101.05.02.0004

Off-Site 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

April 2002

TETRA TECH NUS, INC.

030210/P

OFF-SITE MONITORING WELL INSTALLATION SUMMARY REPORT

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

COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

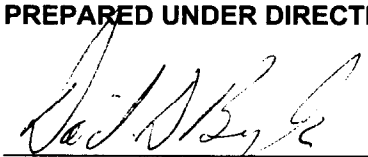
Submitted to:
Engineering Field Activity Northeast
Environmental Branch Code EV2
Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop #82
Lester, Pennsylvania 19113-2090

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

APRIL 2002

PREPARED UNDER DIRECTION OF:



DAVE BRAYACK
PROJECT MANAGER
PITTSBURGH, PENNSYLVANIA

APPROVED BY:

JOHN J. TREPANOWSKI
PROGRAM MANAGER
KING OF PRUSSIA, PENNSYLVANIA

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NUMBER

FIGURE

NUMBER

1.0 INTRODUCTION

This report summarizes the installation of seven new monitoring wells (hereinafter referred to as "off-site wells") located near the former Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage, in Bethpage, New York. The wells were installed to complete a monitoring network to satisfy requirements set forth in the Operable Unit No. 2 groundwater record of decision (ROD) for the U.S. Navy-owned NWIRP Bethpage and Northrop Grumman Corporation sites. Tetra Tech NUS, Inc., (TtNUS) performed the work (CTO 0812) under U.S. Navy Southern Division (SOUTHDIV) of Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract Number N62467-94-D-0888.

1.1 SCOPE OF WORK

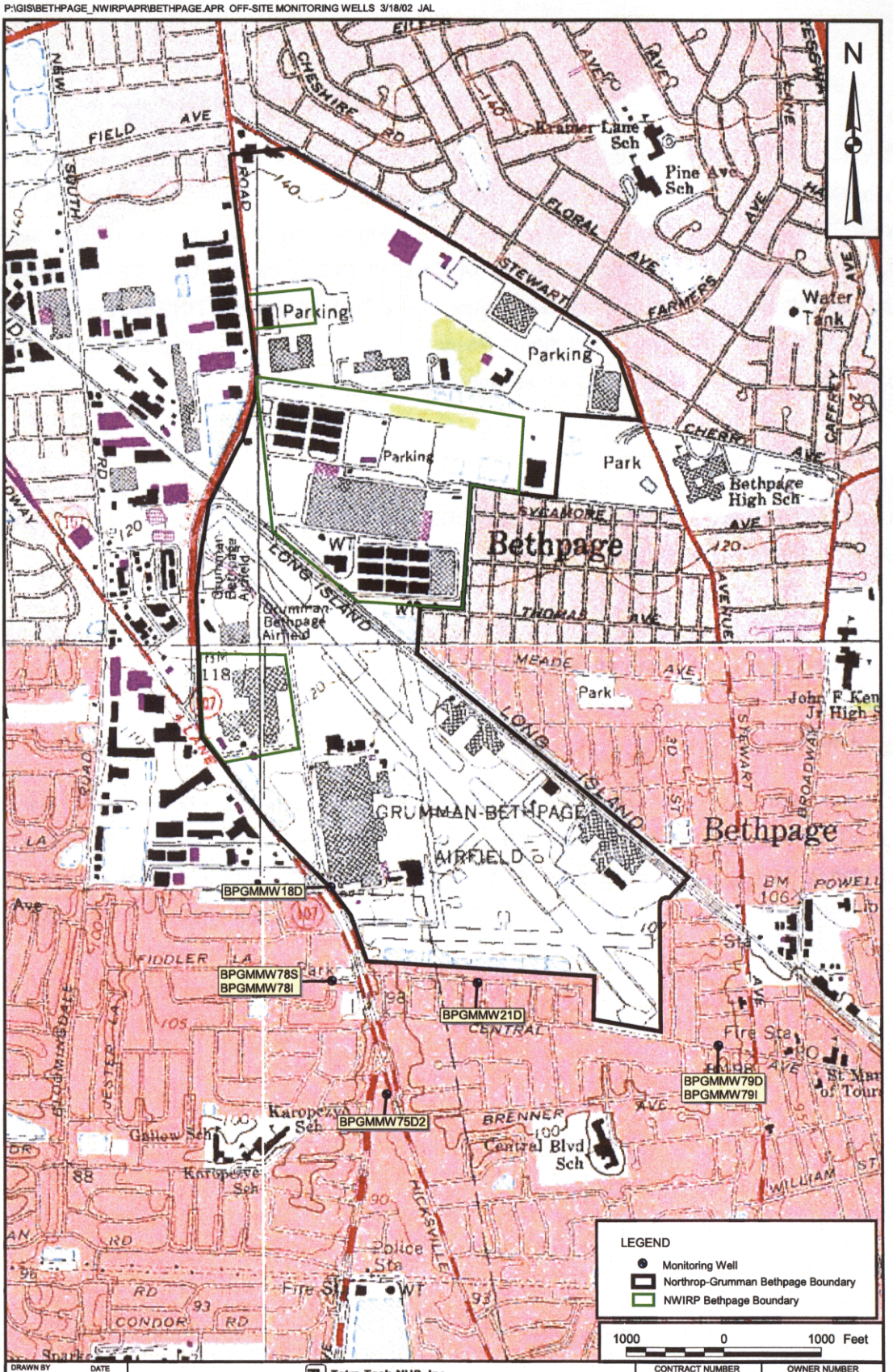
Seven monitoring wells (GM-18D, GM-21D, GM-75D2, GM-78S, GM-78I, GM-79I, GM-79D) were drilled and installed. Figure 1 illustrates the approximate locations of these wells.

