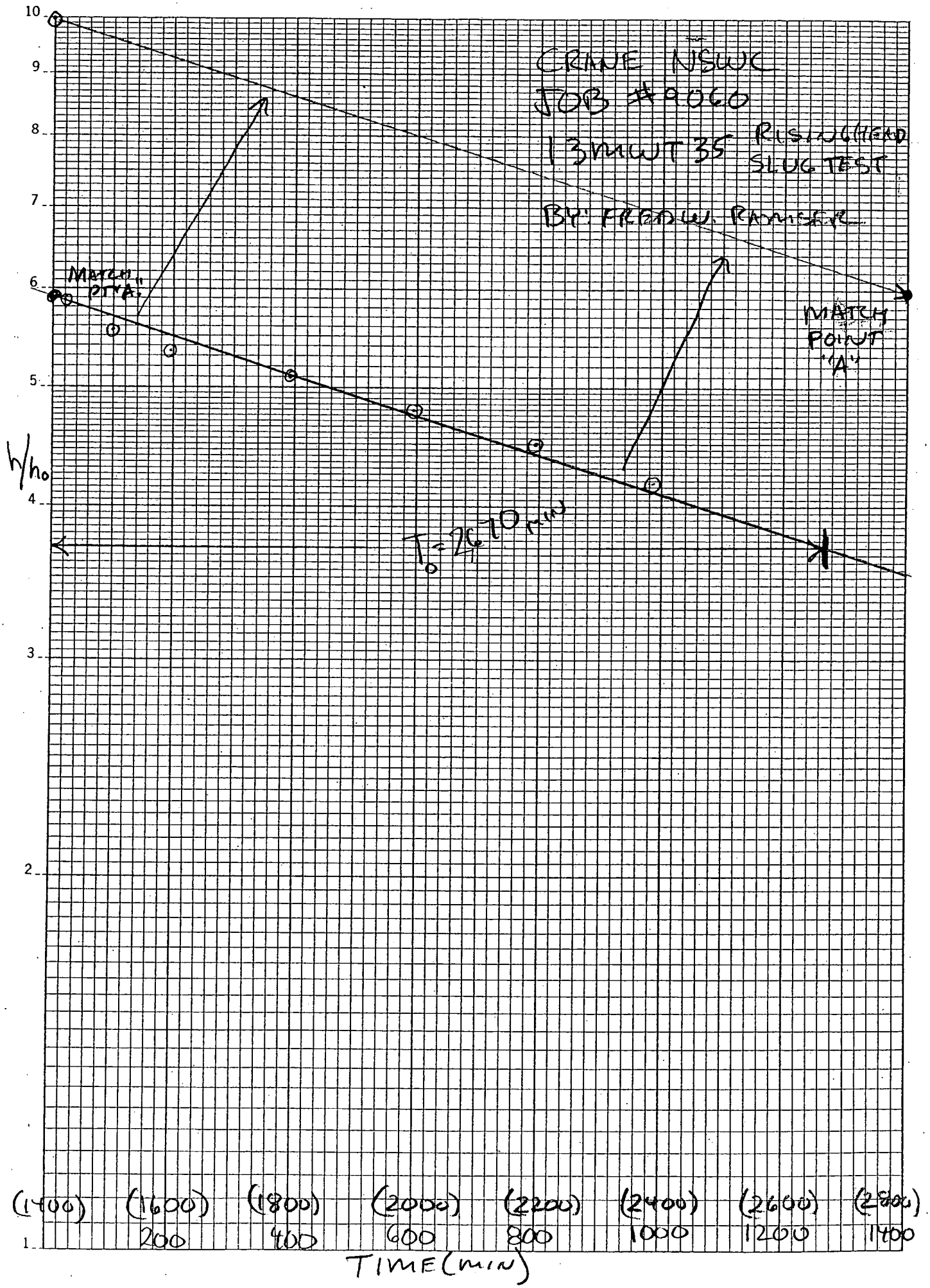
| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 2 = R |
| Length of Well Screen (ft.) : | 8.14 = L |
| Time for 37% head change (min.) : | 2670.00 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 6.21E-07 | ft./min. |
| 1.04E-08 | ft./sec. |
| 8.95E-04 | ft./day |
| 3.16E-07 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$




K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS KEUFFEL & ESSER CO. MADE IN U.S.A.
46 4650

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| In-Situ Inc. | MiniTroll Pro | | | | | | | |
| | | | | | | | | |
| Report generated: | 1/22/2004 | 21:46:32 | | | | | | |
| Report from file: | ...\SN08670 2004-01-20 165520 13mwt35r1.bin | | | | | | | |
| Win-Situ Version | 4.41 | | | | | | | |
| | | | | | | | | |
| Serial number: | 8670 | | | | | | | |
| Firmware Version | 3.07 | | | | | | | |
| Unit name: | | | | | | | | |
| | | | | | | | | |
| Test name: | | 13mwt35r1 | | | | | | |
| | | | | | | | | |
| Test defined on: | 1/20/2004 | 13:04:38 | | | | | | |
| Test started on: | 1/20/2004 | 16:55:20 | | | | | | |
| Test stopped on: | N/A | N/A | | | | | | |
| Test extracted on: | N/A | N/A | | | | | | |
| | | | | | | | | |
| Data gathered using Logarithmic testing | | | | | | | | |
| Maximum time between dat | Minutes. | | | | | | | |
| Number of data samples: | 232 | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| TOTAL DATA SAMPLES | 232 | | | | | | | |
| | | | | | | | | |
| Channel number [1] | | | | | | | | |
| Measurement type: | Temperature | | | | | | | |
| Channel name: | | | | | | | | |
| | | | | | | | | |
| Channel number [2] | | | | | | | | |
| Measurement type: | Pressure | | | | | | | |
| Channel name: | Water level | | | | | | | |
| Sensor Range: | 100 PSIG. | | | | | | | |
| Specific gravity: | 1 | | | | | | | |
| Mode: | TOC | | | | | | | |
| User-defined reference: | 0 | Feet H2O | | | | | | |
| Referenced on: | test start | | | | | | | |
| Pressure head at reference: | 6.209 | Feet H2O | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Chan[1] | Chan[2] | | | | |
| Date | Time | ET (min) | Fahrenheit | Feet H2O | Adjusted ET. (min) | h/ho | ho = | 0.807 |
| --- | --- | --- | --- | --- | | | | |
| 1/20/2004 | 16:55:20 | 0 | 57.38 | 0 | | | | |
| 1/20/2004 | 16:55:20 | 0.005 | 57.4 | -0.012 | | | | |
| 1/20/2004 | 16:55:20 | 0.01 | 57.4 | -0.018 | | | | |
| 1/20/2004 | 16:55:21 | 0.015 | 57.42 | -0.017 | | | | |
| 1/20/2004 | 16:55:21 | 0.02 | 57.42 | -0.023 | | | | |
| 1/20/2004 | 16:55:21 | 0.025 | 57.42 | -0.023 | | | | |
| 1/20/2004 | 16:55:22 | 0.03 | 57.45 | -0.023 | | | | |
| 1/20/2004 | 16:55:22 | 0.035 | 57.45 | -0.029 | | | | |
| 1/20/2004 | 16:55:22 | 0.04 | 57.45 | -0.023 | | | | |
| 1/20/2004 | 16:55:22 | 0.045 | 57.45 | -0.029 | | | | |
| 1/20/2004 | 16:55:23 | 0.05 | 57.45 | -0.029 | | | | |
| 1/20/2004 | 16:55:23 | 0.055 | 57.45 | 0.027 | | | | |
| 1/20/2004 | 16:55:23 | 0.06 | 57.45 | -0.06 | | | | |
| 1/20/2004 | 16:55:24 | 0.065 | 57.45 | 0.793 | | | | |
| 1/20/2004 | 16:55:24 | 0.07 | 57.45 | 1.647 | | | | |
| 1/20/2004 | 16:55:24 | 0.075 | 57.45 | 0.065 | | | | |
| 1/20/2004 | 16:55:25 | 0.08 | 57.45 | 1.31 | | | | |
| 1/20/2004 | 16:55:25 | 0.085 | 57.45 | 1.491 | | | | |
| 1/20/2004 | 16:55:25 | 0.09 | 57.45 | 1.379 | | | | |
| 1/20/2004 | 16:55:25 | 0.095 | 57.47 | 1.261 | | | | |
| 1/20/2004 | 16:55:26 | 0.1 | 57.45 | 1.173 | | | | |
| 1/20/2004 | 16:55:26 | 0.1058 | 57.47 | 1.093 | | | | |
| 1/20/2004 | 16:55:27 | 0.112 | 57.47 | 0.944 | | | | |
| 1/20/2004 | 16:55:27 | 0.1185 | 57.47 | 0.863 | | | | |
| 1/20/2004 | 16:55:27 | 0.1255 | 57.47 | 0.807 | 0 | 1.000 | | |
| 1/20/2004 | 16:55:28 | 0.1328 | 57.47 | 0.782 | 0.0073 | 0.969 | | |
| 1/20/2004 | 16:55:28 | 0.1407 | 57.47 | 0.682 | 0.0152 | 0.845 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1/20/2004 | 16:55:29 | 0.149 | 57.47 | 0.614 | 0.0235 | 0.761 | | |
| 1/20/2004 | 16:55:29 | 0.1578 | 57.47 | 0.682 | 0.0323 | 0.845 | | |
| 1/20/2004 | 16:55:30 | 0.1672 | 57.45 | 0.619 | 0.0417 | 0.767 | | |
| 1/20/2004 | 16:55:30 | 0.177 | 57.45 | 0.613 | 0.0515 | 0.760 | | |
| 1/20/2004 | 16:55:31 | 0.1875 | 57.45 | 0.65 | 0.062 | 0.805 | | |
| 1/20/2004 | 16:55:32 | 0.1985 | 57.45 | 0.619 | 0.073 | 0.767 | | |
| 1/20/2004 | 16:55:32 | 0.2102 | 57.45 | 0.569 | 0.0847 | 0.705 | | |
| 1/20/2004 | 16:55:33 | 0.2227 | 57.45 | 0.625 | 0.0972 | 0.774 | • | |
| 1/20/2004 | 16:55:34 | 0.2358 | 57.45 | 0.575 | 0.1103 | 0.713 | | |
| 1/20/2004 | 16:55:35 | 0.2498 | 57.45 | 0.569 | 0.1243 | 0.705 | | |
| 1/20/2004 | 16:55:36 | 0.2647 | 57.45 | 0.557 | 0.1392 | 0.690 | | |
| 1/20/2004 | 16:55:37 | 0.2803 | 57.45 | 0.55 | 0.1548 | 0.682 | | |
| 1/20/2004 | 16:55:38 | 0.297 | 57.45 | 0.55 | 0.1715 | 0.682 | | |
| 1/20/2004 | 16:55:39 | 0.3147 | 57.42 | 0.543 | 0.1892 | 0.673 | | |
| 1/20/2004 | 16:55:40 | 0.3333 | 57.45 | 0.544 | 0.2078 | 0.674 | | |
| 1/20/2004 | 16:55:41 | 0.3532 | 57.42 | 0.537 | 0.2277 | 0.665 | | |
| 1/20/2004 | 16:55:42 | 0.3742 | 57.42 | 0.537 | 0.2487 | 0.665 | • | |
| 1/20/2004 | 16:55:44 | 0.3963 | 57.42 | 0.531 | 0.2708 | 0.658 | | |
| 1/20/2004 | 16:55:45 | 0.4198 | 57.42 | 0.531 | 0.2943 | 0.658 | | |
| 1/20/2004 | 16:55:46 | 0.4447 | 57.42 | 0.525 | 0.3192 | 0.651 | | |
| 1/20/2004 | 16:55:48 | 0.4697 | 57.42 | 0.525 | 0.3442 | 0.651 | | |
| 1/20/2004 | 16:55:50 | 0.4963 | 57.42 | 0.519 | 0.3708 | 0.643 | | |
| 1/20/2004 | 16:55:51 | 0.5247 | 57.42 | 0.519 | 0.3992 | 0.643 | | |
| 1/20/2004 | 16:55:53 | 0.5547 | 57.42 | 0.512 | 0.4292 | 0.634 | | |
| 1/20/2004 | 16:55:55 | 0.5863 | 57.42 | 0.512 | 0.4608 | 0.634 | | |
| 1/20/2004 | 16:55:57 | 0.6213 | 57.42 | 0.512 | 0.4958 | 0.634 | • | |
| 1/20/2004 | 16:55:59 | 0.658 | 57.42 | 0.506 | 0.5325 | 0.627 | | |
| 1/20/2004 | 16:56:02 | 0.6963 | 57.42 | 0.506 | 0.5708 | 0.627 | | |
| 1/20/2004 | 16:56:04 | 0.738 | 57.42 | 0.506 | 0.6125 | 0.627 | | |
| 1/20/2004 | 16:56:07 | 0.7813 | 57.42 | 0.506 | 0.6558 | 0.627 | | |
| 1/20/2004 | 16:56:09 | 0.828 | 57.42 | 0.5 | 0.7025 | 0.620 | | |
| 1/20/2004 | 16:56:12 | 0.8763 | 57.42 | 0.5 | 0.7508 | 0.620 | | |
| 1/20/2004 | 16:56:15 | 0.928 | 57.42 | 0.5 | 0.8025 | 0.620 | | |
| 1/20/2004 | 16:56:19 | 0.983 | 57.42 | 0.5 | 0.8575 | 0.620 | | |
| 1/20/2004 | 16:56:22 | 1.0413 | 57.42 | 0.5 | 0.9158 | 0.620 | | |
| 1/20/2004 | 16:56:26 | 1.103 | 57.4 | 0.499 | 0.9775 | 0.618 | • | |
| 1/20/2004 | 16:56:30 | 1.168 | 57.4 | 0.493 | 1.0425 | 0.611 | | |
| 1/20/2004 | 16:56:34 | 1.238 | 57.4 | 0.493 | 1.1125 | 0.611 | | |
| 1/20/2004 | 16:56:38 | 1.3113 | 57.4 | 0.493 | 1.1858 | 0.611 | | |
| 1/20/2004 | 16:56:43 | 1.3897 | 57.4 | 0.493 | 1.2642 | 0.611 | | |
| 1/20/2004 | 16:56:48 | 1.473 | 57.4 | 0.493 | 1.3475 | 0.611 | | |
| 1/20/2004 | 16:56:53 | 1.5613 | 57.4 | 0.487 | 1.4358 | 0.603 | | |
| 1/20/2004 | 16:56:59 | 1.6547 | 57.4 | 0.487 | 1.5292 | 0.603 | | |
| 1/20/2004 | 16:57:05 | 1.753 | 57.4 | 0.487 | 1.6275 | 0.603 | | |
| 1/20/2004 | 16:57:11 | 1.858 | 57.4 | 0.487 | 1.7325 | 0.603 | | |
| 1/20/2004 | 16:57:18 | 1.968 | 57.4 | 0.487 | 1.8425 | 0.603 | | |
| 1/20/2004 | 16:57:25 | 2.0847 | 57.4 | 0.487 | 1.9592 | 0.603 | • | |
| 1/20/2004 | 16:57:32 | 2.2097 | 57.4 | 0.487 | 2.0842 | 0.603 | | |
| 1/20/2004 | 16:57:40 | 2.3413 | 57.4 | 0.48 | 2.2158 | 0.595 | | |
| 1/20/2004 | 16:57:49 | 2.4813 | 57.4 | 0.48 | 2.3558 | 0.595 | | |
| 1/20/2004 | 16:57:58 | 2.6297 | 57.4 | 0.48 | 2.5042 | 0.595 | | |
| 1/20/2004 | 16:58:07 | 2.7863 | 57.4 | 0.48 | 2.6608 | 0.595 | | |
| 1/20/2004 | 16:58:17 | 2.953 | 57.38 | 0.48 | 2.8275 | 0.595 | | |
| 1/20/2004 | 16:58:28 | 3.1297 | 57.4 | 0.48 | 3.0042 | 0.595 | • | |
| 1/20/2004 | 16:58:39 | 3.3163 | 57.38 | 0.48 | 3.1908 | 0.595 | | |
| 1/20/2004 | 16:58:51 | 3.5147 | 57.38 | 0.48 | 3.3892 | 0.595 | | |
| 1/20/2004 | 16:59:03 | 3.7247 | 57.38 | 0.48 | 3.5992 | 0.595 | | |
| 1/20/2004 | 16:59:17 | 3.9463 | 57.38 | 0.473 | 3.8208 | 0.586 | | |
| 1/20/2004 | 16:59:31 | 4.1813 | 57.38 | 0.473 | 4.0558 | 0.586 | | |
| 1/20/2004 | 16:59:46 | 4.4297 | 57.38 | 0.473 | 4.3042 | 0.586 | | |
| 1/20/2004 | 17:00:01 | 4.693 | 57.38 | 0.473 | 4.5675 | 0.586 | | |
| 1/20/2004 | 17:00:18 | 4.973 | 57.38 | 0.473 | 4.8475 | 0.586 | | |
| 1/20/2004 | 17:00:36 | 5.2697 | 57.38 | 0.473 | 5.1442 | 0.586 | | |
| 1/20/2004 | 17:00:55 | 5.583 | 57.38 | 0.473 | 5.4575 | 0.586 | | |
| 1/20/2004 | 17:01:15 | 5.9147 | 57.38 | 0.473 | 5.7892 | 0.586 | | |
| 1/20/2004 | 17:01:36 | 6.2663 | 57.38 | 0.473 | 6.1408 | 0.586 | | |
| 1/20/2004 | 17:01:58 | 6.6397 | 57.38 | 0.473 | 6.5142 | 0.586 | | |
| 1/20/2004 | 17:02:22 | 7.0347 | 57.38 | 0.473 | 6.9092 | 0.586 | | |
| 1/20/2004 | 17:02:47 | 7.453 | 57.38 | 0.473 | 7.3275 | 0.586 | | |
| 1/20/2004 | 17:03:14 | 7.8963 | 57.38 | 0.467 | 7.7708 | 0.579 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1/20/2004 | 17:03:42 | 8.3663 | 57.38 | 0.473 | 8.2408 | 0.586 | | |
| 1/20/2004 | 17:04:12 | 8.8647 | 57.38 | 0.473 | 8.7392 | 0.586 | | |
| 1/20/2004 | 17:04:43 | 9.3913 | 57.38 | 0.473 | 9.2658 | 0.586 | | |
| 1/20/2004 | 17:05:17 | 9.9497 | 57.38 | 0.473 | 9.8242 | 0.586 | | |
| 1/20/2004 | 17:05:52 | 10.5413 | 57.38 | 0.473 | 10.4158 | 0.586 | | |
| 1/20/2004 | 17:06:30 | 11.168 | 57.38 | 0.467 | 11.0425 | 0.579 | | |
| 1/20/2004 | 17:07:10 | 11.8313 | 57.38 | 0.467 | 11.7058 | 0.579 | | |
| 1/20/2004 | 17:07:52 | 12.5347 | 57.38 | 0.467 | 12.4092 | 0.579 | | |
| 1/20/2004 | 17:08:37 | 13.2797 | 57.38 | 0.473 | 13.1542 | 0.586 | | |
| 1/20/2004 | 17:09:24 | 14.0697 | 57.38 | 0.467 | 13.9442 | 0.579 | | |
| 1/20/2004 | 17:10:14 | 14.9063 | 57.38 | 0.467 | 14.7808 | 0.579 | | |
| 1/20/2004 | 17:11:07 | 15.7913 | 57.38 | 0.467 | 15.6658 | 0.579 | | |
| 1/20/2004 | 17:12:04 | 16.7297 | 57.38 | 0.467 | 16.6042 | 0.579 | | |
| 1/20/2004 | 17:13:03 | 17.723 | 57.4 | 0.468 | 17.5975 | 0.580 | | |
| 1/20/2004 | 17:14:06 | 18.7763 | 57.38 | 0.467 | 18.6508 | 0.579 | | |
| 1/20/2004 | 17:15:13 | 19.8913 | 57.38 | 0.467 | 19.7658 | 0.579 | | |
| 1/20/2004 | 17:16:24 | 21.073 | 57.38 | 0.467 | 20.9475 | 0.579 | | |
| 1/20/2004 | 17:17:39 | 22.3247 | 57.38 | 0.467 | 22.1992 | 0.579 | | |
| 1/20/2004 | 17:18:59 | 23.6497 | 57.38 | 0.461 | 23.5242 | 0.571 | | |
| 1/20/2004 | 17:20:23 | 25.0547 | 57.4 | 0.468 | 24.9292 | 0.580 | | |
| 1/20/2004 | 17:21:52 | 26.543 | 57.38 | 0.461 | 26.4175 | 0.571 | | |
| 1/20/2004 | 17:23:27 | 28.118 | 57.4 | 0.468 | 27.9925 | 0.580 | | |
| 1/20/2004 | 17:25:07 | 29.7863 | 57.4 | 0.462 | 29.6608 | 0.572 | | |
| 1/20/2004 | 17:26:53 | 31.5547 | 57.4 | 0.468 | 31.4292 | 0.580 | | |
| 1/20/2004 | 17:28:45 | 33.428 | 57.4 | 0.468 | 33.3025 | 0.580 | | |
| 1/20/2004 | 17:30:44 | 35.4113 | 57.4 | 0.462 | 35.2858 | 0.572 | | |
| 1/20/2004 | 17:32:51 | 37.513 | 57.4 | 0.462 | 37.3875 | 0.572 | | |
| 1/20/2004 | 17:35:04 | 39.7397 | 57.4 | 0.468 | 39.6142 | 0.580 | | |
| 1/20/2004 | 17:37:26 | 42.098 | 57.4 | 0.462 | 41.9725 | 0.572 | | |
| 1/20/2004 | 17:39:56 | 44.5963 | 57.4 | 0.462 | 44.4708 | 0.572 | | |
| 1/20/2004 | 17:42:34 | 47.243 | 57.4 | 0.462 | 47.1175 | 0.572 | | |
| 1/20/2004 | 17:45:23 | 50.0463 | 57.4 | 0.462 | 49.9208 | 0.572 | | |
| 1/20/2004 | 17:48:21 | 53.0147 | 57.4 | 0.462 | 52.8892 | 0.572 | | |
| 1/20/2004 | 17:51:29 | 56.1597 | 57.4 | 0.462 | 56.0342 | 0.572 | | |
| 1/20/2004 | 17:54:49 | 59.4913 | 57.4 | 0.455 | 59.3658 | 0.564 | | |
| 1/20/2004 | 17:58:21 | 63.0197 | 57.4 | 0.455 | 62.8942 | 0.564 | | |
| 1/20/2004 | 18:02:05 | 66.758 | 57.4 | 0.455 | 66.6325 | 0.564 | | |
| 1/20/2004 | 18:06:03 | 70.718 | 57.4 | 0.455 | 70.5925 | 0.564 | | |
| 1/20/2004 | 18:10:14 | 74.9113 | 57.4 | 0.449 | 74.7858 | 0.556 | | |
| 1/20/2004 | 18:14:41 | 79.3547 | 57.4 | 0.455 | 79.2292 | 0.564 | | |
| 1/20/2004 | 18:19:23 | 84.0613 | 57.4 | 0.455 | 83.9358 | 0.564 | | |
| 1/20/2004 | 18:24:23 | 89.0463 | 57.4 | 0.449 | 88.9208 | 0.556 | | |
| 1/20/2004 | 18:29:39 | 94.3263 | 57.4 | 0.449 | 94.2008 | 0.556 | | |
| 1/20/2004 | 18:35:15 | 99.9197 | 57.4 | 0.449 | 99.7942 | 0.556 | | |
| 1/20/2004 | 18:41:10 | 105.8447 | 57.4 | 0.449 | 105.7192 | 0.556 | | |
| 1/20/2004 | 18:47:27 | 112.1197 | 57.4 | 0.443 | 111.9942 | 0.549 | | |
| 1/20/2004 | 18:54:06 | 118.768 | 57.4 | 0.443 | 118.6425 | 0.549 | | |
| 1/20/2004 | 19:01:08 | 125.8097 | 57.4 | 0.443 | 125.6842 | 0.549 | | |
| 1/20/2004 | 19:08:36 | 133.268 | 57.4 | 0.443 | 133.1425 | 0.549 | | |
| 1/20/2004 | 19:16:30 | 141.168 | 57.4 | 0.443 | 141.0425 | 0.549 | | |
| 1/20/2004 | 19:24:52 | 149.5363 | 57.4 | 0.443 | 149.4108 | 0.549 | | |
| 1/20/2004 | 19:33:44 | 158.4013 | 57.4 | 0.437 | 158.2758 | 0.542 | | |
| 1/20/2004 | 19:43:07 | 167.7913 | 57.4 | 0.437 | 167.6658 | 0.542 | | |
| 1/20/2004 | 19:53:04 | 177.738 | 57.4 | 0.437 | 177.6125 | 0.542 | | |
| 1/20/2004 | 20:03:04 | 187.738 | 57.4 | 0.431 | 187.6125 | 0.534 | | |
| 1/20/2004 | 20:13:04 | 197.738 | 57.4 | 0.431 | 197.6125 | 0.534 | | |
| 1/20/2004 | 20:23:04 | 207.738 | 57.4 | 0.431 | 207.6125 | 0.534 | | |
| 1/20/2004 | 20:33:04 | 217.738 | 57.4 | 0.424 | 217.6125 | 0.525 | | |
| 1/20/2004 | 20:43:04 | 227.738 | 57.4 | 0.431 | 227.6125 | 0.534 | | |
| 1/20/2004 | 20:53:04 | 237.738 | 57.4 | 0.424 | 237.6125 | 0.525 | | |
| 1/20/2004 | 21:03:04 | 247.738 | 57.4 | 0.431 | 247.6125 | 0.534 | | |
| 1/20/2004 | 21:13:04 | 257.738 | 57.4 | 0.424 | 257.6125 | 0.525 | | |
| 1/20/2004 | 21:23:04 | 267.738 | 57.4 | 0.418 | 267.6125 | 0.518 | | |
| 1/20/2004 | 21:33:04 | 277.738 | 57.4 | 0.424 | 277.6125 | 0.525 | | |
| 1/20/2004 | 21:43:04 | 287.738 | 57.4 | 0.418 | 287.6125 | 0.518 | | |
| 1/20/2004 | 21:53:04 | 297.738 | 57.4 | 0.418 | 297.6125 | 0.518 | | |
| 1/20/2004 | 22:03:04 | 307.738 | 57.4 | 0.418 | 307.6125 | 0.518 | | |
| 1/20/2004 | 22:13:04 | 317.738 | 57.4 | 0.418 | 317.6125 | 0.518 | | |
| 1/20/2004 | 22:23:04 | 327.738 | 57.4 | 0.418 | 327.6125 | 0.518 | | |
| 1/20/2004 | 22:33:04 | 337.738 | 57.4 | 0.412 | 337.6125 | 0.511 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1/20/2004 | 22:43:04 | 347.738 | 57.4 | 0.418 | 347.6125 | 0.518 | | |
| 1/20/2004 | 22:53:04 | 357.738 | 57.4 | 0.412 | 357.6125 | 0.511 | | |
| 1/20/2004 | 23:03:04 | 367.738 | 57.4 | 0.418 | 367.6125 | 0.518 | | |
| 1/20/2004 | 23:13:04 | 377.738 | 57.4 | 0.412 | 377.6125 | 0.511 | | |
| 1/20/2004 | 23:23:04 | 387.738 | 57.4 | 0.412 | 387.6125 | 0.511 | | |
| 1/20/2004 | 23:33:04 | 397.738 | 57.4 | 0.412 | 397.6125 | 0.511 | | |
| 1/20/2004 | 23:43:04 | 407.738 | 57.4 | 0.412 | 407.6125 | 0.511 | | |
| 1/20/2004 | 23:53:04 | 417.738 | 57.4 | 0.406 | 417.6125 | 0.503 | | |
| 1/21/2004 | 0:03:04 | 427.738 | 57.4 | 0.406 | 427.6125 | 0.503 | | |
| 1/21/2004 | 0:13:04 | 437.738 | 57.4 | 0.406 | 437.6125 | 0.503 | | |
| 1/21/2004 | 0:23:04 | 447.738 | 57.4 | 0.406 | 447.6125 | 0.503 | | |
| 1/21/2004 | 0:33:04 | 457.738 | 57.4 | 0.406 | 457.6125 | 0.503 | | |
| 1/21/2004 | 0:43:04 | 467.738 | 57.4 | 0.406 | 467.6125 | 0.503 | | |
| 1/21/2004 | 0:53:04 | 477.738 | 57.4 | 0.399 | 477.6125 | 0.494 | | |
| 1/21/2004 | 1:03:04 | 487.738 | 57.4 | 0.399 | 487.6125 | 0.494 | | |
| 1/21/2004 | 1:13:04 | 497.738 | 57.4 | 0.399 | 497.6125 | 0.494 | | |
| 1/21/2004 | 1:23:04 | 507.738 | 57.4 | 0.399 | 507.6125 | 0.494 | | |
| 1/21/2004 | 1:33:04 | 517.738 | 57.4 | 0.399 | 517.6125 | 0.494 | | |
| 1/21/2004 | 1:43:04 | 527.738 | 57.4 | 0.399 | 527.6125 | 0.494 | | |
| 1/21/2004 | 1:53:04 | 537.738 | 57.4 | 0.399 | 537.6125 | 0.494 | | |
| 1/21/2004 | 2:03:04 | 547.738 | 57.4 | 0.393 | 547.6125 | 0.487 | | |
| 1/21/2004 | 2:13:04 | 557.738 | 57.4 | 0.393 | 557.6125 | 0.487 | | |
| 1/21/2004 | 2:23:04 | 567.738 | 57.4 | 0.393 | 567.6125 | 0.487 | | |
| 1/21/2004 | 2:33:04 | 577.738 | 57.4 | 0.387 | 577.6125 | 0.480 | | |
| 1/21/2004 | 2:43:04 | 587.738 | 57.4 | 0.393 | 587.6125 | 0.487 | | |
| 1/21/2004 | 2:53:04 | 597.738 | 57.4 | 0.387 | 597.6125 | 0.480 | | |
| 1/21/2004 | 3:03:04 | 607.738 | 57.4 | 0.387 | 607.6125 | 0.480 | | |
| 1/21/2004 | 3:13:04 | 617.738 | 57.4 | 0.387 | 617.6125 | 0.480 | | |
| 1/21/2004 | 3:23:04 | 627.738 | 57.4 | 0.387 | 627.6125 | 0.480 | | |
| 1/21/2004 | 3:33:04 | 637.738 | 57.4 | 0.387 | 637.6125 | 0.480 | | |
| 1/21/2004 | 3:43:04 | 647.738 | 57.4 | 0.381 | 647.6125 | 0.472 | | |
| 1/21/2004 | 3:53:04 | 657.738 | 57.4 | 0.381 | 657.6125 | 0.472 | | |
| 1/21/2004 | 4:03:04 | 667.738 | 57.4 | 0.381 | 667.6125 | 0.472 | | |
| 1/21/2004 | 4:13:04 | 677.738 | 57.4 | 0.381 | 677.6125 | 0.472 | | |
| 1/21/2004 | 4:23:04 | 687.738 | 57.4 | 0.381 | 687.6125 | 0.472 | | |
| 1/21/2004 | 4:33:04 | 697.738 | 57.4 | 0.381 | 697.6125 | 0.472 | | |
| 1/21/2004 | 4:43:04 | 707.738 | 57.4 | 0.381 | 707.6125 | 0.472 | | |
| 1/21/2004 | 4:53:04 | 717.738 | 57.4 | 0.374 | 717.6125 | 0.463 | | |
| 1/21/2004 | 5:03:04 | 727.738 | 57.4 | 0.374 | 727.6125 | 0.463 | | |
| 1/21/2004 | 5:13:04 | 737.738 | 57.4 | 0.374 | 737.6125 | 0.463 | | |
| 1/21/2004 | 5:23:04 | 747.738 | 57.4 | 0.374 | 747.6125 | 0.463 | | |
| 1/21/2004 | 5:33:04 | 757.738 | 57.4 | 0.374 | 757.6125 | 0.463 | | |
| 1/21/2004 | 5:43:04 | 767.738 | 57.4 | 0.368 | 767.6125 | 0.456 | | |
| 1/21/2004 | 5:53:04 | 777.738 | 57.4 | 0.368 | 777.6125 | 0.456 | | |
| 1/21/2004 | 6:03:04 | 787.738 | 57.4 | 0.362 | 787.6125 | 0.449 | | |
| 1/21/2004 | 6:13:04 | 797.738 | 57.4 | 0.362 | 797.6125 | 0.449 | | |
| 1/21/2004 | 6:23:04 | 807.738 | 57.4 | 0.362 | 807.6125 | 0.449 | | |
| 1/21/2004 | 6:33:04 | 817.738 | 57.4 | 0.362 | 817.6125 | 0.449 | | |
| 1/21/2004 | 6:43:04 | 827.738 | 57.4 | 0.362 | 827.6125 | 0.449 | | |
| 1/21/2004 | 6:53:04 | 837.738 | 57.4 | 0.362 | 837.6125 | 0.449 | | |
| 1/21/2004 | 7:03:04 | 847.738 | 57.4 | 0.356 | 847.6125 | 0.441 | | |
| 1/21/2004 | 7:13:04 | 857.738 | 57.4 | 0.356 | 857.6125 | 0.441 | | |
| 1/21/2004 | 7:23:04 | 867.738 | 57.4 | 0.356 | 867.6125 | 0.441 | | |
| 1/21/2004 | 7:33:04 | 877.738 | 57.4 | 0.356 | 877.6125 | 0.441 | | |
| 1/21/2004 | 7:43:04 | 887.738 | 57.4 | 0.356 | 887.6125 | 0.441 | | |
| 1/21/2004 | 7:53:04 | 897.738 | 57.4 | 0.35 | 897.6125 | 0.434 | | |
| 1/21/2004 | 8:03:04 | 907.738 | 57.4 | 0.35 | 907.6125 | 0.434 | | |
| 1/21/2004 | 8:13:04 | 917.738 | 57.4 | 0.35 | 917.6125 | 0.434 | | |
| 1/21/2004 | 8:23:04 | 927.738 | 57.4 | 0.343 | 927.6125 | 0.425 | | |
| 1/21/2004 | 8:33:04 | 937.738 | 57.4 | 0.35 | 937.6125 | 0.434 | | |
| 1/21/2004 | 8:43:04 | 947.738 | 57.4 | 0.343 | 947.6125 | 0.425 | | |
| 1/21/2004 | 8:53:04 | 957.738 | 57.4 | 0.343 | 957.6125 | 0.425 | | |
| 1/21/2004 | 9:03:04 | 967.738 | 57.4 | 0.343 | 967.6125 | 0.425 | | |
| 1/21/2004 | 9:13:04 | 977.738 | 57.4 | 0.337 | 977.6125 | 0.418 | | |
| 1/21/2004 | 9:23:04 | 987.738 | 57.4 | 0.337 | 987.6125 | 0.418 | | |

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

Tetra Tech NUS, Inc.

PROJECT NAME: NSWC WELL/BORING NO.: 13MWT35

PROJECT NO.: 9060 GEOLOGIST: FRED W RAMSER

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10', 60.22-70.22 TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 64.08 DATE: 1-20-04

TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

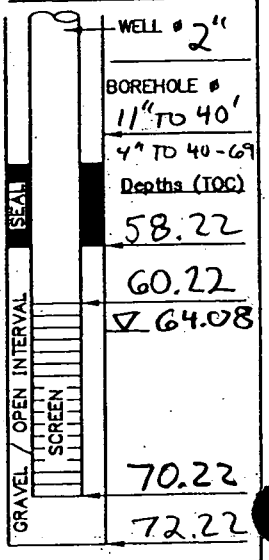
METHOD OF INDUCING WATER LEVEL CHANGE: BAILER ~ 1.5' DISPLACEMENT PAGE ..... OF .....

REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): WATER SURFACE REF = 0.00

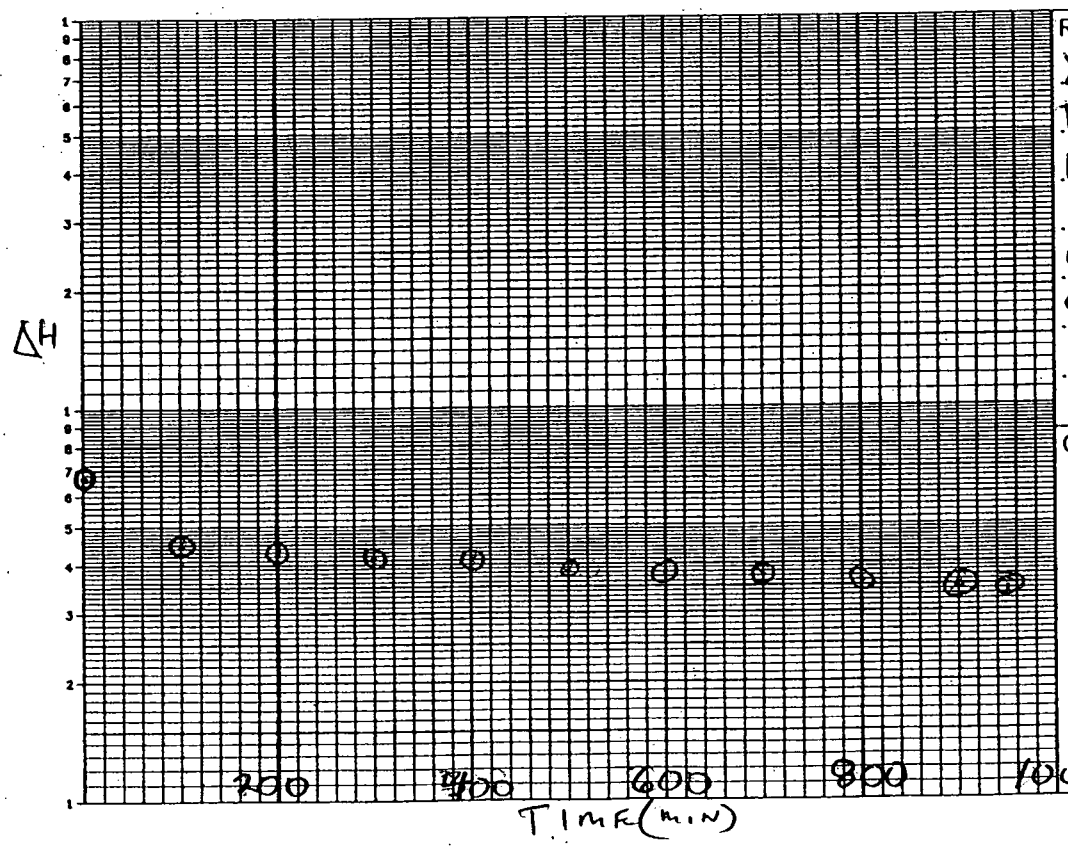
ACAD: FORM_HYDCONTST.dwg 07/08/99 INL

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0.00 | -0.023 | | 607 | | 0.387 |
| 0.085 | 1.49 ($h_0$) | | 707 | | 0.381 |
| 0.169* | 0.682 | | 807 | | 0.362 |
| 0.30 * | 0.550 | | 907 | | 0.350 |
| 0.98 | 0.500 | | 957 | | 0.343 |
| 14.9 | 0.467 | | | | |
| 50.0 | 0.462 | | | | |
| 100 | 0.449 | | | | |
| 200 | 0.431 | | | | |
| 297 | 0.418 | | | | |
| 397 | 0.412 | | | | |
| 507 | 0.399 | | | | |

WELL SCHEMATIC

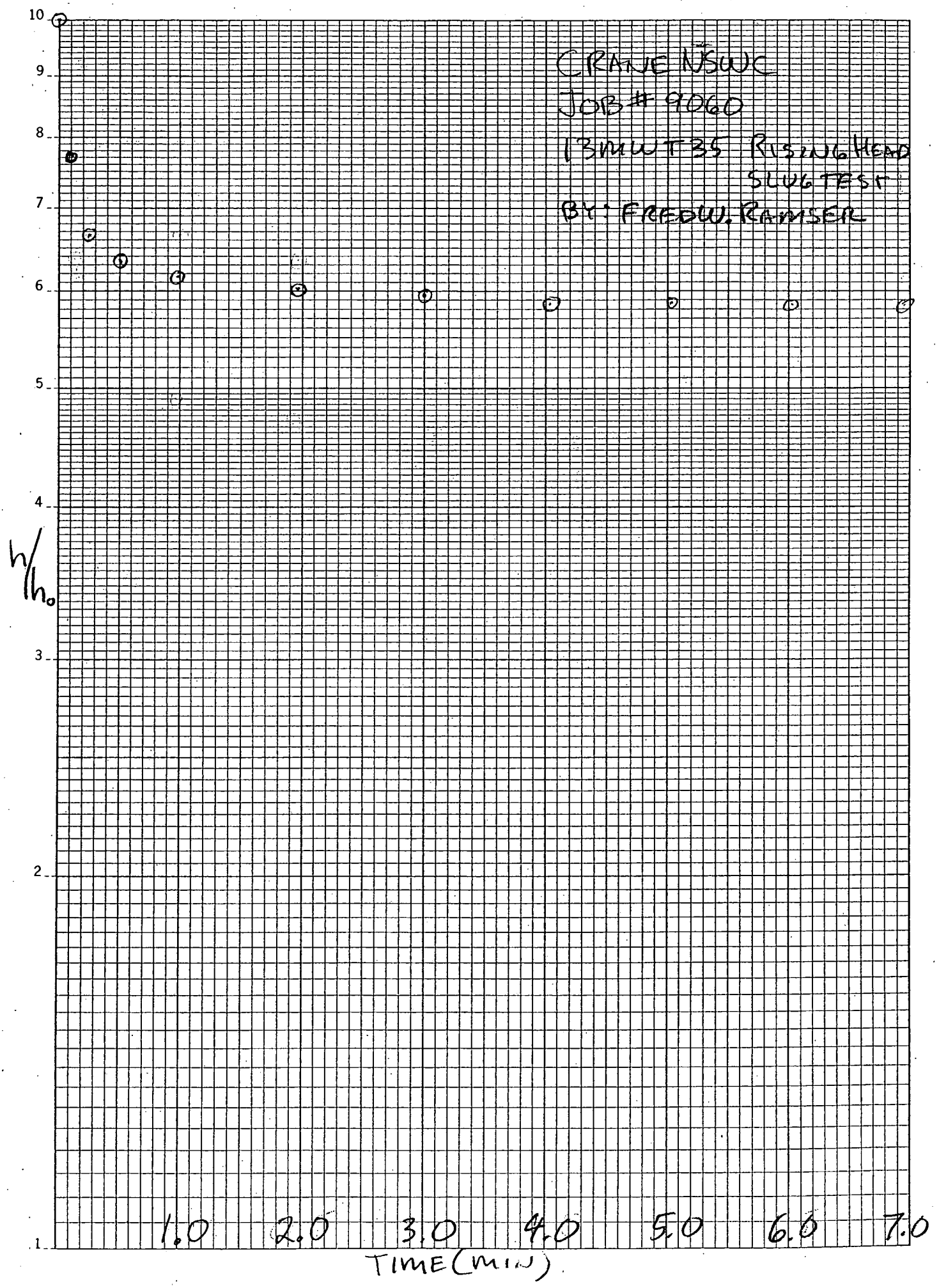



▽ Indicate SWL Depth on Drawing




REMARKS:
$XD_{H2O}$ = 6.166 PRIOR TO BAILER INSERTION
INSERT BAILER @ 1535
6.215
6.166
.049
STARTED TEST @ 1655

CALCS, SKETCH MAPS, ETC.:


CRANE NSWC
JOB # 9060
13MW T35 RISING HEAD
SLUG TEST
BY: FRED W. RAMSER
h/h₀
10
9
8
7
6
5
4
3
2
1
1.0
2.0
3.0
4.0
5.0
6.0
7.0
TIME (MIN)
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

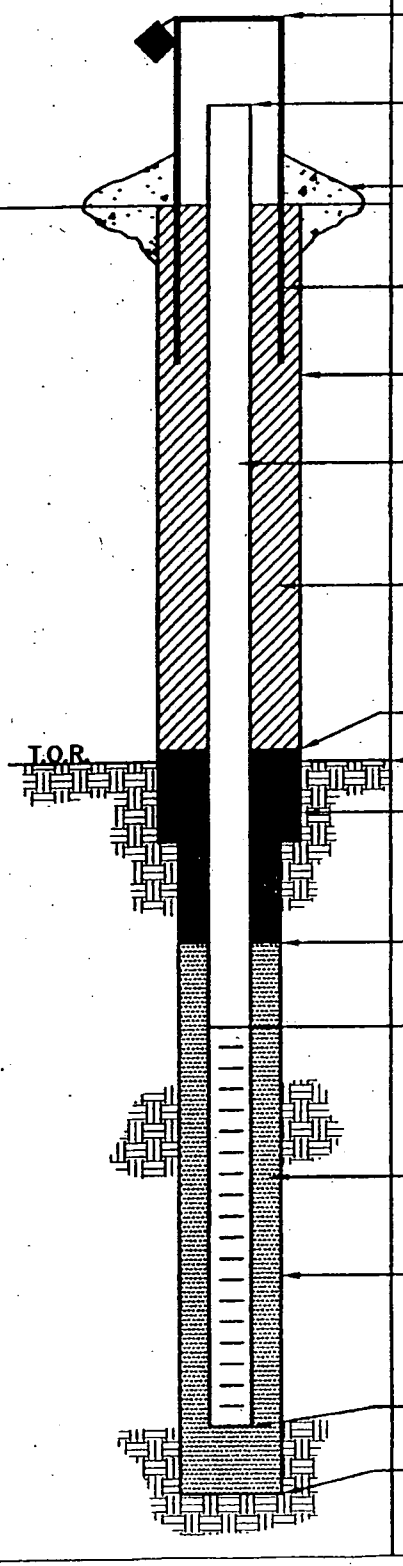
WELL NO.: 13MWT35

Tetra Tech NUS, Inc.

# BEDROCK MONITORING WELL SHEET WELL INSTALLED IN BEDROCK

PROJECT: NSWC CRANE
PROJECT NO.: 9060
DATE BEGUN: 10-28-03
FIELD GEOLOGIST: M.G. COCHRAN
GROUND ELEVATION:
LOCATION: CRANE, IN
BORING: 13MWT35
DATE COMPLETED: 11-19-03
DATUM:

DRILLER: BOWSER MORNER
DRILLING METHOD: SONIC / A.R.
DEVELOPMENT METHOD:




ELEVATION/HEIGHT OF TOP OF SURFACE CASING: 1

ELEVATION/HEIGHT TOP OF RISER: 1

TYPE OF SURFACE SEAL:

I.D. OF SURFACE CASING:

DIAMETER OF HOLE:

RISER PIPE I.D.: 2"
TYPE OF RISER PIPE: PVC SCH 40

TYPE OF BACKFILL: CETCO VOLCLAY COARSE CHIPS

ELEVATION/DEPTH TOP OF SEAL: 13

ELEVATION/DEPTH TOP OF BEDROCK:

TYPE OF SEAL: CETCO VOLCLAY COARSE CHIPS

ELEVATION/DEPTH TOP OF SAND: 155

ELEVATION/DEPTH TOP OF SCREEN: 157
TYPE OF SCREEN: PVC SLOTTED
SLOT SIZE x LENGTH: .020 X 10'
I.D. SCREEN: 2"

TYPE OF SAND PACK: QTZ

DIAMETER OF HOLE IN BEDROCK:
CORE/REAM: 2" / 4"

ELEVATION/DEPTH BOTTOM SCREEN: 167
ELEVATION/DEPTH BOTTOM OF SAND: 169
ELEVATION/DEPTH BOTTOM OF HOLE: 169
BACKFILL MATERIAL BELOW SAND: NA

ACAD: FORM_MWINBR.dwg 07/20/99 INL

# HYDRAULIC CONDUCTIVITY TEST DATA / CALCULATIONS

Note: Yellow cells are input cells, blue cells are automatically calculated

| | |
|---|---|
| Project Name: | CRANE NSWC |
| Project No.: | 9060 |
| Method of Inducing Water Level Change: | BAILER |
| Reference Pt (Top of Casing, Transducer, etc): | WATER LEVEL (REF=0.00 |
| Test Type (Rising Head / Falling Head): | RISING |

| | |
|---|---|
| Well / Boring No.: | 13MWT35 |
| Test No.: | 1 |
| Date: | 1/20/2004 |
| Geologist: | Fred W. Ramser |
| Checked by / Date: | |

| | |
|---|---|
| Well Radius, r (ft.): | 0.0833 |
| Radius of Sand/Gravel Pack Interval, R (ft): | 0.16666667 |
| Screened / Monitored Interval Below Water Table, L (ft): | 8.14 |
| Static Water Level (Depth/ Elevation) (ft.): | 64.08 |
| Baseline Reading for Test Data (SWL, Transducer Reading, etc): | 0.00 |

## TEST DATA

Note: To exclude a data point from the regression, place an "x" in the "exclude" column / data point's row. The first row cannot be excluded.

| Exclude | Elapsed Time (min) | Measured Water Level (feet) | Elapsed Time (min) | Drawdown or Head (H) (feet) | $H/H_0$ | $\ln(H/H_0)$ | Linear Regression of ln(H/H0) (b=0) |
|---|---|---|---|---|---|---|---|
| | 0 | 1.000 | 0.00 | 1.00 | 1.00 | 0.0000 | 0.00 |
| | 0.0972 | 0.774 | 0.10 | 0.77 | 0.77 | -0.2556 | 0.00 |
| | 0.2277 | 0.665 | 0.23 | 0.67 | 0.67 | -0.4073 | 0.00 |
| | 0.4958 | 0.634 | 0.50 | 0.63 | 0.63 | -0.4550 | 0.00 |
| | 0.9775 | 0.618 | 0.98 | 0.62 | 0.62 | -0.4807 | 0.00 |
| | 1.9592 | 0.603 | 1.96 | 0.60 | 0.60 | -0.5051 | 0.00 |
| | 3.0042 | 0.595 | 3.00 | 0.59 | 0.59 | -0.5195 | 0.00 |
| | 9.8242 | 0.586 | 9.82 | 0.59 | 0.59 | -0.5342 | 0.01 |
| | 197.6125 | 0.534 | 197.61 | 0.53 | 0.53 | -0.6272 | 0.10 |
| | 397.6125 | 0.511 | 397.61 | 0.51 | 0.51 | -0.6723 | 0.20 |
| | 597.6125 | 0.480 | 597.61 | 0.48 | 0.48 | -0.7349 | 0.31 |
| | 797.6125 | 0.449 | 797.61 | 0.45 | 0.45 | -0.8017 | 0.41 |
| | 987.6125 | 0.418 | 987.61 | 0.42 | 0.42 | -0.8732 | 0.51 |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |

# CALCULATION OF HYDRAULIC CONDUCTIVITY (K)[1]

| | |
|---|---|
| Number of data points in the slug test: | 13 |
| Slope of the line that linearly approximates ln(h/h0) (m in y=mx+b): | -0.001 |
| Y-intercept of the line that linearly approximates ln(h/h0) (b in y=mx+b): | -0.410 |
| Actual Y-intercept is set to 0. | 0.000 |
| $T_0$ (min): | 1944.577 |
| K (ft/min): | 8.52E-07 |
| **K (ft/day):** | **0.001** |

$$m = \frac{n\left(\sum xy\right) - \left(\sum x\right)\left(\sum y\right)}{n\left(\sum\left(x^2\right)\right) - \left(\sum x\right)^2}$$

$$b = \frac{\left(\sum y\right)\left(\sum\left(x^2\right)\right) - \left(\sum x\right)\left(\sum xy\right)}{n\left(\sum\left(x^2\right)\right) - \left(\sum x\right)^2}$$

**n: Number of data points. x: Elapsed time point. y: ln(H/H0) point**

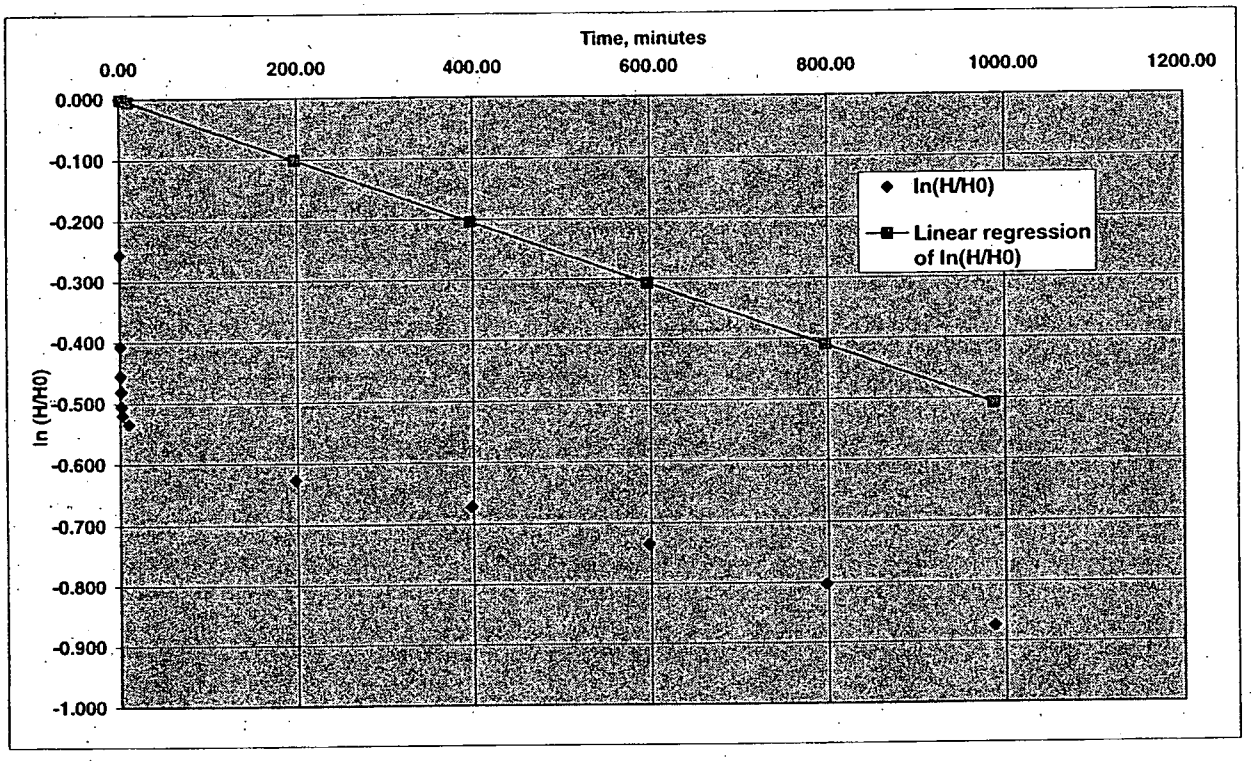
**$T_0$: Time at which ln(H/H0)=-1**

**$K = r^2 * \ln(L/R)/(2LT_0)$**

**L: Screened/monitored interval below water table (ft)**

**r: Well radius (ft)**

**R: Gravel pack radius (ft)**




1. HVORSLEV, M.J. 1951. Time Lag and Soil Permeability in Groundwater Observations. U.S. Army Corps of Engineers. Waterways Experiment Station Bulletin 36, Vicksburg, Mississippi.

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT35 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 20-Jan-04 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .166' | 2 = R |
| Length of Well Screen (ft.) : | | 8.14 = L |
| Time for 37% head change (min.) : | | 2670.00 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 6.21E-07 | ft./min. |
| 1.04E-08 | ft./sec. |
| 8.95E-04 | ft./day |
| 3.16E-07 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(8.14/.166)}{2 \times 8.14 \times 2670}$$

$6.16 \times 10^{-7}$ Ft/min

CHECKED

2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

**Project Name:** Crane NSWC
**Project No.:** 9060
**Test Type:** Rising head

**Well/Boring No.:** 13MWT38
**Aquifer Type:** Bedrock
**Test Date:** 22-Nov-03

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 2.5 | = R |
| Length of Well Screen (ft.) : | 8.95 | = L |
| Time for 37% head change (min.) : | 310.00 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 4.71E-06 | ft./min. |
| 7.84E-08 | ft./sec. |
| 6.78E-03 | ft./day |
| 2.39E-06 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 13MWT38

PROJECT NO.: 9060 GEOLOGIST: M. G. COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 61.65 TOC DATE: 11-22-03

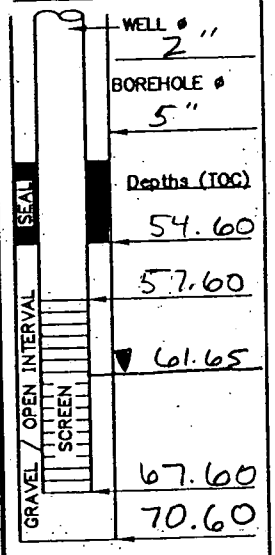
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: BAILER PAGE 1 OF 1

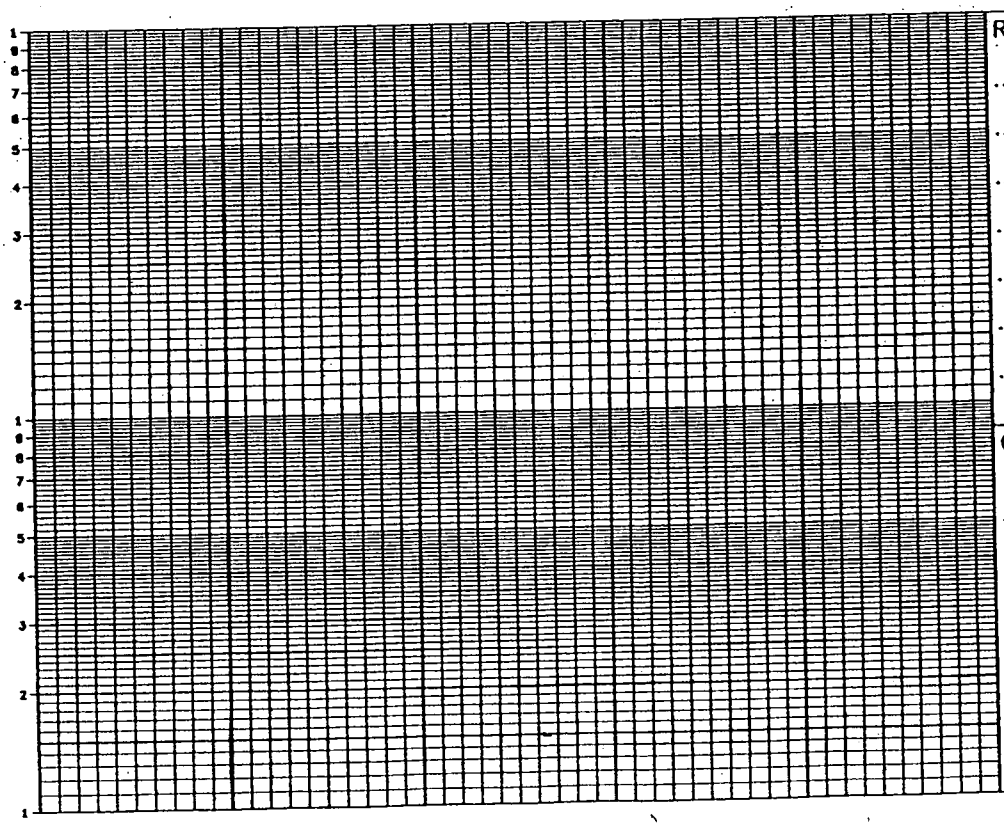
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC, ZERO AT SWL

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 0 | | 3 | -.667 | |
| .1 | -1.474 | | 5 | -.654 | |
| .2 | -.894 | | 10 | -.631 | |
| .3 | -.783 | | 15 | -.614 | |
| .4 | -.752 | | 20 | -.603 | |
| .5 | -.743 | | 30 | -.591 | |
| .6 | -.736 | | 40 | -.563 | |
| .7 | -.729 | | 50 | -.547 | |
| .8 | -.723 | | 60 | -.534 | |
| .9 | -.718 | | 70 | -.522 | |
| 1 | -.711 | | 80 | -.504 | |
| 2 | -.685 | | 86 | -.497 | |

WELL SCHEMATIC



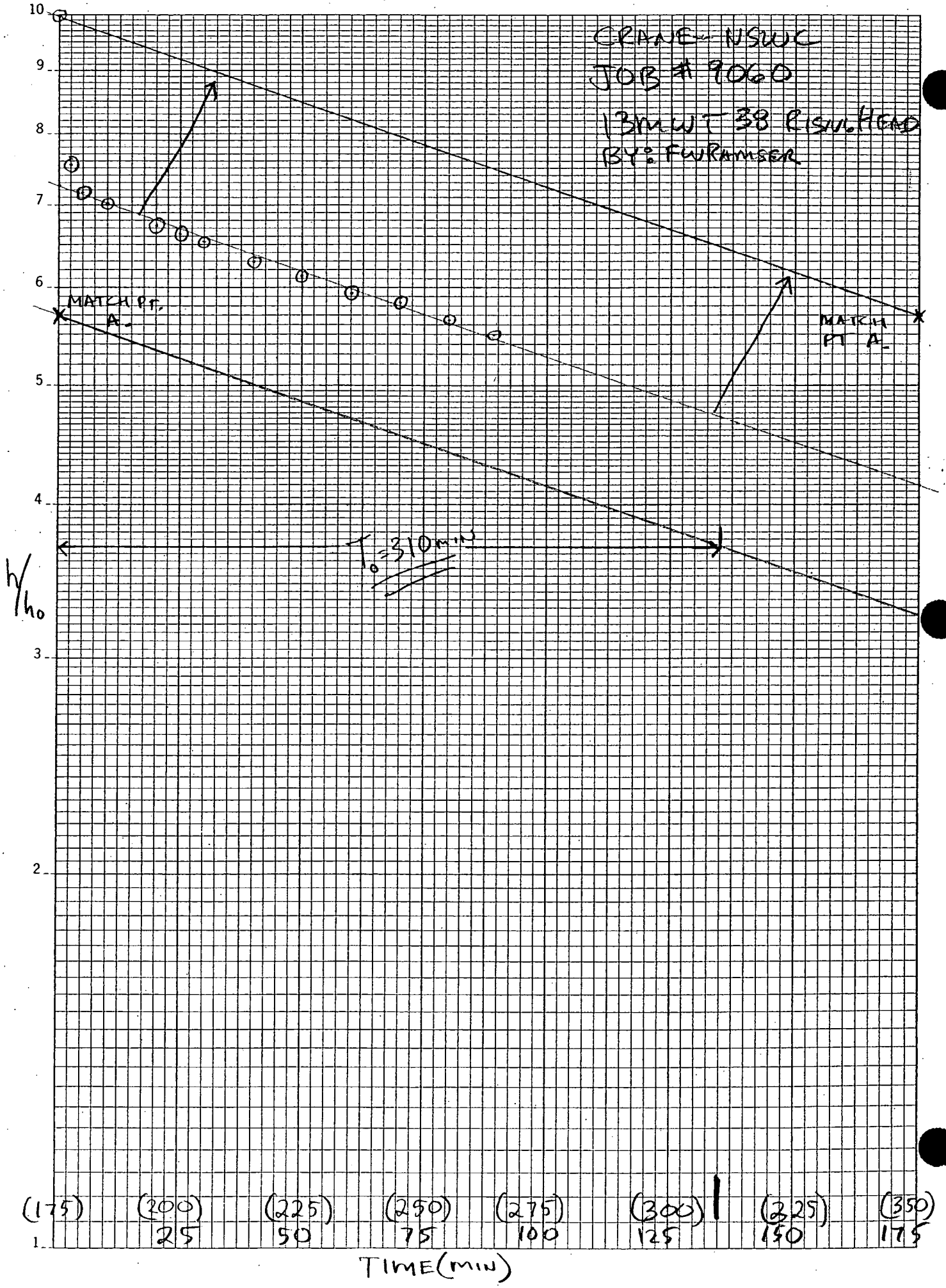

▽ Indicate SWL Depth on Drawing



REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/08/99 INL




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 12/4/2003 10:30:13
Report from file: C:\Win-Situ\Data\SN00916 2003-11-22 161814 13MWT38rising#1.bin
DataMgr Version 3.68

Serial number: 916
Firmware Version 3.07
Unit name:

Test name: 13MWT38rising#1

Test defined on: 11/22/2003 16:17:38
Test started on: 11/22/2003 16:18:14
Test stopped on: 11/22/2003 17:48:04
Test extracted on: N/A

Data gathered using Linear testing
Time between data points: Minutes.
Number of data samples: 899

TOTAL DATA SAMPLES 899

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at reference: 6.165 Feet H2O

● = DATA PLOTTED

| Date | Time | ET (min) | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho |
|---|---|---|---|---|---|
| | 11/22/2003 16:18 | 0 | 0 | | |
| | 11/22/2003 16:18 | 0.1 | -1.474 | | |
| | 11/22/2003 16:18 | 0.2 | -0.894 | 0 | 1.000 |
| | 11/22/2003 16:18 | 0.3 | -0.783 | 0.1 | 0.876 |
| | 11/22/2003 16:18 | 0.4 | -0.752 | 0.2 | 0.841 |
| | 11/22/2003 16:18 | 0.5 | -0.743 | 0.3 | 0.831 |
| | 11/22/2003 16:18 | 0.6 | -0.736 | 0.4 | 0.823 |
| | 11/22/2003 16:18 | 0.7 | -0.729 | 0.5 | 0.815 |
| | 11/22/2003 16:19 | 0.8 | -0.723 | 0.6 | 0.809 |
| | 11/22/2003 16:19 | 0.9 | -0.718 | 0.7 | 0.803 |
| | 11/22/2003 16:19 | 1 | -0.711 | 0.8 | 0.795 |
| | 11/22/2003 16:19 | 1.1 | -0.707 | 0.9 | 0.791 |
| | 11/22/2003 16:19 | 1.2 | -0.705 | 1 | 0.789 |
| | 11/22/2003 16:19 | 1.3 | -0.703 | 1.1 | 0.786 |
| | 11/22/2003 16:19 | 1.4 | -0.698 | 1.2 | 0.781 |
| | 11/22/2003 16:19 | 1.5 | -0.694 | 1.3 | 0.776 |
| | 11/22/2003 16:19 | 1.6 | -0.689 | 1.4 | 0.771 |
| | 11/22/2003 16:19 | 1.7 | -0.689 | 1.5 | 0.771 |
| | 11/22/2003 16:20 | 1.8 | -0.687 | 1.6 | 0.768 |
| | 11/22/2003 16:20 | 1.9 | -0.685 | 1.7 | 0.766 |
| | 11/22/2003 16:20 | 2 | -0.685 | 1.8 | 0.766 |
| | 11/22/2003 16:20 | 2.1 | -0.683 | 1.9 | 0.764 |
| | 11/22/2003 16:20 | 2.2 | -0.678 | 2 | 0.758 |
| | 11/22/2003 16:20 | 2.3 | -0.678 | 2.1 | 0.758 |
| | 11/22/2003 16:20 | 2.4 | -0.676 | 2.2 | 0.756 |
| | 11/22/2003 16:20 | 2.5 | -0.676 | 2.3 | 0.756 |
| | 11/22/2003 16:20 | 2.6 | -0.674 | 2.4 | 0.754 |
| | 11/22/2003 16:20 | 2.7 | -0.671 | 2.5 | 0.751 ● |
| | 11/22/2003 16:21 | 2.8 | -0.671 | 2.6 | 0.751 |
| | 11/22/2003 16:21 | 2.9 | -0.671 | 2.7 | 0.751 |
| | 11/22/2003 16:21 | 3 | -0.667 | 2.8 | 0.746 |
| | 11/22/2003 16:21 | 3.1 | -0.669 | 2.9 | 0.748 |
| | 11/22/2003 16:21 | 3.2 | -0.667 | 3 | 0.746 |
| | 11/22/2003 16:21 | 3.3 | -0.665 | 3.1 | 0.744 |
| | 11/22/2003 16:21 | 3.4 | -0.665 | 3.2 | 0.744 |

ho = -0.894

| | | | | |
|---|---|---|---|---|
| 11/22/2003 16:21 | 3.5 | -0.665 | 3.3 | 0.744 |
| 11/22/2003 16:21 | 3.6 | -0.663 | 3.4 | 0.742 |
| 11/22/2003 16:21 | 3.7 | -0.66 | 3.5 | 0.738 |
| 11/22/2003 16:22 | 3.8 | -0.66 | 3.6 | 0.738 |
| 11/22/2003 16:22 | 3.9 | -0.66 | 3.7 | 0.738 |
| 11/22/2003 16:22 | 4 | -0.66 | 3.8 | 0.738 |
| 11/22/2003 16:22 | 4.1 | -0.66 | 3.9 | 0.738 |
| 11/22/2003 16:22 | 4.2 | -0.658 | 4 | 0.736 |
| 11/22/2003 16:22 | 4.3 | -0.658 | 4.1 | 0.736 |
| 11/22/2003 16:22 | 4.4 | -0.658 | 4.2 | 0.736 |
| 11/22/2003 16:22 | 4.5 | -0.656 | 4.3 | 0.734 |
| 11/22/2003 16:22 | 4.6 | -0.654 | 4.4 | 0.732 |
| 11/22/2003 16:22 | 4.7 | -0.654 | 4.5 | 0.732 |
| 11/22/2003 16:23 | 4.8 | -0.654 | 4.6 | 0.732 |
| 11/22/2003 16:23 | 4.9 | -0.654 | 4.7 | 0.732 |
| 11/22/2003 16:23 | 5 | -0.654 | 4.8 | 0.732 |
| 11/22/2003 16:23 | 5.1 | -0.649 | 4.9 | 0.726 |
| 11/22/2003 16:23 | 5.2 | -0.651 | 5 | 0.728 |
| 11/22/2003 16:23 | 5.3 | -0.651 | 5.1 | 0.728 |
| 11/22/2003 16:23 | 5.4 | -0.649 | 5.2 | 0.726 |
| 11/22/2003 16:23 | 5.5 | -0.651 | 5.3 | 0.728 |
| 11/22/2003 16:23 | 5.6 | -0.649 | 5.4 | 0.726 |
| 11/22/2003 16:23 | 5.7 | -0.647 | 5.5 | 0.724 |
| 11/22/2003 16:24 | 5.8 | -0.645 | 5.6 | 0.721 |
| 11/22/2003 16:24 | 5.9 | -0.649 | 5.7 | 0.726 |
| 11/22/2003 16:24 | 6 | -0.647 | 5.8 | 0.724 |
| 11/22/2003 16:24 | 6.1 | -0.647 | 5.9 | 0.724 |
| 11/22/2003 16:24 | 6.2 | -0.645 | 6 | 0.721 |
| 11/22/2003 16:24 | 6.3 | -0.647 | 6.1 | 0.724 |
| 11/22/2003 16:24 | 6.4 | -0.647 | 6.2 | 0.724 |
| 11/22/2003 16:24 | 6.5 | -0.645 | 6.3 | 0.721 |
| 11/22/2003 16:24 | 6.6 | -0.645 | 6.4 | 0.721 |
| 11/22/2003 16:24 | 6.7 | -0.645 | 6.5 | 0.721 |
| 11/22/2003 16:25 | 6.8 | -0.645 | 6.6 | 0.721 |
| 11/22/2003 16:25 | 6.9 | -0.643 | 6.7 | 0.719 |
| 11/22/2003 16:25 | 7 | -0.643 | 6.8 | 0.719 |
| 11/22/2003 16:25 | 7.1 | -0.64 | 6.9 | 0.716 |
| 11/22/2003 16:25 | 7.2 | -0.643 | 7 | 0.719 |
| 11/22/2003 16:25 | 7.3 | -0.64 | 7.1 | 0.716 |
| 11/22/2003 16:25 | 7.4 | -0.638 | 7.2 | 0.714 |
| 11/22/2003 16:25 | 7.5 | -0.638 | 7.3 | 0.714 |
| 11/22/2003 16:25 | 7.6 | -0.638 | 7.4 | 0.714 |
| 11/22/2003 16:25 | 7.7 | -0.64 | 7.5 | 0.716 |
| 11/22/2003 16:26 | 7.8 | -0.638 | 7.6 | 0.714 |
| 11/22/2003 16:26 | 7.9 | -0.638 | 7.7 | 0.714 |
| 11/22/2003 16:26 | 8 | -0.638 | 7.8 | 0.714 |
| 11/22/2003 16:26 | 8.1 | -0.638 | 7.9 | 0.714 |
| 11/22/2003 16:26 | 8.2 | -0.64 | 8 | 0.716 |
| 11/22/2003 16:26 | 8.3 | -0.638 | 8.1 | 0.714 |
| 11/22/2003 16:26 | 8.4 | -0.643 | 8.2 | 0.719 |
| 11/22/2003 16:26 | 8.5 | -0.636 | 8.3 | 0.711 |
| 11/22/2003 16:26 | 8.6 | -0.636 | 8.4 | 0.711 |
| 11/22/2003 16:26 | 8.7 | -0.636 | 8.5 | 0.711 |
| 11/22/2003 16:27 | 8.8 | -0.636 | 8.6 | 0.711 |
| 11/22/2003 16:27 | 8.9 | -0.634 | 8.7 | 0.709 |
| 11/22/2003 16:27 | 9 | -0.631 | 8.8 | 0.706 |
| 11/22/2003 16:27 | 9.1 | -0.631 | 8.9 | 0.706 |
| 11/22/2003 16:27 | 9.2 | -0.631 | 9 | 0.706 |
| 11/22/2003 16:27 | 9.3 | -0.631 | 9.1 | 0.706 |
| 11/22/2003 16:27 | 9.4 | -0.631 | 9.2 | 0.706 |
| 11/22/2003 16:27 | 9.5 | -0.631 | 9.3 | 0.706 |
| 11/22/2003 16:27 | 9.6 | -0.631 | 9.4 | 0.706 |
| 11/22/2003 16:27 | 9.7 | -0.634 | 9.5 | 0.709 |
| 11/22/2003 16:28 | 9.8 | -0.631 | 9.6 | 0.706 |
| 11/22/2003 16:28 | 9.9 | -0.631 | 9.7 | 0.706 |
| 11/22/2003 16:28 | 10 | -0.631 | 9.8 | 0.706 |
| 11/22/2003 16:28 | 10.1 | -0.629 | 9.9 | 0.704 |
| 11/22/2003 16:28 | 10.2 | -0.627 | 10 | 0.701 |
| 11/22/2003 16:29 | 11.2 | -0.625 | 11 | 0.699 |
| 11/22/2003 16:30 | 12.2 | -0.623 | 12 | 0.697 |
| 11/22/2003 16:31 | 13.2 | -0.62 | 13 | 0.694 |
| 11/22/2003 16:32 | 14.2 | -0.618 | 14 | 0.691 |
| 11/22/2003 16:33 | 15.2 | -0.611 | 15 | 0.683 |
| 11/22/2003 16:34 | 16.2 | -0.611 | 16 | 0.683 |

| | | | | |
|---|---|---|---|---|
| 11/22/2003 16:35 | 17.2 | -0.607 | 17 | 0.679 |
| 11/22/2003 16:36 | 18.2 | -0.607 | 18 | 0.679 |
| 11/22/2003 16:37 | 19.2 | -0.605 | 19 | 0.677 |
| 11/22/2003 16:38 | 20.2 | -0.6 | 20 | 0.671 |
| 11/22/2003 16:39 | 21.2 | -0.6 | 21 | 0.671 |
| 11/22/2003 16:40 | 22.2 | -0.598 | 22 | 0.669 |
| 11/22/2003 16:41 | 23.2 | -0.6 | 23 | 0.671 |
| 11/22/2003 16:42 | 24.2 | -0.594 | 24 | 0.664 |
| 11/22/2003 16:43 | 25.2 | -0.591 | 25 | 0.661 |
| 11/22/2003 16:44 | 26.2 | -0.589 | 26 | 0.659 |
| 11/22/2003 16:45 | 27.2 | -0.587 | 27 | 0.657 |
| 11/22/2003 16:46 | 28.2 | -0.585 | 28 | 0.654 |
| 11/22/2003 16:47 | 29.2 | -0.58 | 29 | 0.649 |
| 11/22/2003 16:48 | 30.2 | -0.583 | 30 | 0.652 |
| 11/22/2003 16:49 | 31.2 | -0.578 | 31 | 0.647 |
| 11/22/2003 16:50 | 32.2 | -0.576 | 32 | 0.644 |
| 11/22/2003 16:51 | 33.2 | -0.574 | 33 | 0.642 |
| 11/22/2003 16:52 | 34.2 | -0.571 | 34 | 0.639 |
| 11/22/2003 16:53 | 35.2 | -0.571 | 35 | 0.639 |
| 11/22/2003 16:54 | 36.2 | -0.571 | 36 | 0.639 |
| 11/22/2003 16:55 | 37.2 | -0.569 | 37 | 0.636 |
| 11/22/2003 16:56 | 38.2 | -0.567 | 38 | 0.634 |
| 11/22/2003 16:57 | 39.2 | -0.565 | 39 | 0.632 |
| 11/22/2003 16:58 | 40.2 | -0.563 | 40 | 0.630 |
| 11/22/2003 16:59 | 41.2 | -0.56 | 41 | 0.626 |
| 11/22/2003 17:00 | 42.2 | -0.56 | 42 | 0.626 |
| 11/22/2003 17:01 | 43.2 | -0.56 | 43 | 0.626 |
| 11/22/2003 17:02 | 44.2 | -0.556 | 44 | 0.622 |
| 11/22/2003 17:03 | 45.2 | -0.554 | 45 | 0.620 |
| 11/22/2003 17:04 | 46.2 | -0.553 | 46 | 0.619 |
| 11/22/2003 17:05 | 47.2 | -0.551 | 47 | 0.616 |
| 11/22/2003 17:06 | 48.2 | -0.551 | 48 | 0.616 |
| 11/22/2003 17:07 | 49.2 | -0.549 | 49 | 0.614 |
| 11/22/2003 17:08 | 50.2 | -0.547 | 50 | 0.612 |
| 11/22/2003 17:09 | 51.2 | -0.545 | 51 | 0.610 |
| 11/22/2003 17:10 | 52.2 | -0.544 | 52 | 0.609 |
| 11/22/2003 17:11 | 53.2 | -0.543 | 53 | 0.607 |
| 11/22/2003 17:12 | 54.2 | -0.54 | 54 | 0.604 |
| 11/22/2003 17:13 | 55.2 | -0.54 | 55 | 0.604 |
| 11/22/2003 17:14 | 56.2 | -0.538 | 56 | 0.602 |
| 11/22/2003 17:15 | 57.2 | -0.538 | 57 | 0.602 |
| 11/22/2003 17:16 | 58.2 | -0.534 | 58 | 0.597 |
| 11/22/2003 17:17 | 59.2 | -0.539 | 59 | 0.603 |
| 11/22/2003 17:18 | 60.2 | -0.53 | 60 | 0.593 |
| 11/22/2003 17:19 | 61.2 | -0.53 | 61 | 0.593 |
| 11/22/2003 17:20 | 62.2 | -0.529 | 62 | 0.592 |
| 11/22/2003 17:21 | 63.2 | -0.527 | 63 | 0.589 |
| 11/22/2003 17:22 | 64.2 | -0.534 | 64 | 0.597 |
| 11/22/2003 17:23 | 65.2 | -0.534 | 65 | 0.597 |
| 11/22/2003 17:24 | 66.2 | -0.531 | 66 | 0.594 |
| 11/22/2003 17:25 | 67.2 | -0.527 | 67 | 0.589 |
| 11/22/2003 17:26 | 68.2 | -0.527 | 68 | 0.589 |
| 11/22/2003 17:27 | 69.2 | -0.524 | 69 | 0.586 |
| 11/22/2003 17:28 | 70.2 | -0.52 | 70 | 0.582 |
| 11/22/2003 17:29 | 71.2 | -0.52 | 71 | 0.582 |
| 11/22/2003 17:30 | 72.2 | -0.518 | 72 | 0.579 |
| 11/22/2003 17:31 | 73.2 | -0.516 | 73 | 0.577 |
| 11/22/2003 17:32 | 74.2 | -0.513 | 74 | 0.574 |
| 11/22/2003 17:33 | 75.2 | -0.511 | 75 | 0.572 |
| 11/22/2003 17:34 | 76.2 | -0.509 | 76 | 0.569 |
| 11/22/2003 17:35 | 77.2 | -0.509 | 77 | 0.569 |
| 11/22/2003 17:36 | 78.2 | -0.507 | 78 | 0.567 |
| 11/22/2003 17:37 | 79.2 | -0.504 | 79 | 0.564 |
| 11/22/2003 17:38 | 80.2 | -0.504 | 80 | 0.564 |
| 11/22/2003 17:39 | 81.2 | -0.502 | 81 | 0.562 |
| 11/22/2003 17:40 | 82.2 | -0.502 | 82 | 0.562 |
| 11/22/2003 17:41 | 83.2 | -0.498 | 83 | 0.557 |
| 11/22/2003 17:42 | 84.2 | -0.504 | 84 | 0.564 |
| 11/22/2003 17:43 | 85.2 | -0.502 | 85 | 0.562 |
| 11/22/2003 17:44 | 86.2 | -0.495 | 86 | 0.554 |
| 11/22/2003 17:45 | 87.2 | -0.497 | 87 | 0.556 |
| 11/22/2003 17:46 | 88.2 | -0.494 | 88 | 0.553 |
| 11/22/2003 17:47 | 89.2 | -0.492 | 89 | 0.550 |

