N90845.AR.000761

Outpost Monitoring Well Installation Summary Report

Naval Weapons Industrial Reserve Plant (NWIRP)

Bethpage, New York

Engineering Field Activity Northeast
Naval Facilities Engineering Command

Contract Number N62467-94-D-0888

Contract Task Order 0812

March 2004

TETRA TECH NUS, INC.

TETRA TECH NUS, INC.
661 Andersen Drive • Pittsburgh, PA 15220
Tel 412.921.7090 • Fax 412.921.4040 • www.tetratech.com

PITT-05-4-007

May 4, 2004

Mr. Jim Colter (Code EV2/JLC)
Remedial Project Manager
Engineering Field Activity, Northeast
Naval Facilities Engineering Command
10 Industrial Highway, MS#82
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N62467-94-D-0888
Contract Task Order 0812

Subject: Appendix N - Geological Cross Sections to
Outpost Monitoring Well Installation Summary Report
NWIRP Bethpage, New York

Dear Mr. Colter:

Appendix N and the subject report, including Appendix N, were distributed as per your attached transmittal letters.

If you have questions or need additional information, please call me at (412) 921- 8375.

Sincerely,

David D. Brayack
Project Manager

cc: Mr. R. Boucher (Navy) w/o attachment
Mr. J. Trepanowski (TtNUS)
File: N4037

DEPARTMENT OF THE NAVY
ENGINEERING FIELD ACTIVITY, NORTHEAST
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
MAIL STOP, #82
LESTER, PA 19113-2090

IN REPLY REFER TO
5090
Code EV21/JLC

30 APR 2004

Mr. Steve Scharf
Project Engineer
New York State Department of Environmental Conservation
Bureau of Eastern Remedial Action
Division of Environmental Remediation
625 Broadway
Albany, NY 12233-7015

Dear Steve:

Subj: Appendix N to the Final Outpost Monitoring Well Installation Summary Report - Operable Unit 2 - Groundwater at NWIRP Bethpage and Northrop Grumman Corporation, New York NYS Registry #1-30-003 A & B

Enclosed, please find a copy of Appendix N - Geologic Cross Sections which is being submitted as an addendum to the Final Outpost Well Installation Summary Report dated March 2004.

These Geologic Cross Sections were developed on behalf of the Navy by ARCADIS and were created using previously collected data and more recent lithologic data collected during the installation of the outpost monitoring wells.

If you have any questions regarding the enclosed document, please give me a call at (610) 595-0567, extension 163.

Sincerely,

JAMES L. COLTER
Remedial Project Manager
By direction of the
Commanding Officer

Enclosure: (1) Appendix N to the Final Outpost Monitoring Well Installation Summary Report dated March 2004

Distribution:
Stan Farkas - NYSDEC (Stony Brook)
Ian Ushe - NYSDOH
Carla Struble - USEPA Region II
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John Cofman - Northrop Grumman
Tim Kelly - Nassau County DPW
Carlo SanGiovanni - ARCADIS
Dave Brayack - Tetra Tech NUS
Al Taormina - J.A. Jones
Information Repositories

Copy to: (w/o enclosures)
Carol Stein - USEPA Region II
Carl Hoffman - NYSDEC (Albany)
Henry Wilkie - NYSDEC (Albany)
John Lovejoy - Nassau County DOH
Ken Bishop - Town of Oyster Bay
Darrol Lopez - Town of Hempstead
Arnold Palleschi - Hempstead Water District
Ron Krumholtz - Bethpage Water District
Frank Flood - Massapequa Water District
Matt Snyder - New York Water Service
Edoardo Licci - South Farmingdale Water District
Anthony Sabino, Esq. - Counsel for Bethpage Water District
W. Carmen, Esq. - ~~Counsel for~~ South Farmingdale Water District
Joe Kaminski - NAVAIR

DEPARTMENT OF THE NAVY
ENGINEERING FIELD ACTIVITY, NORTHEAST
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
MAIL STOP, #82
LESTER, PA 19113-2090

IN REPLY REFER TO
5090
Code EV21/JLC

05 MAY 2004

Mr. Jim McBride
RAB Community Co-Chair
P.O. Box 133
Bethpage, NY 11804

Dear Jim:

Subj: Final Outpost Monitoring Well Installation Summary Report - Operable Unit 2 - Groundwater at NWIRP Bethpage and Northrop Grumman Corporation, New York; NYS Registry #1-30-003 A & B

As requested at the last Restoration Advisory Board (RAB) meeting held on April 14, 2004, the Navy is forwarding a copy of the subject document to each of the community RAB members. As explained during the meeting, this report documents the efforts undertaken by the Navy over the last several months to install nine (9) outpost monitoring wells in accordance with the Outpost Well Installation Workplan attached as Appendix B to the Public Water Supply Contingency Plan (PWSCP) dated July 2003.

Appendix L to this Summary Report shows the analytical results from groundwater samples collected upon successful development of each of the outpost wells. As evidenced by Appendix L, analytical results for Outpost Well BPOW 1-1 shows the presence of several site-related VOCs.

However, these results are screening level quality only. Based on these results, the Navy has purchased dedicated sampling pumps and ARCADIS is currently installing these pumps into each of the outpost wells. Upon completion of the pump installation, the Northrop Grumman Corporation will then collect groundwater samples in accordance with the procedures outlined in the PWSCP.

If you have any questions regarding the enclosed document, please give me a call at (610) 595-0567, extension 163.

Sincerely,

JAMES L. COLTER
Remedial Project Manager
By direction of the
Commanding Officer

Enclosure: (1) Final Outpost Monitoring Well Installation Summary Report dated March 2004

Distribution:
Community RAB Member, Mike Grello
Community RAB Member, Hon. Ed Mangano
Community RAB Member, Linda Mangano
Community RAB Member, Ed Resch
Community RAB Member, Charles Bevilacqua
Community RAB Member, Roy Tringali
Community RAB Member, Rosemary Styne
Town of Oyster Bay, Hon. John Venditto
Town of Oyster Bay DPW, Tom Clark

Copy to: (w/o enclosure)
NAVAIR, Joe Kaminski
NYSDEC (Albany), Steve Scharf
Al Taormina - J.A. Jones

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**D. BRAYACK**	**DATE:**	**OCTOBER 20, 2003**
FROM:	**BERNARD F SPADA III**	**COPIES:**	**DV FILE**
SUBJECT:	**ORGANIC DATA VALIDATION- VOC CTO 812, NWIRP BETHPAGE SDG 120361**		

SAMPLES: 5/Aqueous

BP-BPOW2-1-DEV	BP-BPOW2-2-DEV	BP-IDW-A201-091103
BP-IDW-A224-091103	BP-TB-091003	

OVERVIEW

The sample set for CTO 812, NWIRP Bethpage, SDG 120361 consists of two (2) environmental aqueous samples, two (2) interim derived waste samples, and one (1) trip blank. All samples were analyzed for volatile organic compounds (VOC).

The samples were collected by Tetra Tech NUS on September 10 and 11, 2003 and analyzed by Severn Trent Laboratories. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria using SW-846 Method 8260B analytical and reporting protocols. The data contained in this SDG were validated with regard to the following parameters:

*	•	Data completeness
*	•	Holding times
	•	Initial and continuing calibration
*	•	Blank results
*	•	Surrogate spike recoveries
*	•	Internal standard recoveries
*	•	Blank Spike/Blank Spike Duplicate Results
*	•	Matrix Spike/Matrix Spike Duplicate Results
*	•	Field Duplicate Results
*	•	Detection Limits
*	•	Compound Quantitation
*	•	Compound Identification

The symbol (*) indicates that all quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

VOC

The initial calibration performed on August 27 exceeded the 30% relative standard deviation (RSD) quality control criteria for 2-hexanone. The results for 2-hexanone were qualified as estimated (UJ) in all samples.

Positive results below the reporting limit were qualified as estimated (J) due to uncertainty near the detection limit.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Qualifications were made based on calibration non-compliance.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (10/99), EPA Region II Guidelines (1/92), and the NFESC guidelines. The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."

Tetra Tech NUS
Bernard F. Spada III
Chemist/Data Validator

TetraTech NUS
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity

PROJ_NO: 4037

SDG: 120361 MEDIA: WATER DATA FRACTION: OV

nsample	BP-BPOW2-1-DEV	nsample	BP-BPOW2-1-DEV	nsample	BP-BPOW2-2-DEV
samp_date	9/10/2003	samp_date	9/10/2003	samp_date	9/10/2003
lab_id	C3I120361005	lab_id	C3I120361005	lab_id	C3I120361004
qc_type	NM	qc_type	NM	qc_type	NM
units	UG/L	units	UG/L	units	UG/L
Pct_Solids	0	Pct_Solids	0	Pct_Solids	0
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
2-BUTANONE	5	U	
2-HEXANONE	5	UJ	C
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	U	
BENZENE	2.9		
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	2	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	2	U	
CHLOROFORM	1	U	
CHLOROMETHANE	2	U	
CIS-1,3-DICHLOROPROPENE	1	U	
ETHYLBENZENE	1	U	
METHYLENE CHLORIDE	2	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TOTAL 1,2-DICHLOROETHENE	1	U	
TOTAL XYLENES	3	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	

Parameter	Result	Val Qual	Qual Code
VINYL CHLORIDE	3	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
2-BUTANONE	5	U	
2-HEXANONE	5	UJ	C
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	U	
BENZENE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	2	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	2	U	
CHLOROFORM	1	U	
CHLOROMETHANE	2	U	
CIS-1,3-DICHLOROPROPENE	1	U	
ETHYLBENZENE	1	U	
METHYLENE CHLORIDE	2	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TOTAL 1,2-DICHLOROETHENE	1	U	
TOTAL XYLENES	3	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	

PROJ_NO: 4037

SDG: 120361 MEDIA: WATER DATA FRACTION: OV

nsample	BP-BPOW2-2-DEV
samp_date	9/10/2003
lab_id	C3I120361004
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
VINYL CHLORIDE	3	U	

nsample	BP-IDW-A201-091103
samp_date	9/11/2003
lab_id	C3I120361002
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
2-BUTANONE	5	U	
2-HEXANONE	5	UJ	C
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	U	
BENZENE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	2	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	2	U	
CHLOROFORM	1	U	
CHLOROMETHANE	2	U	
CIS-1,3-DICHLOROPROPENE	1	U	
ETHYLBENZENE	1	U	
METHYLENE CHLORIDE	2	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TOTAL 1,2-DICHLOROETHENE	1	U	
TOTAL XYLENES	3	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	

nsample	BP-IDW-A201-091103
samp_date	9/11/2003
lab_id	C3I120361002
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
VINYL CHLORIDE	3	U	

PROJ_NO: 4037

SDG: 120361 MEDIA: WATER DATA FRACTION: OV

nsample	BP-IDW-A224-091103
samp_date	9/11/2003
lab_id	C3I120361003
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
2-BUTANONE	11		
2-HEXANONE	5	UJ	C
4-METHYL-2-PENTANONE	5	U	
ACETONE	3.5	J	P
BENZENE	1.9		
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	2	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	2	U	
CHLOROFORM	1	U	
CHLOROMETHANE	0.2	J	P
CIS-1,3-DICHLOROPROPENE	1	U	
ETHYLBENZENE	1	U	
METHYLENE CHLORIDE	2	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TOTAL 1,2-DICHLOROETHENE	1	U	
TOTAL XYLENES	3	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	

nsample	BP-IDW-A224-091103
samp_date	9/11/2003
lab_id	C3I120361003
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
VINYL CHLORIDE	3	U	

nsample	BP-TB-091003
samp_date	9/10/2003
lab_id	C3I120361001
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
2-BUTANONE	5	U	
2-HEXANONE	5	UJ	C
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	U	
BENZENE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	2	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	2	U	
CHLOROFORM	1	U	
CHLOROMETHANE	2	U	
CIS-1,3-DICHLOROPROPENE	1	U	
ETHYLBENZENE	1	U	
METHYLENE CHLORIDE	2	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TOTAL 1,2-DICHLOROETHENE	1	U	
TOTAL XYLENES	3	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	

PROJ_NO: 4037

SDG: 120361 MEDIA: WATER DATA FRACTION: OV

nsample	BP-TB-091003
samp_date	9/10/2003
lab_id	C3I120361001
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
VINYL CHLORIDE	3	U	

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO: **D. BRAYACK** **DATE: DECEMBER 12, 2003**

FROM: **SETH C. STAFFEN** **CC: DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – VOA**
CTO 812, NWIRP BETHPAGE
SDG: C3J230178

SAMPLES: 5 / Aqueous / VOA

BP-BPOW3-1-DEV BP-BPOW3-2-DEV BP-IDW-A201-102203*
BP-IDW-A224-102203* BP-TB-102103

OVERVIEW

The sample set for CTO 812, NWIRP Bethpage, SDG C3J230178, consisted of two (2) aqueous environmental samples, two (2) interim derived waste samples (IDW), and one (1) trip blank. The samples were analyzed for TCL volatile organic compounds. The IDW samples did not undergo a data validation review (*). The remaining samples did undergo a full data validation review. No field duplicate pairs were included in this SDG.

The samples were collected by Tetra Tech NUS, Inc. on October 21st and 22nd, 2003, and analyzed by Severn Trent Laboratories. The samples were analyzed under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria using SW-846 Method 8260 analytical and reporting protocols.

The data was evaluated according to the following parameters:

* • Data completeness
* • Holding Times
* • Laboratory method and field quality control blank results
• Initial and continuing calibrations
* • Surrogate spike recoveries
* • Blank Spike recoveries
* • Laboratory duplicates
* • Compound identification
* • Compound quantitation
* • Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, Region II data validation forms are presented in Appendix C, and supporting documentation is presented in Appendix D.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999), USEPA Region II Standard Operating Procedures for the Validation of Organic Data (January 1992), and the NFESC guidelines "Navy IRCDQM" (September 1999).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP).

Tetra Tech NUS

Seth C. Staffen
Environmental Scientist/Data Validator

Tetra Tech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A – Qualified Analytical Results
2. Appendix B – Results as Reported by the Laboratory
3. Appendix C – Region II Data Validation Forms
4. Appendix D – Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity

PROJ_NO: 4037

SDG: C3J230178 MEDIA: WATER DATA FRACTION: OV

nsample	BP-BPOW3-1-DEV
samp_date	10/21/2003
lab_id	C3J230178003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
2-BUTANONE	5	U	
2-HEXANONE	5	UJ	C
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	U	
BENZENE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	UJ	C
BROMOMETHANE	2	UJ	C
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	UJ	C
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	2	UJ	C
CHLOROFORM	1	U	
CHLOROMETHANE	2	U	
CIS-1,3-DICHLOROPROPENE	1	U	
ETHYLBENZENE	1	U	
METHYLENE CHLORIDE	2	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TOTAL 1,2-DICHLOROETHENE	1	U	
TOTAL XYLENES	3	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	

nsample	BP-BPOW3-1-DEV
samp_date	10/21/2003
lab_id	C3J230178003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
VINYL CHLORIDE	3	U	

nsample	BP-BPOW3-2-DEV
samp_date	10/21/2003
lab_id	C3J230178002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
2-BUTANONE	5	U	
2-HEXANONE	5	UJ	C
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UJ	C
BENZENE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	UJ	C
BROMOMETHANE	2	UJ	C
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	2	UJ	C
CHLOROFORM	1	U	
CHLOROMETHANE	2	U	
CIS-1,3-DICHLOROPROPENE	1	U	
ETHYLBENZENE	1	U	
METHYLENE CHLORIDE	2	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	0.29	J	P
TOTAL 1,2-DICHLOROETHENE	1	U	
TOTAL XYLENES	3	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	

PROJ_NO: 4037

SDG: C3J230178 MEDIA: WATER DATA FRACTION: OV

nsample	BP-BPOW3-2-DEV
samp_date	10/21/2003
lab_id	C3J230178002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
VINYL CHLORIDE	3	U	

nsample	BP-IDW-A201-102203
samp_date	10/22/2003
lab_id	C3J230178005
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
2-BUTANONE	5	U	
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	U	
BENZENE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	2	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	2	U	
CHLOROFORM	1	U	
CHLOROMETHANE	2	U	
CIS-1,3-DICHLOROPROPENE	1	U	
ETHYLBENZENE	1	U	
METHYLENE CHLORIDE	2	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TOTAL 1,2-DICHLOROETHENE	1	U	
TOTAL XYLENES	3	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	

nsample	BP-IDW-A201-102203
samp_date	10/22/2003
lab_id	C3J230178005
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
VINYL CHLORIDE	3	U	

PROJ_NO: 4037

SDG: C3J230178 MEDIA: WATER DATA FRACTION: OV

nsample	BP-IDW-A224-102203
samp_date	10/22/2003
lab_id	C3J230178004
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
2-BUTANONE	5	U	
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	U	
BENZENE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	2	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	2	U	
CHLOROFORM	1	U	
CHLOROMETHANE	2	U	
CIS-1,3-DICHLOROPROPENE	1	U	
ETHYLBENZENE	1	U	
METHYLENE CHLORIDE	2	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TOTAL 1,2-DICHLOROETHENE	1	U	
TOTAL XYLENES	3	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	

nsample	BP-IDW-A224-102203
samp_date	10/22/2003
lab_id	C3J230178004
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
VINYL CHLORIDE	3	U	

nsample	BP-TB-102103
samp_date	10/21/2003
lab_id	C3J230178001
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
2-BUTANONE	5	U	
2-HEXANONE	5	UJ	C
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	U	
BENZENE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	UJ	C
BROMOMETHANE	2	UJ	C
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	UJ	C
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	2	UJ	C
CHLOROFORM	1	U	
CHLOROMETHANE	2	U	
CIS-1,3-DICHLOROPROPENE	1	U	
ETHYLBENZENE	1	U	
METHYLENE CHLORIDE	2	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TOTAL 1,2-DICHLOROETHENE	1	U	
TOTAL XYLENES	3	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	

PROJ_NO: 4037

SDG: C3J230178 MEDIA: WATER DATA FRACTION: OV

nsample	BP-TB-102103
samp_date	10/21/2003
lab_id	C3J230178001
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
VINYL CHLORIDE	3	U	

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**D. BRAYACK**	**DATE:**	**DECEMBER 31, 2003**
FROM:	**BERNARD F SPADA III**	**COPIES:**	**DV FILE**
SUBJECT:	**ORGANIC DATA VALIDATION- VOC CTO 812, NWIRP BETHPAGE SDG 100416**		
SAMPLES:	3/Aqueous		

BPOW2-1-100903 BP-RB-100903 BP-TB-100803

OVERVIEW

The sample set for CTO 812, NWIRP Bethpage, SDG 100416 consists of one (1) environmental aqueous sample, one (1) rinse blank, and one (1) trip blank. All samples were analyzed for volatile organic compounds (VOC). Please note that samples BP-IDW-SB-0042, BP-IDW-SB-0312, BP-IDW-SB-9523, and BP-IDW-SB-9544 were collected by the field personnel and analyzed by the laboratory but did not require validation.

The samples were collected by Tetra Tech NUS on October 8 and 9, 2003 and analyzed by Severn Trent Laboratories. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria using SW-846 Method 8260B analytical and reporting protocols. The data contained in this SDG were validated with regard to the following parameters:

*	•	Data completeness
*	•	Holding times
	•	Initial and continuing calibration
*	•	Blank results
*	•	Surrogate spike recoveries
*	•	Internal standard recoveries
*	•	Blank Spike/Blank Spike Duplicate Results
	•	Matrix Spike/Matrix Spike Duplicate Results
*	•	Detection Limits
*	•	Compound Quantitation
*	•	Compound Identification

The symbol (*) indicates that all quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix D. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B. Region II data validation forms are presented in Appendix C.

VOC

Positive results below the reporting limit were qualified as estimated (J) due to uncertainty near the detection limit.

The continuing calibration performed on October 14 at 06:21 exceeded the 25% difference quality control criteria for 2-hexanone. The non-detected results for 2-hexanone were qualified as estimated in samples BPOW2-1-100903, BP-RB-100903, and BP-TB-100803.

The percent recoveries of 1,1-dichloroethene exceeded the relative percent difference (RPD) quality control criteria in the MS/MSD. No qualifications were made on this basis because both percent recoveries were compliant.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Qualifications were made based on calibration non-compliances.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (10/99) and the NFESC guidelines. The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."

Bernard F. Spada III

Tetra Tech NUS
Bernard F. Spada III
Chemist/Data Validator

Edward Sedlmayer /for

TetraTech NUS
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity

PROJ_NO: 4037

SDG: 100416 MEDIA: WATER DATA FRACTION: OV

nsample	BP-IDW-SB-0042	nsample	BP-IDW-SB-0042	nsample	BPOW2-1-100903
samp_date	10/8/2003	samp_date	10/8/2003	samp_date	10/8/2003
lab_id	C3J100416005	lab_id	C3J100416005	lab_id	C3J100416001
qc_type	NM	qc_type	NM	qc_type	NM
units	UG/L	units	UG/L	units	UG/L
Pct_Solids	0	Pct_Solids	0	Pct_Solids	0
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
2-BUTANONE	25	U	
2-HEXANONE	25	U	
4-METHYL-2-PENTANONE	25	U	
ACETONE	50	U	
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	10	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROBENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	10	U	
CHLOROFORM	5	U	
CHLOROMETHANE	10	U	
CIS-1,3-DICHLOROPROPENE	5	U	
ETHYLBENZENE	5	U	
METHYLENE CHLORIDE	10	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	5	U	
TOTAL XYLENES	15	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	

Parameter	Result	Val Qual	Qual Code
VINYL CHLORIDE	15	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
2-BUTANONE	5	UJ	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	3.1	J	P
BENZENE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	2	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	2	U	
CHLOROFORM	1	U	
CHLOROMETHANE	2	U	
CIS-1,3-DICHLOROPROPENE	1	U	
ETHYLBENZENE	1	U	
METHYLENE CHLORIDE	2	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TOTAL 1,2-DICHLOROETHENE	1	U	
TOTAL XYLENES	3	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	

PROJ_NO: 4037

SDG: 100416 MEDIA: WATER DATA FRACTION: OV

nsample	BPOW2-1-100903
samp_date	10/8/2003
lab_id	C3J100416001
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
VINYL CHLORIDE	3	U	

nsample	BP-RB-100903
samp_date	10/9/2003
lab_id	C3J100416006
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
2-BUTANONE	5	U	
2-HEXANONE	5	UJ	C
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	U	
BENZENE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	2	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	2	U	
CHLOROFORM	1	U	
CHLOROMETHANE	2	U	
CIS-1,3-DICHLOROPROPENE	1	U	
ETHYLBENZENE	1	U	
METHYLENE CHLORIDE	2	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TOTAL 1,2-DICHLOROETHENE	1	U	
TOTAL XYLENES	3	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	

nsample	BP-RB-100903
samp_date	10/9/2003
lab_id	C3J100416006
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
VINYL CHLORIDE	3	U	

PROJ_NO: 4037

SDG: 100416 MEDIA: WATER DATA FRACTION: OV

nsample	BP-TB-100803
samp_date	10/8/2003
lab_id	C3J100416007
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
2-BUTANONE	5	UJ	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	2.6	J	P
BENZENE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	2	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	2	U	
CHLOROFORM	1	U	
CHLOROMETHANE	2	U	
CIS-1,3-DICHLOROPROPENE	1	U	
ETHYLBENZENE	1	U	
METHYLENE CHLORIDE	2	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TOTAL 1,2-DICHLOROETHENE	1	U	
TOTAL XYLENES	3	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	

nsample	BP-TB-100803
samp_date	10/8/2003
lab_id	C3J100416007
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
VINYL CHLORIDE	3	U	

OUTPOST MONITORING WELL INSTALLATION
SUMMARY REPORT

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP)
BETHPAGE, NEW YORK

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Engineering Field Activity Northeast
Environmental Branch Code EV2
Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop #82
Lester, Pennsylvania 19113-2090

Submitted by:
TetraTech NUS, Inc.
600 Clark Avenue, Suite 3
King of Prussia, Pennsylvania 19406-1433

CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0812

MARCH 2004

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TABLE

2-1 OUTPOST MONITORING WELL CONSTRUCTION SUMMARY 2-6

FIGURE

1-1 OUTPOST MONITORING WELL LOCATIONS 1-2

APPENDICES

A BPOW1-1 WELL DATA
B BPOW1-2 WELL DATA
C BPOW1-3 WELL DATA
D BPOW2-1 WELL DATA
E BPOW2-2 WELL DATA
F BPOW3-1 WELL DATA
G BPOW3-2 WELL DATA
H BPOW4-1 WELL DATA
I BPOW4-2 WELL DATA
J CHAIN-OF-CUSTODY FORMS
K SAMPLE LOG SHEETS
L ANALYTICAL RESULTS
M SURVEY DATA

1.0 INTRODUCTION

This report summarizes the installation and development of nine Outpost Monitoring Wells located south and hydraulically downgradient of the Naval Weapons Industrial Reserve Plant (NWIRP) New York. The wells were installed in support of Navy's Record of Decision for Operable Unit No. 2 (April 2003) to provide advance warning of potential contaminant impact to local public water suppliers. Tetra Tech NUS, Inc., (TtNUS) performed the work for the U.S. Navy Engineering Field Activity Northeast under Contract Task Order 0812 of Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract Number N62467-94-D-0888.

1.1 SCOPE OF WORK

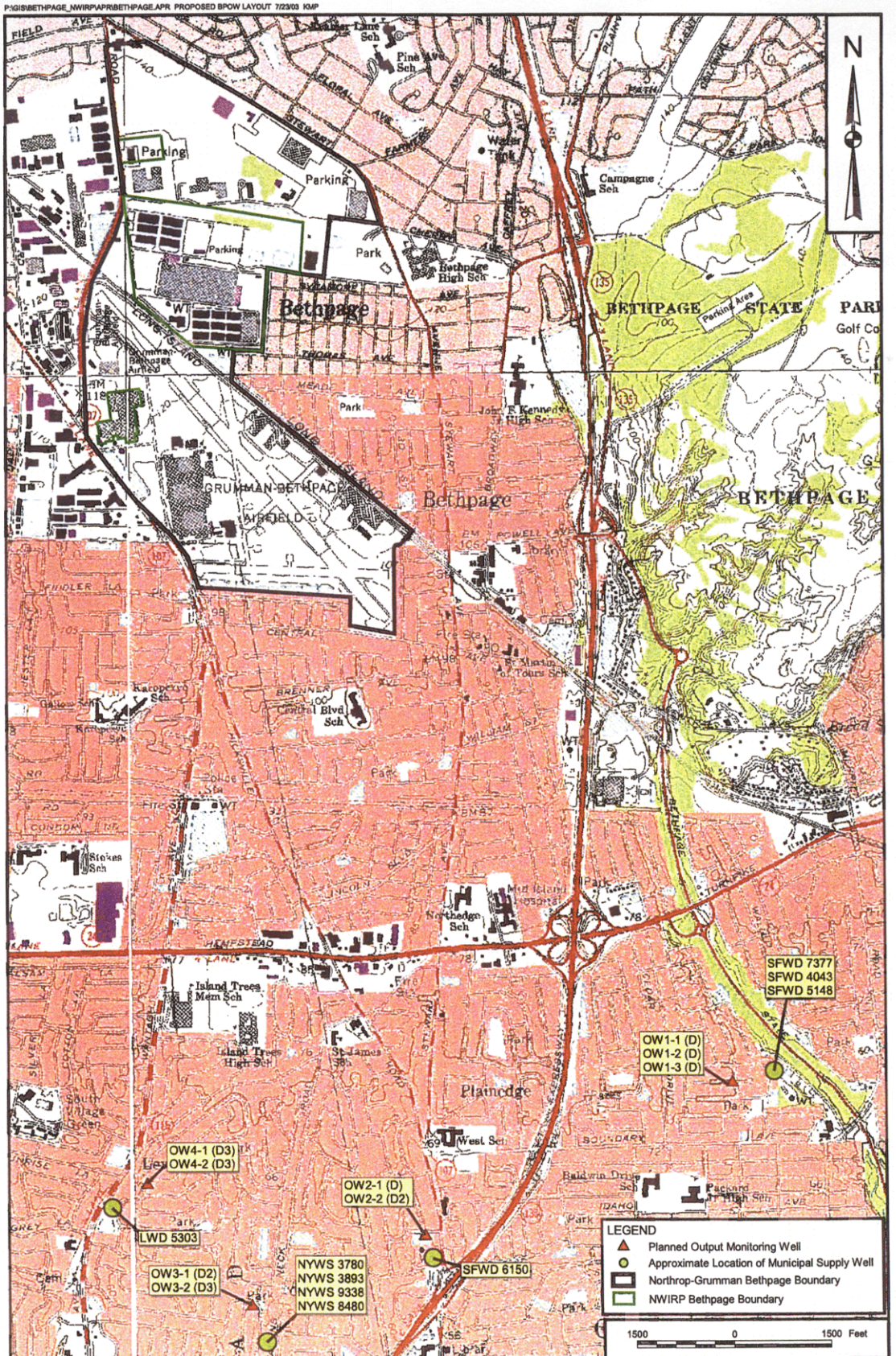
Nine Outpost Monitoring Wells (BPOW1-1, 1-2 and 1-3, BPOW2-1 and 2-2, BPOW3-1 and 3-2, and BPOW 4-1 and 4-2) were drilled and installed between June 2003 and December 2003. These wells were installed in accordance with the "Work Plan Addendum for Outpost Monitoring Wells Installation Program" attached as Appendix B to the "Public Water Supply Contingency Plan" dated July 2003. Figure 1-1 illustrates the approximate locations of these wells.

Target screen intervals were initially selected with the aid of an advanced regional groundwater model that accounted for the location of groundwater contamination, groundwater flow paths, and screen intervals and extraction rates for local public water supply wells. Final screen intervals were selected in the field based on actual lithology. These intervals are summarized in Table 2-1. Final well locations and well head elevations were surveyed.

1.2 REPORT FORMAT

This report presents the methodology and field logs for the installation of the Outpost Monitoring Wells. Section 1.0 provides a brief introduction and summary of the scope of work. Field methodologies for well installation are provided in Section 2.0. Monitoring well construction diagrams, boring logs, borehole geophysical logs, and well development sheets for each well are provided in the appendices. The information is organized by well, with Appendices A through I providing the data for Wells BPOW1-1 through BPOW4-2, respectively. Groundwater samples were collected at the end of well development. Chain-of-custody forms, sample log sheets, and analytical results are presented in Appendices J, K, and L, respectively. Survey drawings are provided in Appendix M.

P:\GIS\BETHPAGE_NWIRP\APR\BETHPAGE.APR PROPOSED BPOW LAYOUT 7/23/03 KMP



DRAWN BY	DATE	Tetra Tech NUS, Inc.	CONTRACT NUMBER	OWNER NUMBER
J. LAMEY	4/28/00		N4037	—
CHECKED BY	DATE	LOCATION OF OUTPOST MONITORING WELLS NAVAL WEAPONS INDUSTRIAL RESERVE PLANT BETHPAGE, NEW YORK	APPROVED BY	DATE
D. BRAYACK	12/23/02		—	—
COST/SCHEDULE-AREA			APPROVED BY	DATE
			—	—
SCALE			DRAWING NO.	REV
AS NOTED			FIGURE 1-1	0

2.0 WELL DRILLING AND INSTALLATION

This section describes the field methodologies for installation and development of nine Outpost Monitoring Wells. The work was performed in accordance with the "Work Plan Addendum for Monitoring Well Installation Program, Naval Weapons Industrial Reserve Plant, Bethpage, New York" (TtNUS, July 2003). Field work was performed from June through December 2003. Uni-Tech Drilling Company, Inc. (UTD), of Malaga, New Jersey, drilled and installed the wells under subcontract to TtNUS. Aqua Terra Geophysics, Inc., of Bellport, New York, under subcontract to UTD, performed the borehole geophysical logging.

2.1 DRILLING METHODOLOGY

Well boreholes were advanced using mud rotary techniques. Well boreholes were approximately 8 inches in diameter. In addition, boreholes for wells BPOW2-2, BPOW3-2, BPOW4-1 and BPOW4-2 were initially reamed to 10 to 12 inches in diameter to a depth of approximately 87 to 105 feet to allow for installation of permanent, polyvinyl chloride (PVC) surface casing. This casing was used to control sloughing of the upper borehole. Drilling mud consisted of potable water and polymer-free sodium bentonite. All drilling mud was contained and recirculated in a baffled, high capacity mud pan.

2.2 SOIL SAMPLING

Soil samples were collected from well borings for lithology description. The samples were collected from the deepest well at each cluster and were taken at periodic depths at the discretion of the field geologist. The samples were described and entered on the boring logs as shown in the attachments. The soil samples were used to provide a comparison to the geophysical logs that were also run on the deepest well at each cluster. The well screen placement was determined by evaluating the geophysical log for each cluster.

Soil samples were collected using 2-inch diameter split-spoon samplers according to American Standard of Test Methods (ASTM) D-1586. Depths not sampled were logged for lithology based on the drilling cuttings brought to the surface entrained in the drilling mud.

2.3 BOREHOLE GEOPHYSICAL LOGGING

Borehole geophysical logs were recorded in the deepest wells (BPOW1-3, BPOW2-2, BPOW3-2 and BPOW4-2) installed. Following advancement to the total well depth of each well boring to be logged, the drilling tools were withdrawn from the borehole. A geophysical probe was then run down the borehole and back up. The geophysical data was recorded using a Mount Sopris MGX II digital logger. The probe was

multi-function and recorded a natural gamma ray log, as well as single point resistivity, and standard potential logs. Geophysical borehole log printouts are provided for the logged wells in the appendices.

2.4 MONITORING WELL INSTALLATION

After advancement of the well borings to the appropriate depths, monitoring wells were installed to the depths indicated in Table 2-1. The mud in the screened interval was thinned to the fullest extent possible prior to well installation. Well material was then installed in the open borehole to the appropriate depth.

All of the wells were constructed of 4-inch diameter, Schedule 80, National Sanitation Foundation-approved polyvinyl chloride (PVC) well screen and riser pipe. All well screens had slot sizes of 0.010 inches. Threaded bottom caps were fitted to the bottom of each well. All pipe sections and bottom caps were flush-jointed and flush-threaded.

Primary filter packs were installed in the annuli around the well screens to the depths indicated in Table 3-1. The filter packs consisted of FilterPro #1 quartz sand installed using a tremie pipe or by allowing the filter pack to gravity fall into the annulus from the surface. Filter packs were installed to the approximate depths as follows:

- Deep (D) Wells: minimum of 10 feet above the top of the screen
- Deep 2 (D2) Wells: minimum of 20 feet above the top of the screen
- Deep 3 (D3) Wells: minimum of 25 feet above the top of the screen

Secondary filter packs of finer sand (FilterPro #0 quartz sand) than the primary filter pack were installed in the annulus around the well riser above the primary filter pack to the depths indicated in Table 3-1. The secondary filter packs were installed to the approximate depths as follows:

- Deep (D) Wells: minimum of 5 foot above the top of the primary filter pack
- Deep 2 (D2) Wells: minimum of 10 foot above the top of the primary filter pack
- Deep 3 (D3) Wells : minimum of 15 feet above the top of the primary filter pack

A 2- to 4-foot thick bentonite seal was installed above the secondary filter pack. The annulus above the bentonite seal was grouted with Volclay© high-solids bentonite slurry. Both the bentonite seal and bentonite slurry were installed using a tremie pipe.

Seven of the nine wells were completed at the surface with a 12-inch diameter steel curb box, set in a 3-foot by 3-foot by 0.5-foot thick concrete pad (BPOW1-1 to BPOW3-2). Because of limited space between

an underground utility and the curb, two of the wells were installed with a 9-inch diameter steel curb box (BPOW4-1 and BPOW4-2). The concrete pad on these two wells was the same as the other seven wells. A layer of fine sand was installed above the grout slurry and inside the curb box to allow for drainage of water from the curb box. The tops of all well risers were set approximately 8 inches below grade. Lockable gripper caps were installed on all well riser tops.

2.5 MONITORING WELL DEVELOPMENT AND SAMPLING

The monitoring wells were developed to remove drilling mud and fine formation particles from the well filter packs. Monitoring wells were developed no sooner than 24 hours after installation. Development was accomplished using two methods: airlifting, mechanical surging, and pumping with a submersible pump for all of the wells.

Monitoring wells were developed using a combination of air lifting, mechanical surging, and pumping with a submersible pump. A threaded, 2-inch diameter steel eductor pipe with a surge block assembly was installed in the wells with the surge block set at the base of the well screen. A ¾-inch diameter polyethylene airline was inserted in the eductor pipe to a depth above the top of the well screen. The deep wells were developed at 5-foot intervals in the screened interval using a combination of mechanical surging (vertical movement of the surge block by a truck-mounted mechanical device) and air lifting. Once the screened interval was completely developed using this technique, the pipe was removed from the well and development continued using a submersible pump. The submersible pump was placed approximately 50 to 75 feet below the static water level in order to remove the stagnant water from above the well screen. When the water became clear, the inside of the well casing was rinsed with water from the pump discharge, and the pump was slowly raised through the water column (with the pump running) until it was at or near the static water level. Pumping ceased and development was complete when the water level stabilized, all traces of drilling mud were removed, and the well produced clear, sediment-free water. The well cap was cleaned and rinsed with deionized water and placed back onto the well riser.

Field water quality parameters of pH, specific conductance, temperature, dissolved oxygen, and turbidity were monitored and recorded periodically throughout well development. In compliance with NYSDEC policy, all wells, (except for BPOW3-2 and BPOW4-2), were developed until turbidity was less than 50 nephelometric turbidity units (NTUs). Every effort was made to develop well BPOW3-2 and BPOW4-2 to a measured turbidity of less than 50 NTUs; however, the 50 NTU criterion was unattainable in these wells due to the lithology of the formation screened (clay and clayey/silty sand). In this case, turbidity was stabilized and development was deemed complete.

Following development of the pumping stage, the pump rate was decreased and a groundwater sample was collected from each well and was analyzed for VOC compounds. All development fluids were containerized and stored at the decontamination area for proper disposal to the POTW.

2.6 WELL REHABILITATION AND RECONSTRUCTION

Monitoring well BPOW4-1 was installed on July 17, 2003. The well screen was set from 652 to 692 feet below ground surface (bgs). During development it was determined that the 4-inch diameter well screen had been damaged and that sand had infiltrated through the screen to a depth of approximately 660 feet bgs. It is unknown how the damage occurred. Well development was terminated and the repair of this well would be conducted at a later date by Unitech Drilling Company, Inc.

On December 8, 2003 repair of this well began. A 2-inch diameter threaded steel pipe was lowered into the 4-inch schedule 80 well screen and riser using the Failing 1500 drill rig. At approximately 660 feet bgs resistance was hit, indicating the level of the sand. Once the pipe was set, a ½-inch polyethylene tubing was placed inside the 2-inch pipe to a depth of approximately 200 feet. An Atlas Copco 185 CFM air compressor was used to supply air through the tubing. As the air was introduced through the tubing, both water and sand began to exit up through the 2-inch pipe and into the mud tub that was placed over the well. This method is similar to the reverse circulation method of drilling and also similar to the air lift method of development. A constant head of water had to be introduced to the well in an effort to keep the sand from entering the well. Water was supplied by using a 2,000 gallon tank and a 2,000 gallon capacity water truck. Approximately 8,000 gallons was used during the repair operation. Approximately one full 55-gallon drum was filled with sand and debris from the damaged area of the well.

As the water, sand and pieces of well screen was evacuated from the hole, UTD began to lower the 2-inch pipe further into the well screen. The 2-inch pipe was finally lowered to a depth of approximately 692 feet bgs, indicating that all of the sand had been evacuated from the well. Material that was forced out of the well included a fine to coarse sand, fine sub-rounded gravel, traces of lignite and pieces of well screen. The sand pack used to place around the well screen was also observed in the cuttings that were evacuated.

After several minutes of making sure all debris was evacuated from the well, UTD began to pull the 2-inch pipe, which took approximately 2 hours. Once the pipe was removed, UTD assembled 4 ten feet sections of 2-inch diameter 10 slot stainless steel screen. A stainless steel pointed end cap was placed on the bottom of the screen. A ten foot section of stainless steel riser pipe was attached to the 40 feet of well screen. A "K" packer was then placed on top of the riser pipe. This packer will serve as a barrier to prevent any sand from infiltrating above the screened interval. This 50 foot section, with the riser and

packer at the top was dropped into the well and allowed to free fall, with the water acting as a floating medium, to the bottom of the cleaned out well.

In order to check the depth of the 2-inch well, UTD immediately began to re-insert the 2-inch pipe and was able to determine that the 2-inch well had successfully been installed. The 2-inch pipe hit resistance at approximately 642 feet bgs. UTD left this pipe in overnight and air lift development operations began the following day using the method described in Section 2.5.

TABLE 2-1
MONITORING WELL SUMMARY
OUTPOST WELLS
NWIRP, BETHPAGE
BETHPAGE, NEW YORK

Well Number	Casing Set (ft bgs)	Date Start	Date Complete	Total Depth (ft bgs)	Total Well Depth (ft bgs)	Gamma Log Depth (ft bgs)	Screened Interval (ft bgs)	Top of Gravel Pack (ft bgs	Top of Fine Sand (ft bgs)	Comments
BPOW1-1	NA	11/10/03	11/11/03	250	241		196-231 and 236-241	186	181	Blank Sect. 231-236
BPOW1-2	NA	11/03/03	11/05/03	350	335		310-335	300	295	
BPOW1-3	NA	10/22/03	10/29/03	430	419	419	374-399 and 409-419	364	359	Blank Sect. 399-409
BPOW2-1	NA	8/25/03	8/28/03	410	400		360-365 and 375-400	350	345	Blank Sect. 365-375
BPOW2-2	105	8/6/03	8/21/03	510	495	487	455-495	435	425	
BPOW3-1	NA	9/29/03	10/8/03	530	516		446-451 and 481-516	426	416	Blank Sect. 451-481
BPOW3-2	95	9/15/03	9/26/03	660	647	659	612-632 and 637-647	587	572	Blank Sect. 632-637
BPOW4-1	87	7/8/03	7/18/03	700	692		652-692	620	602	
BPOW4-2	100	6/5/03	7/7/03	780	765	775	725-735 and 745-765	705	690	Blank Sect. 735-745

NOTES:

All well screen and riser was schedule 80 PVC and all screen slot sizes are 0.010 inches (10 slot).
Development consisted of air lift, surging and submersible pump and all wells were drilled using the mud rotary method.

ft bgs= feet below ground surface
Blank Sect.= schedule 80 PVC riser placed between screened sections of the well
NA= not applicable. No casing was set in these wells.
Gamma log run only on deepest well in each cluster.

APPENDIX A

BPOW1-1 WELL DATA

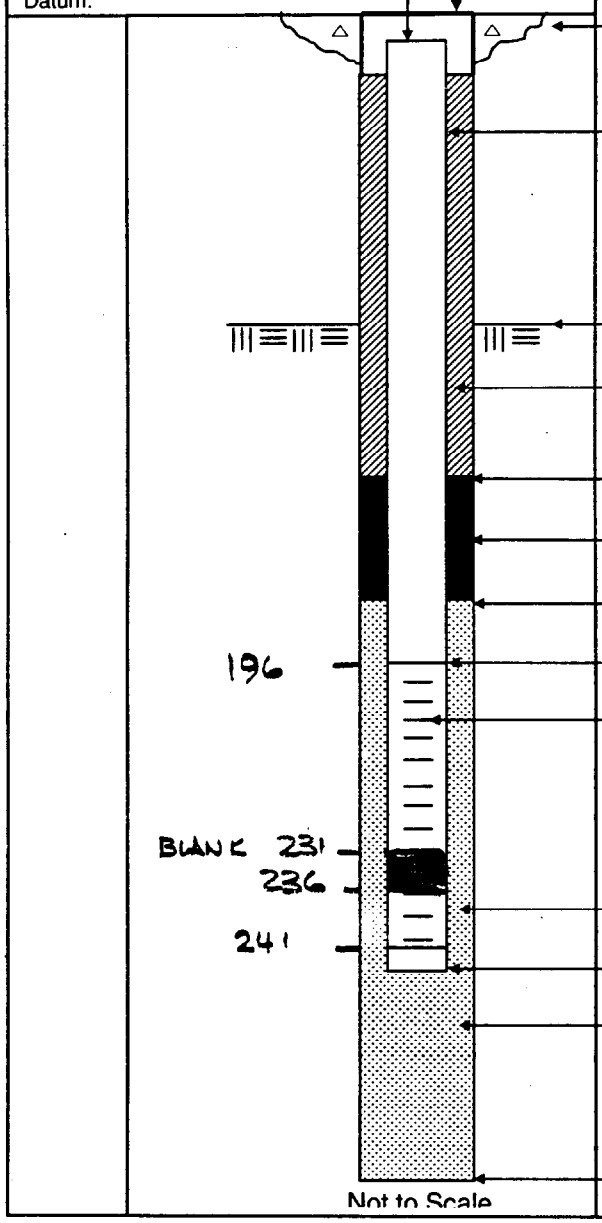
Tetra Tech NUS, Inc.