Surveying of the wells was completed at the end of this project. Well coordinates and elevations for all on-site and off-site wells are provided in Appendix A.

1.2 REPORT FORMAT

This report presents the methodology and field logs for the installation of the off-site 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. Section 3 presents a summary table of monitoring well construction details. Monitoring well construction diagrams, boring logs, borehole geophysical logs, and well development sheets for each well are provided in Appendix B.

P:\GIS\BETHPAGE_NWIRP\APR\BETHPAGE.APR OFF-SITE MONITORING WELLS 3/18/02 JAL



DRAWN BY J. LAMEY	DATE 3/18/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER N4037 / OWNER NUMBER —
CHECKED BY —	DATE —	LOCATION OF OFF-SITE MONITORING WELLS NAVAL WEAPONS INDUSTRIAL RESERVE PLANT BETHPAGE, NEW YORK	APPROVED BY — / DATE —
COST/SCHEDULE-AREA —			APPROVED BY — / DATE —
SCALE AS NOTED			DRAWING NO. FIGURE 1 / REV 0

2.0 WELL DRILLING AND INSTALLATION

This section describes the field methodologies for installation and rehabilitation of the off-site monitoring wells. The work was performed in accordance with the Work Plan for Monitoring Well Installation, Naval Weapons Industrial Reserve Plant, Bethpage, New York (TtNUS, May 2000). All work was performed from November 2000 through October 2001. 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

The boreholes for the off-site wells were advanced using either hollow stem augering or mud rotary drilling techniques.

2.1.1 Hollow Stem Augering

Due to the sandy nature of the upper aquifer and the potential for heaving sands, well boreholes less than 150 feet deep were advanced using hollow stem augering techniques. Two wells (GM-78S, and GM-78I) were advanced using hollow stem augering techniques. The hollow stem augers had an inside diameter (ID) of 6 ¼ inches and outside diameter (OD) of 9 inches. The dimensions of the augers allowed for split-spoon sampling during borehole advancement and installation of 4-inch diameter well material through the augers.

2.1.2 Mud Rotary

Well boreholes greater than 150 feet deep were advanced using mud rotary techniques. Wells GM-18D, GM-21D, GM-75D2, GM-79I, and GM-79D were advanced using mud rotary drilling techniques. Well boreholes were 8 inches in diameter. Boreholes for wells GM-18D, GM-21D, GM-75D2, GM-79I and GM-79D were reamed to 11 inches in diameter to approximately 60 to 70 feet to allow for installation of temporary, polyvinyl chloride (PVC) surface casing, due to 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 only. The depths and frequencies of sampling varied from borehole to borehole but in general samples were collected at five to ten foot

centers. Often the upper portion of the boreholes where previous drilling had characterized the geology, no additional sampling was performed. A summary of the sampling is provided in Table 1.

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 by the augers or entrained in the drilling mud. The frequency of description of the drilling cuttings was at the discretion of the field geologist.

2.3 BOREHOLE GEOPHYSICAL LOGGING

Borehole geophysical logs were recorded in the deepest wells (GM-18D, GM-21D, GM-75D2, and GM-79D) 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. All wells were logged for natural gamma. For well GM-21D single point resistivity, and standard potential logs were also acquired.

Geophysical borehole log printouts are provided for the logged wells in Section 3.0.

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 1. In borings advanced with hollow stem augers, well screens and riser pipe were lowered through the augers to the appropriate depths. Backfill material was filled in around the well screen and riser as the augers were slowly withdrawn from the borehole. In borings advanced using mud rotary techniques, 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.