TETRA-TECH NUS

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT38 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 22-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .208' | 2.5 = R |
| Length of Well Screen (ft.) : | | 8.95 = L |
| Time for 37% head change (min.) : | | 310.00 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 4.71E-06 | ft./min. |
| 7.84E-08 | ft./sec. |
| 6.78E-03 | ft./day |
| 2.39E-06 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(8.95/.208)}{2 \times 8.95 \times 310} =$$

$4.67 \times 10^{-6}$ FT/MIN

CHECKED
[illegible]
2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT42 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 23-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 2.5 = R |
| Length of Well Screen (ft.) : | 4.42 = L |
| Time for 37% head change (min.) : | 43.50 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 5.52E-05 | ft./min. |
| 9.19E-07 | ft./sec. |
| 7.94E-02 | ft./day |
| 2.80E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

3.108

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 13MWT42

PROJECT NO.: 9060 GEOLOGIST: M G COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 20.58 DATE: 11-23-03

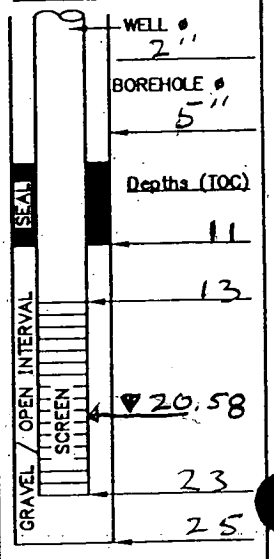
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: BAILER PAGE 1 OF 1

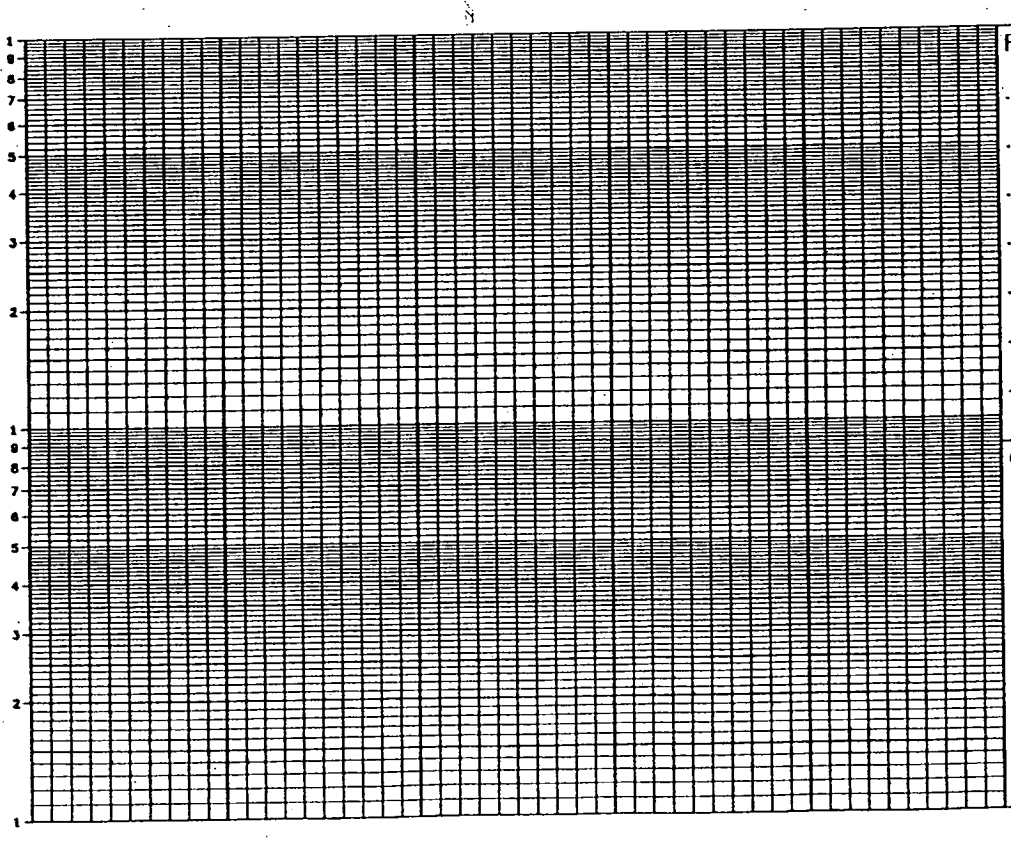
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC ZERO AT SWL + START

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 0 | | 3 | .210 | |
| .1 | -.170 | | 4 | .238 | |
| .2 | -.075 | | 5 | .264 | |
| .3 | -.020 | | 8 | .327 | |
| .4 | .016 | | 10 | .365 | |
| .5 | .042 | | 12 | .400 | |
| .6 | .063 | | 15 | .456 | |
| .7 | .079 | | 20 | .503 | |
| .8 | .089 | | 25 | .560 | |
| .9 | .101 | | 30 | .609 | |
| 1 | .111 | | 35 | .639 | |
| 2 | .169 | | | | |

WELL SCHEMATIC




▽ Indicate SWL Depth on Drawing

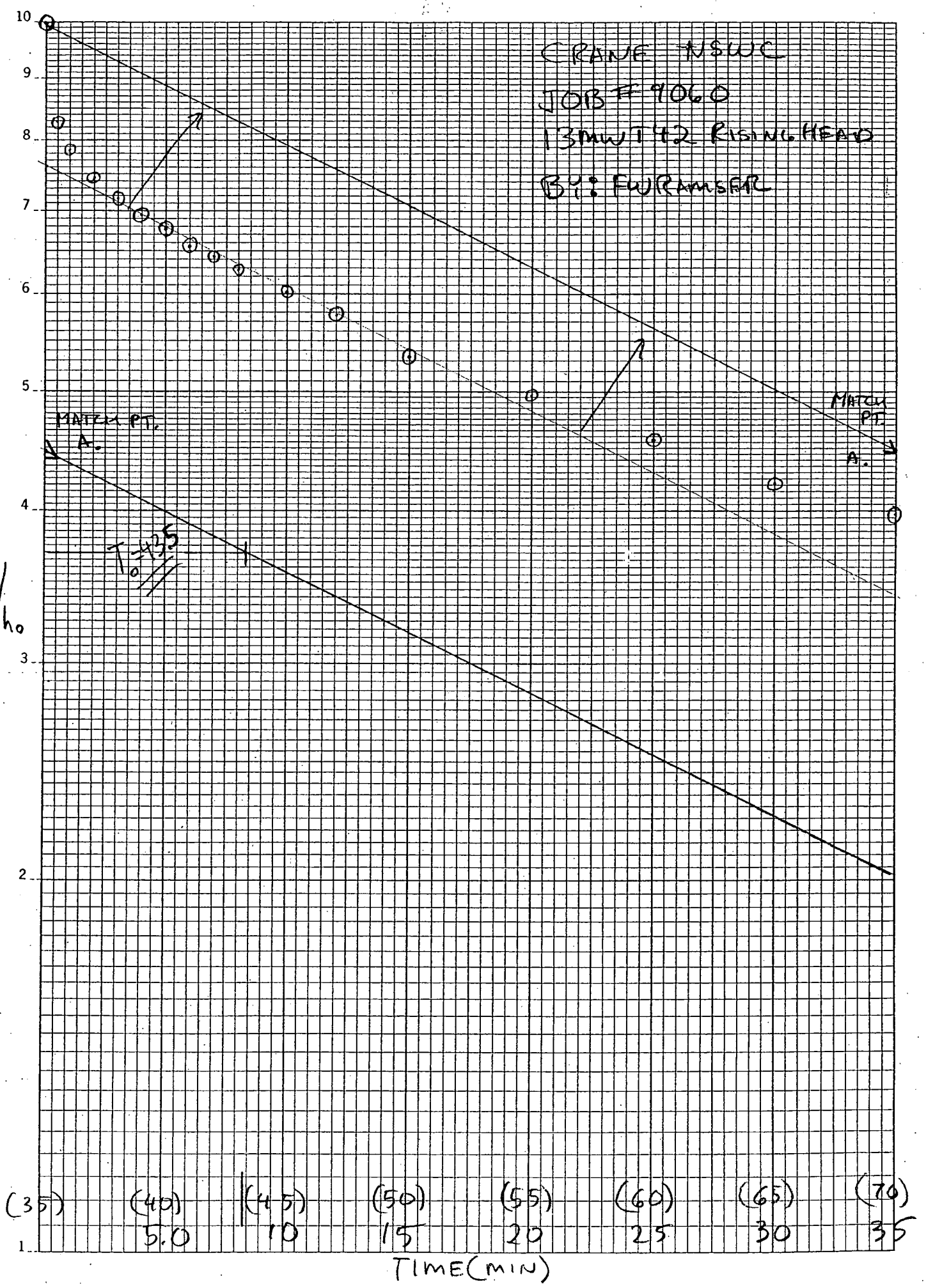


REMARKS:

COULD NOT FIT $H_2O$ INDICATOR PAST BAILER TO CHECK SWL BEFORE TEST. CHECKED SWL AT END OF TEST TO VERIFY. TEST STOPPED DUE TO DARKNESS $H_2O$ LEVEL 20.70 AT END OF TEST

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL


CRANE NSWC
JOB F 9060
13MWT 42 RISING HEAD
BY: FWRAMSAR
MATCH PT. A.
MATCH PT. A.
$T_0$ = 42.5
h/h₀
10
9
8
7
6
5
4
3
2
1
(35)
(40)
(45)
(50)
(55)
(60)
(65)
(70)
5.0
10
15
20
25
30
35
TIME (MIN)
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 12/9/2003 15:23:33
Report from file: H:\Crane IN\SWMU13_16\MGC slug tests 03\site 13\SN06899 2003-11-23 164637 13MWT42rising#1.bin
DataMgr Version 3.68

Serial number: 6899
Firmware Version 3.07
Unit name:

Test name: 13MWT42rising#1

Test defined on: 11/23/2003 16:37:58
Test started on: 11/23/2003 16:46:37
Test stopped on: 11/23/2003 17:23:37
Test extracted on: N/A

Data gathered using Linear testing
Time between data poi Minutes.
Number of data sample 370

TOTAL DATA SAMPLES 370

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at refere 2.111 Feet H2O

ho = -1.345

| Date | Time | ET (min) | Chan[2] Feet H2O | corrected feet h2o | Adjusted ET. (min) | h/ho |
|---|---|---|---|---|---|---|
| 11/23/2003 | 16:46 | 0 | 0 | | | |
| 11/23/2003 | 16:46 | 0.1 | -0.17 | -1.345 | 0 | 1.000 • |
| 11/23/2003 | 16:46 | 0.2 | -0.075 | -1.25 | 0.1 | 0.929 |
| 11/23/2003 | 16:46 | 0.3 | -0.02 | -1.195 | 0.2 | 0.888 |
| 11/23/2003 | 16:47 | 0.4 | 0.016 | -1.159 | 0.3 | 0.862 |
| 11/23/2003 | 16:47 | 0.5 | 0.042 | -1.133 | 0.4 | 0.842 |
| 11/23/2003 | 16:47 | 0.6 | 0.063 | -1.112 | 0.5 | 0.827 • |
| 11/23/2003 | 16:47 | 0.7 | 0.079 | -1.096 | 0.6 | 0.815 |
| 11/23/2003 | 16:47 | 0.8 | 0.089 | -1.086 | 0.7 | 0.807 |
| 11/23/2003 | 16:47 | 0.9 | 0.101 | -1.074 | 0.8 | 0.799 |
| 11/23/2003 | 16:47 | 1 | 0.111 | -1.064 | 0.9 | 0.791 |
| 11/23/2003 | 16:47 | 1.1 | 0.119 | -1.056 | 1 | 0.785 • |
| 11/23/2003 | 16:47 | 1.2 | 0.125 | -1.05 | 1.1 | 0.781 |
| 11/23/2003 | 16:47 | 1.3 | 0.131 | -1.044 | 1.2 | 0.776 |
| 11/23/2003 | 16:48 | 1.4 | 0.137 | -1.038 | 1.3 | 0.772 |
| 11/23/2003 | 16:48 | 1.5 | 0.145 | -1.03 | 1.4 | 0.766 |
| 11/23/2003 | 16:48 | 1.6 | 0.149 | -1.026 | 1.5 | 0.763 |
| 11/23/2003 | 16:48 | 1.7 | 0.155 | -1.02 | 1.6 | 0.758 |
| 11/23/2003 | 16:48 | 1.8 | 0.159 | -1.016 | 1.7 | 0.755 |

| | | | | | |
|---|---|---|---|---|---|
| 11/23/2003 16:48 | 1.9 | 0.165 | -1.01 | 1.8 | 0.751 |
| 11/23/2003 16:48 | 2 | 0.169 | -1.006 | 1.9 | 0.748 |
| 11/23/2003 16:48 | 2.1 | 0.173 | -1.002 | 2 | 0.745 |
| 11/23/2003 16:48 | 2.2 | 0.179 | -0.996 | 2.1 | 0.741 |
| 11/23/2003 16:48 | 2.3 | 0.183 | -0.992 | 2.2 | 0.738 |
| 11/23/2003 16:49 | 2.4 | 0.188 | -0.987 | 2.3 | 0.734 |
| 11/23/2003 16:49 | 2.5 | 0.192 | -0.983 | 2.4 | 0.731 |
| 11/23/2003 16:49 | 2.6 | 0.196 | -0.979 | 2.5 | 0.728 |
| 11/23/2003 16:49 | 2.7 | 0.198 | -0.977 | 2.6 | 0.726 |
| 11/23/2003 16:49 | 2.8 | 0.202 | -0.973 | 2.7 | 0.723 |
| 11/23/2003 16:49 | 2.9 | 0.204 | -0.971 | 2.8 | 0.722 |
| 11/23/2003 16:49 | 3 | 0.21 | -0.965 | 2.9 | 0.717 |
| 11/23/2003 16:49 | 3.1 | 0.212 | -0.963 | 3 | 0.716 |
| 11/23/2003 16:49 | 3.2 | 0.216 | -0.959 | 3.1 | 0.713 |
| 11/23/2003 16:49 | 3.3 | 0.22 | -0.955 | 3.2 | 0.710 |
| 11/23/2003 16:50 | 3.4 | 0.222 | -0.953 | 3.3 | 0.709 |
| 11/23/2003 16:50 | 3.5 | 0.224 | -0.951 | 3.4 | 0.707 |
| 11/23/2003 16:50 | 3.6 | 0.228 | -0.947 | 3.5 | 0.704 |
| 11/23/2003 16:50 | 3.7 | 0.23 | -0.945 | 3.6 | 0.703 |
| 11/23/2003 16:50 | 3.8 | 0.234 | -0.941 | 3.7 | 0.700 |
| 11/23/2003 16:50 | 3.9 | 0.236 | -0.939 | 3.8 | 0.698 |
| 11/23/2003 16:50 | 4 | 0.238 | -0.937 | 3.9 | 0.697 |
| 11/23/2003 16:50 | 4.1 | 0.242 | -0.933 | 4 | 0.694 |
| 11/23/2003 16:50 | 4.2 | 0.244 | -0.931 | 4.1 | 0.692 |
| 11/23/2003 16:50 | 4.3 | 0.248 | -0.927 | 4.2 | 0.689 |
| 11/23/2003 16:51 | 4.4 | 0.25 | -0.925 | 4.3 | 0.688 |
| 11/23/2003 16:51 | 4.5 | 0.252 | -0.923 | 4.4 | 0.686 |
| 11/23/2003 16:51 | 4.6 | 0.256 | -0.919 | 4.5 | 0.683 |
| 11/23/2003 16:51 | 4.7 | 0.256 | -0.919 | 4.6 | 0.683 |
| 11/23/2003 16:51 | 4.8 | 0.26 | -0.915 | 4.7 | 0.680 |
| 11/23/2003 16:51 | 4.9 | 0.262 | -0.913 | 4.8 | 0.679 |
| 11/23/2003 16:51 | 5 | 0.264 | -0.911 | 4.9 | 0.677 |
| 11/23/2003 16:51 | 5.1 | 0.266 | -0.909 | 5 | 0.676 |
| 11/23/2003 16:51 | 5.2 | 0.268 | -0.907 | 5.1 | 0.674 |
| 11/23/2003 16:51 | 5.3 | 0.272 | -0.903 | 5.2 | 0.671 |
| 11/23/2003 16:52 | 5.4 | 0.274 | -0.901 | 5.3 | 0.670 |
| 11/23/2003 16:52 | 5.5 | 0.278 | -0.897 | 5.4 | 0.667 |
| 11/23/2003 16:52 | 5.6 | 0.28 | -0.895 | 5.5 | 0.665 |
| 11/23/2003 16:52 | 5.7 | 0.28 | -0.895 | 5.6 | 0.665 |
| 11/23/2003 16:52 | 5.8 | 0.284 | -0.891 | 5.7 | 0.662 |
| 11/23/2003 16:52 | 5.9 | 0.286 | -0.889 | 5.8 | 0.661 |
| 11/23/2003 16:52 | 6 | 0.286 | -0.889 | 5.9 | 0.661 |
| 11/23/2003 16:52 | 6.1 | 0.29 | -0.885 | 6 | 0.658 |
| 11/23/2003 16:52 | 6.2 | 0.29 | -0.885 | 6.1 | 0.658 |
| 11/23/2003 16:52 | 6.3 | 0.294 | -0.881 | 6.2 | 0.655 |
| 11/23/2003 16:53 | 6.4 | 0.296 | -0.879 | 6.3 | 0.654 |
| 11/23/2003 16:53 | 6.5 | 0.298 | -0.877 | 6.4 | 0.652 |
| 11/23/2003 16:53 | 6.6 | 0.3 | -0.875 | 6.5 | 0.651 |
| 11/23/2003 16:53 | 6.7 | 0.302 | -0.873 | 6.6 | 0.649 |
| 11/23/2003 16:53 | 6.8 | 0.304 | -0.871 | 6.7 | 0.648 |
| 11/23/2003 16:53 | 6.9 | 0.308 | -0.867 | 6.8 | 0.645 |
| 11/23/2003 16:53 | 7 | 0.31 | -0.865 | 6.9 | 0.643 |
| 11/23/2003 16:53 | 7.1 | 0.312 | -0.863 | 7 | 0.642 |
| 11/23/2003 16:53 | 7.2 | 0.314 | -0.861 | 7.1 | 0.640 |
| 11/23/2003 16:53 | 7.3 | 0.316 | -0.859 | 7.2 | 0.639 |
| 11/23/2003 16:54 | 7.4 | 0.321 | -0.854 | 7.3 | 0.635 |
| 11/23/2003 16:54 | 7.5 | 0.321 | -0.854 | 7.4 | 0.635 |
| 11/23/2003 16:54 | 7.6 | 0.369 | -0.806 | 7.5 | 0.599 |

| | | | | | |
|---|---|---|---|---|---|
| 11/23/2003 16:54 | 7.7 | 0.325 | -0.85 | 7.6 | 0.632 |
| 11/23/2003 16:54 | 7.8 | 0.329 | -0.846 | 7.7 | 0.629 |
| 11/23/2003 16:54 | 7.9 | 0.323 | -0.852 | 7.8 | 0.633 |
| 11/23/2003 16:54 | 8 | 0.327 | -0.848 | 7.9 | 0.630 |
| 11/23/2003 16:54 | 8.1 | 0.329 | -0.846 | 8 | 0.629 |
| 11/23/2003 16:54 | 8.2 | 0.331 | -0.844 | 8.1 | 0.628 |
| 11/23/2003 16:54 | 8.3 | 0.333 | -0.842 | 8.2 | 0.626 |
| 11/23/2003 16:55 | 8.4 | 0.335 | -0.84 | 8.3 | 0.625 |
| 11/23/2003 16:55 | 8.5 | 0.337 | -0.838 | 8.4 | 0.623 |
| 11/23/2003 16:55 | 8.6 | 0.341 | -0.834 | 8.5 | 0.620 |
| 11/23/2003 16:55 | 8.7 | 0.343 | -0.832 | 8.6 | 0.619 |
| 11/23/2003 16:55 | 8.8 | 0.345 | -0.83 | 8.7 | 0.617 |
| 11/23/2003 16:55 | 8.9 | 0.347 | -0.828 | 8.8 | 0.616 |
| 11/23/2003 16:55 | 9 | 0.347 | -0.828 | 8.9 | 0.616 |
| 11/23/2003 16:55 | 9.1 | 0.349 | -0.826 | 9 | 0.614 |
| 11/23/2003 16:55 | 9.2 | 0.351 | -0.824 | 9.1 | 0.613 |
| 11/23/2003 16:55 | 9.3 | 0.353 | -0.822 | 9.2 | 0.611 |
| 11/23/2003 16:56 | 9.4 | 0.355 | -0.82 | 9.3 | 0.610 |
| 11/23/2003 16:56 | 9.5 | 0.357 | -0.818 | 9.4 | 0.608 |
| 11/23/2003 16:56 | 9.6 | 0.359 | -0.816 | 9.5 | 0.607 |
| 11/23/2003 16:56 | 9.7 | 0.361 | -0.814 | 9.6 | 0.605 |
| 11/23/2003 16:56 | 9.8 | 0.361 | -0.814 | 9.7 | 0.605 |
| 11/23/2003 16:56 | 9.9 | 0.365 | -0.81 | 9.8 | 0.602 |
| 11/23/2003 16:56 | 10 | 0.365 | -0.81 | 9.9 | 0.602 |
| 11/23/2003 16:56 | 10.1 | 0.367 | -0.808 | 10 | 0.601 |
| 11/23/2003 16:57 | 11.1 | 0.383 | -0.792 | 11 | 0.589 |
| 11/23/2003 16:58 | 12.1 | 0.4 | -0.775 | 12 | 0.576 |
| 11/23/2003 16:59 | 13.1 | 0.414 | -0.761 | 13 | 0.566 |
| 11/23/2003 17:00 | 14.1 | 0.43 | -0.745 | 14 | 0.554 |
| 11/23/2003 17:01 | 15.1 | 0.458 | -0.717 | 15 | 0.533 |
| 11/23/2003 17:02 | 16.1 | 0.456 | -0.719 | 16 | 0.535 |
| 11/23/2003 17:03 | 17.1 | 0.47 | -0.705 | 17 | 0.524 |
| 11/23/2003 17:04 | 18.1 | 0.481 | -0.694 | 18 | 0.516 |
| 11/23/2003 17:05 | 19.1 | 0.495 | -0.68 | 19 | 0.506 |
| 11/23/2003 17:06 | 20.1 | 0.507 | -0.668 | 20 | 0.497 |
| 11/23/2003 17:07 | 21.1 | 0.517 | -0.658 | 21 | 0.489 |
| 11/23/2003 17:08 | 22.1 | 0.545 | -0.63 | 22 | 0.468 |
| 11/23/2003 17:09 | 23.1 | 0.539 | -0.636 | 23 | 0.473 |
| 11/23/2003 17:10 | 24.1 | 0.549 | -0.626 | 24 | 0.465 |
| 11/23/2003 17:11 | 25.1 | 0.562 | -0.613 | 25 | 0.456 |
| 11/23/2003 17:12 | 26.1 | 0.572 | -0.603 | 26 | 0.448 |
| 11/23/2003 17:13 | 27.1 | 0.582 | -0.593 | 27 | 0.441 |
| 11/23/2003 17:14 | 28.1 | 0.59 | -0.585 | 28 | 0.435 |
| 11/23/2003 17:15 | 29.1 | 0.601 | -0.574 | 29 | 0.427 |
| 11/23/2003 17:16 | 30.1 | 0.609 | -0.566 | 30 | 0.421 |
| 11/23/2003 17:17 | 31.1 | 0.617 | -0.558 | 31 | 0.415 |
| 11/23/2003 17:18 | 32.1 | 0.625 | -0.55 | 32 | 0.409 |
| 11/23/2003 17:19 | 33.1 | 0.631 | -0.544 | 33 | 0.404 |
| 11/23/2003 17:20 | 34.1 | 0.629 | -0.546 | 34 | 0.406 |
| 11/23/2003 17:21 | 35.1 | 0.641 | -0.534 | 35 | 0.397 |
| 11/23/2003 17:22 | 36.1 | 0.649 | -0.526 | 36 | 0.391 |

TETRA-TECH NUS

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

**Project Name:** Crane NSWC
**Project No.:** 9060
**Test Type:** Rising head

**Well/Boring No.:** 13MWT42
**Aquifer Type:** Bedrock
**Test Date:** 23-Nov-03

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .208' | 2.5 = R |
| Length of Well Screen (ft.) : | | 4.42 = L |
| Time for 37% head change (min.) : | | 43.50 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 5.52E-05 | ft./min. |
| 9.19E-07 | ft./sec. |
| 7.94E-02 | ft./day |
| 2.80E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(4.42/.208)}{2 \times 4.42 \times 43.50} =$$

$5.48 \times 10^{-5}$ Ft/min

CHECKED
MSL
2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT47 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Falling head | **Test Date:** | 25-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 2 = R |
| Length of Well Screen (ft.) : | 15 = L |
| Time for 37% head change (min.) : | 4.00 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 2.60E-04 | ft./min. |
| 4.34E-06 | ft./sec. |
| 3.75E-01 | ft./day |
| 1.32E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

Tetra Tech NUS, Inc.

PROJECT NAME: N SWC CRANE WELL/BORING NO.: 13MWT47

PROJECT NO.: 9060 GEOLOGIST: M. G. COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 6.56 DATE: 11-25-03

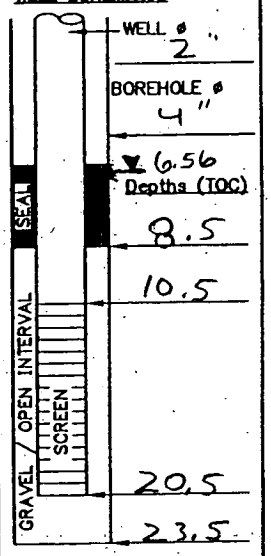
TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: SOLID SLUG PAGE 1 OF 1

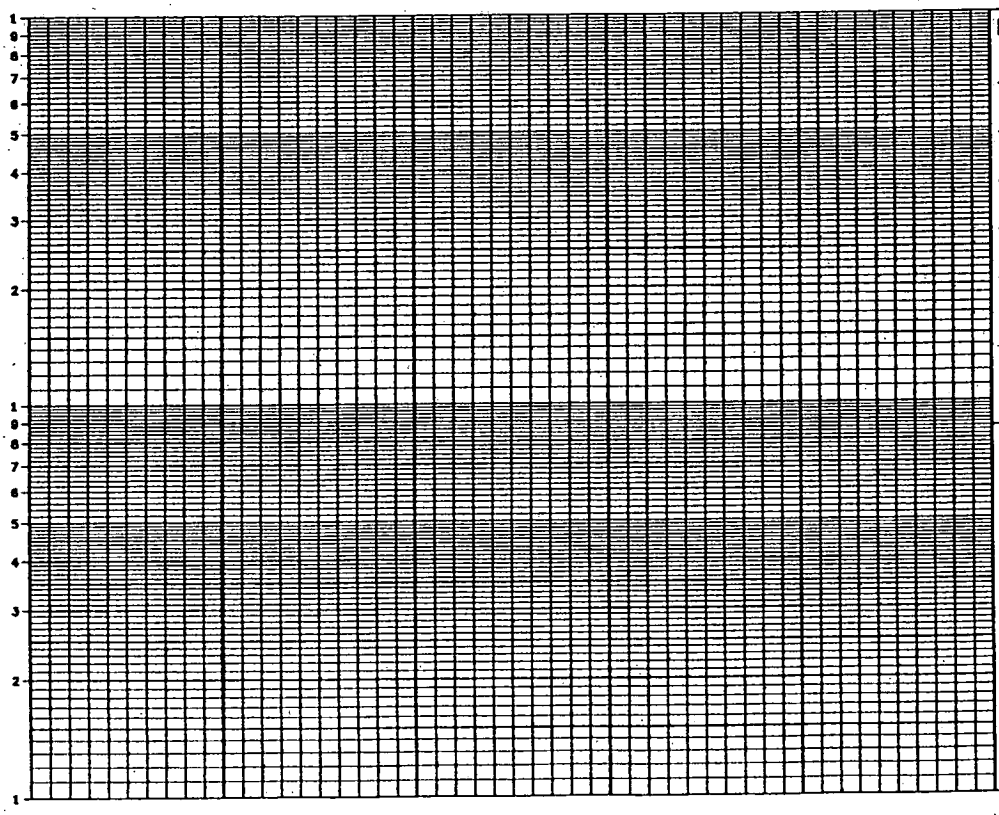
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC, ZERO AT SWL + START

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 0 | | 3 | 1.023 | |
| .1 | 2.649 | | 4 | .864 | |
| .2 | 2.470 | | 5 | .743 | |
| .3 | 2.335 | | 6 | .652 | |
| .4 | 2.218 | | 7 | .574 | |
| .5 | 2.116 | | 8 | .503 | |
| .6 | 2.023 | | 10 | .394 | |
| .7 | 1.940 | | 12 | .327 | |
| .8 | 1.864 | | 15 | .257 | |
| .9 | 1.793 | | 18 | .212 | |
| 1.0 | 1.435 | | | | |
| 2.0 | 1.275 | | | | |

WELL SCHEMATIC



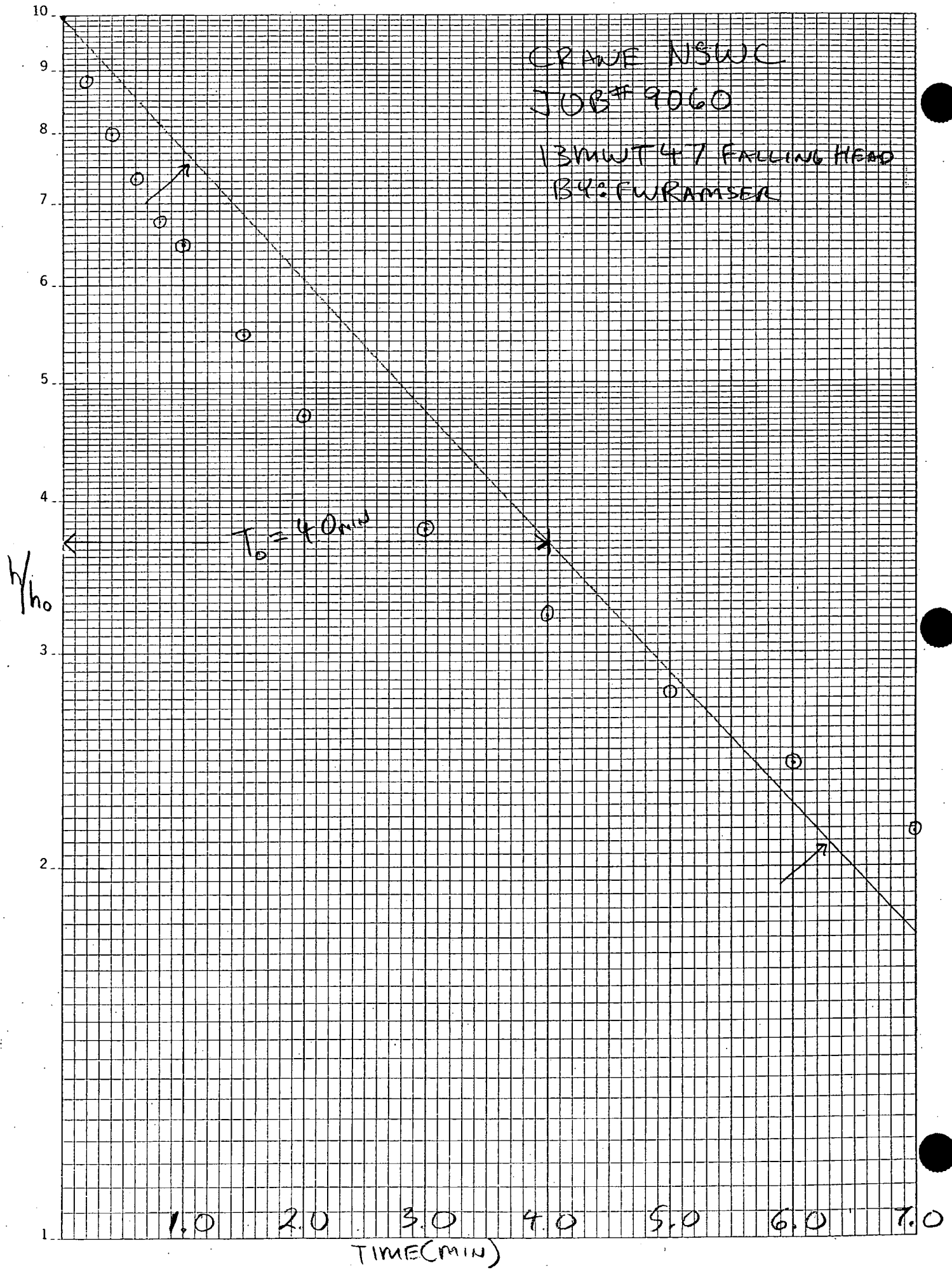

▽ Indicate SWL Depth on Drawing



REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD: FORM_HYDCONTST.dwg 07/06/99 INL


CRAWE NSWC
JOB# 9060
13MWT47 FALLING HEAD
BY: FWRAMSER
$T_o = 40$ min
$h/h_o$
10
9
8
7
6
5
4
3
2
1
1.0
2.0
3.0
4.0
5.0
6.0
7.0
TIME(MIN)
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 12/9/2003 13:56:16
Report from file: H:\Crane IN\SWMU13_16\MGC slug tests 03\site 13\SN06899 2003-11-25 132823 13MWT47falling#1.bin
DataMgr Version 3.68

Serial number: 6899
Firmware Version 3.07
Unit name:

Test name: 13MWT47falling#1

Test defined on: 11/25/2003 13:27:57
Test started on: 11/25/2003 13:28:23
Test stopped on: 11/25/2003 15:00:29
Test extracted on: N/A

Data gathered using Linear testing
Time between data points: (Minutes.
Number of data samples: 921

TOTAL DATA SAMPLES 921

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at reference: 13.72 Feet H2O

• = PLOTTED DATA

| Date | Time | ET (min) | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho | ho = 2.649 |
|---|---|---|---|---|---|---|
| | 11/25/2003 13:28 | 0 | 0 | | | |
| | 11/25/2003 13:28 | 0.1 | 2.649 | 0 | 1.000 | • |
| | 11/25/2003 13:28 | 0.2 | 2.47 | 0.1 | 0.932 | |
| | 11/25/2003 13:28 | 0.3 | 2.335 | 0.2 | 0.881 | • |
| | 11/25/2003 13:28 | 0.4 | 2.218 | 0.3 | 0.837 | |
| | 11/25/2003 13:28 | 0.5 | 2.116 | 0.4 | 0.799 | • |
| | 11/25/2003 13:28 | 0.6 | 2.023 | 0.5 | 0.764 | |
| | 11/25/2003 13:29 | 0.7 | 1.94 | 0.6 | 0.732 | • |
| | 11/25/2003 13:29 | 0.8 | 1.864 | 0.7 | 0.704 | |
| | 11/25/2003 13:29 | 0.9 | 1.793 | 0.8 | 0.677 | • |
| | 11/25/2003 13:29 | 1 | 1.435 | 0.9 | 0.542 | |
| | 11/25/2003 13:29 | 1.1 | 1.451 | 1 | 0.548 | • |
| | 11/25/2003 13:29 | 1.2 | 1.455 | 1.1 | 0.549 | |
| | 11/25/2003 13:29 | 1.3 | 1.455 | 1.2 | 0.549 | |
| | 11/25/2003 13:29 | 1.4 | 1.452 | 1.3 | 0.548 | |
| | 11/25/2003 13:29 | 1.5 | 1.45 | 1.4 | 0.547 | |
| | 11/25/2003 13:29 | 1.6 | 1.448 | 1.5 | 0.547 | • |
| | 11/25/2003 13:30 | 1.7 | 1.382 | 1.6 | 0.522 | |
| | 11/25/2003 13:30 | 1.8 | 1.344 | 1.7 | 0.507 | |
| | 11/25/2003 13:30 | 1.9 | 1.31 | 1.8 | 0.495 | |
| | 11/25/2003 13:30 | 2 | 1.275 | 1.9 | 0.481 | |
| | 11/25/2003 13:30 | 2.1 | 1.245 | 2 | 0.470 | • |
| | 11/25/2003 13:30 | 2.2 | 1.215 | 2.1 | 0.459 | |
| | 11/25/2003 13:30 | 2.3 | 1.187 | 2.2 | 0.448 | |
| | 11/25/2003 13:30 | 2.4 | 1.16 | 2.3 | 0.438 | |
| | 11/25/2003 13:30 | 2.5 | 1.134 | 2.4 | 0.428 | |
| | 11/25/2003 13:30 | 2.6 | 1.11 | 2.5 | 0.419 | |
| | 11/25/2003 13:31 | 2.7 | 1.088 | 2.6 | 0.411 | |
| | 11/25/2003 13:31 | 2.8 | 1.066 | 2.7 | 0.402 | |
| | 11/25/2003 13:31 | 2.9 | 1.046 | 2.8 | 0.395 | |
| | 11/25/2003 13:31 | 3 | 1.023 | 2.9 | 0.386 | |
| | 11/25/2003 13:31 | 3.1 | 1.005 | 3 | 0.379 | • |
| | 11/25/2003 13:31 | 3.2 | 0.987 | 3.1 | 0.373 | |
| | 11/25/2003 13:31 | 3.3 | 0.971 | 3.2 | 0.367 | |
| | 11/25/2003 13:31 | 3.4 | 0.953 | 3.3 | 0.360 | |

| | | | | |
|---|---|---|---|---|
| 11/25/2003 13:31 | 3.5 | 0.937 | 3.4 | 0.354 |
| 11/25/2003 13:31 | 3.6 | 0.921 | 3.5 | 0.348 |
| 11/25/2003 13:32 | 3.7 | 0.907 | 3.6 | 0.342 |
| 11/25/2003 13:32 | 3.8 | 0.892 | 3.7 | 0.337 |
| 11/25/2003 13:32 | 3.9 | 0.876 | 3.8 | 0.331 |
| 11/25/2003 13:32 | 4 | 0.864 | 3.9 | 0.326 |
| 11/25/2003 13:32 | 4.1 | 0.85 | 4 | 0.321 • |
| 11/25/2003 13:32 | 4.2 | 0.836 | 4.1 | 0.316 |
| 11/25/2003 13:32 | 4.3 | 0.824 | 4.2 | 0.311 |
| 11/25/2003 13:32 | 4.4 | 0.812 | 4.3 | 0.307 |
| 11/25/2003 13:32 | 4.5 | 0.8 | 4.4 | 0.302 |
| 11/25/2003 13:32 | 4.6 | 0.788 | 4.5 | 0.297 |
| 11/25/2003 13:33 | 4.7 | 0.778 | 4.6 | 0.294 |
| 11/25/2003 13:33 | 4.8 | 0.766 | 4.7 | 0.289 |
| 11/25/2003 13:33 | 4.9 | 0.755 | 4.8 | 0.285 |
| 11/25/2003 13:33 | 5 | 0.743 | 4.9 | 0.280 |
| 11/25/2003 13:33 | 5.1 | 0.733 | 5 | 0.277 • |
| 11/25/2003 13:33 | 5.2 | 0.725 | 5.1 | 0.274 |
| 11/25/2003 13:33 | 5.3 | 0.715 | 5.2 | 0.270 |
| 11/25/2003 13:33 | 5.4 | 0.705 | 5.3 | 0.266 |
| 11/25/2003 13:33 | 5.5 | 0.695 | 5.4 | 0.262 |
| 11/25/2003 13:33 | 5.6 | 0.687 | 5.5 | 0.259 |
| 11/25/2003 13:34 | 5.7 | 0.677 | 5.6 | 0.256 |
| 11/25/2003 13:34 | 5.8 | 0.669 | 5.7 | 0.253 |
| 11/25/2003 13:34 | 5.9 | 0.661 | 5.8 | 0.250 |
| 11/25/2003 13:34 | 6 | 0.652 | 5.9 | 0.246 |
| 11/25/2003 13:34 | 6.1 | 0.643 | 6 | 0.243 • |
| 11/25/2003 13:34 | 6.2 | 0.636 | 6.1 | 0.240 |
| 11/25/2003 13:34 | 6.3 | 0.628 | 6.2 | 0.237 |
| 11/25/2003 13:34 | 6.4 | 0.62 | 6.3 | 0.234 |
| 11/25/2003 13:34 | 6.5 | 0.612 | 6.4 | 0.231 |
| 11/25/2003 13:34 | 6.6 | 0.604 | 6.5 | 0.228 |
| 11/25/2003 13:35 | 6.7 | 0.596 | 6.6 | 0.225 |
| 11/25/2003 13:35 | 6.8 | 0.588 | 6.7 | 0.222 |
| 11/25/2003 13:35 | 6.9 | 0.58 | 6.8 | 0.219 |
| 11/25/2003 13:35 | 7 | 0.574 | 6.9 | 0.217 |
| 11/25/2003 13:35 | 7.1 | 0.568 | 7 | 0.214 |
| 11/25/2003 13:35 | 7.2 | 0.56 | 7.1 | 0.211 |
| 11/25/2003 13:35 | 7.3 | 0.552 | 7.2 | 0.208 |
| 11/25/2003 13:35 | 7.4 | 0.544 | 7.3 | 0.205 |
| 11/25/2003 13:35 | 7.5 | 0.535 | 7.4 | 0.202 |
| 11/25/2003 13:35 | 7.6 | 0.532 | 7.5 | 0.201 |
| 11/25/2003 13:36 | 7.7 | 0.523 | 7.6 | 0.197 |
| 11/25/2003 13:36 | 7.8 | 0.517 | 7.7 | 0.195 |
| 11/25/2003 13:36 | 7.9 | 0.509 | 7.8 | 0.192 |
| 11/25/2003 13:36 | 8 | 0.503 | 7.9 | 0.190 |
| 11/25/2003 13:36 | 8.1 | 0.497 | 8 | 0.188 |
| 11/25/2003 13:36 | 8.2 | 0.491 | 8.1 | 0.185 |
| 11/25/2003 13:36 | 8.3 | 0.483 | 8.2 | 0.182 |
| 11/25/2003 13:36 | 8.4 | 0.479 | 8.3 | 0.181 |
| 11/25/2003 13:36 | 8.5 | 0.471 | 8.4 | 0.178 |
| 11/25/2003 13:36 | 8.6 | 0.465 | 8.5 | 0.176 |
| 11/25/2003 13:37 | 8.7 | 0.459 | 8.6 | 0.173 |
| 11/25/2003 13:37 | 8.8 | 0.453 | 8.7 | 0.171 |
| 11/25/2003 13:37 | 8.9 | 0.447 | 8.8 | 0.169 |
| 11/25/2003 13:37 | 9 | 0.443 | 8.9 | 0.167 |
| 11/25/2003 13:37 | 9.1 | 0.437 | 9 | 0.165 |
| 11/25/2003 13:37 | 9.2 | 0.43 | 9.1 | 0.162 |
| 11/25/2003 13:37 | 9.3 | 0.426 | 9.2 | 0.161 |
| 11/25/2003 13:37 | 9.4 | 0.42 | 9.3 | 0.159 |
| 11/25/2003 13:37 | 9.5 | 0.416 | 9.4 | 0.157 |
| 11/25/2003 13:37 | 9.6 | 0.412 | 9.5 | 0.156 |
| 11/25/2003 13:38 | 9.7 | 0.406 | 9.6 | 0.153 |
| 11/25/2003 13:38 | 9.8 | 0.402 | 9.7 | 0.152 |
| 11/25/2003 13:38 | 9.9 | 0.398 | 9.8 | 0.150 |
| 11/25/2003 13:38 | 10 | 0.394 | 9.9 | 0.149 |
| 11/25/2003 13:38 | 10.1 | 0.39 | 10 | 0.147 |
| 11/25/2003 13:39 | 11.1 | 0.354 | 11 | 0.134 |
| 11/25/2003 13:40 | 12.1 | 0.323 | 12 | 0.122 |
| 11/25/2003 13:41 | 13.1 | 0.297 | 13 | 0.112 |
| 11/25/2003 13:42 | 14.1 | 0.275 | 14 | 0.104 |
| 11/25/2003 13:43 | 15.1 | 0.257 | 15 | 0.097 |
| 11/25/2003 13:44 | 16.1 | 0.241 | 16 | 0.091 |
| 11/25/2003 13:45 | 17.1 | 0.226 | 17 | 0.085 |

| | | | | |
|---|---|---|---|---|
| 11/25/2003 13:46 | 18.1 | 0.212 | 18 | 0.080 |
| 11/25/2003 13:47 | 19.1 | 0.198 | 19 | 0.075 |
| 11/25/2003 13:48 | 20.1 | 0.188 | 20 | 0.071 |
| 11/25/2003 13:49 | 21.1 | 0.178 | 21 | 0.067 |
| 11/25/2003 13:50 | 22.1 | 0.17 | 22 | 0.064 |
| 11/25/2003 13:51 | 23.1 | 0.165 | 23 | 0.062 |
| 11/25/2003 13:52 | 24.1 | 0.159 | 24 | 0.060 |
| 11/25/2003 13:53 | 25.1 | 0.153 | 25 | 0.058 |
| 11/25/2003 13:54 | 26.1 | 0.149 | 26 | 0.056 |
| 11/25/2003 13:55 | 27.1 | 0.145 | 27 | 0.055 |
| 11/25/2003 13:56 | 28.1 | 0.141 | 28 | 0.053 |
| 11/25/2003 13:57 | 29.1 | 0.139 | 29 | 0.052 |
| 11/25/2003 13:58 | 30.1 | 0.135 | 30 | 0.051 |
| 11/25/2003 13:59 | 31.1 | 0.131 | 31 | 0.049 |
| 11/25/2003 14:00 | 32.1 | 0.129 | 32 | 0.049 |
| 11/25/2003 14:01 | 33.1 | 0.123 | 33 | 0.046 |
| 11/25/2003 14:02 | 34.1 | 0.121 | 34 | 0.046 |
| 11/25/2003 14:03 | 35.1 | 0.114 | 35 | 0.043 |
| 11/25/2003 14:04 | 36.1 | 0.112 | 36 | 0.042 |
| 11/25/2003 14:05 | 37.1 | 0.11 | 37 | 0.042 |
| 11/25/2003 14:06 | 38.1 | 0.108 | 38 | 0.041 |
| 11/25/2003 14:07 | 39.1 | 0.106 | 39 | 0.040 |
| 11/25/2003 14:08 | 40.1 | 0.106 | 40 | 0.040 |
| 11/25/2003 14:09 | 41.1 | 0.104 | 41 | 0.039 |
| 11/25/2003 14:10 | 42.1 | 0.102 | 42 | 0.039 |
| 11/25/2003 14:11 | 43.1 | 0.102 | 43 | 0.039 |
| 11/25/2003 14:12 | 44.1 | 0.1 | 44 | 0.038 |
| 11/25/2003 14:13 | 45.1 | 0.098 | 45 | 0.037 |
| 11/25/2003 14:14 | 46.1 | 0.096 | 46 | 0.036 |
| 11/25/2003 14:15 | 47.1 | 0.094 | 47 | 0.035 |
| 11/25/2003 14:16 | 48.1 | 0.092 | 48 | 0.035 |
| 11/25/2003 14:17 | 49.1 | 0.09 | 49 | 0.034 |
| 11/25/2003 14:18 | 50.1 | 0.09 | 50 | 0.034 |
| 11/25/2003 14:19 | 51.1 | 0.09 | 51 | 0.034 |
| 11/25/2003 14:20 | 52.1 | 0.09 | 52 | 0.034 |
| 11/25/2003 14:21 | 53.1 | 0.087 | 53 | 0.033 |
| 11/25/2003 14:22 | 54.1 | 0.087 | 54 | 0.033 |
| 11/25/2003 14:23 | 55.1 | 0.085 | 55 | 0.032 |
| 11/25/2003 14:24 | 56.1 | 0.085 | 56 | 0.032 |
| 11/25/2003 14:25 | 57.1 | 0.085 | 57 | 0.032 |
| 11/25/2003 14:26 | 58.1 | 0.083 | 58 | 0.031 |
| 11/25/2003 14:27 | 59.1 | 0.083 | 59 | 0.031 |
| 11/25/2003 14:28 | 60.1 | 0.083 | 60 | 0.031 |
| 11/25/2003 14:29 | 61.1 | 0.083 | 61 | 0.031 |
| 11/25/2003 14:30 | 62.1 | 0.083 | 62 | 0.031 |
| 11/25/2003 14:31 | 63.1 | 0.083 | 63 | 0.031 |
| 11/25/2003 14:32 | 64.1 | 0.083 | 64 | 0.031 |
| 11/25/2003 14:33 | 65.1 | 0.083 | 65 | 0.031 |
| 11/25/2003 14:34 | 66.1 | 0.083 | 66 | 0.031 |
| 11/25/2003 14:35 | 67.1 | 0.083 | 67 | 0.031 |
| 11/25/2003 14:36 | 68.1 | 0.083 | 68 | 0.031 |
| 11/25/2003 14:37 | 69.1 | 0.083 | 69 | 0.031 |
| 11/25/2003 14:38 | 70.1 | 0.083 | 70 | 0.031 |
| 11/25/2003 14:39 | 71.1 | 0.083 | 71 | 0.031 |
| 11/25/2003 14:40 | 72.1 | 0.083 | 72 | 0.031 |
| 11/25/2003 14:41 | 73.1 | 0.085 | 73 | 0.032 |
| 11/25/2003 14:42 | 74.1 | 0.083 | 74 | 0.031 |
| 11/25/2003 14:43 | 75.1 | 0.083 | 75 | 0.031 |
| 11/25/2003 14:44 | 76.1 | 0.083 | 76 | 0.031 |
| 11/25/2003 14:45 | 77.1 | 0.083 | 77 | 0.031 |
| 11/25/2003 14:46 | 78.1 | 0.081 | 78 | 0.031 |
| 11/25/2003 14:47 | 79.1 | 0.081 | 79 | 0.031 |
| 11/25/2003 14:48 | 80.1 | 0.081 | 80 | 0.031 |
| 11/25/2003 14:49 | 81.1 | 0.081 | 81 | 0.031 |
| 11/25/2003 14:50 | 82.1 | 0.083 | 82 | 0.031 |
| 11/25/2003 14:51 | 83.1 | 0.083 | 83 | 0.031 |
| 11/25/2003 14:52 | 84.1 | 0.083 | 84 | 0.031 |
| 11/25/2003 14:53 | 85.1 | 0.081 | 85 | 0.031 |
| 11/25/2003 14:54 | 86.1 | 0.081 | 86 | 0.031 |
| 11/25/2003 14:55 | 87.1 | 0.083 | 87 | 0.031 |
| 11/25/2003 14:56 | 88.1 | 0.081 | 88 | 0.031 |
| 11/25/2003 14:57 | 89.1 | 0.083 | 89 | 0.031 |
| 11/25/2003 14:58 | 90.1 | 0.097 | 90 | 0.037 |
| 11/25/2003 14:59 | 91.1 | 0.081 | 91 | 0.031 |

TETRA-TECH NUS

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT47 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Falling head | **Test Date:** | 25-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .166' | 2 = R |
| Length of Well Screen (ft.) : | | 15 = L |
| Time for 37% head change (min.) : | | 4.00 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 2.60E-04 | ft./min. |
| 4.34E-06 | ft./sec. |
| 3.75E-01 | ft./day |
| 1.32E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(15/.166)}{2 \times 15 \times 4}$$

$2.59 \times 10^{-4}$ Ft/min

CHECKED

2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT47 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 25-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 2 = R |
| Length of Well Screen (ft.) : | 15 = L |
| Time for 37% head change (min.) : | 5.45 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.91E-04 | ft./min. |
| 3.19E-06 | ft./sec. |
| 2.75E-01 | ft./day |
| 9.71E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

Tetra Tech NUS, Inc.

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 13MWT47

PROJECT NO.: 9060 GEOLOGIST: M. G. COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: #1

STATIC WATER LEVEL (Depth/Elevation): 6.56 TOC DATE: 11-25-03

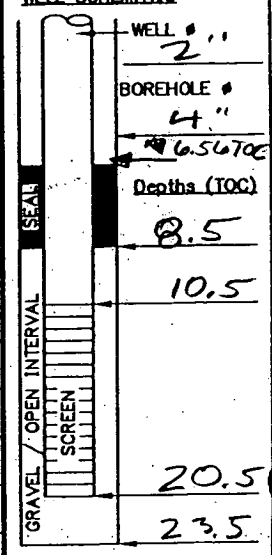
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: SOLID SLUG PAGE 1 OF 1

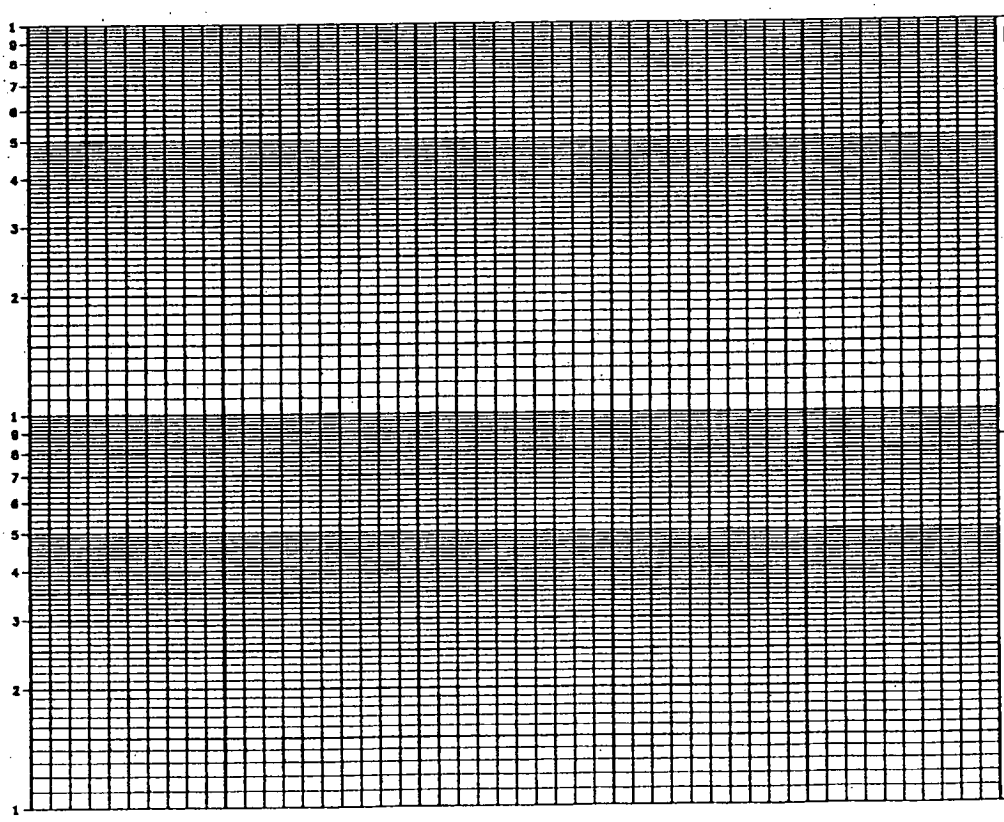
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC, ZERO AT SWL + START

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 0 | | 2.0 | .441 | |
| .1 | -.947 | | 3.0 | .671 | |
| .2 | -.740 | | 4.0 | .816 | |
| .3 | -.595 | | 5.0 | .919 | |
| .4 | -.478 | | 6.0 | 1.000 | |
| .5 | -.373 | | 10.0 | 1.206 | |
| .6 | -.282 | | 20 | 1.409 | |
| .7 | -.200 | | 30 | 1.508 | |
| .8 | -.123 | | 40 | 1.555 | |
| .9 | .176 | | 50 | 1.580 | |
| 1.0 | .195 | | 60 | 1.598 | |
| 1.5 | .264 | | | | |

WELL SCHEMATIC



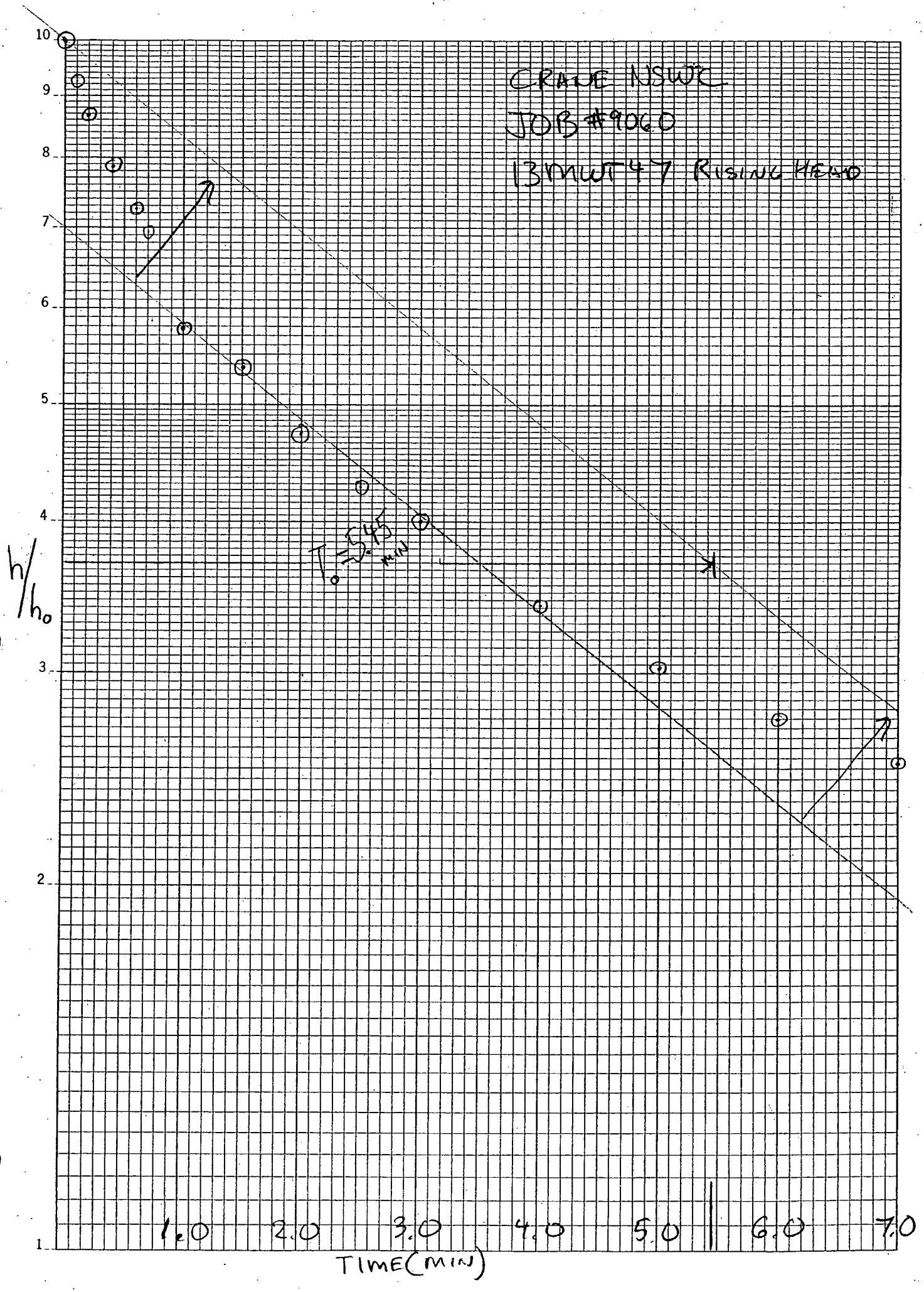

▽ Indicate SWL Depth on Drawing



REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 12/9/2003 13:38:37
Report from file: H:\Crane IN\SWMU13_16\MGC slug tests 03\site 13\SN06899 2003-11-25 122317 13MWT47rising#1.bin
DataMgr Version 3.68

Serial number: 6899
Firmware Version 3.07
Unit name:

Test name: 13MWT47rising#1

Test defined on: 11/25/2003 12:00:52
Test started on: 11/25/2003 12:23:17
Test stopped on: 11/25/2003 13:26:55
Test extracted on: N/A

Data gathered using Linear testing
Time between data poi Minutes.
Number of data sampl 637

TOTAL DATA SAMPLES 637

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined reference 0 Feet H2O
Referenced on: test start
Pressure head at refere 12.11 Feet H2O

ho = -2.697

| Date | Time | ET (min) | Chan[2] Feet H2O | feet corrected | Adjusted ET. (min) | h/ho |
|---|---|---|---|---|---|---|
| | 11/25/2003 12:23 | 0 | 0 | | | |
| | 11/25/2003 12:23 | 0.1 | -0.947 | -2.697 | 0 | 1.000 |
| | 11/25/2003 12:23 | 0.2 | -0.74 | -2.49 | 0.1 | 0.923 |
| | 11/25/2003 12:23 | 0.3 | -0.595 | -2.345 | 0.2 | 0.869 |
| | 11/25/2003 12:23 | 0.4 | -0.478 | -2.228 | 0.3 | 0.826 |
| | 11/25/2003 12:23 | 0.5 | -0.373 | -2.123 | 0.4 | 0.787 |
| | 11/25/2003 12:23 | 0.6 | -0.282 | -2.032 | 0.5 | 0.753 |
| | 11/25/2003 12:23 | 0.7 | -0.2 | -1.95 | 0.6 | 0.723 |
| | 11/25/2003 12:24 | 0.8 | -0.123 | -1.873 | 0.7 | 0.694 |
| | 11/25/2003 12:24 | 0.9 | 0.176 | -1.574 | 0.8 | 0.584 |
| | 11/25/2003 12:24 | 1 | 0.195 | -1.555 | 0.9 | 0.577 |
| | 11/25/2003 12:24 | 1.1 | 0.203 | -1.547 | 1 | 0.574 |
| | 11/25/2003 12:24 | 1.2 | 0.207 | -1.543 | 1.1 | 0.572 |
| | 11/25/2003 12:24 | 1.3 | 0.213 | -1.537 | 1.2 | 0.570 |
| | 11/25/2003 12:24 | 1.4 | 0.222 | -1.528 | 1.3 | 0.567 |
| | 11/25/2003 12:24 | 1.5 | 0.264 | -1.486 | 1.4 | 0.551 |
| | 11/25/2003 12:24 | 1.6 | 0.304 | -1.446 | 1.5 | 0.536 |
| | 11/25/2003 12:24 | 1.7 | 0.343 | -1.407 | 1.6 | 0.522 |
| | 11/25/2003 12:25 | 1.8 | 0.377 | -1.373 | 1.7 | 0.509 |
| | 11/25/2003 12:25 | 1.9 | 0.411 | -1.339 | 1.8 | 0.496 |
| | 11/25/2003 12:25 | 2 | 0.441 | -1.309 | 1.9 | 0.485 |
| | 11/25/2003 12:25 | 2.1 | 0.472 | -1.278 | 2 | 0.474 |
| | 11/25/2003 12:25 | 2.2 | 0.498 | -1.252 | 2.1 | 0.464 |
| | 11/25/2003 12:25 | 2.3 | 0.524 | -1.226 | 2.2 | 0.455 |
| | 11/25/2003 12:25 | 2.4 | 0.548 | -1.202 | 2.3 | 0.446 |
| | 11/25/2003 12:25 | 2.5 | 0.572 | -1.178 | 2.4 | 0.437 |

| | | | | | |
|---|---|---|---|---|---|
| 11/25/2003 12:25 | 2.6 | 0.595 | -1.155 | 2.5 | 0.428 |
| 11/25/2003 12:25 | 2.7 | 0.615 | -1.135 | 2.6 | 0.421 |
| 11/25/2003 12:26 | 2.8 | 0.635 | -1.115 | 2.7 | 0.413 |
| 11/25/2003 12:26 | 2.9 | 0.655 | -1.095 | 2.8 | 0.406 |
| 11/25/2003 12:26 | 3 | 0.671 | -1.079 | 2.9 | 0.400 |
| 11/25/2003 12:26 | 3.1 | 0.689 | -1.061 | 3 | 0.393 |
| 11/25/2003 12:26 | 3.2 | 0.705 | -1.045 | 3.1 | 0.387 |
| 11/25/2003 12:26 | 3.3 | 0.722 | -1.028 | 3.2 | 0.381 |
| 11/25/2003 12:26 | 3.4 | 0.738 | -1.012 | 3.3 | 0.375 |
| 11/25/2003 12:26 | 3.5 | 0.75 | -1 | 3.4 | 0.371 |
| 11/25/2003 12:26 | 3.6 | 0.766 | -0.984 | 3.5 | 0.365 |
| 11/25/2003 12:26 | 3.7 | 0.78 | -0.97 | 3.6 | 0.360 |
| 11/25/2003 12:27 | 3.8 | 0.792 | -0.958 | 3.7 | 0.355 |
| 11/25/2003 12:27 | 3.9 | 0.804 | -0.946 | 3.8 | 0.351 |
| 11/25/2003 12:27 | 4 | 0.816 | -0.934 | 3.9 | 0.346 |
| 11/25/2003 12:27 | 4.1 | 0.829 | -0.921 | 4 | 0.341 |
| 11/25/2003 12:27 | 4.2 | 0.841 | -0.909 | 4.1 | 0.337 |
| 11/25/2003 12:27 | 4.3 | 0.851 | -0.899 | 4.2 | 0.333 |
| 11/25/2003 12:27 | 4.4 | 0.863 | -0.887 | 4.3 | 0.329 |
| 11/25/2003 12:27 | 4.5 | 0.873 | -0.877 | 4.4 | 0.325 |
| 11/25/2003 12:27 | 4.6 | 0.883 | -0.867 | 4.5 | 0.321 |
| 11/25/2003 12:27 | 4.7 | 0.893 | -0.857 | 4.6 | 0.318 |
| 11/25/2003 12:28 | 4.8 | 0.903 | -0.847 | 4.7 | 0.314 |
| 11/25/2003 12:28 | 4.9 | 0.911 | -0.839 | 4.8 | 0.311 |
| 11/25/2003 12:28 | 5 | 0.919 | -0.831 | 4.9 | 0.308 |
| 11/25/2003 12:28 | 5.1 | 0.929 | -0.821 | 5 | 0.304 |
| 11/25/2003 12:28 | 5.2 | 0.938 | -0.812 | 5.1 | 0.301 |
| 11/25/2003 12:28 | 5.3 | 0.948 | -0.802 | 5.2 | 0.297 |
| 11/25/2003 12:28 | 5.4 | 0.956 | -0.794 | 5.3 | 0.294 |
| 11/25/2003 12:28 | 5.5 | 0.964 | -0.786 | 5.4 | 0.291 |
| 11/25/2003 12:28 | 5.6 | 0.972 | -0.778 | 5.5 | 0.288 |
| 11/25/2003 12:28 | 5.7 | 0.978 | -0.772 | 5.6 | 0.286 |
| 11/25/2003 12:29 | 5.8 | 0.986 | -0.764 | 5.7 | 0.283 |
| 11/25/2003 12:29 | 5.9 | 0.994 | -0.756 | 5.8 | 0.280 |
| 11/25/2003 12:29 | 6 | 1 | -0.75 | 5.9 | 0.278 |
| 11/25/2003 12:29 | 6.1 | 1.008 | -0.742 | 6 | 0.275 |
| 11/25/2003 12:29 | 6.2 | 1.016 | -0.734 | 6.1 | 0.272 |
| 11/25/2003 12:29 | 6.3 | 1.022 | -0.728 | 6.2 | 0.270 |
| 11/25/2003 12:29 | 6.4 | 1.028 | -0.722 | 6.3 | 0.268 |
| 11/25/2003 12:29 | 6.5 | 1.034 | -0.716 | 6.4 | 0.265 |
| 11/25/2003 12:29 | 6.6 | 1.043 | -0.707 | 6.5 | 0.262 |
| 11/25/2003 12:29 | 6.7 | 1.049 | -0.701 | 6.6 | 0.260 |
| 11/25/2003 12:30 | 6.8 | 1.055 | -0.695 | 6.7 | 0.258 |
| 11/25/2003 12:30 | 6.9 | 1.061 | -0.689 | 6.8 | 0.255 |
| 11/25/2003 12:30 | 7 | 1.065 | -0.685 | 6.9 | 0.254 |
| 11/25/2003 12:30 | 7.1 | 1.071 | -0.679 | 7 | 0.252 |
| 11/25/2003 12:30 | 7.2 | 1.077 | -0.673 | 7.1 | 0.250 |
| 11/25/2003 12:30 | 7.3 | 1.083 | -0.667 | 7.2 | 0.247 |
| 11/25/2003 12:30 | 7.4 | 1.089 | -0.661 | 7.3 | 0.245 |
| 11/25/2003 12:30 | 7.5 | 1.095 | -0.655 | 7.4 | 0.243 |
| 11/25/2003 12:30 | 7.6 | 1.101 | -0.649 | 7.5 | 0.241 |
| 11/25/2003 12:30 | 7.7 | 1.107 | -0.643 | 7.6 | 0.238 |
| 11/25/2003 12:31 | 7.8 | 1.111 | -0.639 | 7.7 | 0.237 |
| 11/25/2003 12:31 | 7.9 | 1.115 | -0.635 | 7.8 | 0.235 |
| 11/25/2003 12:31 | 8 | 1.121 | -0.629 | 7.9 | 0.233 |
| 11/25/2003 12:31 | 8.1 | 1.125 | -0.625 | 8 | 0.232 |
| 11/25/2003 12:31 | 8.2 | 1.129 | -0.621 | 8.1 | 0.230 |
| 11/25/2003 12:31 | 8.3 | 1.135 | -0.615 | 8.2 | 0.228 |
| 11/25/2003 12:31 | 8.4 | 1.139 | -0.611 | 8.3 | 0.227 |
| 11/25/2003 12:31 | 8.5 | 1.143 | -0.607 | 8.4 | 0.225 |
| 11/25/2003 12:31 | 8.6 | 1.148 | -0.602 | 8.5 | 0.223 |
| 11/25/2003 12:31 | 8.7 | 1.154 | -0.596 | 8.6 | 0.221 |
| 11/25/2003 12:32 | 8.8 | 1.157 | -0.593 | 8.7 | 0.220 |
| 11/25/2003 12:32 | 8.9 | 1.161 | -0.589 | 8.8 | 0.218 |
| 11/25/2003 12:32 | 9 | 1.165 | -0.585 | 8.9 | 0.217 |

| | | | | | |
|---|---|---|---|---|---|
| 11/25/2003 12:32 | 9.1 | 1.169 | -0.581 | 9 | 0.215 |
| 11/25/2003 12:32 | 9.2 | 1.174 | -0.576 | 9.1 | 0.214 |
| 11/25/2003 12:32 | 9.3 | 1.18 | -0.57 | 9.2 | 0.211 |
| 11/25/2003 12:32 | 9.4 | 1.182 | -0.568 | 9.3 | 0.211 |
| 11/25/2003 12:32 | 9.5 | 1.186 | -0.564 | 9.4 | 0.209 |
| 11/25/2003 12:32 | 9.6 | 1.19 | -0.56 | 9.5 | 0.208 |
| 11/25/2003 12:32 | 9.7 | 1.194 | -0.556 | 9.6 | 0.206 |
| 11/25/2003 12:33 | 9.8 | 1.198 | -0.552 | 9.7 | 0.205 |
| 11/25/2003 12:33 | 9.9 | 1.202 | -0.548 | 9.8 | 0.203 |
| 11/25/2003 12:33 | 10 | 1.206 | -0.544 | 9.9 | 0.202 |
| 11/25/2003 12:34 | 11 | 1.238 | -0.512 | 10.9 | 0.190 |
| 11/25/2003 12:35 | 12 | 1.268 | -0.482 | 11.9 | 0.179 |
| 11/25/2003 12:36 | 13 | 1.296 | -0.454 | 12.9 | 0.168 |
| 11/25/2003 12:37 | 14 | 1.319 | -0.431 | 13.9 | 0.160 |
| 11/25/2003 12:38 | 15 | 1.343 | -0.407 | 14.9 | 0.151 |
| 11/25/2003 12:39 | 16 | 1.361 | -0.389 | 15.9 | 0.144 |
| 11/25/2003 12:40 | 17 | 1.377 | -0.373 | 16.9 | 0.138 |
| 11/25/2003 12:41 | 18 | 1.389 | -0.361 | 17.9 | 0.134 |
| 11/25/2003 12:42 | 19 | 1.397 | -0.353 | 18.9 | 0.131 |
| 11/25/2003 12:43 | 20 | 1.409 | -0.341 | 19.9 | 0.126 |
| 11/25/2003 12:44 | 21 | 1.423 | -0.327 | 20.9 | 0.121 |
| 11/25/2003 12:45 | 22 | 1.435 | -0.315 | 21.9 | 0.117 |
| 11/25/2003 12:46 | 23 | 1.447 | -0.303 | 22.9 | 0.112 |
| 11/25/2003 12:47 | 24 | 1.459 | -0.291 | 23.9 | 0.108 |
| 11/25/2003 12:48 | 25 | 1.47 | -0.28 | 24.9 | 0.104 |
| 11/25/2003 12:49 | 26 | 1.478 | -0.272 | 25.9 | 0.101 |
| 11/25/2003 12:50 | 27 | 1.486 | -0.264 | 26.9 | 0.098 |
| 11/25/2003 12:51 | 28 | 1.492 | -0.258 | 27.9 | 0.096 |
| 11/25/2003 12:52 | 29 | 1.502 | -0.248 | 28.9 | 0.092 |
| 11/25/2003 12:53 | 30 | 1.508 | -0.242 | 29.9 | 0.090 |
| 11/25/2003 12:54 | 31 | 1.514 | -0.236 | 30.9 | 0.088 |
| 11/25/2003 12:55 | 32 | 1.518 | -0.232 | 31.9 | 0.086 |
| 11/25/2003 12:56 | 33 | 1.523 | -0.227 | 32.9 | 0.084 |
| 11/25/2003 12:57 | 34 | 1.529 | -0.221 | 33.9 | 0.082 |
| 11/25/2003 12:58 | 35 | 1.533 | -0.217 | 34.9 | 0.080 |
| 11/25/2003 12:59 | 36 | 1.538 | -0.212 | 35.9 | 0.079 |
| 11/25/2003 13:00 | 37 | 1.542 | -0.208 | 36.9 | 0.077 |
| 11/25/2003 13:01 | 38 | 1.547 | -0.203 | 37.9 | 0.075 |
| 11/25/2003 13:02 | 39 | 1.551 | -0.199 | 38.9 | 0.074 |
| 11/25/2003 13:03 | 40 | 1.555 | -0.195 | 39.9 | 0.072 |
| 11/25/2003 13:04 | 41 | 1.557 | -0.193 | 40.9 | 0.072 |
| 11/25/2003 13:05 | 42 | 1.561 | -0.189 | 41.9 | 0.070 |
| 11/25/2003 13:06 | 43 | 1.563 | -0.187 | 42.9 | 0.069 |
| 11/25/2003 13:07 | 44 | 1.567 | -0.183 | 43.9 | 0.068 |
| 11/25/2003 13:08 | 45 | 1.571 | -0.179 | 44.9 | 0.066 |
| 11/25/2003 13:09 | 46 | 1.573 | -0.177 | 45.9 | 0.066 |
| 11/25/2003 13:10 | 47 | 1.573 | -0.177 | 46.9 | 0.066 |
| 11/25/2003 13:11 | 48 | 1.575 | -0.175 | 47.9 | 0.065 |
| 11/25/2003 13:12 | 49 | 1.577 | -0.173 | 48.9 | 0.064 |
| 11/25/2003 13:13 | 50 | 1.58 | -0.17 | 49.9 | 0.063 |
| 11/25/2003 13:14 | 51 | 1.584 | -0.166 | 50.9 | 0.062 |
| 11/25/2003 13:15 | 52 | 1.586 | -0.164 | 51.9 | 0.061 |
| 11/25/2003 13:16 | 53 | 1.588 | -0.162 | 52.9 | 0.060 |
| 11/25/2003 13:17 | 54 | 1.59 | -0.16 | 53.9 | 0.059 |
| 11/25/2003 13:18 | 55 | 1.59 | -0.16 | 54.9 | 0.059 |
| 11/25/2003 13:19 | 56 | 1.59 | -0.16 | 55.9 | 0.059 |
| 11/25/2003 13:20 | 57 | 1.592 | -0.158 | 56.9 | 0.059 |
| 11/25/2003 13:21 | 58 | 1.594 | -0.156 | 57.9 | 0.058 |
| 11/25/2003 13:22 | 59 | 1.596 | -0.154 | 58.9 | 0.057 |
| 11/25/2003 13:23 | 60 | 1.598 | -0.152 | 59.9 | 0.056 |
| 11/25/2003 13:24 | 61 | 1.6 | -0.15 | 60.9 | 0.056 |
| 11/25/2003 13:25 | 62 | 1.6 | -0.15 | 61.9 | 0.056 |
| 11/25/2003 13:26 | 63 | 1.606 | -0.144 | 62.9 | 0.053 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT47 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 25-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083" | 1 = r |
| Effective Radius of Well Screen (in.) : | .166" | 2 = R |
| Length of Well Screen (ft.) : | | 15 = L |
| Time for 37% head change (min.) : | | 5.45 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.91E-04 | ft./min. |
| 3.19E-06 | ft./sec. |
| 2.75E-01 | ft./day |
| 9.71E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(15/.166)}{2 \times 15 \times 5.45} =$$

$1.90 \times 10^{-4}$ Ft/min

CHECKED
MK
2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT47 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 25-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 2 = R |
| Length of Well Screen (ft.) : | 15 = L |
| Time for 37% head change (min.) : | 3.55 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 2.93E-04 | ft./min. |
| 4.89E-06 | ft./sec. |
| 4.23E-01 | ft./day |
| 1.49E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

Tetra Tech NUS, Inc.