WELL No.: BPOW1-1

MONITORING WELL SHEET

PROJECT:	NWIRP	DRILLING Co.:	UNITECH	BORING No.:	BPOW1-1
PROJECT No.:	N4037	DRILLER:	BLEMINGS	DATE COMPLETED:	11/11/03
SITE:	BETHPAGE	DRILLING METHOD:	MUD ROT	NORTHING:	
GEOLOGIST:	CONTI	DEV. METHOD:	AIR LIFT/PUMP	EASTING:	

Ground Elevation =
Datum:



Elevation / Depth of Top of Riser: /

Elevation / Height of Top of Surface Casing: /

I.D. of Surface Casing: 12"

Type of Surface Casing: STEEL

Type of Surface Seal: CONCRETE PAD

I.D. of Riser: 3 13/16

Type of Riser: SCH 80 PVC

Borehole Diameter: 8"

Elevation / Depth Top of Rock: NA / NA

Type of Backfill: VOLCLAY GROUT

Elevation / Depth of Seal: / 181

Type of Seal: FINE SAND

Elevation / Depth of Top of Filter Pack: / 186

Elevation / Depth of Top of Screen: / 196

Type of Screen: PVC SCH 80

Slot Size x Length: 10 SLX

I.D. of Screen: 3 13/16"

Type of Filter Pack: #1 SILICA SAND

Elevation / Depth of Bottom of Screen: / 241

Elevation / Depth of Bottom of Filter Pack: / 242

Type of Backfill Below Well: CAVED

Elevation / Total Depth of Borehole: / 250

REV. 2/12/04

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 1-1
DATE: 11/10/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0						SAND AND GRAVEL	SW	SEE BORING				0
								GW	LOG BPOW 1-3				
									OR GAMMA LOG FOR DETAILS				
	10												0
	20												0
	30						SAND AND GRAVEL	SW GW					0
	40												0
	50												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 1-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 1-1
DATE: 11/10/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	50						SAND AND GRAVEL	GW SW					0
	60												0
	70												0
	80												0
	90												0
							SILTY SAND - SOME GRAVEL - TR CLAY						
	100												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 1-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW1-1
DATE: 11/10/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	100												0
	110												0
				119±									
	120						SANDY CLAY	SC	FROM GAMMA LOG				0
				124±			THEN						
							SILTY SAND						
	130												0
	140												0
							MORE CLAY		TO ≈ 155'				
	150												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW1-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 1-1
DATE: 11/11/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	150												0
	160						SILTY SAND						0
	170												0
	180						TR CLAY						0
	190												0
	200												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW 1-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW1-1
DATE: 11/11/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	200						SILTY SAND						0
	210												0
	220												0
	230												0
				231			SOME CLAY						
									SET WELL 11/11/03				
				236									
							SILTY SAND		196 → 231 SCR 231 → 236 BL 236 → 241 SCR				
	240												0
									C. SAND TO 196 F " TO 181				
	250												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW1-1

31.6 BGS WL @ 1300 HRS 11/20/03

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW1-1
Site: NWIRP
Date Installed: 11/11/03
Date Developed: 11/24/03
Dev. Method: AIRLIFT/ PUMP
Pump Type: 3" SUBMERSIBLE

Depth to Bottom (ft.): 241 BGS
Static Water Level Before (ft.):
Static Water Level After (ft.):
Screen Length (ft.): SEE
Specific Capacity:
Casing ID (in.): 3 13/16

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

196-231 - SCR
231-236 - BL
236-241 - SCR

Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
0955	30	Start	31.6	13.12	4.40	0.362	651/355	Gray - turbid
1015		900	35.17	12.08	4.35	0.329	322/100	Sl. Gray
1035		1400	34.11	11.86	4.32	0.325	152/87.6	Sl. Gray foggy
1040	Load	① 1600 gall - Start into		12.00	gall tank			
1055		250	34.12	11.94	4.39	0.310	253/122	1850 / foggy
1015		850	34.48	12.24	4.42	0.307	185.4/105	2450 / foggy
1125	Load	② 1100 gall - Start	into 2000	gall	tank			2700
1135		300	[illegible]	12.05	4.41	0.306	167/[illegible]	[illegible]
1155		1000	[illegible]	12.31	[illegible]	[illegible]	[illegible]/54	3700
1215		1600	34.42	12.44	4.43	0.303	24/52	[illegible]
1215	Load	③ 1600 gall - Lowered pump				to full bottom		
		Start 1200 gal tank @ 1245						
[illegible]			32.16	12.08	4.36	0.359	511/339	Brown turbid
1305		650	33.48	12.54	4.36	0.359	326/222	[illegible] / H. Brown
1320		1100	33.52	12.76	4.38	0.360	278/196	[illegible] / H. Brown
	Load	④ 1100 gall - Start 2000 gall tank						
1345			33.35	12.34	4.37	0.364	379/228	H. Brown
1405		700	33.38	12.01	4.32	0.361	248/174	6100 Gray

4

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW1-1
Site: NWIRP
Date Installed: 11/11/03
Date Developed: 11/24/03 & 11/25/03
Dev. Method: AIR LIFT/PUMP
Pump Type: 3" SUB

Depth to Bottom (ft.): 241 BGS
Static Water Level Before (ft.): 31.5
Static Water Level After (ft.):
Screen Length (ft.):
Specific Capacity:
Casing ID (in.): 3 13/16

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
1430		1600	33.41	12.14		0.358	156/92	7000 / Sl. gray
	Load	(5) - START 1200 gall						Total 7000 gall 11/24/03
11/24/03								
11/25/03 0830			31.6	11.83	4.57	0.461	468/260	Sl. brown-gray
0850		500	32.86	10.87	4.53	0.390	110/28	7500 / clear
0910		1000	32.88	10.12	4.50	0.373	57/15	8000 / clear
0915	Load	(6) 100						8100 / clear
1030	START	INTO 1400 GALLON TANK w/ PUMP.						
1130	13	800	32.6	12.12	4.75	.385	33/12	CLEAR
1140	13	900	32.6	12.00	4.16	.390	38/12	"
1200	12	1100	32.6	11.99	4.78	.389	31/11	"
	LOAD	LUS w/ 1100 GALLONS						
	DONE	w/ PUMP - TOOK SAMPLES 1200 HRS						

8

APPENDIX B

BPOW1-2 WELL DATA

Tetra Tech NUS, Inc.

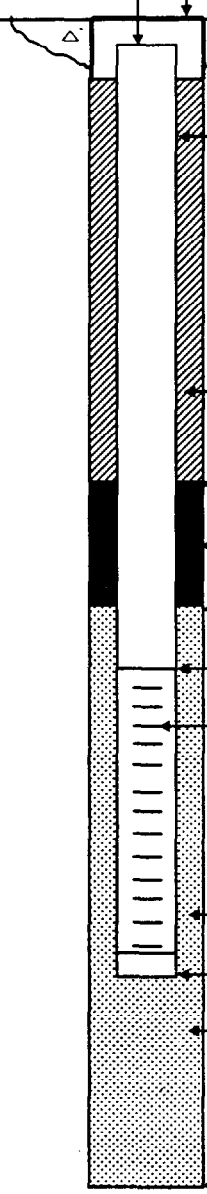
WELL No.: BPOW1-2

MONITORING WELL SHEET

PERMIT No:

PROJECT:	NWIRP	DRILLING Co.:	UNITECH	BORING No.:	BPOW1-2
PROJECT No.:	N4037	DRILLER:	BLEMINGS.	DATE COMPLETED:	11/5/03
SITE:	BETHPAGE	DRILLING METHOD:	MUD ROT	NORTHING:	
GEOLOGIST:	CONTI	DEV. METHOD:	AIR LIFT/PUMP	EASTING:	

Ground Elevation Datum:



Not to Scale

Elevation / Depth of Top of Riser: /

Elevation / Height of Top of Surface Casing: /

I.D. of Surface Casing: 12" Φ

Type of Surface Casing: STEEL

Type of Surface Seal: CONCRETE PAD

I.D. of Riser: 3 13/16"

Type of Riser: PVC SCH 80

Borehole Diameter: 8"

Type of Backfill: VOLCLAY GROUT

Elevation / Depth of ~~Seal~~: FINE SAND / 295

Type of Seal: NA

Elevation / Depth of Top of Filter Pack: / 300

Elevation / Depth of Top of Screen: / 310

Type of Screen: PVC SCH 80

Slot Size x Length: 10 SL X 25'

I.D. of Screen: 3 13/16"

Type of Filter Pack: #1 SILICA SAND

Elevation / Depth of Bottom of Screen: / 335

Elevation / Depth of Bottom of Filter Pack: / 336

Type of Backfill Below Well: CAVED

Elevation / Total Depth of Borehole: / 350

REV 2/12/04

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW1-2
DATE: 11/3/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0930	0						SAND AND GRAVEL		SEE BPOW1-3				0
									LOG AND				
									GAMMA LOG				
									FOR MORE				
									DETAIL				
	10												0
	20												0
	30												0
	40												0
1030	50												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW1-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW1-2
DATE: 11/3/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	50						SAND & GRAVEL						0
	60												0
	70												0
	80						SILTY SAND-						0
							SOME						
							GRAVEL						
	90												0
1130	100												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW1-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW1-2
DATE: 11/3/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	100						SILTY SAND	SM					0
								SP					
1200	110												0
	120												0
1300	130						SILTY SAND	SM					0
								SP					
1400	140												0
11/3 1500	150												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW1-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 1-2
DATE: 11-4-03
GEOLOGIST: Conti
DRILLER: BLEMINGS

	Sample No. and Type or RQD	Depth (FL) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
11/4		150												0
		160												
		170												
		180												
		190												
		200												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 1-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 1-2
DATE: 11-4-03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (FL) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	200						SILTY SAND	SM					0
							TR CLAY	SP					
	210												0
	220												0
	230												0
	240												0
	250												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW 1-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 1-2
DATE: 11/4/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	250												0
	260												0
	270												0
	280												0
	290												0
	300												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 1-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 1-2
DATE: 11/4/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	300												0
	310												0
	320												0
	330												0
									WELL SET @				
									335'				
	340												0
	350								BOTM @ 350				0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 1-2

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW1-2
Site: NWIRP
Date Installed: 11/5/03
Date Developed: 11/18/→
Dev. Method: AIR LIFT/PUMP
Pump Type: 3" SUB

Depth to Bottom (ft.): 335 BGS
Static Water Level Before (ft.): 34.6 BGS
Static Water Level After (ft.):
Screen Length (ft.): 25'
Specific Capacity:
Casing ID (in.): 3 13/16

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

HORIBA/LAMOTTE

	Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
	1600	30	1100		—	—	—	—	INITIAL LOAD (1)
11/18	1700	LOAD	(1) LVS	W/ 1100 GALLONS					PIPE AT 235 initial
11/19	0915	START	INTO	33.3	2000 GAL TANK.				
	0935	30	600	48.6	12.46	4.56	.227	630/319	GRAY-TURBID
	0955	30	1200	49	12.30	4.63	.090	388/207	" "
	1015	27	1600	49.5	12.05	4.67	.085	316/180	" "
	1025	LOAD	(2) LVS	W 1600 GAL - START	INTO	1400		— —	2700)
	1045	30	600	48.5	12.50	4.68	.083	350/190	" "
	1105	27.5	1100	47.5	11.99	4.73	.079	202/133	" "
	1120	LOAD	(3) LVS	W/ 1100 GAL	START	[illegible]	[illegible]		(3800)
	1140	30	600	46	12.06	4.75	.080	321/134	GRAY/SL TURBID
	1200	30	1200	[illegible]	12.25	4.74	.080	216/98	" "
	1220	27	1600	47	12.05	4.75	.078	232/90	" "
	1300	LOAD	(4) LVS	W/ 1600 GAL	/ START	INTO	1400.		LOWER PIPE TO 5' FROM BOTM @ 330' & SURGE
	1320	30	600	44.0	12.52	4.71	.083	310/157	GRAY-SL TURBID
	1340	27.5	1100	44.6	12.60	4.73	.080	306/90	
	1400	LOAD	(5) LVS	W/ 1100 GAL	/ START	INTO	2000		(6500)
	1420	30	600	42.7	12.56	4.71	.080	308/116	GRAY-SL TURBID

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW1-2
Site: NWIRP
Date Installed: 11/5/03
Date Developed: 11/18 →
Dev. Method: AIR LIFT/ PUMP
Pump Type: 3" SUB.

Depth to Bottom (ft.): 33.5 BGS
Static Water Level Before (ft.): 34.6
Static Water Level After (ft.):
Screen Length (ft.): 25'
Specific Capacity:
Casing ID (in.): 3 13/16"

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

HORIBA / LANDTEE

	Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. ~~below TOC~~) BGS	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
11/19 (Conti)	1440	30	1200	42.7	12.42	4.72	.079	202/80	GRAY - SL TURBID
	1500	27	1600	42.7	12.15	4.74	.078	184/68	" " "
	1530	LOAD	(6) LVS WITH 1600		GALLONS				(8100) THIS WELL SO FAR,
11/20	0810	START	INTO 1400 GALLON		TANK				
	0830	30	600	42.7	11.62	4.31	.123	215/104	GRAY - SL TURBID
	0850	27	1100	42.7	11.34	4.40	.086	156/67	" " "
	0850	LOAD	(7) LVS	W/ 1100 GAL	ONS - START	INTO	2000 GAL		(9200)
	0910	30	600	42.7	11.56	4.38	.081	160/64	CLEAR SL "
	0930	30	1200	42.7	11.73	4.41	.077	146/37	" "
	0950	27.0	1600	42.5	11.53	4.42	.077	134/37	" "
	0950	LOAD	(8) LVS W/ 1600	GALLONS/ STAR	T INTO	1400 GAL	TANK		(10,800)
	1010	30	600	42.5	11.53	4.42	.079	153/52	" "
	1030	27.5	1100	42.5	11.60	4.42	.078	113/39	
	1040	LOAD	(9) LVS	W/ 1100	GALLONS/ START	INTO	2000 GALLON		(11,900)
	1100	30	600	41.0	11.73	4.45	.079	173/53	" "
	1120	30	1200	41.0	11.54	4.47	.080	121/37	" "
	1140	27±	1600	41.0	11.54	4.47	.081	85/31	
	1225	LOAD	(10) LVS	W/ 1600	GALLONS - START	INTO	1400 GAL		(13,500)

18

START PUMPING ON 12/1/03

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW1-2
Site: NWIRP
Date Installed: 11/5/03
Date Developed: 11/18 → 11/20
Dev. Method: AIR LIFT/PUMP
Pump Type: 3" SUB.

Depth to Bottom (ft.): 335' BGS
Static Water Level Before (ft.): 34.6
Static Water Level After (ft.):
Screen Length (ft.): 2.5'
Specific Capacity:
Casing ID (in.): 3 13/16"

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

310-335

HORIBA/LAMOTTE

	Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
11/20	1245	30	600	41.0	11.88	4.46	.080	140/43	CLEAR - VSL TURBID 330-335
	1305	27.5	1100	41.0	11.82	4.45	.076	131/35	" " " 325-330
	1320	LOAD (11) LVS W/ 1100 GALLONS/START INTO 2000							(14,600)
	1340	30	600	41.0	11.62	4.41	.076	155/39	" " " 320-325
	1400	30	1200	41.0	11.56	4.43	.075	76/29	" " " 315-320
	1420	27	1600	41.0	11.54	4.43	.074	74/25	" " " 310-315
		LOAD (12) LVS/1600							
				DONE W/	AIR LIFT				(16,200)
12/1	1320	START	INTO 1400 GAL						
	1340	20	400	37.5	12.16	5.01	.172	999/1057	GRAY - TURBID
	1400	20	800	37.5	11.93	5.18	.097	465/373	" "
	1410	20	1000	37.5	11.59	5.23	.097	362/234	" "
	1420	18	1100	37.5	11.56	5.24	.090	265/205	" "
	1430	LOAD LVS W/ 1100 GALLONS							
12/2	0820	START INTO 2000 GALLONS							
	0840	20	400	37.5	10.50	4.42	.151	456/316	GRAY/TURBID
	0900	17.5	700	37.5	11.16	4.63	.083	43/81	CLEAR VSL. TURBID
	0920	17.0	1000	37.5	11.14	4.60	.082	41/43	CLEAR VSL TURBID

DONE W/ PUMP - SAMPLE @ 0930.

APPENDIX C

BPOW1-3 WELL DATA

Tetra Tech NUS, Inc.

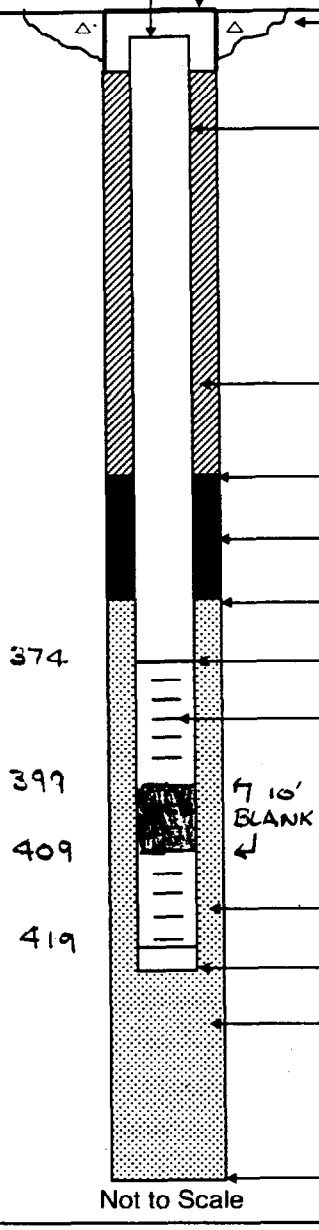
WELL No.: BPOW1-3

MONITORING WELL SHEET

PERMIT No:

PROJECT:	NWIRP	DRILLING Co.:	UTD	BORING No.:	BPOW1-3
PROJECT No.:	N4037	DRILLER:	BLEMINGS	DATE COMPLETED:	10/29/03
SITE:	BETHPAGE	DRILLING METHOD:	MUD ROT	NORTHING:	
GEOLOGIST:	CONTI	DEV. METHOD:	AIR LIFT/PUMP	EASTING:	

Ground Elevation Datum:



Not to Scale

Elevation / Depth of Top of Riser: /

Elevation / Height of Top of Surface Casing: /

I.D. of Surface Casing: 12" Φ

Type of Surface Casing: STEEL

Type of Surface Seal: CONCRETE PAD 3'x3'x6"

I.D. of Riser: 3 13/16"

Type of Riser: SCH 80 PVC

Borehole Diameter: 8"

Type of Backfill: VOLCLAY GROUT

Elevation / Depth of ~~Seal~~: F. SAND / 359

Type of Seal: NA

Elevation / Depth of Top of Filter Pack: / 364

Elevation / Depth of Top of Screen: / 374

Type of Screen: PVC SCH 80

Slot Size x Length: 10 SL

I.D. of Screen: 3 13/16"

Type of Filter Pack: #1 SILICA SAND

Elevation / Depth of Bottom of Screen: / 419

Elevation / Depth of Bottom of Filter Pack: / 420

Type of Backfill Below Well: SAND

Elevation / Total Depth of Borehole: / 430

REV. 2/12/04

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 1 - 3
DATE: 10/22/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD Time	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
1100	0				LOOSE		SAND AND GRAVEL	SW	NOTE: MOST				0
								GW	OF MATL DESC				
									BASED ON				
					TO				CUTTINGS AND				
									FROM GAMMA				
									LOG - A FEW				
									SPOONS WERE				
	10				DENSE				TAKEN - FOR				0
									CONFIRMATION				
1200	20												0
	30						SAND AND GRAVEL	SW					0
								GW					
	40												0
1400	50												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 8"Φ MUD ROTARY - NO CASING SET IN THIS HOLE.

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 1-3

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW1-3
DATE: 10/22/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (FL) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	50						SAND AND GRAVEL						0
	60												0
1500	70												0
	80						SAND - SOME GRAVEL						0
1600	90												0
	100												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW 1-3

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW1-3
DATE: 10/22/03 – 10/23/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

	Sample No. and Type or RQD	Depth (FL) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		100						SAND - SOME GRAVEL	SC					0
								TRACE CLAY	SP					
10/22	1700	110												0
10/23														
		120												0
										MORE CLAY				
										WET.				
	S-1	130	51/50	-8/1		V DENSE	BRN	F/C SAND - SOME	SW	3/4" GRAVEL				0
	0900	131						GRAVEL		SUB ROUND				
		140												0
								SOME						
								CLAY		TO ≈ 150				
	0920	150												0

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW1-3

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW1-3
DATE: 10/23/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	150						SAND - SOME						0
							GRAVEL						
	160												0
0940	170												0
	180						SILTY SAND -						0
							SOME GR.						
	190												0
1000	200												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW1-3

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW1-3
DATE: 10/23/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	200												0
S-2	210	56/51			V DENSE	BRN GRAY	SILTY F/M SAND	SM	WET				0
1020	211							SP	MICACEOUS				
	220												0
	230						SILTY SAND						0
	240												0
	250												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW1-3

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW1-3
DATE: 10/23/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	250						SILTY SAND	SM					0
								SP					
	260												0
	270												0
	280						SILTY SAND -	SM					0
							TR CLAY	SP					
	290						TO SOME	SC					0
							CLAY		(CLAYEY SAND)				
	300												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW1-3

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW1-3
DATE: 10/23/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	300												0
S-3 @ 1200	310	48/50	.5/1		STIFF		SILTY/SANDY CLAY	CL SC	MOIST				0
	311												
	320				DENSE		SILTY F/M SAND						0
	330												0
	340						SILTY F/M SAND	SM					0
							TR CLAY						
	350												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW1-3

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW1-3
DATE: 10/23/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	350						SILTY F/M SAND	SM					0
							TR CLAY	SP					
	360												0
	370												0
	380						SAME AS ABOVE						0
	390												0
	400												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 1-3

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW1-3
DATE: 10/23/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	400						SANDY CLAY	SC	(FROM				0
									CUTTINGS				
									AND GAMMA				
									LOG)				
S-4	410	51/53	.6/1		V DENSE		SILTY SAND-TR	SM	WET				0
@ 1545	411						CLAY						
	420												0
							BOTM @ 430 W/						
							8" Φ						
							GAMMA LOG TO						
							419'						
							SET WELL SCR.						
							374-399 "						
							399-409 BLANK						
							409-419 SCR						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW1-3

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW1-3
Site: NWIRP
Date Installed: 10/29/03
Date Developed: 11/13 →
Dev. Method: AIR LIFT/PUMP
Pump Type: 3" SUBMERSIBLE

Depth to Bottom (ft.): 419' BGS
Static Water Level Before (ft.): 33.5 BGS
Static Water Level After (ft.):
Screen Length (ft.): 40'
Specific Capacity:
Casing ID (in.): 3 13/16

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

374 - 399 - SCR
399 - 409 - BL
409 - 419 SCR

Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below ~~TOG~~) BGS	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU) HORIBA/LAMOTTE	Remarks (odor, color, etc.)
0940	—	—	33.5	—	—	—		INITIAL/ DEV PIPE @ 220±
1010	30	900	42'	11.86	4.43	.208	999	GRAY TURBID
1035	29'	1600	41.5	11.65	4.34	.137	999	" "
1040	LOAD	① LVS	W/ 1600 GALLONS -		START	INTO 1400 GAL		
1100	30	600	38.5	11.83	4.23	.118	701	" "
1120	27.5	1100	38.5	11.78	4.23	.107	644	" "
1130	LOAD	② LVS	W/ 1100 GALLONS					
1140	START	INTO	2000 TANK					
1200	40	800	37.5	11.73	4.34	.105	556/240	" SL TURBID
1220	40	1600	38.0	11.53	4.24	.102	469/241	" "
1230	LOAD	③ LVS	W/ 1600 GALLONS		START	INTO 1400	GALLONS	TANK = 4300 TOTAL
1245	40	600	38.0	11.40	4.18	.095	486/235	pH paper 4→5 Gray SL Turbid
1300	37	1100	38.0	11.34	4.18	.095	409/183	" " "
1320	LOAD	④ LVS	W/ 1100 GALLONS		START	INTO 2000	TANK	5400
1340	35	700	38	11.29	4.05	.095	375/196	pH paper 4-5 check and calib solution was 3.86
1400	35	1400	38	11.27	4.14	.145	305/198	GRAY SL. TURBID
1415	LOAD	⑤ LVS	W/ 1600 GALLONS /		START	INTO 1200		7000
1435	35	700	38	11.00	4.25	.102	258/168	" " "
1450	31	1100	39	10.83	4.16	.098	292/141	" " "

9100

Recalibrate

30

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW1-3
Site: NWIRP
Date Installed: 10/29/03
Date Developed: 11/13 →
Dev. Method: AIR LIFT / PUMP
Pump Type: 3" SUB.

Depth to Bottom (ft.): 419' BGS
Static Water Level Before (ft.): 33.5
Static Water Level After (ft.):
Screen Length (ft.): SEE PG 1
Specific Capacity:
Casing ID (in.): 3 13/16

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

HORIBA/LAMOTTE

	Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below ~~TOC~~) ≈ 28' BGS	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.) LOWERED
11/17	1120		START INTO 2000 GALLON						~~BPOP~~ DEV TOOLS TO 5' FROM BOTM.
	1140	35	700	33.5	11.52	4.15	.141	778	GRAY/TURBID
	1200	35'	1400	33.5	11.49	4.19	.100	444/245	" SL "
	1215	LOAD (7)	LUS W/	1600 GALLONS (9700)	START INTO 1400 GALLON				
	1235	30	600	33.5	11.58	4.26	.100	297/125	GRAY/SL TURBID
	1255	27.5	1100	33.5	11.57	4.28	.098	214/87	" "
	1305	LOAD (8)	LUS W/ 1100 GALLONS (START INTO 2000 TANK)						
	1325	30	600	33.5	11.43	4.30	.099	207/80	" " "
	1345	30	1200	33.5	11.42	4.29	.101	148/52	" " "
	1405	27	1600	33.5	11.33	4.27	.101	138/46	" " "
	1405	LOAD (9)	LUS W/ 1600 GALLONS (START INTO 1600 GAL)						
	1425	30	600	33.5	11.21	4.11	.108	115/42	" V SL TURBID
	1445	27.5	1100	33.5	11.20	4.13	.099	92/34	" " "
	1500	LOAD	(10) LUS W/ 1100 GALLONS (START INTO 2000 GALLON)						SURGE WELL.
	1520	30	600	33.5	11.15	4.39	.150	149/44	GRAY V. SL TURBID
	1540	30	1200	33.5	11.20	4.41	.107	53/34	CLEAR " " 414-419
	1600	27	1600	33.5	11.18	4.42	.106	51/31	" " " 409-414
	1610	LOAD	(11) LUS/W 1600 GALLONS						

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW 1-2
Site: NWIRP
Date Installed: 10/29/03
Date Developed: 11/13 → 11/18/03
Dev. Method: AIR LFT / PUMP
Pump Type: 3" SUB.

Depth to Bottom (ft.): 419' BGS
Static Water Level Before (ft.): 335±
Static Water Level After (ft.):
Screen Length (ft.): SEE PG 1
Specific Capacity:
Casing ID (in.): 3.13"

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

	Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below ~~TOC~~) BGS	Temperature (Degrees C)	pH	Specific Conductance (Units _____) mS/cm	Turbidity (NTU)	Remarks (odor, color, etc.)	
11/18	0925	START	INTO	1400 GALLON TANK						
	0945	30	600	33.5	11.42	4.44	.106	58/27	CLEAR V.SL. TURBID 394-399	15
	1005	27.5	1100	33.5	11.39	4.44	.106	33/19	" " " 389-394	20
	1015	LOAD	(12)	LVS w/ 1100 GALLONS START INTO 2000						
	1035	30	600	33.5	11.36	4.40	.104	46/26	" " " 384-389	25
W2	1055	30	1200	33.5	11.32	4.41	.109	25/22	" " " 379-384	30
	1115	27	1600	33.5	11.35	4.42	.106	25/21	" " " 374-379	35
		LOAD	(13)	LVS w/ 1600 GALLONS (DONE AIR LIFT)						
12/2	0940	START	INTO	2000 GALLON / PUMP w 1000 ALREADY IN IT.					WL 33.5±	INTANK
	1000	20	400	35.0	11.01	4.64	.100	999/1053	GRAY/ TURBID	(1400)
	1020	17.5	700	35.0	11.19	4.64	.096	222/225		(1700)
		LOAD LVS w/ 1700 GALLONS								
	1120	START	INTO	2000 GALLON						
	1140	20	400	35.0	11.27	4.75	.096	287/302	GRAY TURBID	
	1200	17.5	700	35.0	11.38	4.67	.097	36/64	CLEAR / SL TURBID	
	1220	15	900	35.0	11.37	4.65	.094	4/45	"	
		DONE w/ PUMP TOOK SAMPLE @ 1220								

AQUA TERRA GEOPHYSICS INC

AS PER DB ON 10/24/03:

1-1 196-231 SC
231-236 BL
236-241 SC

1-2 310-335

1-3 374-399 SC
399-409 BL
409-419 SC

COMPANY	UNITECH DRILLING
WELL ID	BPOW 1-3
FIELD	NWIRP BETHPAGE
COUNTRY	STATE
LOCATION	OTHER SERVICES

CO
WELL
FLD
CTY
STE
FILING No

SEC TWP RGE

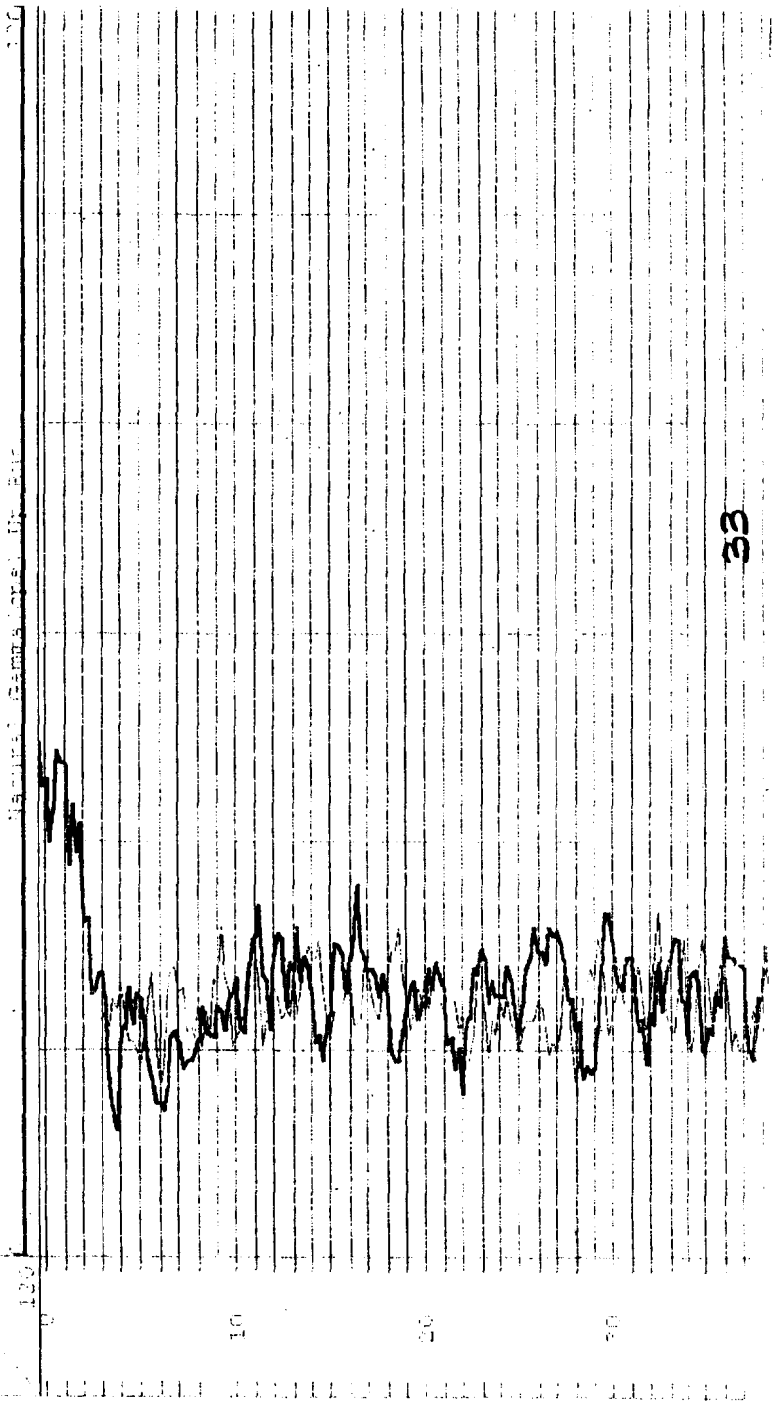
PERMANENT DATUM ELEVATION K.B.

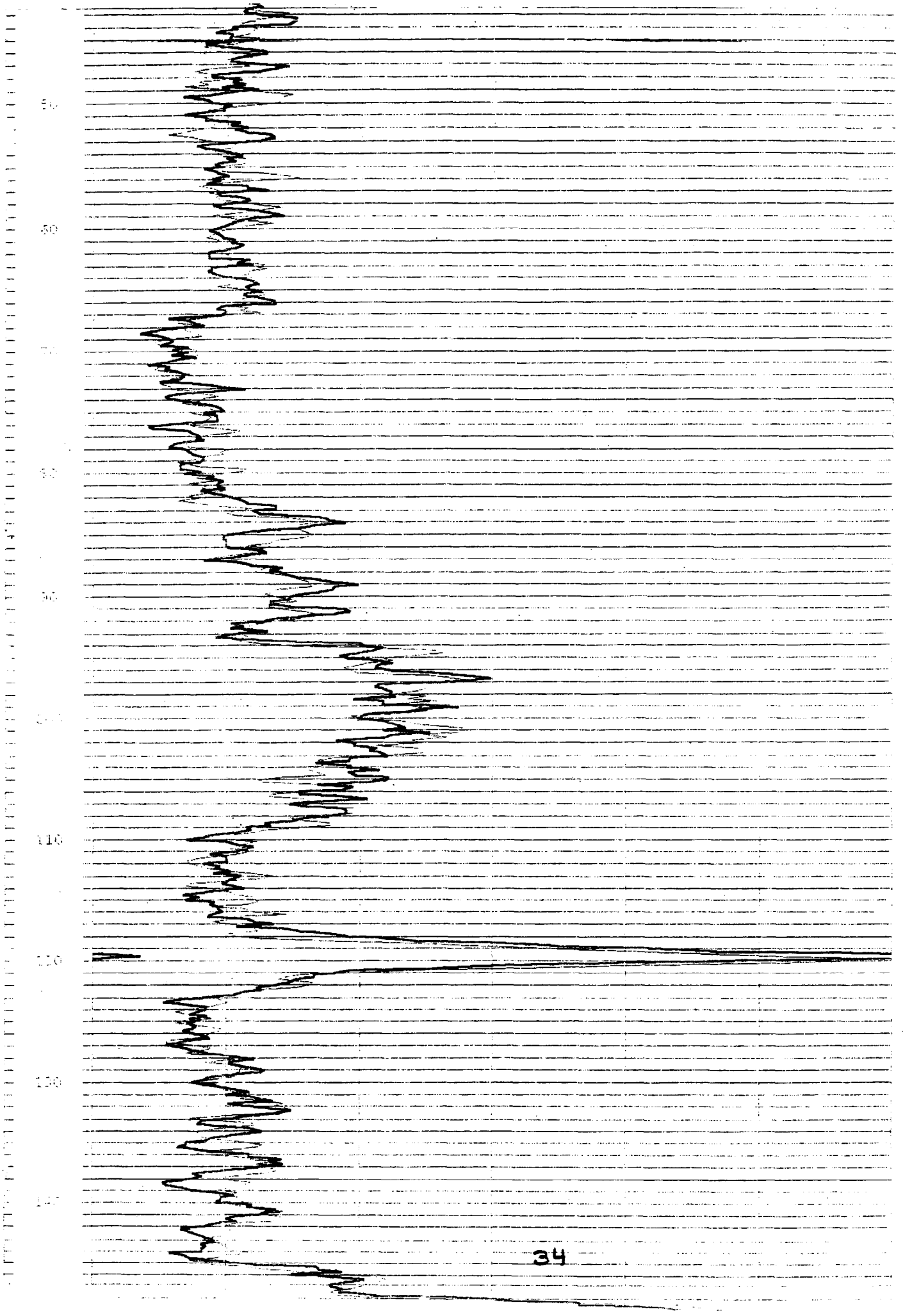
LOG MEAS. FROM GROUND SURFACE ABOVE PERM. DATUM D.F.

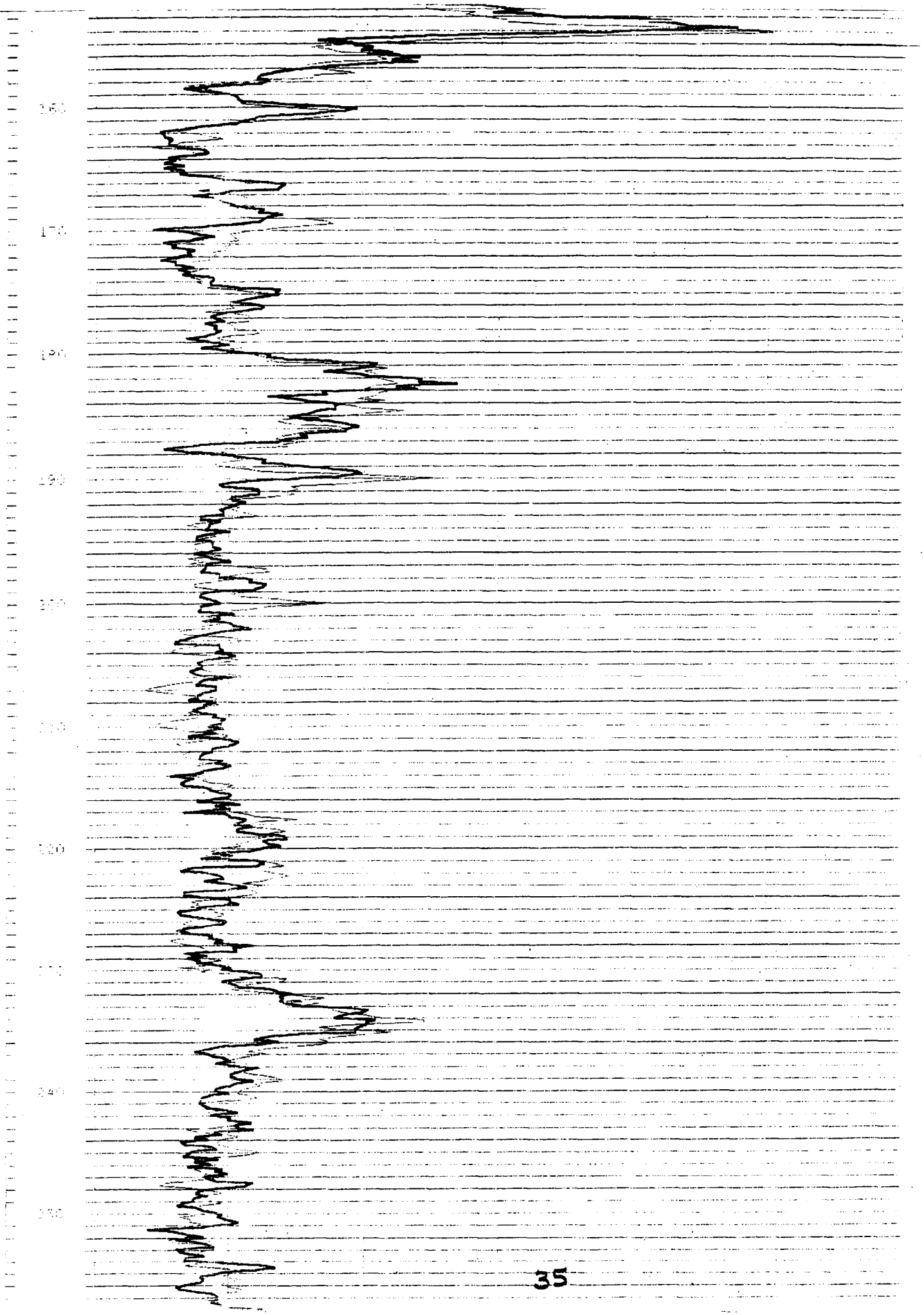
DRILLING MEAS. FROM G.L.

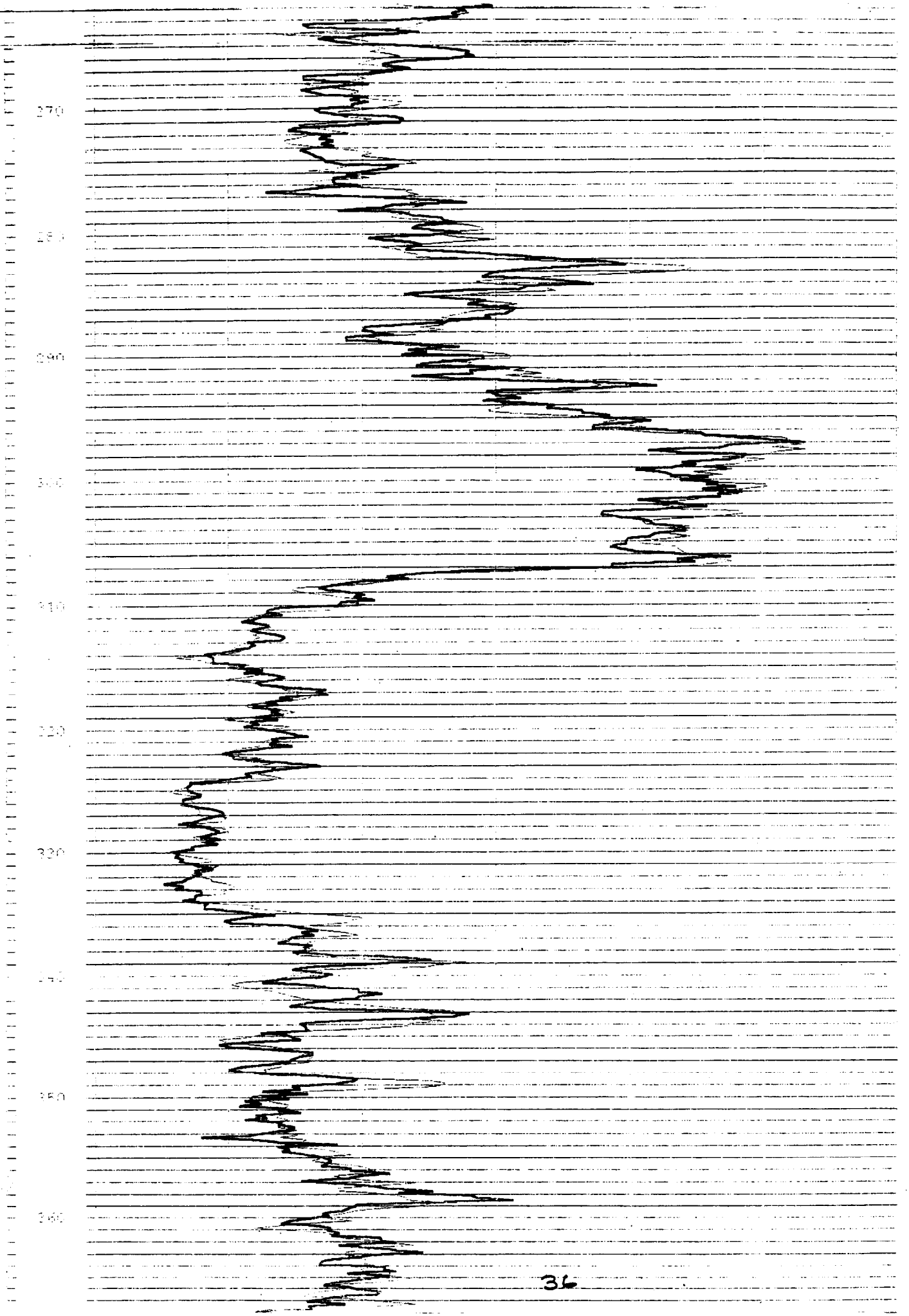
DATE	OCTOBER 24, 2003	TYPE FLUID IN HOLE	BENTONITE
RUN No		SALINITY	
TYPE LOG		DENSITY	
DEPTH-DRILLER	420 FEET	LEVEL	
DEPTH-LOGGER	419 FEET	MAX. REC. TEMP.	
BTM LOGGED INTERVAL			
TOP LOGGED INTERVAL			
OPERATING RIG TIME			
RECORDED BY	BENJAMIN RICE		
WITNESSED BY	STAN CONTI		

RUN NO.	BOREHOLE RECORD BIT	FROM	TO	CASING RECORD SIZE	WGT.	FROM	TO
	8 INCH	GROUND SURFACE	TOTAL DEPTH				




50
60
70
80
90
100
110
120
130
140


160
170
180
190
200
210
220
230
240
250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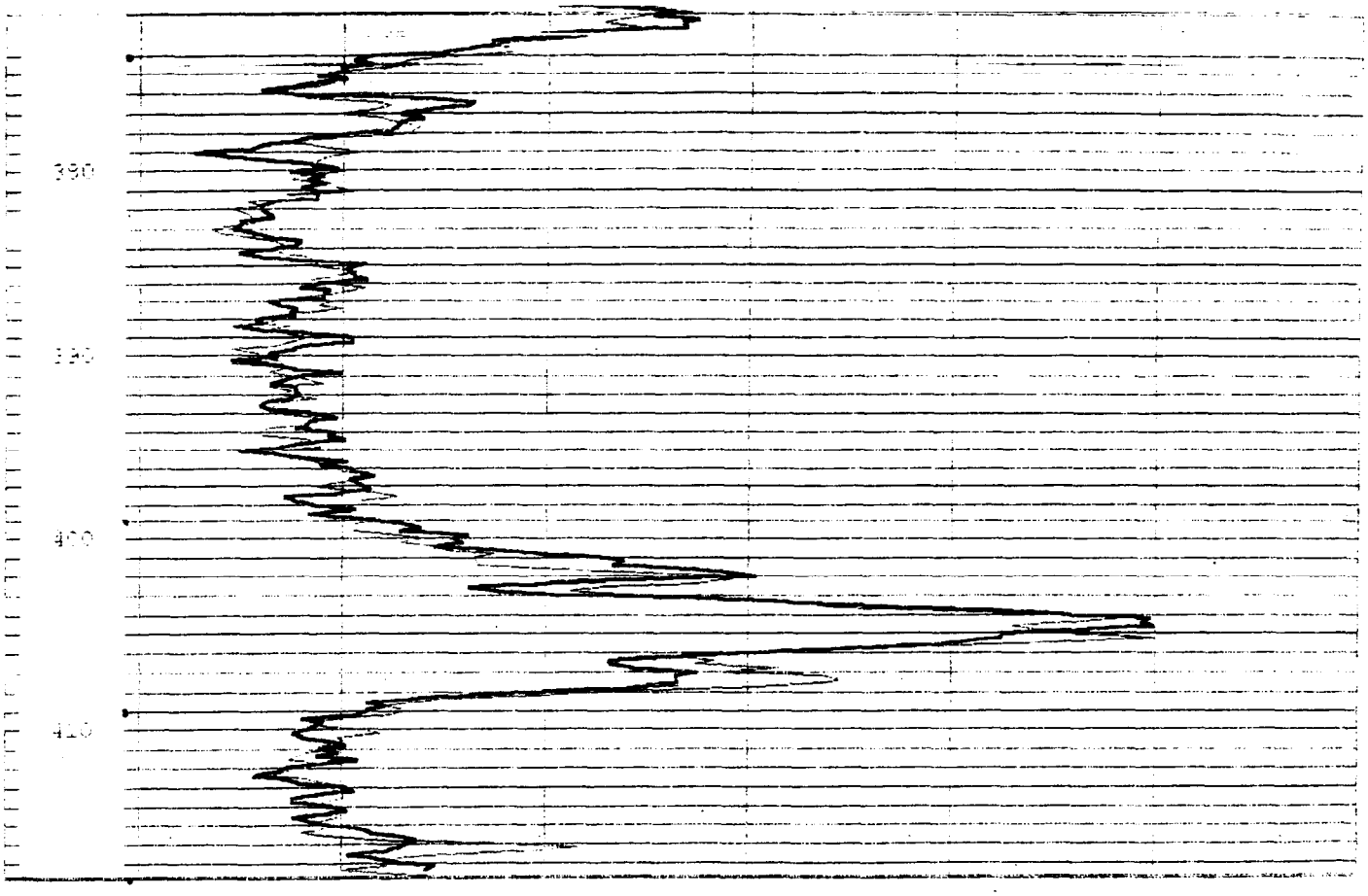
280
290
300
310
320
330
340
350
360


390
400
410

APPENDIX D

BPOW2-1 WELL DATA

Tetra Tech NUS, Inc.