Wells shallower than 150 feet were constructed of 4-inch diameter, Schedule 40, National Sanitation Foundation-approved polyvinyl chloride (PVC) well screen and riser pipe. Wells deeper than 150 feet 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. In wells deeper than 200 feet, well centralizers were installed at an interval approximately 40 to 50 feet.

Primary filter packs were installed in the annuli around the well screens to the depths indicated in Table 1. The filter packs consisted of Filter Pro #1 quartz sand installed using a tremie pipe. Filter packs were installed to depths as follows:

- Shallow wells: minimum of 5 feet above the top of the screen
- Intermediate wells: minimum of 5 feet above the top of the screen
- Deep wells: minimum of 10 feet above the top of the screen
- D2 wells: minimum of 20 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 1. The secondary filter packs were installed to depths as follows:

- Shallow wells: minimum of 1 foot above the top of the primary filter pack
- Intermediate wells: minimum of 1 foot above the top of the primary filter pack
- Deep wells: minimum of 10 feet above the top of the primary filter pack
- D2 wells: minimum of 15 feet above the top of the primary filter pack.

Wells GM-21D and GM-75D2 did not have a graded filterpack.

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.

All wells were completed at the surface with a 9-inch diameter steel curb box, set in a 2-foot by 2-foot by 0.5-foot thick concrete pad. 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

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 deep wells, and pumping and mechanical surging with a submersible pump for shallow and intermediate depth wells.

Monitoring wells screened in deep zones (i.e., D, D2, and D3 suffixed 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 dual surge block assembly (i.e., two rubber swabs set approximately

3 feet apart along a length of perforated steel pipe) 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 2- to 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 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.

Monitoring wells screened in the shallow and intermediate zones were developed by pumping and mechanical surging with a submersible pump. The pump was initially placed approximately five feet from the bottom of the well in order to remove any sediment that potentially had settled on the bottom. Once the sediment was removed from the bottom of the well, the pump was lowered to the bottom of the screen. Pumping continued from the bottom and the pump was periodically raised and lowered manually along the entire length of the screen. When the screened interval was developed completely, the inside of the well casing was rinsed with water from the pump discharge. The pump was then raised slowly through the water column above the screen until it was at or near the static water level. Pumping continued at this interval to remove stagnant water from above the screen. Pumping ceased and development was complete when the water level stabilized, 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 were developed until turbidity was less than 50 nephelometric turbidity units (NTUs). All development fluids were containerized and stored at the decontamination area for proper disposal to the POTW.

TABLE 1
OFF-SITE MONITORING WELL CONSTRUCTION
NWIRP, BETHPAGE, NEW YORK

Well Designation	Date Installed	Drilling Method	Development Method	Screened Interval (ft bls)	Total Well Depth (ft bls)	Top of Gravel Pack (ft bls)	Top of Fine Sand (ft bls)	Nominal Borehole Diameter (inches)	Well Diameter (inches) and Casing Material	Gamma Logged	Remarks
OFF-SITE MONITORING WELLS											
GM-18D	11/08/00	MR	Air Lift & Submersible	290-300	325	275	280	8	4-inch Sch. 80 PVC	Y	SS @ 10-ft centers (110 to TD)
GM-21D	10/11/01	MR	Air Lift & Submersible	278-288	298	260	NA	8	4-inch Sch. 80 PVC	Y	SS @ 10-ft centers (140 to TD)
GM-75D2	04/12/01	MR	Air Lift & Submersible	505-525	550	475	NA	8	4-inch Sch. 80 PVC	Y	SS @ 10-ft centers (290 to 510) SS @ 5-ft centers (510 to 550)
GM-78S	04/27/01	HSA	Submersible	60-70	73.0	53	52	10	4-inch Sch. 40 PVC	N	SS @ 5-ft centers (55 to TD)
GM-78I	04/26/01	HSA	Submersible	89-109	112	83	82	10	4-inch Sch. 40 PVC	N	SS @ 10-ft centers (0 to 80) SS @ 5-ft centers (80 to TD)
GM-79I	11/01/00	MR	Air Lift & Submersible	170-180	185	165	164	8	4-inch Sch. 80 PVC	N	SS @ 5-ft centers (160 to TD)
GM-79D	10/27/00	MR	Air Lift & Submersible	280-290	330	270	265	8	4-inch Sch. 80 PVC	Y	SS @ 10-ft centers (70 to 290) SS @ 5-ft centers (290 to TD)

NOTE: All well screen slot sizes 0.010 inches.