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 13MWT47

PROJECT NO.: 9060 GEOLOGIST: M. G. COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 2

STATIC WATER LEVEL (Depth/Elevation): 6.56 TOC DATE: 11-25-03

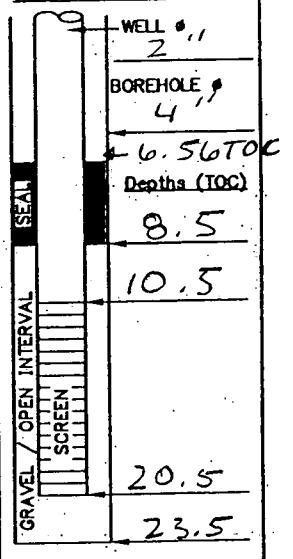
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: SOLID SLUG PAGE 1 OF 1

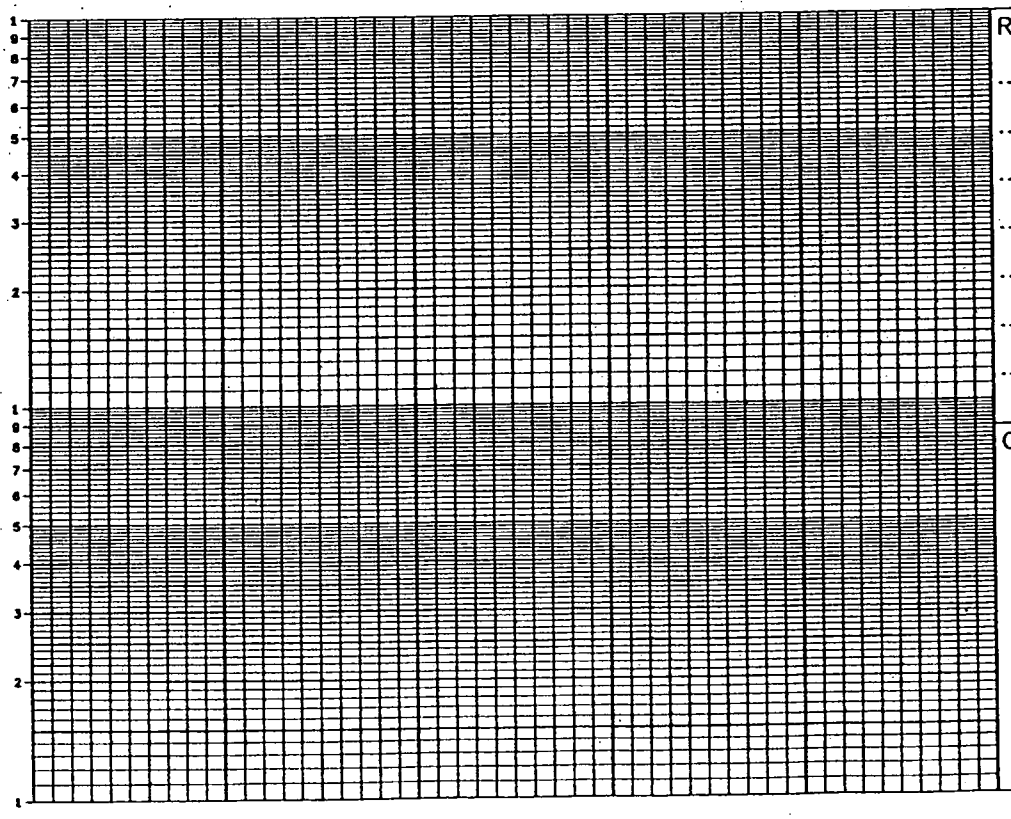
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC, ZERO AT SWL + START

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 0 | | 2 | 3.229 | |
| .1 | 1.762 | | 3 | 3.465 | |
| .2 | 1.980 | | 4 | 3.616 | |
| .3 | 2.135 | | 5 | 3.723 | |
| .4 | 2.266 | | 6 | 3.806 | |
| .5 | 2.375 | | 10 | 4.013 | |
| .6 | 2.473 | | 20 | 4.229 | |
| .7 | 2.560 | | 30 | 4.319 | |
| .8 | 2.641 | | 40 | 4.359 | |
| .9 | 2.714 | | | | |
| 1.0 | 2.782 | | | | |
| 1.5 | 3.046 | | | | |

WELL SCHEMATIC



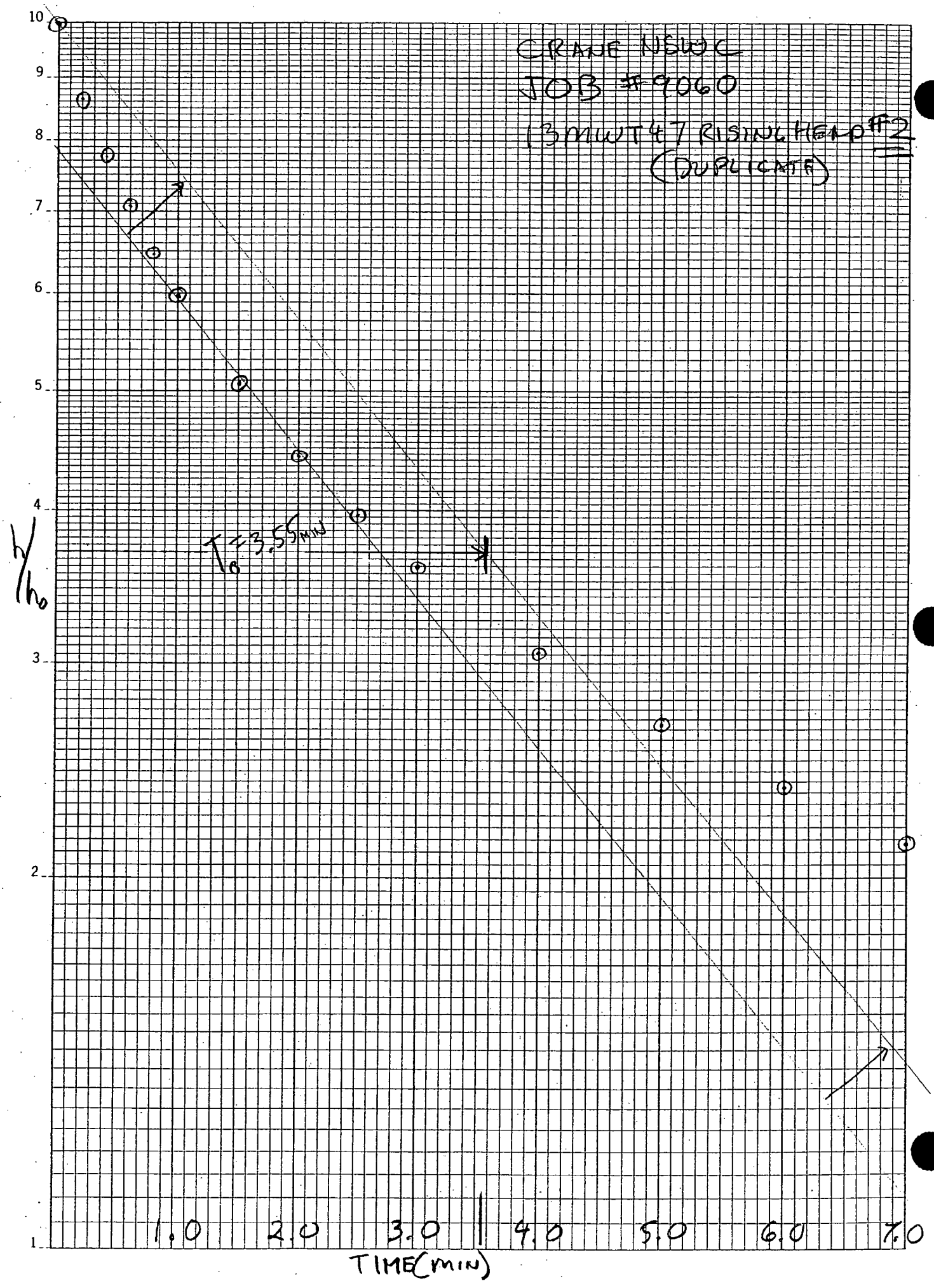

▽ Indicate SWL Depth on Drawing



REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 12/9/2003 14:11:30
Report from file: H:\Crane IN\SWMU13_16\MGC slug tests 03\site 13\SN06899 2003-11-25 150151 13MWT47rising#2.bin
DataMgr Version 3.68

Serial number: 6899
Firmware Version 3.07
Unit name:

Test name: 13MWT47rising#2

Test defined on: 11/25/2003 15:01:28
Test started on: 11/25/2003 15:01:51
Test stopped on: 11/25/2003 15:46:35
Test extracted on: N/A

Data gathered using Linear testing
Time between data points: Minutes.
Number of data samples: 448

TOTAL DATA SAMPLES 448

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at reference: 9.337 Feet H2O

• = PLOTTED DATA

ho = -2.688

| Date | Time | ET (min) | Chan[2] Feet H2O | corrected feet h20 | Adjusted ET. (min) | h/ho |
|---|---|---|---|---|---|---|
| | 11/25/2003 15:01 | 0 | 0 | | | |
| | 11/25/2003 15:01 | 0.1 | 1.762 | -2.688 | 0 | 1.000 • |
| | 11/25/2003 15:02 | 0.2 | 1.98 | -2.47 | 0.1 | 0.919 |
| | 11/25/2003 15:02 | 0.3 | 2.135 | -2.315 | 0.2 | 0.861 • |
| | 11/25/2003 15:02 | 0.4 | 2.266 | -2.184 | 0.3 | 0.813 |
| | 11/25/2003 15:02 | 0.5 | 2.375 | -2.075 | 0.4 | 0.772 • |
| | 11/25/2003 15:02 | 0.6 | 2.473 | -1.977 | 0.5 | 0.735 |
| | 11/25/2003 15:02 | 0.7 | 2.56 | -1.89 | 0.6 | 0.703 • |
| | 11/25/2003 15:02 | 0.8 | 2.641 | -1.809 | 0.7 | 0.673 |
| | 11/25/2003 15:02 | 0.9 | 2.714 | -1.736 | 0.8 | 0.646 • |
| | 11/25/2003 15:02 | 1 | 2.782 | -1.668 | 0.9 | 0.621 |
| | 11/25/2003 15:02 | 1.1 | 2.843 | -1.607 | 1 | 0.598 • |
| | 11/25/2003 15:03 | 1.2 | 2.901 | -1.549 | 1.1 | 0.576 |
| | 11/25/2003 15:03 | 1.3 | 2.951 | -1.499 | 1.2 | 0.558 |
| | 11/25/2003 15:03 | 1.4 | 3 | -1.45 | 1.3 | 0.539 |
| | 11/25/2003 15:03 | 1.5 | 3.046 | -1.404 | 1.4 | 0.522 |
| | 11/25/2003 15:03 | 1.6 | 3.088 | -1.362 | 1.5 | 0.507 • |
| | 11/25/2003 15:03 | 1.7 | 3.127 | -1.323 | 1.6 | 0.492 |
| | 11/25/2003 15:03 | 1.8 | 3.161 | -1.289 | 1.7 | 0.480 |
| | 11/25/2003 15:03 | 1.9 | 3.197 | -1.253 | 1.8 | 0.466 |
| | 11/25/2003 15:03 | 2 | 3.229 | -1.221 | 1.9 | 0.454 |
| | 11/25/2003 15:03 | 2.1 | 3.258 | -1.192 | 2 | 0.443 • |
| | 11/25/2003 15:04 | 2.2 | 3.288 | -1.162 | 2.1 | 0.432 |
| | 11/25/2003 15:04 | 2.3 | 3.326 | -1.124 | 2.2 | 0.418 |
| | 11/25/2003 15:04 | 2.4 | 3.34 | -1.11 | 2.3 | 0.413 |
| | 11/25/2003 15:04 | 2.5 | 3.362 | -1.088 | 2.4 | 0.405 |

| | | | | | |
|---|---|---|---|---|---|
| 11/25/2003 15:04 | 2.6 | 3.385 | -1.065 | 2.5 | 0.396 |
| 11/25/2003 15:04 | 2.7 | 3.409 | -1.041 | 2.6 | 0.387 |
| 11/25/2003 15:04 | 2.8 | 3.427 | -1.023 | 2.7 | 0.381 |
| 11/25/2003 15:04 | 2.9 | 3.447 | -1.003 | 2.8 | 0.373 |
| 11/25/2003 15:04 | 3 | 3.465 | -0.985 | 2.9 | 0.366 |
| 11/25/2003 15:04 | 3.1 | 3.483 | -0.967 | 3 | 0.360 |
| 11/25/2003 15:05 | 3.2 | 3.504 | -0.946 | 3.1 | 0.352 |
| 11/25/2003 15:05 | 3.3 | 3.518 | -0.932 | 3.2 | 0.347 |
| 11/25/2003 15:05 | 3.4 | 3.534 | -0.916 | 3.3 | 0.341 |
| 11/25/2003 15:05 | 3.5 | 3.548 | -0.902 | 3.4 | 0.336 |
| 11/25/2003 15:05 | 3.6 | 3.562 | -0.888 | 3.5 | 0.330 |
| 11/25/2003 15:05 | 3.7 | 3.576 | -0.874 | 3.6 | 0.325 |
| 11/25/2003 15:05 | 3.8 | 3.59 | -0.86 | 3.7 | 0.320 |
| 11/25/2003 15:05 | 3.9 | 3.604 | -0.846 | 3.8 | 0.315 |
| 11/25/2003 15:05 | 4 | 3.616 | -0.834 | 3.9 | 0.310 |
| 11/25/2003 15:05 | 4.1 | 3.628 | -0.822 | 4 | 0.306 |
| 11/25/2003 15:06 | 4.2 | 3.641 | -0.809 | 4.1 | 0.301 |
| 11/25/2003 15:06 | 4.3 | 3.651 | -0.799 | 4.2 | 0.297 |
| 11/25/2003 15:06 | 4.4 | 3.663 | -0.787 | 4.3 | 0.293 |
| 11/25/2003 15:06 | 4.5 | 3.673 | -0.777 | 4.4 | 0.289 |
| 11/25/2003 15:06 | 4.6 | 3.683 | -0.767 | 4.5 | 0.285 |
| 11/25/2003 15:06 | 4.7 | 3.693 | -0.757 | 4.6 | 0.282 |
| 11/25/2003 15:06 | 4.8 | 3.703 | -0.747 | 4.7 | 0.278 |
| 11/25/2003 15:06 | 4.9 | 3.713 | -0.737 | 4.8 | 0.274 |
| 11/25/2003 15:06 | 5 | 3.723 | -0.727 | 4.9 | 0.270 |
| 11/25/2003 15:06 | 5.1 | 3.731 | -0.719 | 5 | 0.267 |
| 11/25/2003 15:07 | 5.2 | 3.743 | -0.707 | 5.1 | 0.263 |
| 11/25/2003 15:07 | 5.3 | 3.751 | -0.699 | 5.2 | 0.260 |
| 11/25/2003 15:07 | 5.4 | 3.759 | -0.691 | 5.3 | 0.257 |
| 11/25/2003 15:07 | 5.5 | 3.768 | -0.682 | 5.4 | 0.254 |
| 11/25/2003 15:07 | 5.6 | 3.776 | -0.674 | 5.5 | 0.251 |
| 11/25/2003 15:07 | 5.7 | 3.784 | -0.666 | 5.6 | 0.248 |
| 11/25/2003 15:07 | 5.8 | 3.792 | -0.658 | 5.7 | 0.245 |
| 11/25/2003 15:07 | 5.9 | 3.798 | -0.652 | 5.8 | 0.243 |
| 11/25/2003 15:07 | 6 | 3.806 | -0.644 | 5.9 | 0.240 |
| 11/25/2003 15:07 | 6.1 | 3.814 | -0.636 | 6 | 0.237 |
| 11/25/2003 15:08 | 6.2 | 3.82 | -0.63 | 6.1 | 0.234 |
| 11/25/2003 15:08 | 6.3 | 3.828 | -0.622 | 6.2 | 0.231 |
| 11/25/2003 15:08 | 6.4 | 3.834 | -0.616 | 6.3 | 0.229 |
| 11/25/2003 15:08 | 6.5 | 3.842 | -0.608 | 6.4 | 0.226 |
| 11/25/2003 15:08 | 6.6 | 3.85 | -0.6 | 6.5 | 0.223 |
| 11/25/2003 15:08 | 6.7 | 3.854 | -0.596 | 6.6 | 0.222 |
| 11/25/2003 15:08 | 6.8 | 3.862 | -0.588 | 6.7 | 0.219 |
| 11/25/2003 15:08 | 6.9 | 3.868 | -0.582 | 6.8 | 0.217 |
| 11/25/2003 15:08 | 7 | 3.872 | -0.578 | 6.9 | 0.215 |
| 11/25/2003 15:08 | 7.1 | 3.878 | -0.572 | 7 | 0.213 |
| 11/25/2003 15:09 | 7.2 | 3.884 | -0.566 | 7.1 | 0.211 |
| 11/25/2003 15:09 | 7.3 | 3.89 | -0.56 | 7.2 | 0.208 |
| 11/25/2003 15:09 | 7.4 | 3.899 | -0.551 | 7.3 | 0.205 |
| 11/25/2003 15:09 | 7.5 | 3.903 | -0.547 | 7.4 | 0.203 |
| 11/25/2003 15:09 | 7.6 | 3.909 | -0.541 | 7.5 | 0.201 |
| 11/25/2003 15:09 | 7.7 | 3.915 | -0.535 | 7.6 | 0.199 |
| 11/25/2003 15:09 | 7.8 | 3.919 | -0.531 | 7.7 | 0.198 |
| 11/25/2003 15:09 | 7.9 | 3.921 | -0.529 | 7.8 | 0.197 |
| 11/25/2003 15:09 | 8 | 3.929 | -0.521 | 7.9 | 0.194 |
| 11/25/2003 15:09 | 8.1 | 3.933 | -0.517 | 8 | 0.192 |
| 11/25/2003 15:10 | 8.2 | 3.939 | -0.511 | 8.1 | 0.190 |
| 11/25/2003 15:10 | 8.3 | 3.943 | -0.507 | 8.2 | 0.189 |
| 11/25/2003 15:10 | 8.4 | 3.949 | -0.501 | 8.3 | 0.186 |
| 11/25/2003 15:10 | 8.5 | 3.951 | -0.499 | 8.4 | 0.186 |
| 11/25/2003 15:10 | 8.6 | 3.957 | -0.493 | 8.5 | 0.183 |
| 11/25/2003 15:10 | 8.7 | 3.961 | -0.489 | 8.6 | 0.182 |
| 11/25/2003 15:10 | 8.8 | 3.965 | -0.485 | 8.7 | 0.180 |
| 11/25/2003 15:10 | 8.9 | 3.971 | -0.479 | 8.8 | 0.178 |
| 11/25/2003 15:10 | 9 | 3.975 | -0.475 | 8.9 | 0.177 |

| | | | | | |
|---|---|---|---|---|---|
| 11/25/2003 15:10 | 9.1 | 3.979 | -0.471 | 9 | 0.175 |
| 11/25/2003 15:11 | 9.2 | 3.983 | -0.467 | 9.1 | 0.174 |
| 11/25/2003 15:11 | 9.3 | 3.985 | -0.465 | 9.2 | 0.173 |
| 11/25/2003 15:11 | 9.4 | 3.991 | -0.459 | 9.3 | 0.171 |
| 11/25/2003 15:11 | 9.5 | 3.993 | -0.457 | 9.4 | 0.170 |
| 11/25/2003 15:11 | 9.6 | 3.999 | -0.451 | 9.5 | 0.168 |
| 11/25/2003 15:11 | 9.7 | 4.003 | -0.447 | 9.6 | 0.166 |
| 11/25/2003 15:11 | 9.8 | 4.005 | -0.445 | 9.7 | 0.166 |
| 11/25/2003 15:11 | 9.9 | 4.011 | -0.439 | 9.8 | 0.163 |
| 11/25/2003 15:11 | 10 | 4.013 | -0.437 | 9.9 | 0.163 |
| 11/25/2003 15:12 | 11 | 4.05 | -0.4 | 10.9 | 0.149 |
| 11/25/2003 15:13 | 12 | 4.08 | -0.37 | 11.9 | 0.138 |
| 11/25/2003 15:14 | 13 | 4.108 | -0.342 | 12.9 | 0.127 |
| 11/25/2003 15:15 | 14 | 4.13 | -0.32 | 13.9 | 0.119 |
| 11/25/2003 15:16 | 15 | 4.152 | -0.298 | 14.9 | 0.111 |
| 11/25/2003 15:17 | 16 | 4.17 | -0.28 | 15.9 | 0.104 |
| 11/25/2003 15:18 | 17 | 4.186 | -0.264 | 16.9 | 0.098 |
| 11/25/2003 15:19 | 18 | 4.203 | -0.247 | 17.9 | 0.092 |
| 11/25/2003 15:20 | 19 | 4.217 | -0.233 | 18.9 | 0.087 |
| 11/25/2003 15:21 | 20 | 4.229 | -0.221 | 19.9 | 0.082 |
| 11/25/2003 15:22 | 21 | 4.241 | -0.209 | 20.9 | 0.078 |
| 11/25/2003 15:23 | 22 | 4.253 | -0.197 | 21.9 | 0.073 |
| 11/25/2003 15:24 | 23 | 4.263 | -0.187 | 22.9 | 0.070 |
| 11/25/2003 15:25 | 24 | 4.273 | -0.177 | 23.9 | 0.066 |
| 11/25/2003 15:26 | 25 | 4.283 | -0.167 | 24.9 | 0.062 |
| 11/25/2003 15:27 | 26 | 4.291 | -0.159 | 25.9 | 0.059 |
| 11/25/2003 15:28 | 27 | 4.299 | -0.151 | 26.9 | 0.056 |
| 11/25/2003 15:29 | 28 | 4.305 | -0.145 | 27.9 | 0.054 |
| 11/25/2003 15:30 | 29 | 4.311 | -0.139 | 28.9 | 0.052 |
| 11/25/2003 15:31 | 30 | 4.319 | -0.131 | 29.9 | 0.049 |
| 11/25/2003 15:32 | 31 | 4.324 | -0.126 | 30.9 | 0.047 |
| 11/25/2003 15:33 | 32 | 4.33 | -0.12 | 31.9 | 0.045 |
| 11/25/2003 15:34 | 33 | 4.336 | -0.114 | 32.9 | 0.042 |
| 11/25/2003 15:35 | 34 | 4.338 | -0.112 | 33.9 | 0.042 |
| 11/25/2003 15:36 | 35 | 4.344 | -0.106 | 34.9 | 0.039 |
| 11/25/2003 15:37 | 36 | 4.346 | -0.104 | 35.9 | 0.039 |
| 11/25/2003 15:38 | 37 | 4.351 | -0.099 | 36.9 | 0.037 |
| 11/25/2003 15:39 | 38 | 4.351 | -0.099 | 37.9 | 0.037 |
| 11/25/2003 15:40 | 39 | 4.355 | -0.095 | 38.9 | 0.035 |
| 11/25/2003 15:41 | 40 | 4.359 | -0.091 | 39.9 | 0.034 |
| 11/25/2003 15:42 | 41 | 4.359 | -0.091 | 40.9 | 0.034 |
| 11/25/2003 15:43 | 42 | 4.362 | -0.088 | 41.9 | 0.033 |
| 11/25/2003 15:44 | 43 | 4.366 | -0.084 | 42.9 | 0.031 |
| 11/25/2003 15:45 | 44 | 4.393 | -0.057 | 43.9 | 0.021 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT47 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 25-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .166 | 2 = R |
| Length of Well Screen (ft.) : | | 15 = L |
| Time for 37% head change (min.) : | | 3.55 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 2.93E-04 | ft./min. |
| 4.89E-06 | ft./sec. |
| 4.23E-01 | ft./day |
| 1.49E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(.158/.166)}{2 \times 15 \times 3.55}$$

$2.91 \times 10^{-4}$ FT/MIN

CHECKED
2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT45 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 21-Jan-04 |

**Done By:** FWRamser
**Checked By:**

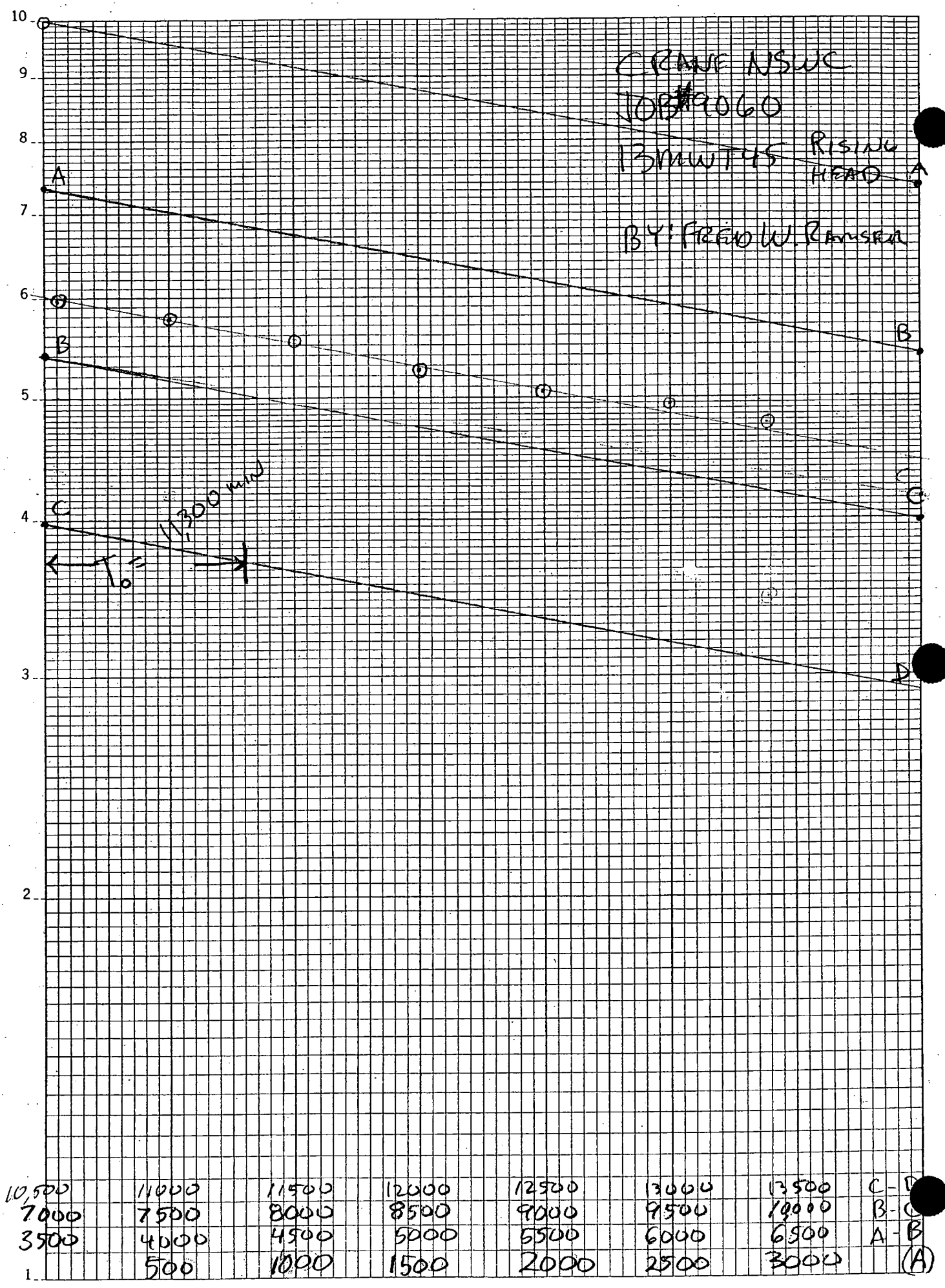
| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 2.5 | = R |
| Length of Well Screen (ft.) : | 13.45 | = L |
| Time for 37% head change (min.) : | 11300 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 9.52E-08 | ft./min. |
| 1.59E-09 | ft./sec. |
| 1.37E-04 | ft./day |
| 4.84E-08 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

Tetra Tech NUS, Inc.

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 13MWT45

PROJECT NO.: 9060 GEOLOGIST: FRED W. RAMSER

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10', 72.14-82.14 TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 72.69 DATE: 1-20-04

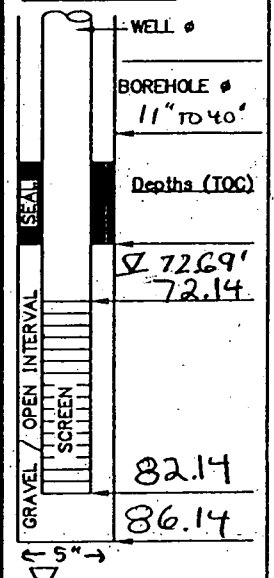
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

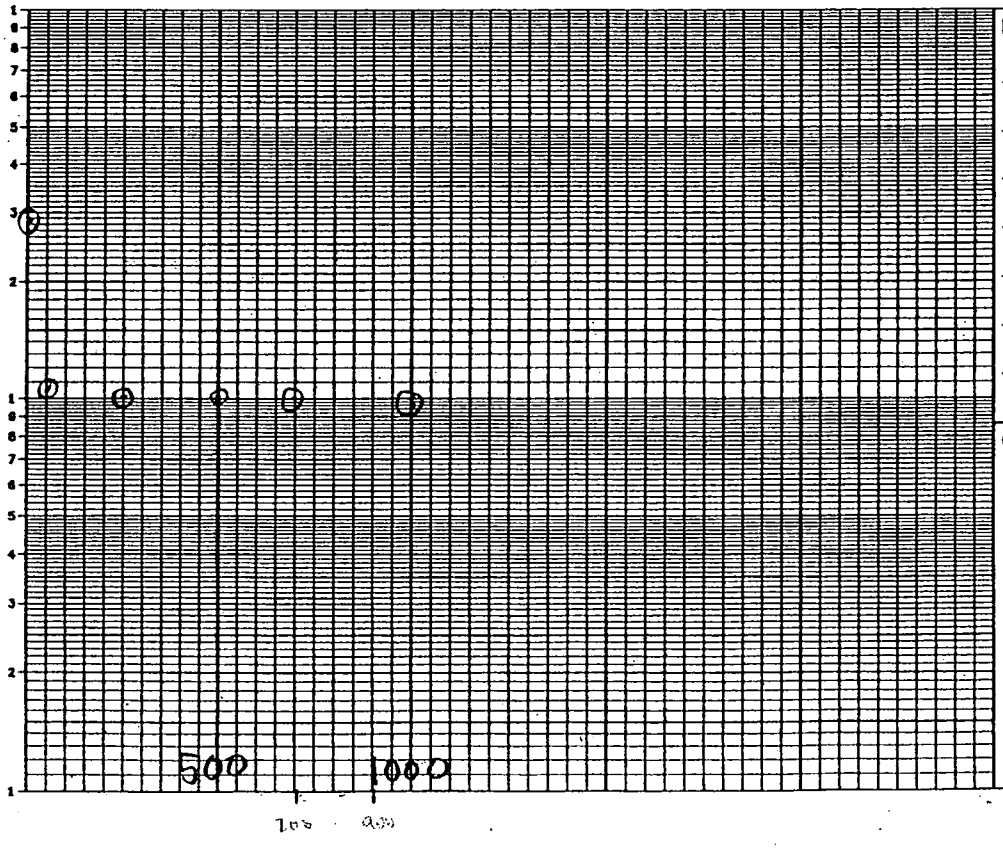
METHOD OF INDUCING WATER LEVEL CHANGE: 1 L BAILER x 2 ⇒ ~3' DISPLACEMENT PAGE ..... OF .....

REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): WATER SURFACE 00.0=REF

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0.0 | 2.916 | | 10 | | 1.077 |
| 50 | 1.067 | | 20 | | 1.088 |
| 250 | 1.04 | | | | |
| 500 | 1.034 | | | | |
| 700 | 0.997 | | | | |
| 1000 | 0.992 | | | | |
| 1500 | 0.939 | | | | |
| 2000 | 0.902 | | | | |
| 2500 | 0.886 | | | | |
| 2897 | 0.849 | | | | |
| | | | | | |
| | | | | | |

WELL SCHEMATIC




REMARKS:

WL @ XD = 9.553

INSERTED BAILERS

@ 1455 XD = 9.892

1717 XD = 9.813

1736 XD = 9.813

START TEST @ 1740

STOP TEST @ 1800

1-22-04

CALCS, SKETCH MAPS, ETC.:

9.813

9.553

.260

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL

WELL NO.: 13MWT45

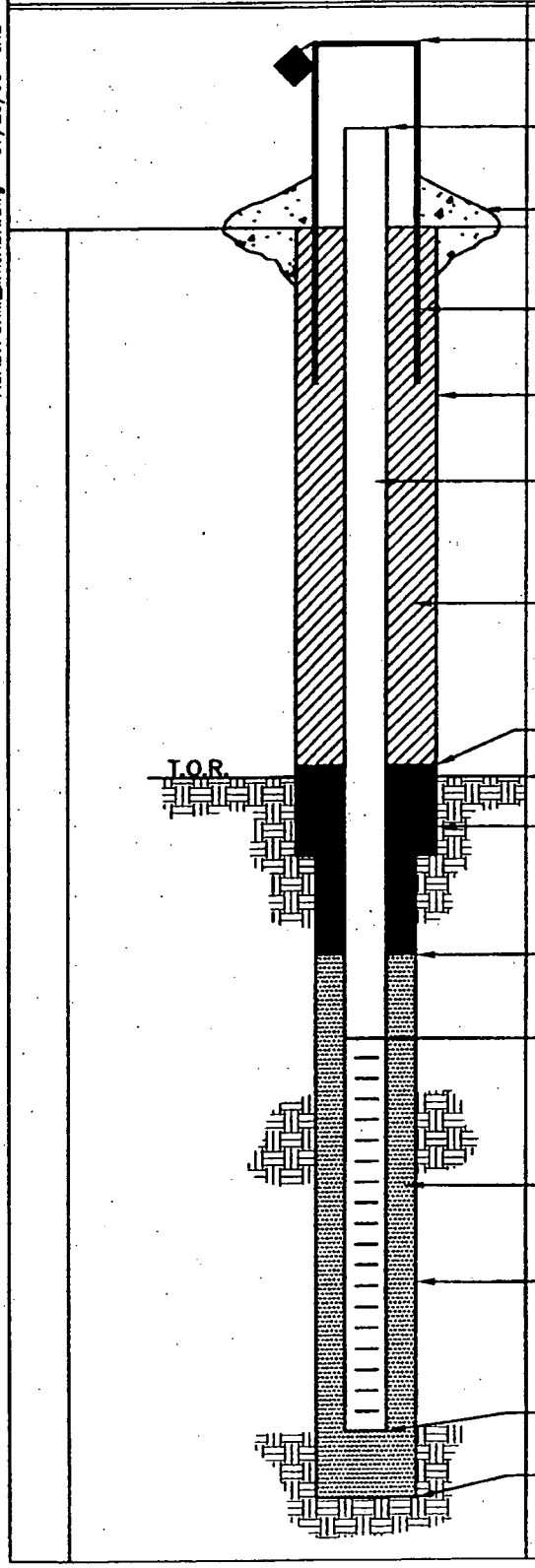
Tetra Tech NUS, Inc.

# BEDROCK MONITORING WELL SHEET WELL INSTALLED IN BEDROCK

PROJECT CRANE NSWC
PROJECT NO. 9060
DATE BEGUN 10-27-03
FIELD GEOLOGIST FRED W. RAMSER
GROUND ELEVATION _____

LOCATION SWMU 13
BORING 13MWT45
DATE COMPLETED 11-10-03
DATUM _____

DRILLER JON KEUFFER
DRILLING METHOD ROTA-SONIC
DEVELOPMENT METHOD _____




ELEVATION/HEIGHT OF TOP OF SURFACE CASING: ~~13.0~~ 1.8

ELEVATION/HEIGHT TOP OF RISER: ~~12.5~~ 1.8

TYPE OF SURFACE SEAL: CONCRETE 4' x 4' x 6"

I.D. OF SURFACE CASING: 4" x 4" SQ

DIAMETER OF HOLE: 11"

RISER PIPE I.D.: 2"
TYPE OF RISER PIPE: SCH. 40 PVC

TYPE OF BACKFILL: BENTONITE "PURE GOLD" CETCO. 6" ISOLATION CASING INSTALLED USING CEMENT/BENTONITE GROUT TO 39'

ELEVATION/DEPTH TOP OF SEAL: 15'

ELEVATION/DEPTH TOP OF BEDROCK: 10'

TYPE OF SEAL: BENTONITE "PURE GOLD" CHIPS CETCO

ELEVATION/DEPTH TOP OF SAND: 167

ELEVATION/DEPTH TOP OF SCREEN: 170
TYPE OF SCREEN: PVC SCH. 40
SLOT SIZE x LENGTH: 0.02 x 10'
I.D. SCREEN: 2"

TYPE OF SAND PACK: QTZ SAND 10/30 SEP / 18B

DIAMETER OF HOLE IN BEDROCK: 5"
CORE/REAM: CORE

ELEVATION/DEPTH BOTTOM SCREEN: 180
ELEVATION/DEPTH BOTTOM OF SAND: 184
ELEVATION/DEPTH BOTTOM OF HOLE: 184
BACKFILL MATERIAL BELOW SAND: NONE

ACAD: FORM_MWINBR.dwg 07/20/99 INL

In-Situ Inc. MiniTroll Pro

Report generated: 1/22/2004 21:31:28
Report from file: ...\SN12487 2004-01-20 173850 13mwt45r1.bin
Win-Situ Version 4.41

Serial number: 12487
Firmware Version 3.07
Unit name:

Test name: 13mwt45r1

Test defined on: 1/20/2004 13:21:03
Test started on: 1/20/2004 17:38:50
Test stopped on: 1/22/2004 18:01:02
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time betwee Minutes.
Number of data sampl 423

TOTAL DATA SAMPLES 423

Channel number [1]
Measurement type: Temperature
Channel name:

Channel number [2]
Measurement type: Pressure
Channel name: Water level
Sensor Range: 100 PSIG.
Specific gravity: 1
Mode: TOC
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at refere 9.818 Feet H2O

ho = 1.785

| Date | Time | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho |
|---|---|---|---|---|---|---|
| 1/20/2004 | 17:38:50 | 0 | 57.07 | 0 | | |
| 1/20/2004 | 17:38:50 | 0.005 | 57.09 | -0.005 | | |
| 1/20/2004 | 17:38:51 | 0.01 | 57.09 | -0.01 | | |
| 1/20/2004 | 17:38:51 | 0.015 | 57.11 | -0.015 | | |
| 1/20/2004 | 17:38:51 | 0.02 | 57.11 | -0.015 | | |
| 1/20/2004 | 17:38:52 | 0.025 | 57.11 | -0.015 | | |
| 1/20/2004 | 17:38:52 | 0.03 | 57.14 | -0.014 | | |
| 1/20/2004 | 17:38:52 | 0.035 | 57.14 | -0.019 | | |
| 1/20/2004 | 17:38:53 | 0.04 | 57.14 | -0.014 | | |
| 1/20/2004 | 17:38:53 | 0.045 | 57.14 | -0.019 | | |
| 1/20/2004 | 17:38:53 | 0.05 | 57.14 | -0.014 | | |
| 1/20/2004 | 17:38:53 | 0.055 | 57.14 | 0.229 | | |
| 1/20/2004 | 17:38:54 | 0.06 | 57.16 | -0.319 | | |
| 1/20/2004 | 17:38:54 | 0.065 | 57.16 | 0.018 | | |
| 1/20/2004 | 17:38:54 | 0.07 | 57.16 | 1.016 | | |
| 1/20/2004 | 17:38:55 | 0.075 | 57.16 | 6.167 | | |
| 1/20/2004 | 17:38:55 | 0.08 | 57.16 | 6.652 | | |
| 1/20/2004 | 17:38:55 | 0.085 | 57.16 | 6.304 | | |
| 1/20/2004 | 17:38:56 | 0.09 | 57.16 | 1.512 | | |
| 1/20/2004 | 17:38:56 | 0.095 | 57.16 | 3.554 | | |
| 1/20/2004 | 17:38:56 | 0.1 | 57.16 | 3.18 | | |
| 1/20/2004 | 17:38:56 | 0.1058 | 57.16 | 3.138 | | |
| 1/20/2004 | 17:38:57 | 0.112 | 57.18 | 3.101 | | |
| 1/20/2004 | 17:38:57 | 0.1185 | 57.16 | 3.016 | | |
| 1/20/2004 | 17:38:58 | 0.1255 | 57.18 | 2.916 | | |
| 1/20/2004 | 17:38:58 | 0.1328 | 57.16 | 2.847 | | |
| 1/20/2004 | 17:38:59 | 0.1407 | 57.18 | 2.774 | | |
| 1/20/2004 | 17:38:59 | 0.149 | 57.18 | 2.721 | | |
| 1/20/2004 | 17:39:00 | 0.1578 | 57.18 | 2.658 | | |
| 1/20/2004 | 17:39:00 | 0.1672 | 57.16 | 2.589 | | |
| 1/20/2004 | 17:39:01 | 0.177 | 57.16 | 2.457 | | |
| 1/20/2004 | 17:39:01 | 0.1875 | 57.16 | 2.346 | | |
| 1/20/2004 | 17:39:02 | 0.1985 | 57.16 | 2.256 | | |
| 1/20/2004 | 17:39:03 | 0.2102 | 57.14 | 2.203 | | |
| 1/20/2004 | 17:39:03 | 0.2227 | 57.14 | 2.092 | | |
| 1/20/2004 | 17:39:04 | 0.2358 | 57.14 | 2.034 | | |
| 1/20/2004 | 17:39:05 | 0.2498 | 57.14 | 1.928 | | |
| 1/20/2004 | 17:39:06 | 0.2647 | 57.14 | 1.839 | | |
| 1/20/2004 | 17:39:07 | 0.2803 | 57.11 | 1.896 | | |
| 1/20/2004 | 17:39:08 | 0.297 | 57.11 | 1.785 | 0 | 1.000 |
| 1/20/2004 | 17:39:09 | 0.3147 | 57.11 | 1.764 | 0.1377 | 0.988 |

t Δh

13mwt45r1

| | | | | | | |
|---|---|---|---|---|---|---|
| 1/20/2004 | 17:39:10 | 0.3333 | 57.11 | 1.69 | 0.1563 | 0.947 |
| 1/20/2004 | 17:39:11 | 0.3532 | 57.11 | 1.653 | 0.1762 | 0.926 |
| 1/20/2004 | 17:39:13 | 0.3742 | 57.11 | 1.627 | 0.1972 | 0.911 |
| 1/20/2004 | 17:39:14 | 0.3963 | 57.11 | 1.595 | 0.2193 | 0.894 |
| 1/20/2004 | 17:39:15 | 0.4198 | 57.11 | 1.564 | 0.2428 | 0.876 |
| 1/20/2004 | 17:39:17 | 0.4447 | 57.11 | 1.532 | 0.2677 | 0.858 |
| 1/20/2004 | 17:39:18 | 0.4697 | 57.11 | 1.511 | 0.2927 | 0.846 |
| 1/20/2004 | 17:39:20 | 0.4963 | 57.11 | 1.479 | 0.3193 | 0.829 |
| 1/20/2004 | 17:39:22 | 0.5247 | 57.11 | 1.432 | 0.3477 | 0.802 |
| 1/20/2004 | 17:39:23 | 0.5547 | 57.11 | 1.41 | 0.3777 | 0.790 |
| 1/20/2004 | 17:39:25 | 0.5863 | 57.11 | 1.384 | 0.4093 | 0.775 |
| 1/20/2004 | 17:39:27 | 0.6213 | 57.11 | 1.358 | 0.4443 | 0.761 |
| 1/20/2004 | 17:39:30 | 0.658 | 57.11 | 1.347 | 0.481 | 0.755 |
| 1/20/2004 | 17:39:32 | 0.6963 | 57.09 | 1.32 | 0.5193 | 0.739 |
| 1/20/2004 | 17:39:34 | 0.738 | 57.11 | 1.279 | 0.561 | 0.717 |
| 1/20/2004 | 17:39:37 | 0.7813 | 57.09 | 1.262 | 0.6043 | 0.707 |
| 1/20/2004 | 17:39:40 | 0.828 | 57.09 | 1.241 | 0.651 | 0.695 |
| 1/20/2004 | 17:39:43 | 0.8763 | 57.09 | 1.236 | 0.6993 | 0.692 |
| 1/20/2004 | 17:39:46 | 0.928 | 57.09 | 1.22 | 0.751 | 0.683 |
| 1/20/2004 | 17:39:49 | 0.983 | 57.09 | 1.209 | 0.806 | 0.677 |
| 1/20/2004 | 17:39:53 | 1.0413 | 57.09 | 1.199 | 0.8643 | 0.672 |
| 1/20/2004 | 17:39:56 | 1.103 | 57.09 | 1.193 | 0.926 | 0.668 |
| 1/20/2004 | 17:40:00 | 1.168 | 57.09 | 1.183 | 0.991 | 0.663 |
| 1/20/2004 | 17:40:04 | 1.238 | 57.09 | 1.178 | 1.061 | 0.660 |
| 1/20/2004 | 17:40:09 | 1.3113 | 57.09 | 1.172 | 1.1343 | 0.657 |
| 1/20/2004 | 17:40:14 | 1.3897 | 57.09 | 1.167 | 1.2127 | 0.654 |
| 1/20/2004 | 17:40:19 | 1.473 | 57.09 | 1.167 | 1.296 | 0.654 |
| 1/20/2004 | 17:40:24 | 1.5613 | 57.09 | 1.157 | 1.3843 | 0.648 |
| 1/20/2004 | 17:40:29 | 1.6547 | 57.09 | 1.157 | 1.4777 | 0.648 |
| 1/20/2004 | 17:40:35 | 1.753 | 57.07 | 1.151 | 1.576 | 0.645 |
| 1/20/2004 | 17:40:42 | 1.858 | 57.07 | 1.145 | 1.681 | 0.641 |
| 1/20/2004 | 17:40:48 | 1.968 | 57.07 | 1.145 | 1.791 | 0.641 |
| 1/20/2004 | 17:40:55 | 2.0847 | 57.07 | 1.14 | 1.9077 | 0.639 |
| 1/20/2004 | 17:41:03 | 2.2097 | 57.07 | 1.135 | 2.0327 | 0.636 |
| 1/20/2004 | 17:41:11 | 2.3413 | 57.07 | 1.135 | 2.1643 | 0.636 |
| 1/20/2004 | 17:41:19 | 2.4813 | 57.07 | 1.129 | 2.3043 | 0.632 |
| 1/20/2004 | 17:41:28 | 2.6297 | 57.07 | 1.129 | 2.4527 | 0.632 |
| 1/20/2004 | 17:41:37 | 2.7863 | 57.07 | 1.129 | 2.6093 | 0.632 |
| 1/20/2004 | 17:41:47 | 2.953 | 57.07 | 1.124 | 2.776 | 0.630 |
| 1/20/2004 | 17:41:58 | 3.1297 | 57.07 | 1.124 | 2.9527 | 0.630 |
| 1/20/2004 | 17:42:09 | 3.3163 | 57.07 | 1.114 | 3.1393 | 0.624 |
| 1/20/2004 | 17:42:21 | 3.5147 | 57.07 | 1.119 | 3.3377 | 0.627 |
| 1/20/2004 | 17:42:34 | 3.7247 | 57.07 | 1.119 | 3.5477 | 0.627 |
| 1/20/2004 | 17:42:47 | 3.9463 | 57.07 | 1.114 | 3.7693 | 0.624 |
| 1/20/2004 | 17:43:01 | 4.1813 | 57.07 | 1.114 | 4.0043 | 0.624 |
| 1/20/2004 | 17:43:16 | 4.4297 | 57.07 | 1.114 | 4.2527 | 0.624 |
| 1/20/2004 | 17:43:32 | 4.693 | 57.07 | 1.108 | 4.516 | 0.621 |
| 1/20/2004 | 17:43:49 | 4.973 | 57.07 | 1.098 | 4.796 | 0.615 |
| 1/20/2004 | 17:44:06 | 5.2697 | 57.05 | 1.092 | 5.0927 | 0.612 |
| 1/20/2004 | 17:44:25 | 5.583 | 57.07 | 1.093 | 5.406 | 0.612 |
| 1/20/2004 | 17:44:45 | 5.9147 | 57.07 | 1.093 | 5.7377 | 0.612 |
| 1/20/2004 | 17:45:06 | 6.2663 | 57.07 | 1.093 | 6.0893 | 0.612 |
| 1/20/2004 | 17:45:29 | 6.6397 | 57.07 | 1.087 | 6.4627 | 0.609 |
| 1/20/2004 | 17:45:52 | 7.0347 | 57.07 | 1.087 | 6.8577 | 0.609 |
| 1/20/2004 | 17:46:17 | 7.453 | 57.07 | 1.087 | 7.276 | 0.609 |
| 1/20/2004 | 17:46:44 | 7.8963 | 57.07 | 1.087 | 7.7193 | 0.609 |
| 1/20/2004 | 17:47:12 | 8.3663 | 57.07 | 1.082 | 8.1893 | 0.606 |
| 1/20/2004 | 17:47:42 | 8.8647 | 57.07 | 1.082 | 8.6877 | 0.606 |
| 1/20/2004 | 17:48:14 | 9.3913 | 57.07 | 1.082 | 9.2143 | 0.606 |
| 1/20/2004 | 17:48:47 | 9.9497 | 57.07 | 1.077 | 9.7727 | 0.603 |
| 1/20/2004 | 17:49:23 | 10.5413 | 57.07 | 1.082 | 10.3643 | 0.606 |
| 1/20/2004 | 17:50:00 | 11.168 | 57.07 | 1.077 | 10.991 | 0.603 |
| 1/20/2004 | 17:50:40 | 11.8313 | 57.07 | 1.077 | 11.6543 | 0.603 |
| 1/20/2004 | 17:51:22 | 12.5347 | 57.07 | 1.077 | 12.3577 | 0.603 |
| 1/20/2004 | 17:52:07 | 13.2797 | 57.07 | 1.087 | 13.1027 | 0.609 |
| 1/20/2004 | 17:52:54 | 14.0697 | 57.09 | 1.088 | 13.8927 | 0.610 |
| 1/20/2004 | 17:53:45 | 14.9063 | 57.09 | 1.088 | 14.7293 | 0.610 |
| 1/20/2004 | 17:54:38 | 15.7913 | 57.09 | 1.088 | 15.6143 | 0.610 |
| 1/20/2004 | 17:55:34 | 16.7297 | 57.09 | 1.093 | 16.5527 | 0.612 |
| 1/20/2004 | 17:56:34 | 17.723 | 57.09 | 1.088 | 17.546 | 0.610 |
| 1/20/2004 | 17:57:37 | 18.7763 | 57.09 | 1.083 | 18.5993 | 0.607 |
| 1/20/2004 | 17:58:44 | 19.8913 | 57.09 | 1.088 | 19.7143 | 0.610 |
| 1/20/2004 | 17:59:55 | 21.073 | 57.09 | 1.088 | 20.896 | 0.610 |
| 1/20/2004 | 18:01:10 | 22.3247 | 57.11 | 1.083 | 22.1477 | 0.607 |
| 1/20/2004 | 18:02:29 | 23.6497 | 57.11 | 1.083 | 23.4727 | 0.607 |
| 1/20/2004 | 18:03:53 | 25.0547 | 57.14 | 1.084 | 24.8777 | 0.607 |
| 1/20/2004 | 18:05:23 | 26.543 | 57.14 | 1.084 | 26.366 | 0.607 |
| 1/20/2004 | 18:06:57 | 28.118 | 57.14 | 1.084 | 27.941 | 0.607 |
| 1/20/2004 | 18:08:37 | 29.7863 | 57.14 | 1.084 | 29.6093 | 0.607 |
| 1/20/2004 | 18:10:23 | 31.5547 | 57.14 | 1.084 | 31.3777 | 0.607 |
| 1/20/2004 | 18:12:16 | 33.428 | 57.14 | 1.084 | 33.251 | 0.607 |
| 1/20/2004 | 18:14:15 | 35.4113 | 57.14 | 1.084 | 35.2343 | 0.607 |
| 1/20/2004 | 18:16:21 | 37.513 | 57.14 | 1.084 | 37.336 | 0.607 |
| 1/20/2004 | 18:18:35 | 39.7397 | 57.14 | 1.068 | 39.5627 | 0.598 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1/20/2004 | 18:20:56 | 42.098 | 57.11 | 1.067 | 41.921 | 0.598 |
| 1/20/2004 | 18:23:26 | 44.5963 | 57.11 | 1.067 | 44.4193 | 0.598 |
| 1/20/2004 | 18:26:05 | 47.243 | 57.11 | 1.067 | 47.066 | 0.598 |
| 1/20/2004 | 18:28:53 | 50.0463 | 57.11 | 1.067 | 49.8693 | 0.598 |
| 1/20/2004 | 18:31:51 | 53.0147 | 57.11 | 1.062 | 52.8377 | 0.595 |
| 1/20/2004 | 18:35:00 | 56.1597 | 57.11 | 1.067 | 55.9827 | 0.598 |
| 1/20/2004 | 18:38:20 | 59.4913 | 57.11 | 1.078 | 59.3143 | 0.604 |
| 1/20/2004 | 18:41:51 | 63.0197 | 57.11 | 1.078 | 62.8427 | 0.604 |
| 1/20/2004 | 18:45:36 | 66.758 | 57.11 | 1.073 | 66.581 | 0.601 |
| 1/20/2004 | 18:49:33 | 70.718 | 57.11 | 1.078 | 70.541 | 0.604 |
| 1/20/2004 | 18:53:45 | 74.9113 | 57.11 | 1.073 | 74.7343 | 0.601 |
| 1/20/2004 | 18:58:11 | 79.3547 | 57.11 | 1.073 | 79.1777 | 0.601 |
| 1/20/2004 | 19:02:54 | 84.0613 | 57.11 | 1.073 | 83.8843 | 0.601 |
| 1/20/2004 | 19:07:53 | 89.0463 | 57.11 | 1.073 | 88.8693 | 0.601 |
| 1/20/2004 | 19:13:10 | 94.3263 | 57.11 | 1.057 | 94.1493 | 0.592 |
| 1/20/2004 | 19:18:45 | 99.9197 | 57.11 | 1.062 | 99.7427 | 0.595 |
| 1/20/2004 | 19:24:41 | 105.8447 | 57.11 | 1.052 | 105.6677 | 0.589 |
| 1/20/2004 | 19:30:57 | 112.1197 | 57.09 | 1.056 | 111.9427 | 0.592 |
| 1/20/2004 | 19:37:36 | 118.768 | 57.09 | 1.051 | 118.591 | 0.589 |
| 1/20/2004 | 19:44:39 | 125.8097 | 57.09 | 1.051 | 125.6327 | 0.589 |
| 1/20/2004 | 19:52:06 | 133.268 | 57.09 | 1.051 | 133.091 | 0.589 |
| 1/20/2004 | 20:00:00 | 141.168 | 57.09 | 1.051 | 140.991 | 0.589 |
| 1/20/2004 | 20:08:22 | 149.5363 | 57.09 | 1.062 | 149.3593 | 0.595 |
| 1/20/2004 | 20:17:14 | 158.4013 | 57.09 | 1.062 | 158.2243 | 0.595 |
| 1/20/2004 | 20:26:38 | 167.7913 | 57.09 | 1.062 | 167.6143 | 0.595 |
| 1/20/2004 | 20:36:34 | 177.738 | 57.09 | 1.062 | 177.561 | 0.595 |
| 1/20/2004 | 20:46:34 | 187.738 | 57.09 | 1.062 | 187.561 | 0.595 |
| 1/20/2004 | 20:56:34 | 197.738 | 57.07 | 1.061 | 197.561 | 0.594 |
| 1/20/2004 | 21:06:34 | 207.738 | 57.07 | 1.045 | 207.561 | 0.585 |
| 1/20/2004 | 21:16:34 | 217.738 | 57.07 | 1.045 | 217.561 | 0.585 |
| 1/20/2004 | 21:26:34 | 227.738 | 57.07 | 1.04 | 227.561 | 0.583 |
| 1/20/2004 | 21:36:34 | 237.738 | 57.07 | 1.04 | 237.561 | 0.583 |
| 1/20/2004 | 21:46:34 | 247.738 | 57.07 | 1.04 | 247.561 | 0.583 |
| 1/20/2004 | 21:56:34 | 257.738 | 57.07 | 1.056 | 257.561 | 0.592 |
| 1/20/2004 | 22:06:34 | 267.738 | 57.07 | 1.04 | 267.561 | 0.583 |
| 1/20/2004 | 22:16:34 | 277.738 | 57.07 | 1.04 | 277.561 | 0.583 |
| 1/20/2004 | 22:26:34 | 287.738 | 57.07 | 1.04 | 287.561 | 0.583 |
| 1/20/2004 | 22:36:34 | 297.738 | 57.07 | 1.034 | 297.561 | 0.579 |
| 1/20/2004 | 22:46:34 | 307.738 | 57.07 | 1.034 | 307.561 | 0.579 |
| 1/20/2004 | 22:56:34 | 317.738 | 57.07 | 1.034 | 317.561 | 0.579 |
| 1/20/2004 | 23:06:34 | 327.738 | 57.07 | 1.034 | 327.561 | 0.579 |
| 1/20/2004 | 23:16:34 | 337.738 | 57.07 | 1.034 | 337.561 | 0.579 |
| 1/20/2004 | 23:26:34 | 347.738 | 57.07 | 1.034 | 347.561 | 0.579 |
| 1/20/2004 | 23:36:34 | 357.738 | 57.07 | 1.029 | 357.561 | 0.576 |
| 1/20/2004 | 23:46:34 | 367.738 | 57.07 | 1.029 | 367.561 | 0.576 |
| 1/20/2004 | 23:56:34 | 377.738 | 57.07 | 1.029 | 377.561 | 0.576 |
| 1/21/2004 | 0:06:34 | 387.738 | 57.07 | 1.029 | 387.561 | 0.576 |
| 1/21/2004 | 0:16:34 | 397.738 | 57.07 | 1.04 | 397.561 | 0.583 |
| 1/21/2004 | 0:26:34 | 407.738 | 57.07 | 1.024 | 407.561 | 0.574 |
| 1/21/2004 | 0:36:34 | 417.738 | 57.07 | 1.04 | 417.561 | 0.583 |
| 1/21/2004 | 0:46:34 | 427.738 | 57.07 | 1.04 | 427.561 | 0.583 |
| 1/21/2004 | 0:56:34 | 437.738 | 57.07 | 1.034 | 437.561 | 0.579 |
| 1/21/2004 | 1:06:34 | 447.738 | 57.07 | 1.034 | 447.561 | 0.579 |
| 1/21/2004 | 1:16:34 | 457.738 | 57.07 | 1.034 | 457.561 | 0.579 |
| 1/21/2004 | 1:26:34 | 467.738 | 57.07 | 1.034 | 467.561 | 0.579 |
| 1/21/2004 | 1:36:34 | 477.738 | 57.07 | 1.034 | 477.561 | 0.579 |
| 1/21/2004 | 1:46:34 | 487.738 | 57.07 | 1.034 | 487.561 | 0.579 |
| 1/21/2004 | 1:56:34 | 497.738 | 57.07 | 1.034 | 497.561 | 0.579 |
| 1/21/2004 | 2:06:34 | 507.738 | 57.05 | 1.018 | 507.561 | 0.570 |
| 1/21/2004 | 2:16:34 | 517.738 | 57.05 | 1.018 | 517.561 | 0.570 |
| 1/21/2004 | 2:26:34 | 527.738 | 57.05 | 1.013 | 527.561 | 0.568 |
| 1/21/2004 | 2:36:34 | 537.738 | 57.07 | 1.013 | 537.561 | 0.568 |
| 1/21/2004 | 2:46:34 | 547.738 | 57.07 | 1.013 | 547.561 | 0.568 |
| 1/21/2004 | 2:56:34 | 557.738 | 57.05 | 1.013 | 557.561 | 0.568 |
| 1/21/2004 | 3:06:34 | 567.738 | 57.07 | 1.013 | 567.561 | 0.568 |
| 1/21/2004 | 3:16:34 | 577.738 | 57.05 | 1.013 | 577.561 | 0.568 |
| 1/21/2004 | 3:26:34 | 587.738 | 57.05 | 1.007 | 587.561 | 0.564 |
| 1/21/2004 | 3:36:34 | 597.738 | 57.07 | 1.008 | 597.561 | 0.565 |
| 1/21/2004 | 3:46:34 | 607.738 | 57.05 | 1.007 | 607.561 | 0.564 |
| 1/21/2004 | 3:56:34 | 617.738 | 57.07 | 1.019 | 617.561 | 0.571 |
| 1/21/2004 | 4:06:34 | 627.738 | 57.05 | 1.023 | 627.561 | 0.573 |
| 1/21/2004 | 4:16:34 | 637.738 | 57.05 | 1.023 | 637.561 | 0.573 |
| 1/21/2004 | 4:26:34 | 647.738 | 57.05 | 1.018 | 647.561 | 0.570 |
| 1/21/2004 | 4:36:34 | 657.738 | 57.05 | 1.018 | 657.561 | 0.570 |
| 1/21/2004 | 4:46:34 | 667.738 | 57.05 | 1.018 | 667.561 | 0.570 |
| 1/21/2004 | 4:56:34 | 677.738 | 57.05 | 1.002 | 677.561 | 0.561 |
| 1/21/2004 | 5:06:34 | 687.738 | 57.05 | 1.002 | 687.561 | 0.561 |
| 1/21/2004 | 5:16:34 | 697.738 | 57.05 | 0.997 | 697.561 | 0.559 |
| 1/21/2004 | 5:26:34 | 707.738 | 57.05 | 1.013 | 707.561 | 0.568 |
| 1/21/2004 | 5:36:34 | 717.738 | 57.05 | 1.013 | 717.561 | 0.568 |
| 1/21/2004 | 5:46:34 | 727.738 | 57.05 | 1.013 | 727.561 | 0.568 |
| 1/21/2004 | 5:56:34 | 737.738 | 57.05 | 1.013 | 737.561 | 0.568 |
| 1/21/2004 | 6:06:34 | 747.738 | 57.05 | 1.007 | 747.561 | 0.564 |
| 1/21/2004 | 6:16:34 | 757.738 | 57.05 | 1.007 | 757.561 | 0.564 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1/21/2004 | 6:26:34 | 767.738 | 57.05 | 1.007 | 767.561 | 0.564 |
| 1/21/2004 | 6:36:34 | 777.738 | 57.05 | 0.997 | 777.561 | 0.559 |
| 1/21/2004 | 6:46:34 | 787.738 | 57.05 | 0.992 | 787.561 | 0.556 |
| 1/21/2004 | 6:56:34 | 797.738 | 57.07 | 0.992 | 797.561 | 0.556 |
| 1/21/2004 | 7:06:34 | 807.738 | 57.05 | 0.992 | 807.561 | 0.556 |
| 1/21/2004 | 7:16:34 | 817.738 | 57.05 | 1.002 | 817.561 | 0.561 |
| 1/21/2004 | 7:26:34 | 827.738 | 57.05 | 0.992 | 827.561 | 0.556 |
| 1/21/2004 | 7:36:34 | 837.738 | 57.07 | 0.992 | 837.561 | 0.556 |
| 1/21/2004 | 7:46:34 | 847.738 | 57.05 | 0.992 | 847.561 | 0.556 |
| 1/21/2004 | 7:56:34 | 857.738 | 57.05 | 0.986 | 857.561 | 0.552 |
| 1/21/2004 | 8:06:34 | 867.738 | 57.05 | 0.986 | 867.561 | 0.552 |
| 1/21/2004 | 8:16:34 | 877.738 | 57.05 | 0.986 | 877.561 | 0.552 |
| 1/21/2004 | 8:26:34 | 887.738 | 57.05 | 0.981 | 887.561 | 0.550 |
| 1/21/2004 | 8:36:34 | 897.738 | 57.05 | 0.986 | 897.561 | 0.552 |
| 1/21/2004 | 8:46:34 | 907.738 | 57.05 | 0.981 | 907.561 | 0.550 |
| 1/21/2004 | 8:56:34 | 917.738 | 57.05 | 0.986 | 917.561 | 0.552 |
| 1/21/2004 | 9:06:34 | 927.738 | 57.05 | 0.981 | 927.561 | 0.550 |
| 1/21/2004 | 9:16:34 | 937.738 | 57.05 | 0.986 | 937.561 | 0.552 |
| 1/21/2004 | 9:26:34 | 947.738 | 57.05 | 0.981 | 947.561 | 0.550 |
| 1/21/2004 | 9:36:34 | 957.738 | 57.05 | 0.981 | 957.561 | 0.550 |
| 1/21/2004 | 9:46:34 | 967.738 | 57.05 | 0.981 | 967.561 | 0.550 |
| 1/21/2004 | 9:56:34 | 977.738 | 57.05 | 0.976 | 977.561 | 0.547 |
| 1/21/2004 | 10:06:34 | 987.738 | 57.05 | 0.992 | 987.561 | 0.556 |
| 1/21/2004 | 10:16:34 | 997.738 | 57.07 | 0.992 | 997.561 | 0.556 |
| 1/21/2004 | 10:26:34 | 1007.738 | 57.05 | 0.992 | 1007.561 | 0.556 |
| 1/21/2004 | 10:36:34 | 1017.738 | 57.05 | 0.992 | 1017.561 | 0.556 |
| 1/21/2004 | 10:46:34 | 1027.738 | 57.05 | 0.992 | 1027.561 | 0.556 |
| 1/21/2004 | 10:56:34 | 1037.738 | 57.05 | 0.992 | 1037.561 | 0.556 |
| 1/21/2004 | 11:06:34 | 1047.738 | 57.05 | 0.992 | 1047.561 | 0.556 |
| 1/21/2004 | 11:16:34 | 1057.738 | 57.05 | 0.976 | 1057.561 | 0.547 |
| 1/21/2004 | 11:26:34 | 1067.738 | 57.05 | 0.971 | 1067.561 | 0.544 |
| 1/21/2004 | 11:36:34 | 1077.738 | 57.05 | 0.971 | 1077.561 | 0.544 |
| 1/21/2004 | 11:46:34 | 1087.738 | 57.05 | 0.971 | 1087.561 | 0.544 |
| 1/21/2004 | 11:56:34 | 1097.738 | 57.05 | 0.971 | 1097.561 | 0.544 |
| 1/21/2004 | 12:06:34 | 1107.738 | 57.05 | 0.986 | 1107.561 | 0.552 |
| 1/21/2004 | 12:16:34 | 1117.738 | 57.05 | 0.981 | 1117.561 | 0.550 |
| 1/21/2004 | 12:26:34 | 1127.738 | 57.05 | 0.981 | 1127.561 | 0.550 |
| 1/21/2004 | 12:36:34 | 1137.738 | 57.05 | 0.965 | 1137.561 | 0.541 |
| 1/21/2004 | 12:46:34 | 1147.738 | 57.05 | 0.965 | 1147.561 | 0.541 |
| 1/21/2004 | 12:56:34 | 1157.738 | 57.05 | 0.965 | 1157.561 | 0.541 |
| 1/21/2004 | 13:06:34 | 1167.738 | 57.05 | 0.965 | 1167.561 | 0.541 |
| 1/21/2004 | 13:16:34 | 1177.738 | 57.05 | 0.976 | 1177.561 | 0.547 |
| 1/21/2004 | 13:26:34 | 1187.738 | 57.05 | 0.976 | 1187.561 | 0.547 |
| 1/21/2004 | 13:36:34 | 1197.738 | 57.05 | 0.976 | 1197.561 | 0.547 |
| 1/21/2004 | 13:46:34 | 1207.738 | 57.05 | 0.976 | 1207.561 | 0.547 |
| 1/21/2004 | 13:56:34 | 1217.738 | 57.05 | 0.976 | 1217.561 | 0.547 |
| 1/21/2004 | 14:06:34 | 1227.738 | 57.05 | 0.971 | 1227.561 | 0.544 |
| 1/21/2004 | 14:16:34 | 1237.738 | 57.05 | 0.965 | 1237.561 | 0.541 |
| 1/21/2004 | 14:26:34 | 1247.738 | 57.05 | 0.955 | 1247.561 | 0.535 |
| 1/21/2004 | 14:36:34 | 1257.738 | 57.05 | 0.955 | 1257.561 | 0.535 |
| 1/21/2004 | 14:46:34 | 1267.738 | 57.05 | 0.955 | 1267.561 | 0.535 |
| 1/21/2004 | 14:56:34 | 1277.738 | 57.05 | 0.955 | 1277.561 | 0.535 |
| 1/21/2004 | 15:06:34 | 1287.738 | 57.05 | 0.955 | 1287.561 | 0.535 |
| 1/21/2004 | 15:16:34 | 1297.738 | 57.05 | 0.955 | 1297.561 | 0.535 |
| 1/21/2004 | 15:26:34 | 1307.738 | 57.05 | 0.949 | 1307.561 | 0.532 |
| 1/21/2004 | 15:36:34 | 1317.738 | 57.05 | 0.949 | 1317.561 | 0.532 |
| 1/21/2004 | 15:46:34 | 1327.738 | 57.05 | 0.949 | 1327.561 | 0.532 |
| 1/21/2004 | 15:56:34 | 1337.738 | 57.05 | 0.949 | 1337.561 | 0.532 |
| 1/21/2004 | 16:06:34 | 1347.738 | 57.05 | 0.949 | 1347.561 | 0.532 |
| 1/21/2004 | 16:16:34 | 1357.738 | 57.05 | 0.965 | 1357.561 | 0.541 |
| 1/21/2004 | 16:26:34 | 1367.738 | 57.05 | 0.96 | 1367.561 | 0.538 |
| 1/21/2004 | 16:36:34 | 1377.738 | 57.05 | 0.96 | 1377.561 | 0.538 |
| 1/21/2004 | 16:46:34 | 1387.738 | 57.05 | 0.944 | 1387.561 | 0.529 |
| 1/21/2004 | 16:56:34 | 1397.738 | 57.05 | 0.944 | 1397.561 | 0.529 |
| 1/21/2004 | 17:06:34 | 1407.738 | 57.05 | 0.944 | 1407.561 | 0.529 |
| 1/21/2004 | 17:16:34 | 1417.738 | 57.05 | 0.944 | 1417.561 | 0.529 |
| 1/21/2004 | 17:26:34 | 1427.738 | 57.05 | 0.944 | 1427.561 | 0.529 |
| 1/21/2004 | 17:36:34 | 1437.738 | 57.05 | 0.944 | 1437.561 | 0.529 |
| 1/21/2004 | 17:46:34 | 1447.738 | 57.05 | 0.939 | 1447.561 | 0.526 |
| 1/21/2004 | 17:56:34 | 1457.738 | 57.05 | 0.939 | 1457.561 | 0.526 |
| 1/21/2004 | 18:06:34 | 1467.738 | 57.05 | 0.955 | 1467.561 | 0.535 |
| 1/21/2004 | 18:16:34 | 1477.738 | 57.05 | 0.939 | 1477.561 | 0.526 |
| 1/21/2004 | 18:26:34 | 1487.738 | 57.05 | 0.939 | 1487.561 | 0.526 |
| 1/21/2004 | 18:36:34 | 1497.738 | 57.05 | 0.934 | 1497.561 | 0.523 |
| 1/21/2004 | 18:46:34 | 1507.738 | 57.05 | 0.939 | 1507.561 | 0.526 |
| 1/21/2004 | 18:56:34 | 1517.738 | 57.05 | 0.949 | 1517.561 | 0.532 |
| 1/21/2004 | 19:06:34 | 1527.738 | 57.05 | 0.949 | 1527.561 | 0.532 |
| 1/21/2004 | 19:16:34 | 1537.738 | 57.05 | 0.949 | 1537.561 | 0.532 |
| 1/21/2004 | 19:26:34 | 1547.738 | 57.05 | 0.949 | 1547.561 | 0.532 |
| 1/21/2004 | 19:36:34 | 1557.738 | 57.05 | 0.949 | 1557.561 | 0.532 |
| 1/21/2004 | 19:46:34 | 1567.738 | 57.05 | 0.944 | 1567.561 | 0.529 |
| 1/21/2004 | 19:56:34 | 1577.738 | 57.05 | 0.934 | 1577.561 | 0.523 |
| 1/21/2004 | 20:06:34 | 1587.738 | 57.05 | 0.944 | 1587.561 | 0.529 |
| 1/21/2004 | 20:16:34 | 1597.738 | 57.05 | 0.928 | 1597.561 | 0.520 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1/21/2004 | 20:26:34 | 1607.738 | 57.05 | 0.928 | 1607.561 | 0.520 |
| 1/21/2004 | 20:36:34 | 1617.738 | 57.05 | 0.928 | 1617.561 | 0.520 |
| 1/21/2004 | 20:46:34 | 1627.738 | 57.05 | 0.928 | 1627.561 | 0.520 |
| 1/21/2004 | 20:56:34 | 1637.738 | 57.05 | 0.928 | 1637.561 | 0.520 |
| 1/21/2004 | 21:06:34 | 1647.738 | 57.05 | 0.928 | 1647.561 | 0.520 |
| 1/21/2004 | 21:16:34 | 1657.738 | 57.05 | 0.939 | 1657.561 | 0.526 |
| 1/21/2004 | 21:26:34 | 1667.738 | 57.05 | 0.944 | 1667.561 | 0.529 |
| 1/21/2004 | 21:36:34 | 1677.738 | 57.05 | 0.928 | 1677.561 | 0.520 |
| 1/21/2004 | 21:46:34 | 1687.738 | 57.05 | 0.928 | 1687.561 | 0.520 |
| 1/21/2004 | 21:56:34 | 1697.738 | 57.05 | 0.923 | 1697.561 | 0.517 |
| 1/21/2004 | 22:06:34 | 1707.738 | 57.05 | 0.923 | 1707.561 | 0.517 |
| 1/21/2004 | 22:16:34 | 1717.738 | 57.05 | 0.923 | 1717.561 | 0.517 |
| 1/21/2004 | 22:26:34 | 1727.738 | 57.05 | 0.923 | 1727.561 | 0.517 |
| 1/21/2004 | 22:36:34 | 1737.738 | 57.05 | 0.923 | 1737.561 | 0.517 |
| 1/21/2004 | 22:46:34 | 1747.738 | 57.05 | 0.923 | 1747.561 | 0.517 |
| 1/21/2004 | 22:56:34 | 1757.738 | 57.05 | 0.923 | 1757.561 | 0.517 |
| 1/21/2004 | 23:06:34 | 1767.738 | 57.05 | 0.918 | 1767.561 | 0.514 |
| 1/21/2004 | 23:16:34 | 1777.738 | 57.05 | 0.918 | 1777.561 | 0.514 |
| 1/21/2004 | 23:26:34 | 1787.738 | 57.05 | 0.923 | 1787.561 | 0.517 |
| 1/21/2004 | 23:36:34 | 1797.738 | 57.05 | 0.939 | 1797.561 | 0.526 |
| 1/21/2004 | 23:46:34 | 1807.738 | 57.05 | 0.934 | 1807.561 | 0.523 |
| 1/21/2004 | 23:56:34 | 1817.738 | 57.05 | 0.934 | 1817.561 | 0.523 |
| 1/22/2004 | 0:06:34 | 1827.738 | 57.05 | 0.928 | 1827.561 | 0.520 |
| 1/22/2004 | 0:16:34 | 1837.738 | 57.05 | 0.928 | 1837.561 | 0.520 |
| 1/22/2004 | 0:26:34 | 1847.738 | 57.05 | 0.928 | 1847.561 | 0.520 |
| 1/22/2004 | 0:36:34 | 1857.738 | 57.05 | 0.928 | 1857.561 | 0.520 |
| 1/22/2004 | 0:46:34 | 1867.738 | 57.05 | 0.928 | 1867.561 | 0.520 |
| 1/22/2004 | 0:56:34 | 1877.738 | 57.05 | 0.923 | 1877.561 | 0.517 |
| 1/22/2004 | 1:06:34 | 1887.738 | 57.05 | 0.907 | 1887.561 | 0.508 |
| 1/22/2004 | 1:16:34 | 1897.738 | 57.05 | 0.907 | 1897.561 | 0.508 |
| 1/22/2004 | 1:26:34 | 1907.738 | 57.05 | 0.907 | 1907.561 | 0.508 |
| 1/22/2004 | 1:36:34 | 1917.738 | 57.05 | 0.907 | 1917.561 | 0.508 |
| 1/22/2004 | 1:46:34 | 1927.738 | 57.05 | 0.907 | 1927.561 | 0.508 |
| 1/22/2004 | 1:56:34 | 1937.738 | 57.05 | 0.907 | 1937.561 | 0.508 |
| 1/22/2004 | 2:06:34 | 1947.738 | 57.05 | 0.907 | 1947.561 | 0.508 |
| 1/22/2004 | 2:16:34 | 1957.738 | 57.05 | 0.902 | 1957.561 | 0.505 |
| 1/22/2004 | 2:26:34 | 1967.738 | 57.05 | 0.907 | 1967.561 | 0.508 |
| 1/22/2004 | 2:36:34 | 1977.738 | 57.05 | 0.902 | 1977.561 | 0.505 |
| 1/22/2004 | 2:46:34 | 1987.738 | 57.05 | 0.902 | 1987.561 | 0.505 |
| 1/22/2004 | 2:56:34 | 1997.738 | 57.05 | 0.902 | 1997.561 | 0.505 |
| 1/22/2004 | 3:06:34 | 2007.738 | 57.05 | 0.902 | 2007.561 | 0.505 |
| 1/22/2004 | 3:16:34 | 2017.738 | 57.05 | 0.897 | 2017.561 | 0.503 |
| 1/22/2004 | 3:26:34 | 2027.738 | 57.05 | 0.902 | 2027.561 | 0.505 |
| 1/22/2004 | 3:36:34 | 2037.738 | 57.05 | 0.902 | 2037.561 | 0.505 |
| 1/22/2004 | 3:46:34 | 2047.738 | 57.05 | 0.897 | 2047.561 | 0.503 |
| 1/22/2004 | 3:56:34 | 2057.738 | 57.05 | 0.897 | 2057.561 | 0.503 |
| 1/22/2004 | 4:06:34 | 2067.738 | 57.05 | 0.897 | 2067.561 | 0.503 |
| 1/22/2004 | 4:16:34 | 2077.738 | 57.05 | 0.912 | 2077.561 | 0.511 |
| 1/22/2004 | 4:26:34 | 2087.738 | 57.05 | 0.912 | 2087.561 | 0.511 |
| 1/22/2004 | 4:36:34 | 2097.738 | 57.05 | 0.907 | 2097.561 | 0.508 |
| 1/22/2004 | 4:46:34 | 2107.738 | 57.05 | 0.897 | 2107.561 | 0.503 |
| 1/22/2004 | 4:56:34 | 2117.738 | 57.05 | 0.897 | 2117.561 | 0.503 |
| 1/22/2004 | 5:06:34 | 2127.738 | 57.05 | 0.891 | 2127.561 | 0.499 |
| 1/22/2004 | 5:16:34 | 2137.738 | 57.05 | 0.907 | 2137.561 | 0.508 |
| 1/22/2004 | 5:26:34 | 2147.738 | 57.05 | 0.907 | 2147.561 | 0.508 |
| 1/22/2004 | 5:36:34 | 2157.738 | 57.05 | 0.907 | 2157.561 | 0.508 |
| 1/22/2004 | 5:46:34 | 2167.738 | 57.05 | 0.891 | 2167.561 | 0.499 |
| 1/22/2004 | 5:56:34 | 2177.738 | 57.05 | 0.891 | 2177.561 | 0.499 |
| 1/22/2004 | 6:06:34 | 2187.738 | 57.05 | 0.891 | 2187.561 | 0.499 |
| 1/22/2004 | 6:16:34 | 2197.738 | 57.05 | 0.891 | 2197.561 | 0.499 |
| 1/22/2004 | 6:26:34 | 2207.738 | 57.05 | 0.891 | 2207.561 | 0.499 |
| 1/22/2004 | 6:36:34 | 2217.738 | 57.05 | 0.891 | 2217.561 | 0.499 |
| 1/22/2004 | 6:46:34 | 2227.738 | 57.05 | 0.891 | 2227.561 | 0.499 |
| 1/22/2004 | 6:56:34 | 2237.738 | 57.05 | 0.886 | 2237.561 | 0.496 |
| 1/22/2004 | 7:06:34 | 2247.738 | 57.05 | 0.886 | 2247.561 | 0.496 |
| 1/22/2004 | 7:16:34 | 2257.738 | 57.05 | 0.886 | 2257.561 | 0.496 |
| 1/22/2004 | 7:26:34 | 2267.738 | 57.05 | 0.886 | 2267.561 | 0.496 |
| 1/22/2004 | 7:36:34 | 2277.738 | 57.05 | 0.886 | 2277.561 | 0.496 |
| 1/22/2004 | 7:46:34 | 2287.738 | 57.05 | 0.902 | 2287.561 | 0.505 |
| 1/22/2004 | 7:56:34 | 2297.738 | 57.05 | 0.897 | 2297.561 | 0.503 |
| 1/22/2004 | 8:06:34 | 2307.738 | 57.05 | 0.881 | 2307.561 | 0.494 |
| 1/22/2004 | 8:16:34 | 2317.738 | 57.05 | 0.881 | 2317.561 | 0.494 |
| 1/22/2004 | 8:26:34 | 2327.738 | 57.05 | 0.881 | 2327.561 | 0.494 |
| 1/22/2004 | 8:36:34 | 2337.738 | 57.05 | 0.897 | 2337.561 | 0.503 |
| 1/22/2004 | 8:46:34 | 2347.738 | 57.05 | 0.897 | 2347.561 | 0.503 |
| 1/22/2004 | 8:56:34 | 2357.738 | 57.05 | 0.897 | 2357.561 | 0.503 |
| 1/22/2004 | 9:06:34 | 2367.738 | 57.05 | 0.891 | 2367.561 | 0.499 |
| 1/22/2004 | 9:16:34 | 2377.738 | 57.05 | 0.891 | 2377.561 | 0.499 |
| 1/22/2004 | 9:26:34 | 2387.738 | 57.05 | 0.897 | 2387.561 | 0.503 |
| 1/22/2004 | 9:36:34 | 2397.738 | 57.05 | 0.891 | 2397.561 | 0.499 |
| 1/22/2004 | 9:46:34 | 2407.738 | 57.05 | 0.891 | 2407.561 | 0.499 |
| 1/22/2004 | 9:56:34 | 2417.738 | 57.05 | 0.876 | 2417.561 | 0.491 |
| 1/22/2004 | 10:06:34 | 2427.738 | 57.05 | 0.876 | 2427.561 | 0.491 |
| 1/22/2004 | 10:16:34 | 2437.738 | 57.05 | 0.876 | 2437.561 | 0.491 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1/22/2004 | 10:26:34 | 2447.738 | 57.05 | 0.876 | 2447.561 | 0.491 |
| 1/22/2004 | 10:36:34 | 2457.738 | 57.05 | 0.876 | 2457.561 | 0.491 |
| 1/22/2004 | 10:46:34 | 2467.738 | 57.05 | 0.886 | 2467.561 | 0.496 |
| 1/22/2004 | 10:56:34 | 2477.738 | 57.05 | 0.891 | 2477.561 | 0.499 |
| 1/22/2004 | 11:06:34 | 2487.738 | 57.05 | 0.891 | 2487.561 | 0.499 |
| 1/22/2004 | 11:16:34 | 2497.738 | 57.05 | 0.886 | 2497.561 | 0.496 |
| 1/22/2004 | 11:26:34 | 2507.738 | 57.05 | 0.886 | 2507.561 | 0.496 |
| 1/22/2004 | 11:36:34 | 2517.738 | 57.05 | 0.881 | 2517.561 | 0.494 |
| 1/22/2004 | 11:46:34 | 2527.738 | 57.05 | 0.886 | 2527.561 | 0.496 |
| 1/22/2004 | 11:56:34 | 2537.738 | 57.05 | 0.886 | 2537.561 | 0.496 |
| 1/22/2004 | 12:06:34 | 2547.738 | 57.05 | 0.886 | 2547.561 | 0.496 |
| 1/22/2004 | 12:16:34 | 2557.738 | 57.05 | 0.886 | 2557.561 | 0.496 |
| 1/22/2004 | 12:26:34 | 2567.738 | 57.05 | 0.881 | 2567.561 | 0.494 |
| 1/22/2004 | 12:36:34 | 2577.738 | 57.05 | 0.881 | 2577.561 | 0.494 |
| 1/22/2004 | 12:46:34 | 2587.738 | 57.05 | 0.881 | 2587.561 | 0.494 |
| 1/22/2004 | 12:56:34 | 2597.738 | 57.05 | 0.881 | 2597.561 | 0.494 |
| 1/22/2004 | 13:06:34 | 2607.738 | 57.05 | 0.881 | 2607.561 | 0.494 |
| 1/22/2004 | 13:16:34 | 2617.738 | 57.05 | 0.881 | 2617.561 | 0.494 |
| 1/22/2004 | 13:26:34 | 2627.738 | 57.05 | 0.881 | 2627.561 | 0.494 |
| 1/22/2004 | 13:36:34 | 2637.738 | 57.05 | 0.865 | 2637.561 | 0.485 |
| 1/22/2004 | 13:46:34 | 2647.738 | 57.05 | 0.865 | 2647.561 | 0.485 |
| 1/22/2004 | 13:56:34 | 2657.738 | 57.05 | 0.865 | 2657.561 | 0.485 |
| 1/22/2004 | 14:06:34 | 2667.738 | 57.05 | 0.865 | 2667.561 | 0.485 |
| 1/22/2004 | 14:16:34 | 2677.738 | 57.05 | 0.86 | 2677.561 | 0.482 |
| 1/22/2004 | 14:26:34 | 2687.738 | 57.05 | 0.865 | 2687.561 | 0.485 |
| 1/22/2004 | 14:36:34 | 2697.738 | 57.05 | 0.86 | 2697.561 | 0.482 |
| 1/22/2004 | 14:46:34 | 2707.738 | 57.05 | 0.86 | 2707.561 | 0.482 |
| 1/22/2004 | 14:56:34 | 2717.738 | 57.05 | 0.86 | 2717.561 | 0.482 |
| 1/22/2004 | 15:06:34 | 2727.738 | 57.05 | 0.86 | 2727.561 | 0.482 |
| 1/22/2004 | 15:16:34 | 2737.738 | 57.05 | 0.86 | 2737.561 | 0.482 |
| 1/22/2004 | 15:26:34 | 2747.738 | 57.05 | 0.87 | 2747.561 | 0.487 |
| 1/22/2004 | 15:36:34 | 2757.738 | 57.05 | 0.87 | 2757.561 | 0.487 |
| 1/22/2004 | 15:46:34 | 2767.738 | 57.05 | 0.87 | 2767.561 | 0.487 |
| 1/22/2004 | 15:56:34 | 2777.738 | 57.05 | 0.87 | 2777.561 | 0.487 |
| 1/22/2004 | 16:06:34 | 2787.738 | 57.05 | 0.87 | 2787.561 | 0.487 |
| 1/22/2004 | 16:16:34 | 2797.738 | 57.05 | 0.87 | 2797.561 | 0.487 |
| 1/22/2004 | 16:26:34 | 2807.738 | 57.05 | 0.87 | 2807.561 | 0.487 |
| 1/22/2004 | 16:36:34 | 2817.738 | 57.05 | 0.854 | 2817.561 | 0.478 |
| 1/22/2004 | 16:46:34 | 2827.738 | 57.05 | 0.854 | 2827.561 | 0.478 |
| 1/22/2004 | 16:56:34 | 2837.738 | 57.05 | 0.865 | 2837.561 | 0.485 |
| 1/22/2004 | 17:06:34 | 2847.738 | 57.05 | 0.849 | 2847.561 | 0.476 |
| 1/22/2004 | 17:16:34 | 2857.738 | 57.05 | 0.854 | 2857.561 | 0.478 |
| 1/22/2004 | 17:26:34 | 2867.738 | 57.05 | 0.849 | 2867.561 | 0.476 |
| 1/22/2004 | 17:36:34 | 2877.738 | 57.05 | 0.849 | 2877.561 | 0.476 |
| 1/22/2004 | 17:46:34 | 2887.738 | 57.05 | 0.849 | 2887.561 | 0.476 |
| 1/22/2004 | 17:56:34 | 2897.738 | 57.05 | 0.849 | 2897.561 | 0.476 |