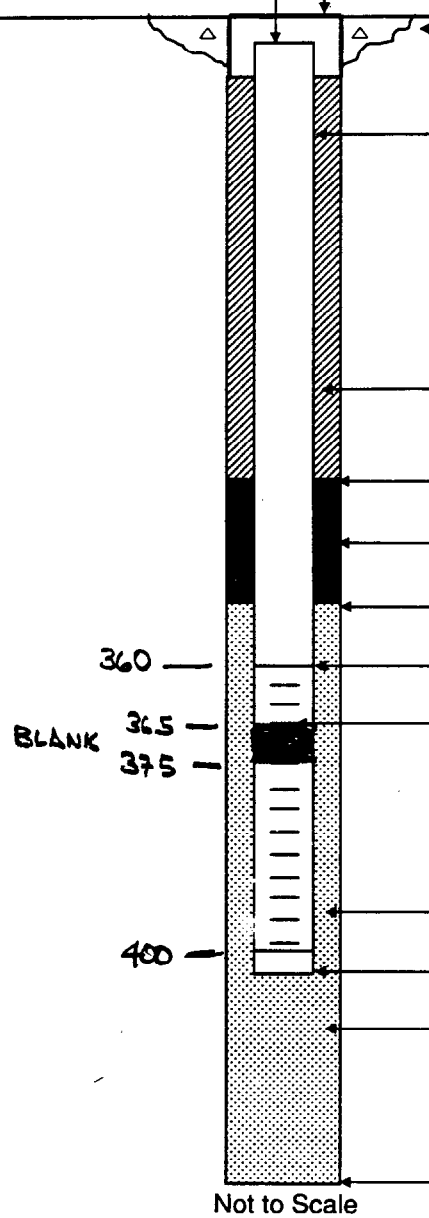
WELL No.: BPOW 2-1

MONITORING WELL SHEET

PERMIT No:

PROJECT:	UWIRP	DRILLING Co.:	UNITECH	BORING No.:	BPOW2-1
PROJECT No.:	N4037	DRILLER:	EVANS	DATE COMPLETED:	8/28/03
SITE:	BPOW 2	DRILLING METHOD:	MUD ROT	NORTHING:	
GEOLOGIST:	CONTI	DEV. METHOD:	AIR LIFT/PUMP	EASTING:	

Ground Elevation Datum:



Not to Scale

Elevation / Depth of Top of Riser: /

Elevation / Height of Top of Surface Casing: /

I.D. of Surface Casing: 12" Φ

Type of Surface Casing: STEEL

Type of Surface Seal: CONCRETE PAD

I.D. of Riser: 3 13/16"

Type of Riser: SCH 80 PVC

Borehole Diameter: 8" Φ

Type of Backfill: VOLCLAY GROUT

Elevation / Depth of ~~Seal~~ #0 F. SAND: / 345

Type of Seal: (FINE SAND) NA

Elevation / Depth of Top of Filter Pack: C SAND / 350

Elevation / Depth of Top of Screen: / 360

Type of Screen: PVC

Slot Size x Length: 10 SL x 40'

I.D. of Screen: 3 13/16" SCH 80

* BLANK FROM 365 - 375 -

Type of Filter Pack: #1 SILICA SAND

Elevation / Depth of Bottom of Screen: / 400

Elevation / Depth of Bottom of Filter Pack: / 401

Type of Backfill Below Well: SILICA SAND

Elevation / Total Depth of Borehole: / 410

REV 2/12/04

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW2-1
DATE: 8/25/03
GEOLOGIST: Conti
DRILLER: EVANS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
1630	0						SEE LOG 2-2						
							AND GAMMA LOG						
							FOR MORE DETAIL						
	10						SAND & GRAVEL	GW					0
	20												0
	30						SAME		1½" ϕ GRAVEL.				0
	40												0
1730	50												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: 8"ϕ MUD ROTARY - INITIALLY

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW2-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW2-1
DATE: 8/26/03
GEOLOGIST: Conti
DRILLER: EVANS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	50						SAND AND GRAVEL.	GW					0
	60												0
	70						SAND - SOME GRAVEL		(FROM CUTTINGS)				0
							SOME CLAY	GW/SC	?				
	80												0
	90												0
	100												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW2-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW
DATE: 8/26/93
GEOLOGIST: Conti
DRILLER: EVANS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	100												
							SILTY SAND-TR F						0
							GRAVEL						
1035	110												0
±													
	120												0
	130												0
							SILTY SAND- SOME	SC					
							CLAY	/SM					
	140												0
1100	150						SAME	SC/SM					0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW2-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW2-1
DATE: 8/26/03
GEOLOGIST: Conti
DRILLER: EVANS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	150					TAN BRN	SILTY SAND-TR CLAY	SM					0
	160												0
1130	170												0
	180						SILTY SAND	SM					0
	190												0
1200	200												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 2-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW2-1
DATE: 8/26/03
GEOLOGIST: Conti
DRILLER: EVANS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	200												
						GRAY	SANDY CLAY	SC	(FROM CUTTINGS)				0
	210					GRAY	SILTY SAND	SM					0
1215	220						SAME						0
	230												0
	240												0
1230	250						SAME						0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW2-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW2-1
DATE: 8/26/03
GEOLOGIST: Conti
DRILLER: EVANS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	250												
						GRAY	SILTY SAND	SM					0
								SP					
	260												0
1245	270												0
							SAME.						
	280												0
	290						MORE CLAY NOTICED						0
							SANDY CLAY	SC					
1310	300												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 2-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 2-1
DATE: 8/26/03
GEOLOGIST: Conti
DRILLER: EVANS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	300												
							SANDY CLAY						0
1400	310												0
	320						SILTY SAND	SP/SM					0
	330												0
	340						SAME						0
1530	350												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 2-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW
DATE: 8/27/03
GEOLOGIST: Conti
DRILLER: EVANS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	350												
							SILTY SAND	SM/SP					0
	360			360									0
			365										
				BLANK									
	370						MORE CLAY						0
			375										
									SET WELL				
	380								360 → 400				0
									W/ BLANK SECTION FROM 365 → 375				
									C. SAND TO 350				
									F SAND TO 345				
	390												0
									DRILLED 8" TO				
									410				
	400				400								0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW 2-1

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW 2-1
Site: NWIRP
Date Installed: 8/28/03
Date Developed: 9/5/03 →
Dev. Method: AIR LIFT/ PUMP
Pump Type:

Depth to Bottom (ft.): 400 BGS
Static Water Level Before (ft.): 11.0'±
Static Water Level After (ft.):
Screen Length (ft.): 40' - 10' BLANK
Specific Capacity:
Casing ID (in.): 3 13/16

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

U-22 2020 HORIBA/LAMOTTE

360 - 400
365 - 375 (BLANK)

Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below ~~TOC~~ GS)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
0955	START	AIR LIFT	INTO 1800 GALLON TANK	—	—	—	—	GRAY - TURBID
1015	20	400	28.00	13.66	4.81	.173	999	RODS @ 250'± GRAY AND TURBID
1035	20	800	27.50	14.20	4.94	.125	999	" " "
1055	20	1200	27.00	13.89	4.95	.115	999	" " "
1115	20	1600	27.00	14.15	4.95	.117	999	" " "
9/5	LOAD	(1) LVS	(1600)					→ CLEAR/NON TURBID.
9/8 1030	INITIAL	W.L.	24.00	LOAD (2)	LVS	(1600) = 3200		LOWER RODS TO ≈ 340'
1235	START	AIR LIFT	INTO 1400	GALLON TANK				THEN SURGE
1255	25	500	26.00	13.62	5.60	.141	349/21	CLEAR
1315	25	1000	26.00	13.52	5.67	.121	395/12	" SURGE
1320	LOAD	(3) DONE	(1100) = 4300					
1320	START	INTO 1800	GALLON TANK.					
1340	30	600	26.00	13.59	5.62	.119	384/9	CLEAR
1400	30	1200	25.50	13.55	5.63	.119	390/8	" 5900
1420	27	1600	25.50	13.56	5.62	.120	388/9	" LOAD (4) W.L. (1600)
1420	START	INTO	1800 GALLON.					SURGE
1440	25	500	25.50	13.45	5.52	.114	308/7	"
1500	27.5	1100	25.50	13.69	5.50	.112	276/5	" LOAD (5) LVS (1100) = 7000

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Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW2-1
Site: NWIRP
Date Installed: 8/28/03
Date Developed: 9/5/03 →
Dev. Method: AIR LIFT / PUMP
Pump Type:

Depth to Bottom (ft.): 400 BGS
Static Water Level Before (ft.):
Static Water Level After (ft.):
Screen Length (ft.): 40 - 10' BLANK
Specific Capacity:
Casing ID (in.): 3 13/16

Responsible Personnel: Contl
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

U-22
HORIBA / LAMOTTE

	Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below ~~TOC~~ GS)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
9/8	1510	START	INTO 1800 GALLON TANK						
	1530	30	600	25.50	13.33	5.47	.114	270/5	CLEAR.
	1550	30	1200	25.50	13.40	5.45	.112	268/6	"
	1610	27	1600	25.50	13.38	5.42	.116	275/5	"
			LOAD (6) LVS W/1600 GALLONS			(8600)	THIS WELL SO FAR.		
9/9	0850	START	INTO 1400 GALLON TANK.						LOWER RODS TO BOTM/SURGE
	0910	30	600	27.00	13.08	4.51	.198	372/54	CLEAR - SL TURBID 25.70 SWL
	0930	27.5	1100	27.00	13.00	4.74	.092	298/26	" NON TURBID
8/9	0950	27	1600	27.00	12.94	4.73	.089	134/15	" "
			LOAD (7) LVS W/1600 GALLONS =			10,200	.1050		SURGE WELL.
	1000	START	INTO 1400 GALLON TANK.						
	1020	25	500	27.00	13.05	4.75	.092	295/43	CLEAR - SL TURBID
	1040	25	1000	27.00	13.14	4.70	.091	146/21	" NON "
	1050		LOAD (8) LVS W/ 1100 GAL			11,300			
	1050	START	INTO 1800 GALLON						
	1110	30	600	27.00	12.96	4.73	.095	198/14	" "
	1130	27.5	1100	27.00	12.95	4.74	.093	137/12	" "
	1150	27	1600	26.50	13.08	4.76	.092	169/10	" " 395.400

LOAD (9) LVS W/1600 GAL 12,900

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW2-1
Site: NWIRP
Date Installed: 8/28/03
Date Developed: 9/5/03 →
Dev. Method: AIR LIFT / PUMP
Pump Type: GRUNDFOS SUB.

Depth to Bottom (ft.): 400' BGS
Static Water Level Before (ft.):
Static Water Level After (ft.):
Screen Length (ft.): 40 – 10' BLANK
Specific Capacity:
Casing ID (in.): 3 13/16

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

360-400
360-365 - SCR.
365-375 - BL
375-400 - SCR.

U22 HORIBA / 2020 LAMOTTE

Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below ~~TOC~~ GS)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
1155	START	INTO 1400 GALLON TANK			—	—	—	CLEAR NON TURBID
1215	30	600	25.00	13.15	4.87	.096	290/12	" " 390-395
1235	27.5	1100	25.00	12.89	4.83	.093	165/11	" " 385-390
1240	LOAD	(10) LUS	W/ 1100 GALLONS		14,000 (1600)	(THIS WELL)		
1240	START	INTO 1800 GALLON TANK.						
1300	30	600	25.00	12.96	4.88	.092	160/14	CLEAR NON TURBID 380-385
1320	27.5	1100	25.00	12.75	4.87	.092	218/12	" " " 375-380
1340	27	1600	25.00	12.72	4.86	.091	160/12	" " " 360-365
	LOAD	(11) LUS	W/ 1600 GALLONS		15,600			
			START @ 800 GALLONS PREVIOUS WELL					(AIR) ↑
1035	START	PUMPING	25.5	—	—	—	—	(PUMP) ↓
1055	15	300 (1100)	26.0	13.34	5.79	.160	999/993	GRAY / TURBID
1115	10	200 (1300)	26.0	13.32	5.70	.128	398/36	CLEAR - SL TURBID.
1135	15	300 (1600)	26.0	13.35	5.65	.120	216/24	" NON "
1155	10	200 (1800)	26.0	13.38	5.64	.118	135/14	" "
			15,600					DONE
			1000					
			16,600	TOTAL THIS WELL.				

APPENDIX E

BPOW2-2 WELL DATA

Tetra Tech NUS, Inc.

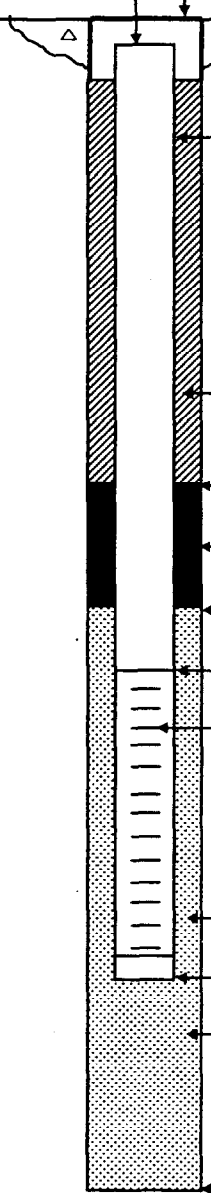
WELL No.: BPOW 2-2

MONITORING WELL SHEET

PERMIT No:

PROJECT:	NWIRP	DRILLING Co.:	UNITECH	BORING No.:	BPOW 2-2
PROJECT No.:	N4037	DRILLER:	EVANS	DATE COMPLETED:	8/20/03
SITE:	BPOW 2	DRILLING METHOD:	MUD ROT	NORTHING:	
GEOLOGIST:	CONTI	DEV. METHOD:		EASTING:	

Ground Elevation Datum:



Not to Scale

Elevation / Depth of Top of Riser:	/
Elevation / Height of Top of Surface Casing:	/
I.D. of Surface Casing:	
Type of Surface Casing:	STEEL
Type of Surface Seal:	CONCRETE PAD
I.D. of Riser:	3 13/16"
Type of Riser:	PVC SCH 80
Borehole Diameter:	8"
Type of Backfill:	VOLCLAY GROUT
Elevation / Depth of ~~Seal~~: F SAND #0	/425
Type of Seal:	NA
Elevation / Depth of Top of Filter Pack: (c)	/ 435
Elevation / Depth of Top of Screen:	/ 455
Type of Screen:	PVC SCH 80
Slot Size x Length:	10 SL x 40'
I.D. of Screen:	3 13/16
Type of Filter Pack: #1	SILICA SAND
Elevation / Depth of Bottom of Screen:	/ 495
Elevation / Depth of Bottom of Filter Pack:	/ 496
Type of Backfill Below Well:	SAND
Elevation / Total Depth of Borehole:	/ 510

REV 2/12/04

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW2-2
DATE: 816103
GEOLOGIST: Conti
DRILLER: EVANS

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
8/6	1445	0				DENSE	TAN BRN	GRAVEL AND SAND	GW	SOME 1" SUB ANG/SUB ROUND GRAVEL LOGGED FROM CUTTINGS.				0
		10												0
	1500	20						SAME						0
		30						SAME						0
8/6	1520	40						GRAVEL AND SAND	GW					0
8/7										SET CASING @ 45'- WOULD NOT GO DEEPER - HOLE DEPTH @ 100'				
	1015	50												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: START W/ 8" Φ MUD ROTARY.
CETCO PURE GOLD GEL (DRILLING MUD)
HOLE WAS REAMED TO 12" TO 100' BUT COULD ONLY INSTALL 10" CAS TO 45'

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW2-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 2-2
DATE: 8/7/03
GEOLOGIST: Conti
DRILLER: EVANS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	50												
							GRAVEL AND SAND	GW					0
1030	60												0
1045	70				DENSE		SAND - SOME GRAVEL		OUT OF F. GRAVEL ≈ 70 TO 80'				0
							TO						
							INTERBEDDED SAND						
							AND CLAYEY SILT						
1100	80												0
1115	90												0
							SAND - TR CLAY						
							TO 100'						
1130	100												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: WILL ATTEMPT TO SET CASING (10") ≈ 100' BUT ONLY WENT DOWN TO 95 - TRIED TO PULL BUT COULD NOT RESUME 8" Ø THRU CASING ON 8/11/03

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 2-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW2-2
DATE: 8/12/03 / 8/13/03 / 8/18/03
GEOLOGIST: Conti
DRILLER: EVANS

	Sample No. and Type or RQD	Depth (FL) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		100												
8/12								SILTY SAND-TR GRAVEL	SM/SP	LOGGED FROM CUTTINGS. SET 8"Φ TO 105-THRU 10"-WHICH WAS ONLY SET TO 45+ SEE NB 1360 FOR DETAILS				0
8/13														
8/18														
		110												0
		120						SAND						0
		130												0
		140						SAND - TR CLAY		NOTED SOME CLAY IN CUTTINGS				0
		150						SAND - SOME CLAY						0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: SET/GROUTED 8"Φ CAS TO 105' ON 8/12/03

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW2-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW2-2
DATE: 8/18/03
GEOLOGIST: Conti
DRILLER: EVANS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	150												
S-1 e	151.	38 / 50/6	1/1		V DENSE	ORANG BRN	F/M SAND - TR	SP	WET	0			0
1140							GRAY CLAY IN "WASH" PORTION		GOOD RECOVERY				
1230	160												0
1300	170												0
1400	180						SAND F/M	SP					0
1430	190												0
1500	200						SAND - TR CLAY						0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW2-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW2-2
DATE: 8/18/03
GEOLOGIST: Conti
DRILLER: EVANS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	200												
					DENSE		SAND F/M						0
1530	210						SILTY SAND-TR CLAY						0
	220												0
1545	230						SAND (SILTY)	SM	(FROM CUTTINGS)				0
								SP					
	240												0
1600	250												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW2-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 2-2
DATE: 8/19/03
GEOLOGIST: Conti
DRILLER: EVANS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
S-2 @ 1050	250	30 50/2	.6/1		V DENSE	YELLOW BRN	SILTY F/M SAND	SM/SP	WET MICACEOUS				0
	260												0
	270						SILTY F/M SAND						0
1115	280												0
	290						SAME. - MORE CLAY NOTICED						0
1145	300												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW 2-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW2-2
DATE: 8/19/03
GEOLOGIST: Conti
DRILLER: EVANS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	300												
							SILTY SAND						0
	310												0
1215	320						SAME		LESS CLAY				0
	330												0
	340						SAME		TR OF CLAY				0
1230	350												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW2-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW2-2
DATE: 8/19/03
GEOLOGIST: Conti
DRILLER: EVANS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	350												
S3 @		36/50	.1/1		V DENSE	GRAY BRN	SILTY SAND - TR CLAY	SM/SP	WET	0			0
1230													
	360												0
1330	370						SAND - TR CLAY						0
	380												0
1450	390						SAND	SM					0
								SP					
	400												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW2-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING

BORING No.: BPOW2-2
DATE: 8/19/03
GEOLOGIST: Conti
DRILLER: EVANS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	400						SILTY F/M SAND						0
1500	410												0
	420						SAME						0
1530	430												0
	440						SAME, W/ TR CLAY.						0
1600	450												0

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW2-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW2-2
DATE: 8-19-03
GEOLOGIST: Conti
DRILLER: EVANS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	450												
S-4 @ 1600	451	36/50	1/1		V. DENSE	BLK GRAY	CLAYEY SAND (LAMINATED)	SC	WET				0
	460						SILTY SAND		LESS CLAY AT 455±				0
	470												0
									476 (PROPOSED)				
	480						SAND						0
									SET WELL ON 8/20/03				
									SCREEN 455-495				
									SAND(C) 435-496				
	490								SAND(F) 425-435				
							SAND - TR CLAY		≈495 - STOP, HERE ≈ 40' BELOW 455				
	500												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW2-2

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW2-2
Site: NWIRP – BPOW2
Date Installed: 8/20/03
Date Developed: 9-3-03 →
Dev. Method: AIR LIFT/PUMP
Pump Type:

Depth to Bottom (ft.): 495 (GS)
Static Water Level Before (ft.): 22'(GS)
Static Water Level After (ft.):
Screen Length (ft.): 40'
Specific Capacity:
Casing ID (in.): 3 13/16

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

HORIBA/LAMOTTE

Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below ~~TOC~~) GS.	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
0915	—	—	22.00	—	—	—	—	INITIAL
0945	23	700	31.00	13.69	4.68	.255	999	PACKER @ 300'± GRAY-TURBID
1015	20	1200	29.50	13.15	4.89	.132	651/268	
1035	16	1600	LOAD 1 LVS					
1040	START	DEV INTO	1400 GAL.					
1100	20	400	29.00	13.60	5.00	.118	490/143	GRAY-SL TURBID PACKER @ 320'
1120	20	800	29.00	13.97	5.01	.106	333/75	" " " "
1140	20	1200	29.00	13.80	5.09	.104	266/53	" " " "
1143		2800	LOAD 2 LVS					
1145	START	INTO 1800 GAL						
1205	25	500	29.00	13.77	5.10	.102	360/81	CLEAR SL " " 320' (24)
1225	22.5	900	29.00	—	5.10	.100	290/43	" " "
1245	20	1200	29.00	13.22	5.14	.099	236/36	" " " " 340
1303		1600 4400	LOAD 3 LVS					
1305	START	INTO 1400 GALLON						
1325	22.5	450	29.00	13.35	5.11	.098	289/54	" " "
1345	20	800	29.00	13.26	5.11	.098	211/32	" " "
1405	18	1100 5500	29.00	14.00	5.03	.092	154/21	" " "

LOAD 4 LVS

19

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

SCREEN 455→495

Well: BPOW2-2
Site: NWIRP
Date Installed: 8/20/03
Date Developed: 9/3/03 →
Dev. Method: AIR LIFT/ PUMP
Pump Type:

Depth to Bottom (ft.): 495' (GS)
Static Water Level Before (ft.): 22'
Static Water Level After (ft.):
Screen Length (ft.): 40'
Specific Capacity:
Casing ID (in.): 3 7/16

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

6/22 2020
HORIBA/ LAMOTTE

Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
1430	START	INTO 1800 GALLON		—	—	—	—	LOWER PIPE TO ≈ 470' BGS GRAY/TURBID
1450	25	500	29.00	13.95	5.06	.094	300/53	CLEAR - SL TURBID
1510	22.5	900	29.00	13.78	5.14	.092	218/26	" " "
1530	20	1200	28.00	13.76	5.16	.091	202/21	"
1550	16	(1600) 7100	28.00	13.75	5.17	.090	150/16	"
1551		LOAD (5) LVS						
1550	START	INTO 1400 GALLON						
1610	20	400	28.00	13.73	5.17	.091	241/27	CLEAR
1630	20	800	28.00	13.20	5.16	.092	258/18	"
1650	20	(1100) 8200	(6) 28.00	13.70	5.17	.091	264/20	" (6) LVS @ 1700 HRS
0915	START	INTO 1800	23.00	—	—	—	—	
0935	25	500	27.50	15.64	5.13	.135	278/26	"
0955	22.5	900	27.50	14.95	5.38	.106	281/16	"
1015	20	1200	27.50	15.44	5.57	.104	262/12	"
1035	20	1600 (9800)	(7) 27.50	14.25	5.60	.102	270/12	" LOAD (7) LVS @ 1035 HRS
1035	START	INTO 1400 GALLON						
1055	25	500	27.50	13.93	5.86	.124	300/17	CLEAR - LOWER PIPE TO BOTM
1115	22.5	900	27.50	14.79	5.84	.116	605/99	" SL TURBID
1130	LOAD	1100 (8) LVS.	(10900)	—	—	—	—	

6/2

9/3 ↑

9/4 ↓

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW2-2
Site: NWIRP
Date Installed: 8/20/03
Date Developed: 9/3/03 →
Dev. Method: AIR LIFT PUMP
Pump Type:

Depth to Bottom (ft.): 495 BGS
Static Water Level Before (ft.): 22'
Static Water Level After (ft.):
Screen Length (ft.): 40
Specific Capacity:
Casing ID (in.): 3 13/16

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

HORIBA/LAMOTTE

Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm.)	Turbidity (NTU)	Remarks (odor, color, etc.)	SCREEN INT
1130	START INTO 1800 GALLON								
1150	20	400	27.50	13.93	5.83	.117	457/61	CLEAR - SL TURBID	495-490
1210	22.5	900	27.50	13.51	5.87	.117	316/16	" NOT "	490-485
1230	20	1200	27.50	13.67	5.88	.112	356/11	" " "	
1250	20	1600 (9) (12,500)	27.50	13.66	5.87	.121	335/10	LOAD (8) LVS (SURGE)	
1300	START INTO 1400 GALLON								
1320	20	400	27.50	13.60	5.82	.110	328/47	CLEAR V SL TURBID	495-490
1340	20	800	27.50	13.63	5.83	.108	219/13	" NON TURBID	490-485
1400	18.3	1100 10 (13600)	27.50	13.65	5.84	.107	216/11	" " " LOAD (10) LVS	480-485
1400	START INTO 1800 GALLON								
1420	20	400	27.0	14.29	5.84	.102	199/15	CLEAR	475-480
1440	20	800	27.0	13.97	5.77	.106	353/8	"	470-475
1500	20	1200	27.0	13.93	5.78	.105	287/6	"	465-470
1510	20	1400	27.0	13.94	5.77	.104	276/6	"	460-465
1520	20	(1600)	27.0	13.97	5.79	.105	290/7	"	455-460
			LOAD (11) LAST LOAD.					COMPLETE	
			(15,200) TOTAL						

6 W

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW2-2
Site: NWIRP
Date Installed: 8/20/03
Date Developed: 9/10/03
Dev. Method: PUMP
Pump Type: GRUNDFOS SUB

Depth to Bottom (ft.): 495' GS
Static Water Level Before (ft.): 23.8 GS
Static Water Level After (ft.):
Screen Length (ft.): 40'
Specific Capacity:
Casing ID (in.): 3 13/16

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

HORIBA/ LAMOTTE

Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
0930	START PUMPING. IN 1800 GALLON TANK							
0950	15	300	25.3	13.21	5.59	.165	456/153	GRAY/TURBID
1010	15	600	25.3	13.25	5.63	.126	264/38	CLEAR/ V.SL TURBID.
1030	13.3	800	25.3	13.20	5.70	.118	250/18	" NON TURBID
								DONE PUMPING.
				15,200				
				800				
				16,000	BPOW2-2			

AQUA TERRA GEOPHYSICS INC

COMPANY	UNI TECH DRILLING
WELL ID	BPOW 2 - 2
FIELD	NWIRP BETHPAGE
COUNTRY	STATE

CO
WELL
FLD
CTY
STE
FILING No

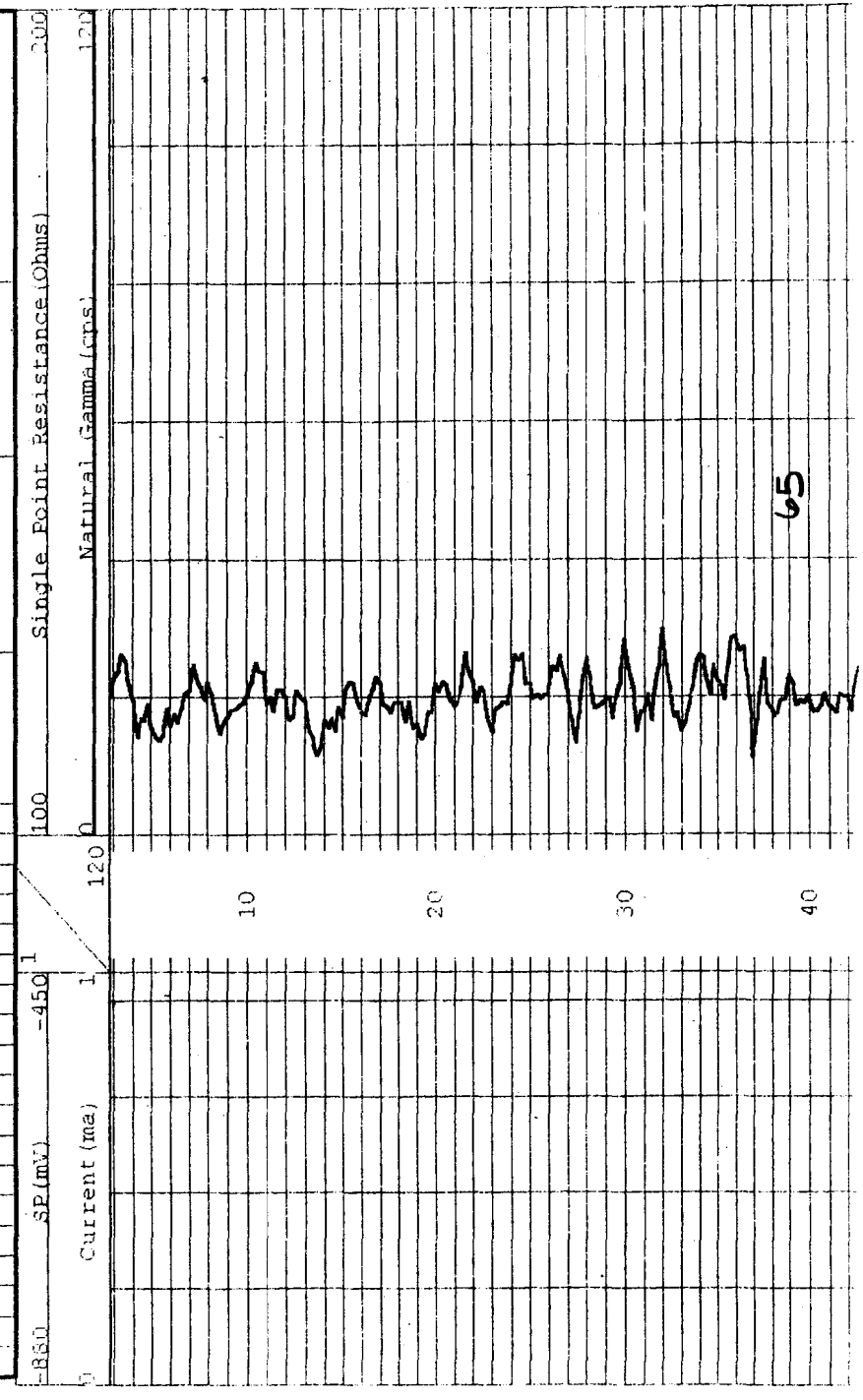
LOCATION

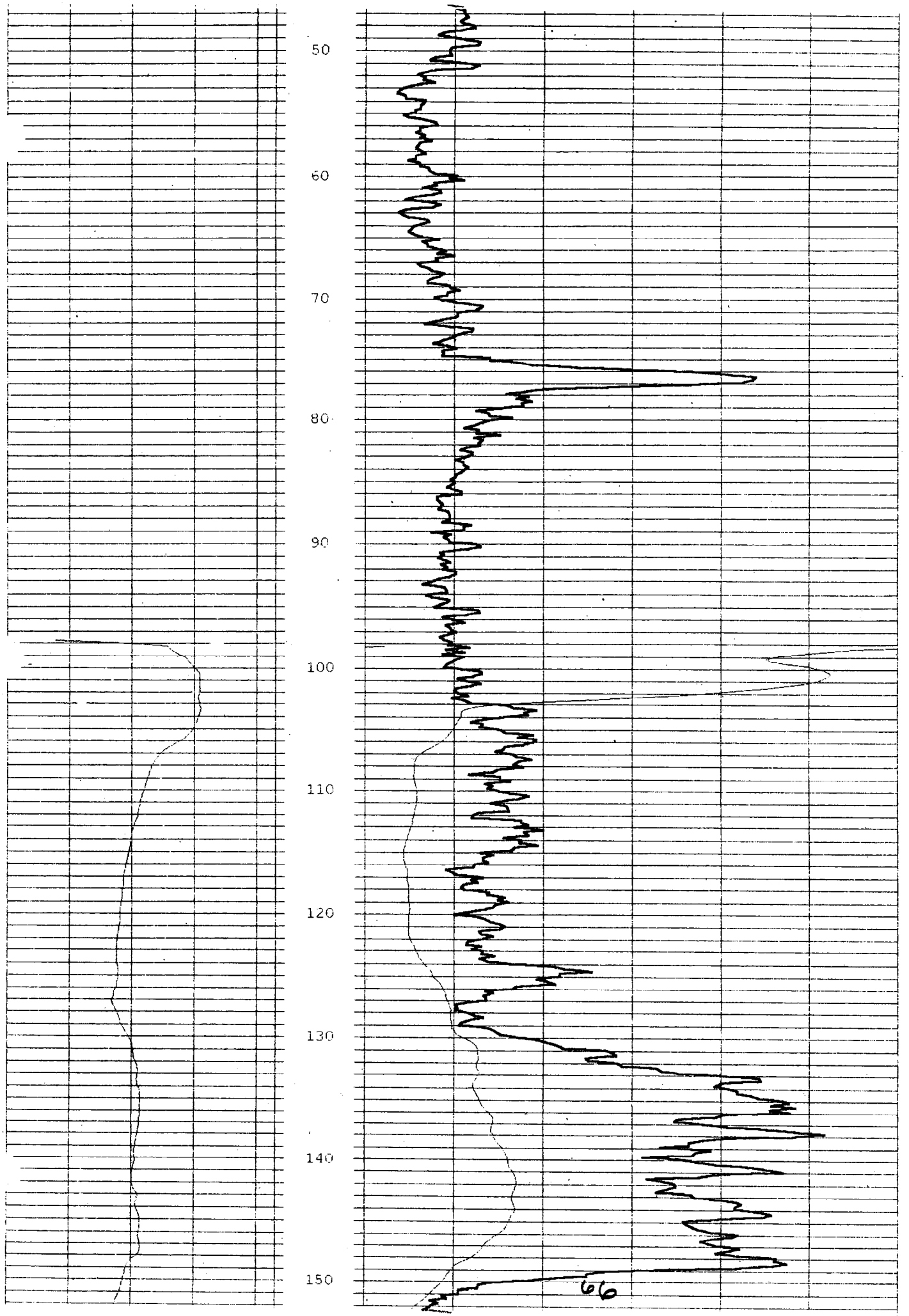
SEC TWP RGE

OTHER SERVICES

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM		ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM			G.L.
DATE	AUGUST 19, 2003	TYPE FLUID IN HOLE	BENTONITE
RUN No		SALINITY	
TYPE LOG		DENSITY	
DEPTH-DRILLER		LEVEL	
DEPTH-LOGGER		MAX. REC. TEMP.	
BTM LOGGED INTERVAL			
TOP LOGGED INTERVAL			
OPERATING RIG TIME			
RECORDED BY	BENJAMIN RICE		
WITNESSED BY	STAN CONTI		

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
	8 INCH	103 FEET	TOTAL DEPTHY	8 INCH	PVC	GROUND SURFACE	103 FEET

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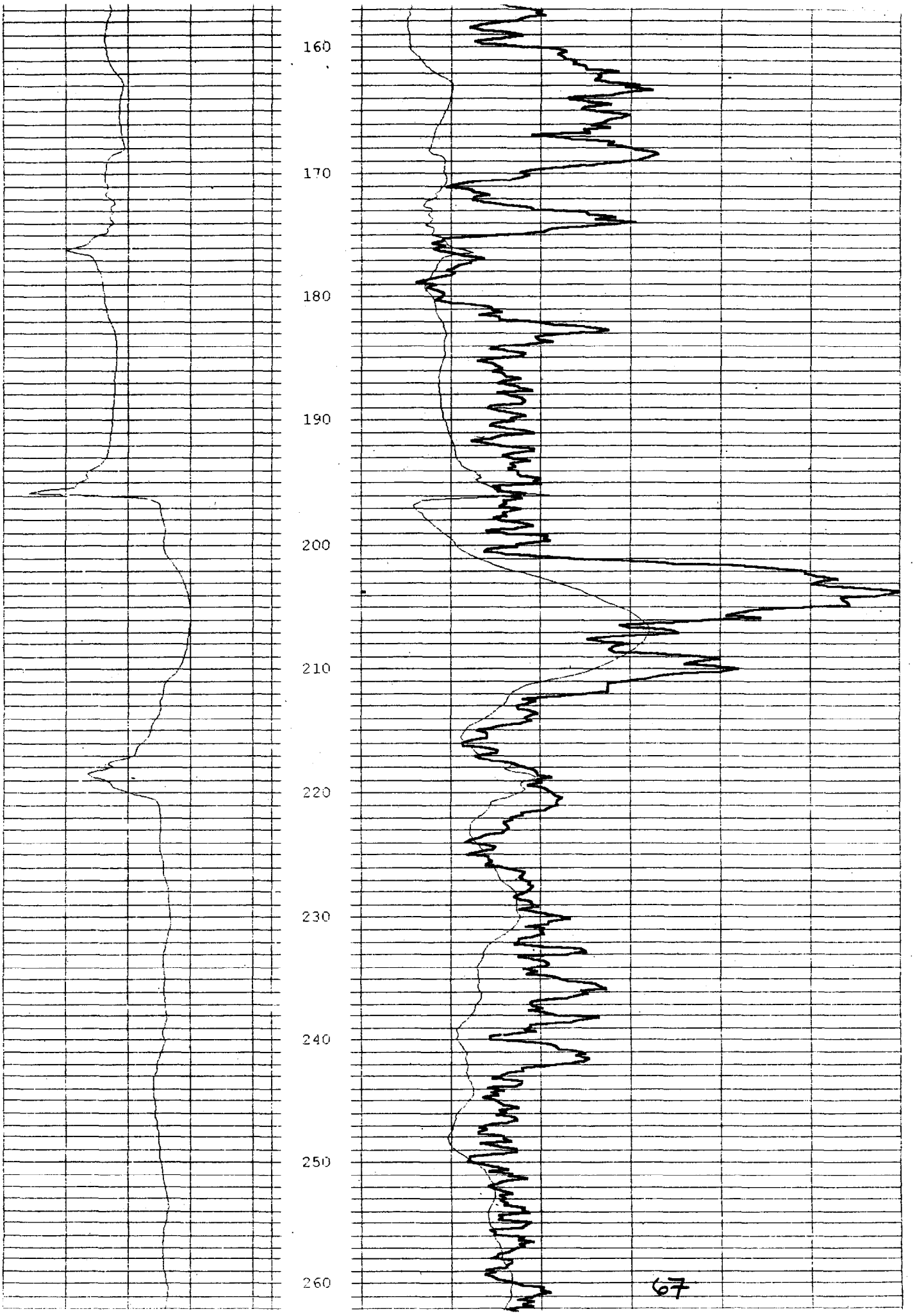
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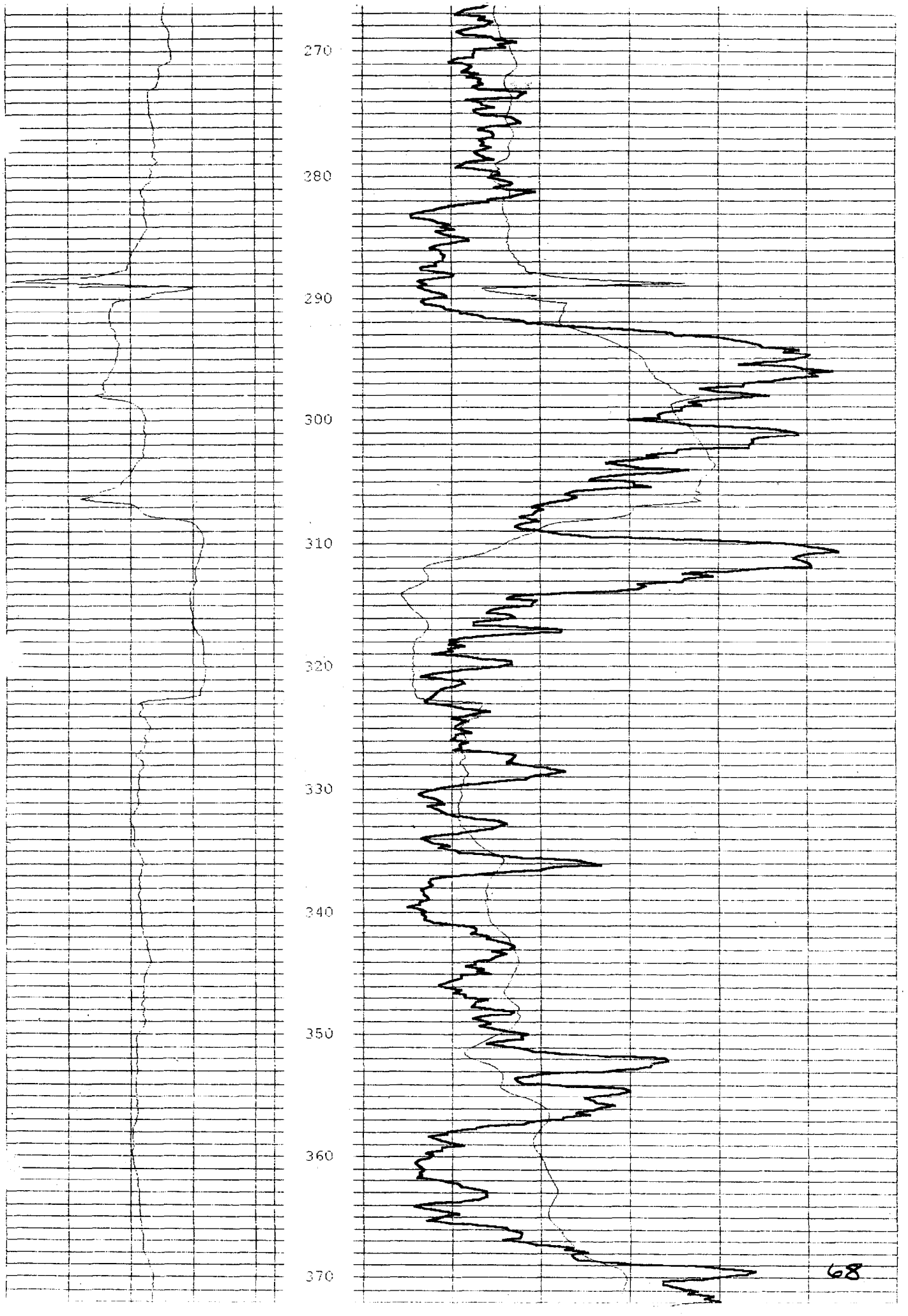
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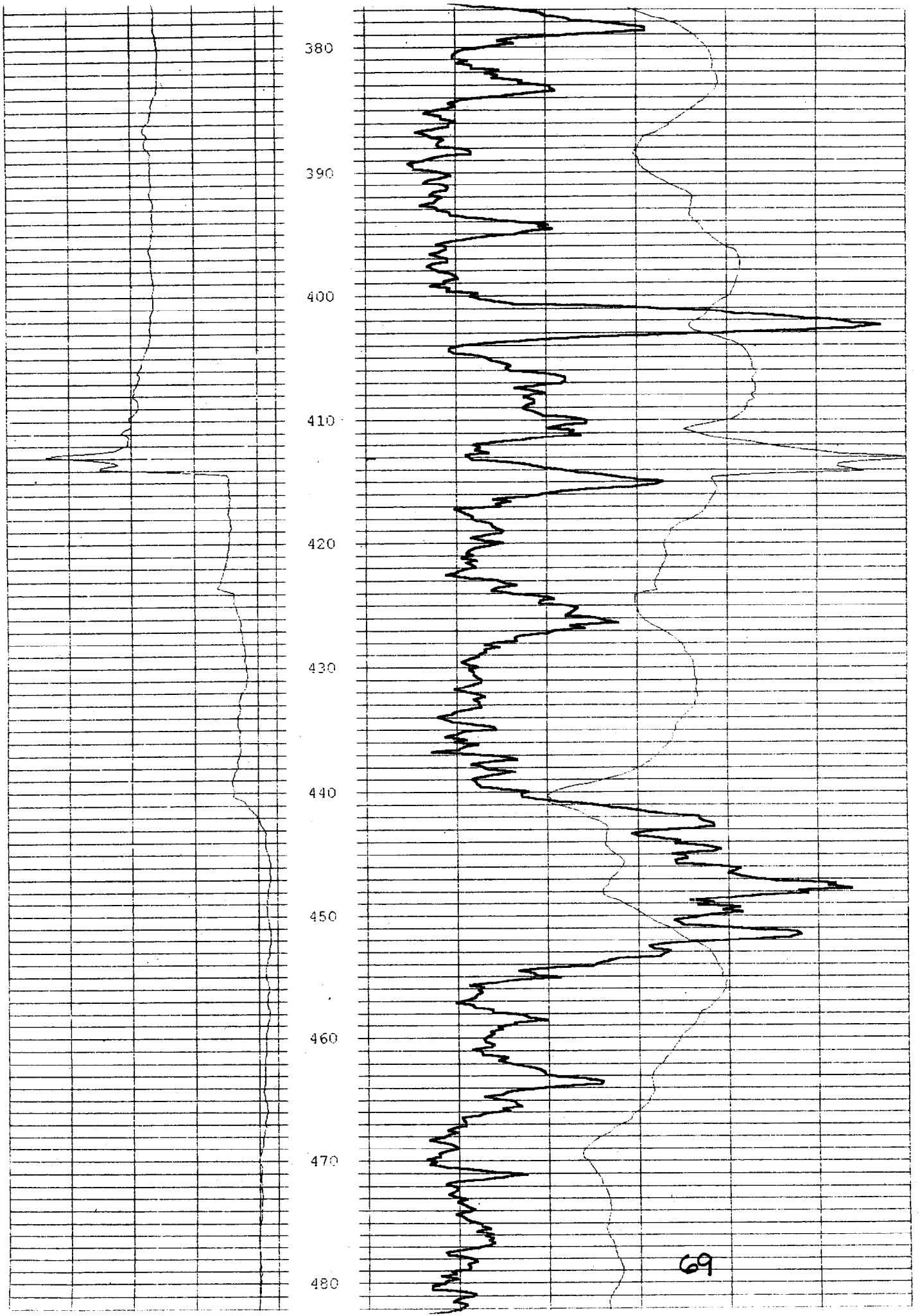
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390
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410
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430
440
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460
470
480
69

APPENDIX F

BPOW3-1 WELL DATA

Tetra Tech NUS, Inc.