HSA hollow-stem auger
MR mud rotary
ft bls feet below land surface
NA not applicable
SS Split Spoon

Well designation suffixes correspond to the following depth zones:
S Shallow (+50 - +40 feet mean sea (msl))
I Intermediate (+40 - -50 feet msl)
D Deep (-50 - -365 feet msl)
D2 Deep 2 (-365 - -530 feet msl)

3.0 WELL LOG SHEETS

This section is a compilation of the field forms associated with each well. Forms for each well include the following:

- Boring log
- Monitoring well construction diagram
- Well development sheet
- Borehole geophysical logs (wells GM-18D, GM-21D, GM-75D2, and GM-79D only).

A summary of well constructions, including date of installation, drilling and development method, screened intervals, total depths, filter pack depth, borehole diameter, well diameter and material, and geophysical logging, is provided in Table 1.

APPENDIX A

SUMMARY OF SURVEYING INFORMATION

AWT ON SITE WELLS.

LAND • HYDROGRAPHIC • ENVIRONMENTAL SURVEYS

ALBERT W. TAY • Professional Land Surveyor
P.O. Box 312 • Plainview, NY 11803-0312

Tel: (516) 433-3725
Fax: (516) 433-0409
E-mail:AWTay@MSN.com

April 15, 2001
Tetra Tech NUS, Inc
Foster Plaza 7
661 Anderson Dr.
Pittsburgh, PA 15220-2745

Attn: Dave Brayack, PE
RE: Bethpage, NY

MONITORING WELL DATA

MW Number	Northing	Easting	Elevation Casing
GM17S	211392.198	1122840.891	115.79
GM17I	211391.428	1122830.969	115.83
GM17D	211382.161	1122827.429	115.68
GM74D2	209747.443	1123004.766	107.36
GM74I	209744.899	1126035.203	107.42
GM74D	209746.160	1126020.470	107.43
GM15S	210594.128	1127057.049	109.35
GM15D	210625.108	112.7034.199	109.66
GM15D2	210611.890	1127076.900	109.59
73D2	209851.283	1124674.455	104.62

Northings and Eastings are in NYS Plane Coordinate system, Lambert projection, NAD 83 (feet) and elevations are NAVD 88(feet).

Submitted by,

Albert W. Tay, L.S.

Ref. No. N46-G-TETRA-18D

Title No.

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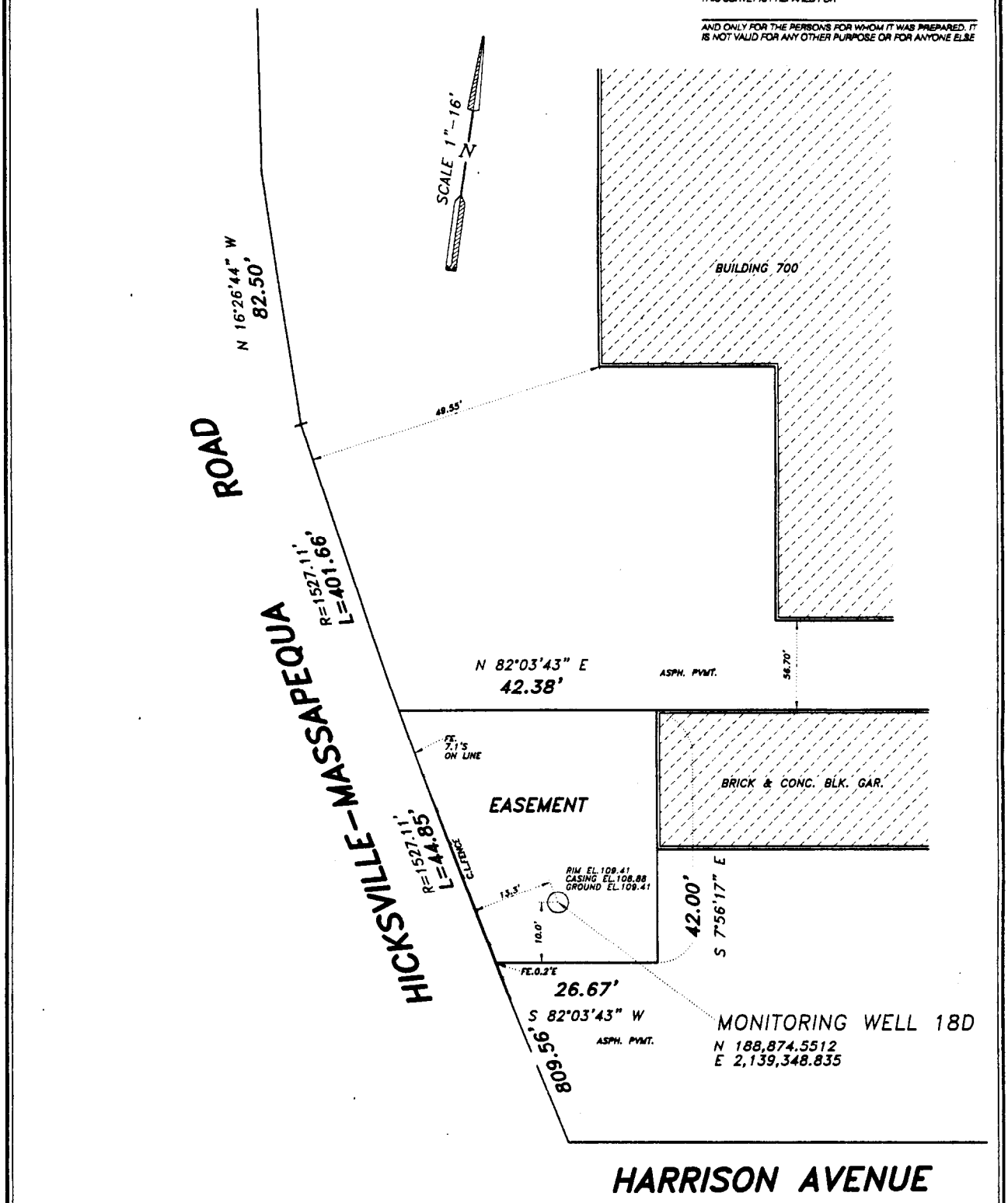