# CALCULATION OF HYDRAULIC CONDUCTIVITY (K)[1]

| | |
|---|---|
| Number of data points in the slug test: | 12 |
| Slope of the line that linearly approximates ln(h/h0) (m in y=mx+b): | 0.000 |
| Y-intercept of the line that linearly approximates ln(h/h0) (b in y=mx+b): | -0.353 |
| Actual Y-intercept is set to 0. | 0.000 |
| $T_0$ (min): | 6423.738 |
| K (ft/min): | 1.67E-07 |
| **K (ft/day):** | **0.000** |

$$m = \frac{n\left(\sum xy\right) - \left(\sum x\right)\left(\sum y\right)}{n\left(\sum\left(x^2\right)\right) - \left(\sum x\right)^2}$$

$$b = \frac{\left(\sum y\right)\left(\sum\left(x^2\right)\right) - \left(\sum x\right)\left(\sum xy\right)}{n\left(\sum\left(x^2\right)\right) - \left(\sum x\right)^2}$$

**n: Number of data points. x: Elapsed time point. y: ln(H/H0) point**

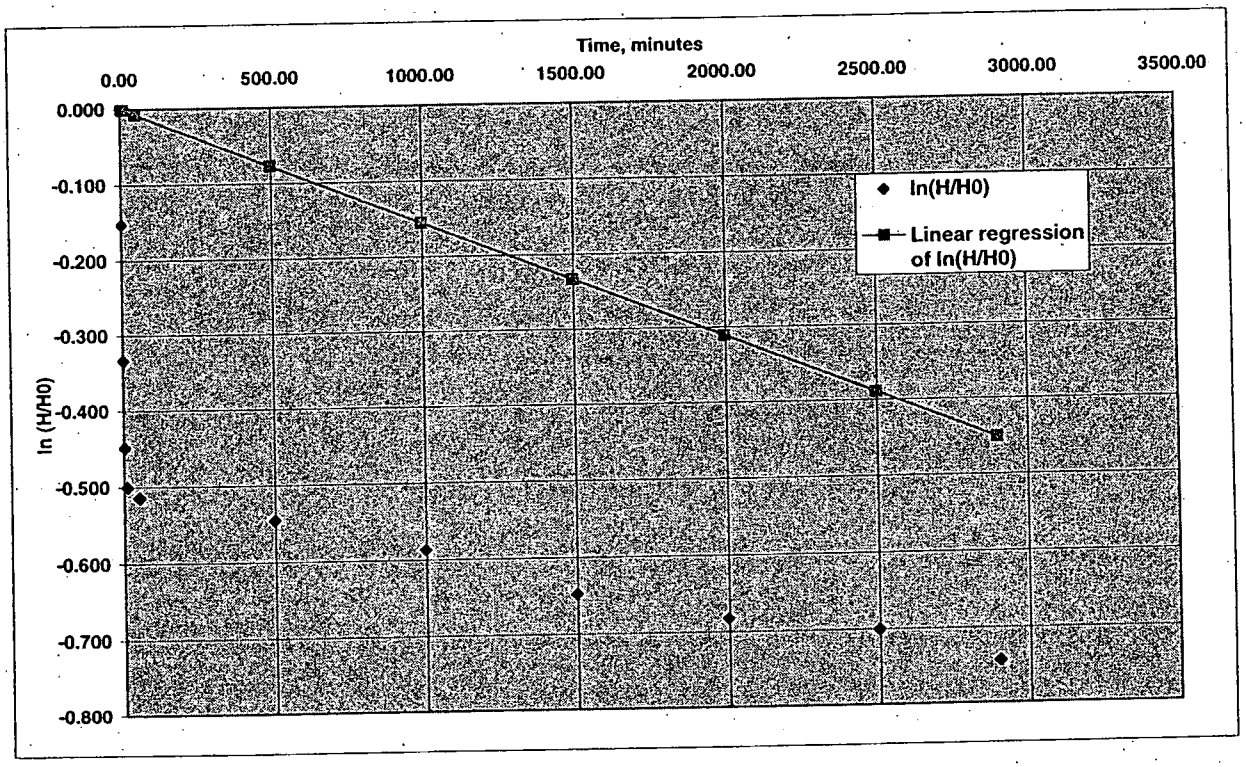
**$T_0$: Time at which ln(H/H0)=-1**

**$K = r^2 * \ln(L/R)/(2LT_0)$**

**L: Screened/monitored interval below water table (ft)**

**r: Well radius (ft)**

**R: Gravel pack radius (ft)**




1. HVORSLEV, M.J. 1951. Time Lag and Soil Permeability in Groundwater Observations. U.S. Army Corps of Engineers. Waterways Experiment Station Bulletin 36, Vicksburg, Mississippi.

# HYDRAULIC CONDUCTIVITY TEST DATA / CALCULATIONS

Note: Yellow cells are input cells, blue cells are automatically calculated

| | |
|---|---|
| Project Name: | CRANE NSWC |
| Project No.: | 9060 |
| Method of Inducing Water Level Change: | BAILER |
| Reference Pt (Top of Casing, Transducer, etc): | WATER LEVEL (REF=0.00 |
| Test Type (Rising Head / Falling Head): | RISING |

| | |
|---|---|
| Well / Boring No.: | 13MWT45 |
| Test No.: | 1 |
| Date: | 1/21/2004 |
| Geologist: | Fred W. Ramser |
| Checked by / Date: | |

| | |
|---|---|
| Well Radius, r (ft.): | 0.0833 |
| Radius of Sand/Gravel Pack Interval, R (ft): | 0.20833333 |
| Screened / Monitored Interval Below Water Table, L (ft): | 13.45 |
| Static Water Level (Depth/ Elevation) (ft.): | 72.69 |
| Baseline Reading for Test Data (SWL, Transducer Reading, etc): | 0.00 |

## TEST DATA

Note: To exclude a data point from the regression, place an "x" in the "exclude" column / data point's row. The first row cannot be excluded.

| Exclude | Elapsed Time (min) | Measured Water Level (feet) | Elapsed Time (min) | Drawdown or Head (H) (feet) | $H/H_0$ | $\ln(H/H_0)$ | Linear Regression of ln(H/H0) (b=0) |
|---|---|---|---|---|---|---|---|
| | 0 | 1.000 | 0.00 | -1.00 | 1.00 | 0.0000 | 0.00 |
| | 0.2677 | 0.858 | 0.27 | -0.86 | 0.86 | -0.1528 | 0.00 |
| | 0.561 | 0.717 | 0.56 | -0.72 | 0.72 | -0.3333 | 0.00 |
| | 1.9077 | 0.639 | 1.91 | -0.64 | 0.64 | -0.4484 | 0.00 |
| | 10.3643 | 0.606 | 10.36 | -0.61 | 0.61 | -0.5006 | 0.00 |
| | 49.8693 | 0.598 | 49.87 | -0.60 | 0.60 | -0.5146 | -0.01 |
| | 497.561 | 0.579 | 497.56 | -0.58 | 0.58 | -0.5460 | -0.08 |
| | 997.561 | 0.556 | 997.56 | -0.56 | 0.56 | -0.5875 | -0.16 |
| | 1497.561 | 0.523 | 1497.56 | -0.52 | 0.52 | -0.6477 | -0.23 |
| | 1997.561 | 0.505 | 1997.56 | -0.51 | 0.51 | -0.6826 | -0.31 |
| | 2497.561 | 0.496 | 2497.56 | -0.50 | 0.50 | -0.7005 | -0.39 |
| | 2897.561 | 0.476 | 2897.56 | -0.48 | 0.48 | -0.7431 | -0.45 |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |
| | | | 0.00 | | | 0.0000 | |

TETRA-TECH NUS

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT45 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 21-Jan-04 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .208' | 2.5 = R |
| Length of Well Screen (ft.) : | | 13.45 = L |
| Time for 37% head change (min.) : | | 11300 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 9.52E-08 | ft./min. |
| 1.59E-09 | ft./sec. |
| 1.37E-04 | ft./day |
| 4.84E-08 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(13.45/.208)}{2 \times 13.45 \times 11300}$$

$9.4 \times 10^{-8}$ Ft/min

CHECKED
2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

**Project Name:** Crane NSWC
**Project No.:** 9060
**Test Type:** Falling head

**Well/Boring No.:** 13MWT46
**Aquifer Type:** Bedrock
**Test Date:** 21-Jan-04

**Done By:** FWRamser
**Checked By:**

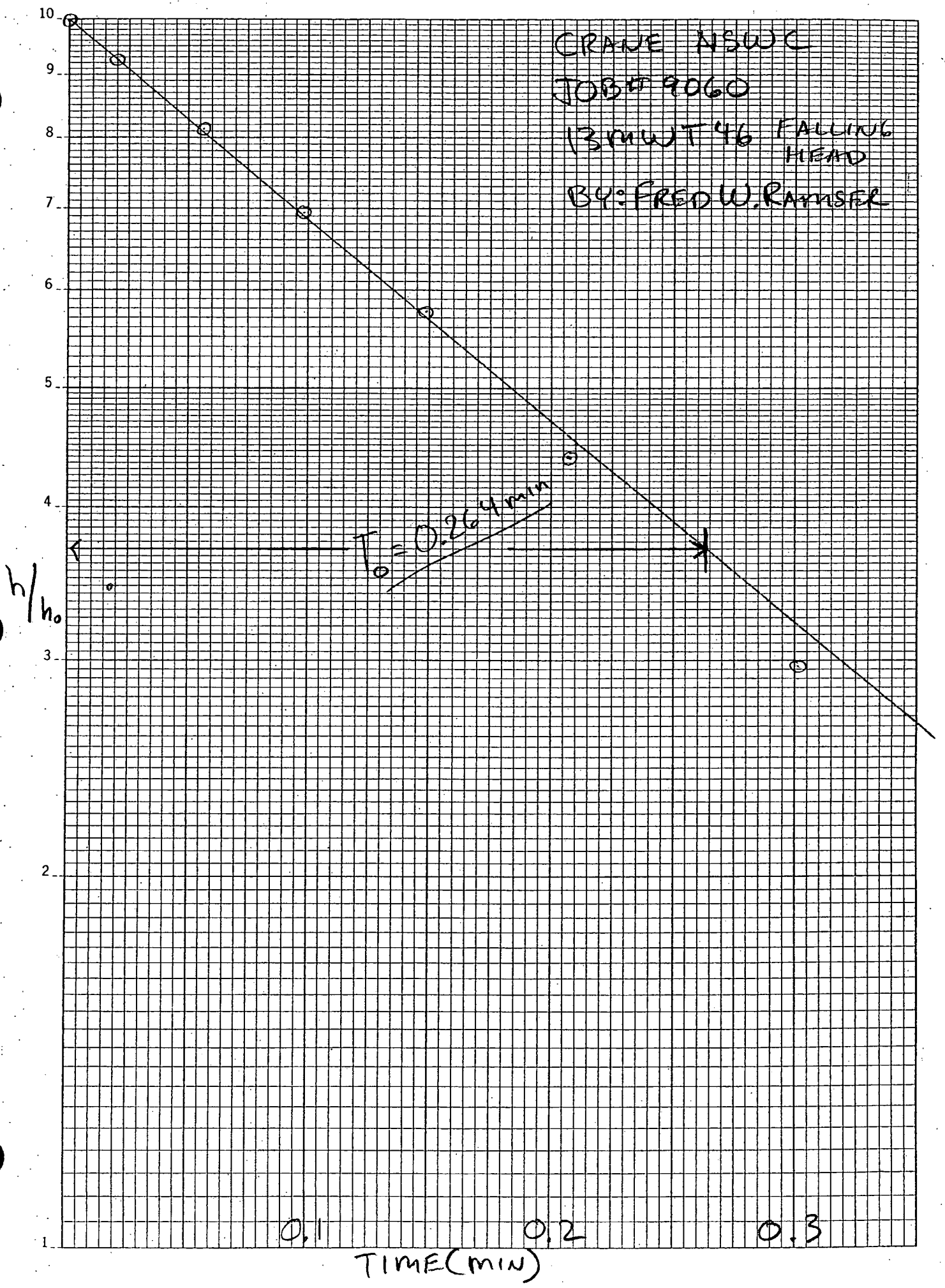
| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 2.5 | = R |
| Length of Well Screen (ft.) : | 12.72 | = L |
| Time for 37% head change (min.) : | 0.264 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 4.25E-03 | ft./min. |
| 7.09E-05 | ft./sec. |
| 6.12E+00 | ft./day |
| 2.16E-03 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$


CRANE NSWC
JOB# 9060
13MWT 46 FALLING HEAD
BY: FRED W. RAMSER
$T_0 = 0.264$ min
$h/h_0$
10
9
8
7
6
5
4
3
2
1
0.1
0.2
0.3
TIME (MIN)
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

Tetra Tech NUS, Inc.

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 13MWT46

PROJECT NO.: 9060 GEOLOGIST: FRED W RAMSER

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10', 57.65-67.65 TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 57.93 DATE: 1-21-04

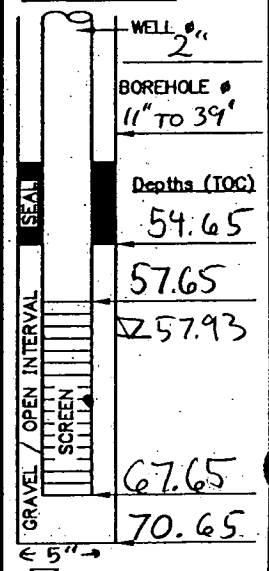
TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

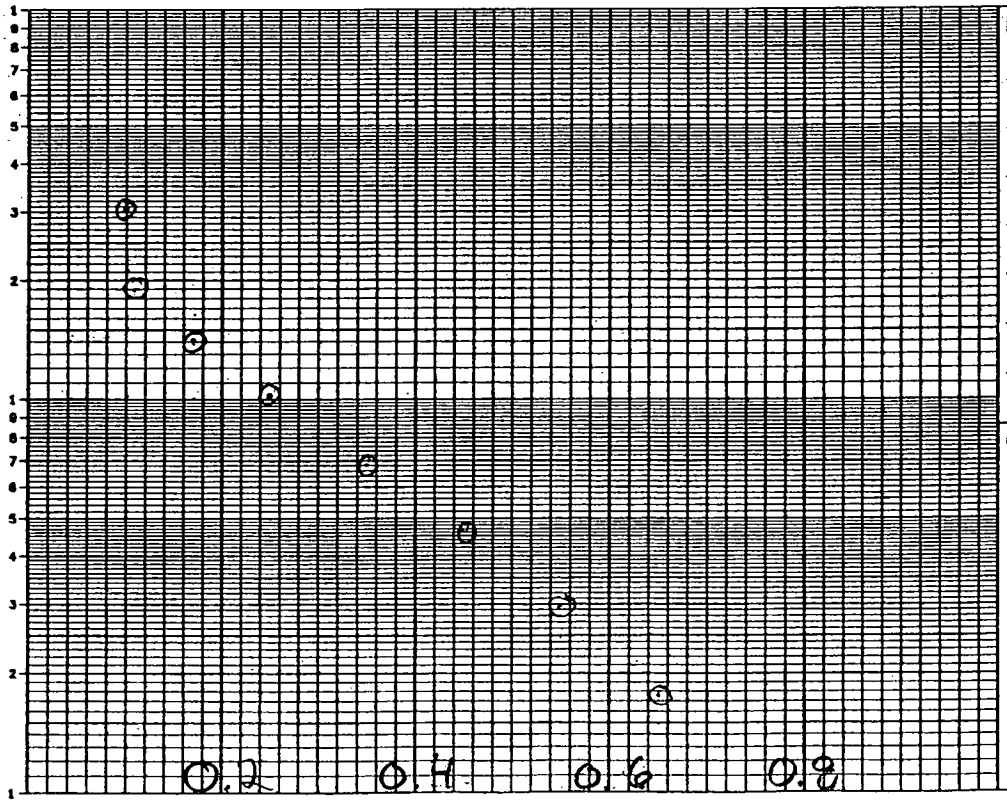
METHOD OF INDUCING WATER LEVEL CHANGE: SOLID SLUG 7.7' x 0.1' dia PAGE ..... OF .....

REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): WATER SURFACE, 0.00 = REF

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0.0 | | 0.02 | | | |
| 0.11 | | 3.1 | | | |
| 0.13 | | 1.97 | | | |
| 0.17 | | 1.40 | | | |
| 0.25 | | 1.03 | | | |
| 0.35 | | 0.684 | | | |
| 0.45 | | 0.466 | | | |
| 0.55 | | 0.291 | | | |
| 0.65 | | 0.179 | | | |
| | | | | | |
| | | | | | |
| | | | | | |

WELL SCHEMATIC




REMARKS:

STARTED @ 1205

STOPPED @ 1220

CALCS, SKETCH MAPS, ETC.:

ACAD: FORM_HYDCONTST.dwg 07/08/99 INL

| | | |
|---|---|---|
| In-Situ Inc. | MiniTroll Pro | |
| Report generated: | 1/22/2004 | 21:39:35 |
| Report from file: | ...\SN08670 2004-01-21 120509 13mwt46t1.bin | |
| Win-Situ Version | 4.41 | |
| Serial number: | 8670 | |
| Firmware Version | 3.07 | |
| Unit name: | | |
| Test name: | | 13mwt46t1 |
| Test defined on: | 1/21/2004 | 9:33:44 |
| Test started on: | 1/21/2004 | 12:05:09 |
| Test stopped on: | N/A | N/A |
| Test extracted on: | N/A | N/A |
| Data gathered using Logarithmic testing | | |
| Maximum time between data p | Minutes. | |
| Number of data samples: | 108 | |
| TOTAL DATA SAMPLES | 108 | |
| Channel number [1] | | |
| Measurement type: | Temperature | |
| Channel name: | | |
| Channel number [2] | | |
| Measurement type: | Pressure | |
| Channel name: | Water level | |
| Sensor Range: | 100 PSIG. | |
| Specific gravity: | 1 | |
| Mode: | TOC | |
| User-defined reference: | 0 | Feet H2O |
| Referenced on: | test start | |
| Pressure head at reference: | 9.505 | Feet H2O |

DATA PLOTTED = ●

| Date | Time | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho | ho = -1.4 |
|---|---|---|---|---|---|---|---|
| 1/21/2004 | 12:05:09 | 0 | 54.3 | 0 | | | |
| 1/21/2004 | 12:05:09 | 0.005 | 54.32 | -0.012 | | | |
| 1/21/2004 | 12:05:09 | 0.01 | 54.32 | -0.024 | | | |
| 1/21/2004 | 12:05:09 | 0.015 | 54.34 | -0.023 | | | |
| 1/21/2004 | 12:05:10 | 0.02 | 54.34 | -0.023 | | | |
| 1/21/2004 | 12:05:10 | 0.025 | 54.34 | -0.03 | | | |
| 1/21/2004 | 12:05:10 | 0.03 | 54.34 | -0.023 | | | |
| 1/21/2004 | 12:05:11 | 0.035 | 54.37 | -0.029 | | | |
| 1/21/2004 | 12:05:11 | 0.04 | 54.37 | -0.029 | | | |
| 1/21/2004 | 12:05:11 | 0.045 | 54.37 | -0.029 | | | |
| 1/21/2004 | 12:05:12 | 0.05 | 54.37 | -0.029 | | | |
| 1/21/2004 | 12:05:12 | 0.055 | 54.37 | -0.029 | | | |
| 1/21/2004 | 12:05:12 | 0.06 | 54.37 | -0.029 | | | |
| 1/21/2004 | 12:05:12 | 0.065 | 54.37 | -0.029 | | | |
| 1/21/2004 | 12:05:13 | 0.07 | 54.37 | -0.029 | | | |
| 1/21/2004 | 12:05:13 | 0.075 | 54.37 | -0.029 | | | |
| 1/21/2004 | 12:05:13 | 0.08 | 54.37 | -0.029 | | | |
| 1/21/2004 | 12:05:14 | 0.085 | 54.37 | -0.029 | | | |
| 1/21/2004 | 12:05:14 | 0.09 | 54.37 | -0.029 | | | |
| 1/21/2004 | 12:05:14 | 0.095 | 54.39 | -0.221 | | | |
| 1/21/2004 | 12:05:15 | 0.1 | 54.39 | -1.056 | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1/21/2004 | 12:05:15 | 0.1058 | 54.39 | -3.088 | | | | | |
| 1/21/2004 | 12:05:15 | 0.112 | 54.39 | -3.212 | | | | | |
| 1/21/2004 | 12:05:16 | 0.1185 | 54.39 | -1.866 | | | | | |
| 1/21/2004 | 12:05:16 | 0.1255 | 54.39 | -0.732 | | | | | |
| 1/21/2004 | 12:05:17 | 0.1328 | 54.39 | -1.972 | | | | | |
| 1/21/2004 | 12:05:17 | 0.1407 | 54.39 | -1.38 | | | | | |
| 1/21/2004 | 12:05:18 | 0.149 | 54.39 | -1.686 | | | | | |
| 1/21/2004 | 12:05:18 | 0.1578 | 54.39 | -1.305 | | | | | |
| 1/21/2004 | 12:05:19 | 0.1672 | 54.37 | -1.4 | 0.000 | 1.000 | | | |
| 1/21/2004 | 12:05:19 | 0.177 | 54.37 | -1.35 | 0.010 | 0.964 | | | |
| 1/21/2004 | 12:05:20 | 0.1875 | 54.37 | -1.3 | 0.020 | 0.929 | | | |
| 1/21/2004 | 12:05:20 | 0.1985 | 54.37 | -1.244 | 0.031 | 0.889 | | | |
| 1/21/2004 | 12:05:21 | 0.2102 | 54.37 | -1.188 | 0.043 | 0.849 | | | |
| 1/21/2004 | 12:05:22 | 0.2227 | 54.37 | -1.138 | 0.056 | 0.813 | | | |
| 1/21/2004 | 12:05:23 | 0.2358 | 54.37 | -1.082 | 0.069 | 0.773 | | | |
| 1/21/2004 | 12:05:24 | 0.2498 | 54.34 | -1.027 | 0.083 | 0.734 | | | |
| 1/21/2004 | 12:05:24 | 0.2647 | 54.34 | -0.971 | 0.098 | 0.694 | | | |
| 1/21/2004 | 12:05:25 | 0.2803 | 54.34 | -0.914 | 0.113 | 0.653 | | | |
| 1/21/2004 | 12:05:26 | 0.297 | 54.34 | -0.852 | 0.130 | 0.609 | | | |
| 1/21/2004 | 12:05:27 | 0.3147 | 54.34 | -0.796 | 0.148 | 0.569 | | | |
| 1/21/2004 | 12:05:29 | 0.3333 | 54.34 | -0.74 | 0.166 | 0.529 | | | |
| 1/21/2004 | 12:05:30 | 0.3532 | 54.34 | -0.684 | 0.186 | 0.489 | | | |
| 1/21/2004 | 12:05:31 | 0.3742 | 54.34 | -0.622 | 0.207 | 0.444 | | | |
| 1/21/2004 | 12:05:32 | 0.3963 | 54.34 | -0.572 | 0.229 | 0.409 | | | |
| 1/21/2004 | 12:05:34 | 0.4198 | 54.34 | -0.516 | 0.253 | 0.369 | | | |
| 1/21/2004 | 12:05:35 | 0.4447 | 54.34 | -0.466 | 0.278 | 0.333 | | | |
| 1/21/2004 | 12:05:37 | 0.4697 | 54.34 | -0.416 | 0.303 | 0.297 | | | |
| 1/21/2004 | 12:05:38 | 0.4963 | 54.34 | -0.372 | 0.329 | 0.266 | | | |
| 1/21/2004 | 12:05:40 | 0.5247 | 54.34 | -0.329 | 0.358 | 0.235 | | | |
| 1/21/2004 | 12:05:42 | 0.5547 | 54.34 | -0.291 | 0.388 | 0.208 | | | |
| 1/21/2004 | 12:05:44 | 0.5863 | 54.34 | -0.248 | 0.419 | 0.177 | | | |
| 1/21/2004 | 12:05:46 | 0.6213 | 54.34 | -0.217 | 0.454 | 0.155 | | | |
| 1/21/2004 | 12:05:48 | 0.658 | 54.34 | -0.179 | 0.491 | 0.128 | | | |
| 1/21/2004 | 12:05:50 | 0.6963 | 54.34 | -0.154 | 0.529 | 0.110 | | | |
| 1/21/2004 | 12:05:53 | 0.738 | 54.34 | -0.129 | 0.571 | 0.092 | | | |
| 1/21/2004 | 12:05:55 | 0.7813 | 54.34 | -0.111 | 0.614 | 0.079 | | | |
| 1/21/2004 | 12:05:58 | 0.828 | 54.34 | -0.092 | 0.661 | 0.066 | | | |
| 1/21/2004 | 12:06:01 | 0.8763 | 54.34 | -0.079 | 0.709 | 0.056 | | | |
| 1/21/2004 | 12:06:04 | 0.928 | 54.34 | -0.073 | 0.761 | 0.052 | | | |
| 1/21/2004 | 12:06:08 | 0.983 | 54.34 | -0.067 | 0.816 | 0.048 | | | |
| 1/21/2004 | 12:06:11 | 1.0413 | 54.32 | -0.062 | 0.874 | 0.044 | | | |
| 1/21/2004 | 12:06:15 | 1.103 | 54.32 | -0.055 | 0.936 | 0.039 | | | |
| 1/21/2004 | 12:06:19 | 1.168 | 54.32 | -0.049 | 1.001 | 0.035 | | | |
| 1/21/2004 | 12:06:23 | 1.238 | 54.32 | -0.049 | 1.071 | 0.035 | | | |
| 1/21/2004 | 12:06:27 | 1.3113 | 54.32 | -0.043 | 1.144 | 0.031 | | | |
| 1/21/2004 | 12:06:32 | 1.3897 | 54.32 | -0.043 | 1.223 | 0.031 | | | |
| 1/21/2004 | 12:06:37 | 1.473 | 54.32 | -0.043 | 1.306 | 0.031 | | | |
| 1/21/2004 | 12:06:42 | 1.5613 | 54.32 | -0.043 | 1.394 | 0.031 | | | |
| 1/21/2004 | 12:06:48 | 1.6547 | 54.32 | -0.037 | 1.488 | 0.026 | | | |
| 1/21/2004 | 12:06:54 | 1.753 | 54.32 | -0.037 | 1.586 | 0.026 | | | |
| 1/21/2004 | 12:07:00 | 1.858 | 54.32 | -0.037 | 1.691 | 0.026 | | | |
| 1/21/2004 | 12:07:07 | 1.968 | 54.32 | -0.037 | 1.801 | 0.026 | | | |
| 1/21/2004 | 12:07:14 | 2.0847 | 54.3 | -0.037 | 1.918 | 0.026 | | | |
| 1/21/2004 | 12:07:21 | 2.2097 | 54.3 | -0.037 | 2.043 | 0.026 | | | |
| 1/21/2004 | 12:07:29 | 2.3413 | 54.3 | -0.031 | 2.174 | 0.022 | | | |
| 1/21/2004 | 12:07:37 | 2.4813 | 54.3 | -0.031 | 2.314 | 0.022 | | | |
| 1/21/2004 | 12:07:46 | 2.6297 | 54.3 | -0.037 | 2.463 | 0.026 | | | |
| 1/21/2004 | 12:07:56 | 2.7863 | 54.3 | -0.031 | 2.619 | 0.022 | | | |
| 1/21/2004 | 12:08:06 | 2.953 | 54.3 | -0.031 | 2.786 | 0.022 | | | |
| 1/21/2004 | 12:08:16 | 3.1297 | 54.3 | -0.031 | 2.963 | 0.022 | | | |
| 1/21/2004 | 12:08:28 | 3.3163 | 54.3 | -0.031 | 3.149 | 0.022 | | | |
| 1/21/2004 | 12:08:39 | 3.5147 | 54.3 | -0.031 | 3.348 | 0.022 | | | |
| 1/21/2004 | 12:08:52 | 3.7247 | 54.3 | -0.031 | 3.558 | 0.022 | | | |
| 1/21/2004 | 12:09:05 | 3.9463 | 54.3 | -0.031 | 3.779 | 0.022 | | | |

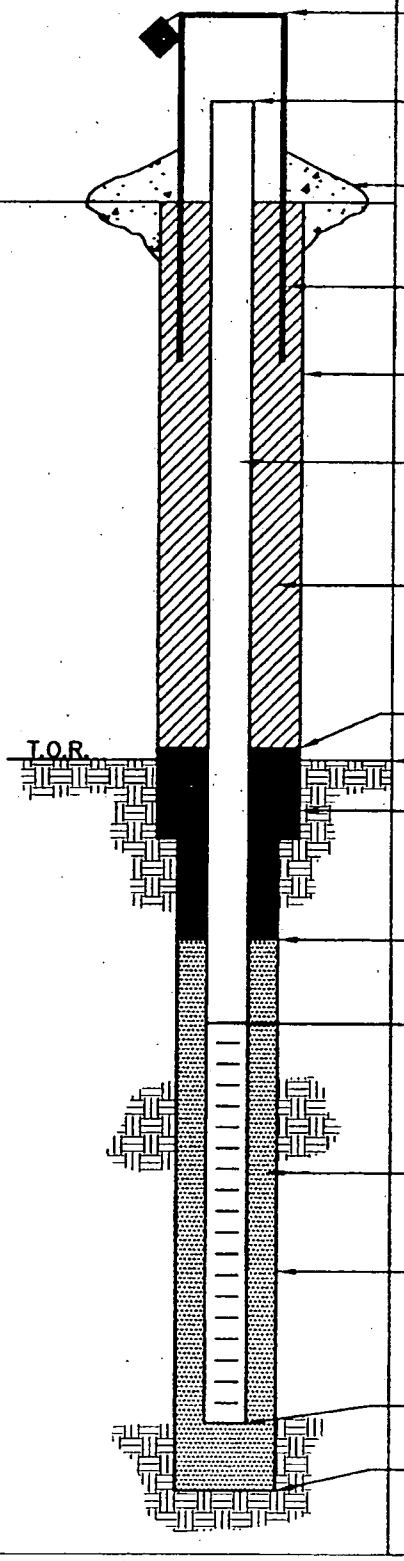
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1/21/2004 | 12:09:19 | 4.1813 | 54.3 | -0.031 | 4.014 | 0.022 | | |
| 1/21/2004 | 12:09:34 | 4.4297 | 54.3 | -0.025 | 4.263 | 0.018 | | |
| 1/21/2004 | 12:09:50 | 4.693 | 54.3 | -0.031 | 4.526 | 0.022 | | |
| 1/21/2004 | 12:10:07 | 4.973 | 54.3 | -0.025 | 4.806 | 0.018 | | |
| 1/21/2004 | 12:10:25 | 5.2697 | 54.28 | -0.032 | 5.103 | 0.023 | | |
| 1/21/2004 | 12:10:44 | 5.583 | 54.28 | -0.026 | 5.416 | 0.019 | | |
| 1/21/2004 | 12:11:03 | 5.9147 | 54.28 | -0.026 | 5.748 | 0.019 | | |
| 1/21/2004 | 12:11:25 | 6.2663 | 54.28 | -0.032 | 6.099 | 0.023 | | |
| 1/21/2004 | 12:11:47 | 6.6397 | 54.28 | -0.026 | 6.473 | 0.019 | | |
| 1/21/2004 | 12:12:11 | 7.0347 | 54.28 | -0.032 | 6.868 | 0.023 | | |
| 1/21/2004 | 12:12:36 | 7.453 | 54.28 | -0.026 | 7.286 | 0.019 | | |
| 1/21/2004 | 12:13:02 | 7.8963 | 54.28 | -0.026 | 7.729 | 0.019 | | |
| 1/21/2004 | 12:13:31 | 8.3663 | 54.28 | -0.026 | 8.199 | 0.019 | | |
| 1/21/2004 | 12:14:00 | 8.8647 | 54.25 | -0.026 | 8.698 | 0.019 | | |
| 1/21/2004 | 12:14:32 | 9.3913 | 54.25 | -0.033 | 9.224 | 0.024 | | |
| 1/21/2004 | 12:15:06 | 9.9497 | 54.25 | -0.026 | 9.783 | 0.019 | | |
| 1/21/2004 | 12:15:41 | 10.5413 | 54.25 | -0.026 | 10.374 | 0.019 | | |
| 1/21/2004 | 12:16:19 | 11.168 | 54.25 | -0.033 | 11.001 | 0.024 | | |
| 1/21/2004 | 12:16:58 | 11.8313 | 54.25 | -0.026 | 11.664 | 0.019 | | |
| 1/21/2004 | 12:17:41 | 12.5347 | 54.23 | -0.027 | 12.368 | 0.019 | | |
| 1/21/2004 | 12:18:25 | 13.2797 | 54.23 | -0.027 | 13.113 | 0.019 | | |
| 1/21/2004 | 12:19:13 | 14.0697 | 54.23 | -0.027 | 13.903 | 0.019 | | |
| 1/21/2004 | 12:20:03 | 14.9063 | 54.23 | -0.027 | 14.739 | 0.019 | | |

WELL NO.: 13MW196

Tetra Tech NUS, Inc.

# BEDROCK MONITORING WELL SHEET WELL INSTALLED IN BEDROCK

| | | |
|---|---|---|
| PROJECT NSWC CRANE | LOCATION SWMU 13 | DRILLER J. KEIFER |
| PROJECT NO. 9060 | BORING | DRILLING METHOD ROTO-SONIC |
| DATE BEGUN 11/21/03 | DATE COMPLETED 11/22/03 | |
| FIELD GEOLOGIST S. GRIER | | DEVELOPMENT METHOD |
| GROUND ELEVATION | DATUM | |




ELEVATION/HEIGHT OF TOP OF SURFACE CASING: /

ELEVATION/HEIGHT TOP OF RISER: /

TYPE OF SURFACE SEAL: CONCRETE

I.D. OF SURFACE CASING: 4" Steel

DIAMETER OF HOLE: 11" down to 39'

RISER PIPE I.D.: 2"

TYPE OF RISER PIPE: 2.5" PVC

TYPE OF BACKFILL:

ELEVATION/DEPTH TOP OF SEAL: /3'

ELEVATION/DEPTH TOP OF BEDROCK:

TYPE OF SEAL: BENTONITE PURE GOLD GEL CHIPS

ELEVATION/DEPTH TOP OF SAND: /52'

ELEVATION/DEPTH TOP OF SCREEN: /55'

TYPE OF SCREEN: PVC

SLOT SIZE x LENGTH: 2"-20 slot

I.D. SCREEN:

TYPE OF SAND PACK:

DIAMETER OF HOLE IN BEDROCK: 4"/5"

CORE/REAM:

ELEVATION/DEPTH BOTTOM SCREEN: /65'

ELEVATION/DEPTH BOTTOM OF SAND: /68'

ELEVATION/DEPTH BOTTOM OF HOLE: /

BACKFILL MATERIAL BELOW SAND: N/A

ACAD: FORM_MWINBR.dwg 07/20/99 INL

TETRA-TECH NUS

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT46 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Falling head | **Test Date:** | 21-Jan-04 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .208' | 2.5 = R |
| Length of Well Screen (ft.) : | | 12.72 = L |
| Time for 37% head change (min.) : | | 0.264 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 4.25E-03 | ft./min. |
| 7.09E-05 | ft./sec. |
| 6.12E+00 | ft./day |
| 2.16E-03 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(12.72/.208)}{2 \times 12.72 \times .264} =$$

$4.22 \times 10^{-3}$ Ft/min

CHECKED

2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 13MWT46 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 21-Jan-04 |

**Done By:** FWRamser
**Checked By:**

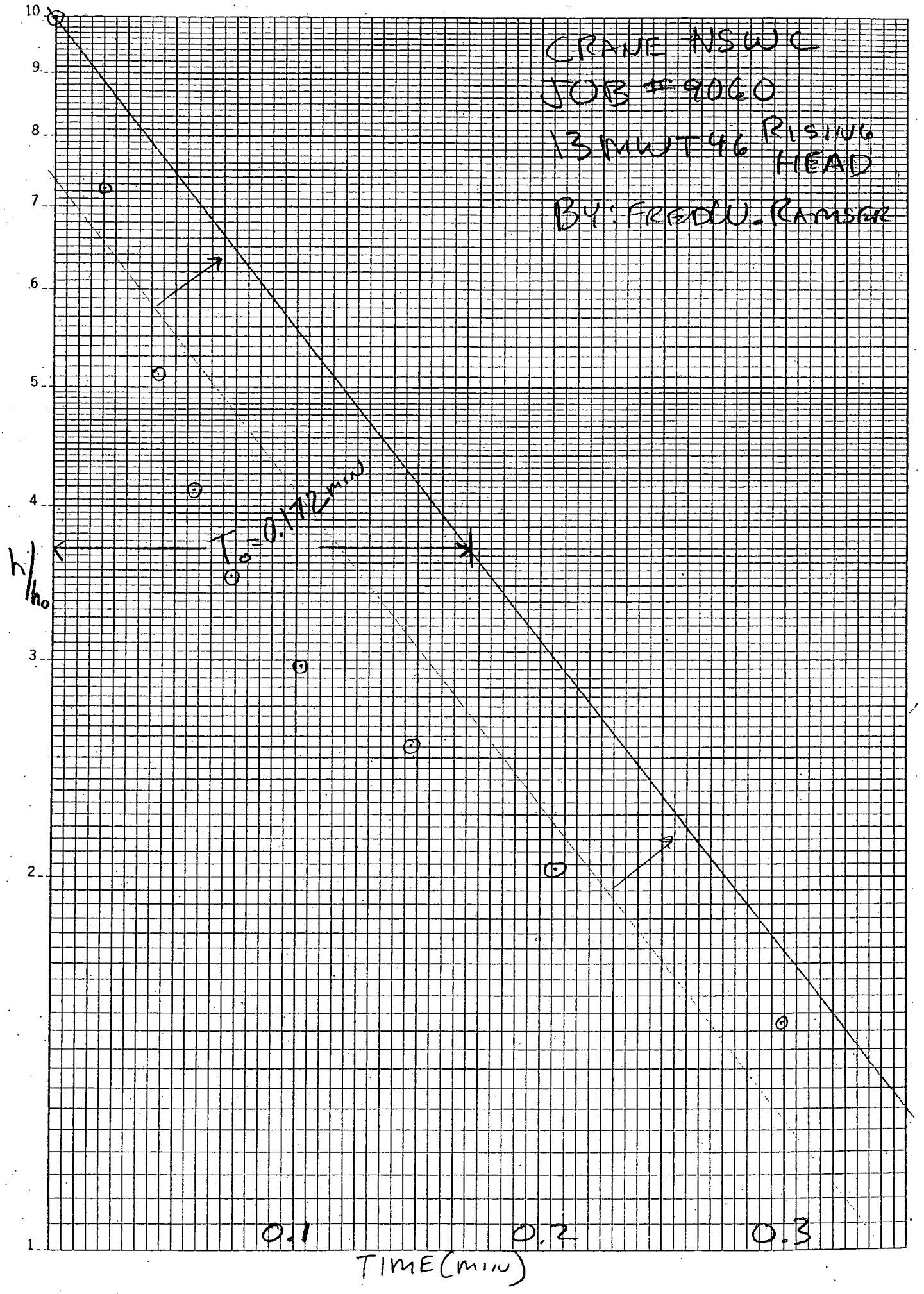
| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 2.5 | = R |
| Length of Well Screen (ft.) : | 12.72 | = L |
| Time for 37% head change (min.) : | 0.172 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 6.53E-03 | ft./min. |
| 1.09E-04 | ft./sec. |
| 9.40E+00 | ft./day |
| 3.32E-03 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

Tetra Tech NUS, Inc.

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 13MWT46

PROJECT NO.: 9060 GEOLOGIST: FRED W RAMSER

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10', 57.65-67.65 TEST NO.: 2

STATIC WATER LEVEL (Depth/Elevation): 57.93 DATE: 1-21-04

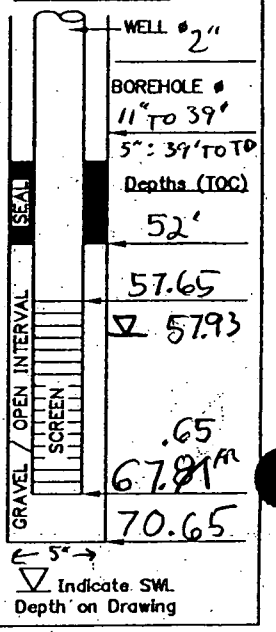
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

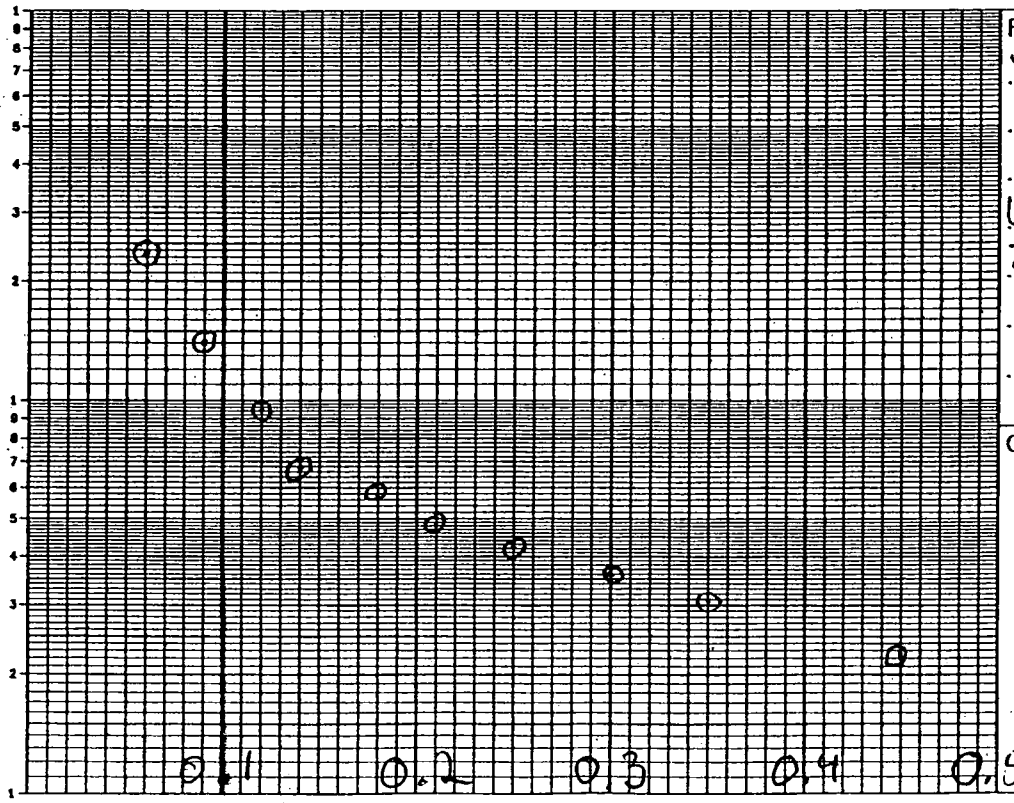
METHOD OF INDUCING WATER LEVEL CHANGE: ~~2 x 1 LB BATTERY 7 x 3' DISPLACEMENT~~ PAGE ..... OF .....

REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): WATER SURFACE, 0.00 = REF

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0.06 | | 2.34 | | | |
| 0.09 | | 1.43 | | | |
| 0.12 | | 0.938 | | | |
| 0.14 | | 0.689 | | | |
| 0.18 | | 0.544 | | | |
| 0.21 | | 0.488 | | | |
| 0.25 | | 0.426 | | | |
| 0.30 | | 0.364 | | | |
| 0.35 | | 0.307 | | | |
| 0.45 | | 0.226 | | | |
| 0.55 | | 0.157 | | | |
| | | | | | |

WELL SCHEMATIC




REMARKS:

$N_{D_{H2O}}$ =

STARTED TEST @ 1225

USED SOLID SLUG 7.7' x ~0.1' dia

STOPPED TEST @ 1237

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL

| | | |
|---|---|---|
| In-Situ Inc. | MiniTroll Pro | |
| Report generated: | 1/22/2004 | 21:42:21 |
| Report from file: | ...\SN08670 2004-01-21 122500 13mwt46_2.bin | |
| Win-Situ Version | 4.41 | |
| Serial number: | 8670 | |
| Firmware Version | 3.07 | |
| Unit name: | | |
| Test name: | | 13mwt46_2 |
| Test defined on: | 1/21/2004 | 12:23:44 |
| Test started on: | 1/21/2004 | 12:25:00 |
| Test stopped on: | N/A | N/A |
| Test extracted on: | N/A | N/A |
| Data gathered using Logarithmic testing | | |
| Maximum time between da | Minutes. | |
| Number of data samples: | 103 | |
| TOTAL DATA SAMPLES | 103 | |
| Channel number [1] | | |
| Measurement type: | Temperature | |
| Channel name: | | |
| Channel number [2] | | |
| Measurement type: | Pressure | |
| Channel name: | Water level | |
| Sensor Range: | 100 PSIG. | |
| Specific gravity: | 1 | |
| Mode: | TOC | |
| User-defined reference: | 0 | Feet H2O |
| Referenced on: | test start | |
| Pressure head at reference | 9.539 | Feet H2O |

| Date | Time | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho | ho = 1.835 |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | | |
| 1/21/2004 | 12:25:00 | 0 | 54.23 | 0 | | | |
| 1/21/2004 | 12:25:00 | 0.005 | 54.25 | -0.012 | | | |
| 1/21/2004 | 12:25:01 | 0.01 | 54.28 | -0.017 | | | |
| 1/21/2004 | 12:25:01 | 0.015 | 54.28 | -0.023 | | | |
| 1/21/2004 | 12:25:01 | 0.02 | 54.28 | -0.023 | | | |
| 1/21/2004 | 12:25:01 | 0.025 | 54.3 | -0.023 | | | |
| 1/21/2004 | 12:25:02 | 0.03 | 54.3 | 0.133 | | | |
| 1/21/2004 | 12:25:02 | 0.035 | 54.3 | 1.068 | | | |
| 1/21/2004 | 12:25:02 | 0.04 | 54.3 | 1.691 | | | |
| 1/21/2004 | 12:25:03 | 0.045 | 54.3 | 1.436 | | | |
| 1/21/2004 | 12:25:03 | 0.05 | 54.3 | 1.872 | | | |
| 1/21/2004 | 12:25:03 | 0.055 | 54.3 | 2.233 | | | |
| 1/21/2004 | 12:25:04 | 0.06 | 54.3 | 2.339 | | | |
| 1/21/2004 | 12:25:04 | 0.065 | 54.3 | 2.14 | | | |
| 1/21/2004 | 12:25:04 | 0.07 | 54.3 | 1.99 | | | |
| 1/21/2004 | 12:25:04 | 0.075 | 54.32 | 1.835 | 0 | 1.0000 | |
| 1/21/2004 | 12:25:05 | 0.08 | 54.3 | 1.685 | 0.005 | 0.9183 | |
| 1/21/2004 | 12:25:05 | 0.085 | 54.32 | 1.548 | 0.01 | 0.8436 | |
| 1/21/2004 | 12:25:05 | 0.09 | 54.32 | 1.43 | 0.015 | 0.7793 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1/21/2004 | 12:25:06 | 0.095 | 54.32 | 1.33 | 0.02 | 0.7248 | | |
| 1/21/2004 | 12:25:06 | 0.1 | 54.32 | 1.237 | 0.025 | 0.6741 | | |
| 1/21/2004 | 12:25:06 | 0.1058 | 54.32 | 1.15 | 0.0308 | 0.6267 | | |
| 1/21/2004 | 12:25:07 | 0.112 | 54.32 | 1.044 | 0.037 | 0.5689 | | |
| 1/21/2004 | 12:25:07 | 0.1185 | 54.32 | 0.938 | 0.0435 | 0.5112 | | |
| 1/21/2004 | 12:25:07 | 0.1255 | 54.32 | 0.844 | 0.0505 | 0.4599 | | |
| 1/21/2004 | 12:25:08 | 0.1328 | 54.32 | 0.757 | 0.0578 | 0.4125 | | |
| 1/21/2004 | 12:25:08 | 0.1407 | 54.32 | 0.689 | 0.0657 | 0.3755 | | |
| 1/21/2004 | 12:25:09 | 0.149 | 54.32 | 0.645 | 0.074 | 0.3515 | | |
| 1/21/2004 | 12:25:09 | 0.1578 | 54.32 | 0.595 | 0.0828 | 0.3243 | | |
| 1/21/2004 | 12:25:10 | 0.1672 | 54.32 | 0.57 | 0.0922 | 0.3106 | | |
| 1/21/2004 | 12:25:11 | 0.177 | 54.3 | 0.544 | 0.102 | 0.2965 | | |
| 1/21/2004 | 12:25:11 | 0.1875 | 54.3 | 0.526 | 0.1125 | 0.2866 | | |
| 1/21/2004 | 12:25:12 | 0.1985 | 54.3 | 0.507 | 0.1235 | 0.2763 | | |
| 1/21/2004 | 12:25:13 | 0.2102 | 54.3 | 0.488 | 0.1352 | 0.2659 | | |
| 1/21/2004 | 12:25:13 | 0.2227 | 54.3 | 0.47 | 0.1477 | 0.2561 | | |
| 1/21/2004 | 12:25:14 | 0.2358 | 54.3 | 0.445 | 0.1608 | 0.2425 | | |
| 1/21/2004 | 12:25:15 | 0.2498 | 54.3 | 0.426 | 0.1748 | 0.2322 | | |
| 1/21/2004 | 12:25:16 | 0.2647 | 54.3 | 0.401 | 0.1897 | 0.2185 | | |
| 1/21/2004 | 12:25:17 | 0.2803 | 54.3 | 0.382 | 0.2053 | 0.2082 | | |
| 1/21/2004 | 12:25:18 | 0.297 | 54.3 | 0.364 | 0.222 | 0.1984 | | |
| 1/21/2004 | 12:25:19 | 0.3147 | 54.28 | 0.344 | 0.2397 | 0.1875 | | |
| 1/21/2004 | 12:25:20 | 0.3333 | 54.28 | 0.326 | 0.2583 | 0.1777 | | |
| 1/21/2004 | 12:25:21 | 0.3532 | 54.28 | 0.307 | 0.2782 | 0.1673 | | |
| 1/21/2004 | 12:25:22 | 0.3742 | 54.28 | 0.282 | 0.2992 | 0.1537 | | |
| 1/21/2004 | 12:25:24 | 0.3963 | 54.28 | 0.257 | 0.3213 | 0.1401 | | |
| 1/21/2004 | 12:25:25 | 0.4198 | 54.28 | 0.238 | 0.3448 | 0.1297 | | |
| 1/21/2004 | 12:25:27 | 0.4447 | 54.28 | 0.226 | 0.3697 | 0.1232 | | |
| 1/21/2004 | 12:25:28 | 0.4697 | 54.28 | 0.22 | 0.3947 | 0.1199 | | |
| 1/21/2004 | 12:25:30 | 0.4963 | 54.28 | 0.207 | 0.4213 | 0.1128 | | |
| 1/21/2004 | 12:25:31 | 0.5247 | 54.28 | 0.189 | 0.4497 | 0.1030 | | |
| 1/21/2004 | 12:25:33 | 0.5547 | 54.28 | 0.157 | 0.4797 | 0.0856 | | |
| 1/21/2004 | 12:25:35 | 0.5863 | 54.28 | 0.139 | 0.5113 | 0.0757 | | |
| 1/21/2004 | 12:25:37 | 0.6213 | 54.28 | 0.114 | 0.5463 | 0.0621 | | |
| 1/21/2004 | 12:25:39 | 0.658 | 54.28 | 0.157 | 0.583 | 0.0856 | | |
| 1/21/2004 | 12:25:42 | 0.6963 | 54.28 | 0.164 | 0.6213 | 0.0894 | | |
| 1/21/2004 | 12:25:44 | 0.738 | 54.28 | 0.151 | 0.663 | 0.0823 | | |
| 1/21/2004 | 12:25:47 | 0.7813 | 54.28 | 0.145 | 0.7063 | 0.0790 | | |
| 1/21/2004 | 12:25:50 | 0.828 | 54.28 | 0.139 | 0.753 | 0.0757 | | |
| 1/21/2004 | 12:25:53 | 0.8763 | 54.28 | 0.132 | 0.8013 | 0.0719 | | |
| 1/21/2004 | 12:25:56 | 0.928 | 54.28 | 0.12 | 0.853 | 0.0654 | | |
| 1/21/2004 | 12:25:59 | 0.983 | 54.28 | 0.114 | 0.908 | 0.0621 | | |
| 1/21/2004 | 12:26:02 | 1.0413 | 54.28 | 0.108 | 0.9663 | 0.0589 | | |
| 1/21/2004 | 12:26:06 | 1.103 | 54.28 | 0.101 | 1.028 | 0.0550 | | |
| 1/21/2004 | 12:26:10 | 1.168 | 54.25 | 0.088 | 1.093 | 0.0480 | | |
| 1/21/2004 | 12:26:14 | 1.238 | 54.25 | 0.082 | 1.163 | 0.0447 | | |
| 1/21/2004 | 12:26:19 | 1.3113 | 54.25 | 0.076 | 1.2363 | 0.0414 | | |
| 1/21/2004 | 12:26:23 | 1.3897 | 54.25 | 0.069 | 1.3147 | 0.0376 | | |
| 1/21/2004 | 12:26:28 | 1.473 | 54.25 | 0.063 | 1.398 | 0.0343 | | |
| 1/21/2004 | 12:26:34 | 1.5613 | 54.25 | 0.057 | 1.4863 | 0.0311 | | |
| 1/21/2004 | 12:26:39 | 1.6547 | 54.25 | 0.057 | 1.5797 | 0.0311 | | |
| 1/21/2004 | 12:26:45 | 1.753 | 54.25 | 0.051 | 1.678 | 0.0278 | | |
| 1/21/2004 | 12:26:51 | 1.858 | 54.25 | 0.051 | 1.783 | 0.0278 | | |
| 1/21/2004 | 12:26:58 | 1.968 | 54.25 | 0.044 | 1.893 | 0.0240 | | |
| 1/21/2004 | 12:27:05 | 2.0847 | 54.25 | 0.038 | 2.0097 | 0.0207 | | |
| 1/21/2004 | 12:27:13 | 2.2097 | 54.25 | 0.038 | 2.1347 | 0.0207 | | |
| 1/21/2004 | 12:27:20 | 2.3413 | 54.25 | 0.038 | 2.2663 | 0.0207 | | |
| 1/21/2004 | 12:27:29 | 2.4813 | 54.25 | 0.038 | 2.4063 | 0.0207 | | |
| 1/21/2004 | 12:27:38 | 2.6297 | 54.25 | 0.032 | 2.5547 | 0.0174 | | |
| 1/21/2004 | 12:27:47 | 2.7863 | 54.25 | 0.032 | 2.7113 | 0.0174 | | |
| 1/21/2004 | 12:27:57 | 2.953 | 54.25 | 0.032 | 2.878 | 0.0174 | | |
| 1/21/2004 | 12:28:08 | 3.1297 | 54.25 | 0.026 | 3.0547 | 0.0142 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1/21/2004 | 12:28:19 | 3.3163 | 54.23 | 0.025 | 3.2413 | 0.0136 | | |
| 1/21/2004 | 12:28:31 | 3.5147 | 54.23 | 0.025 | 3.4397 | 0.0136 | | |
| 1/21/2004 | 12:28:43 | 3.7247 | 54.23 | 0.025 | 3.6497 | 0.0136 | | |
| 1/21/2004 | 12:28:57 | 3.9463 | 54.23 | 0.025 | 3.8713 | 0.0136 | | |
| 1/21/2004 | 12:29:11 | 4.1813 | 54.23 | 0.025 | 4.1063 | 0.0136 | | |
| 1/21/2004 | 12:29:26 | 4.4297 | 54.23 | 0.025 | 4.3547 | 0.0136 | | |
| 1/21/2004 | 12:29:42 | 4.693 | 54.23 | 0.025 | 4.618 | 0.0136 | | |
| 1/21/2004 | 12:29:58 | 4.973 | 54.23 | 0.019 | 4.898 | 0.0104 | | |
| 1/21/2004 | 12:30:16 | 5.2697 | 54.23 | 0.019 | 5.1947 | 0.0104 | | |
| 1/21/2004 | 12:30:35 | 5.583 | 54.23 | 0.019 | 5.508 | 0.0104 | | |
| 1/21/2004 | 12:30:55 | 5.9147 | 54.23 | 0.019 | 5.8397 | 0.0104 | | |
| 1/21/2004 | 12:31:16 | 6.2663 | 54.21 | 0.018 | 6.1913 | 0.0098 | | |
| 1/21/2004 | 12:31:38 | 6.6397 | 54.23 | 0.019 | 6.5647 | 0.0104 | | |
| 1/21/2004 | 12:32:02 | 7.0347 | 54.23 | 0.019 | 6.9597 | 0.0104 | | |
| 1/21/2004 | 12:32:27 | 7.453 | 54.21 | 0.018 | 7.378 | 0.0098 | | |
| 1/21/2004 | 12:32:54 | 7.8963 | 54.21 | 0.018 | 7.8213 | 0.0098 | | |
| 1/21/2004 | 12:33:22 | 8.3663 | 54.21 | 0.018 | 8.2913 | 0.0098 | | |
| 1/21/2004 | 12:33:52 | 8.8647 | 54.21 | 0.018 | 8.7897 | 0.0098 | | |
| 1/21/2004 | 12:34:23 | 9.3913 | 54.21 | 0.018 | 9.3163 | 0.0098 | | |
| 1/21/2004 | 12:34:57 | 9.9497 | 54.21 | 0.018 | 9.8747 | 0.0098 | | |
| 1/21/2004 | 12:35:32 | 10.5413 | 54.21 | 0.018 | 10.4663 | 0.0098 | | |
| 1/21/2004 | 12:36:10 | 11.168 | 54.21 | 0.018 | 11.093 | 0.0098 | | |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

**Project Name:** Crane NSWC
**Project No.:** 9060
**Test Type:** Rising head

**Well/Boring No.:** 13MWT46
**Aquifer Type:** Bedrock
**Test Date:** 21-Jan-04

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .208' | 2.5 = R |
| Length of Well Screen (ft.) : | | 12.72 = L |
| Time for 37% head change (min.) : | | 0.172 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 6.53E-03 | ft./min. |
| 1.09E-04 | ft./sec. |
| 9.40E+00 | ft./day |
| 3.32E-03 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(12.72/.208)}{2 \times 12.72 \times .172}$$

$$6.48 \times 10^{-3}$$

CHECKED

2-18-04

| CLIENT | JOB NUMBER |
|---|---|
| NSWC CRANE | 9060 |

SUBJECT: GW FLOW GRADIENTS AND SEEPAGE VELOCITY - SWMU 13

| BASED ON | DRAWING NUMBER |
|---|---|
| | |

| BY | CHECKED BY | APPROVED BY | DATE |
|---|---|---|---|
| FWR | FCW | | |

SEEPAGE VELOCITY ($V_s$) - SOUTHWESTERN PORTION OF SWMU 13
SHALLOW BEDROCK

$$\text{GRADIENT } (i) = \left[\left(\frac{20}{390}\right) + \left(\frac{5}{65}\right) + \left(\frac{15}{70}\right) + \left(\frac{5}{150}\right)\right] \cdot \frac{1}{4}$$

$i = 0.094$

$K = 0.212$ ft/day (from table 1-2 AVE K SWMU 13)

$n = 0.005$ (ASSUME FRACTURE VOLUME PER UNIT VOLUME OF BEDROCK)

$V_s = Ki/n$

$= (0.212 \text{ ft/day})(0.094)/.005$

$= 3.99$ ft/day

EASTERN PORTION OF SWMU 13:

$$\text{GRADIENT } i = \left[\frac{5}{100} + \frac{5}{150} + \frac{5}{60} + \frac{5}{110} + \frac{5}{170} + \frac{5}{110}\right] \cdot \frac{1}{6}$$

$= 0.0478$

K, n AS ABOVE

$V_s = (0.212 \text{ ft/day})(0.0478)/0.005$

$V_s = 2.0$ ft/day

| CLIENT | JOB NUMBER |
|---|---|
| NSWC CRANE | 9060 |

SUBJECT: GW FLOW GRADIENTS + SEEPAGE VELOCITY – SWMU 13

| BASED ON | DRAWING NUMBER |
|---|---|
| | |

| BY | CHECKED BY | APPROVED BY | DATE |
|---|---|---|---|
| FWR | FCW | | |

SEEPAGE VELOCITY ($V_S$)
DEEP BEDROCK

$$\text{GRADIENT}(i) = \left[\frac{5}{390} + \frac{5}{240} + \frac{5}{190} + \frac{5}{100} + \frac{5}{60}\right] \cdot \frac{1}{5}$$

$i = 0.0387$

$n = 0.005$

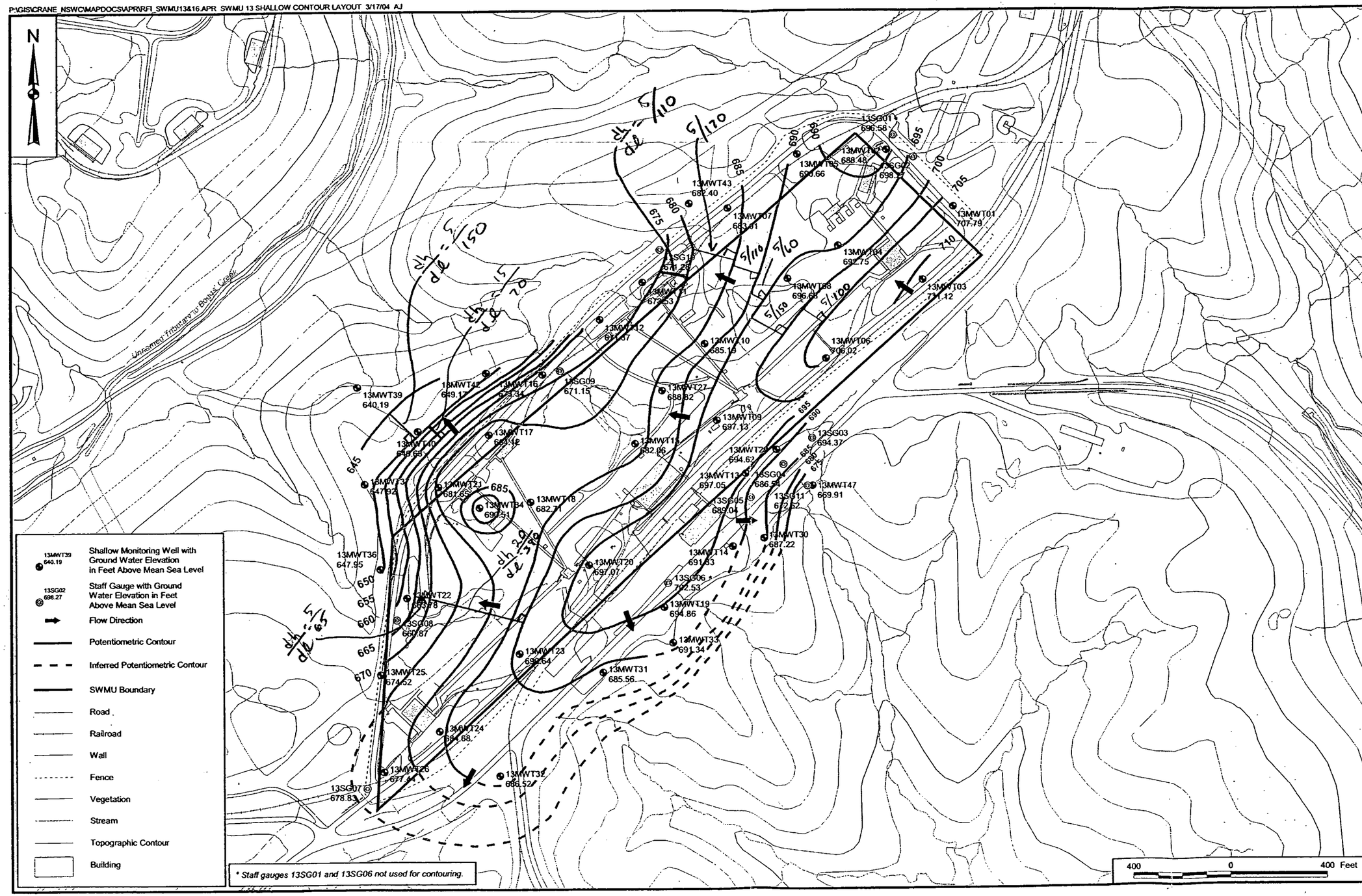
$K = 0.00896$ ft/day

$V = Ki/n$

$= (0.00896 \text{ ft/day})(0.0387)/0.005$

$V = 0.069$ ft/day

P:\GIS\CRANE_NSWC\MAPDOCS\APR\RFI_SWMU13&16.APR SWMU 13 SHALLOW CONTOUR LAYOUT 3/17/04 AJ




CONTRACT NO. CTO 0279

APPROVED BY ___ DATE ___

APPROVED BY ___ DATE ___

DRAWING NO. FIGURE 1 - 12

REV 0

POTENTIOMETRIC SURFACE ELEVATION MAP
FOR SHALLOW WELLS - JANUARY 24, 2004
SWMU 13 - MINE FILL B
NSWC CRANE
CRANE, INDIANA

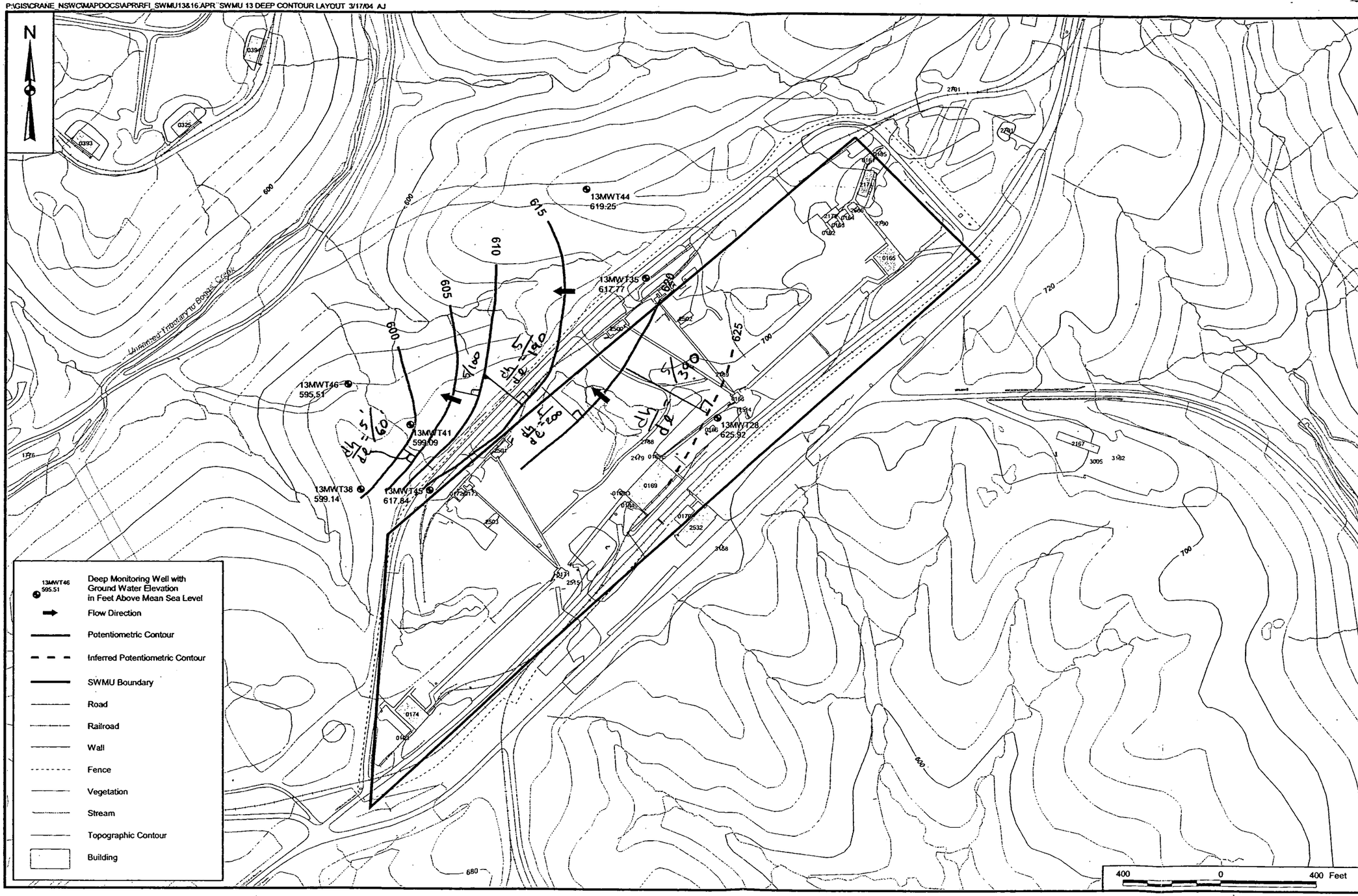
DRAWN BY A. JANOCHA DATE 2/23/04

CHECKED BY F. RAMSER DATE 3/17/04

COST/SCHED-AREA

SCALE AS NOTED

P:\GIS\CRANE_NSWC\MAPDOCS\APR\RFI_SWMU13&16.APR SWMU 13 DEEP CONTOUR LAYOUT 3/17/04 AJ




CONTRACT NO. CTO 0279

APPROVED BY ___ DATE ___

APPROVED BY ___ DATE ___

DRAWING NO. FIGURE 1 - 13

REV 0

POTENTIOMETRIC SURFACE ELEVATION MAP
FOR DEEP WELLS - JANUARY 24, 2004
SWMU 13 - MINE FILL B
NSWC CRANE
CRANE, INDIANA

DEPARTMENT OF THE NAVY * SOUTHERN DIV FACILITIES ENGINEERING COMMAND

DRAWN BY A. JANOCHA DATE 2/23/04

CHECKED BY F. RAMSER DATE 3/17/04

COST/SCHED-AREA

SCALE AS NOTED

# APPENDIX E.3
# SWMU 16
# AQUIFER CHARACTERISTICS, CALCULATIONS, AND RECORDS
# ROUND 1

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 16MWT02 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Falling Head | **Test Date:** | 11-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RMB 6/23/03

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 1 = R |
| Length of Well Screen (ft.) : | 10 = L |
| Time for 37% head change (min.) : | 0.47 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 3.54E-03 | ft./min. |
| 5.89E-05 | ft./sec. |
| 5.09E+00 | ft./day |
| 1.80E-03 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: CRANE WELL/BORING NO.: 16MW102

PROJECT NO.: 9060 CO 0279 GEOLOGIST: BOB BALKOVEC

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' / 21.13' TEST NO.:

STATIC WATER LEVEL (Depth/Elevation): 6.35' DATE: 5/11/03

TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

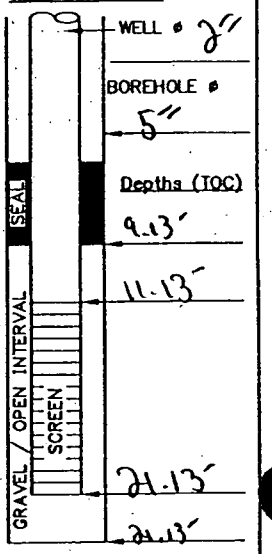
METHOD OF INDUCING WATER LEVEL CHANGE: 1.25" x 42" SOLID SLUG PAGE ..... OF .....

REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30PSI

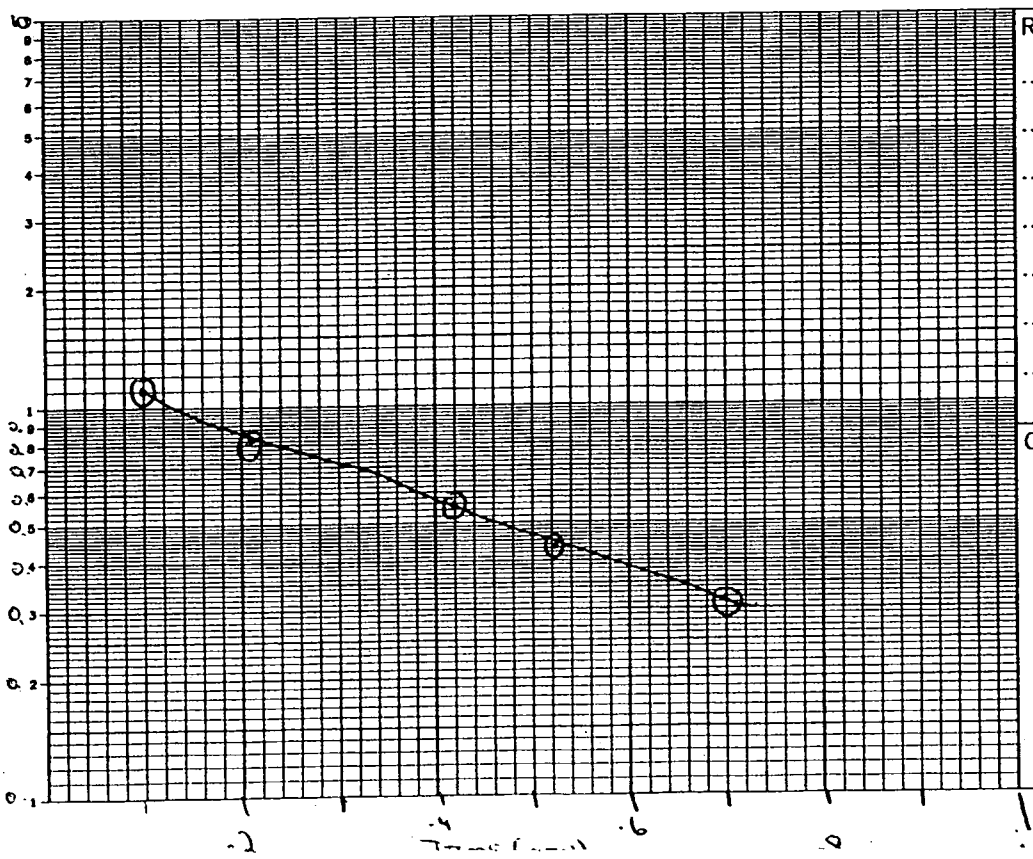
ACAD:FORM_HYDCONTST.dwg 07/06/99 INL

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 14.042 | 0 | 0.69 | 14.36 | +0.318 |
| 0.01 | 14.042 | 0 | 0.93 | 14.255 | +0.213 |
| ~~0.02~~ | — | — | 1.47 | 14.143 | +0.101 |
| 0.03 | 15.392 | +1.35 | | | |
| 0.04 | 16.01 | +1.972 | | | |
| 0.05 | 15.39 | +1.348 | | | |
| 0.06 | 15.726 | +1.684 | | | |
| 0.07 | 15.182 | +1.14 | | | |
| 0.1 | 15.158 | +1.116 | | | |
| 0.21 | 14.904 | +0.862 | | | |
| 0.42 | 14.585 | +0.543 | | | |
| 0.575 | 14.487 | +0.445 | | | |

WELL SCHEMATIC

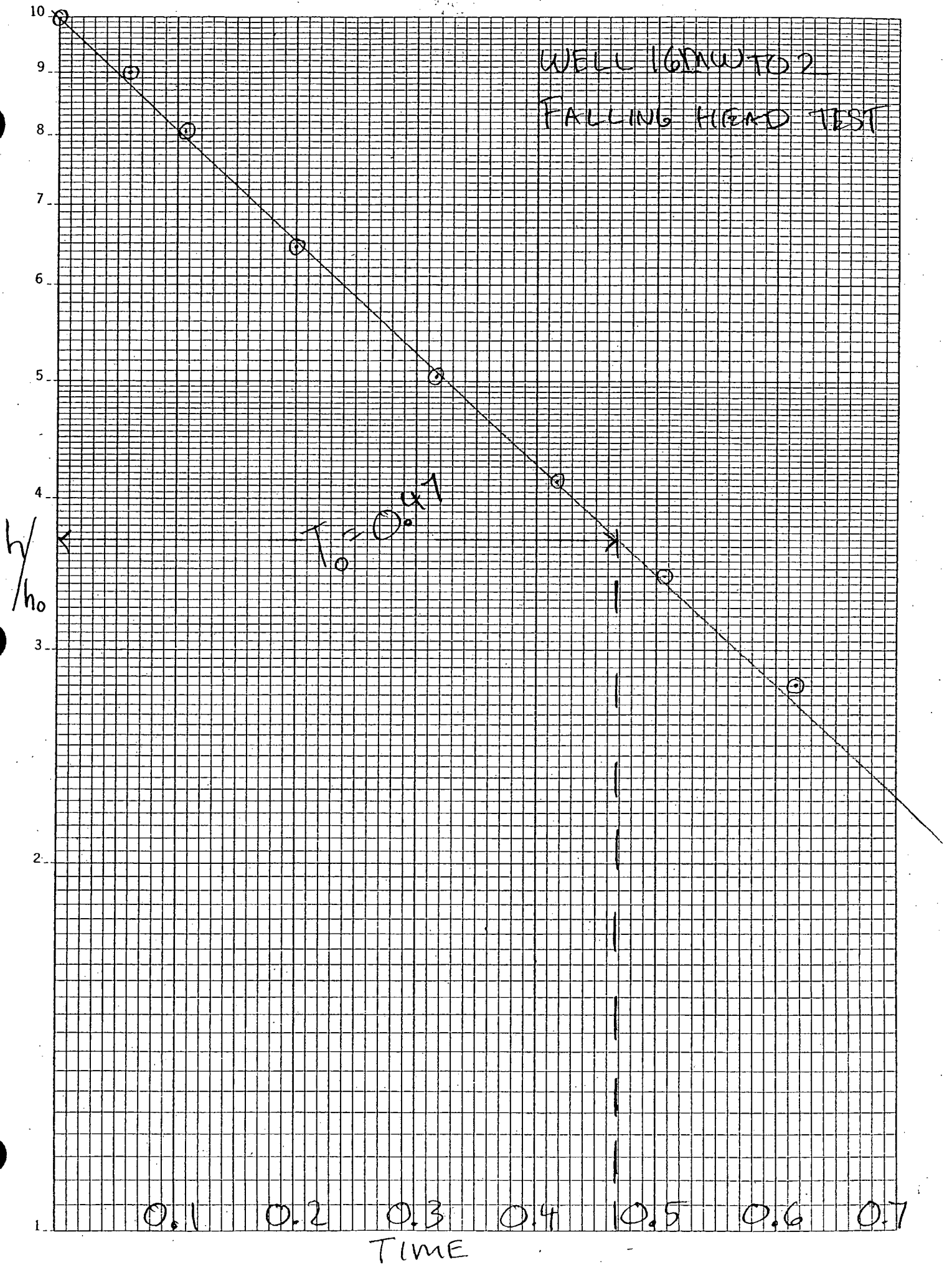



▽ Indicate SWL Depth on Drawing




REMARKS:

CALCS, SKETCH MAPS, ETC.:




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generate 5/11/2003 13:20:14
Report from file: ...\SN00824 2003-05-11 091057 16MWT02 Falling.bin
Win-Situ Versior 4.41

Serial number: 824
Firmware Versio 3.06
Unit name:

Test name: 16MWT02 Falling

Test defined on: 5/11/2003 9:10:41
Test started on: 5/11/2003 9:10:57
Test stopped on N/A N/A
Test extracted o N/A N/A

Data gathered using Logarithmic testing
Maximum time Seconds.
Number of dat 87

TOTAL DATA S. 87

Channel number [1]
Measurement t Temperature
Channel name: Temperature

Channel number [2]
Measurement t Pressure
Channel name: Depth
Sensor Range: 30 PSIG.
Specific gravity 1

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Displacement Feet | adjusted time | h/ho | ho= -1.135 |
|---|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 9:10:57 | 0 | 0 | 52.29 | 14.042 | 0 | | | |
| 5/11/2003 | 9:10:58 | 0.3 | 0.005 | 52.34 | 14.042 | 0 | | | |
| 5/11/2003 | 9:10:58 | 0.6 | 0.01 | 52.34 | 14.042 | 0 | | | |
| 5/11/2003 | 9:10:58 | 0.9 | 0.015 | 52.34 | 14.042 | 0 | | | |
| 5/11/2003 | 9:10:58 | 1.2 | 0.02 | 52.36 | 14.042 | 0 | | | |
| 5/11/2003 | 9:10:59 | 1.5 | 0.025 | 52.36 | 14.947 | -0.905 | | | |
| 5/11/2003 | 9:10:59 | 1.8 | 0.03 | 52.36 | 15.392 | -1.35 | | | |
| 5/11/2003 | 9:10:59 | 2.1 | 0.035 | 52.36 | 15.158 | -1.116 | | | |
| 5/11/2003 | 9:11:00 | 2.4 | 0.04 | 52.36 | 16.014 | -1.972 | | | |
| 5/11/2003 | 9:11:00 | 2.7 | 0.045 | 52.39 | 15.601 | -1.559 | | | |
| 5/11/2003 | 9:11:00 | 3 | 0.05 | 52.39 | 15.39 | -1.348 | | | |
| 5/11/2003 | 9:11:01 | 3.3 | 0.055 | 52.39 | 15.935 | -1.893 | | | |
| 5/11/2003 | 9:11:01 | 3.6 | 0.06 | 52.39 | 15.726 | -1.684 | | | |
| 5/11/2003 | 9:11:01 | 3.9 | 0.065 | 52.39 | 15.201 | -1.159 | Plotted shaded values. | | |
| 5/11/2003 | 9:11:01 | 4.2 | 0.07 | 52.39 | 15.182 | -1.14 | | | |
| 5/11/2003 | 9:11:02 | 4.5 | 0.075 | 52.39 | 15.296 | -1.254 | adjusted time | h/ho | |
| 5/11/2003 | 9:11:02 | 4.8 | 0.08 | 52.39 | 15.177 | -1.135 | 0.000 | 1.000 | |
| 5/11/2003 | 9:11:02 | 5.1 | 0.085 | 52.39 | 15.216 | -1.174 | 0.005 | 1.034 | |
| 5/11/2003 | 9:11:03 | 5.4 | 0.09 | 52.39 | 15.181 | -1.139 | 0.010 | 1.004 | |
| 5/11/2003 | 9:11:03 | 5.7 | 0.095 | 52.39 | 15.171 | -1.129 | 0.015 | 0.995 | |
| 5/11/2003 | 9:11:03 | 6 | 0.1 | 52.39 | 15.158 | -1.116 | 0.020 | 0.983 | |
| 5/11/2003 | 9:11:04 | 6.4 | 0.106667 | 52.39 | 15.143 | -1.101 | 0.027 | 0.970 | |
| 5/11/2003 | 9:11:04 | 6.7 | 0.111667 | 52.39 | 15.128 | -1.086 | 0.032 | 0.957 | |
| 5/11/2003 | 9:11:04 | 7.1 | 0.118333 | 52.39 | 15.111 | -1.069 | 0.038 | 0.942 | |
| 5/11/2003 | 9:11:05 | 7.5 | 0.125 | 52.39 | 15.095 | -1.053 | 0.045 | 0.928 | |
| 5/11/2003 | 9:11:05 | 8 | 0.133333 | 52.39 | 15.08 | -1.038 | 0.053 | 0.915 | |
| 5/11/2003 | 9:11:06 | 8.4 | 0.14 | 52.39 | 15.063 | -1.021 | 0.060 | 0.900 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 9:11:06 | 8.9 | 0.148333 | 52.39 | 15.042 | -1 | 0.068 | 0.884 |
| 5/11/2003 | 9:11:07 | 9.5 | 0.158333 | 52.41 | 15.023 | -0.981 | 0.078 | 0.864 |
| 5/11/2003 | 9:11:07 | 10 | 0.166667 | 52.36 | 14.996 | -0.954 | 0.087 | 0.841 |
| 5/11/2003 | 9:11:08 | 10.6 | 0.176667 | 52.36 | 14.975 | -0.933 | 0.097 | 0.822 |
| 5/11/2003 | 9:11:09 | 11.3 | 0.188333 | 52.36 | 14.951 | -0.909 | 0.108 | 0.801 |
| 5/11/2003 | 9:11:09 | 11.9 | 0.198333 | 52.36 | 14.927 | -0.885 | 0.118 | 0.780 |
| 5/11/2003 | 9:11:10 | 12.6 | 0.21 | 52.36 | 14.904 | -0.862 | 0.130 | 0.759 |
| 5/11/2003 | 9:11:11 | 13.4 | 0.223333 | 52.34 | 14.879 | -0.837 | 0.143 | 0.737 |
| 5/11/2003 | 9:11:11 | 14.2 | 0.236667 | 52.34 | 14.854 | -0.812 | 0.157 | 0.715 |
| 5/11/2003 | 9:11:12 | 15 | 0.25 | 52.34 | 14.828 | -0.786 | 0.170 | 0.693 |
| 5/11/2003 | 9:11:13 | 15.9 | 0.265 | 52.34 | 14.802 | -0.76 | 0.185 | 0.670 |
| 5/11/2003 | 9:11:14 | 16.8 | 0.28 | 52.34 | 14.774 | -0.732 | 0.200 | 0.645 |
| 5/11/2003 | 9:11:15 | 17.8 | 0.296667 | 52.34 | 14.746 | -0.704 | 0.217 | 0.620 |
| 5/11/2003 | 9:11:16 | 18.9 | 0.315 | 52.34 | 14.722 | -0.68 | 0.235 | 0.599 |
| 5/11/2003 | 9:11:17 | 20 | 0.333333 | 52.34 | 14.694 | -0.652 | 0.253 | 0.574 |
| 5/11/2003 | 9:11:18 | 21.2 | 0.353333 | 52.34 | 14.666 | -0.624 | 0.273 | 0.550 |
| 5/11/2003 | 9:11:20 | 22.4 | 0.373333 | 52.34 | 14.64 | -0.598 | 0.293 | 0.527 |
| 5/11/2003 | 9:11:21 | 23.8 | 0.396667 | 52.34 | 14.612 | -0.57 | 0.317 | 0.502 |
| 5/11/2003 | 9:11:22 | 25.2 | 0.42 | 52.34 | 14.585 | -0.543 | 0.340 | 0.478 |
| 5/11/2003 | 9:11:24 | 26.7 | 0.445 | 52.34 | 14.559 | -0.517 | 0.365 | 0.456 |
| 5/11/2003 | 9:11:25 | 28.2 | 0.47 | 52.34 | 14.535 | -0.493 | 0.390 | 0.434 |
| 5/11/2003 | 9:11:27 | 29.8 | 0.496667 | 52.34 | 14.511 | -0.469 | 0.417 | 0.413 |
| 5/11/2003 | 9:11:29 | 31.5 | 0.525 | 52.32 | 14.487 | -0.445 | 0.445 | 0.392 |
| 5/11/2003 | 9:11:31 | 33.3 | 0.555 | 52.34 | 14.46 | -0.418 | 0.475 | 0.368 |
| 5/11/2003 | 9:11:32 | 35.2 | 0.586667 | 52.34 | 14.434 | -0.392 | 0.507 | 0.345 |
| 5/11/2003 | 9:11:35 | 37.3 | 0.621667 | 52.32 | 14.408 | -0.366 | 0.542 | 0.322 |
| 5/11/2003 | 9:11:37 | 39.5 | 0.658333 | 52.32 | 14.384 | -0.342 | 0.578 | 0.301 |
| 5/11/2003 | 9:11:39 | 41.8 | 0.696667 | 52.32 | 14.36 | -0.318 | 0.617 | 0.280 |
| 5/11/2003 | 9:11:42 | 44.3 | 0.738333 | 52.32 | 14.335 | -0.293 | 0.658 | 0.258 |
| 5/11/2003 | 9:11:44 | 46.9 | 0.781667 | 52.32 | 14.315 | -0.273 | 0.702 | 0.241 |
| 5/11/2003 | 9:11:47 | 49.7 | 0.828333 | 52.32 | 14.293 | -0.251 | 0.748 | 0.221 |
| 5/11/2003 | 9:11:50 | 52.6 | 0.876667 | 52.32 | 14.272 | -0.23 | 0.797 | 0.203 |
| 5/11/2003 | 9:11:53 | 55.7 | 0.928333 | 52.32 | 14.255 | -0.213 | 0.848 | 0.188 |
| 5/11/2003 | 9:11:56 | 59 | 0.983333 | 52.32 | 14.236 | -0.194 | 0.903 | 0.171 |
| 5/11/2003 | 9:12:00 | 62.5 | 1.041667 | 52.32 | 14.218 | -0.176 | 0.962 | 0.155 |
| 5/11/2003 | 9:12:03 | 66.2 | 1.103333 | 52.32 | 14.201 | -0.159 | 1.023 | 0.140 |
| 5/11/2003 | 9:12:07 | 70.1 | 1.168333 | 52.32 | 14.19 | -0.148 | 1.088 | 0.130 |
| 5/11/2003 | 9:12:12 | 74.3 | 1.238333 | 52.29 | 14.177 | -0.135 | 1.158 | 0.119 |
| 5/11/2003 | 9:12:16 | 78.7 | 1.311667 | 52.29 | 14.164 | -0.122 | 1.232 | 0.107 |
| 5/11/2003 | 9:12:21 | 83.4 | 1.39 | 52.29 | 14.153 | -0.111 | 1.310 | 0.098 |
| 5/11/2003 | 9:12:26 | 88.4 | 1.473333 | 52.29 | 14.143 | -0.101 | 1.393 | 0.089 |
| 5/11/2003 | 9:12:31 | 93.7 | 1.561667 | 52.29 | 14.134 | -0.092 | 1.482 | 0.081 |
| 5/11/2003 | 9:12:37 | 99.3 | 1.655 | 52.29 | 14.125 | -0.083 | 1.575 | 0.073 |
| 5/11/2003 | 9:12:42 | 105.2 | 1.753333 | 52.29 | 14.117 | -0.075 | 1.673 | 0.066 |
| 5/11/2003 | 9:12:49 | 111.5 | 1.858333 | 52.29 | 14.114 | -0.072 | 1.778 | 0.063 |
| 5/11/2003 | 9:12:55 | 118.1 | 1.968333 | 52.29 | 14.104 | -0.062 | 1.888 | 0.055 |
| 5/11/2003 | 9:13:02 | 125.1 | 2.085 | 52.27 | 14.099 | -0.057 | 2.005 | 0.050 |
| 5/11/2003 | 9:13:10 | 132.6 | 2.21 | 52.27 | 14.095 | -0.053 | 2.130 | 0.047 |
| 5/11/2003 | 9:13:18 | 140.5 | 2.341667 | 52.27 | 14.09 | -0.048 | 2.262 | 0.042 |
| 5/11/2003 | 9:13:26 | 148.9 | 2.481667 | 52.27 | 14.088 | -0.046 | 2.402 | 0.041 |
| 5/11/2003 | 9:13:35 | 157.8 | 2.63 | 52.27 | 14.082 | -0.04 | 2.550 | 0.035 |
| 5/11/2003 | 9:13:44 | 167.2 | 2.786667 | 52.27 | 14.078 | -0.036 | 2.707 | 0.032 |
| 5/11/2003 | 9:13:54 | 177.2 | 2.953333 | 52.27 | 14.08 | -0.038 | 2.873 | 0.033 |
| 5/11/2003 | 9:14:05 | 187.8 | 3.13 | 52.27 | 14.071 | -0.029 | 3.050 | 0.026 |
| 5/11/2003 | 9:14:16 | 199 | 3.316667 | 52.25 | 14.069 | -0.027 | 3.237 | 0.024 |
| 5/11/2003 | 9:14:28 | 210.9 | 3.515 | 52.25 | 14.066 | -0.024 | 3.435 | 0.021 |
| 5/11/2003 | 9:14:41 | 223.5 | 3.725 | 52.25 | 14.064 | -0.022 | 3.645 | 0.019 |
| 5/11/2003 | 9:14:54 | 236.8 | 3.946667 | 52.25 | 14.06 | -0.018 | 3.867 | 0.016 |
| 5/11/2003 | 9:15:08 | 250.9 | 4.181667 | 52.25 | 14.058 | -0.016 | 4.102 | 0.014 |
| 5/11/2003 | 9:15:23 | 265.8 | 4.43 | 52.25 | 14.056 | -0.014 | 4.350 | 0.012 |

TETRA-TECH NUS

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 16MWT02 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Rising Head | **Test Date:** | 11-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RMB 6/23/03

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 1 | = R |
| Length of Well Screen (ft.) : | 10 | = L |
| Time for 37% head change (min.) : | 0.71 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 2.34E-03 | ft./min. |
| 3.90E-05 | ft./sec. |
| 3.37E+00 | ft./day |
| 1.19E-03 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: CRANE WELL/BORING NO.: 16MW202

PROJECT NO.: 9060 030 0279 GEOLOGIST: BOB BALKOVEC

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' / 21.13' TEST NO.:

STATIC WATER LEVEL (Depth/Elevation): 6.35 DATE: 5/14/03

TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

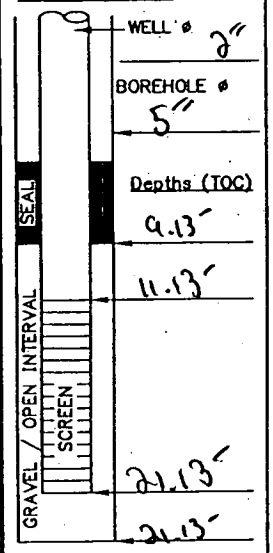
METHOD OF INDUCING WATER LEVEL CHANGE: 1.25' x 42" SOLID SLUG PAGE ..... OF .....

REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30PSI

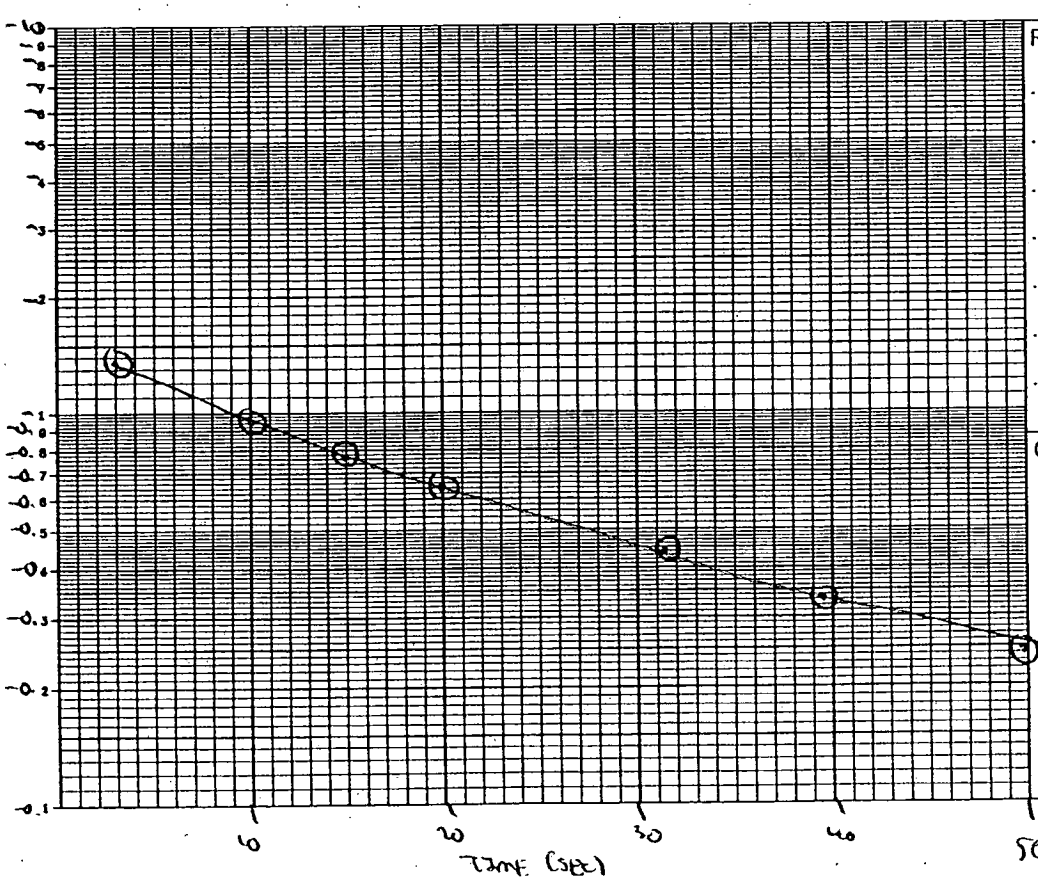
ACAD:FORM_HYDCONTST.dwg 07/06/99 INL

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 14.042 | 0 | | | |
| 1.5 | 14.947 | -0.905 | | | |
| 3 | 15.39 | -1.348 | | | |
| 6 | 15.158 | -1.116 | | | |
| 8 | 15.08 | -1.038 | | | |
| 10 | 14.996 | -0.954 | | | |
| 15 | 14.828 | -0.786 | | | |
| 20 | 14.694 | -0.652 | | | |
| 31.5 | 14.487 | -0.445 | | | |
| 39.5 | 14.384 | -0.342 | | | |
| 49.7 | 14.293 | -0.251 | | | |
| 66.2 | 14.201 | -0.159 | | | |

WELL SCHEMATIC

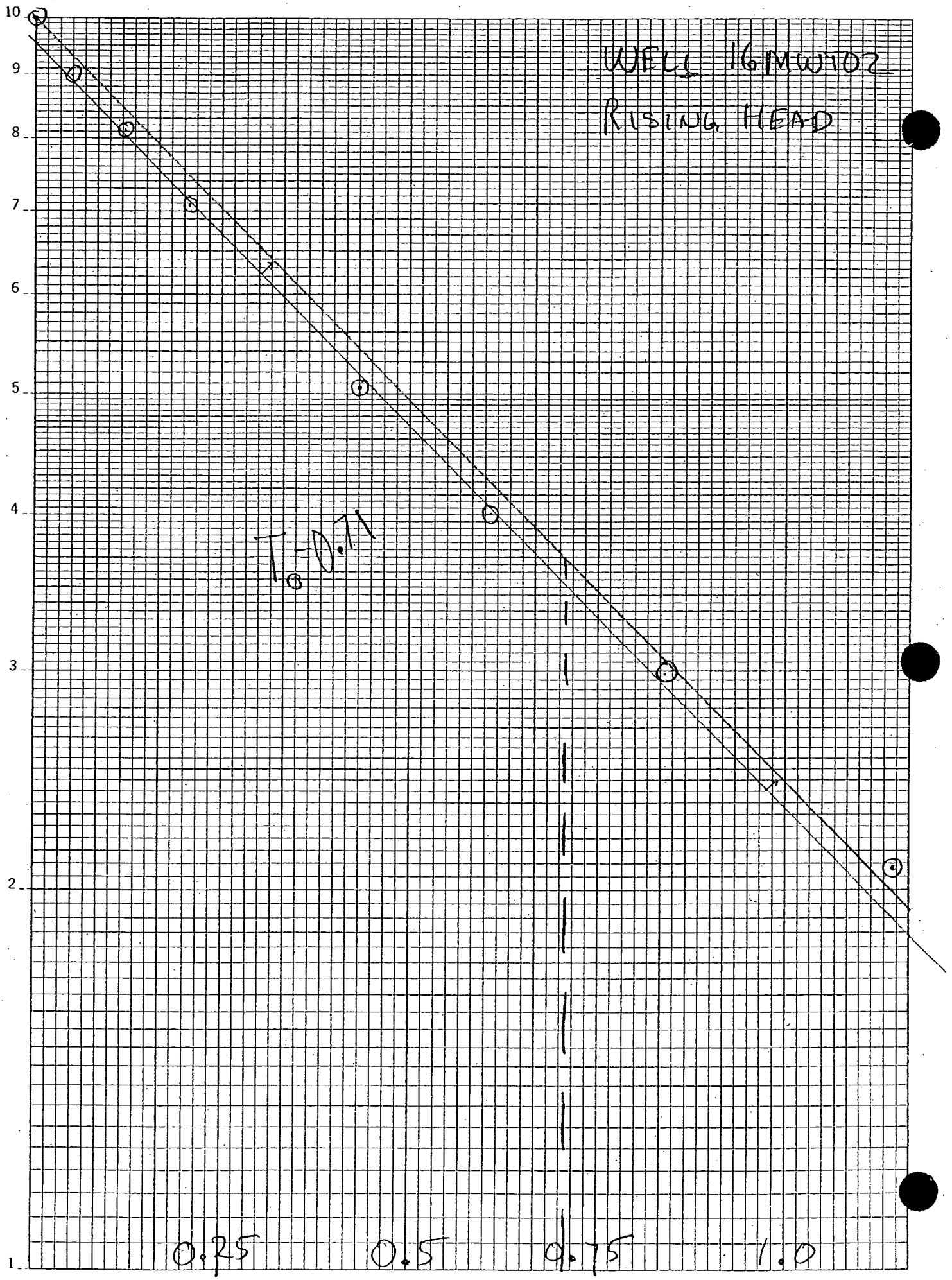



▽ Indicate SWL Depth on Drawing




REMARKS:

CALCS, SKETCH MAPS, ETC.:




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 5/11/2003 13:21:39
Report from file: ...\SN00824 2003-05-11 091704 16MWT02 Rising.bin
Win-Situ Version 4.41

Serial number: 824
Firmware Version 3.06
Unit name:

Test name: 16MWT02 Rising

Test defined on: 5/11/2003 9:16:47
Test started on: 5/11/2003 9:17:04
Test stopped on: N/A N/A
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time b Seconds.
Number of data s 116

TOTAL DATA SAM 116

Channel number [1]
Measurement typ Temperature
Channel name: Temperature

Channel number [2]
Measurement typ Pressure
Channel name: Depth
Sensor Range: 30 PSIG.
Specific gravity: 1

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Displacement Feet | adjusted time | h/ho | ho= -1.11 |
|---|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 9:17:04 | 0 | 0 | 52.23 | 14.045 | 0 | | | |
| 5/11/2003 | 9:17:05 | 0.3 | 0.005 | 52.27 | 14.058 | 0.013 | | | |
| 5/11/2003 | 9:17:05 | 0.6 | 0.01 | 52.29 | 14.065 | 0.02 | | | |
| 5/11/2003 | 9:17:05 | 0.9 | 0.015 | 52.29 | 12.005 | -2.04 | | | |
| 5/11/2003 | 9:17:06 | 1.2 | 0.02 | 52.29 | 14.575 | 0.53 | | | |
| 5/11/2003 | 9:17:06 | 1.5 | 0.025 | 52.32 | 12.293 | -1.752 | | | |
| 5/11/2003 | 9:17:06 | 1.8 | 0.03 | 52.32 | 12.97 | -1.075 | | | |
| 5/11/2003 | 9:17:07 | 2.1 | 0.035 | 52.32 | 12.464 | -1.581 | | | |
| 5/11/2003 | 9:17:07 | 2.4 | 0.04 | 52.32 | 12.907 | -1.138 | | | |
| 5/11/2003 | 9:17:07 | 2.7 | 0.045 | 52.32 | 12.694 | -1.351 | | | |
| 5/11/2003 | 9:17:07 | 3 | 0.05 | 52.32 | 12.815 | -1.23 | | | |
| 5/11/2003 | 9:17:08 | 3.3 | 0.055 | 52.32 | 12.83 | -1.215 | | | |
| 5/11/2003 | 9:17:08 | 3.6 | 0.06 | 52.32 | 12.786 | -1.259 | | | |
| 5/11/2003 | 9:17:08 | 3.9 | 0.065 | 52.34 | 12.862 | -1.183 | | | |
| 5/11/2003 | 9:17:09 | 4.2 | 0.07 | 52.34 | 12.873 | -1.172 | | | |
| 5/11/2003 | 9:17:09 | 4.5 | 0.075 | 52.34 | 12.886 | -1.159 | Plotted shaded values. | | |
| 5/11/2003 | 9:17:09 | 4.8 | 0.08 | 52.34 | 12.899 | -1.146 | | | |
| 5/11/2003 | 9:17:10 | 5.1 | 0.085 | 52.34 | 12.903 | -1.142 | adjusted time | h/ho | |
| 5/11/2003 | 9:17:10 | 5.4 | 0.09 | 52.34 | 12.935 | -1.11 | 0.000 | 1.000 | |
| 5/11/2003 | 9:17:10 | 5.7 | 0.095 | 52.34 | 12.931 | -1.114 | 0.005 | 1.004 | |
| 5/11/2003 | 9:17:10 | 6 | 0.1 | 52.34 | 12.951 | -1.094 | 0.010 | 0.986 | |
| 5/11/2003 | 9:17:11 | 6.4 | 0.106667 | 52.34 | 12.965 | -1.08 | 0.017 | 0.973 | |
| 5/11/2003 | 9:17:11 | 6.7 | 0.111667 | 52.34 | 12.979 | -1.066 | 0.022 | 0.960 | |
| 5/11/2003 | 9:17:12 | 7.1 | 0.118333 | 52.34 | 12.994 | -1.051 | 0.028 | 0.947 | |
| 5/11/2003 | 9:17:12 | 7.5 | 0.125 | 52.34 | 13.007 | -1.038 | 0.035 | 0.935 | |
| 5/11/2003 | 9:17:12 | 8 | 0.133333 | 52.34 | 13.028 | -1.017 | 0.043 | 0.916 | |
| 5/11/2003 | 9:17:13 | 8.4 | 0.14 | 52.34 | 13.047 | -0.998 | 0.050 | 0.899 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 9:17:13 | 8.9 | 0.148333 | 52.34 | 13.06 | -0.985 | 0.058 | 0.887 |
| 5/11/2003 | 9:17:14 | 9.5 | 0.158333 | 52.34 | 13.078 | -0.967 | 0.068 | 0.871 |
| 5/11/2003 | 9:17:14 | 10 | 0.166667 | 52.32 | 13.084 | -0.961 | 0.077 | 0.866 |
| 5/11/2003 | 9:17:15 | 10.6 | 0.176667 | 52.32 | 13.099 | -0.946 | 0.087 | 0.852 |
| 5/11/2003 | 9:17:16 | 11.3 | 0.188333 | 52.32 | 13.116 | -0.929 | 0.098 | 0.837 |
| 5/11/2003 | 9:17:16 | 11.9 | 0.198333 | 52.29 | 13.133 | -0.912 | 0.108 | 0.822 |
| 5/11/2003 | 9:17:17 | 12.6 | 0.21 | 52.29 | 13.15 | -0.895 | 0.120 | 0.806 |
| 5/11/2003 | 9:17:18 | 13.4 | 0.223333 | 52.29 | 13.169 | -0.876 | 0.133 | 0.789 |
| 5/11/2003 | 9:17:19 | 14.2 | 0.236667 | 52.29 | 13.185 | -0.86 | 0.147 | 0.775 |
| 5/11/2003 | 9:17:19 | 15 | 0.25 | 52.29 | 13.204 | -0.841 | 0.160 | 0.758 |
| 5/11/2003 | 9:17:20 | 15.9 | 0.265 | 52.29 | 13.223 | -0.822 | 0.175 | 0.741 |
| 5/11/2003 | 9:17:21 | 16.8 | 0.28 | 52.29 | 13.243 | -0.802 | 0.190 | 0.723 |
| 5/11/2003 | 9:17:22 | 17.8 | 0.296667 | 52.29 | 13.264 | -0.781 | 0.207 | 0.704 |
| 5/11/2003 | 9:17:23 | 18.9 | 0.315 | 52.29 | 13.284 | -0.761 | 0.225 | 0.686 |
| 5/11/2003 | 9:17:24 | 20 | 0.333333 | 52.29 | 13.305 | -0.74 | 0.243 | 0.667 |
| 5/11/2003 | 9:17:26 | 21.2 | 0.353333 | 52.29 | 13.325 | -0.72 | 0.263 | 0.649 |
| 5/11/2003 | 9:17:27 | 22.4 | 0.373333 | 52.29 | 13.348 | -0.697 | 0.283 | 0.628 |
| 5/11/2003 | 9:17:28 | 23.8 | 0.396667 | 52.29 | 13.372 | -0.673 | 0.307 | 0.606 |
| 5/11/2003 | 9:17:30 | 25.2 | 0.42 | 52.29 | 13.395 | -0.65 | 0.330 | 0.586 |
| 5/11/2003 | 9:17:31 | 26.7 | 0.445 | 52.29 | 13.415 | -0.63 | 0.355 | 0.568 |
| 5/11/2003 | 9:17:33 | 28.2 | 0.47 | 52.29 | 13.439 | -0.606 | 0.380 | 0.546 |
| 5/11/2003 | 9:17:34 | 29.8 | 0.496667 | 52.29 | 13.462 | -0.583 | 0.407 | 0.525 |
| 5/11/2003 | 9:17:36 | 31.5 | 0.525 | 52.29 | 13.484 | -0.561 | 0.435 | 0.505 |
| 5/11/2003 | 9:17:38 | 33.3 | 0.555 | 52.29 | 13.514 | -0.531 | 0.465 | 0.478 |
| 5/11/2003 | 9:17:40 | 35.2 | 0.586667 | 52.29 | 13.531 | -0.514 | 0.497 | 0.463 |
| 5/11/2003 | 9:17:42 | 37.3 | 0.621667 | 52.29 | 13.555 | -0.49 | 0.532 | 0.441 |
| 5/11/2003 | 9:17:44 | 39.5 | 0.658333 | 52.27 | 13.58 | -0.465 | 0.568 | 0.419 |
| 5/11/2003 | 9:17:46 | 41.8 | 0.696667 | 52.27 | 13.6 | -0.445 | 0.607 | 0.401 |
| 5/11/2003 | 9:17:49 | 44.3 | 0.738333 | 52.27 | 13.626 | -0.419 | 0.648 | 0.377 |
| 5/11/2003 | 9:17:51 | 46.9 | 0.781667 | 52.27 | 13.649 | -0.396 | 0.692 | 0.357 |
| 5/11/2003 | 9:17:54 | 49.7 | 0.828333 | 52.27 | 13.671 | -0.374 | 0.738 | 0.337 |
| 5/11/2003 | 9:17:57 | 52.6 | 0.876667 | 52.27 | 13.692 | -0.353 | 0.787 | 0.318 |
| 5/11/2003 | 9:18:00 | 55.7 | 0.928333 | 52.27 | 13.714 | -0.331 | 0.838 | 0.298 |
| 5/11/2003 | 9:18:03 | 59 | 0.983333 | 52.27 | 13.735 | -0.31 | 0.893 | 0.279 |
| 5/11/2003 | 9:18:07 | 62.5 | 1.041667 | 52.27 | 13.757 | -0.288 | 0.952 | 0.259 |
| 5/11/2003 | 9:18:11 | 66.2 | 1.103333 | 52.27 | 13.776 | -0.269 | 1.013 | 0.242 |
| 5/11/2003 | 9:18:14 | 70.1 | 1.168333 | 52.27 | 13.794 | -0.251 | 1.078 | 0.226 |
| 5/11/2003 | 9:18:19 | 74.3 | 1.238333 | 52.27 | 13.813 | -0.232 | 1.148 | 0.209 |
| 5/11/2003 | 9:18:23 | 78.7 | 1.311667 | 52.27 | 13.83 | -0.215 | 1.222 | 0.194 |
| 5/11/2003 | 9:18:28 | 83.4 | 1.39 | 52.27 | 13.845 | -0.2 | 1.300 | 0.180 |
| 5/11/2003 | 9:18:33 | 88.4 | 1.473333 | 52.27 | 13.862 | -0.183 | 1.383 | 0.165 |
| 5/11/2003 | 9:18:38 | 93.7 | 1.561667 | 52.27 | 13.873 | -0.172 | 1.472 | 0.155 |
| 5/11/2003 | 9:18:44 | 99.3 | 1.655 | 52.25 | 13.886 | -0.159 | 1.565 | 0.143 |
| 5/11/2003 | 9:18:50 | 105.2 | 1.753333 | 52.25 | 13.899 | -0.146 | 1.663 | 0.132 |
| 5/11/2003 | 9:18:56 | 111.5 | 1.858333 | 52.25 | 13.911 | -0.134 | 1.768 | 0.121 |
| 5/11/2003 | 9:19:02 | 118.1 | 1.968333 | 52.25 | 13.927 | -0.118 | 1.878 | 0.106 |
| 5/11/2003 | 9:19:09 | 125.1 | 2.085 | 52.25 | 13.931 | -0.114 | 1.995 | 0.103 |
| 5/11/2003 | 9:19:17 | 132.6 | 2.21 | 52.25 | 13.939 | -0.106 | 2.120 | 0.095 |
| 5/11/2003 | 9:19:25 | 140.5 | 2.341667 | 52.25 | 13.944 | -0.101 | 2.252 | 0.091 |
| 5/11/2003 | 9:19:33 | 148.9 | 2.481667 | 52.25 | 13.952 | -0.093 | 2.392 | 0.084 |
| 5/11/2003 | 9:19:42 | 157.8 | 2.63 | 52.25 | 13.959 | -0.086 | 2.540 | 0.077 |
| 5/11/2003 | 9:19:52 | 167.2 | 2.786667 | 52.25 | 13.965 | -0.08 | 2.697 | 0.072 |
| 5/11/2003 | 9:20:02 | 177.2 | 2.953333 | 52.23 | 13.967 | -0.078 | 2.863 | 0.070 |
| 5/11/2003 | 9:20:12 | 187.8 | 3.13 | 52.25 | 13.972 | -0.073 | 3.040 | 0.066 |
| 5/11/2003 | 9:20:23 | 199 | 3.316667 | 52.23 | 13.976 | -0.069 | 3.227 | 0.062 |
| 5/11/2003 | 9:20:35 | 210.9 | 3.515 | 52.23 | 13.98 | -0.065 | 3.425 | 0.059 |
| 5/11/2003 | 9:20:48 | 223.5 | 3.725 | 52.23 | 13.98 | -0.065 | 3.635 | 0.059 |
| 5/11/2003 | 9:21:01 | 236.8 | 3.946667 | 52.23 | 13.982 | -0.063 | 3.857 | 0.057 |
| 5/11/2003 | 9:21:15 | 250.9 | 4.181667 | 52.23 | 13.984 | -0.061 | 4.092 | 0.055 |
| 5/11/2003 | 9:21:30 | 265.8 | 4.43 | 52.23 | 13.987 | -0.058 | 4.340 | 0.052 |
| 5/11/2003 | 9:21:46 | 281.6 | 4.693333 | 52.23 | 13.989 | -0.056 | 4.603 | 0.050 |
| 5/11/2003 | 9:22:03 | 298.4 | 4.973333 | 52.23 | 13.989 | -0.056 | 4.883 | 0.050 |
| 5/11/2003 | 9:22:21 | 316.2 | 5.27 | 52.23 | 13.985 | -0.06 | 5.180 | 0.054 |
| 5/11/2003 | 9:22:39 | 335 | 5.583333 | 52.23 | 13.987 | -0.058 | 5.493 | 0.052 |
| 5/11/2003 | 9:22:59 | 354.9 | 5.915 | 52.25 | 13.987 | -0.058 | 5.825 | 0.052 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 9:23:20 | 376 | 6.266667 | 52.25 | 13.987 | -0.058 | 6.177 | 0.052 |
| 5/11/2003 | 9:23:43 | 398.4 | 6.64 | 52.23 | 13.987 | -0.058 | 6.550 | 0.052 |
| 5/11/2003 | 9:24:06 | 422.1 | 7.035 | 52.23 | 13.989 | -0.056 | 6.945 | 0.050 |
| 5/11/2003 | 9:24:32 | 447.2 | 7.453333 | 52.23 | 13.989 | -0.056 | 7.363 | 0.050 |
| 5/11/2003 | 9:24:58 | 473.8 | 7.896667 | 52.23 | 13.985 | -0.06 | 7.807 | 0.054 |
| 5/11/2003 | 9:25:26 | 502 | 8.366667 | 52.23 | 13.985 | -0.06 | 8.277 | 0.054 |
| 5/11/2003 | 9:25:56 | 531.9 | 8.865 | 52.23 | 13.985 | -0.06 | 8.775 | 0.054 |
| 5/11/2003 | 9:26:28 | 563.5 | 9.391667 | 52.23 | 13.985 | -0.06 | 9.302 | 0.054 |
| 5/11/2003 | 9:27:01 | 597 | 9.95 | 52.2 | 13.986 | -0.059 | 9.860 | 0.053 |
| 5/11/2003 | 9:27:37 | 632.5 | 10.54167 | 52.2 | 13.984 | -0.061 | 10.452 | 0.055 |
| 5/11/2003 | 9:28:14 | 670.1 | 11.16833 | 52.2 | 13.984 | -0.061 | 11.078 | 0.055 |
| 5/11/2003 | 9:28:54 | 709.9 | 11.83167 | 52.2 | 13.984 | -0.061 | 11.742 | 0.055 |
| 5/11/2003 | 9:29:36 | 752.1 | 12.535 | 52.2 | 13.982 | -0.063 | 12.445 | 0.057 |
| 5/11/2003 | 9:30:21 | 796.8 | 13.28 | 52.2 | 13.98 | -0.065 | 13.190 | 0.059 |
| 5/11/2003 | 9:31:09 | 844.2 | 14.07 | 52.2 | 13.978 | -0.067 | 13.980 | 0.060 |
| 5/11/2003 | 9:31:59 | 894.4 | 14.90667 | 52.2 | 13.976 | -0.069 | 14.817 | 0.062 |
| 5/11/2003 | 9:32:52 | 947.5 | 15.79167 | 52.2 | 13.975 | -0.07 | 15.702 | 0.063 |
| 5/11/2003 | 9:33:48 | 1003.8 | 16.73 | 52.2 | 13.975 | -0.07 | 16.640 | 0.063 |
| 5/11/2003 | 9:34:48 | 1063.4 | 17.72333 | 52.2 | 13.975 | -0.07 | 17.633 | 0.063 |
| 5/11/2003 | 9:35:51 | 1126.6 | 18.77667 | 52.2 | 13.971 | -0.074 | 18.687 | 0.067 |
| 5/11/2003 | 9:36:58 | 1193.5 | 19.89167 | 52.2 | 13.971 | -0.074 | 19.802 | 0.067 |
| 5/11/2003 | 9:38:09 | 1264.4 | 21.07333 | 52.2 | 13.967 | -0.078 | 20.983 | 0.070 |
| 5/11/2003 | 9:39:24 | 1339.5 | 22.325 | 52.2 | 13.965 | -0.08 | 22.235 | 0.072 |
| 5/11/2003 | 9:40:43 | 1419 | 23.65 | 52.2 | 13.965 | -0.08 | 23.560 | 0.072 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 16MWT04 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Falling Head | **Test Date:** | 11-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RMB 6/23/03

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 1 | = R |
| Length of Well Screen (ft.) : | 10 | = L |
| Time for 37% head change (min.) : | 2.20 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 7.56E-04 | ft./min. |
| 1.26E-05 | ft./sec. |
| 1.09E+00 | ft./day |
| 3.84E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: CRANE WELL/BORING NO.: 16MW104

PROJECT NO.: 9060 G0 0279 GEOLOGIST: BOB BALKOVEC

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10'/27.60' TEST NO.:

STATIC WATER LEVEL (Depth/Elevation): 7.80' DATE: 5/14/03

TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

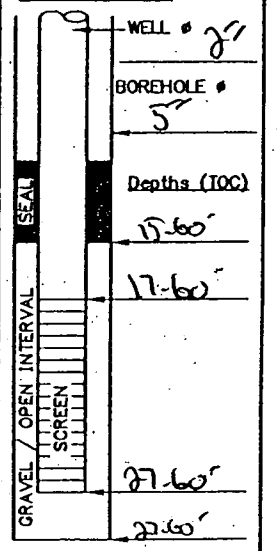
METHOD OF INDUCING WATER LEVEL CHANGE: 1.25" x 4' SOLID SLUG PAGE ..... OF .....

REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30PSI

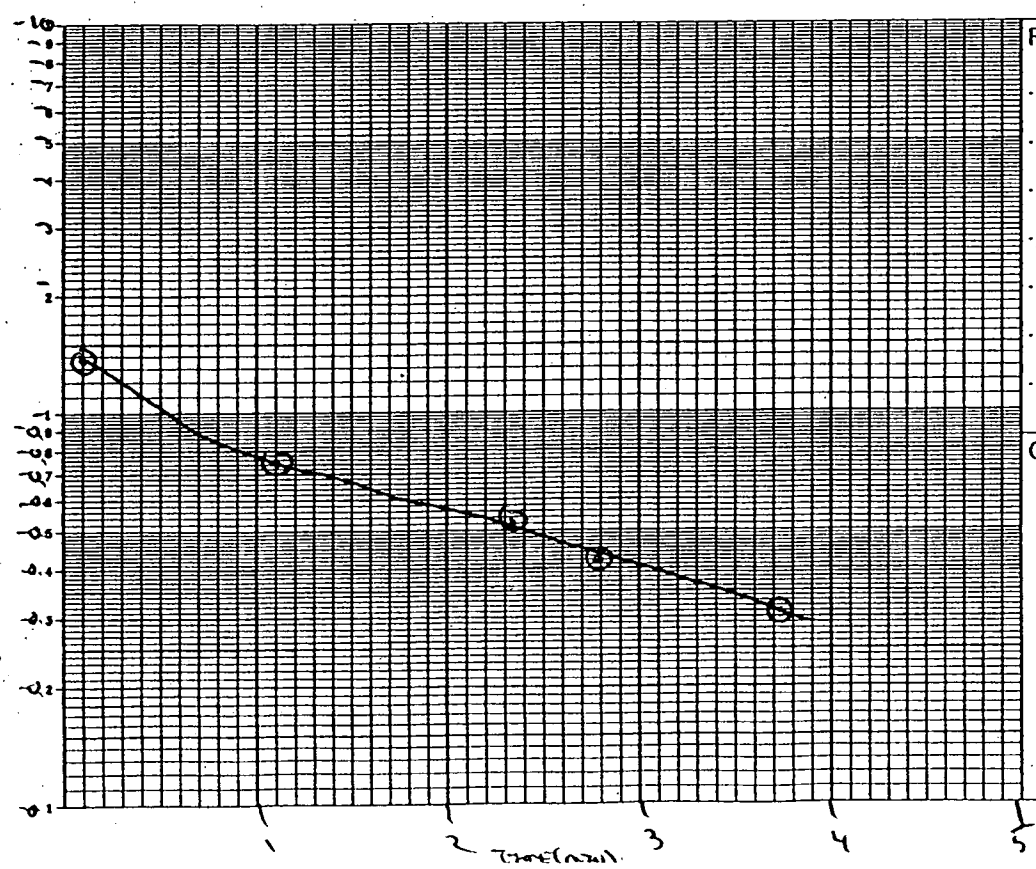
ACAD:FORM_HYDCONTST.dwg 07/06/99 INL

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 18.605 | 0 | 2.77 | 18.183 | -0.422 |
| 0.045 | 16.364 | -2.241 | 3.75 | 18.297 | -0.308 |
| 0.065 | 16.935 | -1.67 | 4.43 | 18.402 | -0.203 |
| 0.085 | 17.181 | -1.424 | 6.26 | 18.50 | -0.102 |
| 0.1 | 17.23 | -1.375 | | | |
| 0.14 | 17.26 | -1.343 | | | |
| 0.39 | 17.402 | -1.203 | | | |
| 0.62 | 17.505 | -1.1 | | | |
| 0.82 | 17.608 | -0.997 | | | |
| 1.10 | 17.855 | -0.75 | | | |
| 1.98 | 17.996 | -0.609 | | | |
| 2.34 | 18.089 | -0.516 | | | |

WELL SCHEMATIC

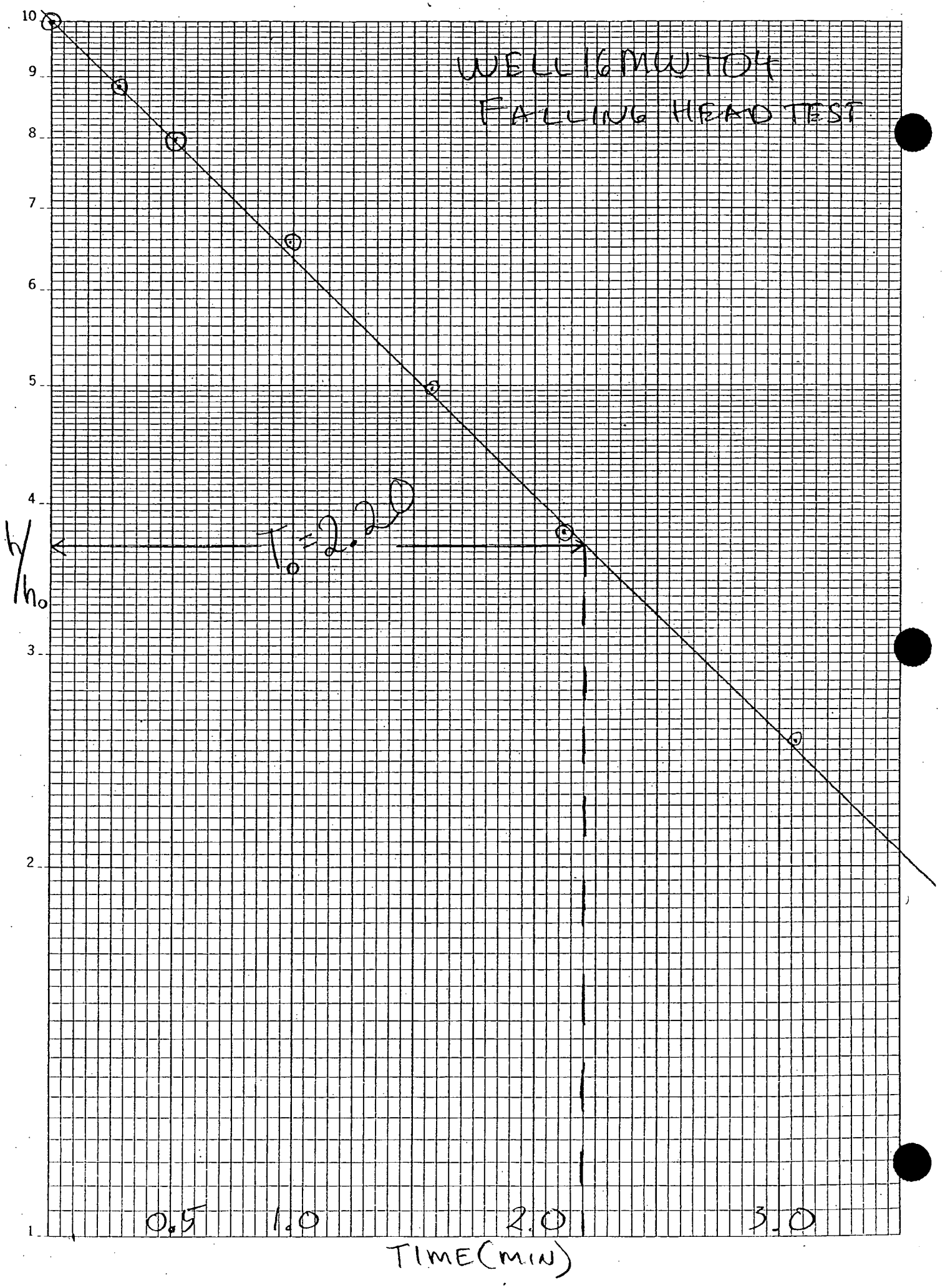



▽ Indicate SWL Depth on Drawing




REMARKS:

CALCS, SKETCH MAPS, ETC.:




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report gen 5/11/2003 13:22:45
Report fror ...\SN00824 2003-05-11 102438 16MWT04 Falling.bin
Win-Situ V 4.41

Serial num 824
Firmware \ 3.06
Unit name:

Test name: 16MWT04 Falling

Test define 5/11/2003 10:24:28
Test starte 5/11/2003 10:24:38
Test stopp N/A N/A
Test extrac N/A N/A

Data gathered using Logarithmic testing
Maximun Seconds.
Number 124

TOTAL DA 124

Channel number [1]
Measurer Temperature
Channel r Temperature

Channel number [2]
Measurer Pressure
Channel r Depth
Sensor R 30 PSIG.
Specific g 1

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Displacement Feet | adjusted time | h/ho | ho= | 1.12 |
|---|---|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 10:24:38 | 0 | 0 | 55.56 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:38 | 0.3 | 0.005 | 55.61 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:38 | 0.6 | 0.01 | 55.61 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:39 | 0.9 | 0.015 | 55.63 | 18.61 | 0.001 | | | | |
| 5/11/2003 | 10:24:39 | 1.2 | 0.02 | 55.63 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:39 | 1.5 | 0.025 | 55.63 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:40 | 1.8 | 0.03 | 55.63 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:40 | 2.1 | 0.035 | 55.63 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:40 | 2.4 | 0.04 | 55.63 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:40 | 2.7 | 0.045 | 55.65 | 18.61 | 0.001 | | | | |
| 5/11/2003 | 10:24:41 | 3 | 0.05 | 55.65 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:41 | 3.3 | 0.055 | 55.65 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:41 | 3.6 | 0.06 | 55.65 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:42 | 3.9 | 0.065 | 55.65 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:42 | 4.2 | 0.07 | 55.65 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:42 | 4.5 | 0.075 | 55.65 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:43 | 4.8 | 0.08 | 55.65 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:43 | 5.1 | 0.085 | 55.65 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:43 | 5.4 | 0.09 | 55.65 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:43 | 5.7 | 0.095 | 55.65 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:44 | 6 | 0.1 | 55.65 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:44 | 6.4 | 0.106667 | 55.65 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:44 | 6.7 | 0.111667 | 55.65 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:45 | 7.1 | 0.118333 | 55.65 | 18.609 | 0 | | | | |
| 5/11/2003 | 10:24:45 | 7.5 | 0.125 | 55.65 | 18.636 | 0.027 | | | | |
| 5/11/2003 | 10:24:46 | 8 | 0.133333 | 55.65 | 18.64 | 0.031 | | | | |
| 5/11/2003 | 10:24:46 | 8.4 | 0.14 | 55.67 | 21.903 | 3.294 | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 10:24:47 | 8.9 | 0.148333 | 55.67 | 20.014 | 1.405 | | |
| 5/11/2003 | 10:24:47 | 9.5 | 0.158333 | 55.67 | 19.411 | 0.802 | | |
| 5/11/2003 | 10:24:48 | 10 | 0.166667 | 55.63 | 20.375 | 1.766 | | |
| 5/11/2003 | 10:24:48 | 10.6 | 0.176667 | 55.63 | 20.449 | 1.84 | | |
| 5/11/2003 | 10:24:49 | 11.3 | 0.188333 | 55.63 | 20.011 | 1.402 | | |
| 5/11/2003 | 10:24:50 | 11.9 | 0.198333 | 55.61 | 19.906 | 1.297 | | |
| 5/11/2003 | 10:24:50 | 12.6 | 0.21 | 55.61 | 19.931 | 1.322 | | |
| 5/11/2003 | 10:24:51 | 13.4 | 0.223333 | 55.61 | 19.955 | 1.346 | | |
| 5/11/2003 | 10:24:52 | 14.2 | 0.236667 | 55.61 | 19.961 | 1.352 | | |
| 5/11/2003 | 10:24:53 | 15 | 0.25 | 55.61 | 19.961 | 1.352 | | |
| 5/11/2003 | 10:24:54 | 15.9 | 0.265 | 55.61 | 19.953 | 1.344 | | |
| 5/11/2003 | 10:24:55 | 16.8 | 0.28 | 55.61 | 19.944 | 1.335 | | |
| 5/11/2003 | 10:24:56 | 17.8 | 0.296667 | 55.61 | 19.933 | 1.324 | | |
| 5/11/2003 | 10:24:57 | 18.9 | 0.315 | 55.61 | 19.921 | 1.312 | | |
| 5/11/2003 | 10:24:58 | 20 | 0.333333 | 55.61 | 19.908 | 1.299 | | |
| 5/11/2003 | 10:24:59 | 21.2 | 0.353333 | 55.61 | 19.897 | 1.288 | | |
| 5/11/2003 | 10:25:00 | 22.4 | 0.373333 | 55.61 | 19.886 | 1.277 | | |
| 5/11/2003 | 10:25:02 | 23.8 | 0.396667 | 55.61 | 19.871 | 1.262 | | |
| 5/11/2003 | 10:25:03 | 25.2 | 0.42 | 55.61 | 19.858 | 1.249 | | |
| 5/11/2003 | 10:25:04 | 26.7 | 0.445 | 55.61 | 19.841 | 1.232 | | |
| 5/11/2003 | 10:25:06 | 28.2 | 0.47 | 55.61 | 19.828 | 1.219 | | |
| 5/11/2003 | 10:25:08 | 29.8 | 0.496667 | 55.61 | 19.813 | 1.204 | | |
| 5/11/2003 | 10:25:09 | 31.5 | 0.525 | 55.61 | 19.796 | 1.187 | | |
| 5/11/2003 | 10:25:11 | 33.3 | 0.555 | 55.61 | 19.783 | 1.174 | Plotted shaded values. | |
| 5/11/2003 | 10:25:13 | 35.2 | 0.586667 | 55.61 | 19.766 | 1.157 | | |
| 5/11/2003 | 10:25:15 | 37.3 | 0.621667 | 55.61 | 19.748 | 1.139 | adjusted time | h/ho |
| 5/11/2003 | 10:25:17 | 39.5 | 0.658333 | 55.61 | 19.729 | 1.12 | 0.000 | 1.000 |
| 5/11/2003 | 10:25:20 | 41.8 | 0.696667 | 55.61 | 19.71 | 1.101 | 0.038 | 0.983 |
| 5/11/2003 | 10:25:22 | 44.3 | 0.738333 | 55.61 | 19.69 | 1.081 | 0.080 | 0.965 |
| 5/11/2003 | 10:25:25 | 46.9 | 0.781667 | 55.61 | 19.669 | 1.06 | 0.123 | 0.946 |
| 5/11/2003 | 10:25:27 | 49.7 | 0.828333 | 55.61 | 19.647 | 1.038 | 0.170 | 0.927 |
| 5/11/2003 | 10:25:30 | 52.6 | 0.876667 | 55.61 | 19.626 | 1.017 | 0.218 | 0.908 |
| 5/11/2003 | 10:25:33 | 55.7 | 0.928333 | 55.61 | 19.598 | 0.989 | 0.270 | 0.883 |
| 5/11/2003 | 10:25:37 | 59 | 0.983333 | 55.58 | 19.573 | 0.964 | 0.325 | 0.861 |
| 5/11/2003 | 10:25:40 | 62.5 | 1.041667 | 55.58 | 19.554 | 0.945 | 0.383 | 0.844 |
| 5/11/2003 | 10:25:44 | 66.2 | 1.103333 | 55.58 | 19.528 | 0.919 | 0.445 | 0.821 |
| 5/11/2003 | 10:25:48 | 70.1 | 1.168333 | 55.58 | 19.5 | 0.891 | 0.510 | 0.796 |
| 5/11/2003 | 10:25:52 | 74.3 | 1.238333 | 55.61 | 19.479 | 0.87 | 0.580 | 0.777 |
| 5/11/2003 | 10:25:56 | 78.7 | 1.311667 | 55.58 | 19.446 | 0.837 | 0.653 | 0.747 |
| 5/11/2003 | 10:26:01 | 83.4 | 1.39 | 55.58 | 19.416 | 0.807 | 0.732 | 0.721 |
| 5/11/2003 | 10:26:06 | 88.4 | 1.473333 | 55.58 | 19.326 | 0.717 | 0.815 | 0.640 |
| 5/11/2003 | 10:26:11 | 93.7 | 1.561667 | 55.63 | 19.337 | 0.728 | 0.903 | 0.650 |
| 5/11/2003 | 10:26:17 | 99.3 | 1.655 | 55.63 | 19.341 | 0.732 | 0.997 | 0.654 |
| 5/11/2003 | 10:26:23 | 105.2 | 1.753333 | 55.58 | 19.294 | 0.685 | 1.095 | 0.612 |
| 5/11/2003 | 10:26:29 | 111.5 | 1.858333 | 55.58 | 19.266 | 0.657 | 1.200 | 0.587 |
| 5/11/2003 | 10:26:36 | 118.1 | 1.968333 | 55.58 | 19.233 | 0.624 | 1.310 | 0.557 |
| 5/11/2003 | 10:26:43 | 125.1 | 2.085 | 55.58 | 19.201 | 0.592 | 1.427 | 0.529 |
| 5/11/2003 | 10:26:50 | 132.6 | 2.21 | 55.58 | 19.167 | 0.558 | 1.552 | 0.498 |
| 5/11/2003 | 10:26:58 | 140.5 | 2.341667 | 55.58 | 19.136 | 0.527 | 1.683 | 0.471 |
| 5/11/2003 | 10:27:07 | 148.9 | 2.481667 | 55.58 | 19.106 | 0.497 | 1.823 | 0.444 |
| 5/11/2003 | 10:27:16 | 157.8 | 2.63 | 55.58 | 19.074 | 0.465 | 1.972 | 0.415 |
| 5/11/2003 | 10:27:25 | 167.2 | 2.786667 | 55.58 | 19.035 | 0.426 | 2.128 | 0.380 |
| 5/11/2003 | 10:27:35 | 177.2 | 2.953333 | 55.58 | 19.007 | 0.398 | 2.295 | 0.355 |
| 5/11/2003 | 10:27:46 | 187.8 | 3.13 | 55.58 | 18.977 | 0.368 | 2.472 | 0.329 |
| 5/11/2003 | 10:27:57 | 199 | 3.316667 | 55.58 | 18.947 | 0.338 | 2.658 | 0.302 |
| 5/11/2003 | 10:28:09 | 210.9 | 3.515 | 55.58 | 18.919 | 0.31 | 2.857 | 0.277 |
| 5/11/2003 | 10:28:21 | 223.5 | 3.725 | 55.58 | 18.893 | 0.284 | 3.067 | 0.254 |
| 5/11/2003 | 10:28:35 | 236.8 | 3.946667 | 55.58 | 18.865 | 0.256 | 3.288 | 0.229 |
| 5/11/2003 | 10:28:49 | 250.9 | 4.181667 | 55.58 | 18.839 | 0.23 | 3.523 | 0.205 |
| 5/11/2003 | 10:29:04 | 265.8 | 4.43 | 55.58 | 18.815 | 0.206 | 3.772 | 0.184 |
| 5/11/2003 | 10:29:19 | 281.6 | 4.693333 | 55.56 | 18.793 | 0.184 | 4.035 | 0.164 |
| 5/11/2003 | 10:29:36 | 298.4 | 4.973333 | 55.56 | 18.778 | 0.169 | 4.315 | 0.151 |
| 5/11/2003 | 10:29:54 | 316.2 | 5.27 | 55.56 | 18.751 | 0.142 | 4.612 | 0.127 |
| 5/11/2003 | 10:30:13 | 335 | 5.583333 | 55.56 | 18.733 | 0.124 | 4.925 | 0.111 |
| 5/11/2003 | 10:30:33 | 354.9 | 5.915 | 55.56 | 18.716 | 0.107 | 5.257 | 0.096 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 10:30:54 | 376 | 6.266667 | 55.56 | 18.703 | 0.094 | 5.608 | 0.084 |
| 5/11/2003 | 10:31:16 | 398.4 | 6.64 | 55.56 | 18.69 | 0.081 | 5.982 | 0.072 |
| 5/11/2003 | 10:31:40 | 422.1 | 7.035 | 55.56 | 18.68 | 0.071 | 6.377 | 0.063 |
| 5/11/2003 | 10:32:05 | 447.2 | 7.453333 | 55.56 | 18.669 | 0.06 | 6.795 | 0.054 |
| 5/11/2003 | 10:32:32 | 473.8 | 7.896667 | 55.56 | 18.66 | 0.051 | 7.238 | 0.046 |
| 5/11/2003 | 10:33:00 | 502 | 8.366667 | 55.56 | 18.652 | 0.043 | 7.708 | 0.038 |
| 5/11/2003 | 10:33:30 | 531.9 | 8.865 | 55.56 | 18.645 | 0.036 | 8.207 | 0.032 |
| 5/11/2003 | 10:34:01 | 563.5 | 9.391667 | 55.56 | 18.641 | 0.032 | 8.733 | 0.029 |
| 5/11/2003 | 10:34:35 | 597 | 9.95 | 55.56 | 18.639 | 0.03 | 9.292 | 0.027 |
| 5/11/2003 | 10:35:10 | 632.5 | 10.54167 | 55.56 | 18.634 | 0.025 | 9.883 | 0.022 |
| 5/11/2003 | 10:35:48 | 670.1 | 11.16833 | 55.56 | 18.628 | 0.019 | 10.510 | 0.017 |
| 5/11/2003 | 10:36:28 | 709.9 | 11.83167 | 55.56 | 18.626 | 0.017 | 11.173 | 0.015 |
| 5/11/2003 | 10:37:10 | 752.1 | 12.535 | 55.56 | 18.624 | 0.015 | 11.877 | 0.013 |
| 5/11/2003 | 10:37:55 | 796.8 | 13.28 | 55.56 | 18.621 | 0.012 | 12.622 | 0.011 |
| 5/11/2003 | 10:38:42 | 844.2 | 14.07 | 55.58 | 18.619 | 0.01 | 13.412 | 0.009 |
| 5/11/2003 | 10:39:32 | 894.4 | 14.90667 | 55.56 | 18.619 | 0.01 | 14.248 | 0.009 |
| 5/11/2003 | 10:40:25 | 947.5 | 15.79167 | 55.58 | 18.615 | 0.006 | 15.133 | 0.005 |
| 5/11/2003 | 10:41:22 | 1003.8 | 16.73 | 55.56 | 18.617 | 0.008 | 16.072 | 0.007 |
| 5/11/2003 | 10:42:21 | 1063.4 | 17.72333 | 55.58 | 18.613 | 0.004 | 17.065 | 0.004 |
| 5/11/2003 | 10:43:24 | 1126.6 | 18.77667 | 55.58 | 18.606 | -0.003 | 18.118 | -0.003 |
| 5/11/2003 | 10:44:31 | 1193.5 | 19.89167 | 55.58 | 18.609 | 0 | 19.233 | 0.000 |
| 5/11/2003 | 10:45:42 | 1264.4 | 21.07333 | 55.58 | 18.611 | 0.002 | 20.415 | 0.002 |
| 5/11/2003 | 10:46:57 | 1339.5 | 22.325 | 55.56 | 18.61 | 0.001 | 21.667 | 0.001 |
| 5/11/2003 | 10:48:17 | 1419 | 23.65 | 55.58 | 18.607 | -0.002 | 22.992 | -0.002 |
| 5/11/2003 | 10:49:41 | 1503.3 | 25.055 | 55.58 | 18.606 | -0.003 | 24.397 | -0.003 |
| 5/11/2003 | 10:51:10 | 1592.6 | 26.54333 | 55.58 | 18.602 | -0.007 | 25.885 | -0.006 |
| 5/11/2003 | 10:52:45 | 1687.1 | 28.11833 | 55.58 | 18.602 | -0.007 | 27.460 | -0.006 |
| 5/11/2003 | 10:54:25 | 1787.2 | 29.78667 | 55.58 | 18.607 | -0.002 | 29.128 | -0.002 |
| 5/11/2003 | 10:56:11 | 1893.3 | 31.555 | 55.58 | 18.604 | -0.005 | 30.897 | -0.004 |
| 5/11/2003 | 10:58:03 | 2005.7 | 33.42833 | 55.58 | 18.607 | -0.002 | 32.770 | -0.002 |
| 5/11/2003 | 11:00:02 | 2124.7 | 35.41167 | 55.58 | 18.606 | -0.003 | 34.753 | -0.003 |
| 5/11/2003 | 11:02:09 | 2250.8 | 37.51333 | 55.58 | 18.606 | -0.003 | 36.855 | -0.003 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 16MWT04 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Rising head | **Test Date:** | 11-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RMB 6/23/03

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 1 = R |
| Length of Well Screen (ft.) : | 10 = L |
| Time for 37% head change (min.) : | 2.27 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 7.32E-04 | ft./min. |
| 1.22E-05 | ft./sec. |
| 1.05E+00 | ft./day |
| 3.72E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: CRANE WELL/BORING NO.: 16MW104

PROJECT NO.: 9060 CTO 0279 GEOLOGIST: BOB BALCONEC

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' / 27.60' TEST NO.:

STATIC WATER LEVEL (Depth/Elevation): 7.80' DATE: 5/4/03

TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

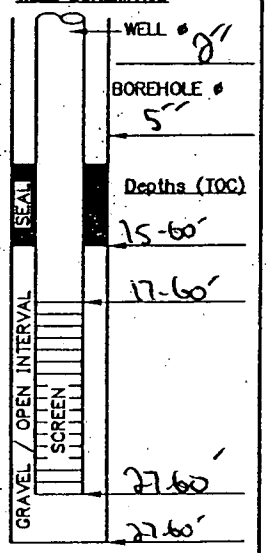
METHOD OF INDUCING WATER LEVEL CHANGE: 1.25" x 42" SOLID SLUG PAGE ..... OF .....

REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30PSI

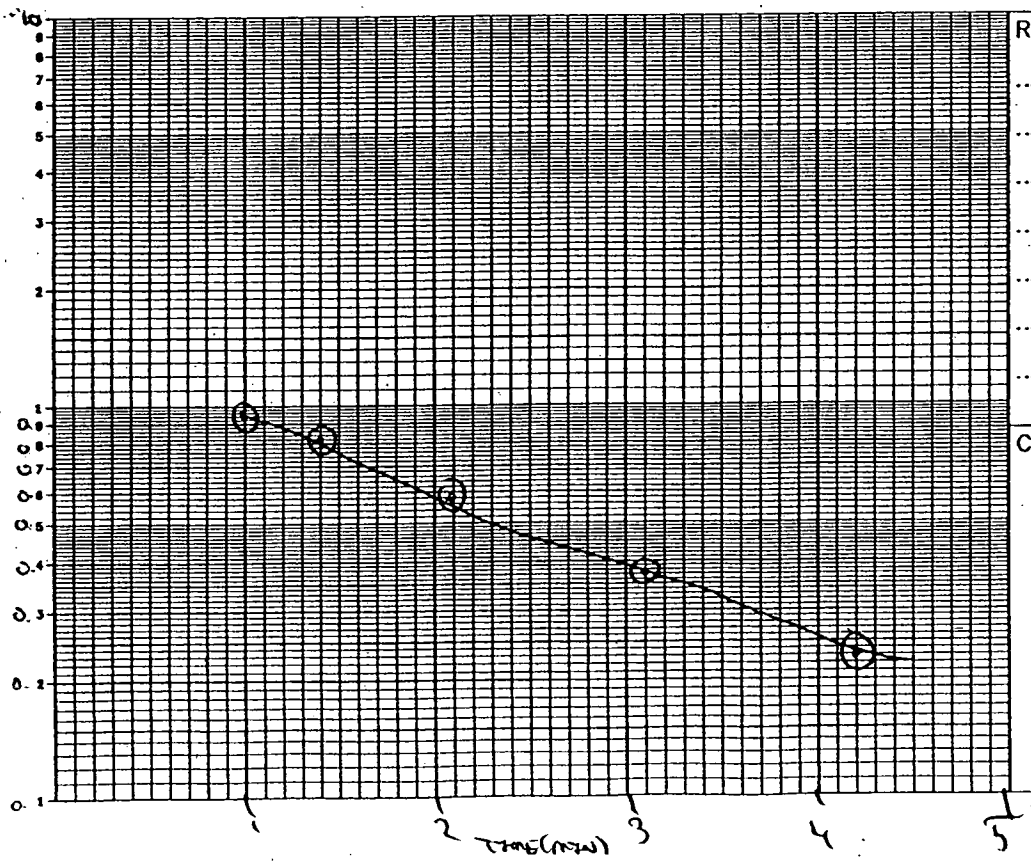
ACAD:FORM_HYDCONTST.dwg 07/06/99 INL

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 18.609 | 0 | 4.18 | 18.839 | +0.23 |
| 0.14 | 21.903 | +3.294 | 5.41 | 18.76 | +0.17 |
| 0.16 | 20.375 | +1.766 | | | |
| 0.21 | 19.931 | +1.322 | | | |
| 0.42 | 19.858 | +1.249 | | | |
| 0.525 | 19.796 | +1.187 | | | |
| 1.041 | 19.554 | +0.945 | | | |
| 1.39 | 19.416 | +0.807 | | | |
| 1.75 | 19.294 | +0.685 | | | |
| 2.085 | 19.201 | +0.592 | | | |
| 2.48 | 19.109 | +0.497 | | | |
| 3.13 | 18.977 | +0.366 | | | |

WELL SCHEMATIC

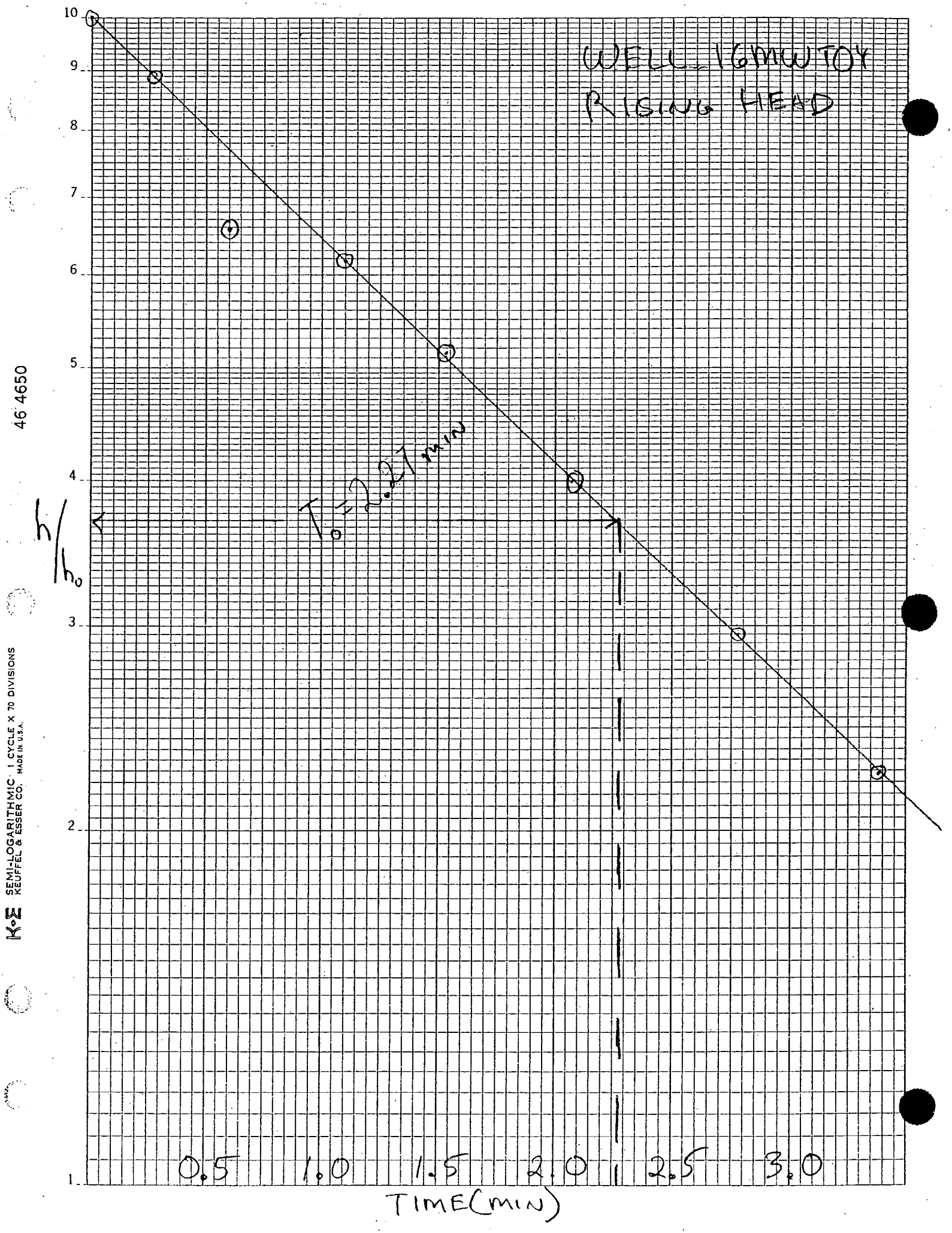



▽ Indicate SWL Depth on Drawing




REMARKS:

CALCS, SKETCH MAPS, ETC.:


WELL 16MW10Y
RISING HEAD
$T_{1/2} = 2.21$ min
$h/h_0$
10
9
8
7
6
5
4
3
2
1
0.5
1.0
1.5
2.0
2.5
3.0
TIME(MIN)
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 5/11/2003 13:24:50
Report from file: ...\SN00824 2003-05-11 110513 16MWT04 Rising .bin
Win-Situ Version 4.41

Serial number: 824
Firmware Version 3.06
Unit name:

Test name: 16MWT04 Rising

Test defined on: 5/11/2003 11:05:04
Test started on: 5/11/2003 11:05:13
Test stopped on: N/A N/A
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time betw Seconds.
Number of data sam 125

TOTAL DATA SAMPL 125

Channel number [1]
Measurement type: Temperature
Channel name: Temperature

Channel number [2]
Measurement type: Pressure
Channel name: Depth
Sensor Range: 30 PSIG.
Specific gravity: 1

ho= -1.124

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Displacement Feet | adjusted time | h/ho |
|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 11:05:13 | 0 | 0 | 55.63 | 18.605 | 0 | | |
| 5/11/2003 | 11:05:14 | 0.3 | 0.005 | 55.67 | 18.605 | 0 | | |
| 5/11/2003 | 11:05:14 | 0.6 | 0.01 | 55.67 | 18.606 | 0.001 | | |
| 5/11/2003 | 11:05:14 | 0.9 | 0.015 | 55.7 | 18.605 | 0 | | |
| 5/11/2003 | 11:05:15 | 1.2 | 0.02 | 55.7 | 18.605 | 0 | | |
| 5/11/2003 | 11:05:15 | 1.5 | 0.025 | 55.7 | 18.632 | 0.027 | | |
| 5/11/2003 | 11:05:15 | 1.8 | 0.03 | 55.7 | 17.777 | -0.828 | | |
| 5/11/2003 | 11:05:15 | 2.1 | 0.035 | 55.72 | 17.519 | -1.086 | | |
| 5/11/2003 | 11:05:16 | 2.4 | 0.04 | 55.7 | 18.317 | -0.288 | | |
| 5/11/2003 | 11:05:16 | 2.7 | 0.045 | 55.72 | 16.364 | -2.241 | | |
| 5/11/2003 | 11:05:16 | 3 | 0.05 | 55.72 | 17.805 | -0.8 | | |
| 5/11/2003 | 11:05:17 | 3.3 | 0.055 | 55.72 | 16.69 | -1.915 | | |
| 5/11/2003 | 11:05:17 | 3.6 | 0.06 | 55.7 | 17.529 | -1.076 | | |
| 5/11/2003 | 11:05:17 | 3.9 | 0.065 | 55.72 | 16.935 | -1.67 | | |
| 5/11/2003 | 11:05:18 | 4.2 | 0.07 | 55.72 | 17.361 | -1.244 | | |
| 5/11/2003 | 11:05:18 | 4.5 | 0.075 | 55.72 | 17.084 | -1.521 | | |
| 5/11/2003 | 11:05:18 | 4.8 | 0.08 | 55.72 | 17.271 | -1.334 | | |
| 5/11/2003 | 11:05:18 | 5.1 | 0.085 | 55.72 | 17.181 | -1.424 | | |
| 5/11/2003 | 11:05:19 | 5.4 | 0.09 | 55.72 | 17.235 | -1.37 | | |
| 5/11/2003 | 11:05:19 | 5.7 | 0.095 | 55.72 | 17.219 | -1.386 | | |
| 5/11/2003 | 11:05:19 | 6 | 0.1 | 55.72 | 17.23 | -1.375 | | |
| 5/11/2003 | 11:05:20 | 6.4 | 0.106667 | 55.72 | 17.228 | -1.377 | | |
| 5/11/2003 | 11:05:20 | 6.7 | 0.111667 | 55.72 | 17.249 | -1.356 | | |
| 5/11/2003 | 11:05:20 | 7.1 | 0.118333 | 55.72 | 17.237 | -1.368 | | |
| 5/11/2003 | 11:05:21 | 7.5 | 0.125 | 55.72 | 17.254 | -1.351 | | |
| 5/11/2003 | 11:05:21 | 8 | 0.133333 | 55.72 | 17.258 | -1.347 | | |
| 5/11/2003 | 11:05:22 | 8.4 | 0.14 | 55.72 | 17.262 | -1.343 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 11:05:22 | 8.9 | 0.148333 | 55.74 | 17.269 | -1.336 | | |
| 5/11/2003 | 11:05:23 | 9.5 | 0.158333 | 55.72 | 17.278 | -1.327 | | |
| 5/11/2003 | 11:05:23 | 10 | 0.166667 | 55.7 | 17.275 | -1.33 | | |
| 5/11/2003 | 11:05:24 | 10.6 | 0.176667 | 55.7 | 17.286 | -1.319 | | |
| 5/11/2003 | 11:05:25 | 11.3 | 0.188333 | 55.7 | 17.29 | -1.315 | | |
| 5/11/2003 | 11:05:25 | 11.9 | 0.198333 | 55.7 | 17.292 | -1.313 | | |
| 5/11/2003 | 11:05:26 | 12.6 | 0.21 | 55.7 | 17.299 | -1.306 | | |
| 5/11/2003 | 11:05:27 | 13.4 | 0.223333 | 55.67 | 17.307 | -1.298 | | |
| 5/11/2003 | 11:05:28 | 14.2 | 0.236667 | 55.67 | 17.314 | -1.291 | | |
| 5/11/2003 | 11:05:28 | 15 | 0.25 | 55.67 | 17.324 | -1.281 | | |
| 5/11/2003 | 11:05:29 | 15.9 | 0.265 | 55.67 | 17.331 | -1.274 | | |
| 5/11/2003 | 11:05:30 | 16.8 | 0.28 | 55.67 | 17.341 | -1.264 | | |
| 5/11/2003 | 11:05:31 | 17.8 | 0.296667 | 55.67 | 17.348 | -1.257 | | |
| 5/11/2003 | 11:05:32 | 18.9 | 0.315 | 55.67 | 17.359 | -1.246 | | |
| 5/11/2003 | 11:05:33 | 20 | 0.333333 | 55.67 | 17.37 | -1.235 | | |
| 5/11/2003 | 11:05:35 | 21.2 | 0.353333 | 55.67 | 17.382 | -1.223 | | |
| 5/11/2003 | 11:05:36 | 22.4 | 0.373333 | 55.67 | 17.391 | -1.214 | | |
| 5/11/2003 | 11:05:37 | 23.8 | 0.396667 | 55.67 | 17.402 | -1.203 | | |
| 5/11/2003 | 11:05:39 | 25.2 | 0.42 | 55.67 | 17.413 | -1.192 | | |
| 5/11/2003 | 11:05:40 | 26.7 | 0.445 | 55.67 | 17.426 | -1.179 | | |
| 5/11/2003 | 11:05:42 | 28.2 | 0.47 | 55.67 | 17.44 | -1.165 | Plotted shaded values. | |
| 5/11/2003 | 11:05:43 | 29.8 | 0.496667 | 55.67 | 17.453 | -1.152 | | |
| 5/11/2003 | 11:05:45 | 31.5 | 0.525 | 55.67 | 17.469 | -1.136 | adjusted time | h/ho |
| 5/11/2003 | 11:05:47 | 33.3 | 0.555 | 55.67 | 17.481 | -1.124 | 0.000 | 1.000 |
| 5/11/2003 | 11:05:49 | 35.2 | 0.586667 | 55.67 | 17.496 | -1.109 | 0.032 | 0.987 |
| 5/11/2003 | 11:05:51 | 37.3 | 0.621667 | 55.67 | 17.505 | -1.1 | 0.067 | 0.979 |
| 5/11/2003 | 11:05:53 | 39.5 | 0.658333 | 55.67 | 17.529 | -1.076 | 0.103 | 0.957 |
| 5/11/2003 | 11:05:55 | 41.8 | 0.696667 | 55.67 | 17.546 | -1.059 | 0.142 | 0.942 |
| 5/11/2003 | 11:05:58 | 44.3 | 0.738333 | 55.65 | 17.567 | -1.038 | 0.183 | 0.923 |
| 5/11/2003 | 11:06:00 | 46.9 | 0.781667 | 55.67 | 17.594 | -1.011 | 0.227 | 0.899 |
| 5/11/2003 | 11:06:03 | 49.7 | 0.828333 | 55.65 | 17.608 | -0.997 | 0.273 | 0.887 |
| 5/11/2003 | 11:06:06 | 52.6 | 0.876667 | 55.65 | 17.628 | -0.977 | 0.322 | 0.869 |
| 5/11/2003 | 11:06:09 | 55.7 | 0.928333 | 55.65 | 17.651 | -0.954 | 0.373 | 0.849 |
| 5/11/2003 | 11:06:12 | 59 | 0.983333 | 55.77 | 17.851 | -0.754 | 0.428 | 0.671 |
| 5/11/2003 | 11:06:16 | 62.5 | 1.041667 | 55.77 | 17.851 | -0.754 | 0.487 | 0.671 |
| 5/11/2003 | 11:06:20 | 66.2 | 1.103333 | 55.77 | 17.855 | -0.75 | 0.548 | 0.667 |
| 5/11/2003 | 11:06:23 | 70.1 | 1.168333 | 55.77 | 17.857 | -0.748 | 0.613 | 0.665 |
| 5/11/2003 | 11:06:28 | 74.3 | 1.238333 | 55.79 | 17.858 | -0.747 | 0.683 | 0.665 |
| 5/11/2003 | 11:06:32 | 78.7 | 1.311667 | 55.77 | 17.86 | -0.745 | 0.757 | 0.663 |
| 5/11/2003 | 11:06:37 | 83.4 | 1.39 | 55.77 | 17.864 | -0.741 | 0.835 | 0.659 |
| 5/11/2003 | 11:06:42 | 88.4 | 1.473333 | 55.7 | 17.854 | -0.751 | 0.918 | 0.668 |
| 5/11/2003 | 11:06:47 | 93.7 | 1.561667 | 55.7 | 17.876 | -0.729 | 1.007 | 0.649 |
| 5/11/2003 | 11:06:53 | 99.3 | 1.655 | 55.67 | 17.91 | -0.695 | 1.100 | 0.618 |
| 5/11/2003 | 11:06:59 | 105.2 | 1.753333 | 55.67 | 17.938 | -0.667 | 1.198 | 0.593 |
| 5/11/2003 | 11:07:05 | 111.5 | 1.858333 | 55.67 | 17.97 | -0.635 | 1.303 | 0.565 |
| 5/11/2003 | 11:07:11 | 118.1 | 1.968333 | 55.67 | 17.996 | -0.609 | 1.413 | 0.542 |
| 5/11/2003 | 11:07:18 | 125.1 | 2.085 | 55.67 | 18.028 | -0.577 | 1.530 | 0.513 |
| 5/11/2003 | 11:07:26 | 132.6 | 2.21 | 55.67 | 18.059 | -0.546 | 1.655 | 0.486 |
| 5/11/2003 | 11:07:34 | 140.5 | 2.341667 | 55.65 | 18.089 | -0.516 | 1.787 | 0.459 |
| 5/11/2003 | 11:07:42 | 148.9 | 2.481667 | 55.65 | 18.121 | -0.484 | 1.927 | 0.431 |
| 5/11/2003 | 11:07:51 | 157.8 | 2.63 | 55.65 | 18.155 | -0.45 | 2.075 | 0.400 |
| 5/11/2003 | 11:08:01 | 167.2 | 2.786667 | 55.65 | 18.183 | -0.422 | 2.232 | 0.375 |
| 5/11/2003 | 11:08:11 | 177.2 | 2.953333 | 55.65 | 18.211 | -0.394 | 2.398 | 0.351 |
| 5/11/2003 | 11:08:21 | 187.8 | 3.13 | 55.63 | 18.243 | -0.362 | 2.575 | 0.322 |
| 5/11/2003 | 11:08:32 | 199 | 3.316667 | 55.63 | 18.273 | -0.332 | 2.762 | 0.295 |
| 5/11/2003 | 11:08:44 | 210.9 | 3.515 | 55.63 | 18.299 | -0.306 | 2.960 | 0.272 |
| 5/11/2003 | 11:08:57 | 223.5 | 3.725 | 55.63 | 18.297 | -0.308 | 3.170 | 0.274 |
| 5/11/2003 | 11:09:10 | 236.8 | 3.946667 | 55.63 | 18.353 | -0.252 | 3.392 | 0.224 |
| 5/11/2003 | 11:09:24 | 250.9 | 4.181667 | 55.61 | 18.379 | -0.226 | 3.627 | 0.201 |
| 5/11/2003 | 11:09:39 | 265.8 | 4.43 | 55.61 | 18.402 | -0.203 | 3.875 | 0.181 |
| 5/11/2003 | 11:09:55 | 281.6 | 4.693333 | 55.61 | 18.42 | -0.185 | 4.138 | 0.165 |
| 5/11/2003 | 11:10:12 | 298.4 | 4.973333 | 55.61 | 18.441 | -0.164 | 4.418 | 0.146 |
| 5/11/2003 | 11:10:30 | 316.2 | 5.27 | 55.61 | 18.46 | -0.145 | 4.715 | 0.129 |
| 5/11/2003 | 11:10:48 | 335 | 5.583333 | 55.61 | 18.476 | -0.129 | 5.028 | 0.115 |
| 5/11/2003 | 11:11:08 | 354.9 | 5.915 | 55.58 | 18.484 | -0.121 | 5.360 | 0.108 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 11:11:29 | 376 | 6.266667 | 55.58 | 18.503 | -0.102 | 5.712 | 0.091 |
| 5/11/2003 | 11:11:52 | 398.4 | 6.64 | 55.58 | 18.516 | -0.089 | 6.085 | 0.079 |
| 5/11/2003 | 11:12:15 | 422.1 | 7.035 | 55.58 | 18.525 | -0.08 | 6.480 | 0.071 |
| 5/11/2003 | 11:12:41 | 447.2 | 7.453333 | 55.58 | 18.535 | -0.07 | 6.898 | 0.062 |
| 5/11/2003 | 11:13:07 | 473.8 | 7.896667 | 55.58 | 18.546 | -0.059 | 7.342 | 0.052 |
| 5/11/2003 | 11:13:35 | 502 | 8.366667 | 55.56 | 18.55 | -0.055 | 7.812 | 0.049 |
| 5/11/2003 | 11:14:05 | 531.9 | 8.865 | 55.56 | 18.557 | -0.048 | 8.310 | 0.043 |
| 5/11/2003 | 11:14:37 | 563.5 | 9.391667 | 55.58 | 18.559 | -0.046 | 8.837 | 0.041 |
| 5/11/2003 | 11:15:10 | 597 | 9.95 | 55.56 | 18.565 | -0.04 | 9.395 | 0.036 |
| 5/11/2003 | 11:15:46 | 632.5 | 10.54167 | 55.56 | 18.567 | -0.038 | 9.987 | 0.034 |
| 5/11/2003 | 11:16:23 | 670.1 | 11.16833 | 55.56 | 18.572 | -0.033 | 10.613 | 0.029 |
| 5/11/2003 | 11:17:03 | 709.9 | 11.83167 | 55.56 | 18.572 | -0.033 | 11.277 | 0.029 |
| 5/11/2003 | 11:17:45 | 752.1 | 12.535 | 55.56 | 18.574 | -0.031 | 11.980 | 0.028 |
| 5/11/2003 | 11:18:30 | 796.8 | 13.28 | 55.58 | 18.572 | -0.033 | 12.725 | 0.029 |
| 5/11/2003 | 11:19:18 | 844.2 | 14.07 | 55.58 | 18.576 | -0.029 | 13.515 | 0.026 |
| 5/11/2003 | 11:20:08 | 894.4 | 14.90667 | 55.58 | 18.578 | -0.027 | 14.352 | 0.024 |
| 5/11/2003 | 11:21:01 | 947.5 | 15.79167 | 55.58 | 18.579 | -0.026 | 15.237 | 0.023 |
| 5/11/2003 | 11:21:57 | 1003.8 | 16.73 | 55.58 | 18.581 | -0.024 | 16.175 | 0.021 |
| 5/11/2003 | 11:22:57 | 1063.4 | 17.72333 | 55.58 | 18.576 | -0.029 | 17.168 | 0.026 |
| 5/11/2003 | 11:24:00 | 1126.6 | 18.77667 | 55.58 | 18.581 | -0.024 | 18.222 | 0.021 |
| 5/11/2003 | 11:25:07 | 1193.5 | 19.89167 | 55.58 | 18.581 | -0.024 | 19.337 | 0.021 |
| 5/11/2003 | 11:26:18 | 1264.4 | 21.07333 | 55.61 | 18.583 | -0.022 | 20.518 | 0.020 |
| 5/11/2003 | 11:27:33 | 1339.5 | 22.325 | 55.61 | 18.583 | -0.022 | 21.770 | 0.020 |
| 5/11/2003 | 11:28:52 | 1419 | 23.65 | 55.61 | 18.581 | -0.024 | 23.095 | 0.021 |
| 5/11/2003 | 11:30:17 | 1503.3 | 25.055 | 55.61 | 18.579 | -0.026 | 24.500 | 0.023 |
| 5/11/2003 | 11:31:46 | 1592.6 | 26.54333 | 55.61 | 18.581 | -0.024 | 25.988 | 0.021 |
| 5/11/2003 | 11:33:20 | 1687.1 | 28.11833 | 55.61 | 18.575 | -0.03 | 27.563 | 0.027 |
| 5/11/2003 | 11:35:01 | 1787.2 | 29.78667 | 55.61 | 18.579 | -0.026 | 29.232 | 0.023 |
| 5/11/2003 | 11:36:47 | 1893.3 | 31.555 | 55.61 | 18.575 | -0.03 | 31.000 | 0.027 |
| 5/11/2003 | 11:38:39 | 2005.7 | 33.42833 | 55.61 | 18.579 | -0.026 | 32.873 | 0.023 |
| 5/11/2003 | 11:40:38 | 2124.7 | 35.41167 | 55.61 | 18.581 | -0.024 | 34.857 | 0.021 |
| 5/11/2003 | 11:42:44 | 2250.8 | 37.51333 | 55.61 | 18.581 | -0.024 | 36.958 | 0.021 |
| 5/11/2003 | 11:44:58 | 2384.4 | 39.74 | 55.63 | 18.577 | -0.028 | 39.185 | 0.025 |

TETRA-TECH NUS

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 16MWT05 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Falling head | **Test Date:** | 9-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RMB 6/23/03

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 1 | = R |
| Length of Well Screen (ft.) : | 10 | = L |
| Time for 37% head change (min.) : | 3.75 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 4.43E-04 | ft./min. |
| 7.39E-06 | ft./sec. |
| 6.38E-01 | ft./day |
| 2.25E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

Tetra Tech NUS, Inc.

PROJECT NAME: CRANE WELL/BORING NO.: 16MW105

PROJECT NO.: 9060 CTO 0279 GEOLOGIST: BOB BALKOVEC

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' / 41.85' TEST NO.:

STATIC WATER LEVEL (Depth/Elevation): 29.30' DATE: 5/11/03

TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

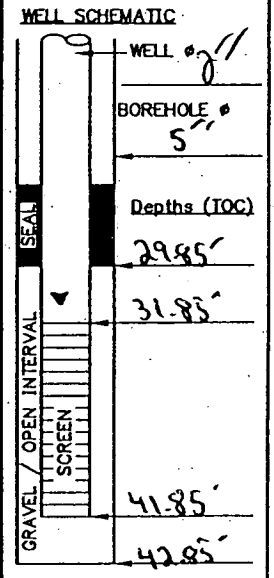
METHOD OF INDUCING WATER LEVEL CHANGE: 1.5" x 39" SOLID SLUG PAGE ..... OF .....

REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30PSI

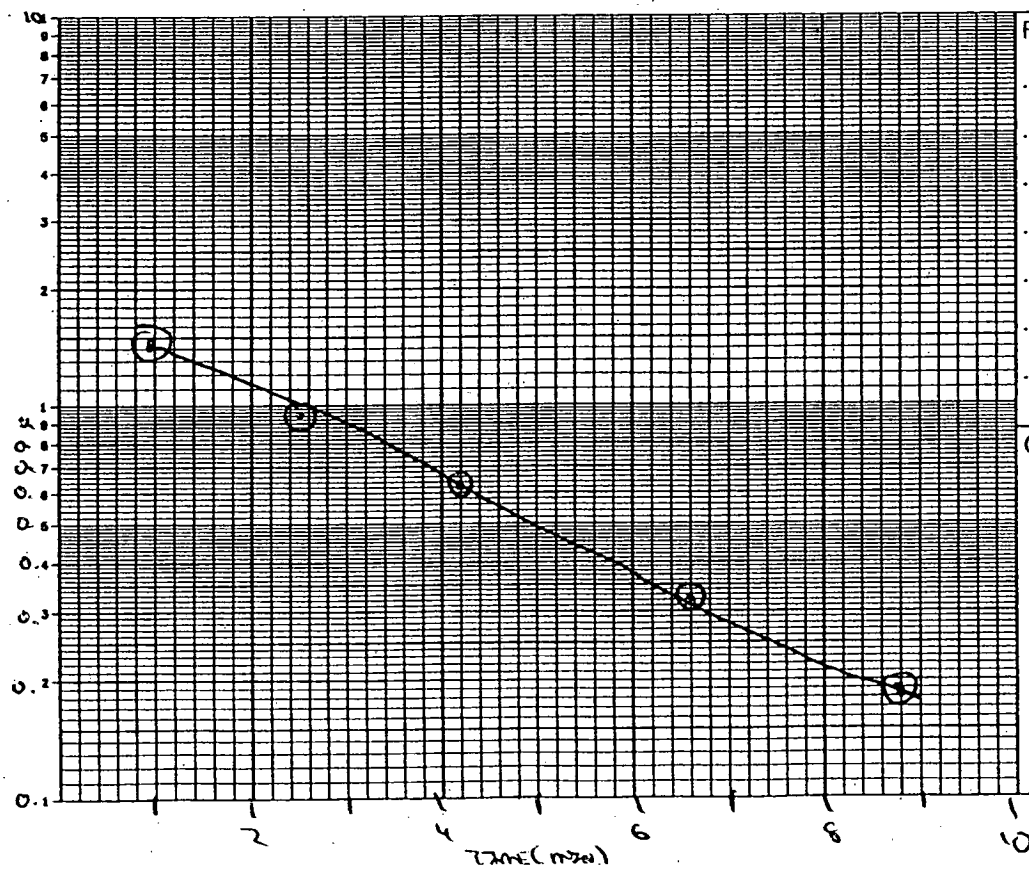
ACAD:FORM_HYDCONTST.dwg 07/06/99 INL

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 14.855 | 0 | 5.27 | 12.323 | 0.468 |
| 0.085 | 14.338 | 2.483 | 6.64 | 12.185 | 0.33 |
| 0.1 | 14.779 | 2.924 | 8.865 | 12.048 | 0.193 |
| 0.21 | 13.7 | 1.845 | 11.83 | 11.956 | 0.101 |
| 0.315 | 13.638 | 1.783 | 18.77 | 11.886 | 0.031 |
| 0.42 | 13.579 | 1.724 | | | |
| 0.525 | 13.523 | 1.668 | | | |
| 1.04 | 13.291 | 1.436 | | | |
| 1.75 | 13.035 | 1.18 | | | |
| 2.48 | 12.824 | 0.969 | | | |
| 3.13 | 12.672 | 0.817 | | | |
| 4.18 | 12.475 | 0.62 | | | |

WELL SCHEMATIC

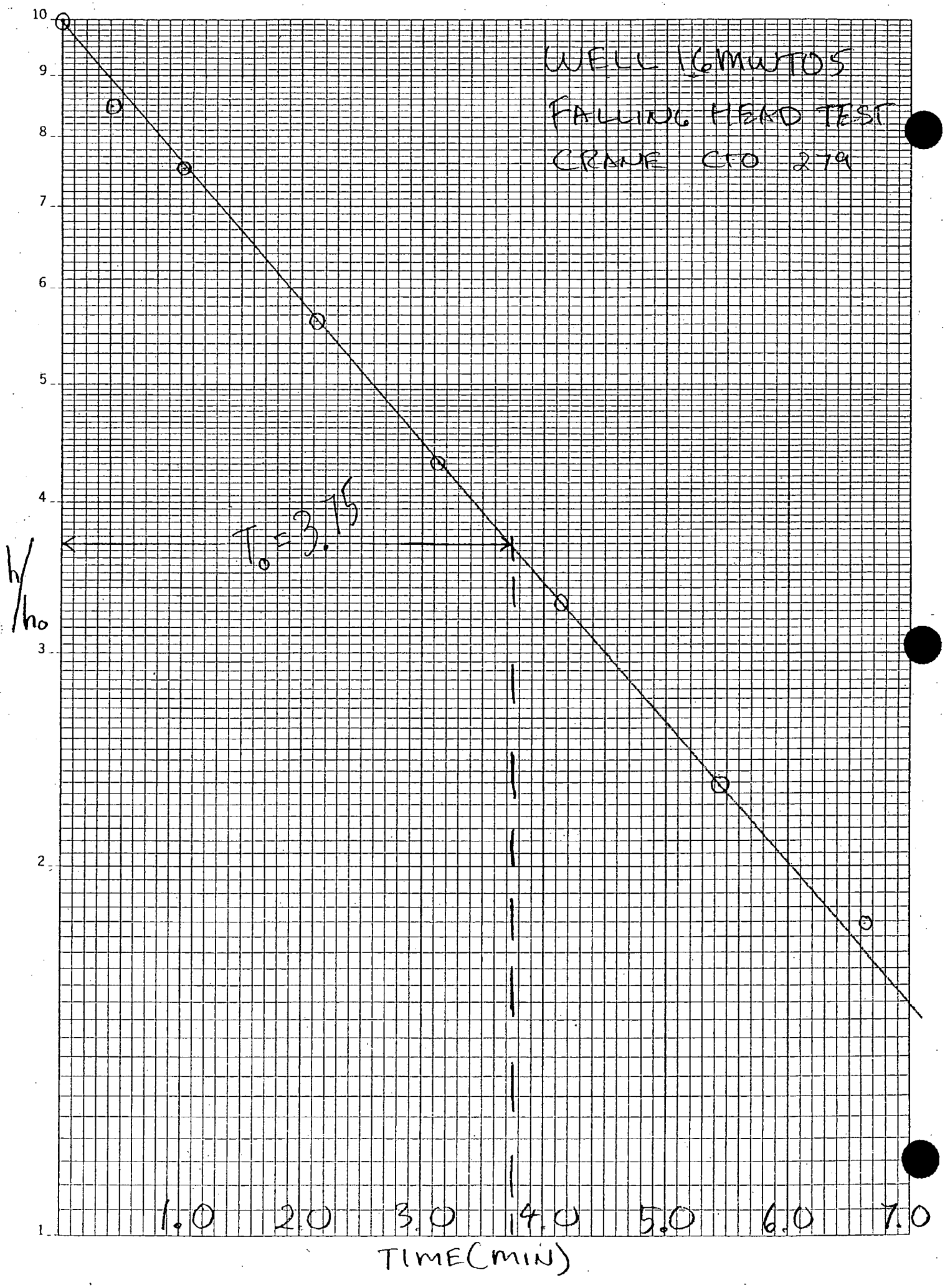



▽ Indicate SWL Depth on Drawing




REMARKS:

CALCS, SKETCH MAPS, ETC.:


WELL 16MW105
FALLING HEAD TEST
CRANE CFO 279
$T_o = 3.75$
h/ho
10
9
8
7
6
5
4
3
2
1
1.0
2.0
3.0
4.0
5.0
6.0
7.0
TIME(MIN)
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generate 5/11/2003 13:25:59
Report from file: ...\SN09015 2003-05-11 093526 16MWT05 Falling.bin
Win-Situ Versio 4.41

Serial number: 9015
Firmware Versic 3.04
Unit name: MW-14FW

Test name: 16MWT05 Falling

Test defined on: 5/11/2003 9:35:15
Test started on: 5/11/2003 9:35:26
Test stopped on N/A N/A
Test extracted o N/A N/A

Data gathered using Logarithmic testing
Maximum time Seconds.
Number of dat 130

TOTAL DATA S 130

Channel number [1]
Measurement t Temperature
Channel name OnBoard Temp

Channel number [2]
Measurement t Pressure
Channel name:
Sensor Range: 30 PSIG.
Specific gravit 1

ho= 1.525

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Displacement Feet | adjusted time | h/ho |
|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 9:35:26 | 0 | 0 | 58.54 | 11.855 | 0 | | |
| 5/11/2003 | 9:35:27 | 0.3 | 0.005 | 58.56 | 11.855 | 0 | | |
| 5/11/2003 | 9:35:27 | 0.6 | 0.01 | 58.59 | 11.855 | 0 | | |
| 5/11/2003 | 9:35:27 | 0.9 | 0.015 | 58.59 | 11.855 | 0 | | |
| 5/11/2003 | 9:35:28 | 1.2 | 0.02 | 58.59 | 11.855 | 0 | | |
| 5/11/2003 | 9:35:28 | 1.5 | 0.025 | 58.61 | 11.855 | 0 | | |
| 5/11/2003 | 9:35:28 | 1.8 | 0.03 | 58.61 | 11.855 | 0 | | |
| 5/11/2003 | 9:35:29 | 2.1 | 0.035 | 58.61 | 11.855 | 0 | | |
| 5/11/2003 | 9:35:29 | 2.4 | 0.04 | 58.61 | 11.855 | 0 | | |
| 5/11/2003 | 9:35:29 | 2.7 | 0.045 | 58.61 | 11.855 | 0 | | |
| 5/11/2003 | 9:35:29 | 3 | 0.05 | 58.61 | 11.855 | 0 | | |
| 5/11/2003 | 9:35:30 | 3.3 | 0.055 | 58.61 | 11.855 | 0 | | |
| 5/11/2003 | 9:35:30 | 3.6 | 0.06 | 58.61 | 11.855 | 0 | | |
| 5/11/2003 | 9:35:30 | 3.9 | 0.065 | 58.63 | 11.855 | 0 | | |
| 5/11/2003 | 9:35:31 | 4.2 | 0.07 | 58.63 | 11.855 | 0 | | |
| 5/11/2003 | 9:35:31 | 4.5 | 0.075 | 58.63 | 11.905 | 0.05 | | |
| 5/11/2003 | 9:35:31 | 4.8 | 0.08 | 58.63 | 11.913 | 0.058 | | |
| 5/11/2003 | 9:35:32 | 5.1 | 0.085 | 58.63 | 14.338 | 2.483 | | |
| 5/11/2003 | 9:35:32 | 5.4 | 0.09 | 58.63 | 13.417 | 1.562 | | |
| 5/11/2003 | 9:35:32 | 5.7 | 0.095 | 58.63 | 13.85 | 1.995 | | |
| 5/11/2003 | 9:35:32 | 6 | 0.1 | 58.63 | 14.779 | 2.924 | | |
| 5/11/2003 | 9:35:33 | 6.4 | 0.106667 | 58.63 | 14.049 | 2.194 | | |
| 5/11/2003 | 9:35:33 | 6.7 | 0.111667 | 58.63 | 14.375 | 2.52 | | |
| 5/11/2003 | 9:35:34 | 7.1 | 0.118333 | 58.63 | 14.418 | 2.563 | | |
| 5/11/2003 | 9:35:34 | 7.5 | 0.125 | 58.63 | 13.567 | 1.712 | | |
| 5/11/2003 | 9:35:34 | 8 | 0.133333 | 58.63 | 14.205 | 2.35 | | |
| 5/11/2003 | 9:35:35 | 8.4 | 0.14 | 58.63 | 13.928 | 2.073 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 9:35:35 | 8.9 | 0.148333 | 58.63 | 13.296 | 1.441 | | |
| 5/11/2003 | 9:35:36 | 9.5 | 0.158333 | 58.63 | 13.973 | 2.118 | | |
| 5/11/2003 | 9:35:37 | 10 | 0.166667 | 58.63 | 13.626 | 1.771 | | |
| 5/11/2003 | 9:35:37 | 10.6 | 0.176667 | 58.61 | 13.786 | 1.931 | | |
| 5/11/2003 | 9:35:38 | 11.3 | 0.188333 | 58.61 | 13.696 | 1.841 | | |
| 5/11/2003 | 9:35:38 | 11.9 | 0.198333 | 58.61 | 13.727 | 1.872 | | |
| 5/11/2003 | 9:35:39 | 12.6 | 0.21 | 58.61 | 13.7 | 1.845 | | |
| 5/11/2003 | 9:35:40 | 13.4 | 0.223333 | 58.61 | 13.692 | 1.837 | | |
| 5/11/2003 | 9:35:41 | 14.2 | 0.236667 | 58.61 | 13.69 | 1.835 | | |
| 5/11/2003 | 9:35:41 | 15 | 0.25 | 58.61 | 13.679 | 1.824 | | |
| 5/11/2003 | 9:35:42 | 15.9 | 0.265 | 58.61 | 13.669 | 1.814 | | |
| 5/11/2003 | 9:35:43 | 16.8 | 0.28 | 58.61 | 13.659 | 1.804 | | |
| 5/11/2003 | 9:35:44 | 17.8 | 0.296667 | 58.59 | 13.65 | 1.795 | | |
| 5/11/2003 | 9:35:45 | 18.9 | 0.315 | 58.59 | 13.638 | 1.783 | | |
| 5/11/2003 | 9:35:46 | 20 | 0.333333 | 58.59 | 13.626 | 1.771 | | |
| 5/11/2003 | 9:35:48 | 21.2 | 0.353333 | 58.59 | 13.614 | 1.759 | | |
| 5/11/2003 | 9:35:49 | 22.4 | 0.373333 | 58.59 | 13.603 | 1.748 | | |
| 5/11/2003 | 9:35:50 | 23.8 | 0.396667 | 58.59 | 13.589 | 1.734 | | |
| 5/11/2003 | 9:35:52 | 25.2 | 0.42 | 58.59 | 13.579 | 1.724 | | |
| 5/11/2003 | 9:35:53 | 26.7 | 0.445 | 58.59 | 13.564 | 1.709 | | |
| 5/11/2003 | 9:35:55 | 28.2 | 0.47 | 58.59 | 13.552 | 1.697 | | |
| 5/11/2003 | 9:35:56 | 29.8 | 0.496667 | 58.59 | 13.538 | 1.683 | | |
| 5/11/2003 | 9:35:58 | 31.5 | 0.525 | 58.59 | 13.523 | 1.668 | | |
| 5/11/2003 | 9:36:00 | 33.3 | 0.555 | 58.59 | 13.509 | 1.654 | | |
| 5/11/2003 | 9:36:02 | 35.2 | 0.586667 | 58.59 | 13.484 | 1.629 | | |
| 5/11/2003 | 9:36:04 | 37.3 | 0.621667 | 58.59 | 13.474 | 1.619 | adjusted time | h/ho |
| 5/11/2003 | 9:36:06 | 39.5 | 0.658333 | 58.59 | 13.458 | 1.603 | | |
| 5/11/2003 | 9:36:08 | 41.8 | 0.696667 | 58.59 | 13.441 | 1.586 | Plotted shaded values. | |
| 5/11/2003 | 9:36:11 | 44.3 | 0.738333 | 58.59 | 13.421 | 1.566 | | |
| 5/11/2003 | 9:36:13 | 46.9 | 0.781667 | 58.59 | 13.402 | 1.547 | | |
| 5/11/2003 | 9:36:16 | 49.7 | 0.828333 | 58.59 | 13.38 | 1.525 | 0.000 | 1.000 |
| 5/11/2003 | 9:36:19 | 52.6 | 0.876667 | 58.59 | 13.359 | 1.504 | 0.048 | 0.986 |
| 5/11/2003 | 9:36:22 | 55.7 | 0.928333 | 58.59 | 13.337 | 1.482 | 0.100 | 0.972 |
| 5/11/2003 | 9:36:25 | 59 | 0.983333 | 58.59 | 13.316 | 1.461 | 0.155 | 0.958 |
| 5/11/2003 | 9:36:29 | 62.5 | 1.041667 | 58.56 | 13.291 | 1.436 | 0.213 | 0.942 |
| 5/11/2003 | 9:36:33 | 66.2 | 1.103333 | 58.7 | 13.151 | 1.296 | 0.275 | 0.850 |
| 5/11/2003 | 9:36:37 | 70.1 | 1.168333 | 58.7 | 13.149 | 1.294 | 0.340 | 0.849 |
| 5/11/2003 | 9:36:41 | 74.3 | 1.238333 | 58.7 | 13.147 | 1.292 | 0.410 | 0.847 |
| 5/11/2003 | 9:36:45 | 78.7 | 1.311667 | 58.7 | 13.143 | 1.288 | 0.483 | 0.845 |
| 5/11/2003 | 9:36:50 | 83.4 | 1.39 | 58.7 | 13.141 | 1.286 | 0.562 | 0.843 |
| 5/11/2003 | 9:36:55 | 88.4 | 1.473333 | 58.7 | 13.139 | 1.284 | 0.645 | 0.842 |
| 5/11/2003 | 9:37:00 | 93.7 | 1.561667 | 58.61 | 13.101 | 1.246 | 0.733 | 0.817 |
| 5/11/2003 | 9:37:06 | 99.3 | 1.655 | 58.61 | 13.068 | 1.213 | 0.827 | 0.795 |
| 5/11/2003 | 9:37:12 | 105.2 | 1.753333 | 58.59 | 13.035 | 1.18 | 0.925 | 0.774 |
| 5/11/2003 | 9:37:18 | 111.5 | 1.858333 | 58.59 | 13.004 | 1.149 | 1.030 | 0.753 |
| 5/11/2003 | 9:37:25 | 118.1 | 1.968333 | 58.59 | 12.969 | 1.114 | 1.140 | 0.730 |
| 5/11/2003 | 9:37:32 | 125.1 | 2.085 | 58.59 | 12.933 | 1.078 | 1.257 | 0.707 |
| 5/11/2003 | 9:37:39 | 132.6 | 2.21 | 58.59 | 12.898 | 1.043 | 1.382 | 0.684 |
| 5/11/2003 | 9:37:47 | 140.5 | 2.341667 | 58.56 | 12.863 | 1.008 | 1.513 | 0.661 |
| 5/11/2003 | 9:37:55 | 148.9 | 2.481667 | 58.56 | 12.824 | 0.969 | 1.653 | 0.635 |
| 5/11/2003 | 9:38:04 | 157.8 | 2.63 | 58.56 | 12.787 | 0.932 | 1.802 | 0.611 |
| 5/11/2003 | 9:38:14 | 167.2 | 2.786667 | 58.56 | 12.75 | 0.895 | 1.958 | 0.587 |
| 5/11/2003 | 9:38:24 | 177.2 | 2.953333 | 58.56 | 12.713 | 0.858 | 2.125 | 0.563 |
| 5/11/2003 | 9:38:34 | 187.8 | 3.13 | 58.56 | 12.672 | 0.817 | 2.302 | 0.536 |
| 5/11/2003 | 9:38:45 | 199 | 3.316667 | 58.56 | 12.633 | 0.778 | 2.488 | 0.510 |
| 5/11/2003 | 9:38:57 | 210.9 | 3.515 | 58.54 | 12.594 | 0.739 | 2.687 | 0.485 |
| 5/11/2003 | 9:39:10 | 223.5 | 3.725 | 58.54 | 12.555 | 0.7 | 2.897 | 0.459 |
| 5/11/2003 | 9:39:23 | 236.8 | 3.946667 | 58.54 | 12.514 | 0.659 | 3.118 | 0.432 |
| 5/11/2003 | 9:39:37 | 250.9 | 4.181667 | 58.54 | 12.475 | 0.62 | 3.353 | 0.407 |
| 5/11/2003 | 9:39:52 | 265.8 | 4.43 | 58.54 | 12.436 | 0.581 | 3.602 | 0.381 |
| 5/11/2003 | 9:40:08 | 281.6 | 4.693333 | 58.54 | 12.397 | 0.542 | 3.865 | 0.355 |
| 5/11/2003 | 9:40:25 | 298.4 | 4.973333 | 58.54 | 12.358 | 0.503 | 4.145 | 0.330 |
| 5/11/2003 | 9:40:43 | 316.2 | 5.27 | 58.52 | 12.323 | 0.468 | 4.442 | 0.307 |
| 5/11/2003 | 9:41:01 | 335 | 5.583333 | 58.52 | 12.286 | 0.431 | 4.755 | 0.283 |
| 5/11/2003 | 9:41:21 | 354.9 | 5.915 | 58.52 | 12.251 | 0.396 | 5.087 | 0.260 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 9:41:42 | 376 | 6.266667 | 58.52 | 12.212 | 0.357 | 5.438 | 0.234 |
| 5/11/2003 | 9:42:05 | 398.4 | 6.64 | 58.52 | 12.185 | 0.33 | 5.812 | 0.216 |
| 5/11/2003 | 9:42:29 | 422.1 | 7.035 | 58.52 | 12.154 | 0.299 | 6.207 | 0.196 |
| 5/11/2003 | 9:42:54 | 447.2 | 7.453333 | 58.52 | 12.126 | 0.271 | 6.625 | 0.178 |
| 5/11/2003 | 9:43:20 | 473.8 | 7.896667 | 58.52 | 12.097 | 0.242 | 7.068 | 0.159 |
| 5/11/2003 | 9:43:48 | 502 | 8.366667 | 58.52 | 12.072 | 0.217 | 7.538 | 0.142 |
| 5/11/2003 | 9:44:18 | 531.9 | 8.865 | 58.52 | 12.048 | 0.193 | 8.037 | 0.127 |
| 5/11/2003 | 9:44:50 | 563.5 | 9.391667 | 58.52 | 12.025 | 0.17 | 8.563 | 0.111 |
| 5/11/2003 | 9:45:23 | 597 | 9.95 | 58.52 | 12.005 | 0.15 | 9.122 | 0.098 |
| 5/11/2003 | 9:45:59 | 632.5 | 10.54167 | 58.52 | 11.986 | 0.131 | 9.713 | 0.086 |
| 5/11/2003 | 9:46:37 | 670.1 | 11.16833 | 58.5 | 11.972 | 0.117 | 10.340 | 0.077 |
| 5/11/2003 | 9:47:16 | 709.9 | 11.83167 | 58.52 | 11.956 | 0.101 | 11.003 | 0.066 |
| 5/11/2003 | 9:47:59 | 752.1 | 12.535 | 58.5 | 11.943 | 0.088 | 11.707 | 0.058 |
| 5/11/2003 | 9:48:43 | 796.8 | 13.28 | 58.5 | 11.929 | 0.074 | 12.452 | 0.049 |
| 5/11/2003 | 9:49:31 | 844.2 | 14.07 | 58.5 | 11.922 | 0.067 | 13.242 | 0.044 |
| 5/11/2003 | 9:50:21 | 894.4 | 14.90667 | 58.5 | 11.912 | 0.057 | 14.078 | 0.037 |
| 5/11/2003 | 9:51:14 | 947.5 | 15.79167 | 58.5 | 11.904 | 0.049 | 14.963 | 0.032 |
| 5/11/2003 | 9:52:10 | 1003.8 | 16.73 | 58.5 | 11.898 | 0.043 | 15.902 | 0.028 |
| 5/11/2003 | 9:53:10 | 1063.4 | 17.72333 | 58.5 | 11.892 | 0.037 | 16.895 | 0.024 |
| 5/11/2003 | 9:54:13 | 1126.6 | 18.77667 | 58.5 | 11.886 | 0.031 | 17.948 | 0.020 |
| 5/11/2003 | 9:55:20 | 1193.5 | 19.89167 | 58.5 | 11.883 | 0.028 | 19.063 | 0.018 |
| 5/11/2003 | 9:56:31 | 1264.4 | 21.07333 | 58.5 | 11.879 | 0.024 | 20.245 | 0.016 |
| 5/11/2003 | 9:57:46 | 1339.5 | 22.325 | 58.5 | 11.877 | 0.022 | 21.497 | 0.014 |
| 5/11/2003 | 9:59:05 | 1419 | 23.65 | 58.5 | 11.875 | 0.02 | 22.822 | 0.013 |
| 5/11/2003 | 10:00:30 | 1503.3 | 25.055 | 58.5 | 11.873 | 0.018 | 24.227 | 0.012 |
| 5/11/2003 | 10:01:59 | 1592.6 | 26.54333 | 58.5 | 11.869 | 0.014 | 25.715 | 0.009 |
| 5/11/2003 | 10:03:34 | 1687.1 | 28.11833 | 58.5 | 11.869 | 0.014 | 27.290 | 0.009 |
| 5/11/2003 | 10:05:14 | 1787.2 | 29.78667 | 58.5 | 11.865 | 0.01 | 28.958 | 0.007 |
| 5/11/2003 | 10:07:00 | 1893.3 | 31.555 | 58.5 | 11.865 | 0.01 | 30.727 | 0.007 |
| 5/11/2003 | 10:08:52 | 2005.7 | 33.42833 | 58.5 | 11.861 | 0.006 | 32.600 | 0.004 |
| 5/11/2003 | 10:10:51 | 2124.7 | 35.41167 | 58.5 | 11.859 | 0.004 | 34.583 | 0.003 |
| 5/11/2003 | 10:12:57 | 2250.8 | 37.51333 | 58.5 | 11.861 | 0.006 | 36.685 | 0.004 |
| 5/11/2003 | 10:15:11 | 2384.4 | 39.74 | 58.5 | 11.859 | 0.004 | 38.912 | 0.003 |
| 5/11/2003 | 10:17:32 | 2525.9 | 42.09833 | 58.5 | 11.857 | 0.002 | 41.270 | 0.001 |
| 5/11/2003 | 10:20:02 | 2675.8 | 44.59667 | 58.5 | 11.854 | -0.001 | 43.768 | -0.001 |
| 5/11/2003 | 10:22:41 | 2834.6 | 47.24333 | 58.5 | 11.855 | 0 | 46.415 | 0.000 |
| 5/11/2003 | 10:25:29 | 3002.8 | 50.04667 | 58.5 | 11.852 | -0.003 | 49.218 | -0.002 |
| 5/11/2003 | 10:28:27 | 3180.9 | 53.015 | 58.5 | 11.855 | 0 | 52.187 | 0.000 |

TETRA-TECH NUS

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane IN | **Well/Boring No.:** | 16MWT05 |
| **Project No.:** | 9060 CTO 0279 | **Aquifer Type:** | confined |
| **Test Type:** | Rising head | **Test Date:** | 9-May-03 |

**Done By:** Fred W. Ramser
**Checked By:** RMB 6/23/03

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 1 = R |
| Length of Well Screen (ft.) : | 10 = L |
| Time for 37% head change (min.) : | 4.10 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 4.05E-04 | ft./min. |
| 6.76E-06 | ft./sec. |
| 5.84E-01 | ft./day |
| 2.06E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

ADJUSTED SLUG TEST DATA ATTACHED

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: CRANE WELL/BORING NO.: 16MW105

PROJECT NO.: 9060 CTO 0279 GEOLOGIST: BOB BALKOVEC

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' / 41.85' TEST NO.:

STATIC WATER LEVEL (Depth/Elevation): 29.30' DATE: 5/4/03

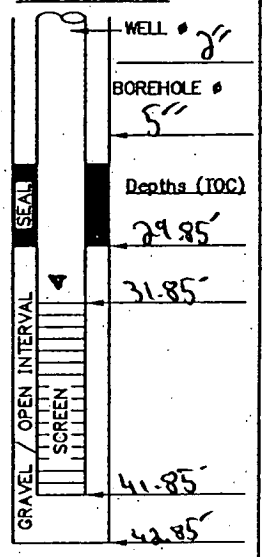
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: 1.5" x 34" SOLID SLUG PAGE ..... OF .....

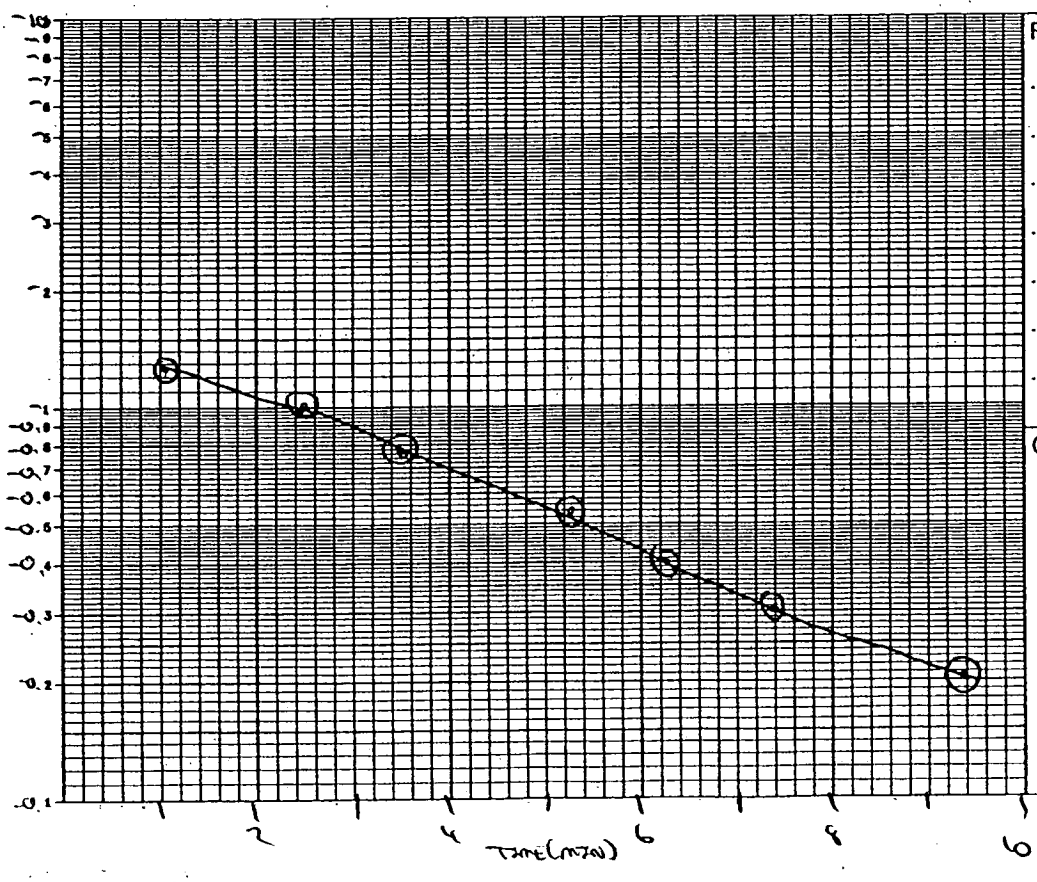
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TRANSDUCER 30 PSI

| ELAPSED TIME (min.) or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 11.863 | 0 | 1.16 | 10.463 | -1.4 |
| 0.02 | 8.765 | -3.098 | 1.655 | 10.623 | -1.24 |
| 0.03 | 10.19 | -1.673 | 2.48 | 10.854 | -1.009 |
| 0.04 | 10.12 | -1.743 | 3.515 | 11.076 | -0.787 |
| 0.05 | 10.03 | -1.833 | 5.27 | 11.344 | -0.519 |
| 0.06 | 9.975 | -1.888 | 6.26 | 11.453 | -0.41 |
| 0.07 | 9.958 | -1.905 | 7.45 | 11.551 | -0.312 |
| 0.1 | 9.965 | -1.898 | 9.39 | 11.658 | -0.205 |
| 0.21 | 10.045 | -1.818 | 13.28 | 11.763 | -0.1 |
| 0.42 | 10.157 | -1.706 | | | |
| 0.621 | 10.254 | -1.609 | | | |
| 0.876 | 10.348 | -1.515 | | | |

WELL SCHEMATIC



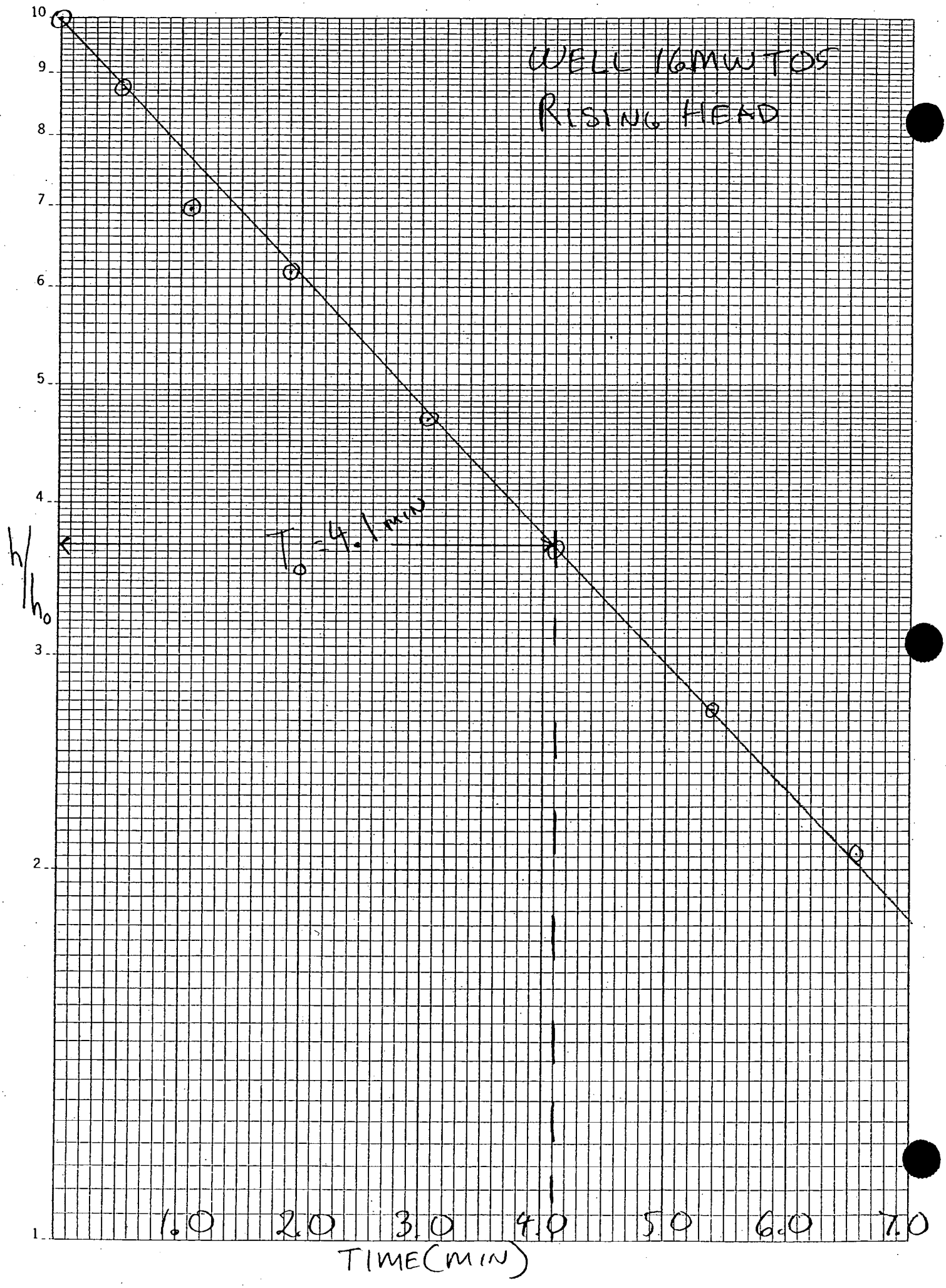

▽ Indicate SWL Depth on Drawing




REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generate 5/11/2003 13:27:01
Report from file: ...\SN09015 2003-05-11 103052 16MWT05 Rising.bin
Win-Situ Versior 4.41

Serial number: 9015
Firmware Versio 3.04
Unit name: MW-14FW

Test name: 16MWT05 Rising

Test defined on: 5/11/2003 10:30:37
Test started on: 5/11/2003 10:30:52
Test stopped on N/A N/A
Test extracted o N/A N/A

Data gathered using Logarithmic testing
Maximum time Seconds.
Number of dat 126

TOTAL DATA S 126

Channel number [1]
Measurement t Temperature
Channel name: OnBoard Temp

Channel number [2]
Measurement t Pressure
Channel name:
Sensor Range: 30 PSIG.
Specific gravity 1

| Date | Time | ET (sec) | ET (min) | Chan[1] Fahrenheit | Chan[2] Feet H2O | Displacement Feet | adjusted time | h/ho | ho= -1.515 |
|---|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 10:30:52 | 0 | 0 | 58.5 | 11.863 | 0 | | | |
| 5/11/2003 | 10:30:53 | 0.3 | 0.005 | 58.54 | 11.863 | 0 | | | |
| 5/11/2003 | 10:30:53 | 0.6 | 0.01 | 58.54 | 11.863 | 0 | | | |
| 5/11/2003 | 10:30:53 | 0.9 | 0.015 | 58.56 | 11.728 | -0.135 | | | |
| 5/11/2003 | 10:30:54 | 1.2 | 0.02 | 58.56 | 8.765 | -3.098 | | | |
| 5/11/2003 | 10:30:54 | 1.5 | 0.025 | 58.56 | 9.583 | -2.28 | | | |
| 5/11/2003 | 10:30:54 | 1.8 | 0.03 | 58.56 | 10.19 | -1.673 | | | |
| 5/11/2003 | 10:30:54 | 2.1 | 0.035 | 58.56 | 9.511 | -2.352 | | | |
| 5/11/2003 | 10:30:55 | 2.4 | 0.04 | 58.59 | 10.12 | -1.743 | | | |
| 5/11/2003 | 10:30:55 | 2.7 | 0.045 | 58.59 | 9.716 | -2.147 | | | |
| 5/11/2003 | 10:30:55 | 3 | 0.05 | 58.59 | 10.03 | -1.833 | | | |
| 5/11/2003 | 10:30:56 | 3.3 | 0.055 | 58.59 | 9.835 | -2.028 | | | |
| 5/11/2003 | 10:30:56 | 3.6 | 0.06 | 58.59 | 9.975 | -1.888 | | | |
| 5/11/2003 | 10:30:56 | 3.9 | 0.065 | 58.59 | 9.895 | -1.968 | | | |
| 5/11/2003 | 10:30:57 | 4.2 | 0.07 | 58.59 | 9.958 | -1.905 | | | |
| 5/11/2003 | 10:30:57 | 4.5 | 0.075 | 58.59 | 9.926 | -1.937 | | | |
| 5/11/2003 | 10:30:57 | 4.8 | 0.08 | 58.59 | 9.956 | -1.907 | | | |
| 5/11/2003 | 10:30:57 | 5.1 | 0.085 | 58.61 | 9.95 | -1.913 | | | |
| 5/11/2003 | 10:30:58 | 5.4 | 0.09 | 58.61 | 9.961 | -1.902 | | | |
| 5/11/2003 | 10:30:58 | 5.7 | 0.095 | 58.61 | 9.965 | -1.898 | | | |
| 5/11/2003 | 10:30:58 | 6 | 0.1 | 58.61 | 9.965 | -1.898 | | | |
| 5/11/2003 | 10:30:59 | 6.4 | 0.106667 | 58.61 | 9.973 | -1.89 | | | |
| 5/11/2003 | 10:30:59 | 6.7 | 0.111667 | 58.61 | 9.979 | -1.884 | | | |
| 5/11/2003 | 10:30:59 | 7.1 | 0.118333 | 58.61 | 9.981 | -1.882 | | | |
| 5/11/2003 | 10:31:00 | 7.5 | 0.125 | 58.61 | 9.991 | -1.872 | | | |
| 5/11/2003 | 10:31:00 | 8 | 0.133333 | 58.61 | 9.995 | -1.868 | | | |
| 5/11/2003 | 10:31:01 | 8.4 | 0.14 | 58.61 | 10 | -1.863 | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 10:31:01 | 8.9 | 0.148333 | 58.61 | 10.004 | -1.859 | | |
| 5/11/2003 | 10:31:02 | 9.5 | 0.158333 | 58.61 | 10.014 | -1.849 | | |
| 5/11/2003 | 10:31:02 | 10 | 0.166667 | 58.59 | 10.014 | -1.849 | | |
| 5/11/2003 | 10:31:03 | 10.6 | 0.176667 | 58.59 | 10.02 | -1.843 | | |
| 5/11/2003 | 10:31:04 | 11.3 | 0.188333 | 58.59 | 10.024 | -1.839 | | |
| 5/11/2003 | 10:31:04 | 11.9 | 0.198333 | 58.59 | 10.034 | -1.829 | | |
| 5/11/2003 | 10:31:05 | 12.6 | 0.21 | 58.59 | 10.045 | -1.818 | | |
| 5/11/2003 | 10:31:06 | 13.4 | 0.223333 | 58.59 | 10.049 | -1.814 | | |
| 5/11/2003 | 10:31:07 | 14.2 | 0.236667 | 58.59 | 10.059 | -1.804 | | |
| 5/11/2003 | 10:31:07 | 15 | 0.25 | 58.59 | 10.065 | -1.798 | | |
| 5/11/2003 | 10:31:08 | 15.9 | 0.265 | 58.56 | 10.075 | -1.788 | | |
| 5/11/2003 | 10:31:09 | 16.8 | 0.28 | 58.56 | 10.083 | -1.78 | | |
| 5/11/2003 | 10:31:10 | 17.8 | 0.296667 | 58.56 | 10.093 | -1.77 | | |
| 5/11/2003 | 10:31:11 | 18.9 | 0.315 | 58.56 | 10.102 | -1.761 | | |
| 5/11/2003 | 10:31:12 | 20 | 0.333333 | 58.56 | 10.114 | -1.749 | | |
| 5/11/2003 | 10:31:14 | 21.2 | 0.353333 | 58.56 | 10.124 | -1.739 | | |
| 5/11/2003 | 10:31:15 | 22.4 | 0.373333 | 58.56 | 10.133 | -1.73 | | |
| 5/11/2003 | 10:31:16 | 23.8 | 0.396667 | 58.56 | 10.145 | -1.718 | | |
| 5/11/2003 | 10:31:18 | 25.2 | 0.42 | 58.56 | 10.157 | -1.706 | | |
| 5/11/2003 | 10:31:19 | 26.7 | 0.445 | 58.56 | 10.169 | -1.694 | | |
| 5/11/2003 | 10:31:21 | 28.2 | 0.47 | 58.56 | 10.182 | -1.681 | | |
| 5/11/2003 | 10:31:22 | 29.8 | 0.496667 | 58.56 | 10.196 | -1.667 | | |
| 5/11/2003 | 10:31:24 | 31.5 | 0.525 | 58.56 | 10.21 | -1.653 | | |
| 5/11/2003 | 10:31:26 | 33.3 | 0.555 | 58.56 | 10.227 | -1.636 | | |
| 5/11/2003 | 10:31:28 | 35.2 | 0.586667 | 58.56 | 10.241 | -1.622 | | |
| 5/11/2003 | 10:31:30 | 37.3 | 0.621667 | 58.56 | 10.254 | -1.609 | | |
| 5/11/2003 | 10:31:32 | 39.5 | 0.658333 | 58.56 | 10.278 | -1.585 | | |
| 5/11/2003 | 10:31:34 | 41.8 | 0.696667 | 58.56 | 10.297 | -1.566 | | |
| 5/11/2003 | 10:31:37 | 44.3 | 0.738333 | 58.54 | 10.305 | -1.558 | Plotted shaded values. | |
| 5/11/2003 | 10:31:39 | 46.9 | 0.781667 | 58.54 | 10.309 | -1.554 | | |
| 5/11/2003 | 10:31:42 | 49.7 | 0.828333 | 58.54 | 10.329 | -1.534 | adjusted time | h/ho |
| 5/11/2003 | 10:31:45 | 52.6 | 0.876667 | 58.54 | 10.348 | -1.515 | 0.000 | 1.000 |
| 5/11/2003 | 10:31:48 | 55.7 | 0.928333 | 58.54 | 10.368 | -1.495 | 0.052 | 0.987 |
| 5/11/2003 | 10:31:51 | 59 | 0.983333 | 58.54 | 10.391 | -1.472 | 0.107 | 0.972 |
| 5/11/2003 | 10:31:55 | 62.5 | 1.041667 | 58.54 | 10.417 | -1.446 | 0.165 | 0.954 |
| 5/11/2003 | 10:31:59 | 66.2 | 1.103333 | 58.54 | 10.438 | -1.425 | 0.227 | 0.941 |
| 5/11/2003 | 10:32:02 | 70.1 | 1.168333 | 58.54 | 10.463 | -1.4 | 0.292 | 0.924 |
| 5/11/2003 | 10:32:07 | 74.3 | 1.238333 | 58.54 | 10.489 | -1.374 | 0.362 | 0.907 |
| 5/11/2003 | 10:32:11 | 78.7 | 1.311667 | 58.54 | 10.512 | -1.351 | 0.435 | 0.892 |
| 5/11/2003 | 10:32:16 | 83.4 | 1.39 | 58.54 | 10.54 | -1.323 | 0.513 | 0.873 |
| 5/11/2003 | 10:32:21 | 88.4 | 1.473333 | 58.54 | 10.569 | -1.294 | 0.597 | 0.854 |
| 5/11/2003 | 10:32:26 | 93.7 | 1.561667 | 58.54 | 10.596 | -1.267 | 0.685 | 0.836 |
| 5/11/2003 | 10:32:32 | 99.3 | 1.655 | 58.54 | 10.623 | -1.24 | 0.778 | 0.818 |
| 5/11/2003 | 10:32:38 | 105.2 | 1.753333 | 58.52 | 10.655 | -1.208 | 0.877 | 0.797 |
| 5/11/2003 | 10:32:44 | 111.5 | 1.858333 | 58.52 | 10.795 | -1.068 | 0.982 | 0.705 |
| 5/11/2003 | 10:32:50 | 118.1 | 1.968333 | 58.54 | 10.807 | -1.056 | 1.092 | 0.697 |
| 5/11/2003 | 10:32:57 | 125.1 | 2.085 | 58.56 | 10.811 | -1.052 | 1.208 | 0.694 |
| 5/11/2003 | 10:33:05 | 132.6 | 2.21 | 58.56 | 10.813 | -1.05 | 1.333 | 0.693 |
| 5/11/2003 | 10:33:13 | 140.5 | 2.341667 | 58.52 | 10.819 | -1.044 | 1.465 | 0.689 |
| 5/11/2003 | 10:33:21 | 148.9 | 2.481667 | 58.52 | 10.854 | -1.009 | 1.605 | 0.666 |
| 5/11/2003 | 10:33:30 | 157.8 | 2.63 | 58.52 | 10.891 | -0.972 | 1.753 | 0.642 |
| 5/11/2003 | 10:33:40 | 167.2 | 2.786667 | 58.52 | 10.928 | -0.935 | 1.910 | 0.617 |
| 5/11/2003 | 10:33:50 | 177.2 | 2.953333 | 58.52 | 10.963 | -0.9 | 2.077 | 0.594 |
| 5/11/2003 | 10:34:00 | 187.8 | 3.13 | 58.52 | 11 | -0.863 | 2.253 | 0.570 |
| 5/11/2003 | 10:34:11 | 199 | 3.316667 | 58.52 | 11.039 | -0.824 | 2.440 | 0.544 |
| 5/11/2003 | 10:34:23 | 210.9 | 3.515 | 58.52 | 11.076 | -0.787 | 2.638 | 0.519 |
| 5/11/2003 | 10:34:36 | 223.5 | 3.725 | 58.52 | 11.115 | -0.748 | 2.848 | 0.494 |
| 5/11/2003 | 10:34:49 | 236.8 | 3.946667 | 58.52 | 11.153 | -0.71 | 3.070 | 0.469 |
| 5/11/2003 | 10:35:03 | 250.9 | 4.181667 | 58.52 | 11.192 | -0.671 | 3.305 | 0.443 |
| 5/11/2003 | 10:35:18 | 265.8 | 4.43 | 58.52 | 11.231 | -0.632 | 3.553 | 0.417 |
| 5/11/2003 | 10:35:34 | 281.6 | 4.693333 | 58.52 | 11.27 | -0.593 | 3.817 | 0.391 |
| 5/11/2003 | 10:35:51 | 298.4 | 4.973333 | 58.52 | 11.309 | -0.554 | 4.097 | 0.366 |
| 5/11/2003 | 10:36:09 | 316.2 | 5.27 | 58.52 | 11.344 | -0.519 | 4.393 | 0.343 |
| 5/11/2003 | 10:36:27 | 335 | 5.583333 | 58.52 | 11.381 | -0.482 | 4.707 | 0.318 |
| 5/11/2003 | 10:36:47 | 354.9 | 5.915 | 58.52 | 11.418 | -0.445 | 5.038 | 0.294 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5/11/2003 | 10:37:08 | 376 | 6.266667 | 58.52 | 11.453 | -0.41 | 5.390 | 0.271 |
| 5/11/2003 | 10:37:31 | 398.4 | 6.64 | 58.52 | 11.488 | -0.375 | 5.763 | 0.248 |
| 5/11/2003 | 10:37:54 | 422.1 | 7.035 | 58.5 | 11.52 | -0.343 | 6.158 | 0.226 |
| 5/11/2003 | 10:38:20 | 447.2 | 7.453333 | 58.5 | 11.551 | -0.312 | 6.577 | 0.206 |
| 5/11/2003 | 10:38:46 | 473.8 | 7.896667 | 58.5 | 11.58 | -0.283 | 7.020 | 0.187 |
| 5/11/2003 | 10:39:14 | 502 | 8.366667 | 58.5 | 11.607 | -0.256 | 7.490 | 0.169 |
| 5/11/2003 | 10:39:44 | 531.9 | 8.865 | 58.5 | 11.635 | -0.228 | 7.988 | 0.150 |
| 5/11/2003 | 10:40:16 | 563.5 | 9.391667 | 58.5 | 11.658 | -0.205 | 8.515 | 0.135 |
| 5/11/2003 | 10:40:49 | 597 | 9.95 | 58.5 | 11.682 | -0.181 | 9.073 | 0.119 |
| 5/11/2003 | 10:41:25 | 632.5 | 10.54167 | 58.5 | 11.701 | -0.162 | 9.665 | 0.107 |
| 5/11/2003 | 10:42:02 | 670.1 | 11.16833 | 58.5 | 11.721 | -0.142 | 10.292 | 0.094 |
| 5/11/2003 | 10:42:42 | 709.9 | 11.83167 | 58.5 | 11.738 | -0.125 | 10.955 | 0.083 |
| 5/11/2003 | 10:43:24 | 752.1 | 12.535 | 58.5 | 11.752 | -0.111 | 11.658 | 0.073 |
| 5/11/2003 | 10:44:09 | 796.8 | 13.28 | 58.5 | 11.763 | -0.1 | 12.403 | 0.066 |
| 5/11/2003 | 10:44:57 | 844.2 | 14.07 | 58.5 | 11.775 | -0.088 | 13.193 | 0.058 |
| 5/11/2003 | 10:45:47 | 894.4 | 14.90667 | 58.5 | 11.785 | -0.078 | 14.030 | 0.051 |
| 5/11/2003 | 10:46:40 | 947.5 | 15.79167 | 58.5 | 11.795 | -0.068 | 14.915 | 0.045 |
| 5/11/2003 | 10:47:36 | 1003.8 | 16.73 | 58.5 | 11.801 | -0.062 | 15.853 | 0.041 |
| 5/11/2003 | 10:48:36 | 1063.4 | 17.72333 | 58.5 | 11.808 | -0.055 | 16.847 | 0.036 |
| 5/11/2003 | 10:49:39 | 1126.6 | 18.77667 | 58.5 | 11.812 | -0.051 | 17.900 | 0.034 |
| 5/11/2003 | 10:50:46 | 1193.5 | 19.89167 | 58.5 | 11.816 | -0.047 | 19.015 | 0.031 |
| 5/11/2003 | 10:51:57 | 1264.4 | 21.07333 | 58.5 | 11.818 | -0.045 | 20.197 | 0.030 |
| 5/11/2003 | 10:53:12 | 1339.5 | 22.325 | 58.5 | 11.822 | -0.041 | 21.448 | 0.027 |
| 5/11/2003 | 10:54:31 | 1419 | 23.65 | 58.5 | 11.824 | -0.039 | 22.773 | 0.026 |
| 5/11/2003 | 10:55:56 | 1503.3 | 25.055 | 58.5 | 11.824 | -0.039 | 24.178 | 0.026 |
| 5/11/2003 | 10:57:25 | 1592.6 | 26.54333 | 58.5 | 11.826 | -0.037 | 25.667 | 0.024 |
| 5/11/2003 | 10:58:59 | 1687.1 | 28.11833 | 58.5 | 11.824 | -0.039 | 27.242 | 0.026 |
| 5/11/2003 | 11:00:40 | 1787.2 | 29.78667 | 58.5 | 11.826 | -0.037 | 28.910 | 0.024 |
| 5/11/2003 | 11:02:26 | 1893.3 | 31.555 | 58.5 | 11.828 | -0.035 | 30.678 | 0.023 |
| 5/11/2003 | 11:04:18 | 2005.7 | 33.42833 | 58.5 | 11.826 | -0.037 | 32.552 | 0.024 |
| 5/11/2003 | 11:06:17 | 2124.7 | 35.41167 | 58.5 | 11.826 | -0.037 | 34.535 | 0.024 |
| 5/11/2003 | 11:08:23 | 2250.8 | 37.51333 | 58.5 | 11.826 | -0.037 | 36.637 | 0.024 |
| 5/11/2003 | 11:10:37 | 2384.4 | 39.74 | 58.5 | 11.826 | -0.037 | 38.863 | 0.024 |
| 5/11/2003 | 11:12:58 | 2525.9 | 42.09833 | 58.5 | 11.826 | -0.037 | 41.222 | 0.024 |

APPENDIX E.4
SWMU 16
AQUIFER CHARACTERISTICS, CALCULATIONS, AND RECORDS
ROUND 2

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 16MWT09 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Falling head | **Test Date:** | 23-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 4.25 | = R |
| Length of Well Screen (ft.) : | 12 | = L |
| Time for 37% head change (min.) : | 5.50 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.85E-04 | ft./min. |
| 3.09E-06 | ft./sec. |
| 2.67E-01 | ft./day |
| 9.42E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 16MWT09

PROJECT NO.: 9060 GEOLOGIST: M. G. COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 13.28' DATE: 11-23-03

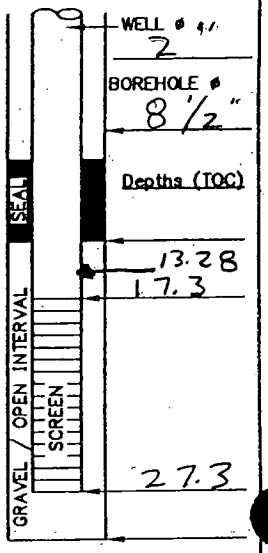
TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: SOLID SLUG PAGE 1 OF 1

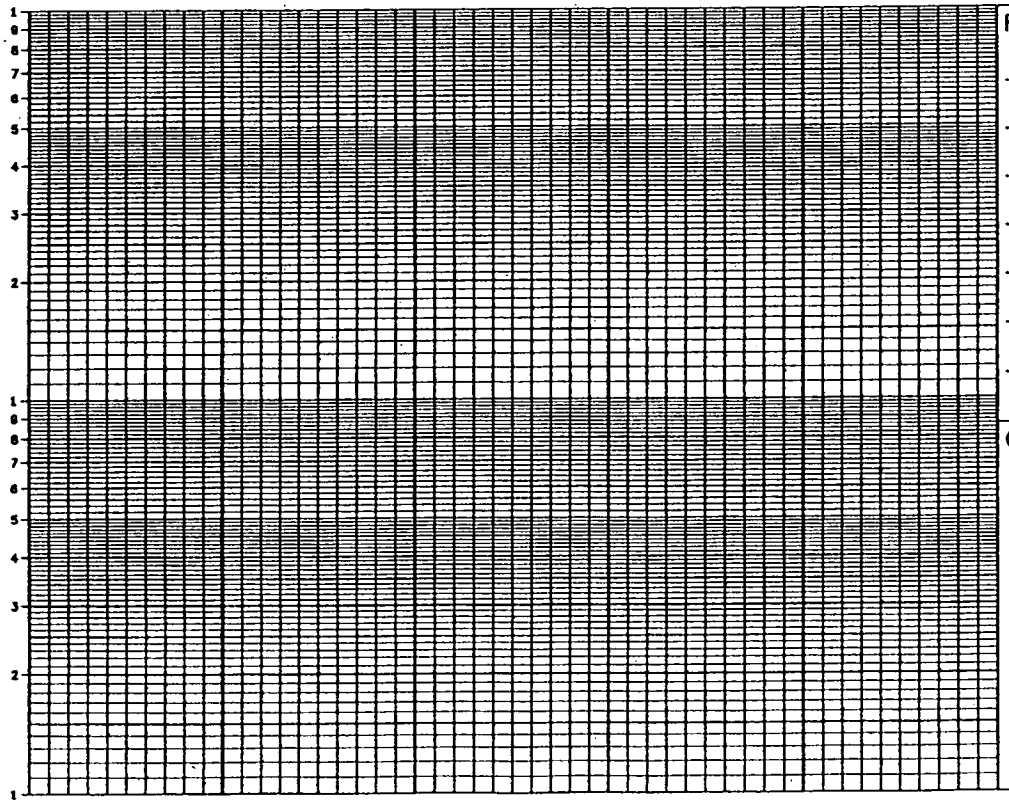
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC, ZERO AT SWL + START

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 0 | | 3.0 | 1.263 | |
| .1 | 2.33 | | 4.0 | 1.060 | |
| .2 | 2.184 | | 5.0 | .894 | |
| .3 | 2.142 | | 6.0 | .762 | |
| .4 | 2.089 | | 8.0 | .558 | |
| .5 | 2.043 | | 10.0 | .419 | |
| .6 | 1.999 | | 12.0 | .322 | |
| .7 | 1.956 | | 15.0 | .223 | |
| .8 | 1.914 | | 18.0 | .159 | |
| .9 | 1.876 | | 20. | .125 | |
| 1.0 | 1.873 | | | | |
| 2.0 | 1.513 | | | | |