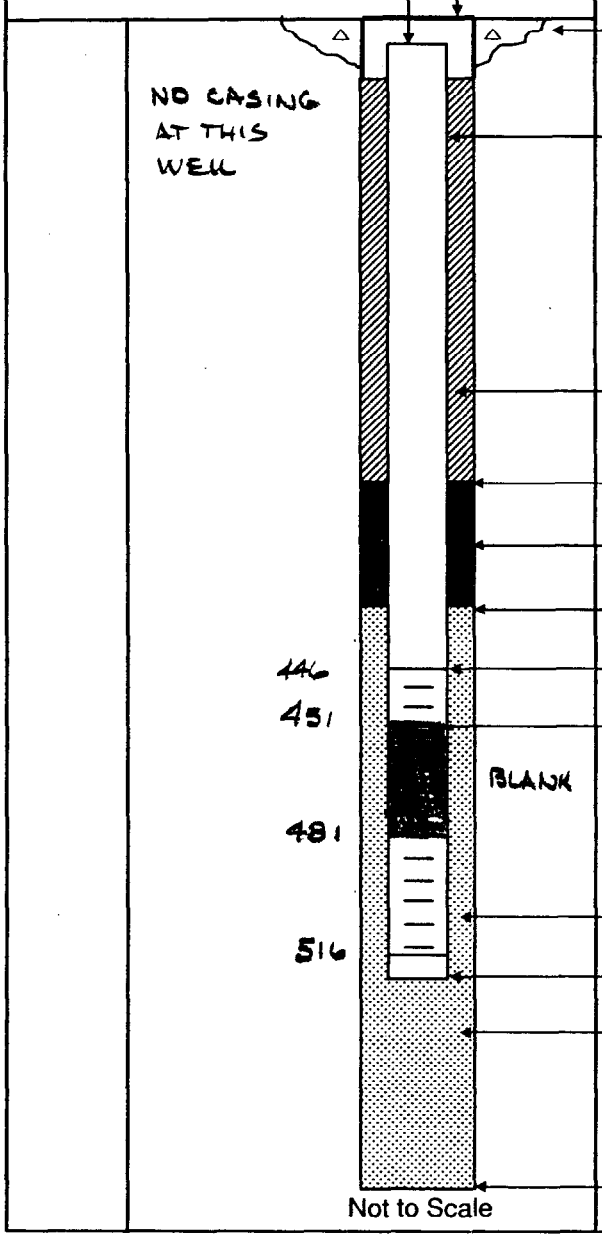
WELL No.: BPOW3-1

MONITORING WELL SHEET

PERMIT No:

PROJECT:	NWIRP	DRILLING Co.:	UNITECH	BORING No.:	BPOW3-1
PROJECT No.:	N4037	DRILLER:	BLEMINGS	DATE COMPLETED:	10/8/03
SITE:	BETHPAGE	DRILLING METHOD:	MUD ROT	NORTHING:	
GEOLOGIST:	CONTI	DEV. METHOD:	AIR / PUMP	EASTING:	

Ground Elevation Datum:



Elevation / Depth of Top of Riser: /

Elevation / Height of Top of Surface Casing: /

I.D. of Surface Casing: 12"

Type of Surface Casing: STEEL

Type of Surface Seal: CONCRETE PAD

I.D. of Riser: 3 13/16"

Type of Riser: SCH 80 PVC

Borehole Diameter: 8" Φ

Type of Backfill: VOLCLAY GROUT

Elevation / Depth of ~~Seal~~ F. SAND #0 / 416

Type of Seal: 00 SAND

Elevation / Depth of Top of ~~Filter Pack~~ C. SAND / 426

Elevation / Depth of Top of Screen: / 446

Type of Screen: PVC SCH 80

Slot Size x Length: 10 SLOT

I.D. of Screen: 3 13/16

Type of Filter Pack: #1 SILICA SAND

Elevation / Depth of Bottom of Screen: / 516

Elevation / Depth of Bottom of Filter Pack: / 517

Type of Backfill Below Well: SILICA SAND

Elevation / Total Depth of Borehole: / 530

REV 2/12/04

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW3-1
DATE: 9-29-03 & 10/1/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
1000	0						SAND & GRAVEL		FOR MORE				0
									DETAILS OF				
									LOG - SEE				
									BPOW3-2 OR				
									GEOPHYSICAL				
									LOG.				
1030	10								ALSO - DUE TO				0
									DRILLING MUD				
									INTERCONNECTION				
									W/ BPOW3-2				
									HAD TO GROUT				
									THIS INITIAL				
									HOLE 0-200'				
									THEN MOVED				
									49' SE FROM				
	20								ORIG LOC.				
									START NEW				0
									ON 10/1/03.				
									SEE NB 13 60				
									FOR DETAILS.				
									10/1/03				
									0-90'				
1100	30						SAME.		NEW LOC				0
	40												0
1130	50												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: 8"Φ MUD ROTARY TO START HOLE. 9/29/03

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 3-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 3-1
DATE: 9-29-03 / 10/2/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	50						SAND AND GRAVEL						0
	60												0
1200	70												0
							SOME CLAY						
	80												0
	90						SAND AND GRAVEL						0
									90 → 290				
									10/2/03				
1400	100						SILTY SAND						0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW3-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW3-1
DATE: 9/30/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
9/30 0830		100						SILTY F/M SAND		TR CLAY				0
		110												0
		120						SAME - MORE CLAY						0
		130												0
		140						SILTY SAND (F/M)						0
		150												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW3-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW3-1
DATE: 9/30/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	150						SILTY F/M SAND						0
	160												0
	170												0
	180						SAME.						0
	190												0
	200												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: HAD INTERCONNECTION W/ BPOW3-2 WHILE DRILLING THIS HOLE - HAD TO GROUT HOLE 0-200 MOVED ~ 49' SE FROM 3-1 - SEE PG 98 NB 1360 FOR SKETCH.

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW3-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW3-1
DATE: 10-2-03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	200						SILTY SAND	SM					0
							TR CLAY	SP					
	210												0
	220												0
	230												0
	240						SAME — MORE						0
							CLAY						
	250												0

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW3-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW3-1
DATE: 10/2/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	250						SILTY F/M SAND						0
	260												0
	270												0
	280						SAME – SOME						0
							CLAY						
10/2	290												0
10/6									10/6/03				
									290 → 530				
	300												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: 8" ϕ MUD ROTARY.

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW3-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW3-1
DATE: 10/6/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (FL) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	300						SAND – TR CLAY						0
	310												0
	320						SAME						0
	330												0
	340						SAME. – TO MORE CLAY						0
	350												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW3-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW3-1
DATE: 10/6/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	350				DENSE		SILTY F/M SAND						0
							TR CLAY						
	360												0
	370												0
	380						SAME - LESS CLAY.						0
	390												0
	400								MORE CLAY				0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW3-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 3-1
DATE: 10/6/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	400						SILTY SAND (F/M)						0
	410						MORE						0
							CLAY						
	420												0
	430												0
	440						SILTY SAND-TR						0
							CLAY						
	450												0

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 3-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW
DATE: 10/6/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	450						SILTY SAND (F/M)						0
	460												0
	470						SAME						0
	480												0
	490						SAME						0
	500												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 3-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 3-1
DATE: 10/6/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	500						SILTY SAND (F/M)						0
	510												0
	520						SAME						0
	530												0
				BOTM					SET WELL				
									446 TO 516				
									BLANK FROM				
									451 TO 481				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 8" Φ TO 530' (NO CASING AT SURFACE)

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 3-1

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW3-1
Site: NWIRP
Date Installed: 10/8/03
Date Developed: 10/16/03
Dev. Method: AIR LIFT/PUMP
Pump Type:

Depth to Bottom (ft.): 516' BGS
Static Water Level Before (ft.): 32' GS.
Static Water Level After (ft.):
Screen Length (ft.): 40'
Specific Capacity:
Casing ID (in.): 3 13/16

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

446 - 451 SCR 5'
451 - 481 BL
481 - 516 SCR 35'

	Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below ~~TOC~~) GS.	Temperature (Degrees C)	pH	Specific Conductance (Units ____) mS/cm	Turbidity (NTU) HORIBA/LAMOTTE	Remarks (odor, color, etc.)
10/15									PUMPED OUT 1600 GALLONS ON 10/15 - NO RDS LOAD 1
10/16	0740	START	INTO 2000 GALLON						
	0800	30	600	39' GS	11.83	4.16	.189	524/314	GRAY / SL TURBID
	0820	30'	1200	39'	11.94	4.45	.100	495/286	" "
	0830	LOAD 2	LVS w/	1600 GALS.	[3200]				
	0915	START	INTO 2000	GALLON					
	0935	30	600	39'	13.00	4.43	.096	960/276	GRAY / SL TURBID
	0955	30	1200	39'	13.20	4.57	.094	788/217	" "
	1015	27 3	1600	LVS w/ 1600	[4800]				
	1050	START	INTO 2000	GAL.					
	1110	30	600	39'	14.23	4.53	.095	803/184	" " "
	1130	30	1200	39'	13.57	4.48	.090	892/138	" " "
	1150	27	1600	39'	13.64	4.48	.092	824/122	" " "
		LOAD 4	LVS	w/ 1600	GALS	[6400]			
	1250	START	INTO 2000	GAL.					
	1310	30	600	39'	14.25	4.53	.098	— /172	"
	1330	30	1200	39'	13.35	4.65	.085	— /140	" " "
	1350	27	1600	39'	13.40	4.61	.084	— /113	" " "
		LOAD 5	LVS	w/ 1600	[8000]				

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Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW 3-1
Site: NWIRP
Date Installed: 10/8/03
Date Developed: 10/16/03
Dev. Method: AIR LIFT/PUMP
Pump Type:

Depth to Bottom (ft.): 516 BGS
Static Water Level Before (ft.): 32' BGS
Static Water Level After (ft.):
Screen Length (ft.): 40 SEE PG 1
Specific Capacity:
Casing ID (in.): 3 13/16

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

HORIBA/LAMOTTE

Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below ~~TOC~~) BGS	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
1420	START	INTO	2000 GAL	—	—	—	—	GRAY – SL TURBID
1440	30	600	36'	12.93	4.24	.090	796/148	" " "
1500	30	1200	36'	12.84	4.25	.084	815/111	" " "
1520	27±	1600	36'	12.83	4.25	.079	684/93	" " "
10/16 1520	LOAD	(6) LVS	W/ 1600 GAL	9600				LOWERED PIPE INTO SCREEN
10/20 1000	– LOAD	(7) LVS	W/1600	GALLONS	NO RDS (11200)			≈ 511' 5' FROM BOTM AREA ±
1100	– START	INTO	1600 GAL					
1120	30	600	34.6'	13.18	4.65	.159	203/36	V. SL TURBID
1140	30	1200	34.6'	13.13	5.01	.092	167/35	" " 511-516
1200	27	1600	34.6'	12.94	5.04	.085	156/32	" " 506-511
	LOAD	(8) LVS	W/ 1600	[12800]				
1245	START	INTO	1600 GAL.					
1305	30	600	34.5	13.80	5.01	.088	587/45	V. SL TURBID 501-506
1325	30	1200	34.5	13.59	5.22	.085	585/30	" " 496-501
1345	27	1600	34.5	13.25	5.16	.083	531/31	" " 491-496
1430	LOAD	(9) LVS	W/1600	[14400]	START	INTO 1600 GAL		
1450	30	600	34.5	12.31	5.05	.085	317/45	V SL TURBID 486-491
1510	30	1200	34.5	12.23	5.05	.082	225/34	" " " 481-486
1530	27	1600	34.5	12.20	5.07	.082	241/31	" " " 446-451

LOAD (10) LVS W/ 1600 = 16,0 (END OF AIR LIFT)

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Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW 3-1
Site: NWIRP
Date Installed: 10/8/03
Date Developed: 10/16/03 →
Dev. Method: AIR LIFT/ PUMP
Pump Type: GRUNDFOS 3" SUB ST. STEEL.

Depth to Bottom (ft.): 516 BGS
Static Water Level Before (ft.): 31.5GS
Static Water Level After (ft.):
Screen Length (ft.): SEE PG 1
Specific Capacity:
Casing ID (in.): 3 13/16"

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU) LAMOTTE	Remarks (odor, color, etc.)
1030	BEGIN SETTING PUMP		31.5	—	—	—	—	31.5 GS- WL- PRIOR TO PUMP INSERTION
1040	START	PUMP	31.5	—	—	—	—	
1100	15'	300	32.0	13.37	5.76	.087	—	GRAY & TURBID
1110	15	450	32.0	13.15	5.85	.081	429	" "
1120	15	600	32.0	13.13	5.85	.087	176	" SL TURBID
1130	15	750	32.0	13.02	5.85	.088	109	" VSL TURBID
1140	15	900	32.0	13.12	5.81	.084	49	" " " "
		DONE W/ PUMP						
1145		TAKE BPOW 3-1-DEV FOR VOCS						

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APPENDIX G

BPOW3-2 WELL DATA

Tetra Tech NUS, Inc.

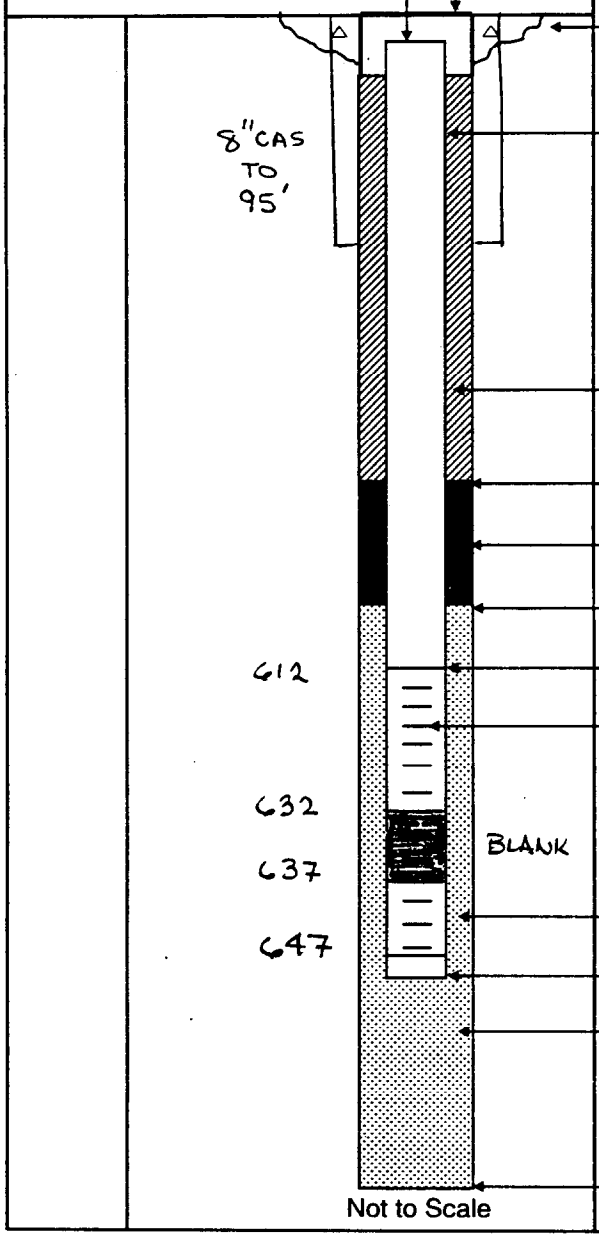
WELL No.: BPOW3-2

MONITORING WELL SHEET

PERMIT No:

PROJECT:	NWIRP	DRILLING Co.:	UNITECH	BORING No.:	BPOW3-2
PROJECT No.:	N4037	DRILLER:	BLEMINGS	DATE COMPLETED:	9/25/03
SITE:	BETHPAGE	DRILLING METHOD:	MUD ROT	NORTHING:	
GEOLOGIST:	CONTI	DEV. METHOD:	AIR/ PUMP	EASTING:	

Ground Elevation Datum:



Elevation / Depth of Top of Riser: /

Elevation / Height of Top of Surface Casing: /

I.D. of Surface Casing: 12"

Type of Surface Casing: STEEL

Type of Surface Seal: CONCRETE PAD

I.D. of Riser: 3 13/16"

Type of Riser: SCH 80 PVC

Borehole Diameter: 7 7/8"

Type of Backfill: VOLCLAY GROUT

Elevation / Depth of Seal: / 572

Type of Seal: #0 SAND C.SAND

Elevation / Depth of Top of ~~Filter Pack~~: / 587

Elevation / Depth of Top of Screen: / 612

Type of Screen: PVC SCH 80

Slot Size x Length: 10 SLOT

I.D. of Screen: 3 13/16"

Type of Filter Pack: #1 SILICA SAND

Elevation / Depth of Bottom of Screen: / 647

Elevation / Depth of Bottom of Filter Pack: / 648

Type of Backfill Below Well: SILICA SAND

Elevation / Total Depth of Borehole: / 650

REV 2/12/04

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 3-2
DATE: 9-15-03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0				DENSE		SAND - SOME GRAVEL		NOTE: LOGGED FROM CUTTINGS EXCEPT WHERE SPOON SAMPLES WERE TAKEN				0
	10												0
	20						SAND AND GRAVEL		SUB ANG → SUB ROUND				0
	30												0
	40						SAND AND GRAVEL						0
	50												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 8" MUD ROTARY TO 100 THEN REAM TO 10"Ø AND SET CASING 8" PVC TO 95'- DRILL ≥ 7 7/8" THRU CASING.

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW3-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 3-2
DATE: 9/16/03
GEOLOGIST: Conti
DRILLER: BLEKINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	50												
							SAND AND GRAVEL		SUB ANG TO SUB ROUND GRAVEL.				0
9/15	60												0
9/16													
	70												0
	80						SAND - SOME GRAVEL						0
	90						SILTY SAND		LESS GRAVEL				0
				—					CASING SET @ 95'± (8"Φ PVC)				
	100												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 3-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW3-2
DATE: 9/17/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	100												
					DENSE		SILTY SAND						0
	110												0
									TR CLAY				
	120						CLAYEY SAND - SOME		1" ⌀ SUB ROUND				0
							GRAVEL						
	130												0
							SILTY SAND		LESS CLAY				
									@ 130'				
9/17	140												0
9/18 0930													
1000	150												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW3-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 3-2
DATE: 9-18-03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	150												
1030					DENSE		SILTY SAND - TR						0
							CLAY - TR GRAVEL						
	160												0
1100	170												0
	180												0
S-1	190												0
1150	191	50/50	-1/1		V DENSE	TAN BRN	SILTY SAND (F/M)	SM/SP	POOR REC				
	200												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 3-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 3-2
DATE: 9-18-03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	200				DENSE		SAND - TR CLAY						0
1230	210												0
	220												0
1300	230												0
	240						SILTY SAND -	SM					0
							SOME CLAY	SC	MORE CLAY				
1330	250												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 3-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW3-2
DATE: 9/18/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	250				DENSE		SAND (F/M) TR CLAY	SM/SP					0
	260												0
1430	270												0
									MORE CLAY				
	280				DENSE	GRAY	SILTY SANDY CLAY	SM/SP					0
9/18	290						SILTY SAND	SP/SM					0
9/22	1000												
1080	300												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW3-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW3-2
DATE: 9-22-03
GEOLOGIST: Conti
DRILLER: BLEMINGS

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
9/22		300												0
	S-2	310	50/100%	1/1		VDENSE	GRAY	SILTY F/M SAND	SP	WET/				0
	1100	311								MICACEOUS				
		320												0
	1110													
		330						SAME	SP/SM					0
	1115													
	1120	340						SANDY CLAY	SC	MORE CLAY				0
										NOTED				
	1125	350						SAME						0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 3-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 3-2
DATE: 9/22/93
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	350				DENSE	GRAY	SANDY CLAY	SC					0
	360						SILTY SAND - TR CLAY						0
1130	370						SAME - SOME GRAVEL		GRAVEL BASED ON CUTTINGS AND DRILL TOOLS				0
1145	380												0
	390												0
1200	400												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 3-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW3-2
DATE: 9/22/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	400												0
S-3	410	50/80/6"	.8/1	410	STIFF	GRAY	SANDY CLAY	SC	MOIST				0
1215	411								LAMINATED				
				C									
	420			L									0
				A									
				Y									
1300	430						SAME- MORE SAND						0
				435									
1310	440												0
1315	450												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW3-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW3-2
DATE: 9/22/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	450												
													0
1345	460												0
1400	470						SANDY CLAY	SC	DRILLER NOTES MORE CLAY ≈ 470' BGS.				0
	480						TO SILTY SAND	SM ✓ SP					0
1415	490												0
	500												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW3-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW3-2
DATE: 9/22/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

	Sample No. and Type or RQD	Depth (FL) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		500												0
							LT.							
9/22	S-4	510	50 / 50/6"	.7/1		V DENSE	GRAY	SILTY F/M SAND -	SP/	WET				0
	1435	511						TR C. SAND AND LIGNITE	SW	ALSO TRACE OF 3/4 PC FRIABLE GRAVEL.				
		520												0
↑														
9/22		530												0
9/23														
↓														
		540												0
		550												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW3-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW3-2
DATE: 9-23-03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0915	550				DENSE	GRAY	SILTY SAND	SM					0
								SP					
	560												0
1000	570												0
	580						SAME AS ABOVE						0
1030	590												0
	600												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW3-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 3-2
DATE: 9/23/03
GEOLOGIST: Conti
DRILLER: BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	600												
							SILTY SAND - TR CLAY						0
S-5	610	50/100	1/1		V DENSE	GRAY	SILTY SAND F/M	SM	WET				0
@ 1105				612			TR WOOD FRAGS	SP					
	620												0
	630												0
					632								
				BLANK									
					637								
	640												0
									SET WELL ON 9/24/03				
									4" Ø SCH 80				
									10 SLOT				
					647								
	650												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: DRILLED TO 660' - LOGGED TO 659

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 3-2

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW3-2
Site: NWIRP
Date Installed: 9/15/03
Date Developed: 10/13/03
Dev. Method: AIR LIFT / PUMP
Pump Type:

Depth to Bottom (ft.): 647'
Static Water Level Before (ft.): 33 ± GS
Static Water Level After (ft.):
Screen Length (ft.): 40' / 30'
Specific Capacity:
Casing ID (in.): 3 13/16"

612-632 SCR
632-637 BLANK
637-647 SCR

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU) HORIBA/LAMOTTE	Remarks (odor, color, etc.)
1030	LOAD (1)	LEAVES w/ (1600) GAL						GRAY TURBID - NO RDGS
1030	START	INTO 1400 GAL TANKS		-	-	-	-	DEV PIPE @ 360'± INITIALLY
1050	35	700	39'±	13.91	4.13	.138	999	BRN GRAY TURBID
1110	27.5	1100	39'	13.26	4.37	.078	999	" " "
1115	LOAD	(2) LEAVES w/ (1100)		[2700]				
1135	30	600	39'	13.73	4.57	.077	999	" " "
1155	32.5	1300	39'	13.79	4.58	.073	999	" " "
1210	LOAD	(3) LEAVES w/ (1700)		[4400]				
1215	START	INTO 1400 GAL.						GRAY - TURBID
1235	25	500	39'	14.44	4.70	.070	999	
1255	27.5	1100	39	14.14	4.52	.081	999/731	" "
1300	LOAD (4)	LEAVES w/ (1100)		[5500]				
1300	START	INTO 2000 GALLON						
1320	30	600	39'	14.40	4.51	.079	999/1036	GRAY TURBID
1340	30	1200	39'	13.90	4.67	.071	999/527	" "
1400	LOAD (5)	LEAVES w/ (1600) GALS		[7100]	START INTO 1400 GALLON TANK			
1420	30	600	37'	13.80	4.90	.075	999/747	GRAY TURBID
1440	27.5	1100	37'	13.90	4.81	.075	999/552	" "

LOAD (6) LEAVES w/ (1100) GALS [8200] 10/13/03

100

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW 3-2
Site: NWIRP
Date Installed: 9/15/03
Date Developed: 10/13/03
Dev. Method: AIR LIFT/ PUMP
Pump Type:

Depth to Bottom (ft.): 64.7 (BGS)
Static Water Level Before (ft.): 35' GS
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 3 13/16 ID

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

HORIBA / LAMOTE

Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below ~~TOC~~) 35' GS.	Temperature (Degrees C)	pH	Specific Conductance (Units ____) mS/cm	Turbidity (NTU)	Remarks (odor, color, etc.)
10/14 ↓ 0850	START INTO 2000 GAL TANK			-	-	-	-	
0910	30	600	36'	12.98	4.84	.112	999/984	GRAY / TURBID PH PAPER 4 → 5
0930	30	1200	36'	13.05	4.96	.078	999/623	" "
0950	LOAD (7) LEAVES W/ (1600) GALS [9800] START INTO 1400 GALLON TANK							
1010	30	600	36'	13.02	4.92	.076	999/627	GRAY / TURBID
1030	27.5	1100	36	13.55	5.11	.063	999/372	" "
1030	LOAD (8) LEAVES W (1100)			[10900] START INTO 2000				
1050	30	600	36'	13.45	5.21	.063	999/462	" "
1110	30	1200	36'	14.51	5.08	.063	952/302	" "
1130	27	1600	36'	13.05	4.97	.058	659/261	" "
1130	LOAD (9) LVS W/ 1600 G.			[12,500]	START INTO 1400			
1150	30	600	36'	13.71	5.21	.061	999/334	" "
1210	27	1100	36'	13.70	5.39	.059	999/243	" "
1215	LOAD (10) LVS W/ 1100 G			[13,600]				
1300	START INTO 2000							
1320	30	600	36'	13.65	5.24	.061	999/390	" "
1340	30	1200	36'	13.12	5.08	.058	956/264	" "
1400	27	1600	36'	12.72	4.94	.058	796/226	" "

LOAD (11) LVS W/ 1600 GALS [15,] START INTO 1400 GALLON

10

* NOTE: GW PRESSURE SAMPLES CONTAINED NO SEDIMENT, GW HAD THE APPEARANCE OF "LEMONADE" SHOULD NOT CLEAR UP (<50NTUS) DURING AIR LIFT.

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BROW 3-2
Site: NWIRP
Date Installed: 9-15-03
Date Developed: 10/13 →
Dev. Method: AIR LIFT / SUMP
Pump Type:

Depth to Bottom (ft.): 647' BGS
Static Water Level Before (ft.): 34' 10/15
Static Water Level After (ft.):
Screen Length (ft.): SEE PG 1
Specific Capacity:
Casing ID (in.): 2 13/16

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

HORIBA / LAMOTTE

	Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below ~~TOC~~ GS)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
10/14	1420	30	600	36'	12.86	4.88	.057	706/268	GRAY- SL TURBID
↓	1440	27	1100	36'	12.76	4.84	.057	595/211	" "
	1445	LOAD	(12) LVS	W/ 1100 GALS	[16,300]	START INTO 2000 GAL			
	1505	30	600	36'	13.15	5.01	.058	817/278	" " "
	1525	30	1200	36'	13.00	5.03	.058	682/207	" " "
	1545	27	1600	36'	13.03	5.13	.057	727/178	
	1600	LOAD	(13) LVS.	W/ 1600 GAL	[17,900]				
10/15	0800	START	INTO 2000	34' INI					
	0820	30	600	35' (GS)	12.67	4.51	.115	585/310	GRAY / SL TURBID
	0840	30	1200	35' "	12.66	4.68	.068	472/237	" "
	0900	27	1600	35'	12.79	4.73	.064	423/210	642-647
	0900	LOAD	(14) LVS	W/ 1600 GAL	[19,500]	START INTO 1400			
	0920	30	600	35'	12.79	4.83	.063	641/318	" " 637-642
	0940	27	1100	35'	12.95	4.86	.062	401/233	" " 627-632
	1000	LOAD	(15) LVS	W/ 1100 GAL	[20,600]	START INTO 2000 GAL			
	1020	30	600	35'	13.15	4.89	.067	648/289	" " 622-627
	1040	30	1200	35'	13.10	5.03	.071	528/211	" " 617-622
	1100	27	1600	35'	13.05	5.05	.073	621/228	" " 612-617

LOAD (16) LVS W/ 1600 GAL 22,200 THIS WELL (AIR LIFT) * DONE AIR LIFT

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Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW3-2
Site: NWIRP
Date Installed: 9-15-03
Date Developed: 10/13 → 10/21
Dev. Method: AIR LIFT / PUMP
Pump Type: GRUNDFOS 3" SUB S.S.

Depth to Bottom (ft.): 69.7 GS
Static Water Level Before (ft.): 32.8 PVC
Static Water Level After (ft.):
Screen Length (ft.): SEE PG 1
Specific Capacity:
Casing ID (in.): 3 3/16

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

LAMOTE

	Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
10/21	0830	—	—	32.8	—	—	—	—	INITIAL - PRIOR TO PUMPING
	0900	START	PUMP	@ BPOW3-2	(3 in S.S. SUB)			—	
	0920	15	300	32.3	13.15	5.73	.270	—	GRAY BRN - TURBID
	0930	15	450	32.2	13.12	5.79	.096	799	" " "
	0940	15	600	32.1	13.10	5.86	.083	355	" " "
	0950	15	750	32.0	13.03	5.82	.077	124	" " SL TURBID
	1000	15	900	32.0	13.05	5.80	.077	49	" " V SL TURBID
				DONE W/ PUMP					
				TOOK SAMPLE					
				BP BPOW3-2 DEV @ 1000 HRS					

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AQUA TERRA GEOPHYSICS INC

COMPANY	UNITECH DRILLING
WELL ID	BPOW3-2
FIELD	NWIRP BETHPAGE
COUNTRY	STATE
LOCATION	OTHER SERVICES

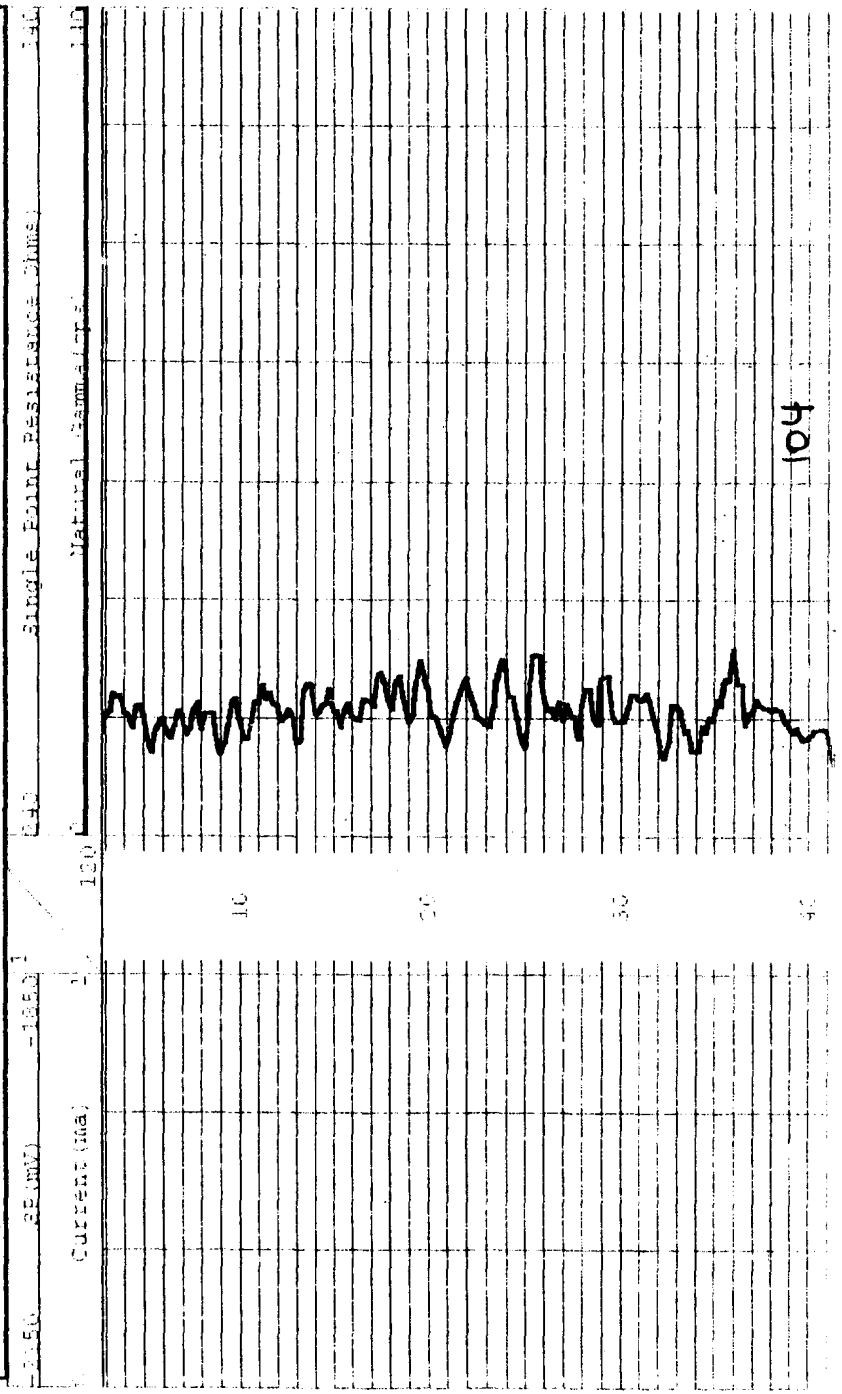
CO WELL FLD CTY STE FILING No

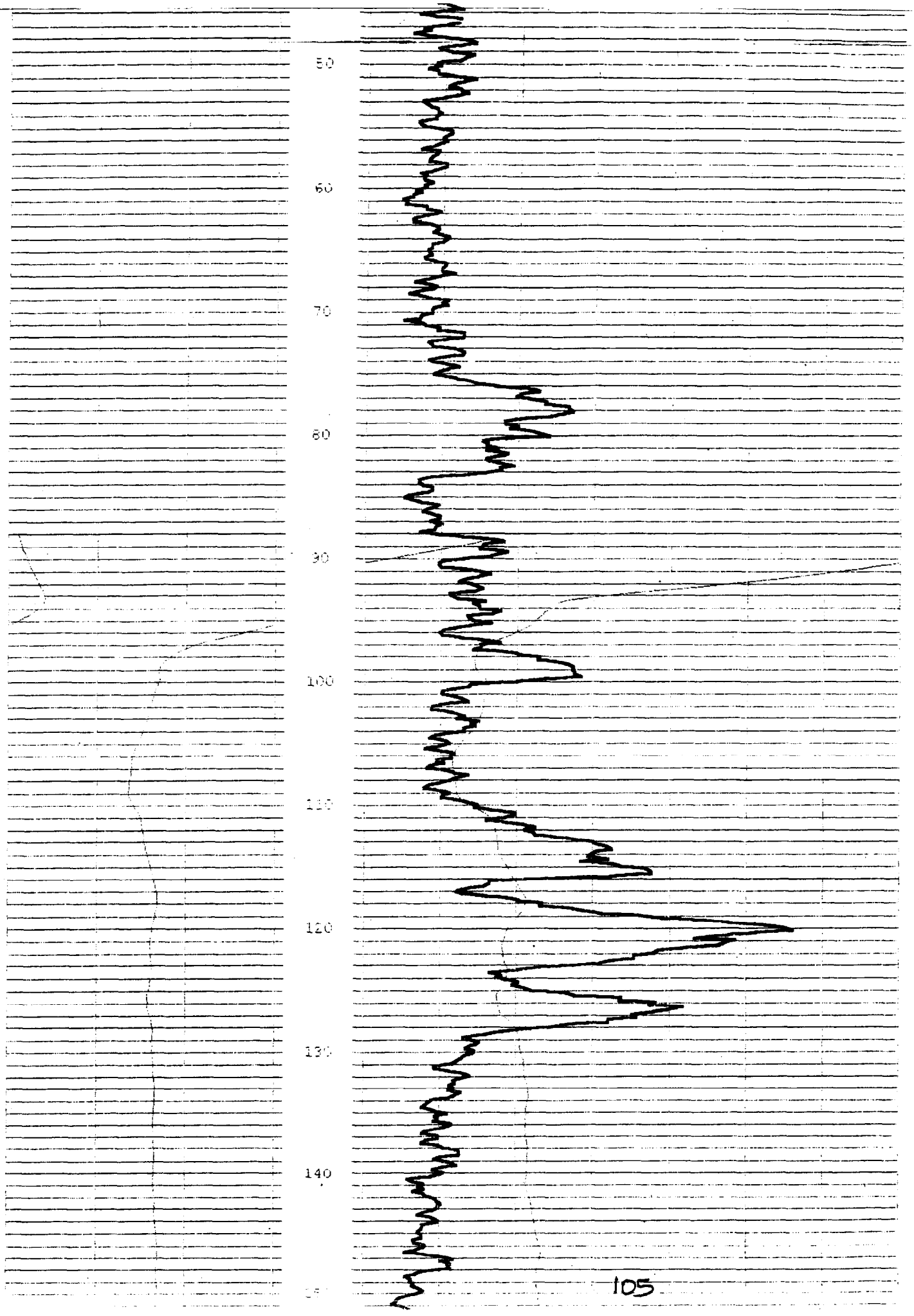
SEC TWP RGE

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM	GROUND SURFACE	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM			G.L.

DATE	SEPTEMBER 23, 2003	TYPE FLUID IN HOLE	BENTONITE
RUN No		SALINITY	
TYPE LOG		DENSITY	
DEPTH-DRILLER	660 FEET	LEVEL	
DEPTH-LOGGER	659 FEET	MAX. REC. TEMP.	
BTM LOGGED INTERVAL			
TOP LOGGED INTERVAL			
OPERATING RIG TIME	1.5 HRS.		
RECORDED BY	BENJAMIN RICE		
WITNESSED BY	STAN CONTI		