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Surveyed OCT.29, 2001
Surveyed
Surveyed
Surveyed
By

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Lots
Filed Map
Block Lots
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NASSAU Co.

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Professional Land Surveyor - City Surveyor
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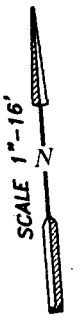

HARRISON AVENUE

EASEMENT

10.00'

R=10.00'
L=15.71'

CONC. MONUMENT

6.9'

N 4°11'39" E
15.00'

9.7'

15.00'
S 4°11'39" W

10.00'
N 85°48'21" W

NORTH BUTEHORN STREET

CURB

MONITORING WELL 21D

N 187,955.2973
E 2,141,089.3629

RIM EL.105.99
CASING EL.105.68
GROUND EL.105.99

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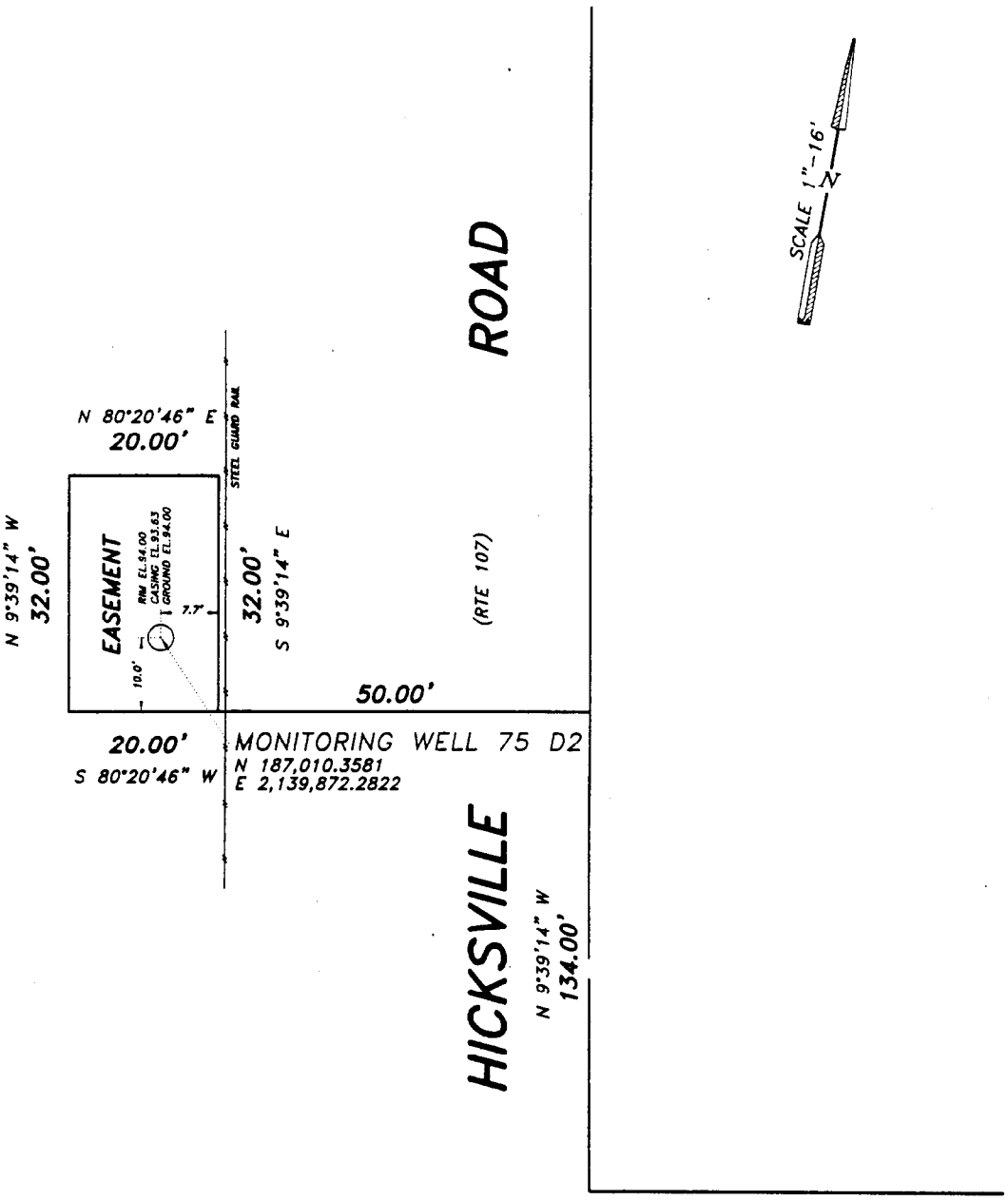