WELL SCHEMATIC



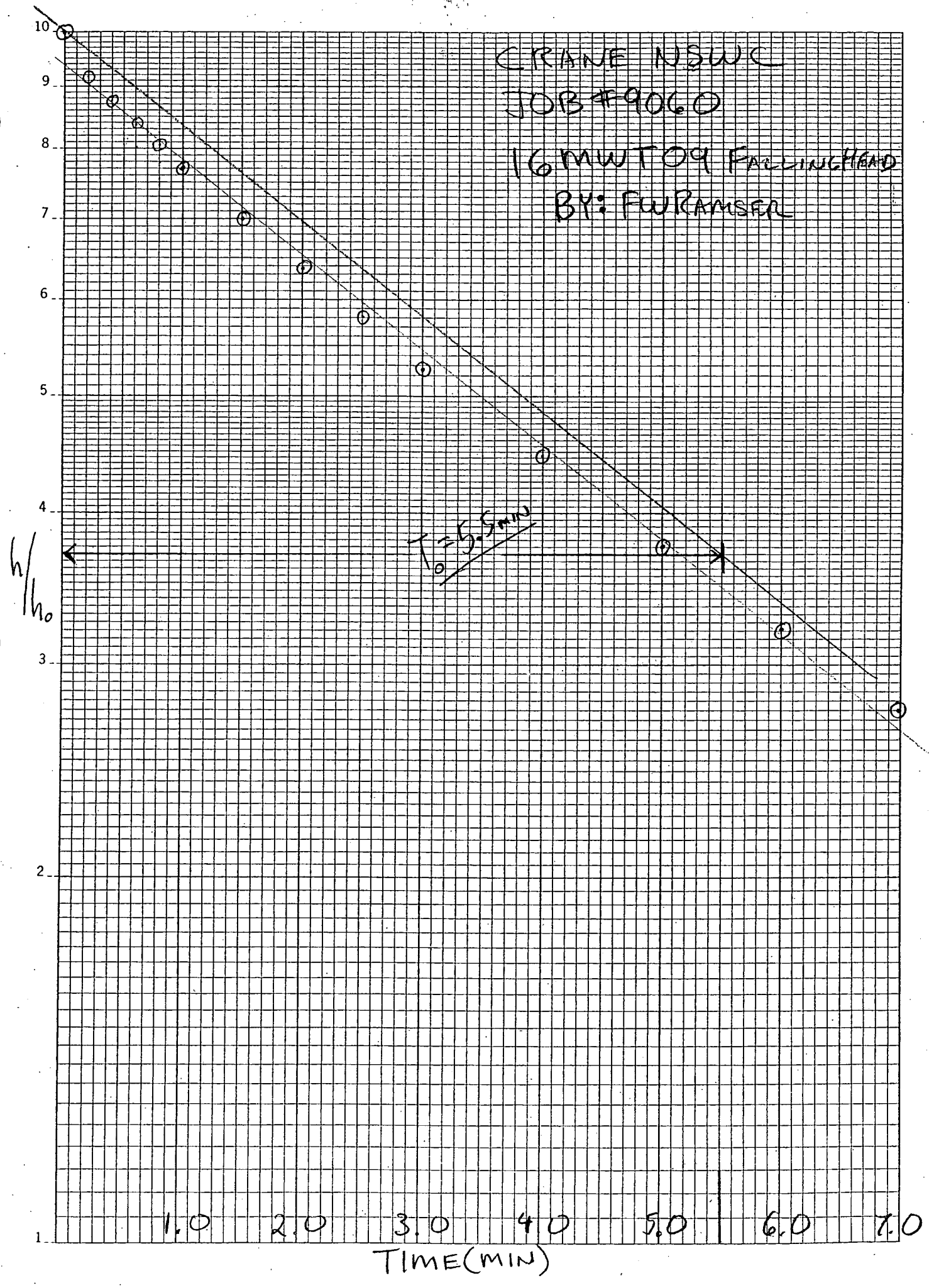

▽ Indicate SWL Depth on Drawing



REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL


CRANE NSWC
JOB #9060
16MWT09 FALLINGHEAD
BY: FWRAMSER
h/h0
10
9
8
7
6
5
4
3
2
1
1.0
2.0
3.0
4.0
5.0
6.0
7.0
TIME(MIN)
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 12/9/2003 16:23:20
Report from file: H:\Crane IN\SWMU13_16\MGC slug tests 03\site 16\SN06899 2003-11-23 094607 16MWT09falling#1.bin
DataMgr Version 3.68

Serial number: 6899
Firmware Version 3.07
Unit name:

Test name: 16MWT09falling#1

Test defined on: 11/23/2003 9:45:24
Test started on: 11/23/2003 9:46:07
Test stopped on: 11/23/2003 10:06:55
Test extracted on: N/A

Data gathered using Linear testing
Time between da Minutes.
Number of data s 209

TOTAL DATA SAM 209

Channel number [2]
Measurement typ Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined refer 0 Feet H2O
Referenced on: test start
Pressure head at 14.226 Feet H2O

ho = 2.333

| Date | Time | ET (min) | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho |
|---|---|---|---|---|---|
| 11/23/2003 | 9:46 | 0 | 0 | | |
| 11/23/2003 | 9:46 | 0.1 | 2.333 | 0 | 1.000 |
| 11/23/2003 | 9:46 | 0.2 | 2.184 | 0.1 | 0.936 |
| 11/23/2003 | 9:46 | 0.3 | 2.142 | 0.2 | 0.918 |
| 11/23/2003 | 9:46 | 0.4 | 2.089 | 0.3 | 0.895 |
| 11/23/2003 | 9:46 | 0.5 | 2.043 | 0.4 | 0.876 |
| 11/23/2003 | 9:46 | 0.6 | 1.999 | 0.5 | 0.857 |
| 11/23/2003 | 9:46 | 0.7 | 1.956 | 0.6 | 0.838 |
| 11/23/2003 | 9:46 | 0.8 | 1.914 | 0.7 | 0.820 |
| 11/23/2003 | 9:47 | 0.9 | 1.876 | 0.8 | 0.804 |
| 11/23/2003 | 9:47 | 1 | 1.837 | 0.9 | 0.787 |
| 11/23/2003 | 9:47 | 1.1 | 1.797 | 1 | 0.770 |
| 11/23/2003 | 9:47 | 1.2 | 1.765 | 1.1 | 0.757 |
| 11/23/2003 | 9:47 | 1.3 | 1.731 | 1.2 | 0.742 |
| 11/23/2003 | 9:47 | 1.4 | 1.696 | 1.3 | 0.727 |
| 11/23/2003 | 9:47 | 1.5 | 1.66 | 1.4 | 0.712 |
| 11/23/2003 | 9:47 | 1.6 | 1.634 | 1.5 | 0.700 |
| 11/23/2003 | 9:47 | 1.7 | 1.602 | 1.6 | 0.687 |
| 11/23/2003 | 9:47 | 1.8 | 1.572 | 1.7 | 0.674 |
| 11/23/2003 | 9:48 | 1.9 | 1.543 | 1.8 | 0.661 |
| 11/23/2003 | 9:48 | 2 | 1.513 | 1.9 | 0.649 |
| 11/23/2003 | 9:48 | 2.1 | 1.489 | 2 | 0.638 |
| 11/23/2003 | 9:48 | 2.2 | 1.461 | 2.1 | 0.626 |

| | | | | |
|---|---|---|---|---|
| 11/23/2003 9:48 | 2.3 | 1.435 | 2.2 | 0.615 |
| 11/23/2003 9:48 | 2.4 | 1.408 | 2.3 | 0.604 |
| 11/23/2003 9:48 | 2.5 | 1.382 | 2.4 | 0.592 |
| 11/23/2003 9:48 | 2.6 | 1.356 | 2.5 | 0.581 |
| 11/23/2003 9:48 | 2.7 | 1.332 | 2.6 | 0.571 |
| 11/23/2003 9:48 | 2.8 | 1.307 | 2.7 | 0.560 |
| 11/23/2003 9:49 | 2.9 | 1.283 | 2.8 | 0.550 |
| 11/23/2003 9:49 | 3 | 1.263 | 2.9 | 0.541 |
| 11/23/2003 9:49 | 3.1 | 1.225 | 3 | 0.525 |
| 11/23/2003 9:49 | 3.2 | 1.223 | 3.1 | 0.524 |
| 11/23/2003 9:49 | 3.3 | 1.199 | 3.2 | 0.514 |
| 11/23/2003 9:49 | 3.4 | 1.176 | 3.3 | 0.504 |
| 11/23/2003 9:49 | 3.5 | 1.156 | 3.4 | 0.495 |
| 11/23/2003 9:49 | 3.6 | 1.136 | 3.5 | 0.487 |
| 11/23/2003 9:49 | 3.7 | 1.116 | 3.6 | 0.478 |
| 11/23/2003 9:49 | 3.8 | 1.098 | 3.7 | 0.471 |
| 11/23/2003 9:50 | 3.9 | 1.08 | 3.8 | 0.463 |
| 11/23/2003 9:50 | 4 | 1.06 | 3.9 | 0.454 |
| 11/23/2003 9:50 | 4.1 | 1.041 | 4 | 0.446 |
| 11/23/2003 9:50 | 4.2 | 1.023 | 4.1 | 0.438 |
| 11/23/2003 9:50 | 4.3 | 1.009 | 4.2 | 0.432 |
| 11/23/2003 9:50 | 4.4 | 0.989 | 4.3 | 0.424 |
| 11/23/2003 9:50 | 4.5 | 0.973 | 4.4 | 0.417 |
| 11/23/2003 9:50 | 4.6 | 0.961 | 4.5 | 0.412 |
| 11/23/2003 9:50 | 4.7 | 0.941 | 4.6 | 0.403 |
| 11/23/2003 9:50 | 4.8 | 0.927 | 4.7 | 0.397 |
| 11/23/2003 9:51 | 4.9 | 0.91 | 4.8 | 0.390 |
| 11/23/2003 9:51 | 5 | 0.894 | 4.9 | 0.383 |
| 11/23/2003 9:51 | 5.1 | 0.876 | 5 | 0.375 |
| 11/23/2003 9:51 | 5.2 | 0.86 | 5.1 | 0.369 |
| 11/23/2003 9:51 | 5.3 | 0.848 | 5.2 | 0.363 |
| 11/23/2003 9:51 | 5.4 | 0.836 | 5.3 | 0.358 |
| 11/23/2003 9:51 | 5.5 | 0.824 | 5.4 | 0.353 |
| 11/23/2003 9:51 | 5.6 | 0.812 | 5.5 | 0.348 |
| 11/23/2003 9:51 | 5.7 | 0.8 | 5.6 | 0.343 |
| 11/23/2003 9:51 | 5.8 | 0.786 | 5.7 | 0.337 |
| 11/23/2003 9:52 | 5.9 | 0.776 | 5.8 | 0.333 |
| 11/23/2003 9:52 | 6 | 0.762 | 5.9 | 0.327 |
| 11/23/2003 9:52 | 6.1 | 0.75 | 6 | 0.321 |
| 11/23/2003 9:52 | 6.2 | 0.737 | 6.1 | 0.316 |
| 11/23/2003 9:52 | 6.3 | 0.725 | 6.2 | 0.311 |
| 11/23/2003 9:52 | 6.4 | 0.715 | 6.3 | 0.306 |
| 11/23/2003 9:52 | 6.5 | 0.703 | 6.4 | 0.301 |
| 11/23/2003 9:52 | 6.6 | 0.693 | 6.5 | 0.297 |
| 11/23/2003 9:52 | 6.7 | 0.683 | 6.6 | 0.293 |
| 11/23/2003 9:52 | 6.8 | 0.673 | 6.7 | 0.288 |
| 11/23/2003 9:53 | 6.9 | 0.663 | 6.8 | 0.284 |
| 11/23/2003 9:53 | 7 | 0.651 | 6.9 | 0.279 |
| 11/23/2003 9:53 | 7.1 | 0.641 | 7 | 0.275 |
| 11/23/2003 9:53 | 7.2 | 0.629 | 7.1 | 0.270 |
| 11/23/2003 9:53 | 7.3 | 0.619 | 7.2 | 0.265 |
| 11/23/2003 9:53 | 7.4 | 0.617 | 7.3 | 0.264 |
| 11/23/2003 9:53 | 7.5 | 0.602 | 7.4 | 0.258 |
| 11/23/2003 9:53 | 7.6 | 0.592 | 7.5 | 0.254 |
| 11/23/2003 9:53 | 7.7 | 0.58 | 7.6 | 0.249 |
| 11/23/2003 9:53 | 7.8 | 0.574 | 7.7 | 0.246 |
| 11/23/2003 9:54 | 7.9 | 0.564 | 7.8 | 0.242 |
| 11/23/2003 9:54 | 8 | 0.558 | 7.9 | 0.239 |
| 11/23/2003 9:54 | 8.1 | 0.552 | 8 | 0.237 |
| 11/23/2003 9:54 | 8.2 | 0.54 | 8.1 | 0.231 |
| 11/23/2003 9:54 | 8.3 | 0.534 | 8.2 | 0.229 |
| 11/23/2003 9:54 | 8.4 | 0.526 | 8.3 | 0.225 |

| | | | | |
|---|---|---|---|---|
| 11/23/2003 9:54 | 8.5 | 0.52 | 8.4 | 0.223 |
| 11/23/2003 9:54 | 8.6 | 0.512 | 8.5 | 0.219 |
| 11/23/2003 9:54 | 8.7 | 0.502 | 8.6 | 0.215 |
| 11/23/2003 9:54 | 8.8 | 0.5 | 8.7 | 0.214 |
| 11/23/2003 9:55 | 8.9 | 0.492 | 8.8 | 0.211 |
| 11/23/2003 9:55 | 9 | 0.482 | 8.9 | 0.207 |
| 11/23/2003 9:55 | 9.1 | 0.478 | 9 | 0.205 |
| 11/23/2003 9:55 | 9.2 | 0.459 | 9.1 | 0.197 |
| 11/23/2003 9:55 | 9.3 | 0.459 | 9.2 | 0.197 |
| 11/23/2003 9:55 | 9.4 | 0.453 | 9.3 | 0.194 |
| 11/23/2003 9:55 | 9.5 | 0.453 | 9.4 | 0.194 |
| 11/23/2003 9:55 | 9.6 | 0.445 | 9.5 | 0.191 |
| 11/23/2003 9:55 | 9.7 | 0.437 | 9.6 | 0.187 |
| 11/23/2003 9:55 | 9.8 | 0.431 | 9.7 | 0.185 |
| 11/23/2003 9:56 | 9.9 | 0.427 | 9.8 | 0.183 |
| 11/23/2003 9:56 | 10 | 0.419 | 9.9 | 0.180 |
| 11/23/2003 9:56 | 10.1 | 0.413 | 10 | 0.177 |
| 11/23/2003 9:57 | 11.1 | 0.361 | 11 | 0.155 |
| 11/23/2003 9:58 | 12.1 | 0.316 | 12 | 0.135 |
| 11/23/2003 9:59 | 13.1 | 0.276 | 13 | 0.118 |
| 11/23/2003 10:00 | 14.1 | 0.266 | 14 | 0.114 |
| 11/23/2003 10:01 | 15.1 | 0.219 | 15 | 0.094 |
| 11/23/2003 10:02 | 16.1 | 0.197 | 16 | 0.084 |
| 11/23/2003 10:03 | 17.1 | 0.177 | 17 | 0.076 |
| 11/23/2003 10:04 | 18.1 | 0.159 | 18 | 0.068 |
| 11/23/2003 10:05 | 19.1 | 0.143 | 19 | 0.061 |
| 11/23/2003 10:06 | 20.1 | 0.129 | 20 | 0.055 |

TETRA-TECH NUS

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 16MWT09 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Falling head | **Test Date:** | 23-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .354' | 4.25 = R |
| Length of Well Screen (ft.) : | | 12 = L |
| Time for 37% head change (min.) : | | 5.50 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.85E-04 | ft./min. |
| 3.09E-06 | ft./sec. |
| 2.67E-01 | ft./day |
| 9.42E-05 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(12/.354)}{2 \times 12 \times 5.50} =$$

$1.84 \times 10^{-4}$ Ft/min

CHECKED

MA

2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 16MWT09 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 23-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 4.25 = R |
| Length of Well Screen (ft.) : | 12 = L |
| Time for 37% head change (min.) : | 3.55 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 2.87E-04 | ft./min. |
| 4.79E-06 | ft./sec. |
| 4.13E-01 | ft./day |
| 1.46E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 16MWT09

PROJECT NO.: 90060 GEOLOGIST: M. G. COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 13.28 DATE: 11-23-03

TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

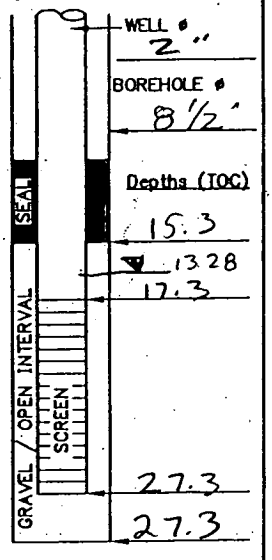
METHOD OF INDUCING WATER LEVEL CHANGE: SOLID SLUG PAGE 1 OF 1

REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC, ZERO AT SWL + START

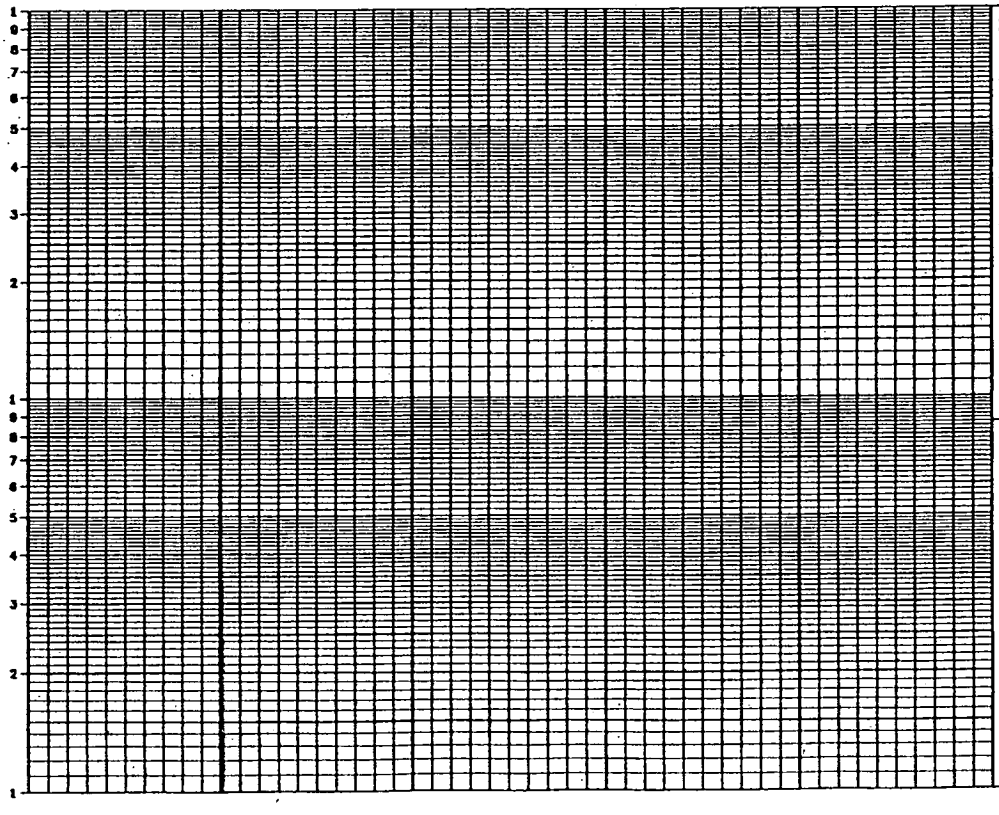
ACAD:FORM_HYDCONTST.dwg 07/06/99 INL

| ELAPSED TIME (min or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 0 | | 3.0 | -.576 | |
| .1 | -1.213 | | 4.0 | -.383 | |
| .2 | -1.485 | | 5.0 | -.226 | |
| .3 | -1.491 | | 6.0 | -.107 | |
| .4 | -1.447 | | 8.0 | .069 | |
| .5 | -1.397 | | 10.0 | .181 | |
| .6 | -1.346 | | | | |
| .7 | -1.300 | | | | |
| .8 | -1.253 | | | | |
| .9 | -1.209 | | | | |
| 1.0 | -1.169 | | | | |
| 2.0 | -.828 | | | | |

WELL SCHEMATIC

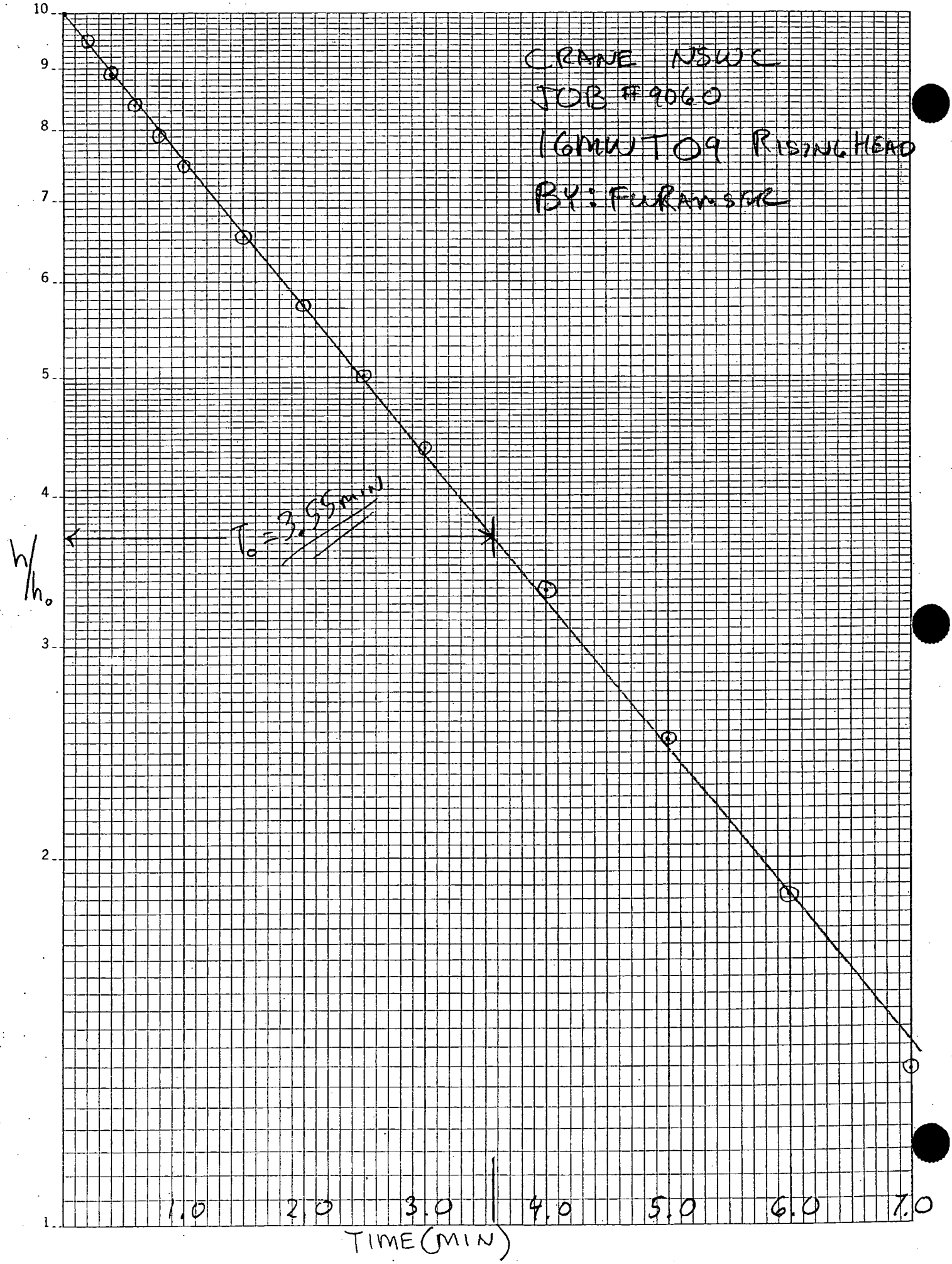



▽ Indicate SWL Depth on Drawing



REMARKS:

CALCS, SKETCH MAPS, ETC.:


CRANE NSWC
JOB # 9060
16MW T09 RISING HEAD
BY: FURRAMSOR
$T_o = 3.25$ min
$h/h_o$
10
9
8
7
6
5
4
3
2
1
1.0
2.0
3.0
4.0
5.0
6.0
7.0
TIME (MIN)
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 12/10/2003 8:41:24
Report from file: H:\Crane IN\SWMU13_16\MGC slug tests 03\site 16\SN06899 2003-11-23 100953_16MWT09rising#1.bin
DataMgr Version 3.68

Serial number: 6899
Firmware Version 3.07
Unit name:

Test name: 16MWT09rising#1

Test defined on: 11/23/2003 10:08:47
Test started on: 11/23/2003 10:09:53
Test stopped on: 11/23/2003 10:21:03
Test extracted on: N/A

Data gathered using Linear testing
Time between data point Minutes.
Number of data samples 112

TOTAL DATA SAMPLES 112

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at referen 13.749 Feet H2O

| Date | Time | ET (min) | Chan[2] Feet H2O | Adj Feet H20 | Adjusted ET. (min) | h/ho | ho = -1.741 |
|---|---|---|---|---|---|---|---|
| | 11/23/2003 10:09 | 0 | 0 | | | | |
| | 11/23/2003 10:09 | 0.1 | -1.213 | | | | |
| | 11/23/2003 10:10 | 0.2 | -1.485 | | | | |
| | 11/23/2003 10:10 | 0.3 | -1.491 | -1.741 | 0 | 1.000 | |
| | 11/23/2003 10:10 | 0.4 | -1.447 | -1.697 | 0.1 | 0.975 | |
| | 11/23/2003 10:10 | 0.5 | -1.397 | -1.647 | 0.2 | 0.946 | |
| | 11/23/2003 10:10 | 0.6 | -1.346 | -1.596 | 0.3 | 0.917 | |
| | 11/23/2003 10:10 | 0.7 | -1.3 | -1.55 | 0.4 | 0.890 | |
| | 11/23/2003 10:10 | 0.8 | -1.253 | -1.503 | 0.5 | 0.863 | |
| | 11/23/2003 10:10 | 0.9 | -1.209 | -1.459 | 0.6 | 0.838 | |
| | 11/23/2003 10:10 | 1 | -1.169 | -1.419 | 0.7 | 0.815 | |
| | 11/23/2003 10:10 | 1.1 | -1.131 | -1.381 | 0.8 | 0.793 | |
| | 11/23/2003 10:11 | 1.2 | -1.092 | -1.342 | 0.9 | 0.771 | |
| | 11/23/2003 10:11 | 1.3 | -1.054 | -1.304 | 1 | 0.749 | |
| | 11/23/2003 10:11 | 1.4 | -1.02 | -1.27 | 1.1 | 0.729 | |
| | 11/23/2003 10:11 | 1.5 | -0.983 | -1.233 | 1.2 | 0.708 | |
| | 11/23/2003 10:11 | 1.6 | -0.949 | -1.199 | 1.3 | 0.689 | |
| | 11/23/2003 10:11 | 1.7 | -0.921 | -1.171 | 1.4 | 0.673 | |
| | 11/23/2003 10:11 | 1.8 | -0.887 | -1.137 | 1.5 | 0.653 | |
| | 11/23/2003 10:11 | 1.9 | -0.856 | -1.106 | 1.6 | 0.635 | |
| | 11/23/2003 10:11 | 2 | -0.828 | -1.078 | 1.7 | 0.619 | |

| | | | | | |
|---|---|---|---|---|---|
| 11/23/2003 10:11 | 2.1 | -0.8 | -1.05 | 1.8 | 0.603 |
| 11/23/2003 10:12 | 2.2 | -0.774 | -1.024 | 1.9 | 0.588 |
| 11/23/2003 10:12 | 2.3 | -0.746 | -0.996 | 2 | 0.572 |
| 11/23/2003 10:12 | 2.4 | -0.719 | -0.969 | 2.1 | 0.557 |
| 11/23/2003 10:12 | 2.5 | -0.695 | -0.945 | 2.2 | 0.543 |
| 11/23/2003 10:12 | 2.6 | -0.669 | -0.919 | 2.3 | 0.528 |
| 11/23/2003 10:12 | 2.7 | -0.645 | -0.895 | 2.4 | 0.514 |
| 11/23/2003 10:12 | 2.8 | -0.623 | -0.873 | 2.5 | 0.501 |
| 11/23/2003 10:12 | 2.9 | -0.598 | -0.848 | 2.6 | 0.487 |
| 11/23/2003 10:12 | 3 | -0.576 | -0.826 | 2.7 | 0.474 |
| 11/23/2003 10:12 | 3.1 | -0.554 | -0.804 | 2.8 | 0.462 |
| 11/23/2003 10:13 | 3.2 | -0.534 | -0.784 | 2.9 | 0.450 |
| 11/23/2003 10:13 | 3.3 | -0.512 | -0.762 | 3 | 0.438 |
| 11/23/2003 10:13 | 3.4 | -0.492 | -0.742 | 3.1 | 0.426 |
| 11/23/2003 10:13 | 3.5 | -0.472 | -0.722 | 3.2 | 0.415 |
| 11/23/2003 10:13 | 3.6 | -0.456 | -0.706 | 3.3 | 0.406 |
| 11/23/2003 10:13 | 3.7 | -0.437 | -0.687 | 3.4 | 0.395 |
| 11/23/2003 10:13 | 3.8 | -0.417 | -0.667 | 3.5 | 0.383 |
| 11/23/2003 10:13 | 3.9 | -0.397 | -0.647 | 3.6 | 0.372 |
| 11/23/2003 10:13 | 4 | -0.383 | -0.633 | 3.7 | 0.364 |
| 11/23/2003 10:13 | 4.1 | -0.365 | -0.615 | 3.8 | 0.353 |
| 11/23/2003 10:14 | 4.2 | -0.347 | -0.597 | 3.9 | 0.343 |
| 11/23/2003 10:14 | 4.3 | -0.331 | -0.581 | 4 | 0.334 |
| 11/23/2003 10:14 | 4.4 | -0.314 | -0.564 | 4.1 | 0.324 |
| 11/23/2003 10:14 | 4.5 | -0.304 | -0.554 | 4.2 | 0.318 |
| 11/23/2003 10:14 | 4.6 | -0.286 | -0.536 | 4.3 | 0.308 |
| 11/23/2003 10:14 | 4.7 | -0.27 | -0.52 | 4.4 | 0.299 |
| 11/23/2003 10:14 | 4.8 | -0.254 | -0.504 | 4.5 | 0.289 |
| 11/23/2003 10:14 | 4.9 | -0.24 | -0.49 | 4.6 | 0.281 |
| 11/23/2003 10:14 | 5 | -0.226 | -0.476 | 4.7 | 0.273 |
| 11/23/2003 10:14 | 5.1 | -0.214 | -0.464 | 4.8 | 0.267 |
| 11/23/2003 10:15 | 5.2 | -0.199 | -0.449 | 4.9 | 0.258 |
| 11/23/2003 10:15 | 5.3 | -0.187 | -0.437 | 5 | 0.251 |
| 11/23/2003 10:15 | 5.4 | -0.176 | -0.426 | 5.1 | 0.245 |
| 11/23/2003 10:15 | 5.5 | -0.161 | -0.411 | 5.2 | 0.236 |
| 11/23/2003 10:15 | 5.6 | -0.151 | -0.401 | 5.3 | 0.230 |
| 11/23/2003 10:15 | 5.7 | -0.139 | -0.389 | 5.4 | 0.223 |
| 11/23/2003 10:15 | 5.8 | -0.129 | -0.379 | 5.5 | 0.218 |
| 11/23/2003 10:15 | 5.9 | -0.117 | -0.367 | 5.6 | 0.211 |
| 11/23/2003 10:15 | 6 | -0.107 | -0.357 | 5.7 | 0.205 |
| 11/23/2003 10:15 | 6.1 | -0.097 | -0.347 | 5.8 | 0.199 |
| 11/23/2003 10:16 | 6.2 | -0.085 | -0.335 | 5.9 | 0.192 |
| 11/23/2003 10:16 | 6.3 | -0.073 | -0.323 | 6 | 0.186 |
| 11/23/2003 10:16 | 6.4 | -0.066 | -0.316 | 6.1 | 0.182 |
| 11/23/2003 10:16 | 6.5 | -0.054 | -0.304 | 6.2 | 0.175 |
| 11/23/2003 10:16 | 6.6 | -0.046 | -0.296 | 6.3 | 0.170 |
| 11/23/2003 10:16 | 6.7 | -0.036 | -0.286 | 6.4 | 0.164 |
| 11/23/2003 10:16 | 6.8 | -0.028 | -0.278 | 6.5 | 0.160 |
| 11/23/2003 10:16 | 6.9 | -0.018 | -0.268 | 6.6 | 0.154 |
| 11/23/2003 10:16 | 7 | -0.01 | -0.26 | 6.7 | 0.149 |
| 11/23/2003 10:16 | 7.1 | -0.004 | -0.254 | 6.8 | 0.146 |
| 11/23/2003 10:17 | 7.2 | 0.01 | -0.24 | 6.9 | 0.138 |
| 11/23/2003 10:17 | 7.3 | 0.016 | -0.234 | 7 | 0.134 |
| 11/23/2003 10:17 | 7.4 | 0.024 | -0.226 | 7.1 | 0.130 |
| 11/23/2003 10:17 | 7.5 | 0.032 | -0.218 | 7.2 | 0.125 |
| 11/23/2003 10:17 | 7.6 | 0.038 | -0.212 | 7.3 | 0.122 |
| 11/23/2003 10:17 | 7.7 | 0.046 | -0.204 | 7.4 | 0.117 |
| 11/23/2003 10:17 | 7.8 | 0.054 | -0.196 | 7.5 | 0.113 |
| 11/23/2003 10:17 | 7.9 | 0.06 | -0.19 | 7.6 | 0.109 |
| 11/23/2003 10:17 | 8 | 0.069 | -0.181 | 7.7 | 0.104 |

| | | | | | |
|---|---|---|---|---|---|
| 11/23/2003 10:17 | 8.1 | 0.075 | -0.175 | 7.8 | 0.101 |
| 11/23/2003 10:18 | 8.2 | 0.081 | -0.169 | 7.9 | 0.097 |
| 11/23/2003 10:18 | 8.3 | 0.087 | -0.163 | 8 | 0.094 |
| 11/23/2003 10:18 | 8.4 | 0.095 | -0.155 | 8.1 | 0.089 |
| 11/23/2003 10:18 | 8.5 | 0.099 | -0.151 | 8.2 | 0.087 |
| 11/23/2003 10:18 | 8.6 | 0.107 | -0.143 | 8.3 | 0.082 |
| 11/23/2003 10:18 | 8.7 | 0.113 | -0.137 | 8.4 | 0.079 |
| 11/23/2003 10:18 | 8.8 | 0.119 | -0.131 | 8.5 | 0.075 |
| 11/23/2003 10:18 | 8.9 | 0.125 | -0.125 | 8.6 | 0.072 |
| 11/23/2003 10:18 | 9 | 0.129 | -0.121 | 8.7 | 0.070 |
| 11/23/2003 10:18 | 9.1 | 0.135 | -0.115 | 8.8 | 0.066 |
| 11/23/2003 10:19 | 9.2 | 0.141 | -0.109 | 8.9 | 0.063 |
| 11/23/2003 10:19 | 9.3 | 0.147 | -0.103 | 9 | 0.059 |
| 11/23/2003 10:19 | 9.4 | 0.151 | -0.099 | 9.1 | 0.057 |
| 11/23/2003 10:19 | 9.5 | 0.155 | -0.095 | 9.2 | 0.055 |
| 11/23/2003 10:19 | 9.6 | 0.159 | -0.091 | 9.3 | 0.052 |
| 11/23/2003 10:19 | 9.7 | 0.165 | -0.085 | 9.4 | 0.049 |
| 11/23/2003 10:19 | 9.8 | 0.173 | -0.077 | 9.5 | 0.044 |
| 11/23/2003 10:19 | 9.9 | 0.175 | -0.075 | 9.6 | 0.043 |
| 11/23/2003 10:19 | 10 | 0.181 | -0.069 | 9.7 | 0.040 |
| 11/23/2003 10:19 | 10.1 | 0.187 | -0.063 | 9.8 | 0.036 |
| 11/23/2003 10:20 | 10.2 | 0.189 | -0.061 | 9.9 | 0.035 |
| 11/23/2003 10:20 | 10.3 | 0.195 | -0.055 | 10 | 0.032 |
| 11/23/2003 10:20 | 10.4 | 0.199 | -0.051 | 10.1 | 0.029 |
| 11/23/2003 10:20 | 10.5 | 0.205 | -0.045 | 10.2 | 0.026 |
| 11/23/2003 10:20 | 10.6 | 0.207 | -0.043 | 10.3 | 0.025 |
| 11/23/2003 10:20 | 10.7 | 0.213 | -0.037 | 10.4 | 0.021 |
| 11/23/2003 10:20 | 10.8 | 0.215 | -0.035 | 10.5 | 0.020 |
| 11/23/2003 10:20 | 10.9 | 0.221 | -0.029 | 10.6 | 0.017 |
| 11/23/2003 10:20 | 11 | 0.223 | -0.027 | 10.7 | 0.016 |
| 11/23/2003 10:20 | 11.1 | 0.227 | -0.023 | 10.8 | 0.013 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 16MWT09 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 23-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083 = | 1 = r |
| Effective Radius of Well Screen (in.) : | .354 = | 4.25 = R |
| Length of Well Screen (ft.) : | | 12 = L |
| Time for 37% head change (min.) : | | 3.55 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 2.87E-04 | ft./min. |
| 4.79E-06 | ft./sec. |
| 4.13E-01 | ft./day |
| 1.46E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(12/.354)}{2 \times 12 \times 3.55} =$$

$$= 2.88 \times (10^{-4} \text{ Ft})/\text{min}$$

CHECKED

2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 16MWT10 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head #2 | **Test Date:** | 23-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 4.25 | = R |
| Length of Well Screen (ft.) : | 5.64 | = L |
| Time for 37% head change (min.) : | 0.094 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.81E-02 | ft./min. |
| 3.02E-04 | ft./sec. |
| 2.61E+01 | ft./day |
| 9.21E-03 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

Tetra Tech NUS, Inc.

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 16MWT10

PROJECT NO.: 9060 GEOLOGIST: M G. COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 2

STATIC WATER LEVEL (Depth/Elevation): 22.16 TOR DATE: 11-22-03

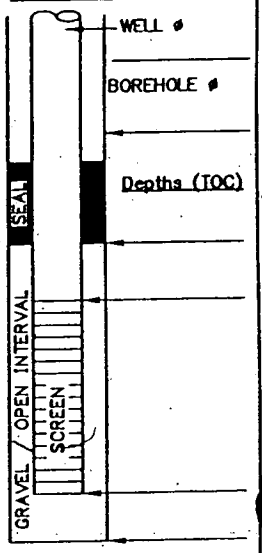
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: BAILER PAGE 1 OF 1

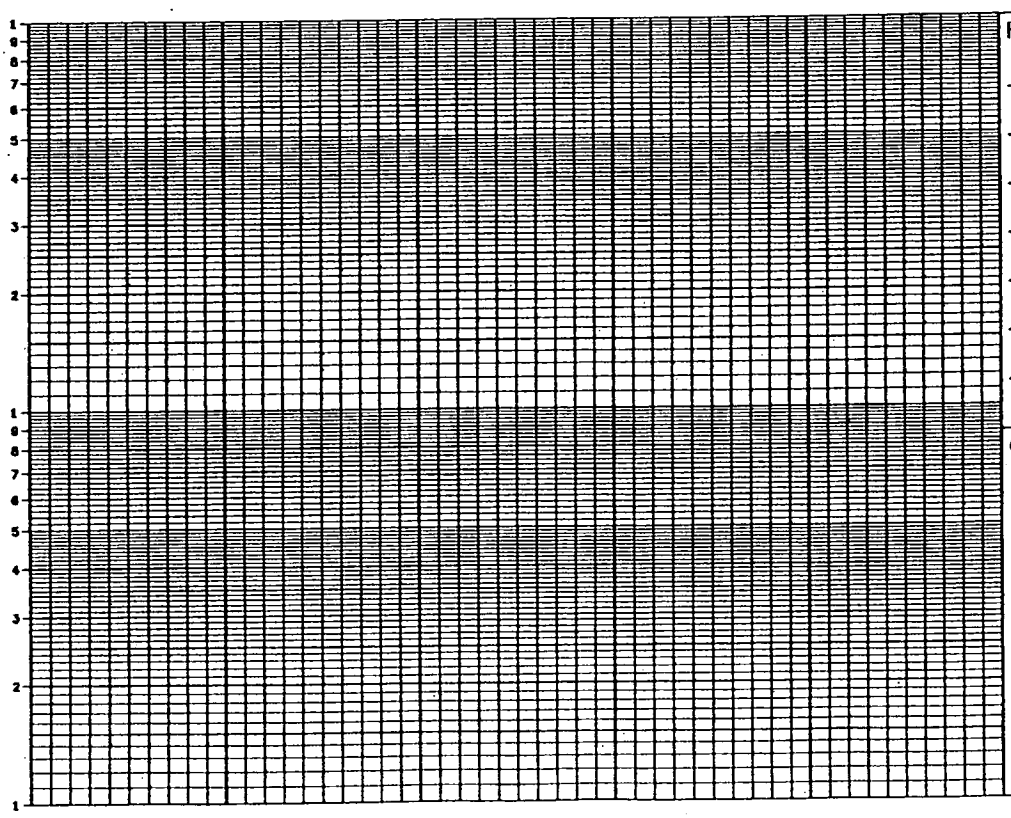
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC, ZERO AT STATIC

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | -.002 | | 3 | -.157 | |
| .1 | -.798 | | 4 | -.128 | |
| .2 | -.425 | | 5 | -.113 | |
| .3 | -.360 | | 6 | -.095 | |
| .4 | -.330 | | 8 | -.075 | |
| .5 | -.312 | | 10 | -.057 | |
| .6 | -.299 | | 12 | -.048 | |
| .7 | -.285 | | 15 | -.036 | |
| .8 | -.272 | | 20 | -.023 | |
| .9 | -.261 | | 23 | -.016 | |
| 1 | -.254 | | | | |
| 2 | -.195 | | | | |

WELL SCHEMATIC




▽ Indicate SWL Depth on Drawing

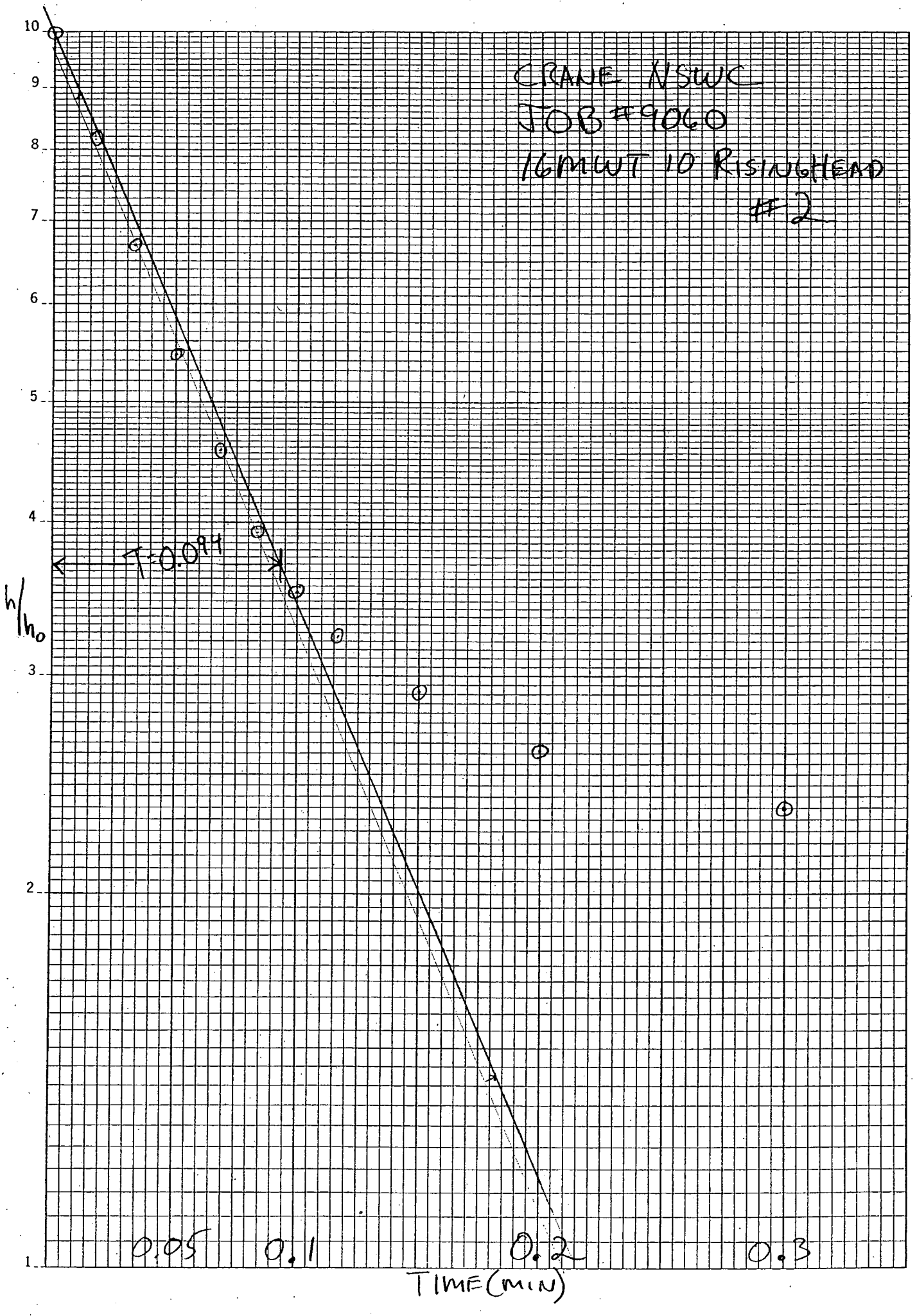


REMARKS:

TEST #5 ON FILE.

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL




K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 4650

In-Situ Inc. MiniTroll Pro

Report generated: 12/4/2003 10:26:23
Report from file: C:\Win-Situ\Data\SN00916 2003-11-22 113435 .bin
DataMgr Version 3.68

Serial number: 916
Firmware Version 3.07
Unit name:

Test name:

Test defined on: 11/22/2003 11:34:13
Test started on: 11/22/2003 11:34:35
Test stopped on: 11/22/2003 11:59:02
Test extracted on: N/A

Data gathered using Linear testing
Time between data Minutes.
Number of data san 1467

TOTAL DATA SAMPL 1467

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined referer 0 Feet H2O
Referenced on: channel definition.
Pressure head at rel 4.706 Feet H2O

ho = -1.461

| Date | Time | ET (min) | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho |
|---|---|---|---|---|---|
| 11/22/2003 | 11:34 | 0 | -0.002 | | |
| 11/22/2003 | 11:34 | 0.0167 | -0.002 | | |
| 11/22/2003 | 11:34 | 0.0333 | -1.754 | | |
| 11/22/2003 | 11:34 | 0.05 | -1.461 | 0 | 1.000 |
| 11/22/2003 | 11:34 | 0.0667 | -1.19 | 0.0167 | 0.815 |
| 11/22/2003 | 11:34 | 0.0833 | -0.979 | 0.0333 | 0.670 |
| 11/22/2003 | 11:34 | 0.1 | -0.798 | 0.05 | 0.546 |
| 11/22/2003 | 11:34 | 0.1167 | -0.669 | 0.0667 | 0.458 |
| 11/22/2003 | 11:34 | 0.1333 | -0.574 | 0.0833 | 0.393 |
| 11/22/2003 | 11:34 | 0.15 | -0.512 | 0.1 | 0.350 |
| 11/22/2003 | 11:34 | 0.1667 | -0.474 | 0.1167 | 0.324 |
| 11/22/2003 | 11:34 | 0.1833 | -0.445 | 0.1333 | 0.305 |
| 11/22/2003 | 11:34 | 0.2 | -0.425 | 0.15 | 0.291 |
| 11/22/2003 | 11:34 | 0.2167 | -0.405 | 0.1667 | 0.277 |
| 11/22/2003 | 11:34 | 0.2333 | -0.394 | 0.1833 | 0.270 |
| 11/22/2003 | 11:34 | 0.25 | -0.383 | 0.2 | 0.262 |
| 11/22/2003 | 11:34 | 0.2667 | -0.374 | 0.2167 | 0.256 |
| 11/22/2003 | 11:34 | 0.2833 | -0.367 | 0.2333 | 0.251 |
| 11/22/2003 | 11:34 | 0.3 | -0.36 | 0.25 | 0.246 |

| | | | | |
|---|---|---|---|---|
| 11/22/2003 11:34 | 0.3167 | -0.354 | 0.2667 | 0.242 |
| 11/22/2003 11:34 | 0.3333 | -0.347 | 0.2833 | 0.238 |
| 11/22/2003 11:34 | 0.35 | -0.343 | 0.3 | 0.235 |
| 11/22/2003 11:34 | 0.3667 | -0.338 | 0.3167 | 0.231 |
| 11/22/2003 11:34 | 0.3833 | -0.334 | 0.3333 | 0.229 |
| 11/22/2003 11:34 | 0.4 | -0.33 | 0.35 | 0.226 |
| 11/22/2003 11:35 | 0.4167 | -0.327 | 0.3667 | 0.224 |
| 11/22/2003 11:35 | 0.4333 | -0.325 | 0.3833 | 0.222 |
| 11/22/2003 11:35 | 0.45 | -0.321 | 0.4 | 0.220 |
| 11/22/2003 11:35 | 0.4667 | -0.321 | 0.4167 | 0.220 |
| 11/22/2003 11:35 | 0.4833 | -0.316 | 0.4333 | 0.216 |
| 11/22/2003 11:35 | 0.5 | -0.312 | 0.45 | 0.214 |
| 11/22/2003 11:35 | 0.5167 | -0.31 | 0.4667 | 0.212 |
| 11/22/2003 11:35 | 0.5333 | -0.307 | 0.4833 | 0.210 |
| 11/22/2003 11:35 | 0.55 | -0.303 | 0.5 | 0.207 |
| 11/22/2003 11:35 | 0.5667 | -0.303 | 0.5167 | 0.207 |
| 11/22/2003 11:35 | 0.5833 | -0.301 | 0.5333 | 0.206 |
| 11/22/2003 11:35 | 0.6 | -0.299 | 0.55 | 0.205 |
| 11/22/2003 11:35 | 0.6167 | -0.294 | 0.5667 | 0.201 |
| 11/22/2003 11:35 | 0.6333 | -0.294 | 0.5833 | 0.201 |
| 11/22/2003 11:35 | 0.65 | -0.292 | 0.6 | 0.200 |
| 11/22/2003 11:35 | 0.6667 | -0.29 | 0.6167 | 0.198 |
| 11/22/2003 11:35 | 0.6833 | -0.287 | 0.6333 | 0.196 |
| 11/22/2003 11:35 | 0.7 | -0.285 | 0.65 | 0.195 |
| 11/22/2003 11:35 | 0.7167 | -0.283 | 0.6667 | 0.194 |
| 11/22/2003 11:35 | 0.7333 | -0.281 | 0.6833 | 0.192 |
| 11/22/2003 11:35 | 0.75 | -0.277 | 0.7 | 0.190 |
| 11/22/2003 11:35 | 0.7667 | -0.274 | 0.7167 | 0.188 |
| 11/22/2003 11:35 | 0.7833 | -0.274 | 0.7333 | 0.188 |
| 11/22/2003 11:35 | 0.8 | -0.272 | 0.75 | 0.186 |
| 11/22/2003 11:35 | 0.8167 | -0.27 | 0.7667 | 0.185 |
| 11/22/2003 11:35 | 0.8333 | -0.27 | 0.7833 | 0.185 |
| 11/22/2003 11:35 | 0.85 | -0.268 | 0.8 | 0.183 |
| 11/22/2003 11:35 | 0.8667 | -0.265 | 0.8167 | 0.181 |
| 11/22/2003 11:35 | 0.8833 | -0.263 | 0.8333 | 0.180 |
| 11/22/2003 11:35 | 0.9 | -0.261 | 0.85 | 0.179 |
| 11/22/2003 11:35 | 0.9167 | -0.263 | 0.8667 | 0.180 |
| 11/22/2003 11:35 | 0.9333 | -0.261 | 0.8833 | 0.179 |
| 11/22/2003 11:35 | 0.95 | -0.257 | 0.9 | 0.176 |
| 11/22/2003 11:35 | 0.9667 | -0.257 | 0.9167 | 0.176 |
| 11/22/2003 11:35 | 0.9833 | -0.257 | 0.9333 | 0.176 |
| 11/22/2003 11:35 | 1 | -0.254 | 0.95 | 0.174 |
| 11/22/2003 11:35 | 1.0167 | -0.254 | 0.9667 | 0.174 |
| 11/22/2003 11:35 | 1.0333 | -0.252 | 0.9833 | 0.172 |
| 11/22/2003 11:35 | 1.05 | -0.248 | 1 | 0.170 |
| 11/22/2003 11:36 | 2.05 | -0.195 | 2 | 0.133 |
| 11/22/2003 11:37 | 3.05 | -0.155 | 3 | 0.106 |
| 11/22/2003 11:38 | 4.05 | -0.128 | 4 | 0.088 |
| 11/22/2003 11:39 | 5.05 | -0.11 | 5 | 0.075 |
| 11/22/2003 11:40 | 6.05 | -0.093 | 6 | 0.064 |
| 11/22/2003 11:41 | 7.05 | -0.079 | 7 | 0.054 |
| 11/22/2003 11:42 | 8.05 | -0.072 | 8 | 0.049 |
| 11/22/2003 11:43 | 9.05 | -0.066 | 9 | 0.045 |
| 11/22/2003 11:44 | 10.05 | -0.055 | 10 | 0.038 |
| 11/22/2003 11:45 | 11.05 | -0.05 | 11 | 0.034 |
| 11/22/2003 11:46 | 12.05 | -0.046 | 12 | 0.031 |
| 11/22/2003 11:47 | 13.05 | -0.043 | 13 | 0.029 |
| 11/22/2003 11:48 | 14.05 | -0.039 | 14 | 0.027 |

| | | | | |
|---|---|---|---|---|
| 11/22/2003 11:49 | 15.05 | -0.034 | 15 | 0.023 |
| 11/22/2003 11:50 | 16.05 | -0.032 | 16 | 0.022 |
| 11/22/2003 11:51 | 17.05 | -0.028 | 17 | 0.019 |
| 11/22/2003 11:52 | 18.05 | -0.025 | 18 | 0.017 |
| 11/22/2003 11:53 | 19.05 | -0.023 | 19 | 0.016 |
| 11/22/2003 11:54 | 20.05 | -0.021 | 20 | 0.014 |
| 11/22/2003 11:55 | 21.05 | -0.021 | 21 | 0.014 |
| 11/22/2003 11:56 | 22.05 | -0.018 | 22 | 0.012 |
| 11/22/2003 11:57 | 23.05 | -0.016 | 23 | 0.011 |
| 11/22/2003 11:58 | 24.05 | -0.014 | 24 | 0.010 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

**Project Name:** Crane NSWC
**Project No.:** 9060
**Test Type:** Rising head #2

**Well/Boring No.:** 16MWT10
**Aquifer Type:** Bedrock
**Test Date:** 23-Nov-03

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .354' | 4.25 = R |
| Length of Well Screen (ft.) : | | 5.64 = L |
| Time for 37% head change (min.) : | | 0.094 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.81E-02 | ft./min. |
| 3.02E-04 | ft./sec. |
| 2.61E+01 | ft./day |
| 9.21E-03 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(5.64/.354)}{2 \times 5.64 \times .094} =$$

$1.80 \times 10^{-2}$ Ft/min

CHECKED

2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 16MWT10 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 23-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 4.25 = R |
| Length of Well Screen (ft.) : | 5.64 = L |
| Time for 37% head change (min.) : | 0.09 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.89E-02 | ft./min. |
| 3.16E-04 | ft./sec. |
| 2.73E+01 | ft./day |
| 9.62E-03 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

Tetra Tech NUS, Inc.

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 16MWT10

PROJECT NO.: 9060 GEOLOGIST: M.G. COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 22.16 TOR DATE: 11-22-03

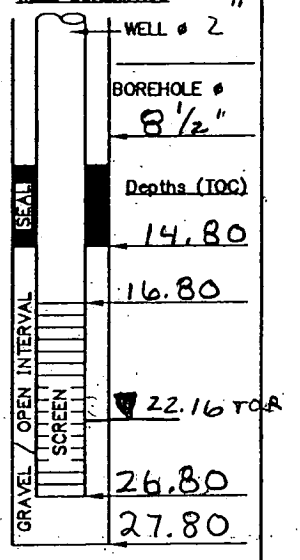
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: BAILER PAGE 1 OF 1

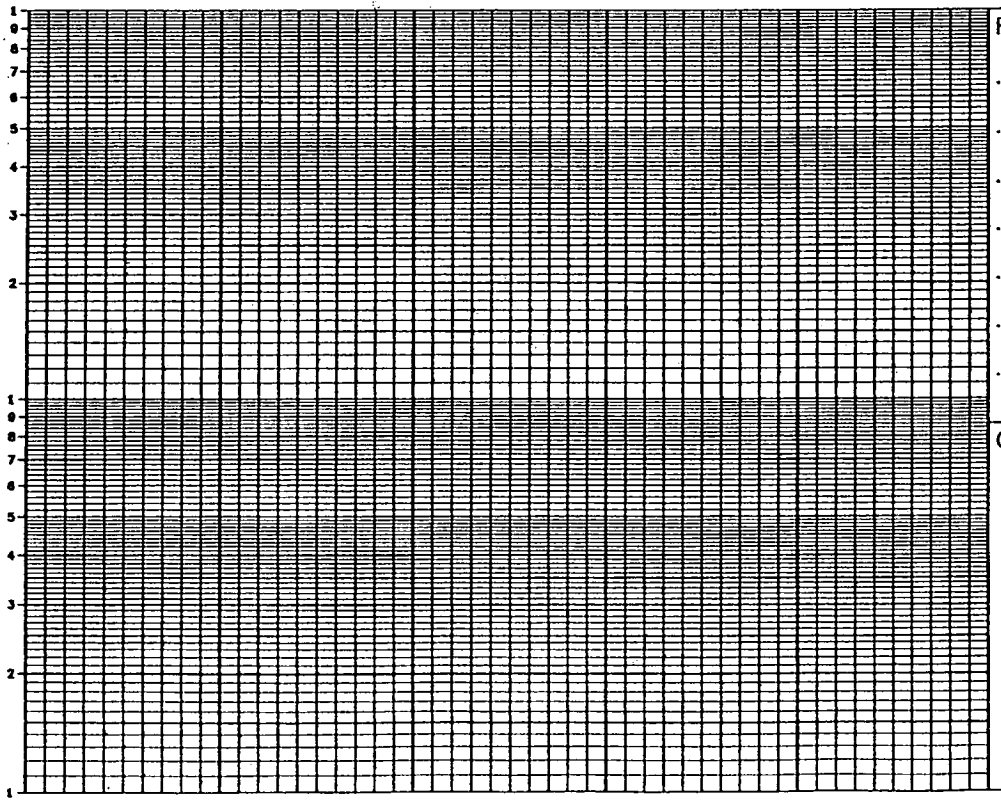
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC, ZERO AT STATIC

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | .010 | | 6.2663 | -.097 | |
| .025 | -2.664 | | 7.0347 | -.088 | |
| .03 | -1.806 | | 8.3663 | -.074 | |
| .1 | -.756 | | 9.9497 | -.058 | |
| .2102 | -.392 | | 10.5413 | -.054 | |
| .3333 | -.334 | | 12.5347 | -.043 | |
| .5247 | -.300 | | 14.9063 | -.034 | |
| 1.04 | -.249 | | 15.7913 | -.031 | |
| 2.2097 | -.188 | | 19.8913 | -.025 | |
| 3.1297 | -.157 | | 24.78 | -.006 | |
| 4.1813 | -.132 | | | | |
| 5.2697 | -.110 | | | | |

WELL SCHEMATIC



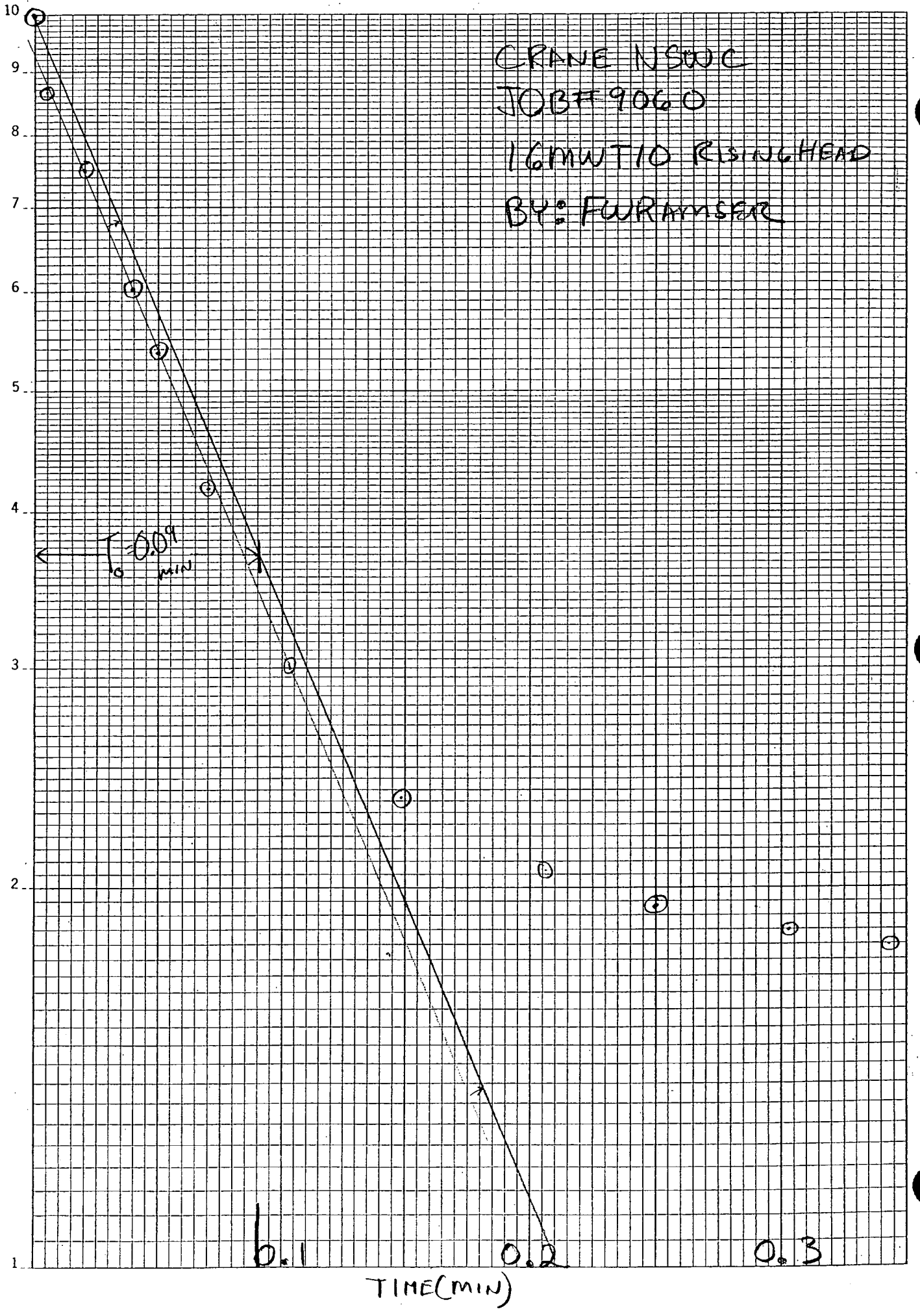

▽ Indicate SWL Depth on Drawing



REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 12/4/2003 10:01:35
Report from file: C:\Win-Situ\Data\SN00916 2003-11-22 105857 16MWT10rising#1.bin
DataMgr Version 3.68

Serial number: 916
Firmware Version 3.07
Unit name:

Test name: 16MWT10rising#1

Test defined on: 11/22/2003 10:56:32
Test started on: 11/22/2003 10:58:57
Test stopped on: 11/22/2003 11:30:49
Test extracted on: N/A

Data gathered using Logarithmic testing
Maximum time betwee Minutes.
Number of data sampl 121

TOTAL DATA SAMPLE: 121

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined reference 0 Feet H2O
Referenced on: channel definition.
Pressure head at refer 4.704 Feet H2O

• = DATA PLOTTED

| Date | Time | ET (min) | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho | |
|---|---|---|---|---|---|---|
| 11/22/2003 | 10:58 | 0 | 0.01 | | | |
| 11/22/2003 | 10:58 | 0.0048 | 0.009 | | | |
| 11/22/2003 | 10:58 | 0.0098 | 0.011 | | | |
| 11/22/2003 | 10:58 | 0.015 | 0.011 | | | |
| 11/22/2003 | 10:58 | 0.0198 | -0.569 | | | |
| 11/22/2003 | 10:58 | 0.025 | -2.664 | | | |
| 11/22/2003 | 10:58 | 0.03 | -1.806 | 0.000 | 1.000 | • |
| 11/22/2003 | 10:58 | 0.035 | -1.561 | 0.005 | 0.864 | • |
| 11/22/2003 | 10:58 | 0.0398 | -1.525 | 0.010 | 0.844 | |
| 11/22/2003 | 10:58 | 0.045 | -1.45 | 0.015 | 0.803 | |
| 11/22/2003 | 10:59 | 0.05 | -1.354 | 0.020 | 0.750 | • |
| 11/22/2003 | 10:59 | 0.0548 | -1.294 | 0.025 | 0.717 | |
| 11/22/2003 | 10:59 | 0.06 | -1.243 | 0.030 | 0.688 | |
| 11/22/2003 | 10:59 | 0.0648 | -1.141 | 0.035 | 0.632 | |
| 11/22/2003 | 10:59 | 0.07 | -1.085 | 0.040 | 0.601 | • |
| 11/22/2003 | 10:59 | 0.075 | -1.03 | 0.045 | 0.570 | |
| 11/22/2003 | 10:59 | 0.0798 | -0.972 | 0.050 | 0.538 | • |
| 11/22/2003 | 10:59 | 0.0848 | -0.928 | 0.055 | 0.514 | |
| 11/22/2003 | 10:59 | 0.09 | -0.843 | 0.060 | 0.467 | |
| 11/22/2003 | 10:59 | 0.095 | -0.794 | 0.065 | 0.440 | |
| 11/22/2003 | 10:59 | 0.1 | -0.756 | 0.070 | 0.419 | • |

ho = -1.806

| | | | | |
|---|---|---|---|---|
| 11/22/2003 10:59 | 0.1057 | -0.707 | 0.076 | 0.391 |
| 11/22/2003 10:59 | 0.1118 | -0.654 | 0.082 | 0.362 |
| 11/22/2003 10:59 | 0.1185 | -0.614 | 0.089 | 0.340 |
| 11/22/2003 10:59 | 0.1255 | -0.576 | 0.096 | 0.319 |
| 11/22/2003 10:59 | 0.1327 | -0.543 | 0.103 | 0.301 |
| 11/22/2003 10:59 | 0.1405 | -0.512 | 0.111 | 0.283 |
| 11/22/2003 10:59 | 0.1488 | -0.485 | 0.119 | 0.269 |
| 11/22/2003 10:59 | 0.1578 | -0.463 | 0.128 | 0.256 |
| 11/22/2003 10:59 | 0.167 | -0.445 | 0.137 | 0.246 |
| 11/22/2003 10:59 | 0.1768 | -0.427 | 0.147 | 0.236 |
| 11/22/2003 10:59 | 0.1875 | -0.414 | 0.158 | 0.229 |
| 11/22/2003 10:59 | 0.1985 | -0.401 | 0.169 | 0.222 |
| 11/22/2003 10:59 | 0.21 | -0.392 | 0.180 | 0.217 |
| 11/22/2003 10:59 | 0.2225 | -0.383 | 0.193 | 0.212 |
| 11/22/2003 10:59 | 0.2358 | -0.374 | 0.206 | 0.207 |
| 11/22/2003 10:59 | 0.2498 | -0.365 | 0.220 | 0.202 |
| 11/22/2003 10:59 | 0.2647 | -0.358 | 0.235 | 0.198 |
| 11/22/2003 10:59 | 0.2803 | -0.351 | 0.250 | 0.194 |
| 11/22/2003 10:59 | 0.297 | -0.345 | 0.267 | 0.191 |
| 11/22/2003 10:59 | 0.3145 | -0.338 | 0.285 | 0.187 |
| 11/22/2003 10:59 | 0.3333 | -0.334 | 0.303 | 0.185 |
| 11/22/2003 10:59 | 0.3532 | -0.327 | 0.323 | 0.181 |
| 11/22/2003 10:59 | 0.374 | -0.325 | 0.344 | 0.180 |
| 11/22/2003 10:59 | 0.3963 | -0.32 | 0.366 | 0.177 |
| 11/22/2003 10:59 | 0.4198 | -0.316 | 0.390 | 0.175 |
| 11/22/2003 10:59 | 0.4445 | -0.314 | 0.415 | 0.174 |
| 11/22/2003 10:59 | 0.4695 | -0.309 | 0.440 | 0.171 |
| 11/22/2003 10:59 | 0.4963 | -0.304 | 0.466 | 0.168 |
| 11/22/2003 10:59 | 0.5247 | -0.3 | 0.495 | 0.166 |
| 11/22/2003 10:59 | 0.5547 | -0.298 | 0.525 | 0.165 |
| 11/22/2003 10:59 | 0.5862 | -0.293 | 0.556 | 0.162 |
| 11/22/2003 10:59 | 0.6213 | -0.289 | 0.591 | 0.160 |
| 11/22/2003 10:59 | 0.6578 | -0.284 | 0.628 | 0.157 |
| 11/22/2003 10:59 | 0.6963 | -0.28 | 0.666 | 0.155 |
| 11/22/2003 10:59 | 0.738 | -0.278 | 0.708 | 0.154 |
| 11/22/2003 10:59 | 0.7813 | -0.273 | 0.751 | 0.151 |
| 11/22/2003 10:59 | 0.8278 | -0.267 | 0.798 | 0.148 |
| 11/22/2003 10:59 | 0.8762 | -0.262 | 0.846 | 0.145 |
| 11/22/2003 10:59 | 0.9278 | -0.258 | 0.898 | 0.143 |
| 11/22/2003 10:59 | 0.9828 | -0.253 | 0.953 | 0.140 |
| 11/22/2003 10:59 | 1.0412 | -0.249 | 1.011 | 0.138 |
| 11/22/2003 11:00 | 1.103 | -0.244 | 1.073 | 0.135 |
| 11/22/2003 11:00 | 1.1678 | -0.24 | 1.138 | 0.133 |
| 11/22/2003 11:00 | 1.238 | -0.233 | 1.208 | 0.129 |
| 11/22/2003 11:00 | 1.3113 | -0.229 | 1.281 | 0.127 |
| 11/22/2003 11:00 | 1.3895 | -0.224 | 1.360 | 0.124 |
| 11/22/2003 11:00 | 1.4728 | -0.222 | 1.443 | 0.123 |
| 11/22/2003 11:00 | 1.5613 | -0.213 | 1.531 | 0.118 |
| 11/22/2003 11:00 | 1.6547 | -0.211 | 1.625 | 0.117 |
| 11/22/2003 11:00 | 1.753 | -0.204 | 1.723 | 0.113 |
| 11/22/2003 11:00 | 1.858 | -0.2 | 1.828 | 0.111 |
| 11/22/2003 11:00 | 1.9678 | -0.195 | 1.938 | 0.108 |
| 11/22/2003 11:01 | 2.0845 | -0.191 | 2.055 | 0.106 |
| 11/22/2003 11:01 | 2.2097 | -0.188 | 2.180 | 0.104 |
| 11/22/2003 11:01 | 2.3412 | -0.182 | 2.311 | 0.101 |
| 11/22/2003 11:01 | 2.4812 | -0.177 | 2.451 | 0.098 |
| 11/22/2003 11:01 | 2.6297 | -0.17 | 2.600 | 0.094 |
| 11/22/2003 11:01 | 2.7863 | -0.168 | 2.756 | 0.093 |
| 11/22/2003 11:01 | 2.953 | -0.162 | 2.923 | 0.090 |
| 11/22/2003 11:02 | 3.1297 | -0.157 | 3.100 | 0.087 |

| | | | | |
|---|---|---|---|---|
| 11/22/2003 11:02 | 3.3162 | -0.148 | 3.286 | 0.082 |
| 11/22/2003 11:02 | 3.5145 | -0.146 | 3.485 | 0.081 |
| 11/22/2003 11:02 | 3.7245 | -0.142 | 3.695 | 0.079 |
| 11/22/2003 11:02 | 3.9463 | -0.135 | 3.916 | 0.075 |
| 11/22/2003 11:03 | 4.1812 | -0.132 | 4.151 | 0.073 |
| 11/22/2003 11:03 | 4.4295 | -0.126 | 4.400 | 0.070 |
| 11/22/2003 11:03 | 4.6928 | -0.121 | 4.663 | 0.067 |
| 11/22/2003 11:03 | 4.9728 | -0.115 | 4.943 | 0.064 |
| 11/22/2003 11:04 | 5.2697 | -0.11 | 5.240 | 0.061 |
| 11/22/2003 11:04 | 5.583 | -0.105 | 5.553 | 0.058 |
| 11/22/2003 11:04 | 5.9145 | -0.101 | 5.885 | 0.056 |
| 11/22/2003 11:05 | 6.2663 | -0.097 | 6.236 | 0.054 |
| 11/22/2003 11:05 | 6.6395 | -0.092 | 6.610 | 0.051 |
| 11/22/2003 11:05 | 7.0345 | -0.088 | 7.005 | 0.049 |
| 11/22/2003 11:06 | 7.453 | -0.085 | 7.423 | 0.047 |
| 11/22/2003 11:06 | 7.8962 | -0.079 | 7.866 | 0.044 |
| 11/22/2003 11:07 | 8.3663 | -0.074 | 8.336 | 0.041 |
| 11/22/2003 11:07 | 8.8645 | -0.07 | 8.835 | 0.039 |
| 11/22/2003 11:08 | 9.3913 | -0.063 | 9.361 | 0.035 |
| 11/22/2003 11:08 | 9.9497 | -0.058 | 9.920 | 0.032 |
| 11/22/2003 11:09 | 10.5413 | -0.054 | 10.511 | 0.030 |
| 11/22/2003 11:10 | 11.168 | -0.052 | 11.138 | 0.029 |
| 11/22/2003 11:10 | 11.8312 | -0.05 | 11.801 | 0.028 |
| 11/22/2003 11:11 | 12.5347 | -0.043 | 12.505 | 0.024 |
| 11/22/2003 11:12 | 13.2795 | -0.04 | 13.250 | 0.022 |
| 11/22/2003 11:13 | 14.0695 | -0.036 | 14.040 | 0.020 |
| 11/22/2003 11:13 | 14.9062 | -0.034 | 14.876 | 0.019 |
| 11/22/2003 11:14 | 15.7913 | -0.031 | 15.761 | 0.017 |
| 11/22/2003 11:15 | 16.7295 | -0.031 | 16.700 | 0.017 |
| 11/22/2003 11:16 | 17.723 | -0.027 | 17.693 | 0.015 |
| 11/22/2003 11:17 | 18.7762 | -0.025 | 18.746 | 0.014 |
| 11/22/2003 11:18 | 19.8913 | -0.025 | 19.861 | 0.014 |
| 11/22/2003 11:20 | 21.073 | -0.02 | 21.043 | 0.011 |
| 11/22/2003 11:21 | 22.3247 | -0.015 | 22.295 | 0.008 |
| 11/22/2003 11:22 | 23.6497 | -0.018 | 23.620 | 0.010 |
| 11/22/2003 11:24 | 25.0545 | -0.015 | 25.025 | 0.008 |
| 11/22/2003 11:25 | 26.5428 | -0.013 | 26.513 | 0.007 |
| 11/22/2003 11:27 | 28.1178 | -0.015 | 28.088 | 0.008 |
| 11/22/2003 11:28 | 29.7863 | -0.006 | 29.756 | 0.003 |
| 11/22/2003 11:30 | 31.5545 | 0.025 | 31.525 | -0.014 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 16MWT10 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 23-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .354' | 4.25 = R |
| Length of Well Screen (ft.) : | | 5.64 = L |
| Time for 37% head change (min.) : | | 0.09 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 1.89E-02 | ft./min. |
| 3.16E-04 | ft./sec. |
| 2.73E+01 | ft./day |
| 9.62E-03 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(5.64/.354)}{2 \times 5.64 \times .09} =$$

$1.88 \times 10^{-2}$ Ft/min

CHECKED

2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 16MWT15 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Falling head | **Test Date:** | 23-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | 1 | = r |
| Effective Radius of Well Screen (in.) : | 2.5 | = R |
| Length of Well Screen (ft.) : | 14 | = L |
| Time for 37% head change (min.) : | 385.00 | = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 2.71E-06 | ft./min. |
| 4.52E-08 | ft./sec. |
| 3.90E-03 | ft./day |
| 1.38E-06 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

Tetra Tech NUS, Inc.