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
	8 INCH	95 FEET	TOTAL DEPTH	8 INCH	PVC	GROUND SURFACE	95 FEET

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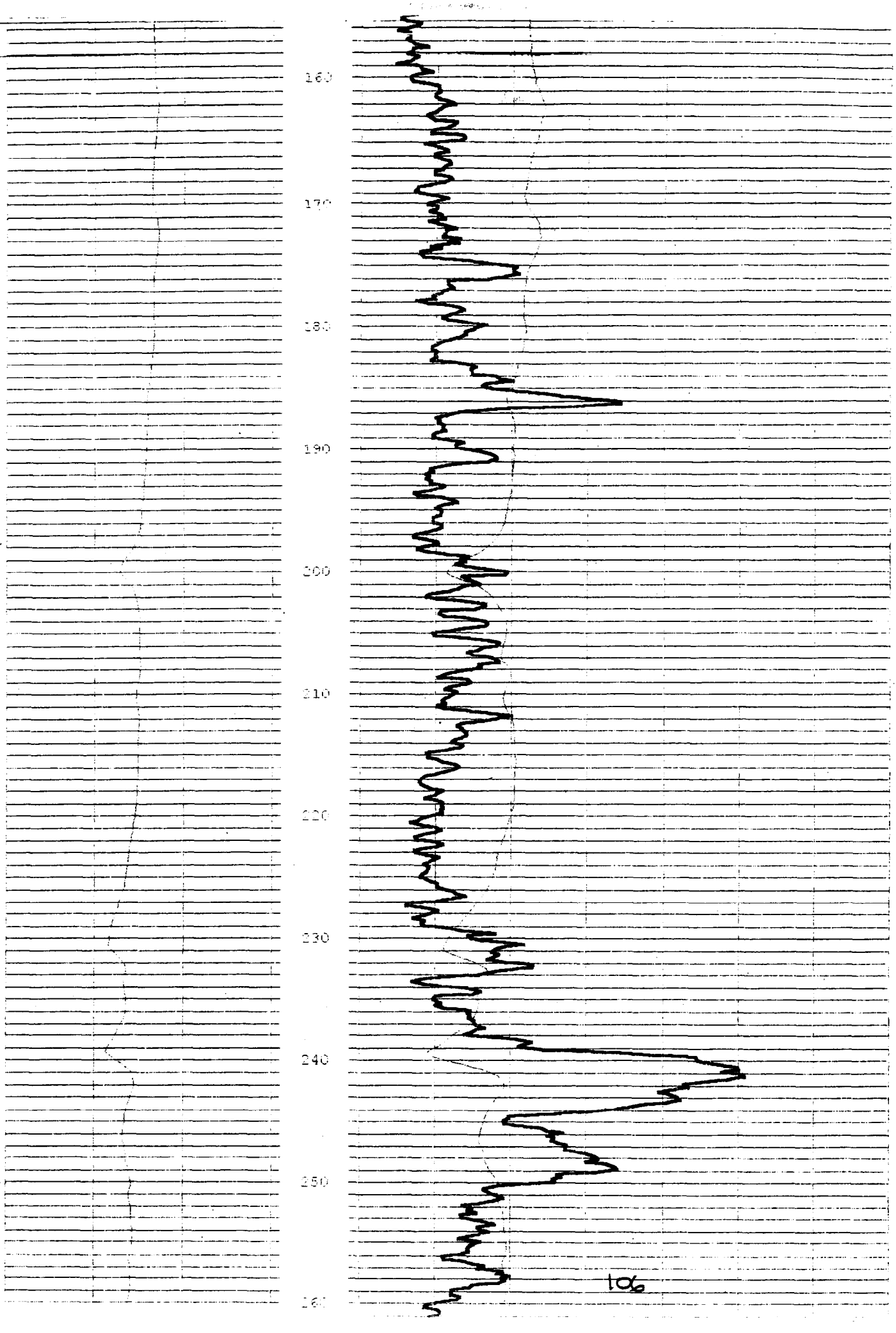
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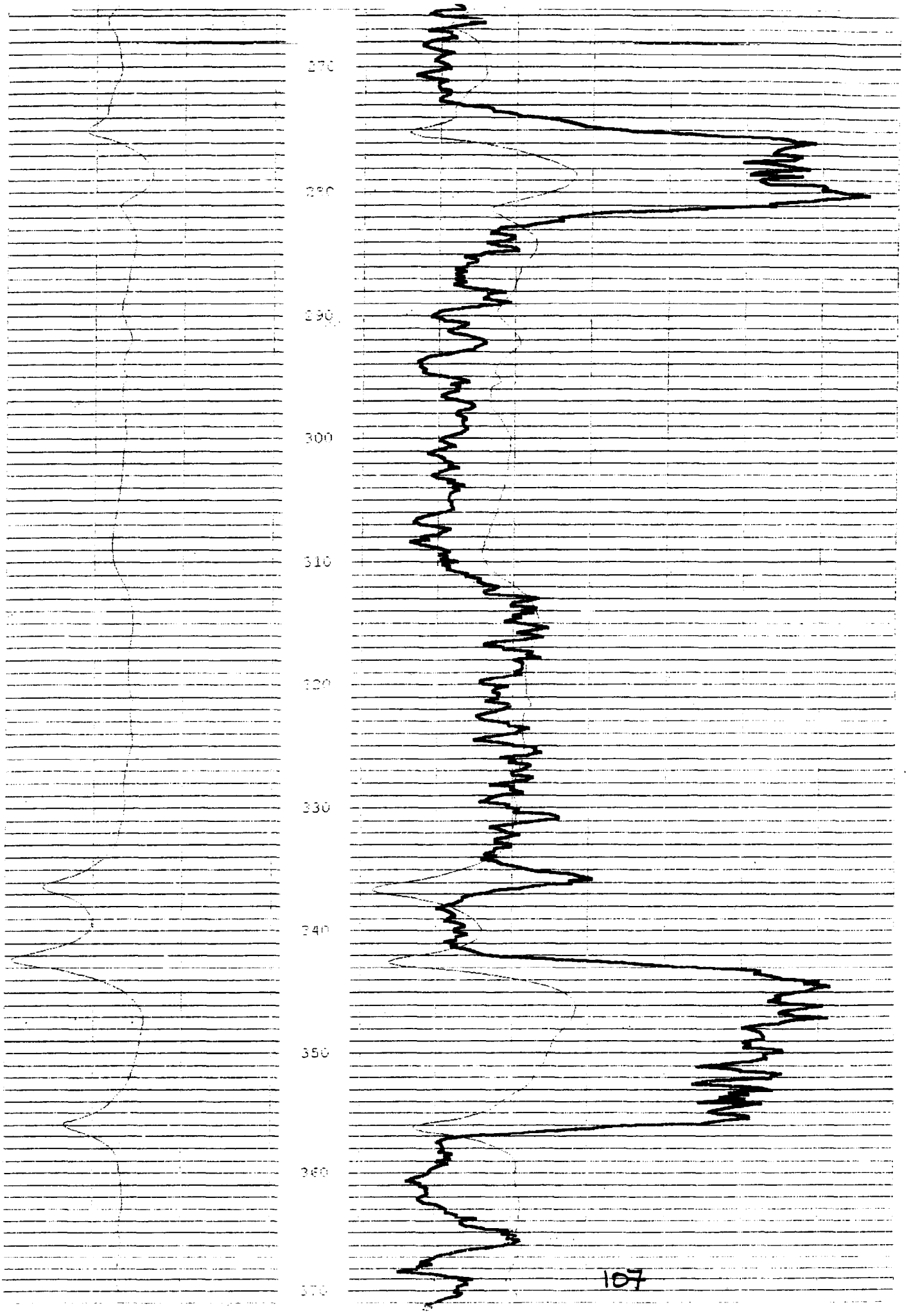
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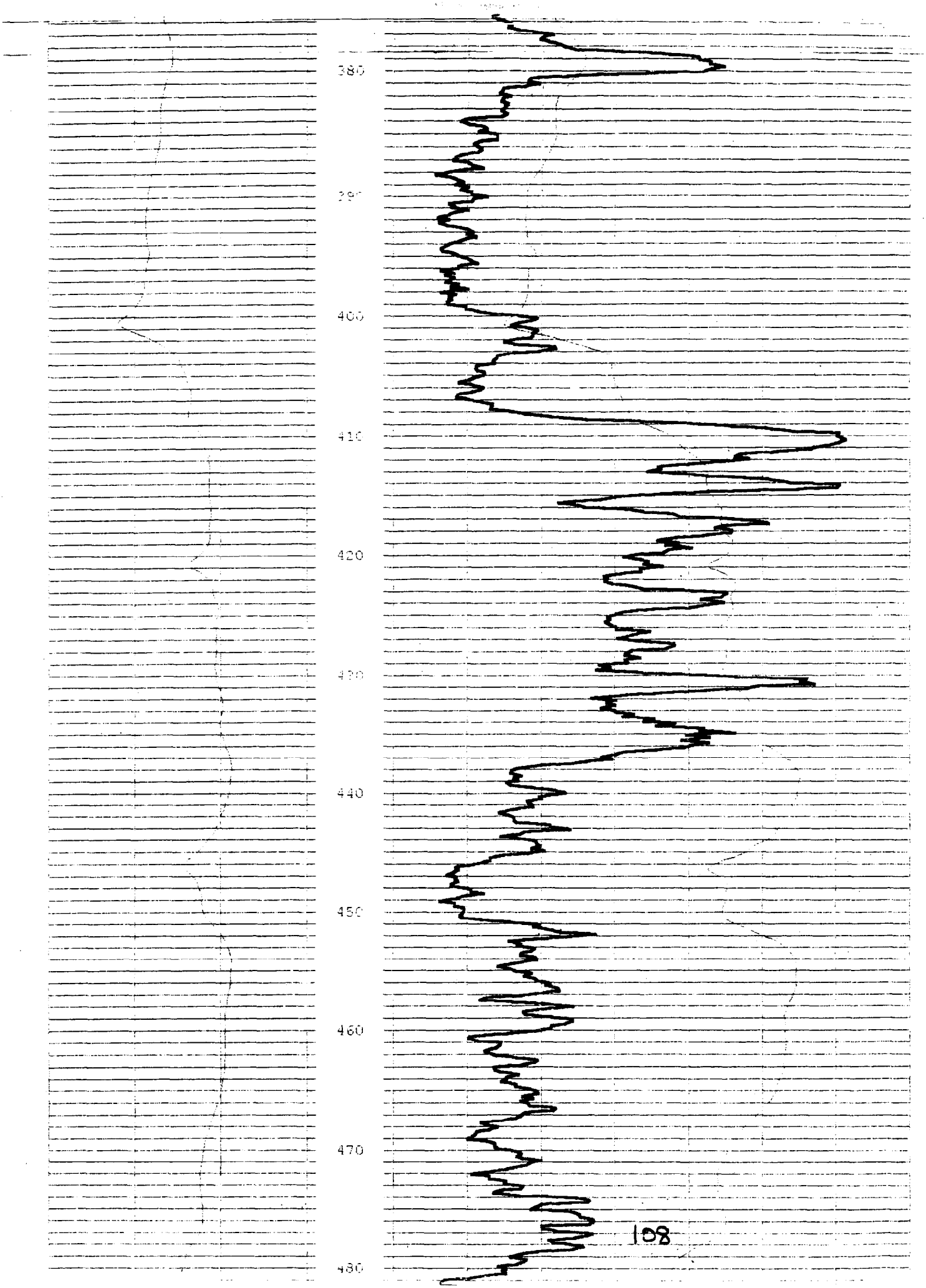
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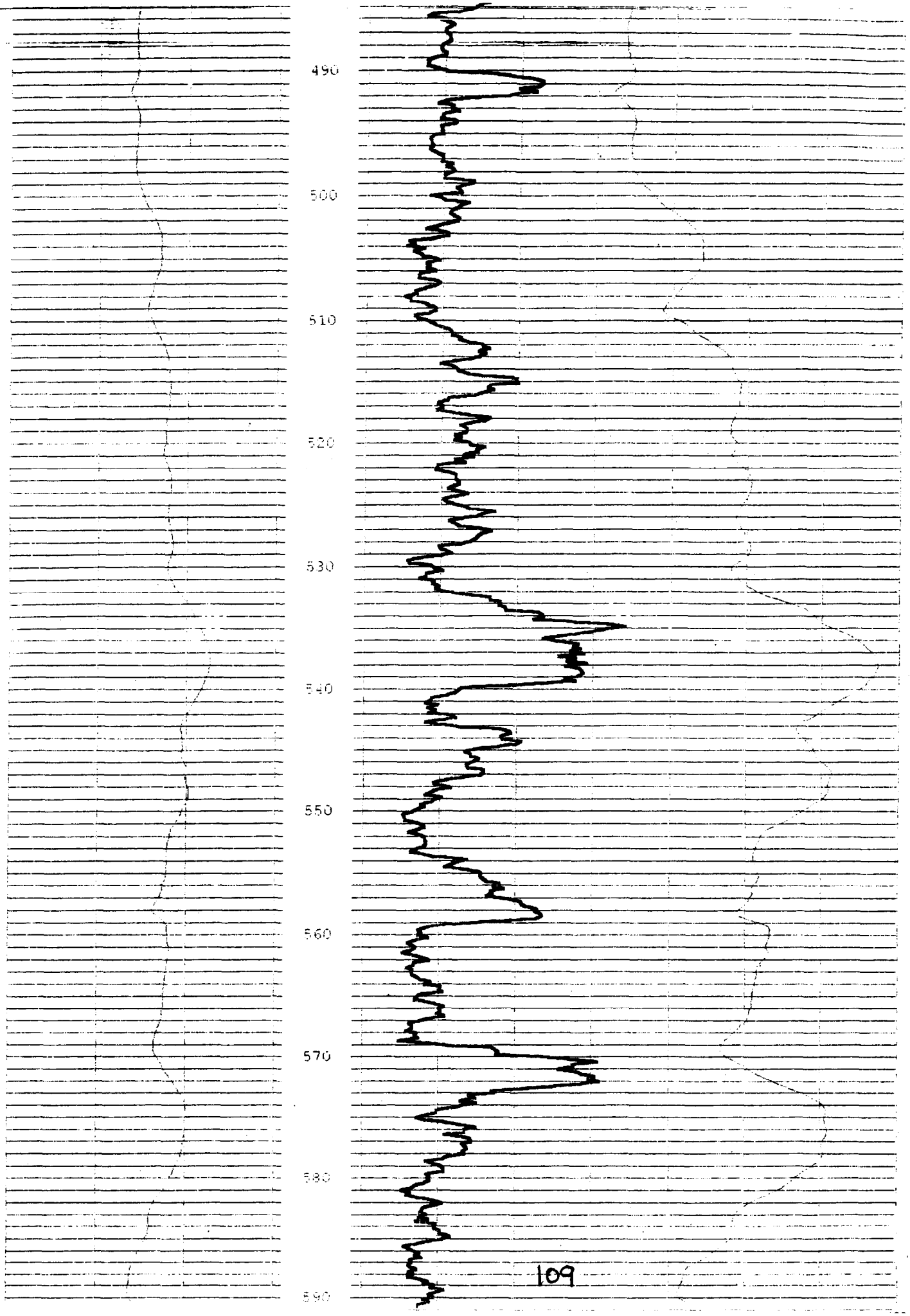
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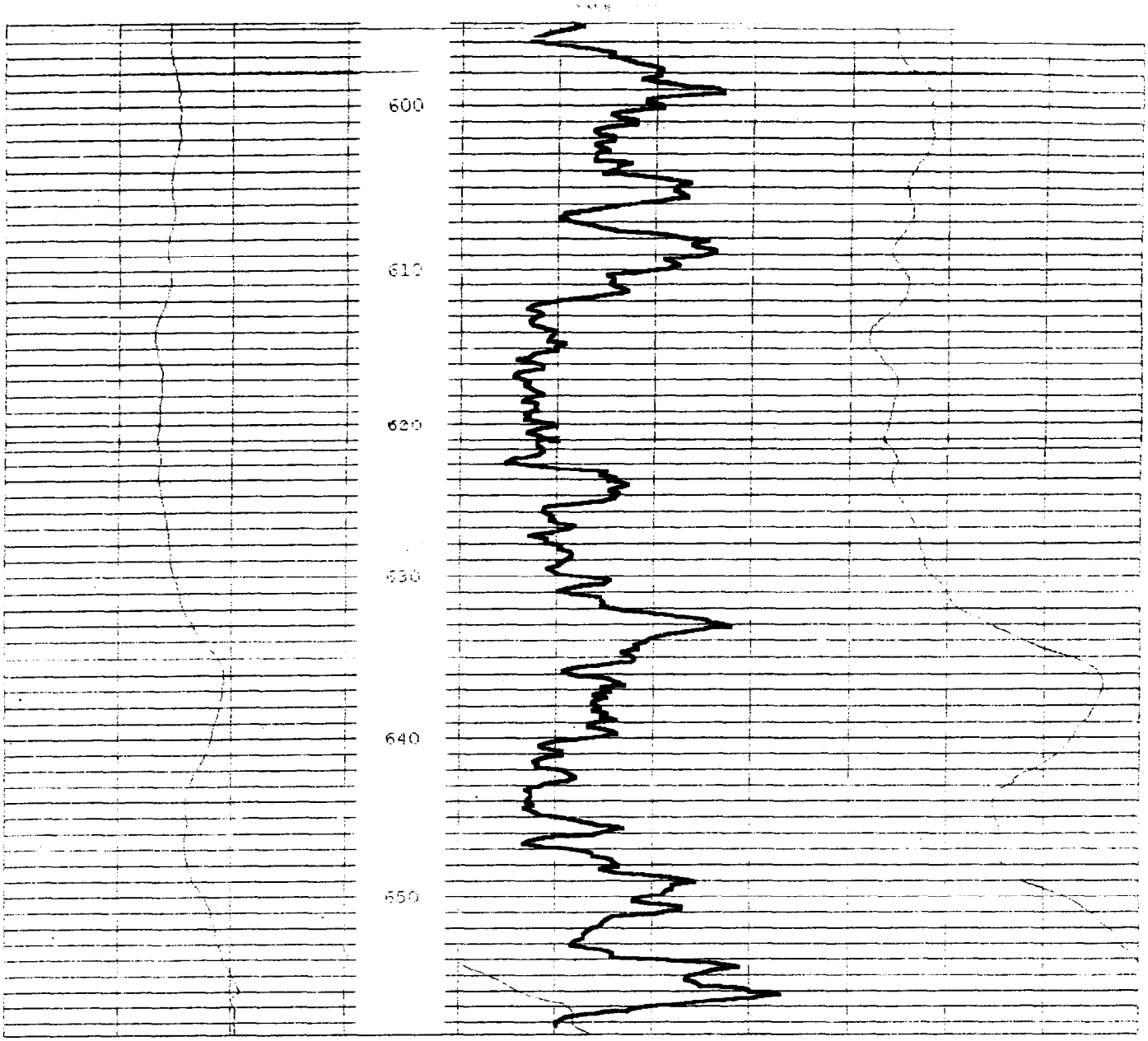
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APPENDIX H

BPOW4-1 WELL DATA

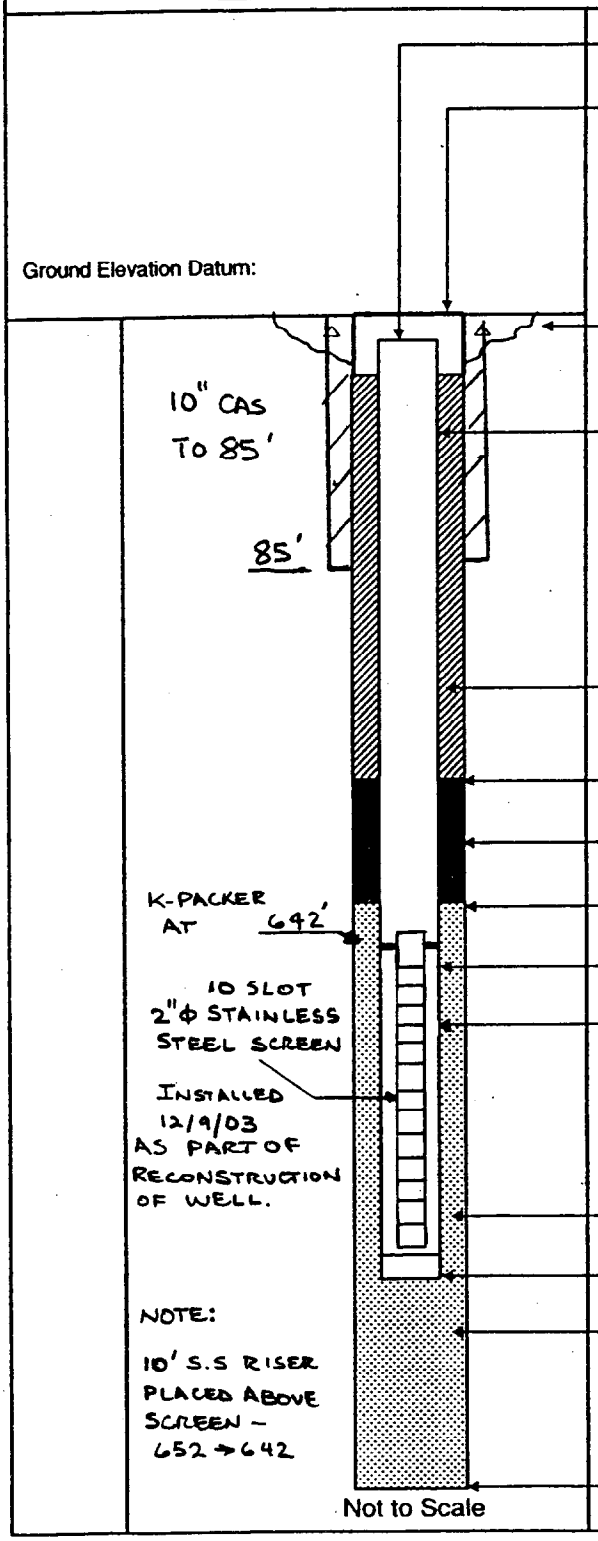
Tetra Tech NUS, Inc.

WELL No.: BPOW4-1

MONITORING WELL SHEET

PERMIT No:

PROJECT:	NWIRP	DRILLING Co.:	UNITECH	BORING No.:	BPOW4-1
PROJECT No.:	N4037	DRILLER:	BLEMMINGS	DATE COMPLETED:	7/17/03
SITE:	BETHPAGE	DRILLING METHOD:	MUD ROT	RECONSTRUCTED NORTHING:	12/9/03
GEOLOGIST:	CONTI	DEV. METHOD:	AIR/PUMP	EASTING:	



Ground Elevation Datum:

Elevation / Depth of Top of Riser:	/	
Elevation / Height of Top of Surface Casing:	/	
I.D. of Surface Casing:	9"	
Type of Surface Casing:	STEEL	
Type of Surface Seal:	CONCRETE PAD 2'x2'x6"	
I.D. of Riser:	3 13/16"	
Type of Riser:	PVC SCH 80	
Borehole Diameter:	8 3/4 ≈ 9"	
Type of Backfill:	VOLCLAY GROUT	
Elevation / Depth of ~~Seal~~:	F SAND #0	1602
Type of Seal:	NA	
Elevation / Depth of Top of ~~Filter Pack~~:	C. SAND	1620
Elevation / Depth of Top of Screen:		1652
Type of Screen: (PLACED 7/17/03)	PVC SCH 80	
Slot Size x Length:	10 SL x 40'	
INITIAL I.D. of Screen:	3 13/16"	
Type of Filter Pack:	#1 SILICA SAND	
Elevation / Depth of Bottom of Screen:		1692
Elevation / Depth of Bottom of Filter Pack:		1693
Type of Backfill Below Well:	SILICA SAND	
Elevation / Total Depth of Borehole:		1700

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW4-1
DATE: 7-8-03
GEOLOGIST: Conti / Shickora
DRILLER: J BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0						TOP 6" TOPSOIL						
	10						SAND AND GRAVEL		(FROM CUTTINGS)				0
	20												0
	30												0
	40						SAND AND GRAVEL		1" Φ SUB ROUND FROM CUTTINGS				0
	50												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: START W 8" Φ MUD ROTARY - REAM TO 12" TO SET 10" CASING.

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW4-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW4-1
DATE: 7-8-03 / 7-9-03
GEOLOGIST: Conti
DRILLER: J BLEMINGS

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		50				DENSE		SAND AND GRAVEL						0
		60												
7/8		70												0
7/9														
		80						SAND						
		90						CLAYEY SAND		± 90'				0
7/11										80-90' - STABILIZER BAR - HAD SANDY CLAY / CLAYEY SAND ENTIRE 10' LENGTH. JAY WILL SET 10" CAS ≈ 90'.				
↓														
		100						Sand and Gravel		1/4" ϕ sub round				0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: Ream to 12" ϕ on 7-10-03
Set 10" CASING TO 85' on 7-10-03
8 3/4" ϕ drilling from 85' to T.D.

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW4-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW4-1
DATE: 7-11-03 / 7-14-03
GEOLOGIST: Conti / ShickorA
DRILLER: J BLEMINGS

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		100												
7/11	1055	110						Sand (Trace gravel)		(from cuttings)				0
7/14	0925													
		120						Sand + Gravel		1/2" ϕ sub round				
	1050	130						Sand and Gravel		1" ϕ sub round from cuttings				0
	1445	140												
	1515	150						clayey Sand + Gravel		1" ϕ sub round				0

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW 4-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: Failing 1500

BORING No.: BPOW 4-1
DATE: 7-14-03
GEOLOGIST: Conti / Shickora
DRILLER: J. Blening

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	150												
1540	160						Sand + Gravel		1"ϕ subround				0
1617	170						Same as above						0
1647	180												
7/14 1719	190						Same as above						0
7/15													
	200												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW 4-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: Failing 1500

BORING No.: BPOW 4-1
DATE: 7-15-03
GEOLOGIST: ~~Conti~~ Shickora
DRILLER: J. Blemings

Sample No. and Type or RQD	Depth (FL) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	200												
0930	210						Clayey Sand (Trace gravel)		From cuttings				0
	220												
1005	230						Sandy Silt + Clay		From cuttings				0
	240						Same as above						0
1033	250						Sand (Trace clay)						0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 4-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: Failing 1500

BORING No.: BPOW 4-1
DATE: 7-15-03
GEOLOGIST: ~~Conti~~ Shickora
DRILLER: J. Blemings

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	250												
	260												
1059	270					Black	Sand (Trace Silt/Clay) Some lignite		From cuttings				0
	280												
1123	290						Sand (some clay)		From cuttings				0
	300												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 4-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: Failing 1500

BORING No.: BPOW 4-1
DATE: 7-15-03
GEOLOGIST: ~~Conti~~ Shickora
DRILLER: J-Blemings

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	300												
1151	310						Sand (some clay)		From cuttings				0
	320												
1320	330						Same as above		From cuttings				0
	340												
1357	350						Same as above		From cuttings				0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 4-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: Failing 1500

BORING No.: BPOW 4-1
DATE: 7-15-03
GEOLOGIST: ~~Contr~~ Shickora
DRILLER: J. Blemings

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	350												
	360												
1423	370						Sand (Trace Silt/Clay)		From cuttings				0
	380												
1455	390						Same as above		From cuttings				0
	400												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 4-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: Failing 1500

BORING No.: BPOW 4-1
DATE: 7-15-03
GEOLOGIST: ~~Conti~~ Shickora
DRILLER: J Blemings

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	400												
1521	410						Same as above		From cuttings				0
	420												
1605	430						Sandy clay (Trace silt)		From cuttings				0
	440												
1642	450						Same as above						0

7/15

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW 4-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: Failing 1500

BORING No.: BPOW 4-1
DATE: 7-15-03
GEOLOGIST: ~~Contr~~ Shickora
DRILLER: J. Flemings

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
7/16 ↓	450												
	460												
0940	470						Sand (Trace Silt and Clay and Lignite)		From cuttings				0
	480												
1009	490						Same as above		From cuttings				0
	500												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW4-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: Failing 1500

BORING No.: BPOW 4-1
DATE: 7-16-03
GEOLOGIST: ~~Conti~~ Shickora
DRILLER: J Blemings

Sample No. and Type or RQD	Depth (FL) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	500						Same as above		From cuttings				0
1038	510						Sand (Trace silt and clay)						
	520												
1103	530						Same as above		From Cuttings				0
	540												
1132	550						Same as above		From Cuttings				0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 4-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: Failing 1500

BORING No.: BPOW 4-1
DATE: 7-16-03
GEOLOGIST: ~~Conti~~ Shickora
DRILLER: J. Blemings

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	550												
	560												
1334	570						Sand (Trace Fine Gravel + lignite)		From cuttings				0
	580												
1402	590						Sand (Trace clay and Gravel)		From cuttings				0
	600												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 4-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: Failing 1500

BORING No.: BPOW 4-1
DATE: 7-16-03
GEOLOGIST: ~~Conti~~ Shickora
DRILLER: J. Blemings

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	600												
1433	610						Sand (Trace clay and lignite)		From cuttings				0
	620												
1508	630						Sand (Trace Clay)		From cuttings				0
									Losing mud				
									To Formation				
							medium to course grain		at ≈ 635' BGS				
	640						Sand + Fine Gravel						
									Losing mud				
									To formation				
↑													
7/16 1710	650						Sand + Fine Gravel						0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW4-1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: Failing 1500

BORING No.: BPOW 4-1
DATE: 7-17-03
GEOLOGIST: ~~Conti~~ Shickora
DRILLER: J. Blemings

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	650			652									
							Medium to course grain						
0852	660						Sand (Trace Silt and clay) (fine gravel)		From cuttings				0
0923	670						Same as above		From cuttings				0
	680												
1005	690						Same as above		From cuttings				0
				692									
1031	700			EOB			Same as above						0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 4-1

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW4-1
Site: NWIRP BETHPAGE
Date Installed: 7-17-03
Date Developed: 7/23/03 →
Dev. Method: AIR LIFT / PUMP
Pump Type:

Depth to Bottom (ft.): 692 ± BGS
Static Water Level Before (ft.): ≈45'
Static Water Level After (ft.):
Screen Length (ft.):
Specific Capacity:
Casing ID (in.):

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ms/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
7/23 0930	—	—		—	—	—	—	INITIAL START
1020	30±	1400		15.80	9.05	.447	990	GRAY - V. TURBID
1025	LOAD (1)	LEAVES						1400 NET
1155	START	AIR LIFT						
1225	30±	900/2300		14.50	7.03	.104	990	BRN - V. TURBID W/F SAND
1305	LOAD (2)	2800						
1305	START LOAD (3) 2nTank							
1335	27±	800/3800		18.60	6.25	.126	560	BRN - SL TURBID W/F SAND
1400		900 3700	— HAVING PROBLEMS W/ SAND IN WELL - ALSO					
			DEV RODS "HUNG UP" IN HOLE. SEE NB 1360 FOR DETAILS ≈ 7/23/03					
								7/24/03
			WILL ATTEMPT TO REPAIR WELL AND					
			REDEVELOP					

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PH 4.61 COND -1.1% TURB 0 TEMP 16.57

DEV AFTER REPAIR TO WELL

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW4-1
Site: NWIRP
Date Installed: 7/17/03
Date Developed: 12/10/03
Dev. Method: AIR LIFT/PUMP
Pump Type: 3" SUB

Depth to Bottom (ft.): 692'
Static Water Level Before (ft.): 28' BGS
Static Water Level After (ft.):
Screen Length (ft.): 40'
Specific Capacity:
Casing ID (in.): 2"Φ

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

Due to 2"Φ SCREEN - CANNOT isolate the zones within the screen, during dev.

HORIBA / LAMOTTE

Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below ~~TOC~~ GS)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
1030	LOAD	① LVS w/ 1600 GALLONS						LOAD ① NO PARAMETERS
1130	START	INTO 2000 GALLON TANK						WELL DEV PIPE AT ≈ 600' INITIALLY
1150	25	500	33.0	11.29	4.21	.149	76/42	Gray - Sl Turbid
1210	27.5	1100	33.0	11.17	4.58	.105	43/37	" "
1230	27	1600	33.0	11.05	4.60	.097	45/35	" "
1240	LOAD	② LVS w/ 1600 = [3200]			SINT INTO 1400 GALLON			
1300	30	600	33.5	11.40	4.57	.093	85/40	" "
1320	27.5	1100	33.5	11.22	4.58	.089	69/41	" "
1330	LOAD	③ LVS w/ 1100 GALLONS			START INTO 2000 (4300)			
1350	25	500	33.5	11.33	4.62	.089	70/50	Gray Sl. Turbid
1410	27.5	1100	33.5	10.94	4.58	.087	82/40	" " "
1430	27	1600	33.5	11.19	4.61	.083	85/41	" " "
1440	LOAD	④ LVS w/ 1600 =	[5900]		START INTO 1400 GAL			
1500	30	600	33.5	11.12	4.63	.086	72/48	Gray SL Turbd
1520	27.5	1100	33.5	11.18	4.64	.085	75/49	" " "
1530	LOAD	⑤ LVS w/ 1100 GALLONS			START INTO 1600 7000			
1550	25	500	33.5	11.15	4.65	.086	79/55	" " "
1610	27.5	1100	33.5	11.20	4.61	.083	76/45	" " "
1630	27	1600	33.5	11.12	4.63	.087	78/45	" " "
1630	LOAD	⑥ LVS w/ 1600 GALLONS			[8600]			

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW 4-1
Site: NWIRP
Date Installed: 7/17/03
Date Developed: 12/10/03 »
Dev. Method: AIR LIFT
Pump Type: 3" SUB.

Depth to Bottom (ft.): 692
Static Water Level Before (ft.): 28'
Static Water Level After (ft.):
Screen Length (ft.): 40
Specific Capacity:
Casing ID (in.): 2"Φ SS

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

HORIBA/LAMOTTE

Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below ~~TOC~~ BGS)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
12/11 0820	START INTO 2000 GALLON TANK (2000)							CLEAR V. SL TURBID
0840	30	600	35.5	12.08	4.68	.089	117/49	" " "
0900	27.5	1100	35.5	11.89	4.75	.083	68/32	" " "
0920	27	1600	35.5	12.03	4.80	.082	80/32	
0925	LOAD (7) LUS w/ 1600 GALLONS (10,200) GALLONS (START INTO 1400							
0945	25	500	35.5	12.09	4.82	.081	103/39	CLEAR V SL TURBID
1005	27.5	1100	35.5	12.05	4.81	.082	78/29	" " "
1010	LOAD (8) LUS w/ 1100 GALLONS (11,300) START INTO 2000							
1030	25	500	35.5	12.25	4.88	.082	105/32	" " "
1050	27.5	1100	35.5	12.25	4.89	.079	114/31	" " "
1110	27	1600	35.5	12.36	4.90	.078	117/27	" " "
1130	LOAD (9) LUS w/ 1600 GALLON (12,900) START INTO 1400 GALLON							
1150	25	500	35.5	12.24	4.87	.077	111/31	" " "
1210	27.5	1100	35.5	12.11	4.89	.074	70/25	" " "
	END OF AIR LIFT DEV. (14000) TOTAL							

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PUMPING / SURGING

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW4-1
Site:
Date Installed: 7/17/03
Date Developed: 12/15/03
Dev. Method: PUMP/AIRLIFT
Pump Type: SS GRUNDFOS SUB - 3"

Depth to Bottom (ft.): 692'± GS
Static Water Level Before (ft.): 27.8 GS
Static Water Level After (ft.):
Screen Length (ft.):
Specific Capacity:
Casing ID (in.):

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

HORIBA/LAMOTTE

Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below ~~TOC~~ GS)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
1415	START	INTO	1400 GALLON					pH PAPER CHECK 4→5
1435	15	300	33.0	11.95	4.29	.222	684/475	GRAY SL TURBID
1455	15	600	33.0	11.90	4.43	.098	131/57	CLEAR V SL TURBID
1515	15	900	33.0	11.79	4.46	.069	91/34	" " "
1535	15	1200	33.0	11.84	4.48	.068	85/29	" " "
			DONE W/ PUMP @ 1200 GALLONS					
			TOOK SAMPLE BP-BPOW4-1-DEV. (VOCS)					

APPENDIX I

BPOW4-2 WELL DATA

Tetra Tech NUS, Inc.

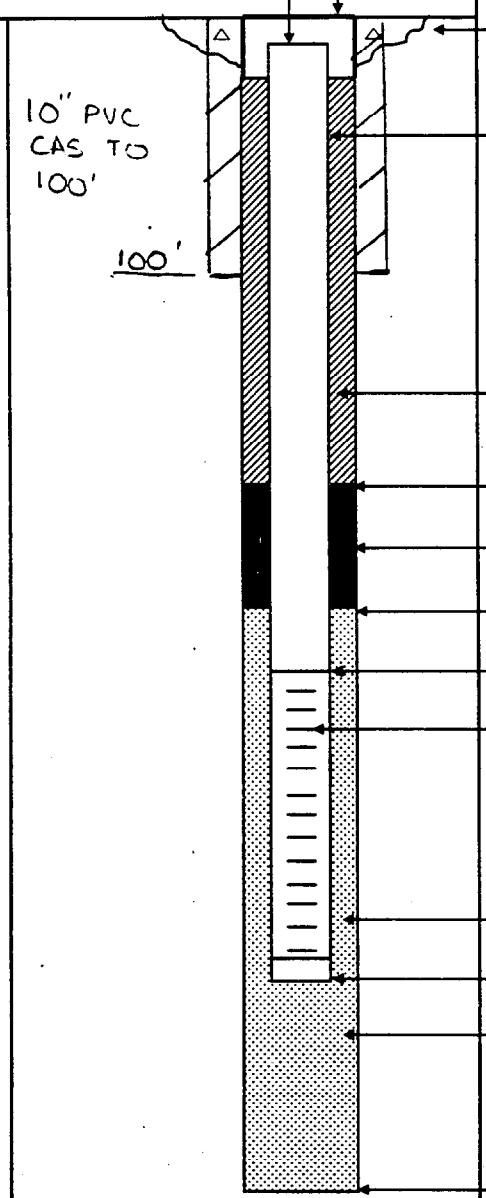
WELL No.: BPOW4-2

MONITORING WELL SHEET

PERMIT No:

PROJECT:	NWIRP	DRILLING Co.:	UNITECH	BORING No.:	BPOW4-2
PROJECT No.:	N4037	DRILLER:	BLEMINGS	DATE COMPLETED:	7/7/03
SITE:	BETHPAGE	DRILLING METHOD:	MUD ROT	NORTHING:	
GEOLOGIST:	CONTI	DEV. METHOD:	AIR/PUMP	EASTING:	

Ground Elevation Datum:



Not to Scale

Elevation / Depth of Top of Riser: /

Elevation / Height of Top of Surface Casing: /

I.D. of Surface Casing: 9"

Type of Surface Casing: STEEL

Type of Surface Seal: CONCRETE PAD 2'x2'x6"

I.D. of Riser: 3 13/16"

Type of Riser: PVC SCH 80

Borehole Diameter: 9 1/2"

Type of Backfill: VOLCLAY GROUT

Elevation / Depth ~~of Seal~~: F SAND #0 1690

Type of Seal: NA

Elevation / Depth of Top of ~~Filter Pack~~: C SAND 1705

Elevation / Depth of Top of Screen: 1725

Type of Screen: PVC SCH 80

Slot Size x Length: 10 x 30 W 10' BLANK 735→745

I.D. of Screen: 3 13/16"

Type of Filter Pack: #1 SILICA SAND

Elevation / Depth of Bottom of Screen: 1765

Elevation / Depth of Bottom of Filter Pack: 1766

Type of Backfill Below Well: SILICA SAND

Elevation / Total Depth of Borehole: 1780

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW4-2
DATE: 6/4/03 →
GEOLOGIST: Conti
DRILLER: J. BLEMINGS

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
6/4	1130	0				DENSE	BRN	SAND AND GRAVEL		LOGGED FROM				0
										CUTTINGS				
	0900									IN BETWEEN SAMPLES				
6/5										RODS" CHATTERING"				
		10								FROM 0' TO 20'.				0
										RESTART @ NEW				
										LOCATION - ≈ 1' WEST -				
										0-20 ≈ 15 MIN. NO OBSTRUCTIONS				
										GOOD RETURN OF DRILL CUTTINGS.				
	0915	20				M DENSE	BRN	SAND - SOME GRAVEL	SW					0
										MIX MORE MUD				
	1030	30												0
	1100	40						SAND AND GRAVEL		(FROM CUTTINGS)				0
	1120	50												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: START W/ 8" Φ MUD ROT. GOT TO 6' - LOST RETURN
TOO CLOSE TO STORM SEWER - MOVE ≈ 1' WEST (CLOSER TO CURB)
DRILL TO 150 ± W/ 8" Φ - REAM W/ 12" Φ TO 150 - SET 10" Φ CASING.

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 4-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW4-2
DATE: 6-5-03 / 6-17-03
GEOLOGIST: Conti
DRILLER: J BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	50												
S-1 @ 1120	52	100/6"	.5/.5		V DENSE	YELLOW BRN	SAND AND GRAVEL	GW	WET SUBROUND 1" GRAVEL. W/ 1 1/2" PCS IN WASH PORTION OF SAMPLE.	0			0
1200	60												0
1230	70						SAND AND GRAVEL		LESS GRAVEL ≈ 70' TO 80'				0
1300	80												0
					DENSE	BRN	SILTY F/M SAND	SP					
1330	90												0
1400	100												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: SET 10" @ 110' (GROUTED IN) SEE NB1351 FOR DETAILS - SET 10" @ 100' ON 6/17/03 - AT 2ND LOCATION.

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW4-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW4-2
DATE: 6/5/03 / 6/17/03 / 6/19/03
GEOLOGIST: Conti
DRILLER: J BLEMINGS

	Sample No. and Type or RQD	Depth (FL) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
6/17		100												
6/19						DENSE	BRN	SILTY F/M SAND	SM SP					0
	1130	110								10"Φ SET @ 110				
										AND GROUTED				0
										IN PERM. HAD				
										TO MOVE 10' N.				
										DUE TO LEAKAGE				
										AROUND CAS.				
										SET 2ND CAS TO				
										100' ON 6/17/03.				
	1230	120												
														0
		130												
														0
		140												
														0
	1415	150												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW4-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW4-2
DATE: 6/19/03
GEOLOGIST: Conti
DRILLER: J BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	150												
S-2	152	100/6	.5/.5		V DENSE	BRN	SAND-SOME GRAVEL	SP	WET	0			0
1440							TR WHITE CLAY						
1500	160												0
1520	170												0
1540	180												0
1600	190												0
1620	200												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW4-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW4-2
DATE: 6/19/03 → 6/20/03
GEOLOGIST: Conti
DRILLER: J. BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	200												
													0
S-3	210	50/48	2/2										
1640	212	28/32			V DENSE	BRN TO	F/M SAND - TR CLAY	SP	WET	0			0
						GRAY	SEAM ≈ 211' ≈ 2" THICK						
1700	220								HIT SOME CLAY				
													0
6/19 1730	230								REACHED 230' ON 6/19/03				0
6/20									MORE CLAY NOTICED ≈ 230 IN CUTTINGS.				
0900	240												
													0
0930	250												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW4-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW4-2
DATE: 6/20/03
GEOLOGIST: Conti
DRILLER: J BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	250												
S-4 @		28/38	1.5/2.0		V. DENSE	MOTTLED ORANG	SILTY F/M SAND	SM	WET/MICACEOUS	0			0
0945		109/6				BRN GRAY	SOME CLAY IN "WASH" PORTION OF SAMPLE.						
	260												0
	270												0
	280												0
	290												0
	300												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW4-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW4-2
DATE: 6/20/03
GEOLOGIST: Conti
DRILLER: J BLEMINGS

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		300												
														0
	S-5	310												
	1145	311	100%	.4/.5		V DENSE	GRAY	SILTY F/M SAND	SP	WET	0			0
6/20								TR GRAVEL						
6/23														
	1200	320												
														0
	1230	330								DRILLER NOTED POSSIBLE CLAY.				0
	1300	340												0
		350												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW4-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW4-2
DATE: 6/23/03
GEOLOGIST: Conti
DRILLER: J BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	350												
S-6 e	351	50/50	1/1		V STIFF / HARD	BRN GRAY	SILTY CLAY	CL	MOIST	0			0
1345									VERY HARD- WAS DIFFICULT TO PRY LOOSE FROM SPOON				
—	360												
													0
1400	370												
													0
1430	380												
													0
1500	390												
													0
1515	400												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes X No ____ Well I.D. #: BPOW4-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW4-2
DATE: 6/23/03
GEOLOGIST: Conti
DRILLER: J BLEMINGS

	Sample No. and Type or RQD	Depth (FL) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		400												
	S-7	410												
6/23/03	@ 1550	411	100/6	.9/1		V DENSE /STIFF	GRAY	SANDY CLAY - STREAKS OF LIGNITE MATL	SC	MOIST MICACEOUS	0			0
	1600	420						STILL IN SOME CLAY		(CUTTINGS)				
														0
MON 6/23	1630	430												
6/24 TUE.														0
	0900	440												
														0
	0930	450												

* When rock coring, enter rock brokeness.

** Include monitor reading in 5 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW4-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 4-2
DATE: 6/24/03
GEOLOGIST: Conti
DRILLER: J BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	450												
S-8 c		100/6"	.2/.5		V DENSE	GRAY	SILTY F/M SAND	SM/SP	WET MICACEOUS	0			0
0930													
0945	460												0
1000	470												0
1030	480												0
1100	490												0
	500												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 4-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW 4-2
DATE: 6/24/03
GEOLOGIST: Conti
DRILLER: J BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	500												0
S-9 @	510	100/6"			V DENSE	GRAY	F/M SAND - TR F GRAVEL	SP	WET	0			0
1130	511						TR BLACK STREAKS (LIGNITE)?		MICACEOUS				
1200	520												0
1230	530												0
1245	540												0
1300	550												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW 4-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW4-2
DATE: 6/24/03
GEOLOGIST: Conti
DRILLER: J BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	550												
S-10 @ 1330	551	100/6"	4/.5		V DENSE	GRAY	F/M SAND	SP	WET MICACEOUS	0			0
	560												0
	570												0
1430	580												0
	590												0
1500	600												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW 4-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW4-2
DATE: 6/24/03
GEOLOGIST: Conti
DRILLER: J BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	600												
1530													0
S-1 @	610	100%											
1550	611	6"	.5/.5		✓ DENSE	TAN GRAY	F/M SAND - SOME TAN SANDY CLAY - TOP 2" OF SPOON	SP/SM	WET → MOIST				0
	620												
													0
	630												0
	640												0
6/24	650												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW4-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW4-2
DATE: 6/25/03
GEOLOGIST: Conti
DRILLER: J BLEMINGS

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		650												
6/25	S-12 @ 0935	651	100/6"	.5/.5		V DENSE	GRAY	SAND AND GRAVEL TR CLAY	SW	WET ≈ 3/4"ϕ SUB ROUND GRAVEL	0			0
		1000	660											
														0
		670												0
		1015	680											0
		1030	690											0
		700												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW4-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW4-2
DATE: 6/25/03
GEOLOGIST: Conti
DRILLER: J BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
1100	700												0
1115	710				DENSE	GRAY	COARSE SAND - SOME F/M SAND	SP	WET - FROM CUTTINGS NO SPOON HERE				0
	720												0
				725									
	730												0
				BLANK									
	740												0
	742						SANDY SOME v CLAY @ 742'		DRILLER NOTED SOME CLAY AT ≈ 742 W STREAKS				
							NOTED THEN						
							F TO C SAND		TO 747.				
1500	750												0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: BPOW4-2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: FAILING 1500

BORING No.: BPOW4-2
DATE: 6/25/03
GEOLOGIST: Conti
DRILLER: J BLEMINGS

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	750				DENSE	GRAY	F/C SAND						0
1540	760												0
				765									
	770								NOTICED SOME				0
									CLAY IN				
									CUTTINGS				
									DRILLER ALSO				
									NOTED CLAY				
									≈ 770'±				
	780												0
									GAMMA LOG				
									TO 775.				

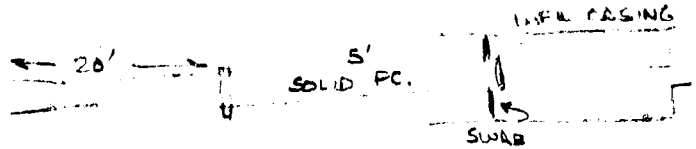
* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: BPOW4-2



1. Pipe initially @ 735' ± ≈ 10' INTO SCREEN
Start at top - raise & lower pipe ≈ every 1000 gallons

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW4-2
Site: NWIRP
Date Installed: 7-7-03
Date Developed: 7/28/03 →
Dev. Method: AIR LIFT / PUMP
Pump Type:

Depth to Bottom (ft.): 765' ± BGS
Static Water Level Before (ft.): ≈ 41 BGS
Static Water Level After (ft.):
Screen Length (ft.): 30' w/ 10' BLANK
Specific Capacity:
Casing ID (in.):

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

* COULD NOT GET PROBE PAST THE DEV PIPE JOINTS.

	Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)	LAMOTTE TURB
7/28	1600	—	—	41' ±	—	—	—	—	BRN GRAY - TURBID	
7/28	1700	30	1400	NA*	13.46	4.47	.172	999		
7/29	0810	START AIR LIFT 7/29/03								
	0840	~40	≈1200/2600	NA	14.15	4.62	.074	999	BRN GRAY - TURBID	
	0845	~40	≈1400/3800	LOAD 2	TAKEN TO	FRAC	TANK.			
	0920	START	AIR LIFT	INTO 2000	GAL TANK					
	0950	~33	1000/3800	NA	14.66	4.73	.060	999	BRN GRAY - TURBID.	
	1015	~33	1800/4600	NA	15.24	4.63	.053	999	" " "	
	1020	START	AIR LIFT	INTO 1500	GAL TANK					
	1050	~37	1100/5700	NA	14.65	4.79	.049	999	" " "	1100
	1100	~35	1400/6000	LOAD 4	TAKEN TO	FRAC	TANK			
	1115	START	AIR LIFT	INTO 2000	GALLON TANK.					
	1145	~33	1000/7000	NA	14.41	4.81	.048	999	" " "	1000
	1210	~33	1800 7800	NA	14.49	4.74	.049	999		650
	1255	START	AIR LIFT	INTO 1500	GALLON TANK					
	1335	~35	1400 9200	NA	14.31	4.91	.059	999	" " "	550
	1350	START	AIR LIFT	INTO 2000	GALLON TANK.					
	1420	~33	1000	NA	14.68	4.88	.042	760		450

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW4-2
Site: NWIRP
Date Installed: 7-7-03
Date Developed: 7/28/03 →
Dev. Method: AIR LIFT / PUMP
Pump Type:

Depth to Bottom (ft.): 965 ± BGS
Static Water Level Before (ft.): 36.5 BGS
Static Water Level After (ft.):
Screen Length (ft.): 30' W/ 10' BLANK
Specific Capacity:
Casing ID (in.): 3 13/16"

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

HORIBA'S TURBIDITY RDS SUSPECT / USE LAMOTTE

	Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/Cm)	Turbidity (NTU) *	Remarks (odor, color, etc.)	LAMOTTE
7/29	1445	~33	(1800) 11000	NA	14.91	5.08	.042	999	LT GRAY SL TURBID	400
	1450	START AIR LIFT INTO 1500 GAL TANK.								
	1520	~37	1100	NA	14.68	5.30	.045	982	" " " "	400
	1530	~35	(1400) 12400							
•	1535	START AIR LIFT INTO 2000 GAL								
	1605	~33	1000	NA	15.33	5.46	.044	859	" " " "	370
	1630	~33	(1800) 14,200	NA	16.40	5.52	.045	818	" " " "	340
•	1635	START AIR LIFT INTO 1500 GAL TANK								
	1715	~35	(1400) 15,600	NA	16.23	5.47	.049	819	" " " "	300
7/30	0835	START AIR LIFT INTO 2000 GAL							ADDED 15' MORE OF RODS AND SURGE ≈ EVERY 1000 GALLONS	
	0905	~30	900	NA	13.89	5.17	.083	999	GRAY & TURBID	OFF SCALE
	0935	~30	(1800) 17400	NA	14.91	5.16	.060	975	" & SL TURBID	500
•	1010	START AIR LIFT INTO 1500 GAL.								
	1055	~31	(1400) 18800		14.42	5.35	.057	999	" " "	700
•	1100	START AIR LIFT INTO 2000 GALLON								
	1130	~33	1000	NA	15.07	5.45	.051	683	" & SL TURBID	270
	1200	30	(1800) 20,600	NA	15.55	5.53	.048	660	" & SL "	240

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Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW4-2
Site: NWIRP
Date Installed: 7/7/03
Date Developed: 7/28/03 →
Dev. Method: AIR LIFT / PUMP
Pump Type:

Depth to Bottom (ft.): 765 ± BGS
Static Water Level Before (ft.): 36.5 BGS
Static Water Level After (ft.):
Screen Length (ft.): 30' + 10' BLANK
Specific Capacity:
Casing ID (in.): 3 13/16" ID

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

765 → 715 SCREEN
735 → 725 SCREEN

	Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below ~~TOC~~) GS	Temperature (Degrees C)	pH	Specific Conductance (Units ____) mS/cm	Turbidity (NTU)	Remarks (odor, color, etc.)	LAMOTTE	
•	1240	START AIR LIFT INTO 1500 GALLON							NO SED	230	
	1320	35	(1400) 22000	39.5	15.76	5.59	0.055	627	GRAY / SL TURBID		
•	1335	START AIR LIFT INTO 2000 GAL									
	1405	30	900	40.2	14.86	5.53	0.045	651		230	
	1435	30	(1800) 23800	40.2	14.95	5.56	0.042	649	" " " NO SED	220	
•	1440	START AIR LIFT INTO 1500 GAL									
	1520	35	(1400) 25200	40.5	14.84	5.67	0.043	571	" " " NO SED	200	
•	1520	START AIR LIFT INTO 2000 GALLON									
	1550	33	1000	40.5	14.89	5.71	0.044	542	" " " NO SED	200	
7/30	1620	30	(1800) 27,000	40.5	14.77	5.69	0.041	571	" " " NO SED	160	
7/31	•0810	START AIR LIFT INTO 2000 GALLON							WL @ 36.5 BGS 5' OFF BOTM	760-765	
	0840	30	1000	38	14.20	4.49	0.081	834		390	
	0915	28	(1800) 28800	37.5	14.66	4.64	0.051	610	GRAY SL TURBID	230	
•	0920	START AIR LIFT INTO 1500 GALLON									
	0955	40	(1400) 30200	38	14.79	4.76	0.052	506	" " "	160	760-765
•	1000	START AIR LIFT INTO 2000 GALLON									
	1030	36	1100	37.5	15.12	4.84	0.042	464	" " "	130	755-760
	1100	30	(1800) 32000	37.5	19.93*	4.85	0.041	350	" " "	140	750-755

*NO RE. WHY IT INCREASED
WI DOUBLE CHECKED

1 of 4

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BPOW4-2
Site: NWIRP
Date Installed: 7-7-03
Date Developed: 7/28/03 → 7/31/03
Dev. Method: AIR LIFT/PUMP
Pump Type: GRUNFOS SUB

Depth to Bottom (ft.): 765 ± 865
Static Water Level Before (ft.): 36.5
Static Water Level After (ft.): 39.5
Screen Length (ft.): 30' + 10' BLANK
Specific Capacity: 30 GPM @ 3' DD
Casing ID (in.): 3 13/16

Responsible Personnel: Conti
Drilling Co.: Uni-Tech
Project Name: NWIRP Bethpage-Outpost Wells
Project Number: N4037

Time	Estimated Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ms/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)	LAMOTTE	
1110	START AIR LIFT INTO 1500 GALLON TANK									
1145	40	(1400) 33,400	38.5	15.28	4.94	0.040	416	GRAY V. SL TURBID	130	745-750
1255	START AIR LIFT INTO 2000 GAL TANK									
1325	33	(1000)	39.5	15.65	4.93	0.046	469	" " "	130	730-735
1355	30	(1800) 35200	39.5	15.45	4.95	0.042	445	" " "	130	725-730
				AIR LIFT DEV.		COMPLETE				
1200	START	DEV BY	PUMP INTO	2000 GAL				INITIAL WL. 27.5± GS		
1230	17	500	29.0	14.95	4.78	0.109	999	GRAY · TURBID	OFF SCALE	
1300	15	900	29.0	15.73	4.82	0.072	"	" "	450	
1330	14	1200	29.0	15.24	4.87	0.059	908	" SL "	300	
1400	12.5	1500	29.0	15.62	4.98	0.058	706	" "	190	
1430	12	(1800) 37,000	29.0	15.59	4.80	0.061	784	" "	160	
1530	START	PUMP INTO 2000 GAL.								
1600	13±	400	29.0	15.15	4.93	0.056	685	" "	150	
1630	13	800	29.0	14.85	4.96	0.054	669	" "	140	
1700	13	(1200) 38200	29.0	14.95	4.95	0.056	675	" "	145	

50

814

AQUA TERRA GEOPHYSICS INC

COMPANY	UNI TECH DRILLING
WELL ID	BPOW 4-2
FIELD	NWIRP BETHPAGE
COUNTRY	NASSAU STATE NY

CO WELL FLD CTY STE FILING No

LOCATION

SEC TWP RGE

OTHER SERVICES

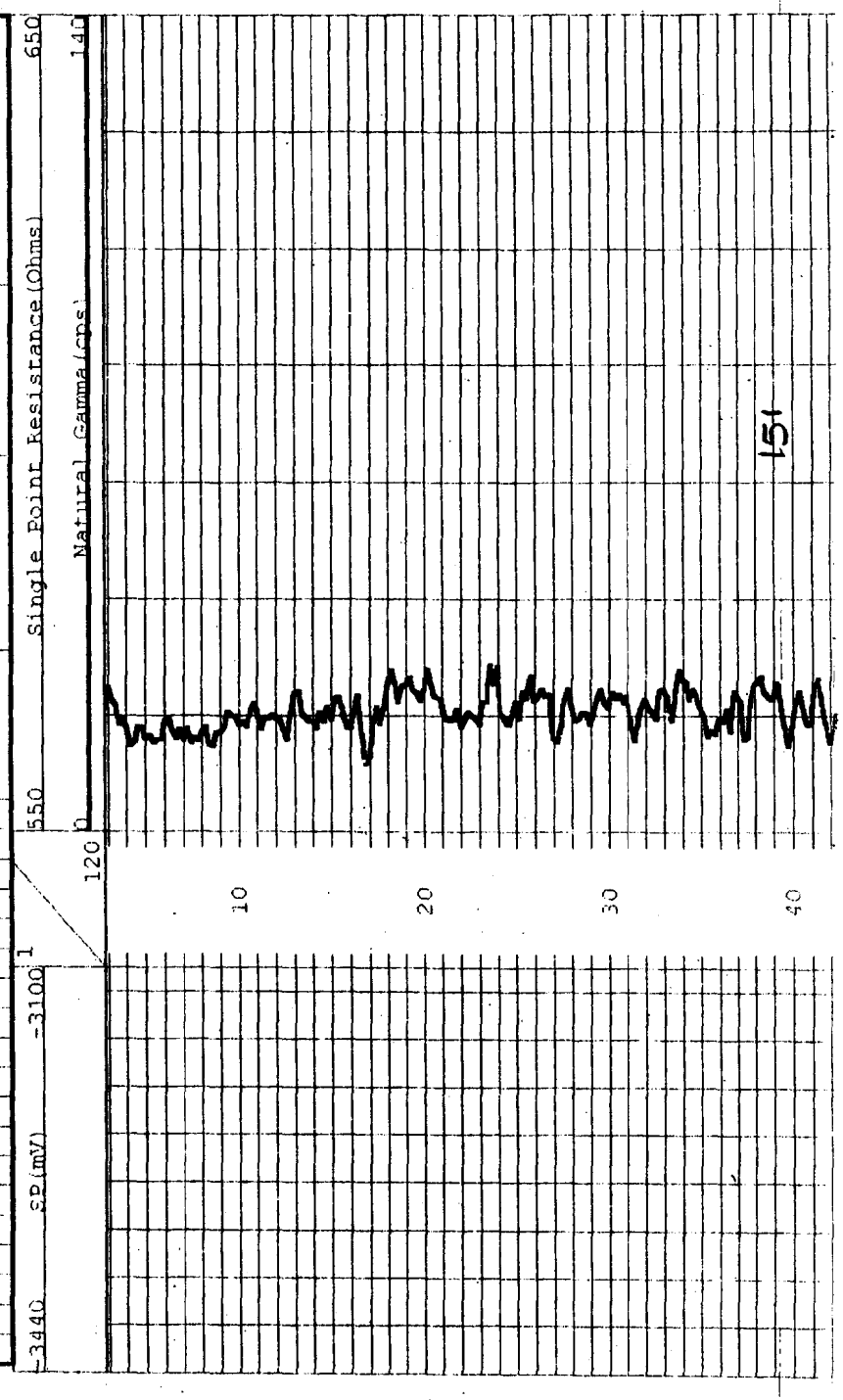
PERMANENT DATUM ELEVATION K.B.