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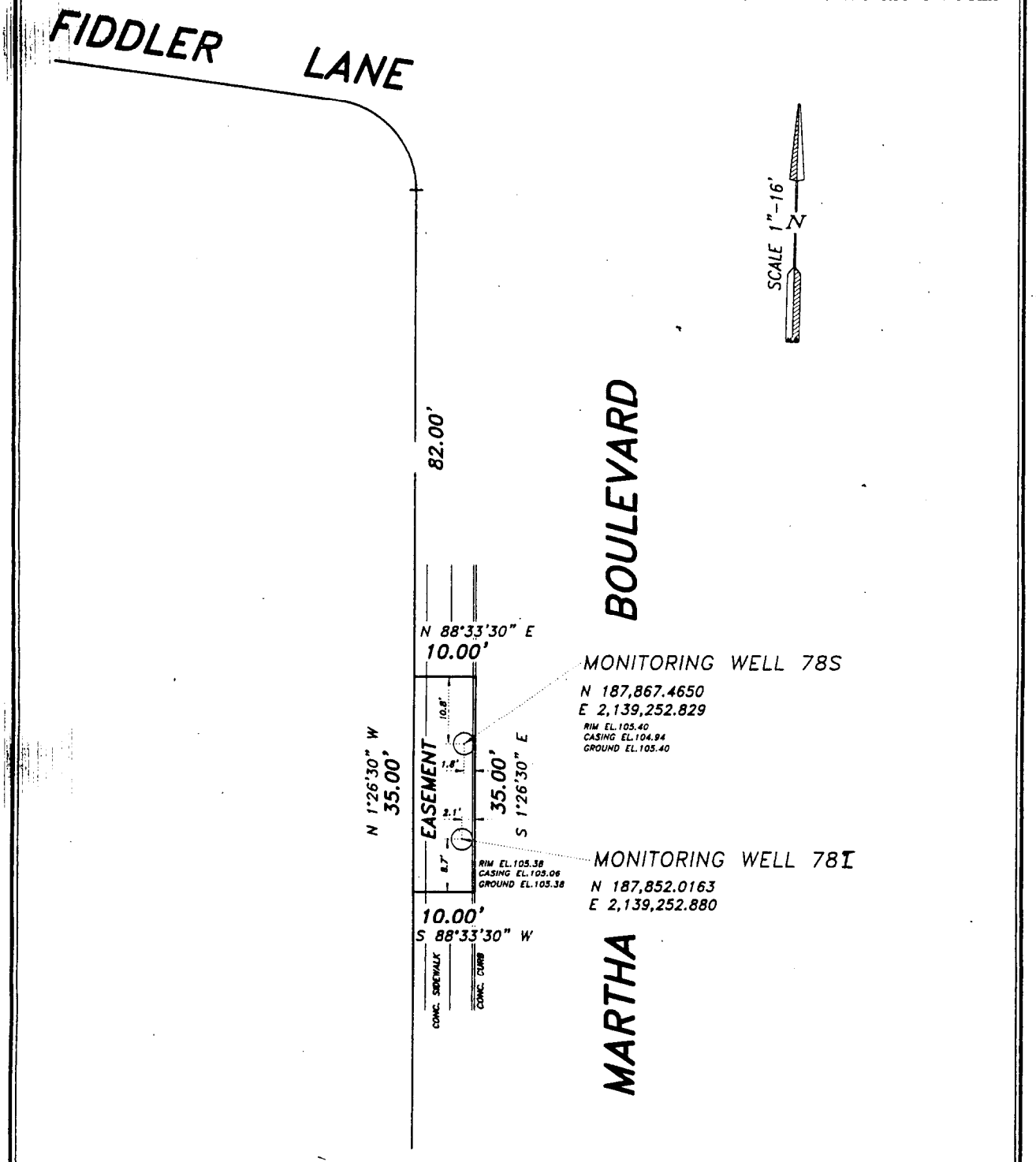