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 16MWT15

PROJECT NO.: 9060 GEOLOGIST: M. G. COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 56.66 TOC DATE: 11-23-03

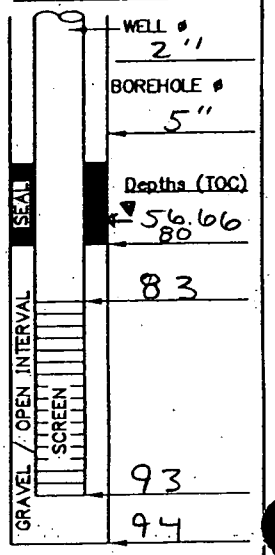
TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: SOLID SLUG PAGE 1 OF 1

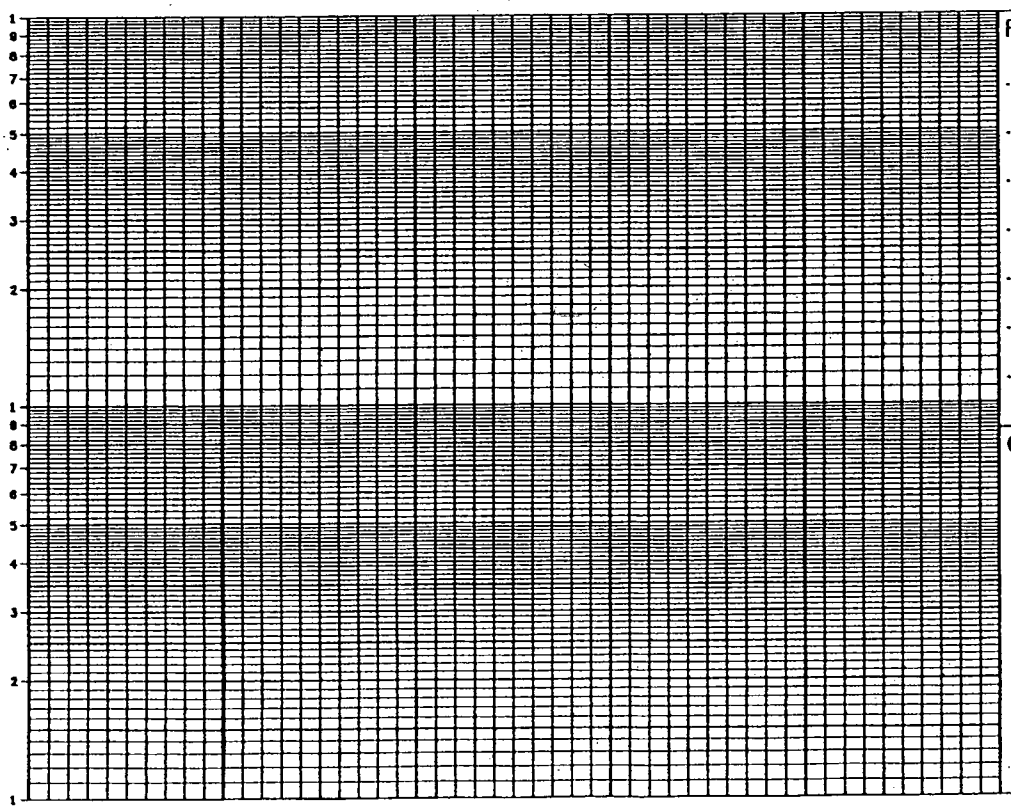
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC, ZERO AT SWL + START

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 0 | | 150 | 1.478 | |
| .2 | 2.748 | | 180 | 1.389 | |
| 1 | 2.657 | | 210 | 1.331 | |
| 5 | 2.530 | | 240 | 1.273 | |
| 10 | 2.433 | | 270 | 1.229 | |
| 20 | 2.321 | | 300 | 1.187 | |
| 30 | 2.217 | | | | |
| 40 | 2.122 | | | | |
| 60 | 1.960 | | | | |
| 80 | 1.822 | | | | |
| 100 | 1.709 | | | | |
| 120 | 1.604 | | | | |

WELL SCHEMATIC




▽ Indicate SWL Depth on Drawing

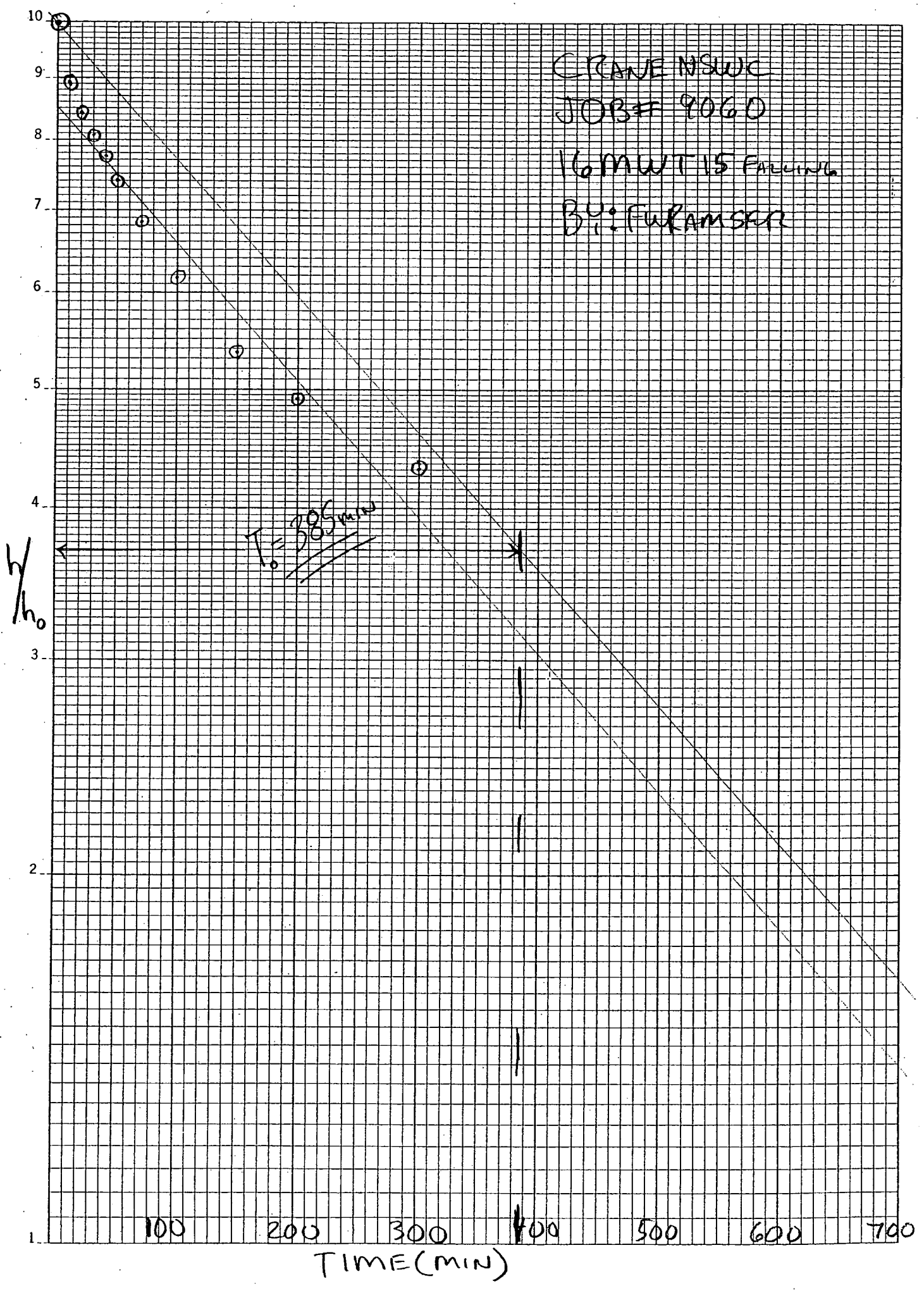


REMARKS:

TEST STOPPED AT 6:00 PM. DARK, REQUIRED TO LEAVE SECURITY AREA

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL


CRANE NSWC
JOB# 9060
16MWT15 FALLING
BY: FURAMSAR
$T_0$ = 385 min
$h/h_0$
10
9
8
7
6
5
4
3
2
1
100
200
300
400
500
600
700
TIME (MIN)
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 12/4/2003 9:49:15
Report from file: C:\Win-Situ\Data\SN00916 2003-11-23 124002 16MWT15falling#1.bin
DataMgr Version 3.68

Serial number: 916
Firmware Version 3.07
Unit name:

Test name: 16MWT15falling#1

Test defined on: 11/23/2003 12:38:27
Test started on: 11/23/2003 12:40:02
Test stopped on: 11/23/2003 17:45:39
Test extracted on: N/A

Data gathered using Linear testing
Time between data points: Minutes.
Number of data samples: 3057

TOTAL DATA SAMPLES 3057

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at reference: 18.509 Feet H2O

| Date | Time | ET (min) | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho | ho = 2.748 |
|---|---|---|---|---|---|---|
| | 11/23/2003 12:40 | 0 | 0 | | | |
| | 11/23/2003 12:40 | 0.1 | 2.521 | | | |
| | 11/23/2003 12:40 | 0.2 | 2.748 | 0 | 1 | |
| | 11/23/2003 12:40 | 0.3 | 2.726 | 0.1 | 0.991994 | |
| | 11/23/2003 12:40 | 0.4 | 2.712 | 0.2 | 0.9869 | |
| | 11/23/2003 12:40 | 0.5 | 2.699 | 0.3 | 0.982169 | |
| | 11/23/2003 12:40 | 0.6 | 2.69 | 0.4 | 0.978894 | |
| | 11/23/2003 12:40 | 0.7 | 2.679 | 0.5 | 0.974891 | |
| | 11/23/2003 12:40 | 0.8 | 2.67 | 0.6 | 0.971616 | |
| | 11/23/2003 12:40 | 0.9 | 2.666 | 0.7 | 0.97016 | |
| | 11/23/2003 12:41 | 1 | 2.657 | 0.8 | 0.966885 | |
| | 11/23/2003 12:41 | 1.1 | 2.652 | 0.9 | 0.965066 | |
| | 11/23/2003 12:41 | 1.2 | 2.646 | 1 | 0.962882 | |
| | 11/23/2003 12:41 | 1.3 | 2.639 | 1.1 | 0.960335 | |
| | 11/23/2003 12:41 | 1.4 | 2.632 | 1.2 | 0.957787 | |
| | 11/23/2003 12:41 | 1.5 | 2.63 | 1.3 | 0.95706 | |
| | 11/23/2003 12:41 | 1.6 | 2.626 | 1.4 | 0.955604 | |
| | 11/23/2003 12:41 | 1.7 | 2.619 | 1.5 | 0.953057 | |
| | 11/23/2003 12:41 | 1.8 | 2.617 | 1.6 | 0.952329 | |
| | 11/23/2003 12:41 | 1.9 | 2.61 | 1.7 | 0.949782 | |
| | 11/23/2003 12:42 | 2 | 2.606 | 1.8 | 0.948326 | |
| | 11/23/2003 12:42 | 2.1 | 2.604 | 1.9 | 0.947598 | |
| | 11/23/2003 12:42 | 2.2 | 2.599 | 2 | 0.945779 | |
| | 11/23/2003 12:42 | 2.3 | 2.595 | 2.1 | 0.944323 | |
| | 11/23/2003 12:42 | 2.4 | 2.595 | 2.2 | 0.944323 | |
| | 11/23/2003 12:42 | 2.5 | 2.59 | 2.3 | 0.942504 | |
| | 11/23/2003 12:42 | 2.6 | 2.586 | 2.4 | 0.941048 | |
| | 11/23/2003 12:42 | 2.7 | 2.584 | 2.5 | 0.94032 | |
| | 11/23/2003 12:42 | 2.8 | 2.581 | 2.6 | 0.939229 | |
| | 11/23/2003 12:42 | 2.9 | 2.577 | 2.7 | 0.937773 | |
| | 11/23/2003 12:43 | 3 | 2.575 | 2.8 | 0.937045 | |
| | 11/23/2003 12:43 | 3.1 | 2.575 | 2.9 | 0.937045 | |
| | 11/23/2003 12:43 | 3.2 | 2.57 | 3 | 0.935226 | |

| | | | | |
|---|---|---|---|---|
| 11/23/2003 12:43 | 3.3 | 2.568 | 3.1 | 0.934498 |
| 11/23/2003 12:43 | 3.4 | 2.568 | 3.2 | 0.934498 |
| 11/23/2003 12:43 | 3.5 | 2.564 | 3.3 | 0.933042 |
| 11/23/2003 12:43 | 3.6 | 2.561 | 3.4 | 0.931951 |
| 11/23/2003 12:43 | 3.7 | 2.559 | 3.5 | 0.931223 |
| 11/23/2003 12:43 | 3.8 | 2.555 | 3.6 | 0.929767 |
| 11/23/2003 12:43 | 3.9 | 2.555 | 3.7 | 0.929767 |
| 11/23/2003 12:44 | 4 | 2.55 | 3.8 | 0.927948 |
| 11/23/2003 12:44 | 4.1 | 2.55 | 3.9 | 0.927948 |
| 11/23/2003 12:44 | 4.2 | 2.544 | 4 | 0.925764 |
| 11/23/2003 12:44 | 4.3 | 2.55 | 4.1 | 0.927948 |
| 11/23/2003 12:44 | 4.4 | 2.544 | 4.2 | 0.925764 |
| 11/23/2003 12:44 | 4.5 | 2.541 | 4.3 | 0.924672 |
| 11/23/2003 12:44 | 4.6 | 2.539 | 4.4 | 0.923945 |
| 11/23/2003 12:44 | 4.7 | 2.541 | 4.5 | 0.924672 |
| 11/23/2003 12:44 | 4.8 | 2.532 | 4.6 | 0.921397 |
| 11/23/2003 12:44 | 4.9 | 2.53 | 4.7 | 0.92067 |
| 11/23/2003 12:45 | 5 | 2.53 | 4.8 | 0.92067 |
| 11/23/2003 12:45 | 5.1 | 2.528 | 4.9 | 0.919942 |
| 11/23/2003 12:45 | 5.2 | 2.526 | 5 | 0.919214 |
| 11/23/2003 12:45 | 5.3 | 2.526 | 5.1 | 0.919214 |
| 11/23/2003 12:45 | 5.4 | 2.521 | 5.2 | 0.917394 |
| 11/23/2003 12:45 | 5.5 | 2.521 | 5.3 | 0.917394 |
| 11/23/2003 12:45 | 5.6 | 2.517 | 5.4 | 0.915939 |
| 11/23/2003 12:45 | 5.7 | 2.517 | 5.5 | 0.915939 |
| 11/23/2003 12:45 | 5.8 | 2.517 | 5.6 | 0.915939 |
| 11/23/2003 12:45 | 5.9 | 2.515 | 5.7 | 0.915211 |
| 11/23/2003 12:46 | 6 | 2.51 | 5.8 | 0.913392 |
| 11/23/2003 12:46 | 6.1 | 2.508 | 5.9 | 0.912664 |
| 11/23/2003 12:46 | 6.2 | 2.506 | 6 | 0.911936 |
| 11/23/2003 12:46 | 6.3 | 2.506 | 6.1 | 0.911936 |
| 11/23/2003 12:46 | 6.4 | 2.504 | 6.2 | 0.911208 |
| 11/23/2003 12:46 | 6.5 | 2.501 | 6.3 | 0.910116 |
| 11/23/2003 12:46 | 6.6 | 2.499 | 6.4 | 0.909389 |
| 11/23/2003 12:46 | 6.7 | 2.499 | 6.5 | 0.909389 |
| 11/23/2003 12:46 | 6.8 | 2.499 | 6.6 | 0.909389 |
| 11/23/2003 12:46 | 6.9 | 2.495 | 6.7 | 0.907933 |
| 11/23/2003 12:47 | 7 | 2.495 | 6.8 | 0.907933 |
| 11/23/2003 12:47 | 7.1 | 2.493 | 6.9 | 0.907205 |
| 11/23/2003 12:47 | 7.2 | 2.49 | 7 | 0.906114 |
| 11/23/2003 12:47 | 7.3 | 2.488 | 7.1 | 0.905386 |
| 11/23/2003 12:47 | 7.4 | 2.486 | 7.2 | 0.904658 |
| 11/23/2003 12:47 | 7.5 | 2.486 | 7.3 | 0.904658 |
| 11/23/2003 12:47 | 7.6 | 2.484 | 7.4 | 0.90393 |
| 11/23/2003 12:47 | 7.7 | 2.479 | 7.5 | 0.902111 |
| 11/23/2003 12:47 | 7.8 | 2.477 | 7.6 | 0.901383 |
| 11/23/2003 12:47 | 7.9 | 2.477 | 7.7 | 0.901383 |
| 11/23/2003 12:48 | 8 | 2.475 | 7.8 | 0.900655 |
| 11/23/2003 12:48 | 8.1 | 2.473 | 7.9 | 0.899927 |
| 11/23/2003 12:48 | 8.2 | 2.47 | 8 | 0.898836 |
| 11/23/2003 12:48 | 8.3 | 2.47 | 8.1 | 0.898836 |
| 11/23/2003 12:48 | 8.4 | 2.47 | 8.2 | 0.898836 |
| 11/23/2003 12:48 | 8.5 | 2.466 | 8.3 | 0.89738 |
| 11/23/2003 12:48 | 8.6 | 2.466 | 8.4 | 0.89738 |
| 11/23/2003 12:48 | 8.7 | 2.464 | 8.5 | 0.896652 |
| 11/23/2003 12:48 | 8.8 | 2.461 | 8.6 | 0.89556 |
| 11/23/2003 12:48 | 8.9 | 2.459 | 8.7 | 0.894833 |
| 11/23/2003 12:49 | 9 | 2.457 | 8.8 | 0.894105 |
| 11/23/2003 12:49 | 9.1 | 2.457 | 8.9 | 0.894105 |
| 11/23/2003 12:49 | 9.2 | 2.457 | 9 | 0.894105 |
| 11/23/2003 12:49 | 9.3 | 2.455 | 9.1 | 0.893377 |
| 11/23/2003 12:49 | 9.4 | 2.453 | 9.2 | 0.892649 |
| 11/23/2003 12:49 | 9.5 | 2.453 | 9.3 | 0.892649 |
| 11/23/2003 12:49 | 9.6 | 2.45 | 9.4 | 0.891557 |
| 11/23/2003 12:49 | 9.7 | 2.45 | 9.5 | 0.891557 |
| 11/23/2003 12:49 | 9.8 | 2.446 | 9.6 | 0.890102 |
| 11/23/2003 12:49 | 9.9 | 2.444 | 9.7 | 0.889374 |
| 11/23/2003 12:50 | 10 | 2.439 | 9.8 | 0.887555 |
| 11/23/2003 12:50 | 10.1 | 2.444 | 9.9 | 0.889374 |
| 11/23/2003 12:50 | 10.2 | 2.439 | 10 | 0.887555 |
| 11/23/2003 12:51 | 11.2 | 2.417 | 11 | 0.879549 |
| 11/23/2003 12:52 | 12.2 | 2.419 | 12 | 0.880277 |

| | | | | |
|---|---|---|---|---|
| 11/23/2003 12:53 | 13.2 | 2.406 | 13 | 0.875546 |
| 11/23/2003 12:54 | 14.2 | 2.392 | 14 | 0.870451 |
| 11/23/2003 12:55 | 15.2 | 2.381 | 15 | 0.866448 |
| 11/23/2003 12:56 | 16.2 | 2.368 | 16 | 0.861718 |
| 11/23/2003 12:57 | 17.2 | 2.355 | 17 | 0.856987 |
| 11/23/2003 12:58 | 18.2 | 2.341 | 18 | 0.851892 |
| 11/23/2003 12:59 | 19.2 | 2.333 | 19 | 0.848981 |
| 11/23/2003 13:00 | 20.2 | 2.319 | 20 | 0.843886 |
| 11/23/2003 13:01 | 21.2 | 2.308 | 21 | 0.839884 |
| 11/23/2003 13:02 | 22.2 | 2.297 | 22 | 0.835881 |
| 11/23/2003 13:03 | 23.2 | 2.286 | 23 | 0.831878 |
| 11/23/2003 13:04 | 24.2 | 2.277 | 24 | 0.828603 |
| 11/23/2003 13:05 | 25.2 | 2.266 | 25 | 0.8246 |
| 11/23/2003 13:06 | 26.2 | 2.255 | 26 | 0.820597 |
| 11/23/2003 13:07 | 27.2 | 2.244 | 27 | 0.816594 |
| 11/23/2003 13:08 | 28.2 | 2.235 | 28 | 0.813319 |
| 11/23/2003 13:09 | 29.2 | 2.224 | 29 | 0.809316 |
| 11/23/2003 13:10 | 30.2 | 2.215 | 30 | 0.806041 |
| 11/23/2003 13:11 | 31.2 | 2.206 | 31 | 0.802766 |
| 11/23/2003 13:12 | 32.2 | 2.195 | 32 | 0.798763 |
| 11/23/2003 13:13 | 33.2 | 2.184 | 33 | 0.79476 |
| 11/23/2003 13:14 | 34.2 | 2.175 | 34 | 0.791485 |
| 11/23/2003 13:15 | 35.2 | 2.166 | 35 | 0.78821 |
| 11/23/2003 13:16 | 36.2 | 2.155 | 36 | 0.784207 |
| 11/23/2003 13:17 | 37.2 | 2.148 | 37 | 0.781659 |
| 11/23/2003 13:18 | 38.2 | 2.137 | 38 | 0.777656 |
| 11/23/2003 13:19 | 39.2 | 2.13 | 39 | 0.775109 |
| 11/23/2003 13:20 | 40.2 | 2.122 | 40 | 0.772198 |
| 11/23/2003 13:21 | 41.2 | 2.108 | 41 | 0.767103 |
| 11/23/2003 13:22 | 42.2 | 2.104 | 42 | 0.765648 |
| 11/23/2003 13:23 | 43.2 | 2.093 | 43 | 0.761645 |
| 11/23/2003 13:24 | 44.2 | 2.084 | 44 | 0.75837 |
| 11/23/2003 13:25 | 45.2 | 2.075 | 45 | 0.755095 |
| 11/23/2003 13:25 | 45.3 | 2.075 | 45.1 | 0.755095 |
| 11/23/2003 13:26 | 46.2 | 2.066 | 46 | 0.75182 |
| 11/23/2003 13:27 | 47.2 | 2.057 | 47 | 0.748544 |
| 11/23/2003 13:28 | 48.2 | 2.048 | 48 | 0.745269 |
| 11/23/2003 13:29 | 49.2 | 2.039 | 49 | 0.741994 |
| 11/23/2003 13:30 | 50.2 | 2.037 | 50 | 0.741266 |
| 11/23/2003 13:31 | 51.2 | 2.026 | 51 | 0.737263 |
| 11/23/2003 13:32 | 52.2 | 2.017 | 52 | 0.733988 |
| 11/23/2003 13:33 | 53.2 | 2.008 | 53 | 0.730713 |
| 11/23/2003 13:34 | 54.2 | 2.004 | 54 | 0.729258 |
| 11/23/2003 13:35 | 55.2 | 1.997 | 55 | 0.72671 |
| 11/23/2003 13:36 | 56.2 | 1.989 | 56 | 0.723799 |
| 11/23/2003 13:37 | 57.2 | 1.979 | 57 | 0.72016 |
| 11/23/2003 13:38 | 58.2 | 1.971 | 58 | 0.717249 |
| 11/23/2003 13:39 | 59.2 | 1.962 | 59 | 0.713974 |
| 11/23/2003 13:40 | 60.2 | 1.957 | 60 | 0.712154 |
| 11/23/2003 13:50 | 70.2 | 1.884 | 70 | 0.68559 |
| 11/23/2003 14:00 | 80.2 | 1.822 | 80 | 0.663028 |
| 11/23/2003 14:10 | 90.2 | 1.76 | 90 | 0.640466 |
| 11/23/2003 14:20 | 100.2 | 1.702 | 100 | 0.61936 |
| 11/23/2003 14:30 | 110.2 | 1.649 | 110 | 0.600073 |
| 11/23/2003 14:40 | 120.2 | 1.602 | 120 | 0.582969 |
| 11/23/2003 14:50 | 130.2 | 1.56 | 130 | 0.567686 |
| 11/23/2003 15:00 | 140.2 | 1.515 | 140 | 0.55131 |
| 11/23/2003 15:10 | 150.2 | 1.478 | 150 | 0.537846 |
| 11/23/2003 15:20 | 160.2 | 1.444 | 160 | 0.525473 |
| 11/23/2003 15:30 | 170.2 | 1.411 | 170 | 0.513464 |
| 11/23/2003 15:40 | 180.2 | 1.391 | 180 | 0.506186 |
| 11/23/2003 15:50 | 190.2 | 1.371 | 190 | 0.498908 |
| 11/23/2003 16:00 | 200.2 | 1.351 | 200 | 0.49163 |
| 11/23/2003 16:20 | 220.2 | 1.309 | 220 | 0.476346 |
| 11/23/2003 16:40 | 240.2 | 1.278 | 240 | 0.465066 |
| 11/23/2003 17:00 | 260.2 | 1.24 | 260 | 0.451237 |
| 11/23/2003 17:20 | 280.2 | 1.213 | 280 | 0.441412 |
| 11/23/2003 17:40 | 300.2 | 1.184 | 300 | 0.430859 |

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 16MWT15 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Falling head | **Test Date:** | 23-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .208' | 2.5 = R |
| Length of Well Screen (ft.) : | | 14 = L |
| Time for 37% head change (min.) : | | 385.00 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 2.71E-06 | ft./min. |
| 4.52E-08 | ft./sec. |
| 3.90E-03 | ft./day |
| 1.38E-06 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(14/.2081)}{2 \times 14 \times 385} =$$

$2.69 \times 10^{-6}$ Ft/min

CHECKED

2-18-04

**TETRA-TECH NUS**

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 16MWT17 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Falling head | **Test Date:** | 23-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 4.25 = R |
| Length of Well Screen (ft.) : | 10.6 = L |
| Time for 37% head change (min.) : | 3.20 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 3.48E-04 | ft./min. |
| 5.80E-06 | ft./sec. |
| 5.01E-01 | ft./day |
| 1.77E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

Tetra Tech NUS, Inc.

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 16MWT17

PROJECT NO.: 9060 GEOLOGIST: M. G. COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 15.40 TOC DATE: 11-23-03

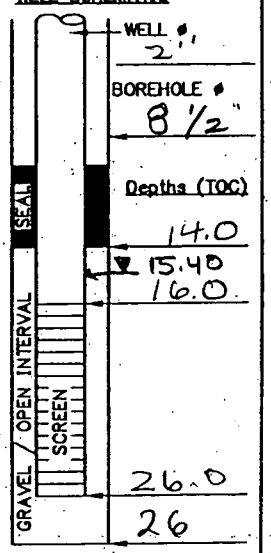
TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: SOLID SLUG PAGE 1 OF 1

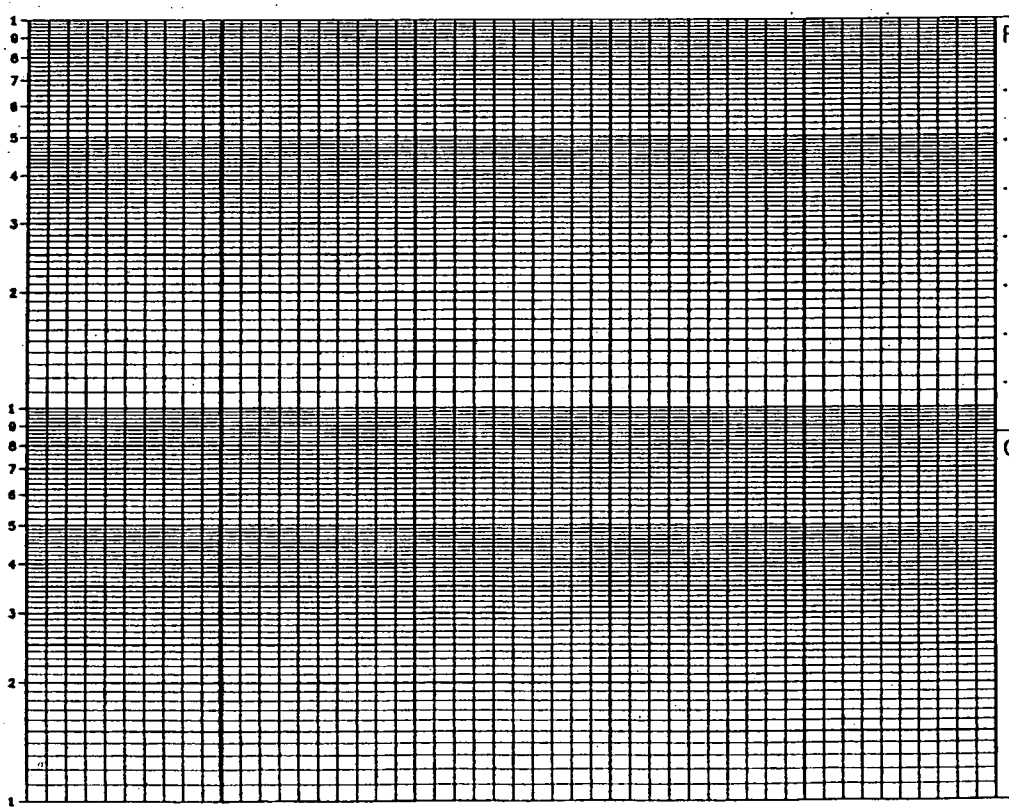
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC. ZERO AT SWL + START

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 0 | | 3 | .677 | |
| .1 | 1.280 | | 4 | .514 | |
| .2 | 1.725 | | 5 | .399 | |
| .3 | 1.651 | | 6 | .294 | |
| .4 | 1.590 | | 7 | .259 | |
| .5 | 1.526 | | 8 | .217 | |
| .6 | 1.469 | | 10 | .171 | |
| .7 | 1.419 | | 12 | .139 | |
| .8 | 1.362 | | 15 | .112 | |
| .9 | 1.324 | | 17 | .102 | |
| 1.0 | 1.276 | | | | |
| 2.0 | .919 | | | | |

WELL SCHEMATIC



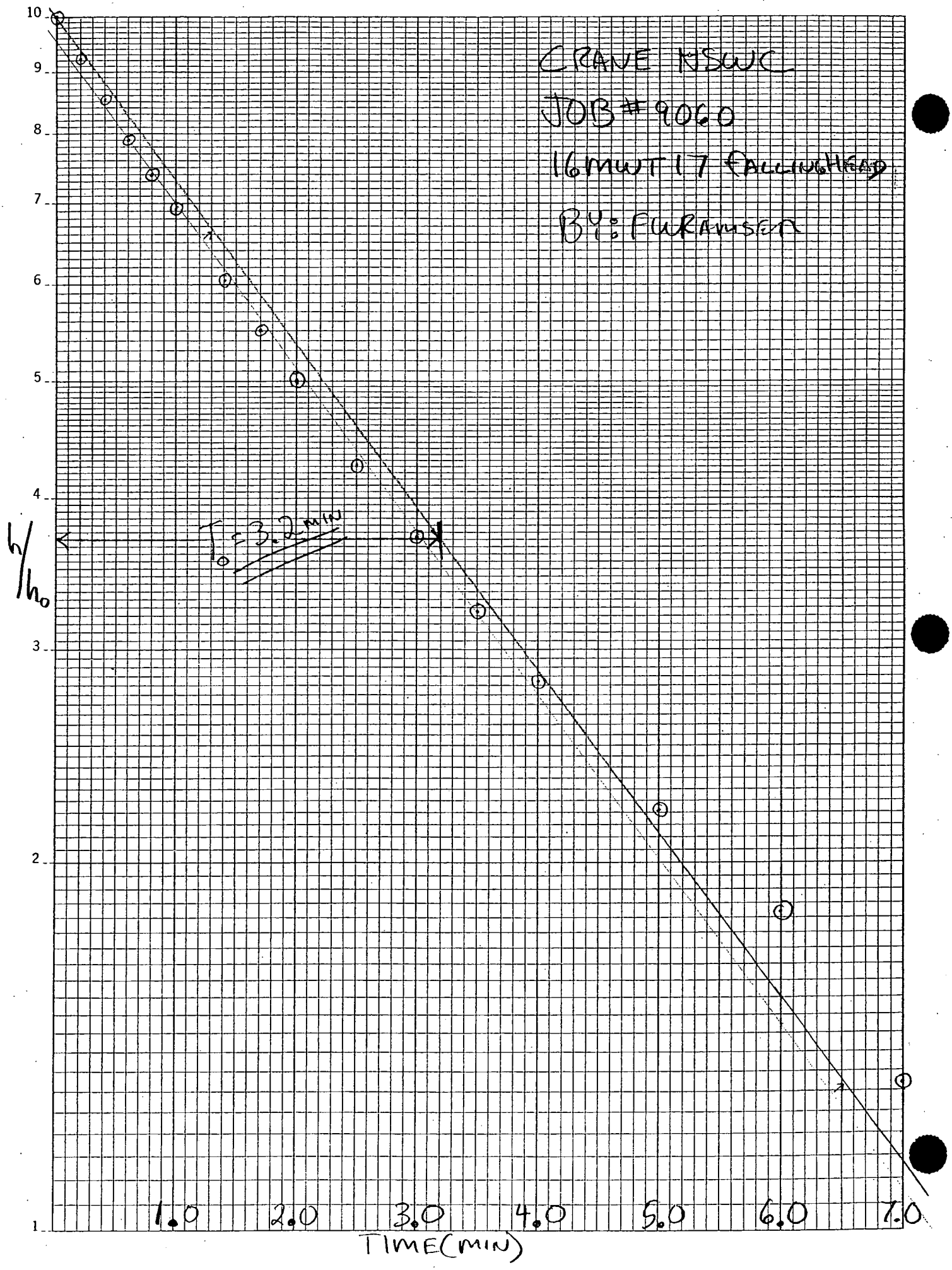

▽ Indicate SWL Depth on Drawing



REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD: FORM_HYDCONTST.dwg 07/06/99 INL




46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

In-Situ Inc. MiniTroll Pro

Report generated: 12/10/2003 8:47:40
Report from file: H:\Crane IN\SWMU13_16\MGC slug tests 03\site 16\SN06899 2003-11-23 105030
DataMgr Version 3.68 16MWT17falling#1.bin

Serial number: 6899
Firmware Version 3.07
Unit name:

Test name: 16MWT17falling#1

Test defined on: 11/23/2003 10:50:06
Test started on: 11/23/2003 10:50:30
Test stopped on: 11/23/2003 11:08:30
Test extracted on: N/A

Data gathered using Linear testing
Time between data Minutes.
Number of data san 180

TOTAL DATA SAMPL 180

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined referer 0 Feet H2O
Referenced on: test start
Pressure head at rel 10.617 Feet H2O

• ⇒ PLOTTED DATA

ho = 1.725

| Date | Time | ET (min) | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho | |
|---|---|---|---|---|---|---|
| 11/23/2003 | 10:50 | 0 | 0 | | | |
| 11/23/2003 | 10:50 | 0.1 | 1.28 | | | |
| 11/23/2003 | 10:50 | 0.2 | 1.725 | 0 | 1.000 | • |
| 11/23/2003 | 10:50 | 0.3 | 1.651 | 0.1 | 0.957 | |
| 11/23/2003 | 10:50 | 0.4 | 1.59 | 0.2 | 0.922 | • |
| 11/23/2003 | 10:51 | 0.5 | 1.526 | 0.3 | 0.885 | |
| 11/23/2003 | 10:51 | 0.6 | 1.469 | 0.4 | 0.852 | • |
| 11/23/2003 | 10:51 | 0.7 | 1.419 | 0.5 | 0.823 | |
| 11/23/2003 | 10:51 | 0.8 | 1.362 | 0.6 | 0.790 | • |
| 11/23/2003 | 10:51 | 0.9 | 1.324 | 0.7 | 0.768 | |
| 11/23/2003 | 10:51 | 1 | 1.276 | 0.8 | 0.740 | • |
| 11/23/2003 | 10:51 | 1.1 | 1.233 | 0.9 | 0.715 | |
| 11/23/2003 | 10:51 | 1.2 | 1.193 | 1 | 0.692 | • |
| 11/23/2003 | 10:51 | 1.3 | 1.153 | 1.1 | 0.668 | |
| 11/23/2003 | 10:51 | 1.4 | 1.114 | 1.2 | 0.646 | |
| 11/23/2003 | 10:52 | 1.5 | 1.08 | 1.3 | 0.626 | |
| 11/23/2003 | 10:52 | 1.6 | 1.044 | 1.4 | 0.605 | • |
| 11/23/2003 | 10:52 | 1.7 | 1.012 | 1.5 | 0.587 | |
| 11/23/2003 | 10:52 | 1.8 | 0.979 | 1.6 | 0.568 | |

| | | | | |
|---|---|---|---|---|
| 11/23/2003 10:52 | 1.9 | 0.949 | 1.7 | 0.550 |
| 11/23/2003 10:52 | 2 | 0.919 | 1.8 | 0.533 |
| 11/23/2003 10:52 | 2.1 | 0.891 | 1.9 | 0.517 |
| 11/23/2003 10:52 | 2.2 | 0.862 | 2 | 0.500 |
| 11/23/2003 10:52 | 2.3 | 0.834 | 2.1 | 0.483 |
| 11/23/2003 10:52 | 2.4 | 0.798 | 2.2 | 0.463 |
| 11/23/2003 10:53 | 2.5 | 0.788 | 2.3 | 0.457 |
| 11/23/2003 10:53 | 2.6 | 0.768 | 2.4 | 0.445 |
| 11/23/2003 10:53 | 2.7 | 0.737 | 2.5 | 0.427 |
| 11/23/2003 10:53 | 2.8 | 0.717 | 2.6 | 0.416 |
| 11/23/2003 10:53 | 2.9 | 0.697 | 2.7 | 0.404 |
| 11/23/2003 10:53 | 3 | 0.677 | 2.8 | 0.392 |
| 11/23/2003 10:53 | 3.1 | 0.659 | 2.9 | 0.382 |
| 11/23/2003 10:53 | 3.2 | 0.641 | 3 | 0.372 |
| 11/23/2003 10:53 | 3.3 | 0.622 | 3.1 | 0.361 |
| 11/23/2003 10:53 | 3.4 | 0.604 | 3.2 | 0.350 |
| 11/23/2003 10:54 | 3.5 | 0.59 | 3.3 | 0.342 |
| 11/23/2003 10:54 | 3.6 | 0.574 | 3.4 | 0.333 |
| 11/23/2003 10:54 | 3.7 | 0.558 | 3.5 | 0.323 |
| 11/23/2003 10:54 | 3.8 | 0.544 | 3.6 | 0.315 |
| 11/23/2003 10:54 | 3.9 | 0.528 | 3.7 | 0.306 |
| 11/23/2003 10:54 | 4 | 0.514 | 3.8 | 0.298 |
| 11/23/2003 10:54 | 4.1 | 0.499 | 3.9 | 0.289 |
| 11/23/2003 10:54 | 4.2 | 0.487 | 4 | 0.282 |
| 11/23/2003 10:54 | 4.3 | 0.475 | 4.1 | 0.275 |
| 11/23/2003 10:54 | 4.4 | 0.461 | 4.2 | 0.267 |
| 11/23/2003 10:55 | 4.5 | 0.449 | 4.3 | 0.260 |
| 11/23/2003 10:55 | 4.6 | 0.439 | 4.4 | 0.254 |
| 11/23/2003 10:55 | 4.7 | 0.429 | 4.5 | 0.249 |
| 11/23/2003 10:55 | 4.8 | 0.419 | 4.6 | 0.243 |
| 11/23/2003 10:55 | 4.9 | 0.407 | 4.7 | 0.236 |
| 11/23/2003 10:55 | 5 | 0.399 | 4.8 | 0.231 |
| 11/23/2003 10:55 | 5.1 | 0.389 | 4.9 | 0.226 |
| 11/23/2003 10:55 | 5.2 | 0.381 | 5 | 0.221 |
| 11/23/2003 10:55 | 5.3 | 0.37 | 5.1 | 0.214 |
| 11/23/2003 10:55 | 5.4 | 0.362 | 5.2 | 0.210 |
| 11/23/2003 10:56 | 5.5 | 0.354 | 5.3 | 0.205 |
| 11/23/2003 10:56 | 5.6 | 0.346 | 5.4 | 0.201 |
| 11/23/2003 10:56 | 5.7 | 0.338 | 5.5 | 0.196 |
| 11/23/2003 10:56 | 5.8 | 0.33 | 5.6 | 0.191 |
| 11/23/2003 10:56 | 5.9 | 0.324 | 5.7 | 0.188 |
| 11/23/2003 10:56 | 6 | 0.294 | 5.8 | 0.170 |
| 11/23/2003 10:56 | 6.1 | 0.31 | 5.9 | 0.180 |
| 11/23/2003 10:56 | 6.2 | 0.314 | 6 | 0.182 |
| 11/23/2003 10:56 | 6.3 | 0.315 | 6.1 | 0.183 |
| 11/23/2003 10:56 | 6.4 | 0.294 | 6.2 | 0.170 |
| 11/23/2003 10:57 | 6.5 | 0.288 | 6.3 | 0.167 |
| 11/23/2003 10:57 | 6.6 | 0.282 | 6.4 | 0.163 |
| 11/23/2003 10:57 | 6.7 | 0.276 | 6.5 | 0.160 |
| 11/23/2003 10:57 | 6.8 | 0.272 | 6.6 | 0.158 |
| 11/23/2003 10:57 | 6.9 | 0.265 | 6.7 | 0.154 |
| 11/23/2003 10:57 | 7 | 0.259 | 6.8 | 0.150 |
| 11/23/2003 10:57 | 7.1 | 0.255 | 6.9 | 0.148 |
| 11/23/2003 10:57 | 7.2 | 0.227 | 7 | 0.132 |
| 11/23/2003 10:57 | 7.3 | 0.243 | 7.1 | 0.141 |
| 11/23/2003 10:57 | 7.4 | 0.247 | 7.2 | 0.143 |
| 11/23/2003 10:58 | 7.5 | 0.249 | 7.3 | 0.144 |
| 11/23/2003 10:58 | 7.6 | 0.251 | 7.4 | 0.146 |

| | | | | |
|---|---|---|---|---|
| 11/23/2003 10:58 | 7.7 | 0.251 | 7.5 | 0.146 |
| 11/23/2003 10:58 | 7.8 | 0.227 | 7.6 | 0.132 |
| 11/23/2003 10:58 | 7.9 | 0.223 | 7.7 | 0.129 |
| 11/23/2003 10:58 | 8 | 0.217 | 7.8 | 0.126 |
| 11/23/2003 10:58 | 8.1 | 0.217 | 7.9 | 0.126 |
| 11/23/2003 10:58 | 8.2 | 0.211 | 8 | 0.122 |
| 11/23/2003 10:58 | 8.3 | 0.209 | 8.1 | 0.121 |
| 11/23/2003 10:58 | 8.4 | 0.205 | 8.2 | 0.119 |
| 11/23/2003 10:59 | 8.5 | 0.207 | 8.3 | 0.120 |
| 11/23/2003 10:59 | 8.6 | 0.203 | 8.4 | 0.118 |
| 11/23/2003 10:59 | 8.7 | 0.199 | 8.5 | 0.115 |
| 11/23/2003 10:59 | 8.8 | 0.195 | 8.6 | 0.113 |
| 11/23/2003 10:59 | 8.9 | 0.195 | 8.7 | 0.113 |
| 11/23/2003 10:59 | 9 | 0.191 | 8.8 | 0.111 |
| 11/23/2003 10:59 | 9.1 | 0.189 | 8.9 | 0.110 |
| 11/23/2003 10:59 | 9.2 | 0.187 | 9 | 0.108 |
| 11/23/2003 10:59 | 9.3 | 0.185 | 9.1 | 0.107 |
| 11/23/2003 10:59 | 9.4 | 0.181 | 9.2 | 0.105 |
| 11/23/2003 11:00 | 9.5 | 0.181 | 9.3 | 0.105 |
| 11/23/2003 11:00 | 9.6 | 0.177 | 9.4 | 0.103 |
| 11/23/2003 11:00 | 9.7 | 0.173 | 9.5 | 0.100 |
| 11/23/2003 11:00 | 9.8 | 0.173 | 9.6 | 0.100 |
| 11/23/2003 11:00 | 9.9 | 0.171 | 9.7 | 0.099 |
| 11/23/2003 11:00 | 10 | 0.171 | 9.8 | 0.099 |
| 11/23/2003 11:00 | 10.1 | 0.164 | 9.9 | 0.095 |
| 11/23/2003 11:00 | 10.2 | 0.162 | 10 | 0.094 |
| 11/23/2003 11:01 | 11.2 | 0.151 | 11 | 0.088 |
| 11/23/2003 11:02 | 12.2 | 0.137 | 12 | 0.079 |
| 11/23/2003 11:03 | 13.2 | 0.125 | 13 | 0.072 |
| 11/23/2003 11:04 | 14.2 | 0.119 | 14 | 0.069 |
| 11/23/2003 11:05 | 15.2 | 0.11 | 15 | 0.064 |
| 11/23/2003 11:06 | 16.2 | 0.108 | 16 | 0.063 |
| 11/23/2003 11:07 | 17.2 | 0.1 | 17 | 0.058 |

TETRA-TECH NUS

**HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET**
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 16MWT17 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Falling head | **Test Date:** | 23-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083 | 1 = r |
| Effective Radius of Well Screen (in.) : | .354 | 4.25 = R |
| Length of Well Screen (ft.) : | | 10.6 = L |
| Time for 37% head change (min.) : | | 3.20 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 3.48E-04 | ft./min. |
| 5.80E-06 | ft./sec. |
| 5.01E-01 | ft./day |
| 1.77E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(10.6/.354)}{2 \times 10.6 \times 3.20} =$$

$3.45 \times 10^{-4}$ Ft/min

CHECKED

2-18-04

TETRA-TECH NUS

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 16MWT17 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 23-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | |
|---|---|
| Radius of Well Casing (in.) : | 1 = r |
| Effective Radius of Well Screen (in.) : | 4.25 = R |
| Length of Well Screen (ft.) : | 10.6 = L |
| Time for 37% head change (min.) : | 3.15 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 3.53E-04 | ft./min. |
| 5.89E-06 | ft./sec. |
| 5.09E-01 | ft./day |
| 1.80E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

# HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

**Tetra Tech NUS, Inc.**

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 16MWT17

PROJECT NO.: 9060 GEOLOGIST: M. G. COCHRAN

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 15.40 TOC DATE: 11-23-03

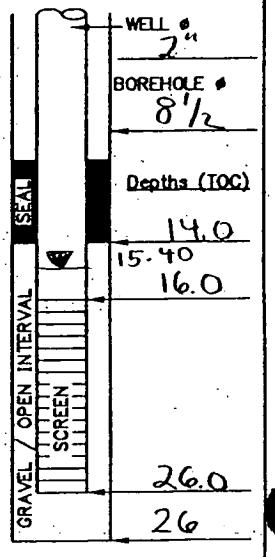
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: SOLID SLUG PAGE 1 OF 1

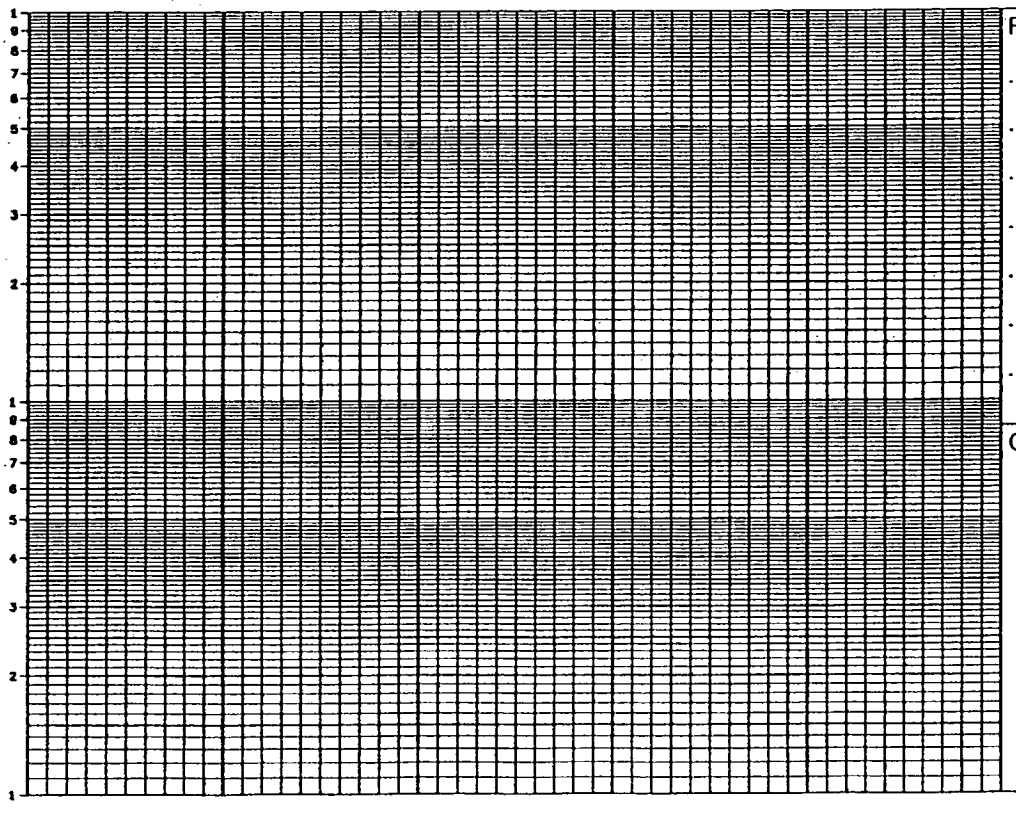
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC 2

| ELAPSED TIME (min. or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) | ELAPSED TIME (min or sec.) | MEASURED WATER LEVEL (feet) | DRAWDOWN OR HEAD (ΔH) (feet) |
|---|---|---|---|---|---|
| 0 | 0 | | 3 | -.323 | |
| .1 | -1.566 | | 4 | -.252 | |
| .2 | -.883 | | 5 | -.200 | |
| .3 | -.790 | | 6 | -.170 | |
| .4 | -.754 | | 7 | -.145 | |
| .5 | -.722 | | 8 | -.129 | |
| .6 | -.691 | | 10 | -.109 | |
| .7 | -.665 | | 12 | -.097 | |
| .8 | -.639 | | 15 | -.087 | |
| .9 | -.619 | | 18 | -.083 | |
| 1.0 | -.597 | | | | |
| 2.0 | -.434 | | | | |

WELL SCHEMATIC



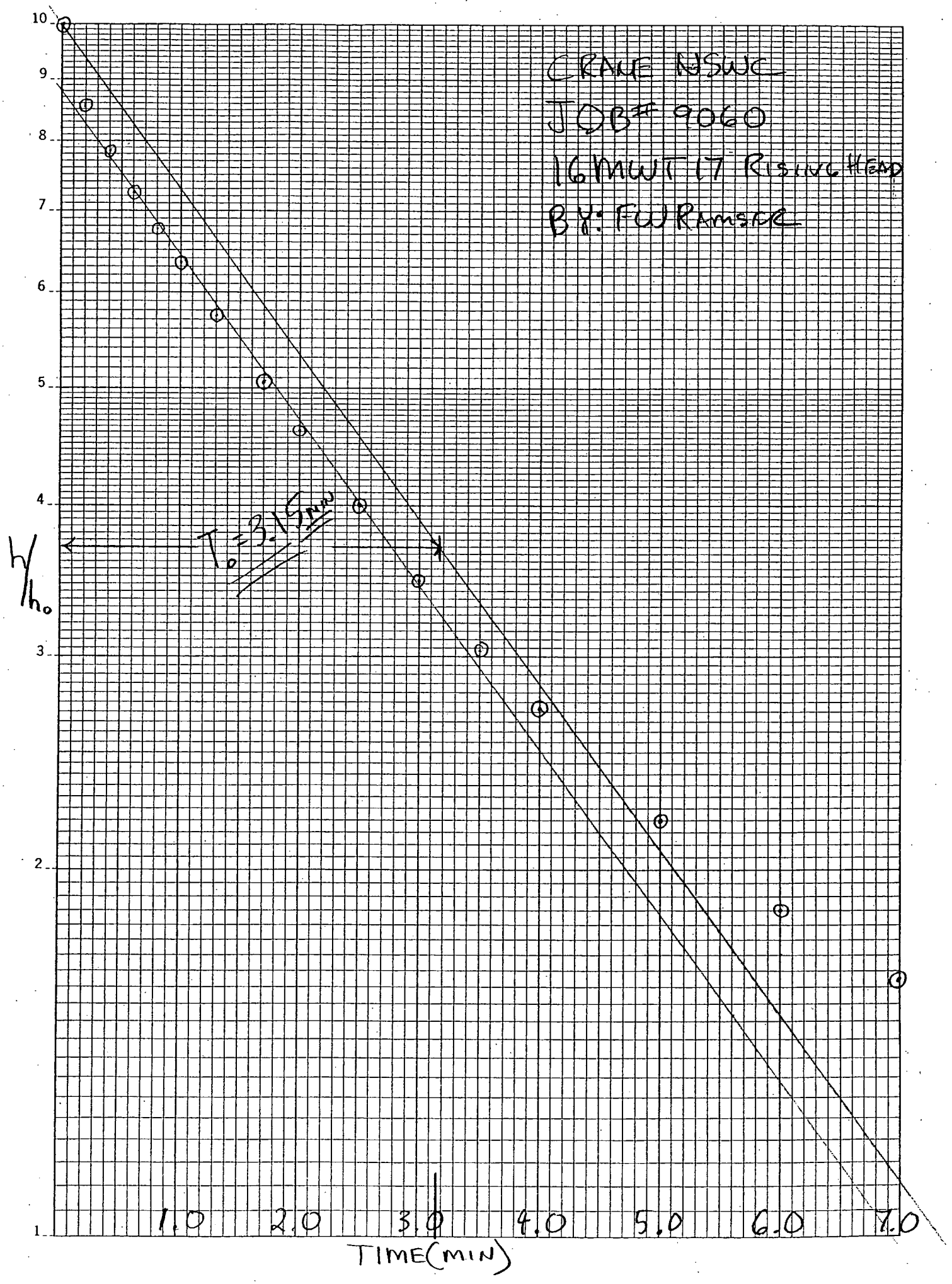

▽ Indicate SWL Depth on Drawing



REMARKS:

CALCS, SKETCH MAPS, ETC.:

ACAD:FORM_HYDCONTST.dwg 07/06/99 INL




K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 4650

In-Situ Inc. MiniTroll Pro

Report generated: 12/10/2003 8:54:48
Report from file: H:\Crane IN\SWMU13_16\MGC slug tests 03\site 16\SN06899 2003-11-23 111045 16MWT17rising#1.bin
DataMgr Version 3.68

Serial number: 6899
Firmware Version 3.07
Unit name:

Test name: 16MWT17rising#1

Test defined on: 11/23/2003 11:10:06
Test started on: 11/23/2003 11:10:45
Test stopped on: 11/23/2003 11:31:18
Test extracted on: N/A

Data gathered using Linear testing
Time between data points: Minutes.
Number of data samples: 206

TOTAL DATA SAMPLES 206

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: Surface
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at reference: 10.706 Feet H2O

ho = -0.883

| Date | Time | ET (min) | Chan[2] Feet H2O | Adjusted ET. (min) | h/ho |
|---|---|---|---|---|---|
| | 11/23/2003 11:10 | 0 | 0 | | |
| | 11/23/2003 11:10 | 0.1 | -1.566 | | |
| | 11/23/2003 11:10 | 0.2 | -0.883 | 0 | 1.000 |
| | 11/23/2003 11:11 | 0.3 | -0.79 | 0.1 | 0.895 |
| | 11/23/2003 11:11 | 0.4 | -0.754 | 0.2 | 0.854 |
| | 11/23/2003 11:11 | 0.5 | -0.722 | 0.3 | 0.818 |
| | 11/23/2003 11:11 | 0.6 | -0.691 | 0.4 | 0.783 |
| | 11/23/2003 11:11 | 0.7 | -0.665 | 0.5 | 0.753 |
| | 11/23/2003 11:11 | 0.8 | -0.639 | 0.6 | 0.724 |
| | 11/23/2003 11:11 | 0.9 | -0.619 | 0.7 | 0.701 |
| | 11/23/2003 11:11 | 1 | -0.597 | 0.8 | 0.676 |
| | 11/23/2003 11:11 | 1.1 | -0.576 | 0.9 | 0.652 |
| | 11/23/2003 11:11 | 1.2 | -0.559 | 1 | 0.633 |
| | 11/23/2003 11:12 | 1.3 | -0.54 | 1.1 | 0.612 |
| | 11/23/2003 11:12 | 1.4 | -0.522 | 1.2 | 0.591 |
| | 11/23/2003 11:12 | 1.5 | -0.506 | 1.3 | 0.573 |
| | 11/23/2003 11:12 | 1.6 | -0.49 | 1.4 | 0.555 |
| | 11/23/2003 11:12 | 1.7 | -0.476 | 1.5 | 0.539 |
| | 11/23/2003 11:12 | 1.8 | -0.46 | 1.6 | 0.521 |

| | | | | |
|---|---|---|---|---|
| 11/23/2003 11:12 | 1.9 | -0.448 | 1.7 | 0.507 |
| 11/23/2003 11:12 | 2 | -0.434 | 1.8 | 0.492 |
| 11/23/2003 11:12 | 2.1 | -0.419 | 1.9 | 0.475 |
| 11/23/2003 11:12 | 2.2 | -0.407 | 2 | 0.461 |
| 11/23/2003 11:13 | 2.3 | -0.399 | 2.1 | 0.452 |
| 11/23/2003 11:13 | 2.4 | -0.387 | 2.2 | 0.438 |
| 11/23/2003 11:13 | 2.5 | -0.373 | 2.3 | 0.422 |
| 11/23/2003 11:13 | 2.6 | -0.363 | 2.4 | 0.411 |
| 11/23/2003 11:13 | 2.7 | -0.353 | 2.5 | 0.400 |
| 11/23/2003 11:13 | 2.8 | -0.343 | 2.6 | 0.388 |
| 11/23/2003 11:13 | 2.9 | -0.333 | 2.7 | 0.377 |
| 11/23/2003 11:13 | 3 | -0.323 | 2.8 | 0.366 |
| 11/23/2003 11:13 | 3.1 | -0.314 | 2.9 | 0.356 |
| 11/23/2003 11:13 | 3.2 | -0.306 | 3 | 0.347 |
| 11/23/2003 11:14 | 3.3 | -0.298 | 3.1 | 0.337 |
| 11/23/2003 11:14 | 3.4 | -0.29 | 3.2 | 0.328 |
| 11/23/2003 11:14 | 3.5 | -0.282 | 3.3 | 0.319 |
| 11/23/2003 11:14 | 3.6 | -0.276 | 3.4 | 0.313 |
| 11/23/2003 11:14 | 3.7 | -0.268 | 3.5 | 0.304 |
| 11/23/2003 11:14 | 3.8 | -0.262 | 3.6 | 0.297 |
| 11/23/2003 11:14 | 3.9 | -0.256 | 3.7 | 0.290 |
| 11/23/2003 11:14 | 4 | -0.252 | 3.8 | 0.285 |
| 11/23/2003 11:14 | 4.1 | -0.244 | 3.9 | 0.276 |
| 11/23/2003 11:14 | 4.2 | -0.24 | 4 | 0.272 |
| 11/23/2003 11:15 | 4.3 | -0.232 | 4.1 | 0.263 |
| 11/23/2003 11:15 | 4.4 | -0.228 | 4.2 | 0.258 |
| 11/23/2003 11:15 | 4.5 | -0.222 | 4.3 | 0.251 |
| 11/23/2003 11:15 | 4.6 | -0.22 | 4.4 | 0.249 |
| 11/23/2003 11:15 | 4.7 | -0.214 | 4.5 | 0.242 |
| 11/23/2003 11:15 | 4.8 | -0.206 | 4.6 | 0.233 |
| 11/23/2003 11:15 | 4.9 | -0.204 | 4.7 | 0.231 |
| 11/23/2003 11:15 | 5 | -0.2 | 4.8 | 0.227 |
| 11/23/2003 11:15 | 5.1 | -0.198 | 4.9 | 0.224 |
| 11/23/2003 11:15 | 5.2 | -0.194 | 5 | 0.220 |
| 11/23/2003 11:16 | 5.3 | -0.187 | 5.1 | 0.212 |
| 11/23/2003 11:16 | 5.4 | -0.185 | 5.2 | 0.210 |
| 11/23/2003 11:16 | 5.5 | -0.183 | 5.3 | 0.207 |
| 11/23/2003 11:16 | 5.6 | -0.179 | 5.4 | 0.203 |
| 11/23/2003 11:16 | 5.7 | -0.178 | 5.5 | 0.202 |
| 11/23/2003 11:16 | 5.8 | -0.174 | 5.6 | 0.197 |
| 11/23/2003 11:16 | 5.9 | -0.173 | 5.7 | 0.196 |
| 11/23/2003 11:16 | 6 | -0.17 | 5.8 | 0.193 |
| 11/23/2003 11:16 | 6.1 | -0.165 | 5.9 | 0.187 |
| 11/23/2003 11:16 | 6.2 | -0.163 | 6 | 0.185 |
| 11/23/2003 11:17 | 6.3 | -0.161 | 6.1 | 0.182 |
| 11/23/2003 11:17 | 6.4 | -0.159 | 6.2 | 0.180 |
| 11/23/2003 11:17 | 6.5 | -0.155 | 6.3 | 0.176 |
| 11/23/2003 11:17 | 6.6 | -0.153 | 6.4 | 0.173 |
| 11/23/2003 11:17 | 6.7 | -0.153 | 6.5 | 0.173 |
| 11/23/2003 11:17 | 6.8 | -0.149 | 6.6 | 0.169 |
| 11/23/2003 11:17 | 6.9 | -0.147 | 6.7 | 0.166 |
| 11/23/2003 11:17 | 7 | -0.145 | 6.8 | 0.164 |
| 11/23/2003 11:17 | 7.1 | -0.145 | 6.9 | 0.164 |
| 11/23/2003 11:17 | 7.2 | -0.143 | 7 | 0.162 |
| 11/23/2003 11:18 | 7.3 | -0.143 | 7.1 | 0.162 |
| 11/23/2003 11:18 | 7.4 | -0.141 | 7.2 | 0.160 |
| 11/23/2003 11:18 | 7.5 | -0.143 | 7.3 | 0.162 |
| 11/23/2003 11:18 | 7.6 | -0.139 | 7.4 | 0.157 |

| | | | | |
|---|---|---|---|---|
| 11/23/2003 11:18 | 7.7 | -0.135 | 7.5 | 0.153 |
| 11/23/2003 11:18 | 7.8 | -0.131 | 7.6 | 0.148 |
| 11/23/2003 11:18 | 7.9 | -0.131 | 7.7 | 0.148 |
| 11/23/2003 11:18 | 8 | -0.129 | 7.8 | 0.146 |
| 11/23/2003 11:18 | 8.1 | -0.129 | 7.9 | 0.146 |
| 11/23/2003 11:18 | 8.2 | -0.127 | 8 | 0.144 |
| 11/23/2003 11:19 | 8.3 | -0.129 | 8.1 | 0.146 |
| 11/23/2003 11:19 | 8.4 | -0.125 | 8.2 | 0.142 |
| 11/23/2003 11:19 | 8.5 | -0.127 | 8.3 | 0.144 |
| 11/23/2003 11:19 | 8.6 | -0.125 | 8.4 | 0.142 |
| 11/23/2003 11:19 | 8.7 | -0.123 | 8.5 | 0.139 |
| 11/23/2003 11:19 | 8.8 | -0.121 | 8.6 | 0.137 |
| 11/23/2003 11:19 | 8.9 | -0.121 | 8.7 | 0.137 |
| 11/23/2003 11:19 | 9 | -0.117 | 8.8 | 0.133 |
| 11/23/2003 11:19 | 9.1 | -0.119 | 8.9 | 0.135 |
| 11/23/2003 11:19 | 9.2 | -0.123 | 9 | 0.139 |
| 11/23/2003 11:20 | 9.3 | -0.117 | 9.1 | 0.133 |
| 11/23/2003 11:20 | 9.4 | -0.115 | 9.2 | 0.130 |
| 11/23/2003 11:20 | 9.5 | -0.113 | 9.3 | 0.128 |
| 11/23/2003 11:20 | 9.6 | -0.113 | 9.4 | 0.128 |
| 11/23/2003 11:20 | 9.7 | -0.113 | 9.5 | 0.128 |
| 11/23/2003 11:20 | 9.8 | -0.111 | 9.6 | 0.126 |
| 11/23/2003 11:20 | 9.9 | -0.107 | 9.7 | 0.121 |
| 11/23/2003 11:20 | 10 | -0.109 | 9.8 | 0.123 |
| 11/23/2003 11:20 | 10.1 | -0.111 | 9.9 | 0.126 |
| 11/23/2003 11:20 | 10.2 | -0.111 | 10 | 0.126 |
| 11/23/2003 11:21 | 11.2 | -0.099 | 11 | 0.112 |
| 11/23/2003 11:22 | 12.2 | -0.097 | 12 | 0.110 |
| 11/23/2003 11:23 | 13.2 | -0.093 | 13 | 0.105 |
| 11/23/2003 11:24 | 14.2 | -0.087 | 14 | 0.099 |
| 11/23/2003 11:25 | 15.2 | -0.089 | 15 | 0.101 |
| 11/23/2003 11:26 | 16.2 | -0.087 | 16 | 0.099 |
| 11/23/2003 11:27 | 17.2 | -0.087 | 17 | 0.099 |
| 11/23/2003 11:28 | 18.2 | -0.083 | 18 | 0.094 |
| 11/23/2003 11:29 | 19.2 | -0.085 | 19 | 0.096 |
| 11/23/2003 11:30 | 20.2 | -0.081 | 20 | 0.092 |

**TETRA-TECH NUS**

## HYDRAULIC CONDUCTIVITY TEST DATA EVALUATION SHEET
**Hvorslev Method**

| | | | |
|---|---|---|---|
| **Project Name:** | Crane NSWC | **Well/Boring No.:** | 16MWT17 |
| **Project No.:** | 9060 | **Aquifer Type:** | Bedrock |
| **Test Type:** | Rising head | **Test Date:** | 23-Nov-03 |

**Done By:** FWRamser
**Checked By:**

| | | |
|---|---|---|
| Radius of Well Casing (in.) : | .083' | 1 = r |
| Effective Radius of Well Screen (in.) : | .354' | 4.25 = R |
| Length of Well Screen (ft.) : | | 10.6 = L |
| Time for 37% head change (min.) : | | 3.15 = To |

**Hydraulic Conductivity (K) :**

| | |
|---|---|
| 3.53E-04 | ft./min. |
| 5.89E-06 | ft./sec. |
| 5.09E-01 | ft./day |
| 1.80E-04 | cm./sec. |

**Equation:**

$$K = \frac{r^2 \times Ln(L/R)}{2 \times L \times To}$$

$$\frac{.083^2 \times LN(10.6/.354)}{2 \times 10.6 \times 3.15} =$$

$3.51 \times 10^{-4}$ Ft/min

CHECKED

2-18-04

| CLIENT | JOB NUMBER |
|---|---|
| NSWC CRANE | 9060 |

SUBJECT: GW FLOW GRADIENT/VELOCITIES - SWMU 16 (SHALLOW)

BASED ON: | DRAWING NUMBER:

| BY | CHECKED BY | APPROVED BY | DATE |
|---|---|---|---|
| FWR | FCW | | |

VELOCITY + Shallow GROUND WATER:

NORTH AREA: $i = dh/dl$, $dh = 751.18 - 747.03 = 4.15$, $dl = 210$

$i = \frac{4.15}{210} =$

$i = 0.0198$ ✓

K = 1.83 ft/day (FROM TABLE 1-4, AVG K SWMU 16)

n = 0.005 (ASSUMED FRACTURE VOL. PER UNIT VOL OF ROCK MASS)

$V = Ki/n$

$= (1.83 ft/day)(0.0198)/0.005$

$= 7.3$ ft/day ✓

EAST-CENTRAL:

$i = \frac{dh}{dl} = \frac{8'}{110} = 0.0727$ ✓

K = 1.83 ft/day (FROM TABLE 1-4 AVG. K SWMU 16)

n = 0.005 (ASSUMED FRACTURE VOL. PER UNIT VOL OF ROCK MASS)

$V = Ki/n$

$= (1.83 ft/day)(0.0727)/(.005)$

$= 26.62$ ft/day ✓

| CLIENT | JOB NUMBER |
|---|---|
| NSWC CRANE | 9060 |

SUBJECT: GW FLOW GRADIENT + SEEPAGE VELOCITY. - SWMU 16 (INTERMEDIATE)

| BASED ON | DRAWING NUMBER | | |
|---|---|---|---|
| BY | CHECKED BY FAW | APPROVED BY | DATE |

VELOCITY:

* INTERMEDIATE GROUND WATER

$$i = \frac{dh}{dl} = \left(\frac{0.5}{70} + \frac{0.5}{200}\right)\frac{1}{2}$$

$$= 0.0048$$

K = 0.611 ft/day (FROM TABLE 1-4, AVE K SWMU 16)

n = 0.005

$$V = Ki/n$$

$$= (0.611 \text{ ft/day})(0.0048)/(0.005)$$

$$V = 0.59 \text{ ft/day}$$

| | |
|---|---|
| CLIENT NSWC CRANE | JOB NUMBER 9060 |
| SUBJECT GW FLOW GRADIENT + SEEPAGE VELOCITY - SWMU 16 (DEEP GW) | |
| BASED ON | DRAWING NUMBER |
| BY FWR / CHECKED BY FCW | APPROVED BY / DATE |

VELOCITY: * DEEP GROUNDWATER

$i = \frac{dh}{dl} = \frac{3}{150}$ ✓
$= 0.02$

K = 0.004 ft/day (FROM TABLE 1-4, AVE K SWMU 16)

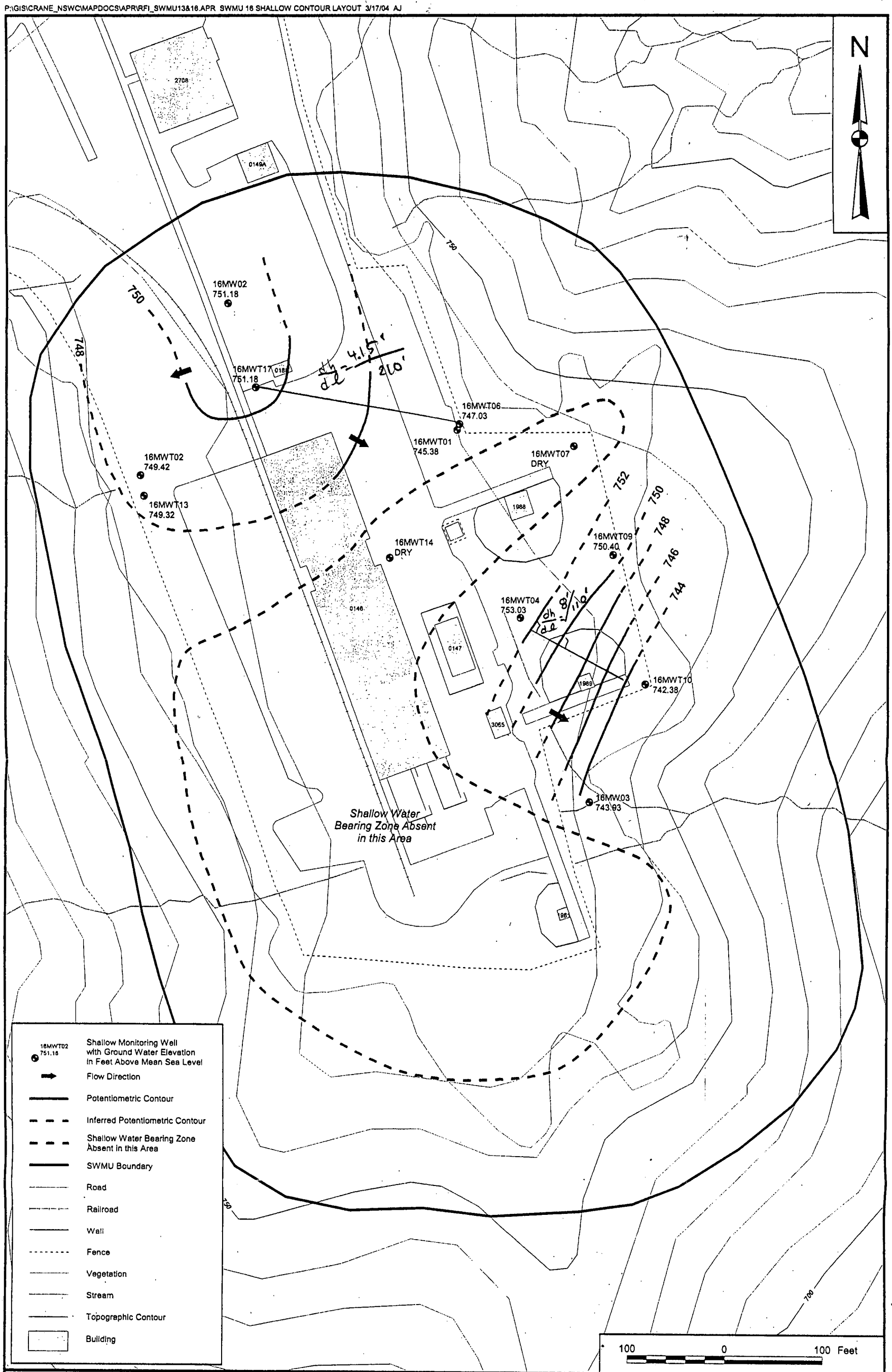
n = 0.005

$V = Ki/n$

$= (0.004 \text{ ft/day})(0.02)/0.005$

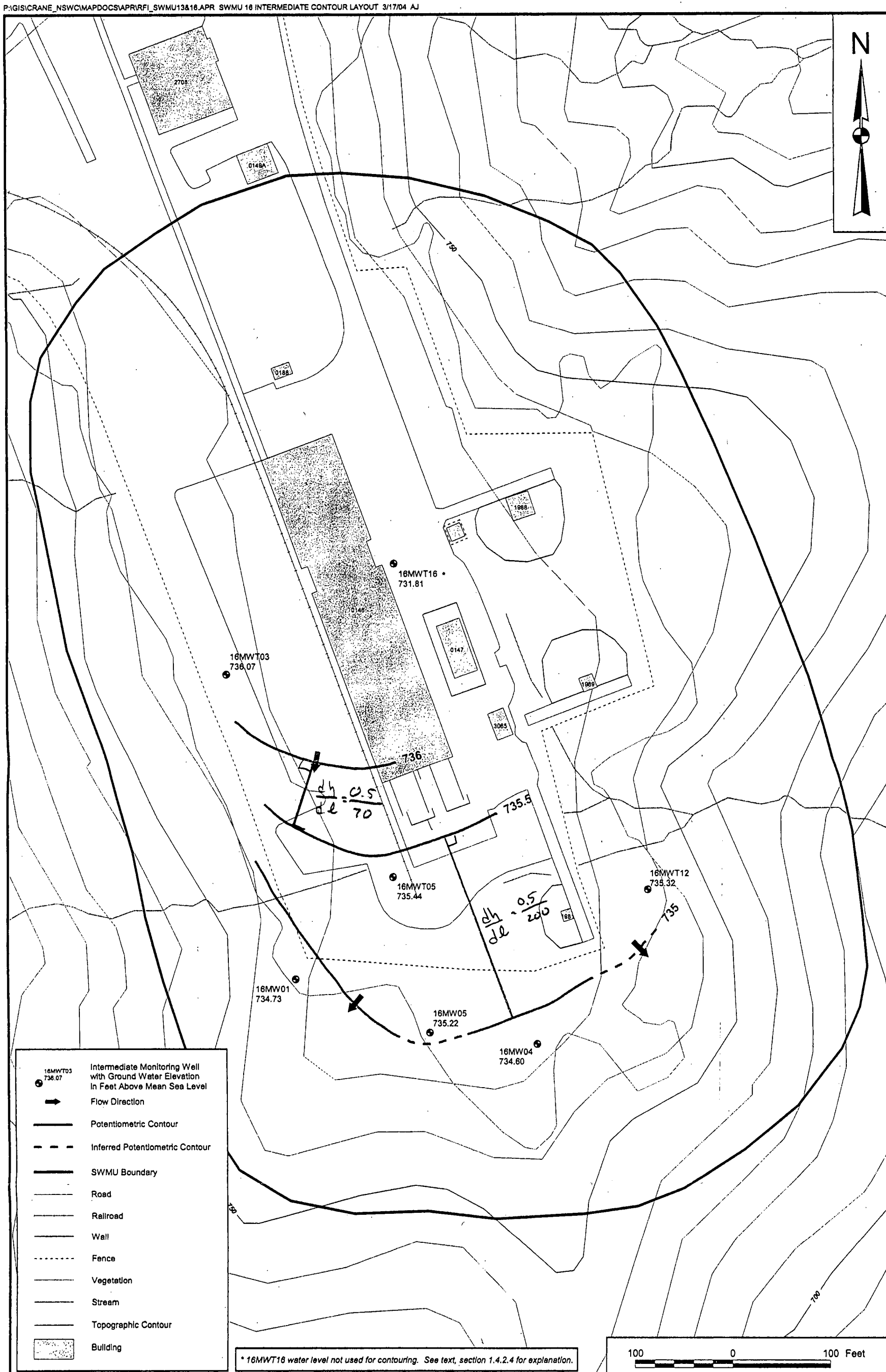
$= \underline{\underline{0.016 \text{ ft/day}}}$ ✓

P:\GIS\CRANE_NSWC\MAPDOCS\APR\RFI_SWMU13&16.APR SWMU 16 SHALLOW CONTOUR LAYOUT 3/17/04 AJ




| | | | |
|---|---|---|---|
| DRAWN BY A. JANOCHA | DATE 2/23/04 | POTENTIOMETRIC SURFACE MAP FOR<br>SHALLOW WELLS - JANUARY 24, 2004<br>SWMU 16 - CAST HIGH EXPLOSIVES FILL/BUILDING 146 INCINERATOR<br>NSWC CRANE<br>CRANE, INDIANA | CONTRACT NUMBER CTO 0279 |
| CHECKED BY F. RAMSER | DATE 3/17/04 | | APPROVED BY — DATE — |
| COST/SCHEDULE-AREA | | | APPROVED BY — DATE — |
| SCALE AS NOTED | | | DRAWING NO. FIGURE 1 - 17 / REV 0 |

P:\GIS\CRANE_NSWC\MAPDOCS\APR\RFI_SWMU13&16.APR SWMU 16 INTERMEDIATE CONTOUR LAYOUT 3/17/04 AJ

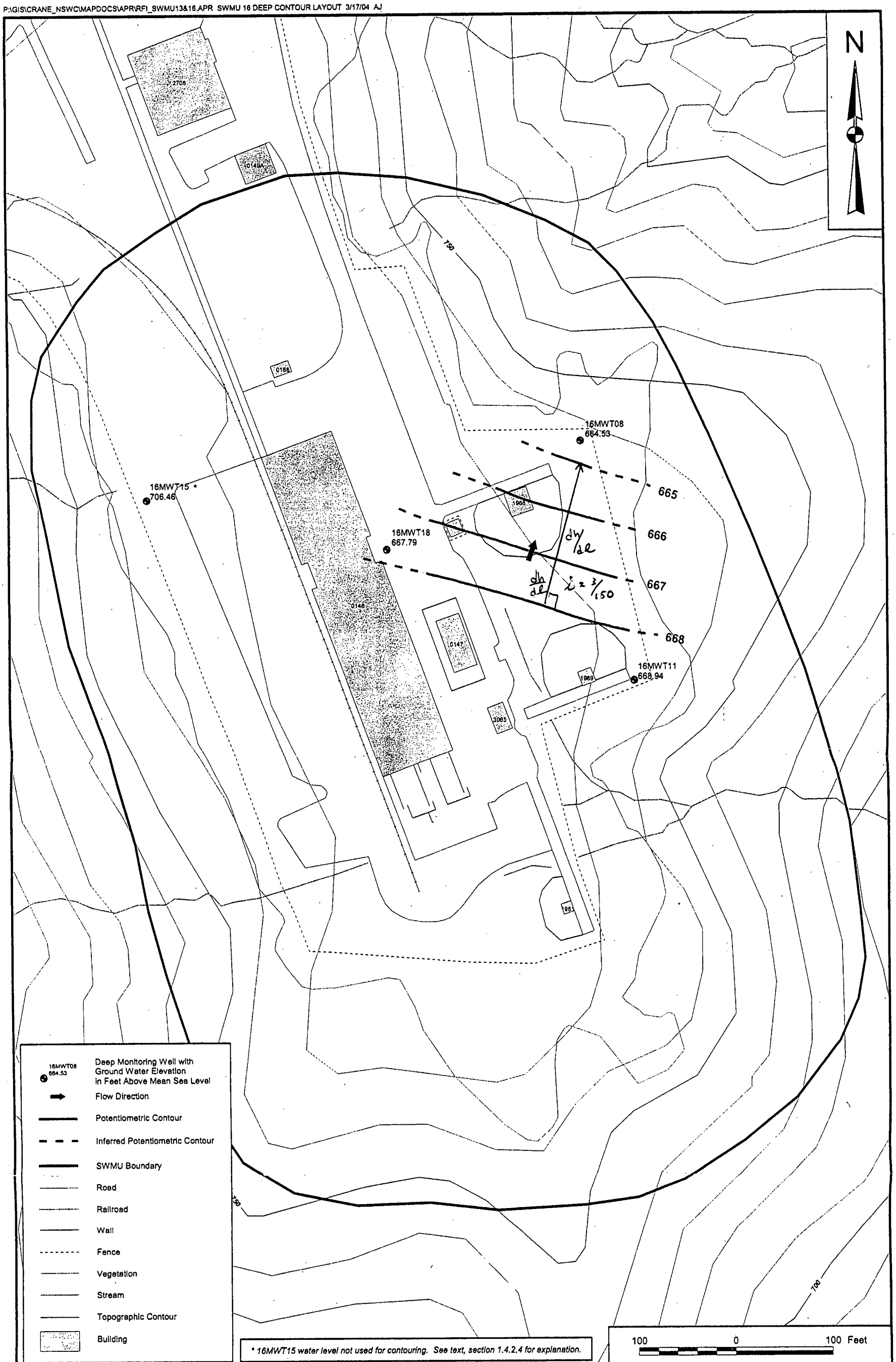



| DRAWN BY | DATE |
|---|---|
| A. JANOCHA | 2/23/04 |
| CHECKED BY | DATE |
| F. RAMSER | 3/17/04 |
| COST/SCHEDULE-AREA | |
| SCALE | |
| AS NOTED | |

POTENTIOMETRIC SURFACE MAP FOR
INTERMEDIATE WELLS - JANUARY 24, 2004
SWMU 16 - CAST HIGH EXPLOSIVES FILL/BUILDING 146 INCINERATOR
NSWC CRANE
CRANE, INDIANA

| CONTRACT NUMBER | |
|---|---|
| CTO 0279 | |
| APPROVED BY | DATE |
| APPROVED BY | DATE |
| DRAWING NO. FIGURE 1 - 18 | REV 0 |

P:\GIS\CRANE_NSWC\MAPDOCS\APR\RFI_SWMU13&16.APR SWMU 16 DEEP CONTOUR LAYOUT 3/17/04 AJ




| | | | |
|---|---|---|---|
| DRAWN BY A. JANOCHA | DATE 2/23/04 | POTENTIOMETRIC SURFACE MAP FOR DEEP WELLS - JANUARY 24, 2004 SWMU 16 - CAST HIGH EXPLOSIVES FILL/BUILDING 146 INCINERATOR NSWC CRANE CRANE, INDIANA | CONTRACT NUMBER CTO 0279 |
| CHECKED BY F. RAMSER | DATE 3/17/04 | | APPROVED BY — DATE — |
| COST/SCHEDULE-AREA | | | APPROVED BY — DATE — |
| SCALE AS NOTED | | | DRAWING NO. FIGURE 1 - 19 REV 0 |