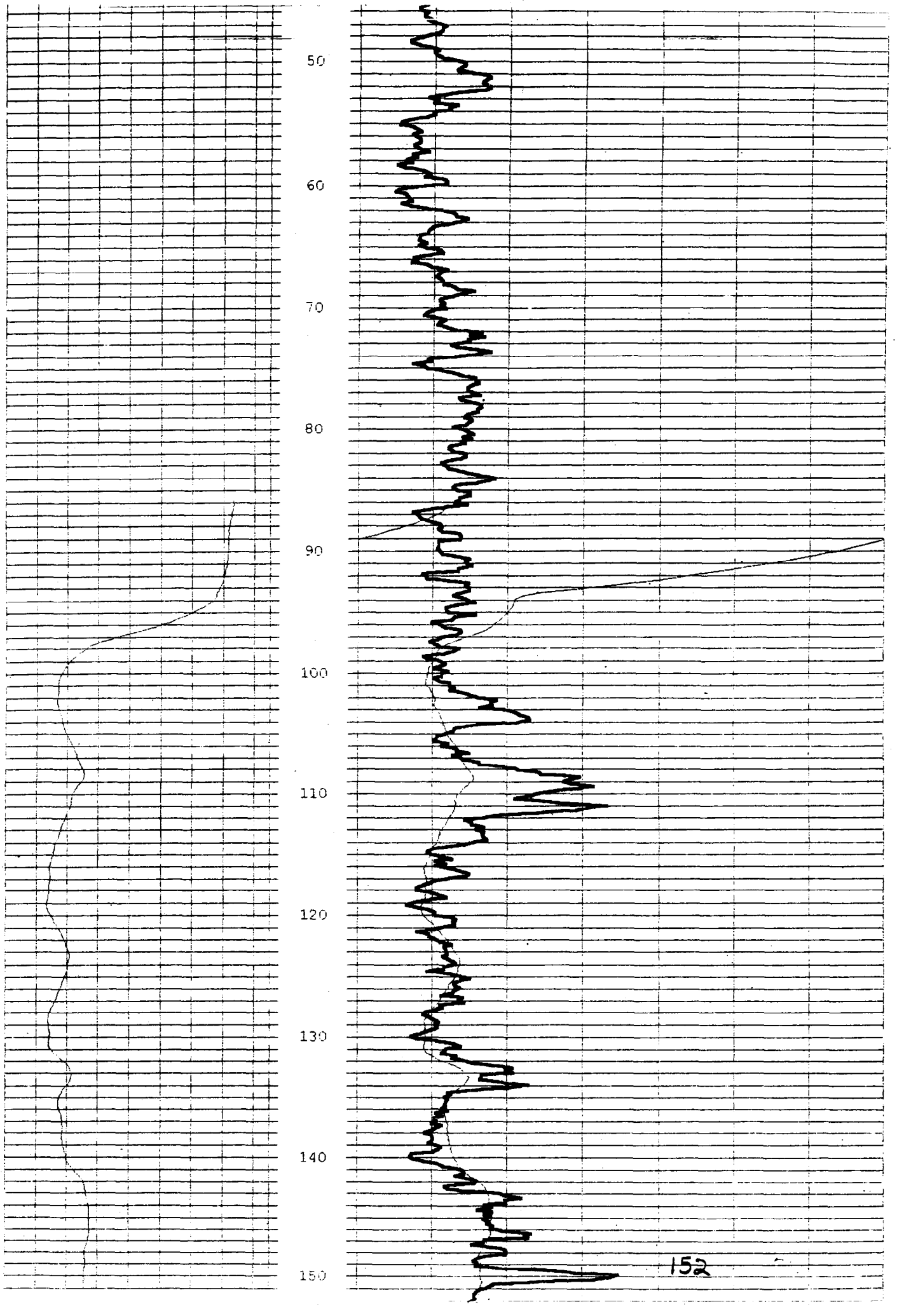
LOG MEAS. FROM GROUND SURFACE ABOVE PERM. DATUM D.F.

DRILLING MEAS. FROM G.L.

DATE	JUNE 26, 2003	TYPE FLUID IN HOLE	BENTONITE
RUN No		SALINITY	
TYPE LOG		DENSITY	
DEPTH-DRILLER	780 FEET	LEVEL	
DEPTH-LOGGER	775 FEET	MAX. REC. TEMP.	
BTM LOGGED INTERVAL			
TOP LOGGED INTERVAL			
OPERATING RIG TIME			
RECORDED BY	BENJAMIN RICE		
WITNESSED BY	STAN CONTI		

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
	12 INCH	GROUND SURFACE	94 FEET	10 INCH	PVC	GROUND SURFACE	94 FEET
	8 INCH	94 FEET	TOTAL DEPTH				

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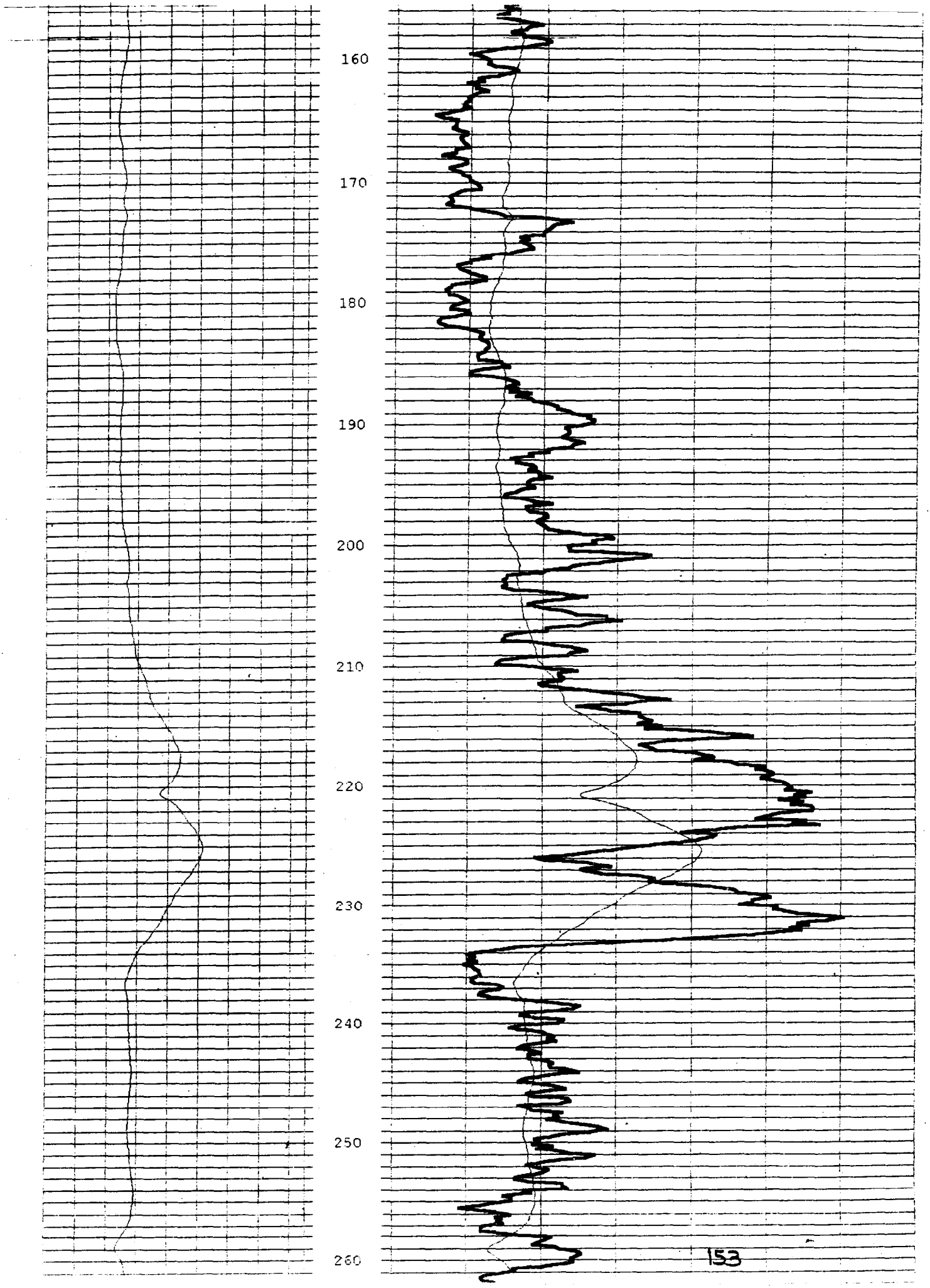
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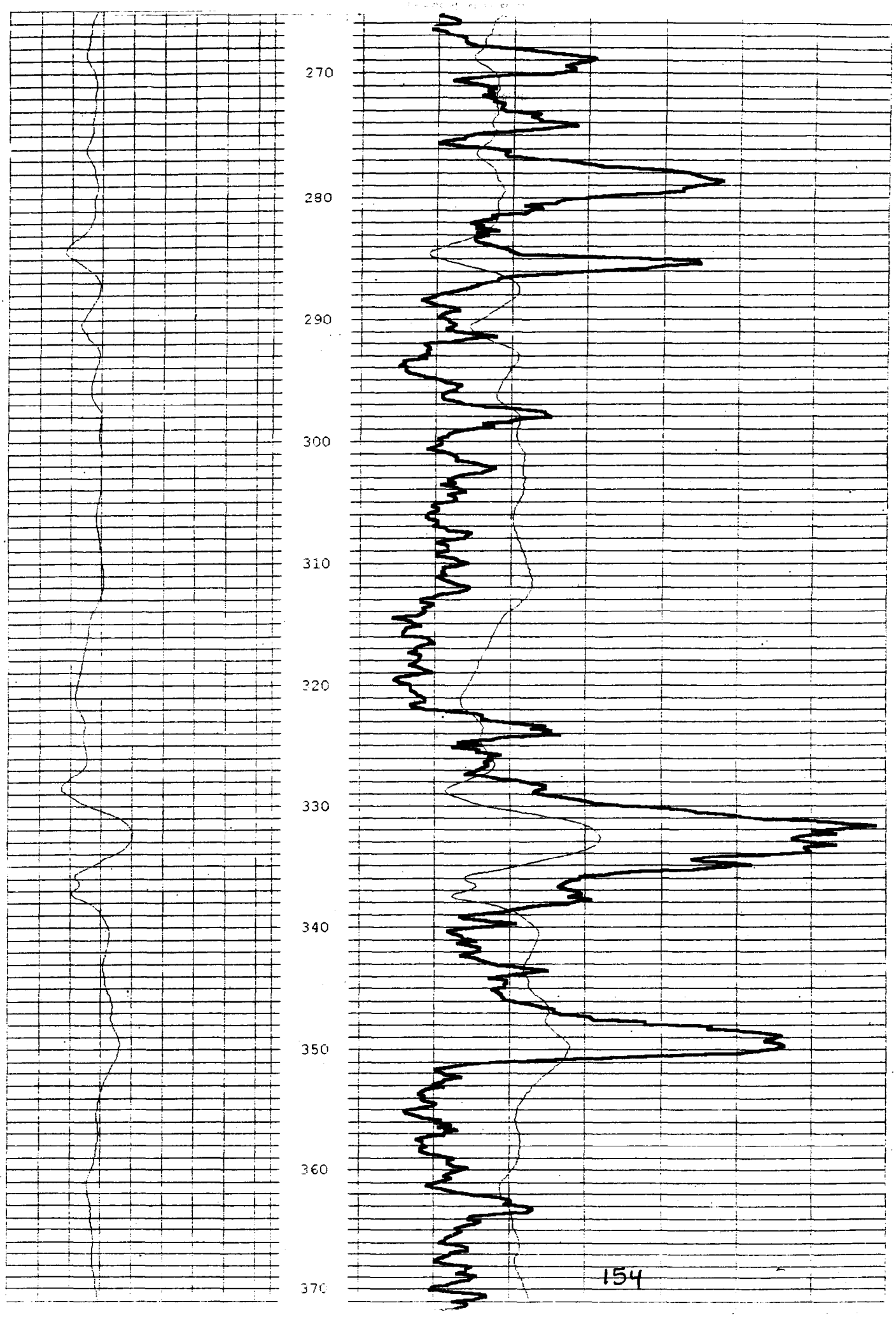
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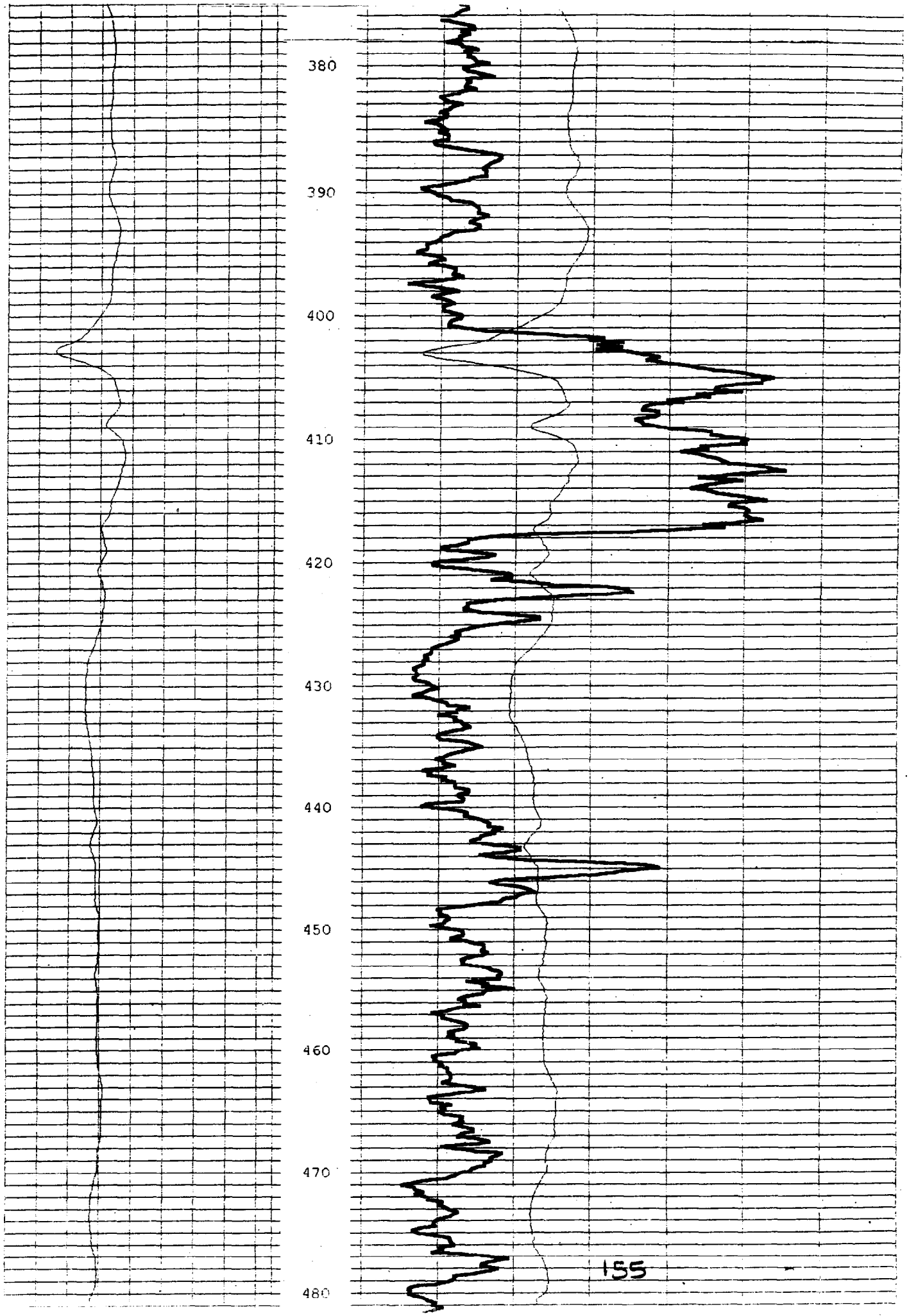
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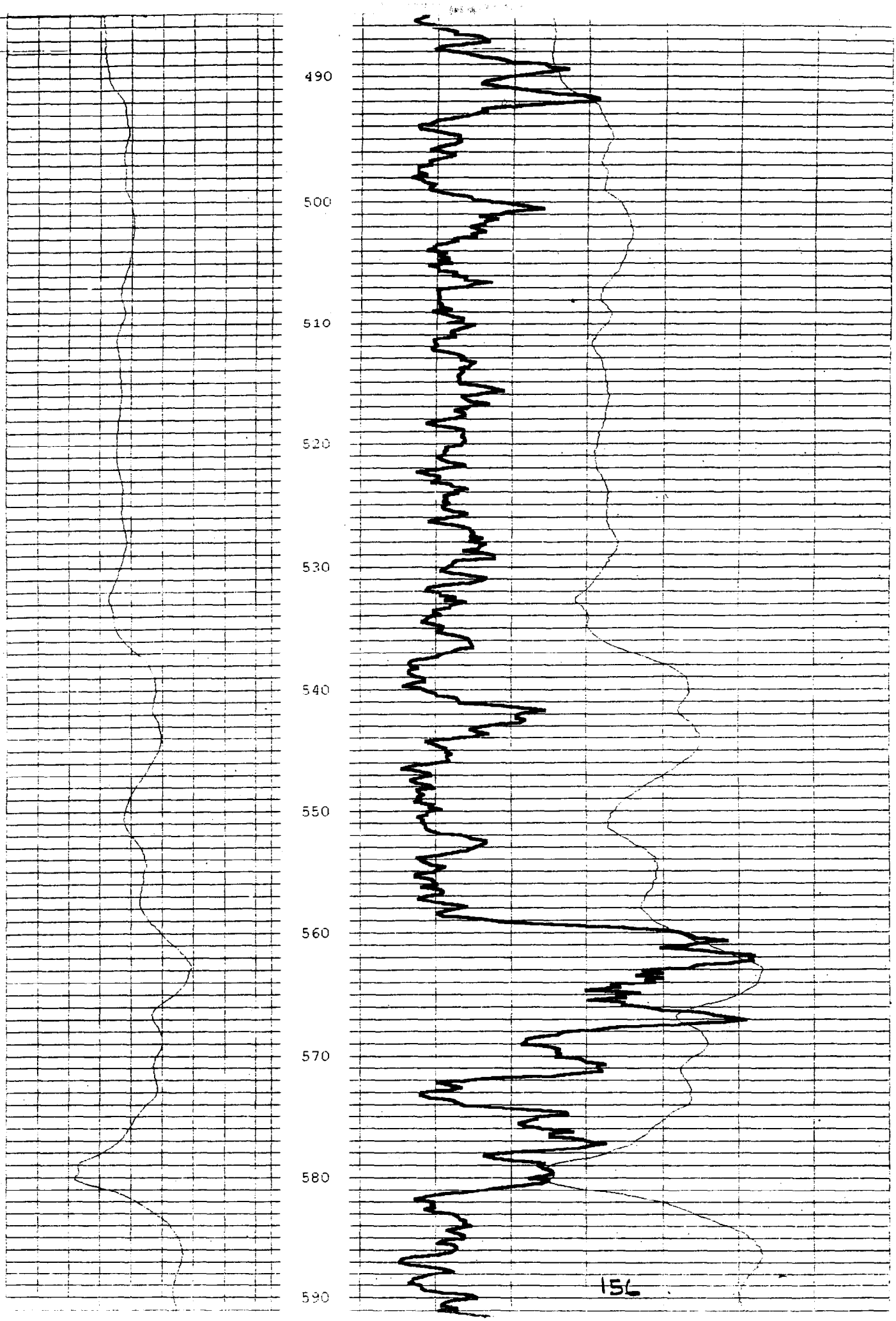
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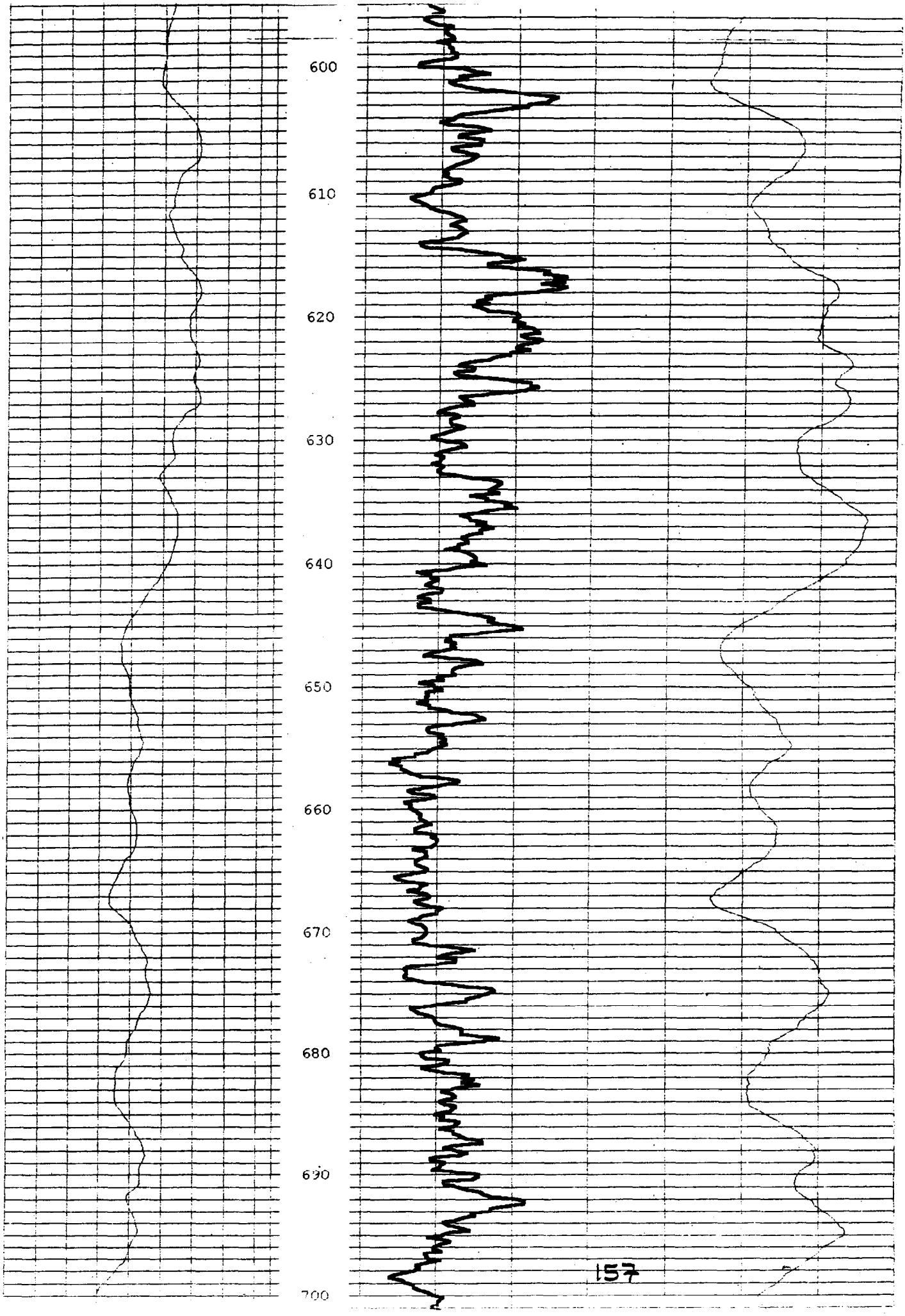
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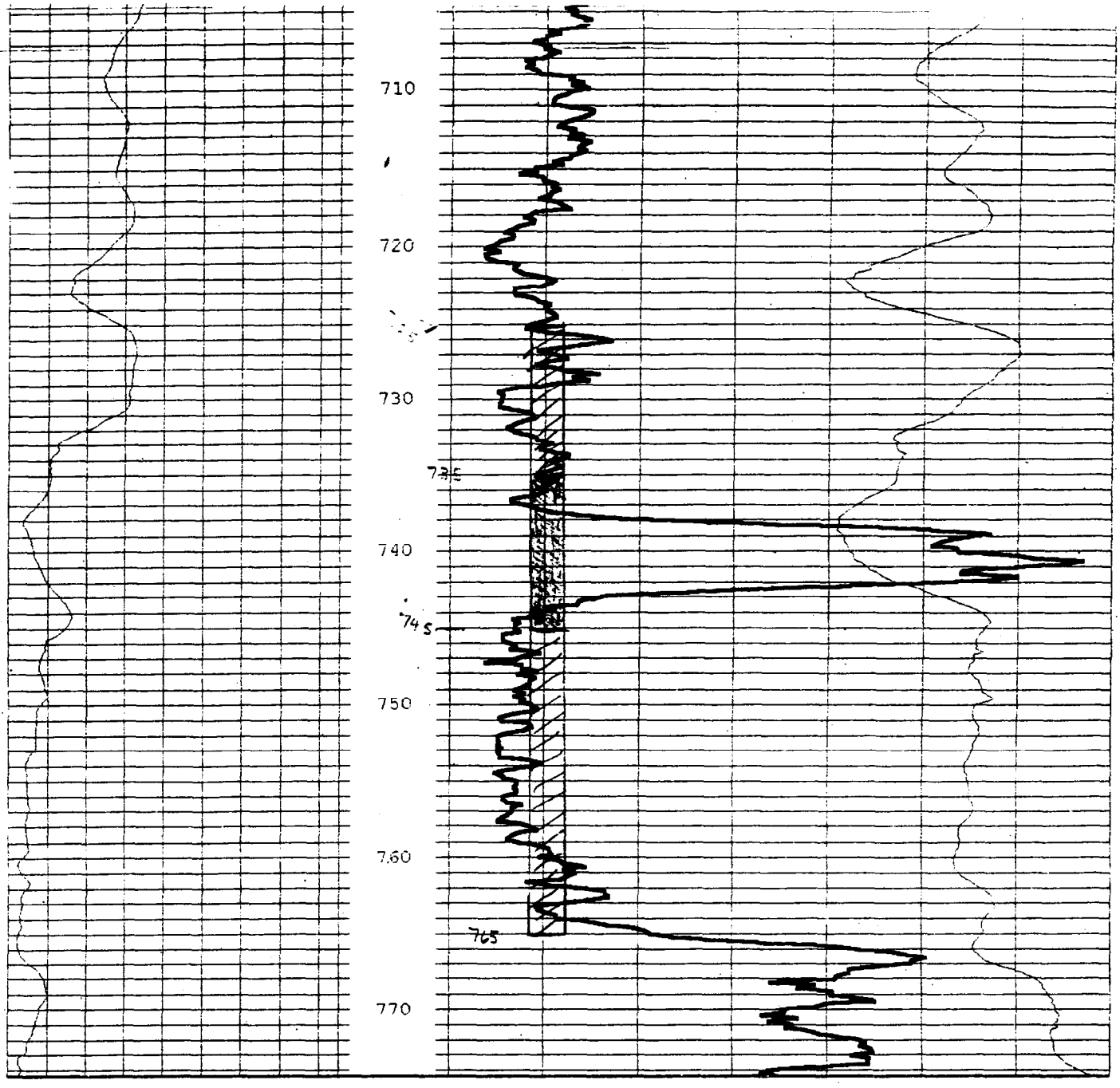
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APPENDIX J

CHAIN-OF-CUSTODY FORMS

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER BPOW-080503 | PAGE 1 OF 1

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
N4037	NWIRP BETHPAGE	D. BRAYACK 412 921 8375	STL LAB / V. BORTOT (412) 820 8320
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: S CONTI 412 921 8422	ADDRESS: 450 WILLIAM PITT WAY
		CARRIER/WAYBILL NUMBER: FED EX AB# 8412 2491 3948	CITY, STATE: PITTSBURGH, PA. 15238

S Conti

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2003	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	VOCS 40 ml Vial	TOTAL CADMIUM	TOTAL CHROME (500 ml)	TSS (250 ml)					COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)						G	P	P						
PRESERVATIVE USED						4°C	4°C HCl	4°C HNO3	4°C					
8/5	0730	BP-TB-080503	AQ	G	2	2								
8/5	0750	BP-IDW-BT1-080503	AQ	G	5	3	1	1						FROM BAKER TANK A201 (1)
8/5	0810	BP-IDW-BT2-080503	AQ	G	5	3	1	1						FROM BAKER TANK A224 (2)
8/4	1700	BP-BPOW4-2-DEV	AQ/GW	G	3	3								TAKEN AT BPOW4-2 - FROM PUMP, DURING FINAL STAGE OF DEVELOPMENT.
														NOTE: BOTH TANKS FULL. AND CONSIST OF MOSTLY DEV. WATER.

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY S Conti	8/5/03	1200	1. RECEIVED BY FED EX.		
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS CALL D BRAYACK FOR QUESTIONS -- SEND RESULTS TO TT NUS/BRAYACK

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TETRA TECH NUS, INC.

CHAIN OF CUSTODY | NUMBER BPOW-091003 | PAGE 1 OF 1

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT: 4128208380
N4037	NWIRP BETHPAGE	DAVE BRAYACK 412 921 8375	STL LAB / V BORTOT
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
SJ Conti		SJ CONTI 412 921 8422	450 WILLIAM PITT WAY
		CARRIER/WAYBILL NUMBER	CITY, STATE
		FED EX AB# 8412 2491 1625	PGH. PA 15238

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2003	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	VOCS (40ml Vials)	VOCS (~~40ml Vials~~)	TOTAL CADMIUM / TOTAL CHROME (~~HCL~~ HNO3)	TSS (250 mL)					COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)						G	G	P	P					
PRESERVATIVE USED						4°C	HCL	4°C	HNO3 4°C					
9/10	0700	BP-TB-091003	AQ	G	2	2	—							
9/11	0730	BP-IDW-A201-091103	AQ	G	5	3	—	1	1					DEV WATER ETC BAKER TANK A201
9/11	0800	BP-IDW-A224-091103	AQ	G	5	3	—	1	1					DEV WATER, SUMP ETC A224
9/10	1030	BP-BPOW2-2-DEV	GW	G	3	3	—							FROM WELL BPOW2-2 DURING END OF DEV
9/10	1200	BP-BPOW2-1-DEV	GW	G	3	3	—							FROM BPOW2-1 END OF DEV.

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
SJ Conti	9/11/03	1200	FED EX		
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMEN

DISTRIBU WHITE (ACCOMPANIES SAMPLE) YELLOW (FI COPY) PINK (FILE COPY)

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TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER BPOW-100803 | PAGE 1 OF 1

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
N4037	NWIRP BETHPAGE	D. BRAYACK 412 921 8375	STL LAB / V. BORTOT
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
SJConti		S CONTI 412 921 8422	450 WILLIAM PITT WAY
		CARRIER/WAYBILL NUMBER	CITY, STATE
		FED EX AB# 8412 2491 1485	PITTSBURGH PA 15238

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2003	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	VOCS (40ml VOA)	VOCS (4 oz)	TCLP METALS TOTAL SOLIDS 8 oz	GRO (40ml VOA)	DRO (1L AMBER)	TAL METALS	TOTAL SOLIDS/pH (250 ml)	COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)						G	G	G	G	G	P	P	
PRESERVATIVE USED						4°C HCL	4°C	4°C	4°C HCL	4°C	4°C HNO3	4°C	
10/8	0830	BP-TB-100803	AQ	G	2	2							
10/9	1200	BP-RB-100903	AQ	G	2	2							RB-THRU PUMP & TUBING.
10/9	1130	BPOW2-1-100903	GW	G	3	3							RE-SAMPLE FROM BPOW2-2, 2-1
			~~GW~~	~~G~~	~~3~~	~~3~~ SJC							~~RE-SAMPLE FROM BPOW2-1~~ SJC
10/8	0915	BP-IDW-SB-9544	SOIL	G	3		2	1					SLUDGE BOX 9544 (CUTTINGS)
10/8	0945	BP-IDW-SB-0312	SOIL	G	3		2	1					0312 (CUTTINGS)
10/8	1000	BP-IDW-SB-9523	SOIL	G	3		2	1					9523 (CUTTINGS)
10/8	1030	BP-IDW-SB-0042	AQ	G	9	3 THIN MUD			2	2	1	1	THIN MUD (SB 0042) 3-2, 3-1
									"THINNED OUT MUD"				

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
SJConti	10/9/03	1400	FED EX.		
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS 9544 = MOIST SAND - TAN BRN | 0312 F/C SAND | 9523 GRAY SILTY F SAND | FIELD pH (0042) BETWEEN 7 & 8

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER BPOW-102103 | PAGE 1 OF 1

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
N4037	NWIRP BETHPAGE	DAVE BRAYACK - 412 921 8375	STL LAB / V. BORTOT 412 820 8380
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
SJ Conti		SJ CONTI - 412 921 8422	450 WILLIAM PITT WAY
		CARRIER/WAYBILL NUMBER	CITY, STATE
		FED EX # 8316 7332 9630	PITTSBURGH PA 15238

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2003	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	VOCS (40ml Vials)	~~VOCS (40ml Vials)~~	TOTAL CADMIUM	TOTAL CHROME	TSS (250ml)				COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)						G	G	P	P					
PRESERVATIVE USED						4°C HCL	4°C	4°C HNO3	4°C					
10/21	0800	BP-TB-102103	AQ	G	2	2								
10/21	1000	BP-BPOW3-2-DEV	GW	G	3	3								FROM BPOW 3-2 END OF DEV
10/21	1145	BP-BPOW3-1-DEV	GW	G	3	3								FROM BPOW 3-1 END OF DEV
10/22	0820	BP-IDW-A224-102203	AQ/GW	G	5	3		1	1					DEV WATER 3-1, 3-2
10/22	0840	BP-IDW-A201-102203	AQ/GW	G	5	3		1	1					DEV WATER 3-1, 3-2

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
SJ Conti	10/22/03	1600	FED EX		
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY) 3/99

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TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER BPOW-120103 | PAGE 1 OF 1

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT: 412 820 8350
N4037	NWIRP BETHPAGE	D. BRAYACK 412 921 8375	STL LAB / V. BORTOT
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
S Conti		S CONTI 412 921 8422	450 WILLIAM PITT WAY
		CARRIER/WAYBILL NUMBER	CITY, STATE
		FED EX AE # 8412 2491 1544	PITTSBURGH, PA 15238

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED: 4°C HCL

TYPE OF ANALYSIS: VOCs (40 ml)

DATE YEAR 2003	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	VOCs (40 ml)	COMMENTS
12/1	1100	BP-TB-120103	AQ	G	2	2	TRIP BLANK
12/2	1220	BP-BPOW1-3-DEV	GW	G	3	3	END OF DEV STAGE/PUMPING
12/2	0930	BP-BPOW1-2-DEV	GW	G	3	3	"
12/1	1200	BP-BPOW1-1-DEV	GW	G	3	3	"
12/2	1400	BPOW2-1-120203	GW	G	3	3	RE-SAMPLE OF BPOW 2-1
12/2	1245	BP-RB-120203	AQ	G	2	2	RB - THRU PUMP AND TUBING

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
S Conti	12/2/03	1700	FED EX		
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER BPOW-- 121503 | PAGE 1 OF 1

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
N4037	NWIRP BETHPAGE	DAVE BRAYACK 412 921 8375	SIL LAB / V. BORTOT
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
SJ Conti		SJ CONTI 412 921 8422	450 WILLIAM PITT WAY
		CARRIER/WAYBILL NUMBER	CITY, STATE
		FED EX AB# 8412 2491 4039	PITTSBURGH PA 15238

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2003	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: VOCS 40 ml VOA								COMMENTS
					CONTAINER TYPE PLASTIC (P) or GLASS (G)	G								
					PRESERVATIVE USED	4°C HCL								
12/15	1400	BP-TB-121503	AQ	G	2	2								TRIP BLANK
12/15	1535	BP-BPOW4-1-DEV	GW	G	3	3								DURING FINAL STAGE OF DEV

ALSO:
[INCLUDED SOME UNUSED SOIL SAMPLE JARS.]

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY SJ Conti	12/16/03	1200	1. RECEIVED BY FED EX		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS: GW FROM FINAL STAGE OF DEV.

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY) 3/99

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APPENDIX K

SAMPLE LOG SHEETS

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NWIRP Bethpage
Project No.: N4037

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: BP-BPOW4-2-DEV
Sample Location: BPOW4-2
Sampled By: SJC
C.O.C. No.: BPOW-080503
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA: LAMOTTE

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	Salinity
Date: 8/4/03								
Time: 1700								
Method: DIRECT FILL	CLEAR	4.95	.056	14.95	145	—	—	—

PURGE DATA:

Date:	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	Salinity
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatile Organic Compounds	4°C/HCL	3 ~~2~~-40 mL Glass Vials	✓

OBSERVATIONS / NOTES:

Hydropunch advanced to sample depth and screen exposed at: NA hrs. TDS = NA

Sample depth (screened interval) = from NA to NA ft.

Screen exposed to formation for NA minutes.

Depth of borehole prior to advancing hydropunch = NA ft.

SAMPLED FROM PUMP - DURING LAST STAGE OF DEVELOPMENT

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): SJ Cordi

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NWIRP Bethpage
Project No.: N4037

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: BP-BPOW2-1-DEV
Sample Location: BPOW2-1
Sampled By: SJC
C.O.C. No.: BPOW-091003
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA: HORIBA/ LAMOTE

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	Salinity
Date: 9/10/03								
Time: 1200								
Method: PUMP	CLEAR	5.64	.118	13.38	135/14	—	—	—

PURGE DATA:

Date:	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	Salinity
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatile Organic Compounds	4°C/HCL	3 x 40 mL Glass Vials	✓

OBSERVATIONS / NOTES:

Hydropunch advanced to sample depth and screen exposed at: — hrs. TDS = —

Sample depth (screened interval) = from — to — ft.

Screen exposed to formation for — minutes.

Depth of borehole prior to advancing hydropunch = — ft.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): SJConte

16C

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NWIRP Bethpage
Project No.: N4037

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: BP-BPOW2-2-DEV
Sample Location: BPOW2-2
Sampled By: SJC
C.O.C. No.: BPOW-091003
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA: HORIBA/LAMOTTE

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	Salinity
Date: 9/10/03								
Time: 1030								
Method: FROM PUMP	CLEAR	5.70	.118	13.20	250/18	—	—	—

PURGE DATA:

Date:	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	Salinity
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatile Organic Compounds	4°C/HCL	3 x 40 mL Glass Vials	✓

OBSERVATIONS / NOTES:

Hydropunch advanced to sample depth and screen exposed at: — hrs. TDS = —

Sample depth (screened interval) = from — to — ft.

Screen exposed to formation for — minutes.

Depth of borehole prior to advancing hydropunch = — ft.

Circle if Applicable:		Signature(s):
MS/MSD	Duplicate ID No.:	SJConti

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NWIRP Bethpage
Project No.: N4037

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: BPOW2-1-100903
Sample Location: BPOW2-1
Sampled By: SJC
C.O.C. No.: BPOW-100903
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU (HORIBA)	Turbidity NTU (LAMOTTE)	DO mg/l	ORP mV	Salinity
Date: 10/9/03									
Time: 1130									
Method: PUMP	CLEAR	4.42	-131	13.24	219	6	—	—	—

PURGE DATA:

	GALS Volume	pH	S.C.	Temp. (C)	Turbidity		~~DO~~	~~ORP~~	Salinity
Date: 10/9/03									
Method: PUMP	0	—	—	—	—	—	1005		—
Monitor Reading (ppm): 0	300	4.39	.208	13.46	999	672	1025	15 GPM	—
Well Casing Diameter & Material: 4" SCH 80 PVC 3.31 ID	500	4.43	.148	13.60	796	407	1045	12.5"	—
	750	4.43	.134	13.26	199	8	1105	12.5"	—
Total Well Depth (TD): 400'	1000	4.42	-131	13.24	219	6	1125	12.5"	—
Static Water Level (WL): 23.2									
One Casing Volume (gal/L): ≈200									
Start Purge (hrs): 1005									
End Purge (hrs): 1130									
Total Purge Time (min): 90									
Total Vol. Purged (gal/L): 1000									

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatile Organic Compounds	4°C	3 x 40 mL Glass Vials	✓
		24.3 WL @ 1025	

OBSERVATIONS / NOTES:

Hydropunch advanced to sample depth and screen exposed at: NA hrs.

TDS = NA

Sample depth (screened interval) = from NA to NA ft.

Screen exposed to formation for NA minutes.

Depth of borehole prior to advancing hydropunch = NA ft.

Resample of this well. Was Sampled previously at the end of Development. See Dev Sheets for Details

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): SJ Conti

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NWIRP Bethpage
Project No.: N4037

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: BP-BPOW3-2-DEV
Sample Location: BPOW3-2
Sampled By: SJC
C.O.C. No.: BPOW-102103
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA: LAMOTE

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	Salinity
Date: 10/21/03								
Time: 1000								
Method: PUMP	CLEAR	5.80	.077	13.05	49	—	—	—

PURGE DATA:

Date:	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	Salinity
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatile Organic Compounds	4°C	3-40 mL Glass Vials	✓

OBSERVATIONS / NOTES:

Hydropunch advanced to sample depth and screen exposed at: — hrs. TDS = —

Sample depth (screened interval) = from — to — ft.

Screen exposed to formation for — minutes.

Depth of borehole prior to advancing hydropunch = — ft.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): SJConti

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NWIRP Bethpage
Project No.: N4037

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: BP-BPOW 3-1-DEV
Sample Location: BPOW 3-1
Sampled By: SJC
C.O.C. No.: BPOW-102103
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA: LAMORE

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	Salinity
Date: 10/21/03								
Time: 1145								
Method: PUMP	CLEAR	5.81	.084	13.12	51	—	—	—

PURGE DATA:

Date:	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	Salinity
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatile Organic Compounds	4°C	3-40 mL Glass Vials	✓

OBSERVATIONS / NOTES:

Hydropunch advanced to sample depth and screen exposed at: — hrs. TDS = —

Sample depth (screened interval) = from — to — ft.