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LAND SURVEYOR ALBERT A. BIANCO

Ref. No. N46-G-TETRA-791-79D

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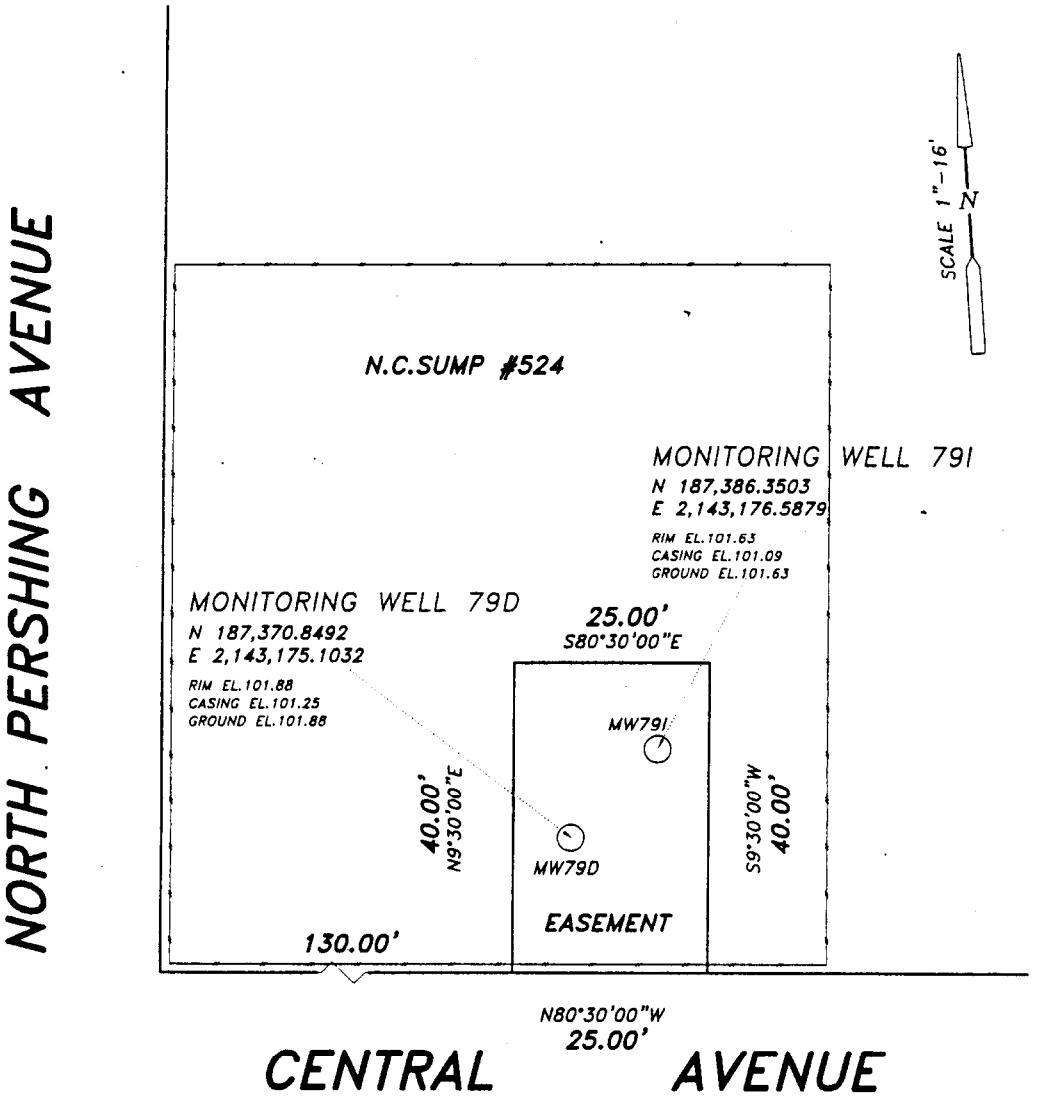