Screen exposed to formation for — minutes.

Depth of borehole prior to advancing hydropunch = — ft.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): SJ Conte

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NWIRP Bethpage
Project No.: N4037

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: BP-BPOW1-1-DEV
Sample Location: BPOW1-1
Sampled By: SJC
C.O.C. No.: BPOW-120103
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA: HORIBA/LAMOTE

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	Salinity
Date: 12/1/03								
Time: 1200								
Method: PUMP	CLEAR	4.78	.389	11.99	31/11	—	—	—

PURGE DATA:

Date:	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	Salinity
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatile Organic Compounds	4°C	3 x 40 mL Glass Vials	✓

OBSERVATIONS / NOTES:

Hydropunch advanced to sample depth and screen exposed at: _____ hrs. TDS = _____

Sample depth (screened interval) = from _____ to _____ ft.

Screen exposed to formation for _____ minutes.

Depth of borehole prior to advancing hydropunch = _____ ft.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): SJ Conte

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NWIRP Bethpage
Project No.: N4037

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: BP-BPOW1-2-DEV
Sample Location: BPOW1-2
Sampled By: SJC
C.O.C. No.: BPOW-120103
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA: HORIBA / LAMOTTE

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	Salinity
Date: 12/2/03								
Time: 0930								
Method: PUMP	CLEAR	4.60	.082	11.14	41/43	—	—	—

PURGE DATA:

Date:	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	Salinity
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatile Organic Compounds	4°C	3-40 mL Glass Vials	✓

OBSERVATIONS / NOTES:

Hydropunch advanced to sample depth and screen exposed at: _____ hrs. TDS = _____

Sample depth (screened interval) = from _____ to _____ ft.

Screen exposed to formation for _____ minutes.

Depth of borehole prior to advancing hydropunch = _____ ft.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): SJ Conte

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NWIRP Bethpage
Project No.: N4037

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: BP- BPOW1-3-DEV
Sample Location: BPOW1-3
Sampled By: SJC
C.O.C. No.: BPOW-120103
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA: HORIBA / LAMOTTE

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	Salinity
Date: 12-2-03								
Time: 1220								
Method: FROM PUMP	CLEAR	4.65	.094	11.37	4/45	—	—	—

PURGE DATA:

Date:	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	Salinity
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatile Organic Compounds	4°C	3-40 mL Glass Vials	✓

OBSERVATIONS / NOTES:

Hydropunch advanced to sample depth and screen exposed at: — hrs. TDS = —

Sample depth (screened interval) = from — to — ft.

Screen exposed to formation for — minutes.

Depth of borehole prior to advancing hydropunch = — ft.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): SJCorcoran

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NWIRP Bethpage
Project No.: N4037

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: BPOW2-1-120203
Sample Location: BPOW2-1
Sampled By: SJC
C.O.C. No.: BPOW-120103
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA: HORIBA/LAMOTTE

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	~~DO~~ mg/l	ORP mV	Salinity
Date: 12/02/03								
Time: 1400								
Method: PUMP	CLEAR	4.64	.119	11.98	1/0	—	—	—

PURGE DATA: TIME

	Volume	pH	S.C.	Temp. (C)	Turbidity	~~DO~~	ORP	Salinity	
Date: 12/2/03									
Method: PUMP	START	W/	PUMP			1300	—	—	
Monitor Reading (ppm): 0	300 CLEAR	4.69	.138	12.31	1/2	1320	—	—	15 GPM
Well Casing Diameter & Material	600	4.63	.123	12.01	1/1	1340	—	—	15 GPM
Type: 3 13/16" ID PVC	800	4.64	.119	11.98	1/0	1400	—	—	13 GPM
Total Well Depth (TD): 400'									
Static Water Level (WL): ~23'									
One Casing Volume (gal/L): ≈200									
Start Purge (hrs): 1300									
End Purge (hrs): 1400									
Total Purge Time (min): 60									
Total Vol. Purged (gal/L): 800									

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatile Organic Compounds	4°C	3 x 40 mL Glass Vials	✓

OBSERVATIONS / NOTES:

Hydropunch advanced to sample depth and screen exposed at: — hrs. TDS = —

Sample depth (screened interval) = from — to — ft. 2ND RESAMPLE

Screen exposed to formation for — minutes.

Depth of borehole prior to advancing hydropunch = — ft.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): SJ Conti

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NWIRP Bethpage
Project No.: N4037

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: BP-BPOW4-1-DEV
Sample Location: BPOW4-1
Sampled By: SJC
C.O.C. No.: BPOW-121503
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA: HORIBA / LAMOTTE

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	Salinity
Date: 12/15/03								
Time: 1535								
Method: PUMP	CLEAR	4.48	.068	11.84	85/29	—	—	—

PURGE DATA:

Date:	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	Salinity
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatile Organic Compounds	4°C	3 x 40 mL Glass Vials	✓

OBSERVATIONS / NOTES:

Hydropunch advanced to sample depth and screen exposed at: — hrs. TDS = —

Sample depth (screened interval) = from — to — ft.

Screen exposed to formation for — minutes.

Depth of borehole prior to advancing hydropunch = — ft.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): [signature]

APPENDIX L

ANALYTICAL RESULTS

TETRA TECH NUS INC

Client Sample ID: BP-BPOW1-1-DEV

GC/MS Volatiles

Lot-Sample #...:	C3L030292-004	**Work Order #...:**	F5X4P1AA	**Matrix.....:**	WATER
Date Sampled...:	12/01/03	**Date Received..:**	12/03/03	**MS Run #.....:**	3338043
Prep Date.....:	12/04/03	**Analysis Date..:**	12/04/03		
Prep Batch #...:	3338159	**Analysis Time..:**	12:13		
Dilution Factor:	1	**Initial Wgt/Vol:**	5 mL	**Final Wgt/Vol..:**	5 mL
Analyst ID.....:	010099	**Instrument ID..:**	HP5		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.11
Bromodichloromethane	ND	1.0	ug/L	0.12
Bromoform	ND	1.0	ug/L	0.18
Bromomethane	ND	2.0	ug/L	0.37
2-Butanone	ND	5.0	ug/L	1.2
Carbon disulfide	ND	1.0	ug/L	0.16
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.11
Dibromochloromethane	ND	1.0	ug/L	0.093
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	**0.32 J**	**1.0**	**ug/L**	**0.14**
Chloromethane	ND	2.0	ug/L	0.075
1,1-Dichloroethane	**1.6**	**1.0**	**ug/L**	**0.16**
1,2-Dichloroethane	ND	1.0	ug/L	0.092
1,1-Dichloroethene	**2.9**	**1.0**	**ug/L**	**0.21**
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.32
1,2-Dichloropropane	ND	1.0	ug/L	0.11
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.18
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.087
Ethylbenzene	ND	1.0	ug/L	0.11
2-Hexanone	ND	5.0	ug/L	1.2
Methylene chloride	ND	2.0	ug/L	0.16
4-Methyl-2-pentanone	ND	5.0	ug/L	1.0
Styrene	ND	1.0	ug/L	0.11
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.16
Tetrachloroethene	**1.2**	**1.0**	**ug/L**	**0.24**
Toluene	**0.22 J**	**1.0**	**ug/L**	**0.14**
1,1,1-Trichloroethane	**6.4**	**1.0**	**ug/L**	**0.16**
1,1,2-Trichloroethane	ND	1.0	ug/L	0.12
Trichloroethene	**1.9**	**1.0**	**ug/L**	**0.095**
Vinyl chloride	ND	3.0	ug/L	0.17
Xylenes (total)	ND	3.0	ug/L	0.45

(Continued on next page)

TETRA TECH NUS INC

Client Sample ID: BP-BPOW1-2-DEV

GC/MS Volatiles

Lot-Sample #...:	C3L030292-003	**Work Order #...:**	F5X4M1AA	**Matrix.....:**	WATER
Date Sampled...:	12/02/03	**Date Received..:**	12/03/03	**MS Run #.....:**	3338043
Prep Date.....:	12/04/03	**Analysis Date..:**	12/04/03		
Prep Batch #...:	3338159	**Analysis Time..:**	11:50		
Dilution Factor:	1	**Initial Wgt/Vol:**	5 mL	**Final Wgt/Vol..:**	5 mL
Analyst ID.....:	010099	**Instrument ID..:**	HP5		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	**2.5 J**	**10**	**ug/L**	**2.5**
Benzene	ND	1.0	ug/L	0.11
Bromodichloromethane	ND	1.0	ug/L	0.12
Bromoform	ND	1.0	ug/L	0.18
Bromomethane	ND	2.0	ug/L	0.37
2-Butanone	ND	5.0	ug/L	1.2
Carbon disulfide	ND	1.0	ug/L	0.16
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.11
Dibromochloromethane	ND	1.0	ug/L	0.093
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.14
Chloromethane	ND	2.0	ug/L	0.075
1,1-Dichloroethane	ND	1.0	ug/L	0.16
1,2-Dichloroethane	ND	1.0	ug/L	0.092
1,1-Dichloroethene	ND	1.0	ug/L	0.21
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.32
1,2-Dichloropropane	ND	1.0	ug/L	0.11
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.18
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.087
Ethylbenzene	ND	1.0	ug/L	0.11
2-Hexanone	ND	5.0	ug/L	1.2
Methylene chloride	ND	2.0	ug/L	0.16
4-Methyl-2-pentanone	ND	5.0	ug/L	1.0
Styrene	ND	1.0	ug/L	0.11
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.16
Tetrachloroethene	**0.58 J**	**1.0**	**ug/L**	**0.24**
Toluene	ND	1.0	ug/L	0.14
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.12
Trichloroethene	ND	1.0	ug/L	0.095
Vinyl chloride	ND	3.0	ug/L	0.17
Xylenes (total)	ND	3.0	ug/L	0.45

(Continued on next page)

TETRA TECH NUS INC

Client Sample ID: BP-BPOW1-3-DEV

GC/MS Volatiles

Lot-Sample #...:	C3L030292-002	**Work Order #...:**	F5X4J1AA	**Matrix.....:**	WATER
Date Sampled...:	12/02/03	**Date Received..:**	12/03/03	**MS Run #.....:**	3338043
Prep Date.....:	12/04/03	**Analysis Date..:**	12/04/03		
Prep Batch #...:	3338159	**Analysis Time..:**	11:26		
Dilution Factor:	1	**Initial Wgt/Vol:**	5 mL	**Final Wgt/Vol..:**	5 mL
Analyst ID.....:	010099	**Instrument ID..:**	HP5		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.11
Bromodichloromethane	ND	1.0	ug/L	0.12
Bromoform	ND	1.0	ug/L	0.18
Bromomethane	ND	2.0	ug/L	0.37
2-Butanone	ND	5.0	ug/L	1.2
Carbon disulfide	ND	1.0	ug/L	0.16
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.11
Dibromochloromethane	ND	1.0	ug/L	0.093
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.14
Chloromethane	ND	2.0	ug/L	0.075
1,1-Dichloroethane	ND	1.0	ug/L	0.16
1,2-Dichloroethane	ND	1.0	ug/L	0.092
1,1-Dichloroethene	ND	1.0	ug/L	0.21
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.32
1,2-Dichloropropane	ND	1.0	ug/L	0.11
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.18
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.087
Ethylbenzene	ND	1.0	ug/L	0.11
2-Hexanone	ND	5.0	ug/L	1.2
Methylene chloride	ND	2.0	ug/L	0.16
4-Methyl-2-pentanone	ND	5.0	ug/L	1.0
Styrene	ND	1.0	ug/L	0.11
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.16
Tetrachloroethene	ND	1.0	ug/L	0.24
Toluene	ND	1.0	ug/L	0.14
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.12
Trichloroethene	ND	1.0	ug/L	0.095
Vinyl chloride	ND	3.0	ug/L	0.17
Xylenes (total)	ND	3.0	ug/L	0.45

(Continued on next page)

TETRA TECH NUS INC

Client Sample ID: BP-BPOW2-1-DEV

GC/MS Volatiles

Lot-Sample #...:	C3I120361-005	**Work Order #...:**	FX9AW1AA	**Matrix.....:**	WATER
Date Sampled...:	09/10/03 12:00	**Date Received..:**	09/12/03	**MS Run #.....:**	
Prep Date.....:	09/17/03	**Analysis Date..:**	09/18/03		
Prep Batch #...:	3260714	**Analysis Time..:**	00:47		
Dilution Factor:	1				
Analyst ID.....:	034635	**Instrument ID..:**	HP5		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	**2.9**	**1.0**	**ug/L**	**0.11**
Bromodichloromethane	ND	1.0	ug/L	0.12
Bromoform	ND	1.0	ug/L	0.18
Bromomethane	ND	2.0	ug/L	0.37
2-Butanone	ND	5.0	ug/L	1.2
Carbon disulfide	ND	1.0	ug/L	0.16
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.11
Dibromochloromethane	ND	1.0	ug/L	0.093
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.14
Chloromethane	ND	2.0	ug/L	0.075
1,1-Dichloroethane	ND	1.0	ug/L	0.16
1,2-Dichloroethane	ND	1.0	ug/L	0.092
1,1-Dichloroethene	ND	1.0	ug/L	0.21
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.32
1,2-Dichloropropane	ND	1.0	ug/L	0.11
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.18
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.087
Ethylbenzene	ND	1.0	ug/L	0.11
2-Hexanone	ND	5.0	ug/L	1.2
Methylene chloride	ND	2.0	ug/L	0.16
4-Methyl-2-pentanone	ND	5.0	ug/L	1.0
Styrene	ND	1.0	ug/L	0.11
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.16
Tetrachloroethene	ND	1.0	ug/L	0.24
Toluene	ND	1.0	ug/L	0.14
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.12
Trichloroethene	ND	1.0	ug/L	0.095
Vinyl chloride	ND	3.0	ug/L	0.17
Xylenes (total)	ND	3.0	ug/L	0.45

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TETRA TECH NUS INC

Client Sample ID: BPOW2-1-100903

GC/MS Volatiles

Lot-Sample #...:	C3J100416-001	Work Order #...:	F2CR81AA	Matrix.....:	WATER
Date Sampled...:	10/08/03	Date Received..:	10/10/03	MS Run #.....:	3287107
Prep Date.....:	10/14/03	Analysis Date..:	10/14/03		
Prep Batch #...:	3287263	Analysis Time..:	15:26		
Dilution Factor:	1	Initial Wgt/Vol:	5 mL	Final Wgt/Vol..:	5 mL
Analyst ID.....:	016328	Instrument ID..:	HP6		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	3.1 J	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.11
Bromodichloromethane	ND	1.0	ug/L	0.12
Bromoform	ND	1.0	ug/L	0.18
Bromomethane	ND	2.0	ug/L	0.37
2-Butanone	ND	5.0	ug/L	1.2
Carbon disulfide	ND	1.0	ug/L	0.16
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.11
Dibromochloromethane	ND	1.0	ug/L	0.093
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.14
Chloromethane	ND	2.0	ug/L	0.075
1,1-Dichloroethane	ND	1.0	ug/L	0.16
1,2-Dichloroethane	ND	1.0	ug/L	0.092
1,1-Dichloroethene	ND	1.0	ug/L	0.21
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.32
1,2-Dichloropropane	ND	1.0	ug/L	0.11
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.18
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.087
Ethylbenzene	ND	1.0	ug/L	0.11
2-Hexanone	ND	5.0	ug/L	1.2
Methylene chloride	ND	2.0	ug/L	0.16
4-Methyl-2-pentanone	ND	5.0	ug/L	1.0
Styrene	ND	1.0	ug/L	0.11
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.16
Tetrachloroethene	ND	1.0	ug/L	0.24
Toluene	ND	1.0	ug/L	0.14
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.12
Trichloroethene	ND	1.0	ug/L	0.095
Vinyl chloride	ND	3.0	ug/L	0.17
Xylenes (total)	ND	3.0	ug/L	0.45

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TETRA TECH NUS INC

Client Sample ID: BPOW2-1-120203

GC/MS Volatiles

Lot-Sample #...:	C3L030292-005	**Work Order #...:**	F5X4R1AA	**Matrix.....:**	WATER
Date Sampled...:	12/02/03	**Date Received..:**	12/03/03	**MS Run #.....:**	3338043
Prep Date.....:	12/04/03	**Analysis Date..:**	12/04/03		
Prep Batch #...:	3338159	**Analysis Time..:**	12:37		
Dilution Factor:	1	**Initial Wgt/Vol:**	5 mL	**Final Wgt/Vol..:**	5 mL
Analyst ID.....:	010099	**Instrument ID..:**	HP5		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.11
Bromodichloromethane	ND	1.0	ug/L	0.12
Bromoform	ND	1.0	ug/L	0.18
Bromomethane	ND	2.0	ug/L	0.37
2-Butanone	ND	5.0	ug/L	1.2
Carbon disulfide	ND	1.0	ug/L	0.16
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.11
Dibromochloromethane	ND	1.0	ug/L	0.093
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.14
Chloromethane	ND	2.0	ug/L	0.075
1,1-Dichloroethane	ND	1.0	ug/L	0.16
1,2-Dichloroethane	ND	1.0	ug/L	0.092
1,1-Dichloroethene	ND	1.0	ug/L	0.21
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.32
1,2-Dichloropropane	ND	1.0	ug/L	0.11
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.18
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.087
Ethylbenzene	ND	1.0	ug/L	0.11
2-Hexanone	ND	5.0	ug/L	1.2
Methylene chloride	ND	2.0	ug/L	0.16
4-Methyl-2-pentanone	ND	5.0	ug/L	1.0
Styrene	ND	1.0	ug/L	0.11
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.16
Tetrachloroethene	ND	1.0	ug/L	0.24
Toluene	ND	1.0	ug/L	0.14
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.12
Trichloroethene	ND	1.0	ug/L	0.095
Vinyl chloride	ND	3.0	ug/L	0.17
Xylenes (total)	ND	3.0	ug/L	0.45

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TETRA TECH NUS INC

Client Sample ID: BP-BPOW2-2-DEV

GC/MS Volatiles

Lot-Sample #...:	C3I120361-004	**Work Order #...:**	FX9AR1AA	**Matrix.....:**	WATER
Date Sampled...:	09/10/03 10:30	**Date Received..:**	09/12/03	**MS Run #.....:**	
Prep Date.....:	09/17/03	**Analysis Date..:**	09/18/03		
Prep Batch #...:	3260714	**Analysis Time..:**	00:24		
Dilution Factor:	1				
Analyst ID.....:	034635	**Instrument ID..:**	HP5		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.11
Bromodichloromethane	ND	1.0	ug/L	0.12
Bromoform	ND	1.0	ug/L	0.18
Bromomethane	ND	2.0	ug/L	0.37
2-Butanone	ND	5.0	ug/L	1.2
Carbon disulfide	ND	1.0	ug/L	0.16
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.11
Dibromochloromethane	ND	1.0	ug/L	0.093
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.14
Chloromethane	ND	2.0	ug/L	0.075
1,1-Dichloroethane	ND	1.0	ug/L	0.16
1,2-Dichloroethane	ND	1.0	ug/L	0.092
1,1-Dichloroethene	ND	1.0	ug/L	0.21
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.32
1,2-Dichloropropane	ND	1.0	ug/L	0.11
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.18
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.087
Ethylbenzene	ND	1.0	ug/L	0.11
2-Hexanone	ND	5.0	ug/L	1.2
Methylene chloride	ND	2.0	ug/L	0.16
4-Methyl-2-pentanone	ND	5.0	ug/L	1.0
Styrene	ND	1.0	ug/L	0.11
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.16
Tetrachloroethene	ND	1.0	ug/L	0.24
Toluene	ND	1.0	ug/L	0.14
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.12
Trichloroethene	ND	1.0	ug/L	0.095
Vinyl chloride	ND	3.0	ug/L	0.17
Xylenes (total)	ND	3.0	ug/L	0.45

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech NUS Inc
NWIRP Beth Page
Project Number: CTO812

Lot #: C3J230178 **Date Reported:** 11/07/03

Client Sample ID: BP-BPOW3-1-DEV
Sample #: 003 Date Sampled: 10/21/03 11:45 Date Received: 10/23/03 Matrix: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Volatile Organics by GC/MS					Reviewed
Acetone	ND	10	ug/L	SW846 8260B	
Benzene	ND	1.0	ug/L	SW846 8260B	
Bromodichloromethane	ND	1.0	ug/L	SW846 8260B	
Bromoform	ND	1.0	ug/L	SW846 8260B	
Bromomethane	ND	2.0	ug/L	SW846 8260B	
2-Butanone	ND	5.0	ug/L	SW846 8260B	
Carbon disulfide	ND	1.0	ug/L	SW846 8260B	
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B	
Chlorobenzene	ND	1.0	ug/L	SW846 8260B	
Dibromochloromethane	ND	1.0	ug/L	SW846 8260B	
Chloroethane	ND	2.0	ug/L	SW846 8260B	
Chloroform	ND	1.0	ug/L	SW846 8260B	
Chloromethane	ND	2.0	ug/L	SW846 8260B	
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B	
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B	
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B	
1,2-Dichloroethene (total)	ND	1.0	ug/L	SW846 8260B	
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B	
cis-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B	
trans-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B	
Ethylbenzene	ND	1.0	ug/L	SW846 8260B	
2-Hexanone	ND	5.0	ug/L	SW846 8260B	
Methylene chloride	ND	2.0	ug/L	SW846 8260B	
4-Methyl-2-pentanone	ND	5.0	ug/L	SW846 8260B	
Styrene	ND	1.0	ug/L	SW846 8260B	
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260B	
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B	
Toluene	ND	1.0	ug/L	SW846 8260B	
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B	
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B	
Trichloroethene	ND	1.0	ug/L	SW846 8260B	
Vinyl chloride	ND	3.0	ug/L	SW846 8260B	
Xylenes (total)	ND	3.0	ug/L	SW846 8260B	

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

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Tetra Tech NUS Inc
NWIRP Beth Page
Project Number: CTO812

Lot #: C3J230178 **Date Reported:** 11/07/03

Client Sample ID: BP-BPOW3-2-DEV
Sample #: 002 Date Sampled: 10/21/03 10:00 Date Received: 10/23/03 Matrix: **WATER**

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Volatile Organics by GC/MS					Reviewed
Acetone	ND	10	ug/L	SW846 8260B	
Benzene	ND	1.0	ug/L	SW846 8260B	
Bromodichloromethane	ND	1.0	ug/L	SW846 8260B	
Bromoform	ND	1.0	ug/L	SW846 8260B	
Bromomethane	ND	2.0	ug/L	SW846 8260B	
2-Butanone	ND	5.0	ug/L	SW846 8260B	
Carbon disulfide	ND	1.0	ug/L	SW846 8260B	
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B	
Chlorobenzene	ND	1.0	ug/L	SW846 8260B	
Dibromochloromethane	ND	1.0	ug/L	SW846 8260B	
Chloroethane	ND	2.0	ug/L	SW846 8260B	
Chloroform	ND	1.0	ug/L	SW846 8260B	
Chloromethane	ND	2.0	ug/L	SW846 8260B	
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B	
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B	
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B	
1,2-Dichloroethene (total)	ND	1.0	ug/L	SW846 8260B	
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B	
cis-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B	
trans-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B	
Ethylbenzene	ND	1.0	ug/L	SW846 8260B	
2-Hexanone	ND	5.0	ug/L	SW846 8260B	
Methylene chloride	ND	2.0	ug/L	SW846 8260B	
4-Methyl-2-pentanone	ND	5.0	ug/L	SW846 8260B	
Styrene	ND	1.0	ug/L	SW846 8260B	
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260B	
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B	
Toluene	**0.29 J**	**1.0**	**ug/L**	**SW846 8260B**	
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B	
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B	
Trichloroethene	ND	1.0	ug/L	SW846 8260B	
Vinyl chloride	ND	3.0	ug/L	SW846 8260B	
Xylenes (total)	ND	3.0	ug/L	SW846 8260B	

J Estimated result. Result is less than RL.

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech NUS Inc PAGE 1

Lot #: C3L170286 NWIRP Beth Page **Date Reported:** 1/08/04

Project Number: CTO812

Client Sample ID: BP-BPOW4-1-DEV

Sample #: 001 Date Sampled: 12/15/03 15:35 Date Received: 12/17/03 Matrix: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Volatile Organics by GC/MS					Reviewed
Acetone	ND	10	ug/L	SW846 8260B	
Benzene	ND	1.0	ug/L	SW846 8260B	
Bromodichloromethane	ND	1.0	ug/L	SW846 8260B	
Bromoform	ND	1.0	ug/L	SW846 8260B	
Bromomethane	ND	2.0	ug/L	SW846 8260B	
2-Butanone	ND	5.0	ug/L	SW846 8260B	
Carbon disulfide	ND	1.0	ug/L	SW846 8260B	
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B	
Chlorobenzene	ND	1.0	ug/L	SW846 8260B	
Dibromochloromethane	ND	1.0	ug/L	SW846 8260B	
Chloroethane	ND	2.0	ug/L	SW846 8260B	
Chloroform	ND	1.0	ug/L	SW846 8260B	
Chloromethane	ND	2.0	ug/L	SW846 8260B	
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B	
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B	
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B	
1,2-Dichloroethene (total)	ND	1.0	ug/L	SW846 8260B	
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B	
cis-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B	
trans-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B	
Ethylbenzene	ND	1.0	ug/L	SW846 8260B	
2-Hexanone	ND	5.0	ug/L	SW846 8260B	
Methylene chloride	ND	2.0	ug/L	SW846 8260B	
4-Methyl-2-pentanone	ND	5.0	ug/L	SW846 8260B	
Styrene	ND	1.0	ug/L	SW846 8260B	
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260B	
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B	
Toluene	**0.28 J**	**1.0**	**ug/L**	**SW846 8260B**	
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B	
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B	
Trichloroethene	ND	1.0	ug/L	SW846 8260B	
Vinyl chloride	ND	3.0	ug/L	SW846 8260B	
Xylenes (total)	ND	3.0	ug/L	SW846 8260B	

J Estimated result. Result is less than RL.

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TETRA TECH NUS INC

Client Sample ID: BP-BPOW4-2-DEV

GC/MS Volatiles

Lot-Sample #...:	C3H060299-003	**Work Order #...:**	FVQ101AA	**Matrix.....:**	WATER
Date Sampled...:	08/04/03	**Date Received..:**	08/06/03	**MS Run #.....:**	3219024
Prep Date.....:	08/07/03	**Analysis Date..:**	08/07/03		
Prep Batch #...:	3219133	**Analysis Time..:**	11:05		
Dilution Factor:	1	**Initial Wgt/Vol:**	5 mL	**Final Wgt/Vol..:**	5 mL
Analyst ID.....:	016328	**Instrument ID..:**	HP6		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.11
Bromodichloromethane	ND	1.0	ug/L	0.12
Bromoform	ND	1.0	ug/L	0.18
Bromomethane	ND	2.0	ug/L	0.37
2-Butanone	ND	5.0	ug/L	1.2
Carbon disulfide	ND	1.0	ug/L	0.16
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.11
Dibromochloromethane	ND	1.0	ug/L	0.093
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.14
Chloromethane	ND	2.0	ug/L	0.075
1,1-Dichloroethane	ND	1.0	ug/L	0.16
1,2-Dichloroethane	ND	1.0	ug/L	0.092
1,1-Dichloroethene	ND	1.0	ug/L	0.21
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.32
1,2-Dichloropropane	ND	1.0	ug/L	0.11
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.18
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.087
Ethylbenzene	ND	1.0	ug/L	0.11
2-Hexanone	ND	5.0	ug/L	1.2
Methylene chloride	ND	2.0	ug/L	0.16
4-Methyl-2-pentanone	ND	5.0	ug/L	1.0
Styrene	ND	1.0	ug/L	0.11
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.16
Tetrachloroethene	ND	1.0	ug/L	0.24
Toluene	ND	1.0	ug/L	0.14
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.12
Trichloroethene	ND	1.0	ug/L	0.095
Vinyl chloride	ND	3.0	ug/L	0.17
Xylenes (total)	ND	3.0	ug/L	0.45

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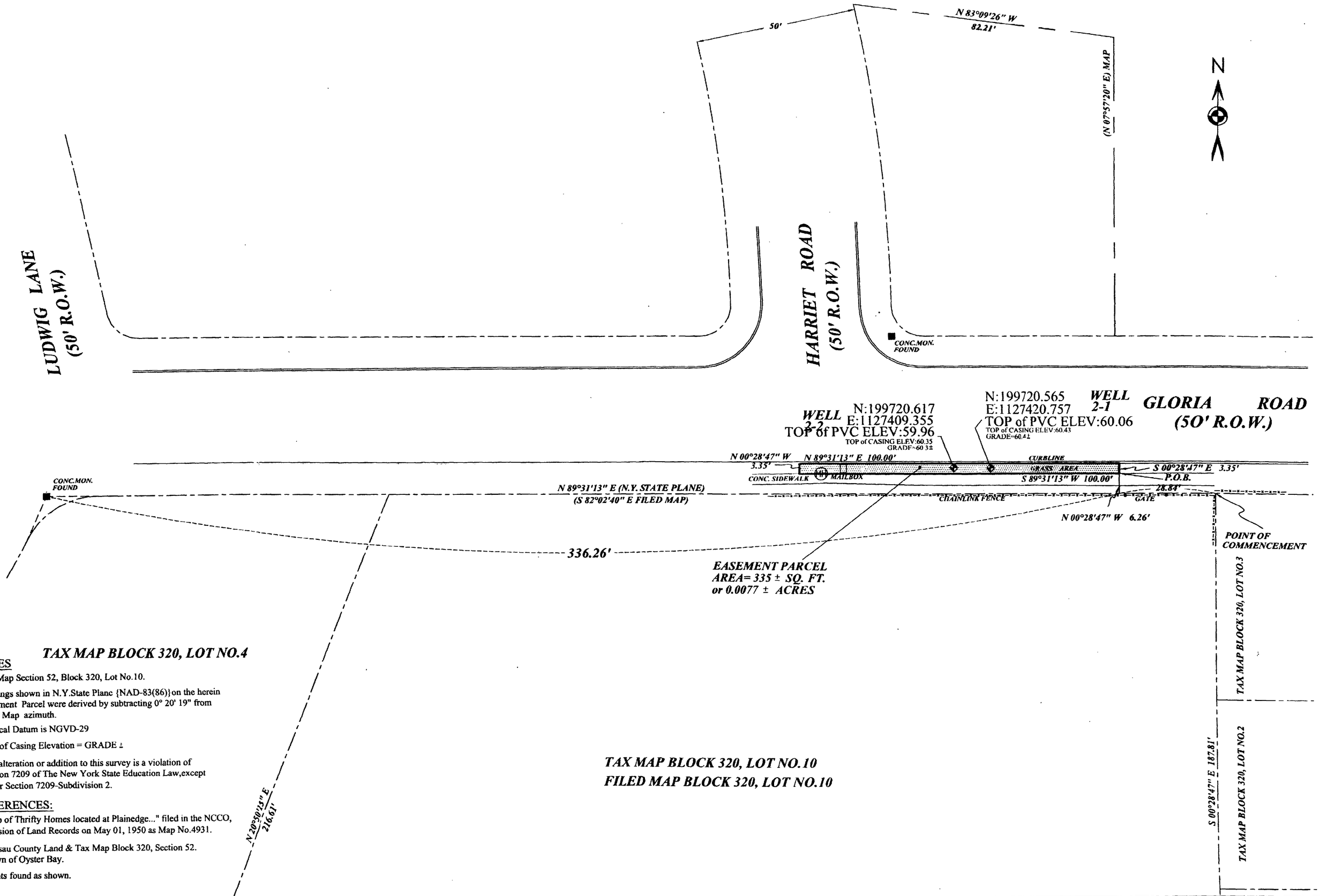
APPENDIX M

SURVEY DATA



NOTES

1. Tax Map Section 52, Block 320, Lot No.10.
2. Bearings shown in N.Y.State Plane {NAD-83(86)}on the herein Easement Parcel were derived by subtracting 0° 20' 19" from Filed Map azimuth.
3. Vertical Datum is NGVD-29
4. Top of Casing Elevation = GRADE ±
5. Any alteration or addition to this survey is a violation of Section 7209 of The New York State Education Law,except as per Section 7209-Subdivision 2.

REFERENCES:

1. "Map of Thrifty Homes located at Plainedge..." filed in the NCCO, Division of Land Records on May 01, 1950 as Map No.4931.
2. Nassau County Land & Tax Map Block 320, Section 52. Town of Oyster Bay.
3. Points found as shown.

NO.	DATE	DESCRIPTION	APPR'D.

REVISIONS

DRAWN BY: G.R.S.
CHECKED BY:N.E.B.

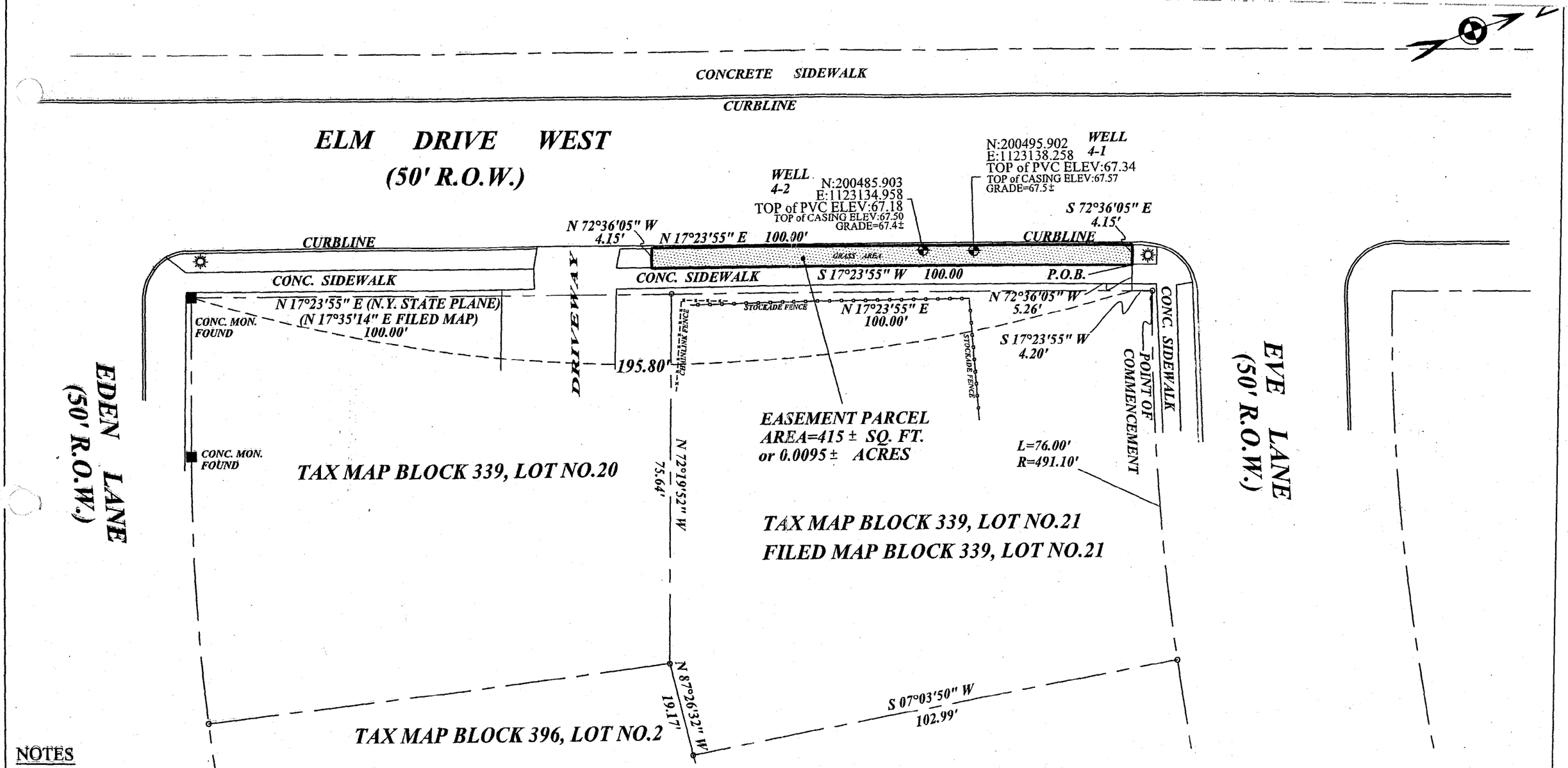
SCALE: 1"=20'

HIRANI ENGINEERING & LAND SURVEYING, P.C.
47 MINEOLA BLVD., SECOND FLOOR
MINEOLA, NY 11501
T (516) 248-1010 F (516) 248-9018
HIRANI

OWNER: U.S. DEPT. OF NAVY
CONTRACTOR: TETRA TECH NUS

SUBJECT:
MONITORING WELL LOCATION FOR WELLS
BP-OW 2-1(D) & BP-OW 2-2 (D2).

DATE DRAWN: 01/12/04
DATE SURVEYED: 01/02/04
CONTRACT # : S02-2117
SHEET NO: 1 OF



NOTES

1. Tax Map Section 51, Block 339, Lot No.21.
2. Bearings shown in N.Y.State Plane {NAD-83(86)}on the herein Easement Parcel were derived by subtracting 0° 20' 19" from Filed Map azimuth.
3. Vertical Datum is NGVD-29
4. Top of Casing Elevation = GRADE ±

Any alteration or addition to this survey is a violation of Section 7209 of The New York State Education Law,except

REFERENCES:

1. "Subdivision Map Levittown-Section-26..." filed in the NCCO, Division of Land Records on Feb. 20, 1951 as Map No.5164.
2. Nassau County Land & Tax Map Block 339, Section 51 Town of Hempstead.
3. Points found as shown.

0' 20' 40' 60'

NO.	DATE	DESCRIPTION	APPR'D.
		REVISIONS	

DRAWN BY:G.R.S.
CHECKED BY:N.E.B.

SCALE: 1"=20'

HIRANI ENGINEERING & LAND SURVEYING, P.C.
47 MINEOLA BLVD., 2ND FLOOR
MINEOLA, N.Y. 11501
T (516) 248-1010 F (516) 248-9016
HIRANI

OWNER: U.S DEPT. OF NAVY

CONTRACTOR: TETRA TECH NUS

SUBJECT:
MONITORING WELL LOCATIONS OF WELLS
BP-OW 4-1 (D-3) & BP-OW 4-2 (D-3)

DATE DRAWN: 01/12/04
DATE SURVEYED: 01/02/04

CONTRACT# S02-2117

SHEET NO: 1 OF 1

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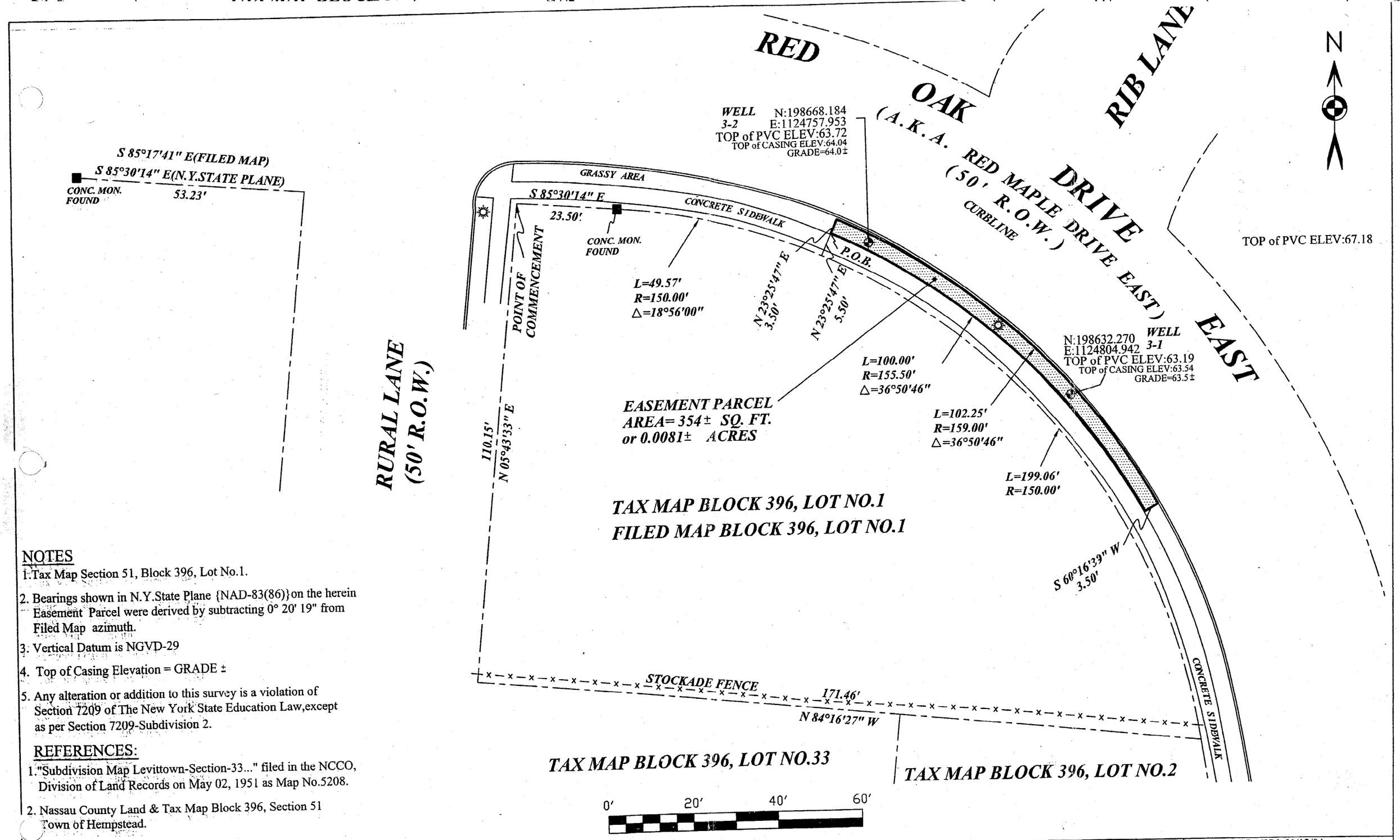

NOTES

1. Tax Map Section 51, Block 396, Lot No.1.
2. Bearings shown in N.Y.State Plane {NAD-83(86)}on the herein Easement Parcel were derived by subtracting 0° 20' 19" from Filed Map azimuth.
3. Vertical Datum is NGVD-29
4. Top of Casing Elevation = GRADE ±
5. Any alteration or addition to this survey is a violation of Section 7209 of The New York State Education Law,except as per Section 7209-Subdivision 2.

REFERENCES:

1. "Subdivision Map Levittown-Section-33..." filed in the NCCO, Division of Land Records on May 02, 1951 as Map No.5208.
2. Nassau County Land & Tax Map Block 396, Section 51 Town of Hempstead.
3. Points found as shown.

NO.	DATE	DESCRIPTION	APPR'D.
		REVISIONS	

DRAWN BY:G.R.S.
CHECKED BY:N.E.B.
SCALE: 1"=20'

HIRANI ENGINEERING & LAND SURVEYING, P.C.
47 MINEOLA BLVD., 2ND FLOOR
MINEOLA, N.Y. 11501
T (516) 248-1010 F (516) 248-9016
HIRANI

OWNER: U.S DEPT. OF NAVY
CONTRACTOR: TETRA TECH NUS

SUBJECT:
MONITORING WELL LOCATION FOR WELLS BP-OW 3-1 (D2) & BP-OW 3-2 (D3)

DATE DRAWN: 01/12/04
DATE SURVEYED: 01/02/04
CONTRACT# S02-2117
SHEET NO: 1 OF 1

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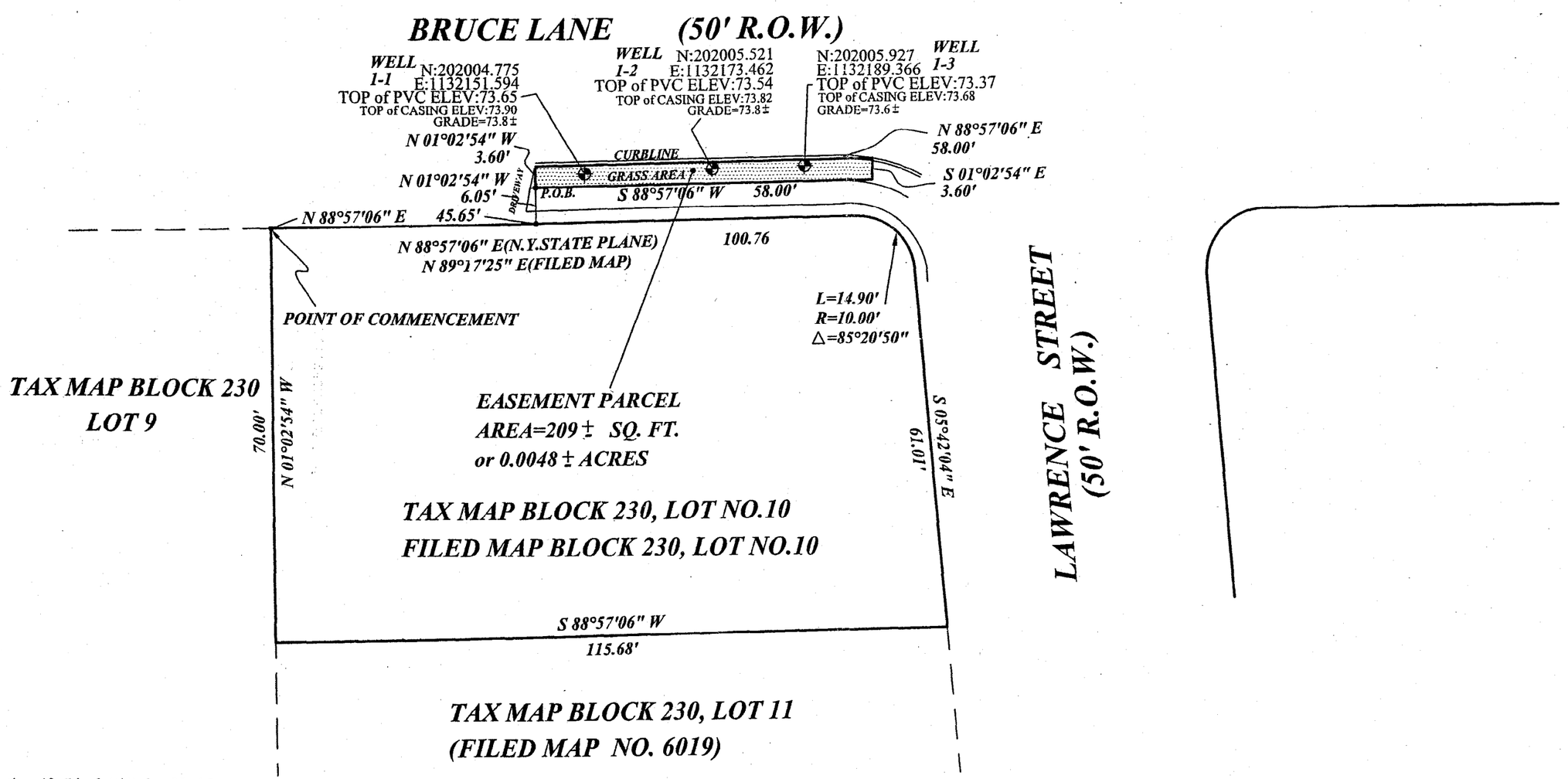

NOTES

1. Tax Map Section 49, Block 230, Lot No.10.
2. Bearings shown in N.Y.State Plane {NAD-83(86)}on the herein Easement Parcel were derived by subtracting 0° 20' 19" from Filed Map azimuth.
3. Vertical Datum is NGVD-29
4. Top of Casing Elevation = GRADE ±
5. Any alteration or addition to this survey is a violation of Section 7209 of The New York State Education Law,except per Section 7209-Subdivision 2.

REFERENCES:

1. "Map of Pinehurst - Section 1..... Filed in the NCCO, Division of Land Records on September 13, 1951 as Map No. 5308.
2. "Map of Pinehurst-Section-2..." filed in the NCCO, Division of Land Records on Dec. 14, 1953 as Map No.6019.
3. Nassau County Land & Tax Map Block 230, Section 49 Town of Oyster Bay.

0' 20' 40' 60'

NO.	DATE	DESCRIPTION	APPR'D.
		REVISIONS	

DRAWN BY:G.R.S.
CHECKED BY:N.E.B.

SCALE: 1"=20'

HIRANI ENGINEERING & LAND SURVEYING, P.C.
47 MINEOLA BLVD., 2ND FLOOR
MINEOLA, N.Y. 11501
T (516) 248-1010 F (516) 248-9016
HIRANI

OWNER: U.S DEPT. OF NAVY
CONTRACTOR: TETRA TECH NUS

SUBJECT:
MONITORING WELL LOCATIONS OF WELLS BP-OW 1-1 (D),BP-OW 1-2 (D) & BP-OW 1-3(D).

DATE DRAWN: 01/12/04
DATE SURVEYED: 01/02/04
CONTRACT# S02-2117
SHEET NO: 1 OF 1

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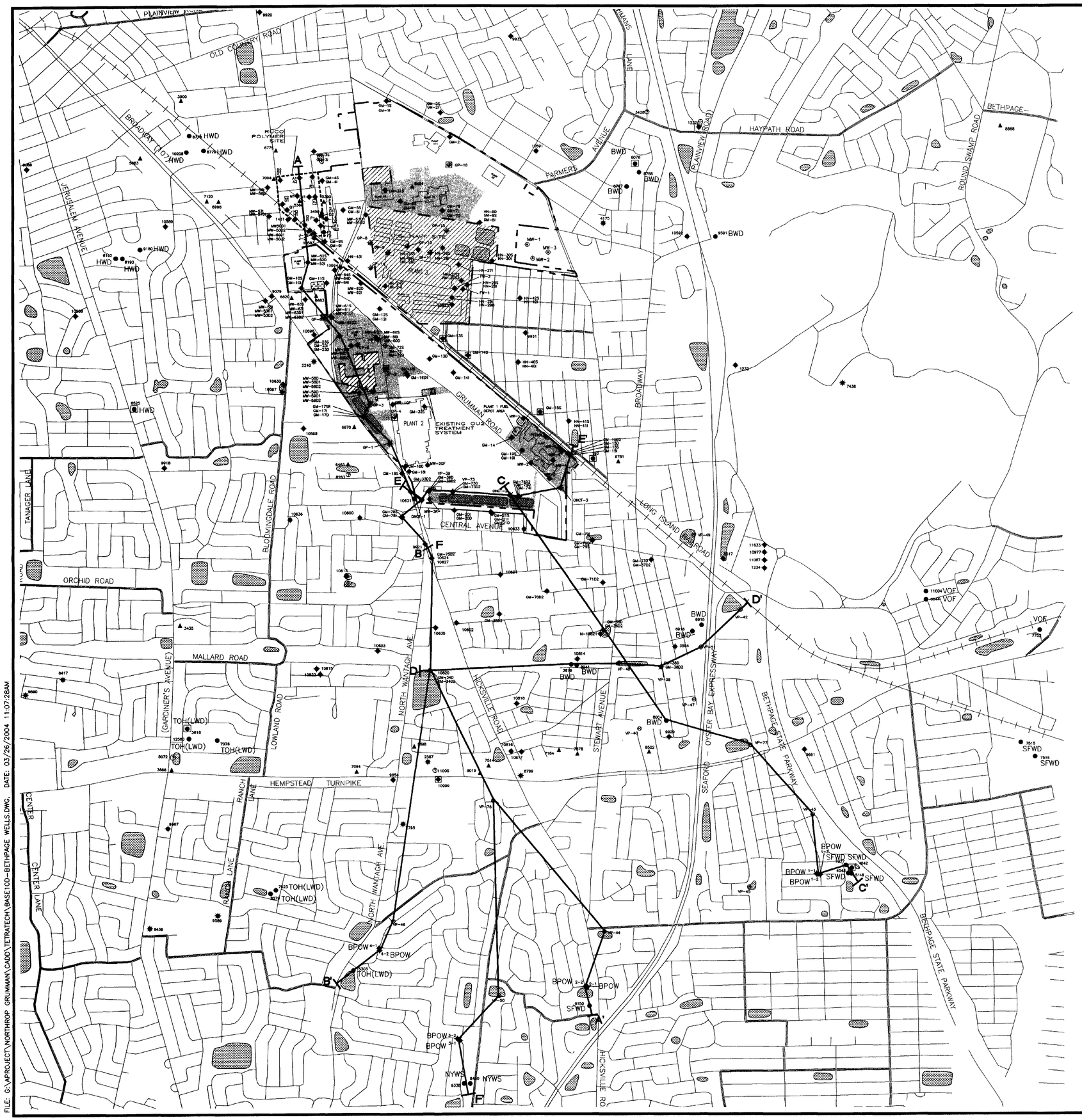

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EXPLANATION

- PROPERTY BOUNDARY OF THE RUCO POLYMER SITE
- PROPERTY BOUNDARY OF THE FORMER GRUMMAN AEROSPACE SITE
- PROPERTY BOUNDARY OF U.S. NAVY SITE
- DENOTES NORTHROP GRUMMAN OWNED PROPERTY
- DENOTES U.S. NAVY OWNED PROPERTY
- BASINS
- 6781 ▲ INDUSTRIAL WELL
- 747 ● PUBLIC SUPPLY WELL
- 9918 ◆ OBSERVATION, MONITORING WELL
- 8799 ✱ IRRIGATION WELL
- 6635 ⍰ UNKNOWN USE OF WELL
- GP-4 ✱ NORTHROP GRUMMAN OR NAVY PRODUCTION WELL OR OU2 REMEDIAL WELL
- VP-51 ⊗ EXISTING VERTICAL PROFILE BORING
- ✱ ABANDONED OR DESTROYED WELL
- MW-1 ⊙ BETHPAGE PARK MONITORING WELL (APPROXIMATE)
- BPOW OUTPOST WELL
- SFWD SOUTH FARMINGDALE WATER DISTRICT
- LWD LEVITTOWN WATER DISTRICT
- NYWS NEW YORK WATER SERVICE
- BWD BETHPAGE WATER DISTRICT
- TOH TOWN OF HEMPSTEAD WATER DISTRICT
- HWD HICKSVILLE WATER DISTRICT
- VOF VILLAGE OF FARMINGDALE WATER DISTRICT
- VP VERTICAL PROFILE BORING

NOTES:

1. THIS FIGURE DOES NOT INCLUDE ALL ACTIVE MONITORING AND OBSERVATION WELLS INSTALLED SINCE 1992.
2. THIS FIGURE INCLUDES ALL SHALLOW WELLS IDENTIFIED ON TABLE 1-1 OF THE OCTOBER 2000 FS REPORT PLUS SELECT ADDITIONAL MONITORING AND OBSERVATION WELLS.
3. THIS FIGURE INCLUDES LOCATIONS OF PUBLIC SUPPLY WELLS BASED ON INFORMATION REQUESTED BY ARCADIS IN SEPTEMBER 2001 LETTER.
4. THIS FIGURE INCLUDES LOCATIONS OF VERTICAL PROFILE BORINGS INSTALLED BY THE US NAVY.
5. BASIN LOCATIONS OBTAINED FROM USGS TOPOGRAPHIC MAPS (HICKSVILLE, AMITYVILLE, HUNTINGTON, AND FREEPORT QUADRANGLES), AND INFORMATION PROVIDED BY NORTHROP GRUMMAN.
6. NORTHROP GRUMMAN PROPERTY HOLDINGS BASED ON DATA PROVIDED IN SEPTEMBER 2000.
7. LOCATION OF MONITORING WELLS INSTALLED BY DVIRICA & BARTILUCCI AT PLANT 1 (i.e., MW-1 TO MW-6) ARE ESTIMATED FROM D&B SITE PLAN, PROVIDED ON DECEMBER 19, 2002.

0' 1000' 2000'
SCALE: 1" = 1000'

ALL COORDINATES REFERENCED TO NORTH AMERICAN DATUM 1929

NO.	DATE	REVISION DESCRIPTION	BY / CKD

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT

BETHPAGE, NEW YORK
CONTRACT NO. GCMP-02-011-0888

LOCATION OF LINES OF SECTION

ARCADIS

DRAFT

PROJECT MANAGER C. SANGIOVANNI	DEPARTMENT MANAGER
LEAD DESIGN PROF.	CHECKED D. STERN
DRAWN AG	DATE 3/18/04
PROJECT NUMBER NY001371.0001	DRAWING NUMBER 1

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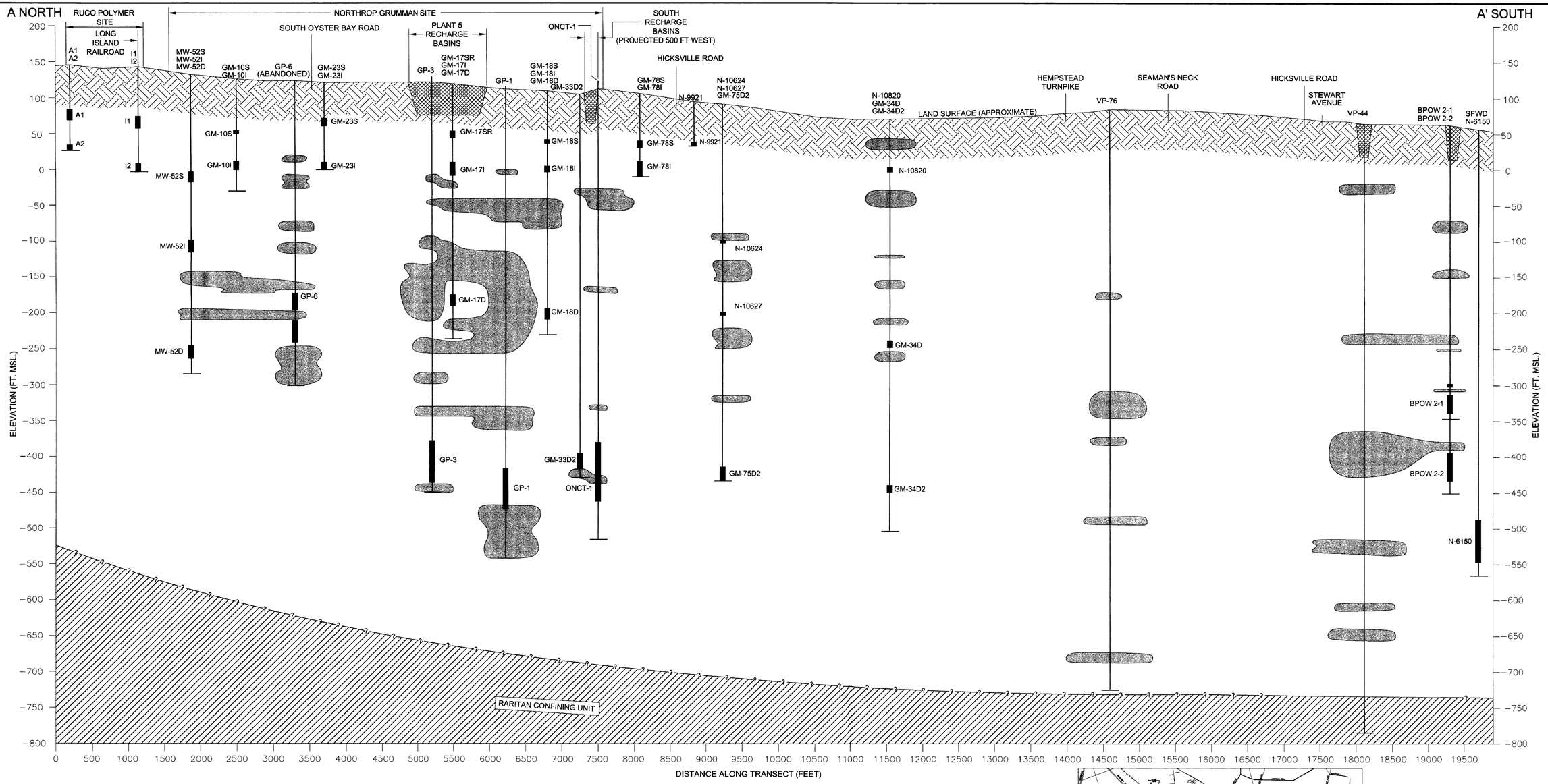

LOCATION OF LINE OF SECTION
SCALE: 1"=3000'

SOURCE RARITAN CONFINING UNIT ELEVATION: USGS (1990).

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EXPLANATION

UNSATURATED ZONE

CLAYEY SAND, SANDY CLAY, AND CLAY (CONFINING UNITS) AS INTERPRETED FROM LITHOLOGIC AND GEOPHYSICAL (NATURAL GAMMA) LOGS

UNSHADED AREAS REPRESENT SATURATED AQUIFER MATERIAL WHICH CONSIST OF SAND WITH VARYING AMOUNTS OF GRAVEL AND SILT.

RECHARGE BASIN (TYPICAL; NOT TO SCALE)

VP-44 — VERTICAL PROFILE BORING
END OF BORING

GM-33D2 — WELL ID
LAND SURFACE
WELL SCREENED INTERVAL
END OF BORING

VP VERTICAL PROFILE BORING
BPOW OUTPOST WELL
SFWD SOUTH FARMINGDALE WATER DISTRICT
FT MSL FEET RELATIVE TO MEAN SEA LEVEL

HORIZONTAL SCALE: 1"=500'
VERTICAL SCALE: 1"=50'
VERTICAL EXAGERATION = 10X

NOTE:
LITHOLOGY NOT AVAILABLE FOR WELL SFWD 6150.

REV.	ISSUED DATE	DESCRIPTION

KEYPLAN

SEE LOCATION OF LINE OF SECTION BELOW

PROJECT TITLE

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK
CONTRACT NO. GCMP-02-011-0888

SHEET TITLE

GEOLOGIC CROSS SECTION A-A'

ARCADIS
88 Duryea Road
Melville, NY 11747
Tel: 631-249-7600 Fax: 631-249-7610
www.arcadis-us.com

SEAL

SEAL

DRAFT

PROJECT MANAGER	DEPARTMENT MANAGER
C. SAN GIOVANNI	M. WOLFERT
LEAD DESIGN PROF.	CHECKED BY D. STERN
TASK/PHASE NUMBER	DRAWN BY A. G.
PROJECT NUMBER NY001371.0001	DRAWING NUMBER 2

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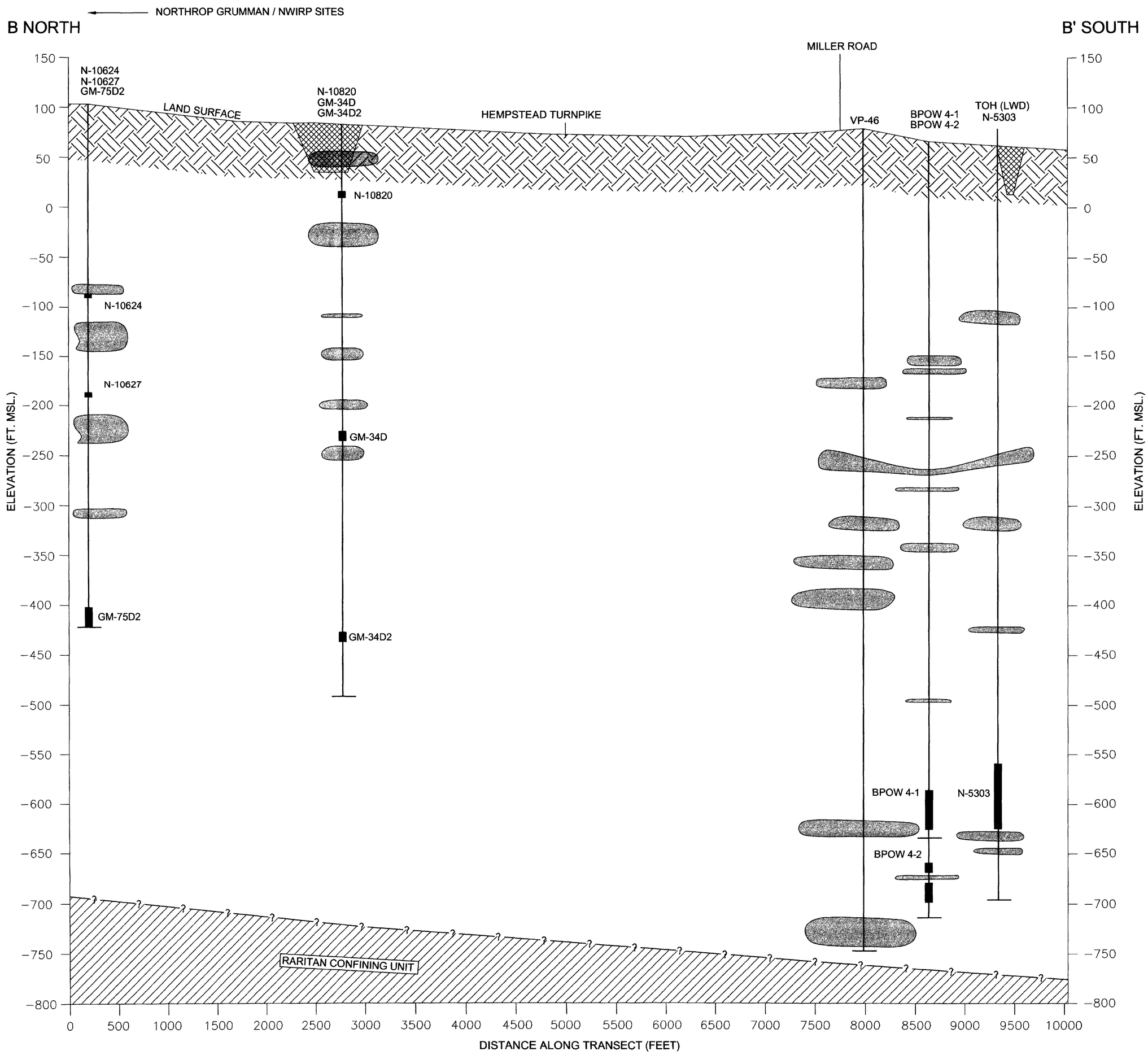

LOCATION OF LINE OF SECTION
SCALE: 1"=3000'

EXPLANATION

UNSATURATED ZONE

CLAYEY SAND, SANDY CLAY, AND CLAY (CONFINING UNITS) AS INTERPRETED FROM LITHOLOGIC AND GEOPHYSICAL (NATURAL GAMMA) LOGS

UNSHADED AREAS REPRESENT SATURATED AQUIFER MATERIAL WHICH CONSIST OF SAND WITH VARYING AMOUNTS OF GRAVEL AND SILT.

RECHARGE BASIN (TYPICAL; NOT TO SCALE)

VP-46 – VERTICAL PROFILE BORING
END OF BORING

GM-34D2 – WELL ID
LAND SURFACE
WELL SCREENED INTERVAL
END OF BORING

VP	VERTICAL PROFILE BORING
BPOW	OUTPOST WELL
TOH(LWD)	TOWN OF HEMPSTEAD (LEVITTOWN WATER DISTRICT)
FT MSL	FEET RELATIVE TO MEAN SEA LEVEL
NWIRP	NAVAL WEAPONS INDUSTRIAL RESERVE PLANT

HORIZONTAL SCALE: 1"=500'
VERTICAL SCALE: 1"=50'
VERTICAL EXAGERATION = 10X

SOURCE RARITAN CONFINING UNIT ELEVATION: USGS (1990).

REV.	ISSUED DATE	DESCRIPTION

KEYPLAN

SEE LOCATION OF LINE OF SECTION BELOW

PROJECT TITLE

NAVAL WEAPONS
INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK
CONTRACT NO. GCMP-02-011-0888

SHEET TITLE

GEOLOGIC
CROSS-SECTION B-B'

ARCADIS

88 Duryea Road
Melville, NY 11747
Tel: 631-249-7600 Fax: 631-249-7610
www.arcadis-us.com

SEAL

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DRAFT

PROJECT MANAGER	DEPARTMENT MANAGER
C. SAN GIOVANNI	M. WOLFERT
LEAD DESIGN PROF.	CHECKED BY
	D. STERN
TASK/PHASE NUMBER	DRAWN BY
	A. G.
PROJECT NUMBER	DRAWING NUMBER
NY001371.0001	3

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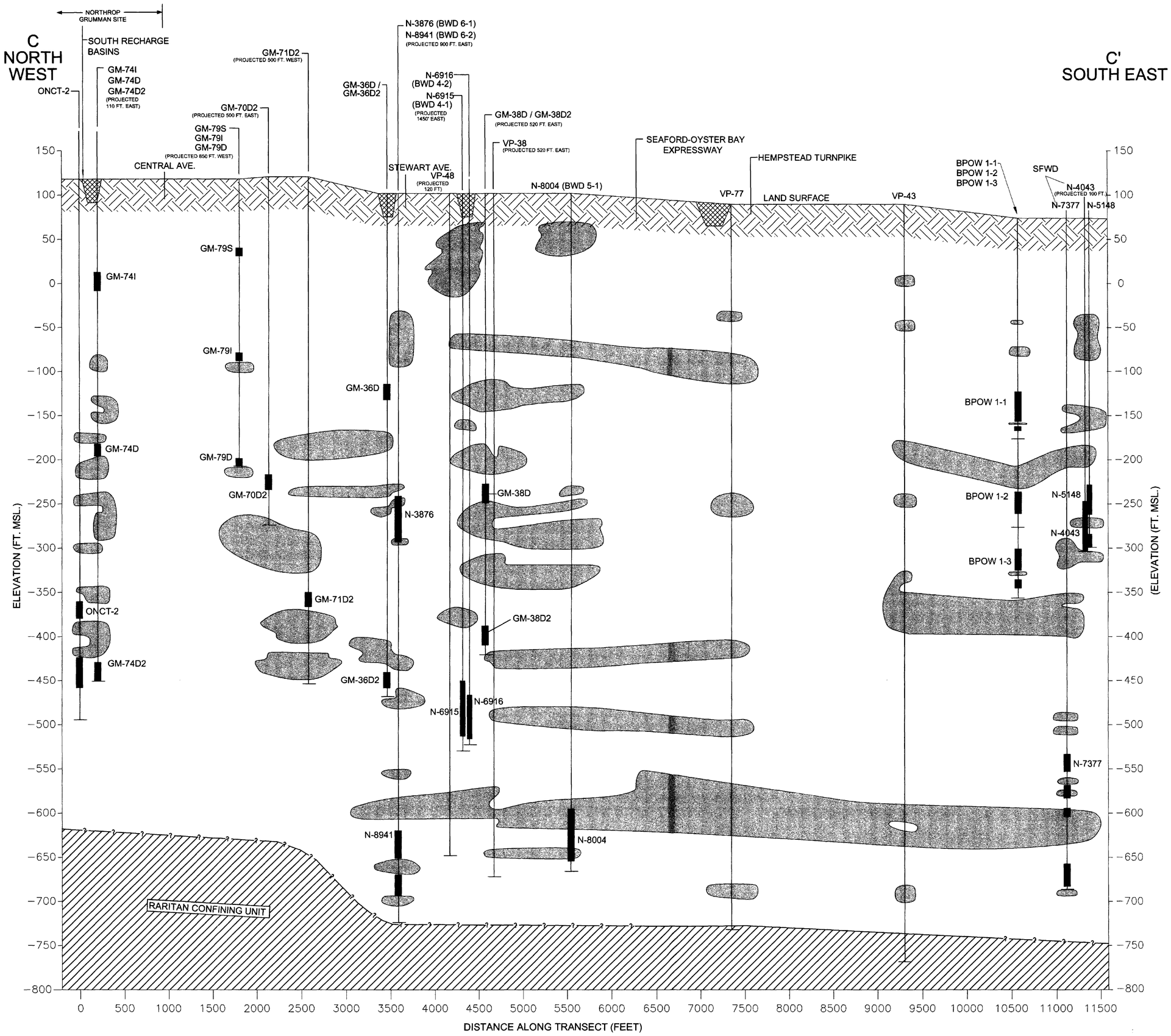

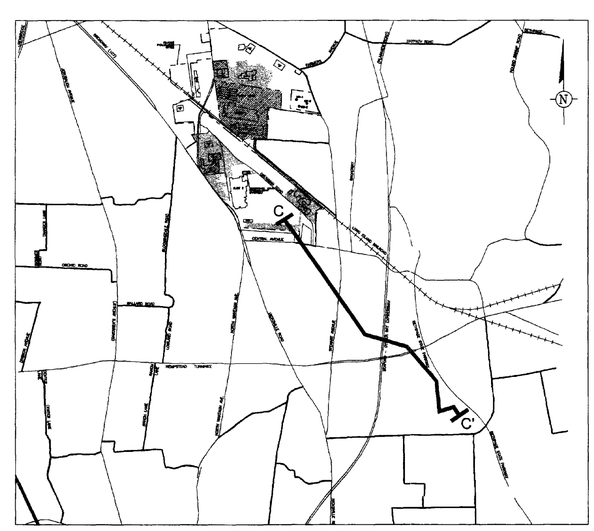

LOCATION OF LINE OF SECTION
SCALE: 1"=3000'

SOURCE RARITAN CONFINING UNIT ELEVATION: USGS (1990).

EXPLANATION

UNSATURATED ZONE

CLAYEY SAND, SANDY CLAY, AND CLAY (CONFINING UNITS) AS INTERPRETED FROM LITHOLOGIC AND GEOPHYSICAL (NATURAL GAMMA) LOGS

UNSHADED AREAS REPRESENT SATURATED AQUIFER MATERIAL WHICH CONSIST OF SAND WITH VARYING AMOUNTS OF GRAVEL AND SILT.

RECHARGE BASIN (TYPICAL; NOT TO SCALE)

VP-43 — VERTICAL PROFILE BORING — END OF BORING

GM-38D2 – WELL ID — LAND SURFACE — WELL SCREENED INTERVAL — END OF BORING

VP	VERTICAL PROFILE BORING
BWD	BETHPAGE WATER DISTRICT
SFWD	SOUTH FARMINGDALE WATER DISTRICT
FT MSL	FEET RELATIVE TO MEAN SEA LEVEL

HORIZONTAL SCALE: 1"=500'
VERTICAL SCALE: 1"=50'
VERTICAL EXAGERATION = 10X

REV.	ISSUED DATE	DESCRIPTION

KEYPLAN

SEE LOCATION OF LINE OF SECTION BELOW

PROJECT TITLE

NAVAL WEAPONS
INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK
CONTRACT NO. GCMP-02-011-0888

SHEET TITLE

GEOLOGIC
CROSS-SECTION C-C'

ARCADIS
88 Duryea Road
Melville, NY 11747
Tel: 631-249-7600 Fax: 631-249-7610
www.arcadis-us.com

SEAL

SEAL

DRAFT

PROJECT MANAGER C. SAN GIOVANNI	DEPARTMENT MANAGER M. WOLFERT
LEAD DESIGN PROF.	CHECKED BY D. STERN
TASK/PHASE NUMBER	DRAWN BY A. G.
PROJECT NUMBER NY001371.0001	DRAWING NUMBER 4

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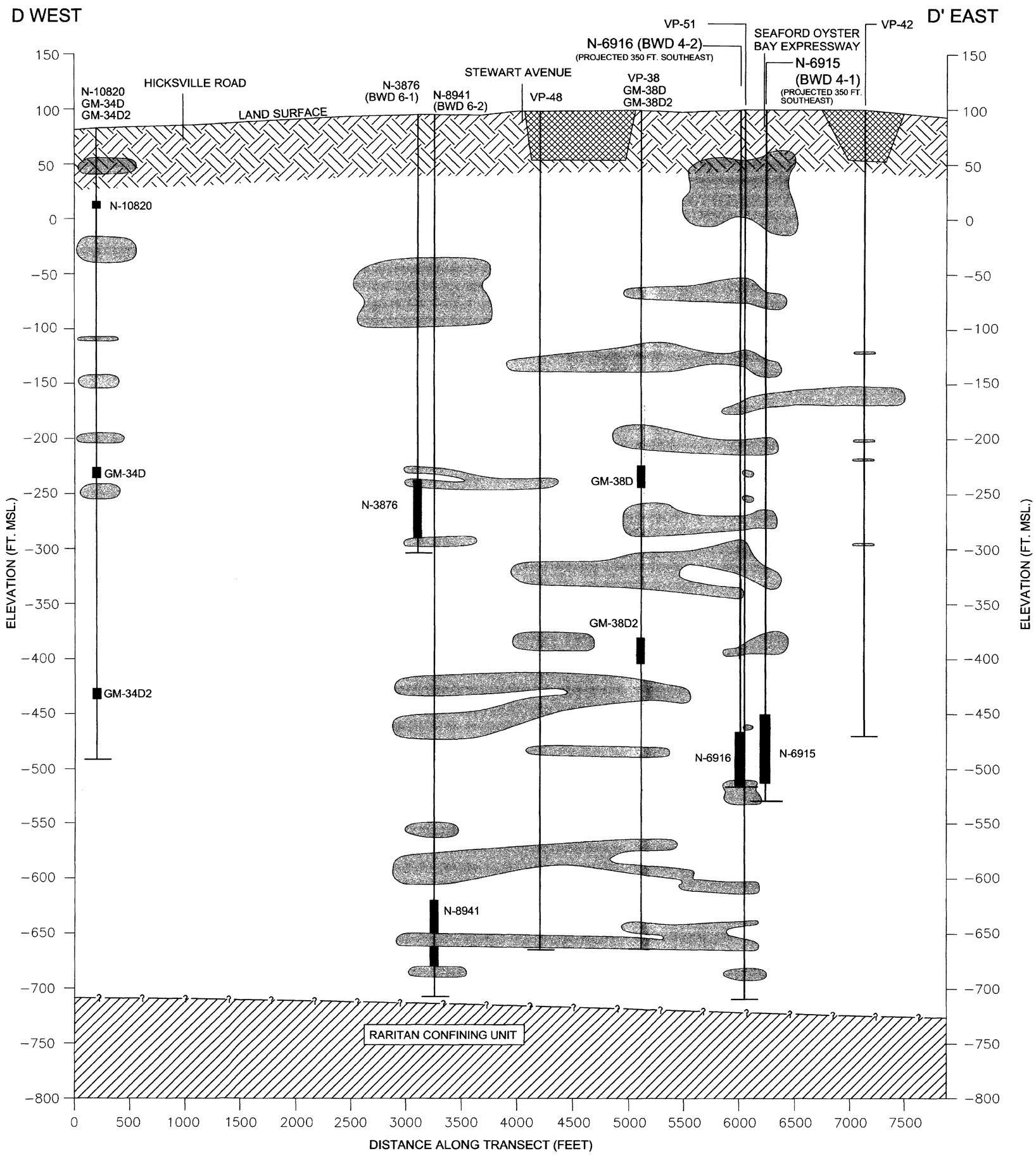

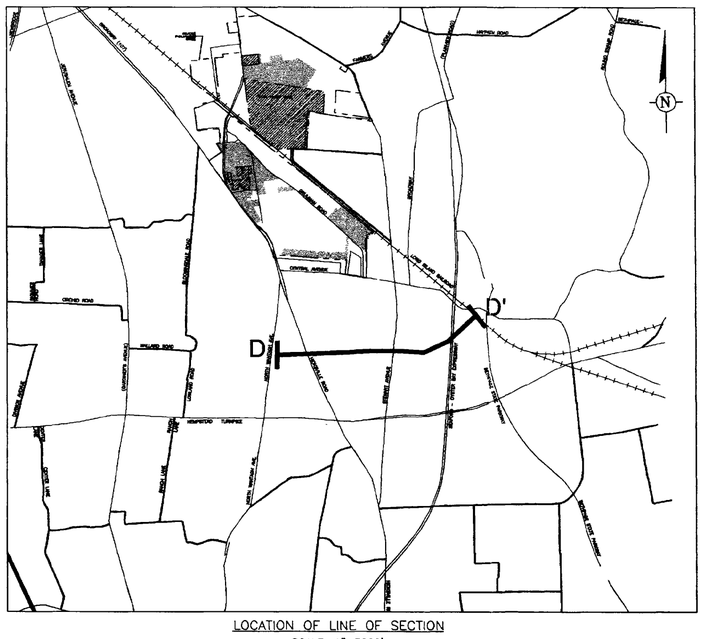

LOCATION OF LINE OF SECTION
SCALE: 1"=3000'

SOURCE RARITAN CONFINING UNIT ELEVATION: USGS (1990).

EXPLANATION

UNSATURATED ZONE

CLAYEY SAND, SANDY CLAY, AND CLAY (CONFINING UNITS) AS INTERPRETED FROM LITHOLOGIC AND GEOPHYSICAL (NATURAL GAMMA) LOGS

UNSHADED AREAS REPRESENT SATURATED AQUIFER MATERIAL WHICH CONSIST OF SAND WITH VARYING AMOUNTS OF GRAVEL AND SILT.

RECHARGE BASIN (TYPICAL; NOT TO SCALE)

VP-51 – VERTICAL PROFILE BORING
END OF BORING

GM-34D2 – WELL ID
LAND SURFACE
WELL SCREENED INTERVAL
END OF BORING

VP VERTICAL PROFILE BORING
BWD BETHPAGE WATER DISTRICT
FT MSL FEET RELATIVE TO MEAN SEA LEVEL

50
0
0 500

HORIZONTAL SCALE: 1"=500'
VERTICAL SCALE: 1"=50'
VERTICAL EXAGERATION = 10X

REV.	ISSUED DATE	DESCRIPTION

KEYPLAN

SEE LOCATION OF LINE OF SECTION BELOW

PROJECT TITLE

NAVAL WEAPONS
INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK
CONTRACT NO. GCMP-02-011-0888

SHEET TITLE

GEOLOGIC
CROSS-SECTION D-D'

ARCADIS

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Melville, NY 11747
Tel: 631-249-7600 Fax: 631-249-7610
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PROJECT MANAGER	DEPARTMENT MANAGER
C. SAN GIOVANNI	M. WOLFERT
LEAD DESIGN PROF.	CHECKED BY
	D. STERN
TASK/PHASE NUMBER	DRAWN BY
	A. G.
PROJECT NUMBER	DRAWING NUMBER
NY001371.0001	5

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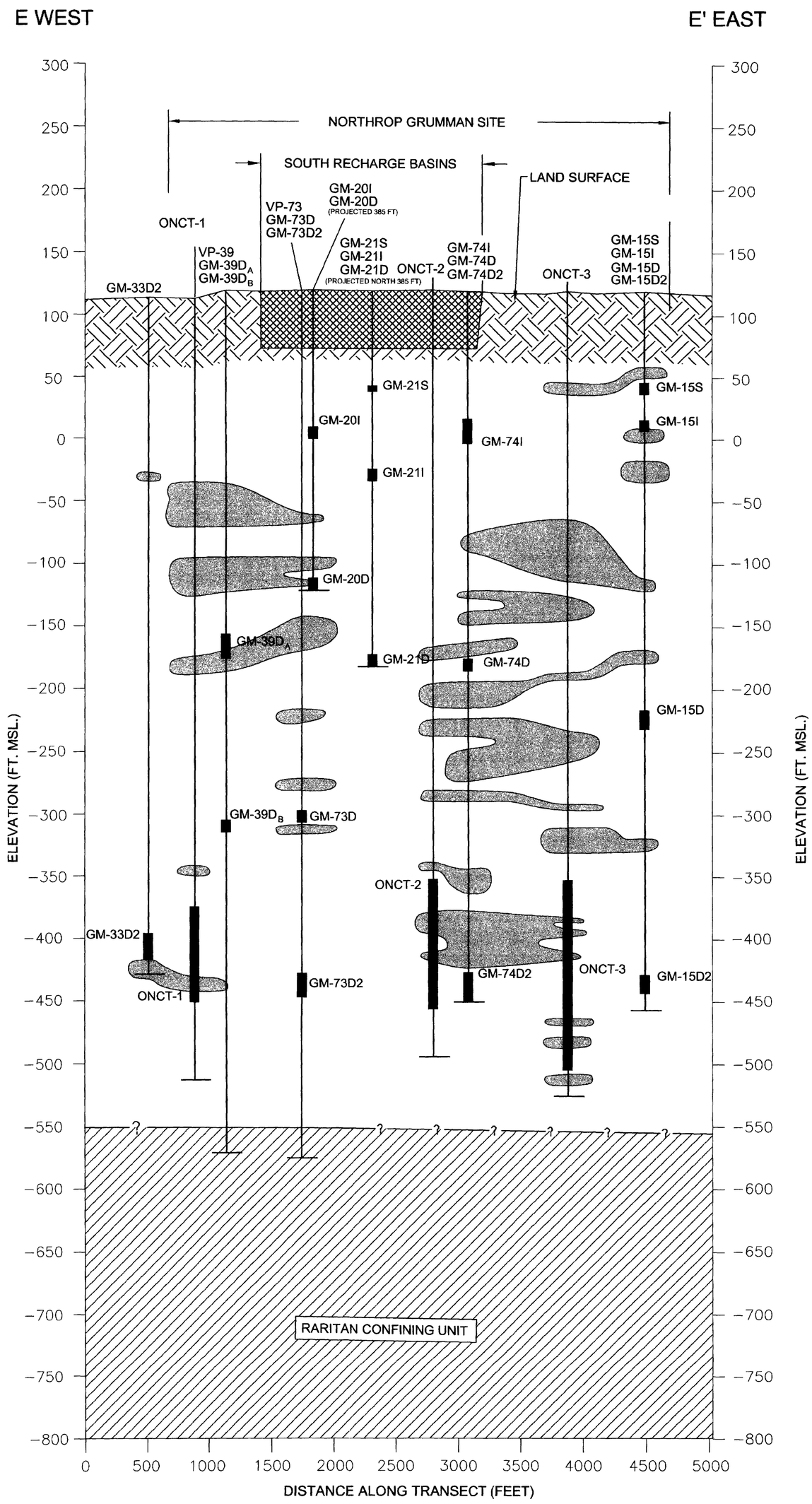

LOCATION OF LINE OF SECTION
SCALE: 1"=3000'

SOURCE RARITAN CONFINING UNIT ELEVATION: USGS (1990).

EXPLANATION

UNSATURATED ZONE

CLAYEY SAND, SANDY CLAY, AND CLAY (CONFINING UNITS) AS INTERPRETED FROM LITHOLOGIC AND GEOPHYSICAL (NATURAL GAMMA) LOGS

UNSHADED AREAS REPRESENT SATURATED AQUIFER MATERIAL WHICH CONSIST OF SAND WITH VARYING AMOUNTS OF GRAVEL AND SILT.

RECHARGE BASIN (TYPICAL; NOT TO SCALE)

VP-73 — VERTICAL PROFILE BORING; END OF BORING

GM-33D2 – WELL ID; LAND SURFACE; WELL SCREENED INTERVAL; END OF BORING

VP VERTICAL PROFILE BORING

FT MSL FEET RELATIVE TO MEAN SEA LEVEL

HORIZONTAL SCALE: 1"=500'
VERTICAL SCALE: 1"=50'
VERTICAL EXAGERATION = 10X

REV.	ISSUED DATE	DESCRIPTION

KEYPLAN

SEE LOCATION OF LINE OF SECTION BELOW

PROJECT TITLE

NAVAL WEAPONS
INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK
CONTRACT NO. GCMP-02-011-0888

SHEET TITLE

GEOLOGIC
CROSS-SECTION E-E'

ARCADIS

88 Duryea Road
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SEAL	SEAL
	DRAFT
PROJECT MANAGER C. SAN GIOVANNI	DEPARTMENT MANAGER M. WOLFERT
LEAD DESIGN PROF.	CHECKED BY D. STERN
TASK/PHASE NUMBER	DRAWN BY A. G.
PROJECT NUMBER NY001371.0001	DRAWING NUMBER 6

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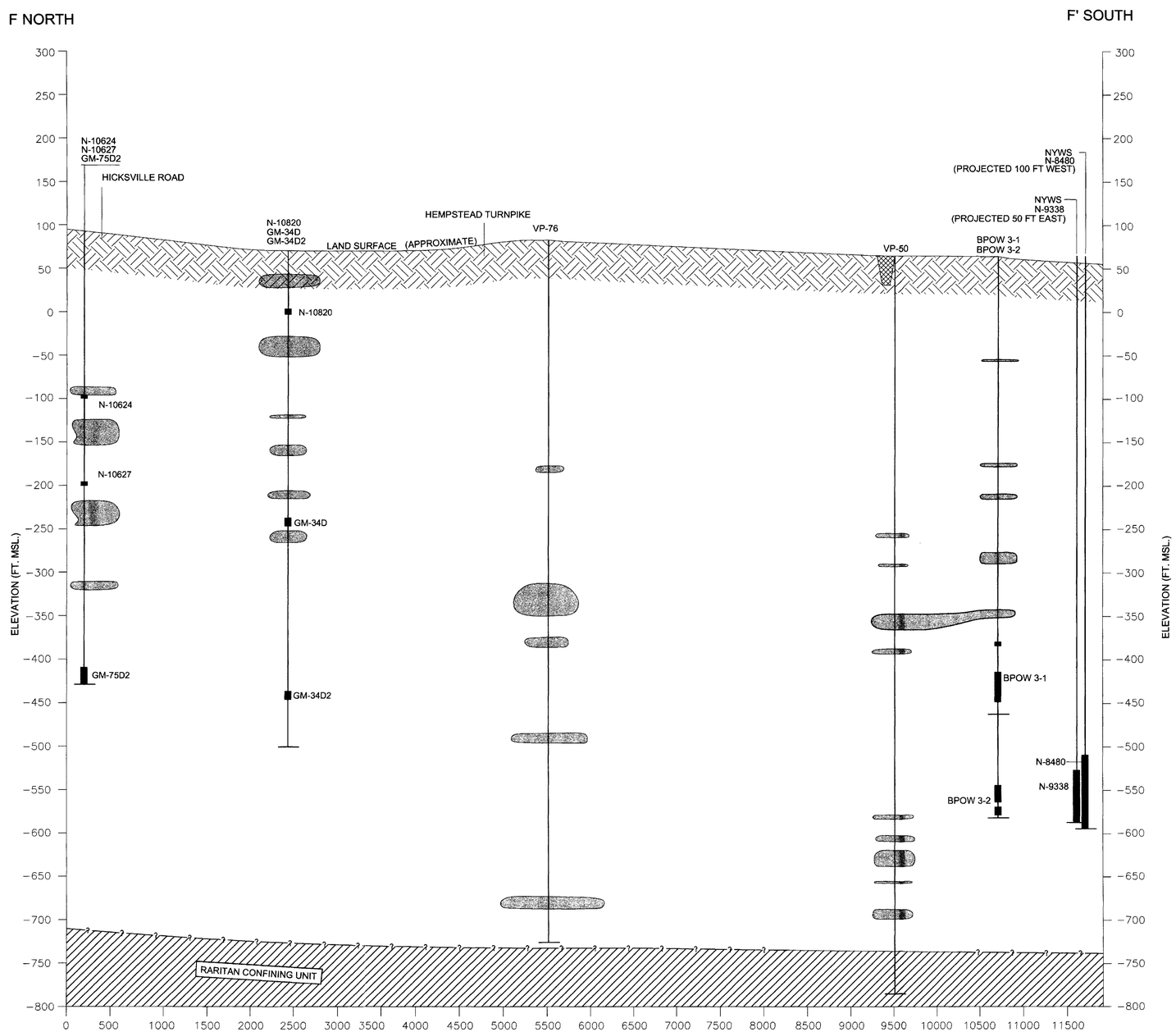

LOCATION OF LINE OF SECTION
SCALE: 1"=3000'

SOURCE RARITAN CONFINING UNIT ELEVATION: USGS (1990).

EXPLANATION

UNSATURATED ZONE

CLAYEY SAND, SANDY CLAY, AND CLAY (CONFINING UNITS) AS INTERPRETED FROM LITHOLOGIC AND GEOPHYSICAL (NATURAL GAMMA) LOGS

UNSHADED AREAS REPRESENT SATURATED AQUIFER MATERIAL WHICH CONSIST OF SAND WITH VARYING AMOUNTS OF GRAVEL AND SILT.

RECHARGE BASIN (TYPICAL; NOT TO SCALE)

VP-50 – VERTICAL PROFILE BORING
END OF BORING

GM-75D2 – WELL ID
LAND SURFACE
WELL SCREENED INTERVAL
END OF BORING

VP VERTICAL PROFILE BORING
NYWS NEW YORK WATER SERVICE
FT MSL FEET RELATIVE TO MEAN SEA LEVEL

50
0
0 500

HORIZONTAL SCALE: 1"=500'
VERTICAL SCALE: 1"=50'
VERTICAL EXAGERATION = 10X

NOTE:
LITHOLOGY NOT AVAILABLE FOR NYWS WELLS N-8480 AND N-9338.

REV.	ISSUED DATE	DESCRIPTION

KEYPLAN

SEE LOCATION OF LINE OF SECTION BELOW

PROJECT TITLE

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK
CONTRACT NO. GCMP-02-011-0888

SHEET TITLE

GEOLOGIC CROSS SECTION F-F'

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www.arcadis-us.com

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SEAL

DRAFT

PROJECT MANAGER	DEPARTMENT MANAGER
C. SAN GIOVANNI	M. WOLFERT
LEAD DESIGN PROF.	CHECKED BY
	D. STERN
TASK/PHASE NUMBER	DRAWN BY
	A. G.
PROJECT NUMBER	DRAWING NUMBER
NY001371.0001	7

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