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718-327-6532 516-239-9253 FAX 516-239-8214

LAND SURVEYOR ALBERT A. BIANCO

APPENDIX B

MONITORING WELL DATA FORMS

GM18D

BORING NO.: GM-18D

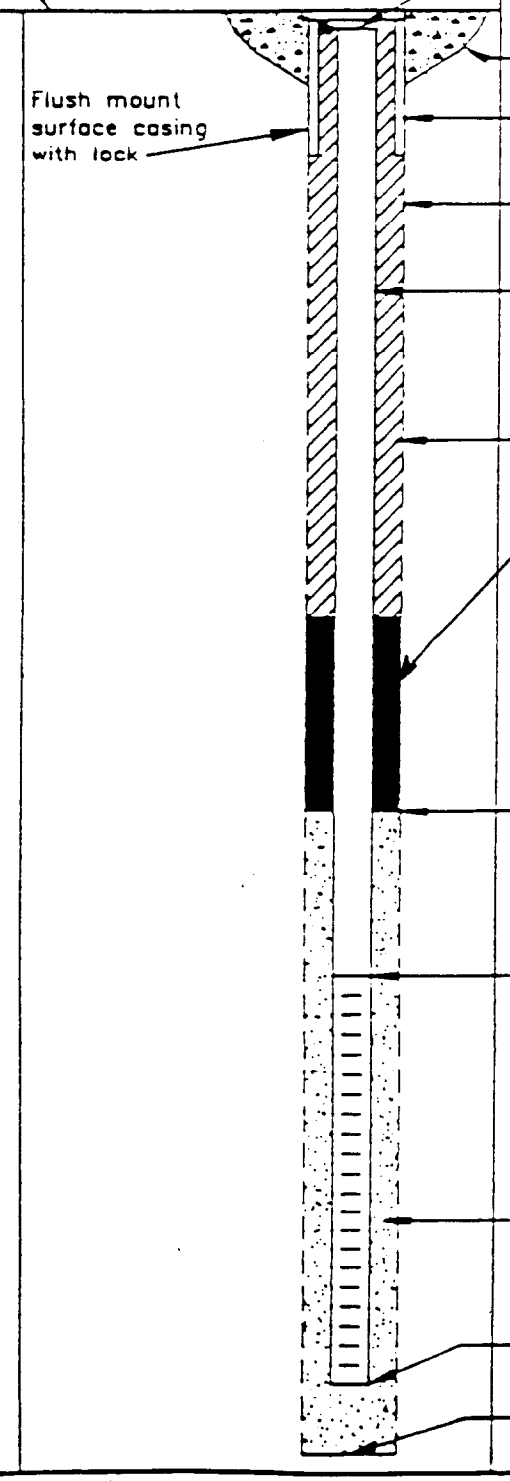
Tetra Tech NUS, Inc.

MONITORING WELL SHEET

PROJECT NWIRP BETHPAGE
PROJECT NO. 0565
ELEVATION
FIELD GEOLOGIST S. NOLL

LOCATION OFF-SITE
BORING GM-18D
DATE 11/8/00

DRILLER J. EVANS
DRILLING METHOD MUD ROTARY
DEVELOPMENT METHOD AIR LIFT



ELEVATION TOP OF RISER:

TYPE OF SURFACE SEAL: CONCRETE

TYPE OF PROTECTIVE CASING: FLUSH MOUNT CURB

I.D. OF PROTECTIVE CASING: 8"

DIAMETER OF HOLE: 8"

TYPE OF RISER PIPE: SCH 80 PVC (4" DIAMETER)

RISER PIPE I.D.: 3 7/8"

TYPE OF BACKFILL/SEAL: VOLCLAY BENTONITE GROUT / OTTO FARR COLD BENTONITE SLURRY (275'-270')

DEPTH/ELEVATION TOP OF SAND: 275' /

DEPTH/ELEVATION TOP OF SCREEN: 290' /

TYPE OF SCREEN: SCH 80 PVC (4" DIAMETER)

SLOT SIZE x LENGTH: 0.010" x 10'

TYPE OF SAND PACK: FILPRO #1 SAND TO 290' / FILPRO #0 SAND TO 275'

DIAMETER OF HOLE IN ~~BEDROCK~~ SAND: 8"

DEPTH/ELEVATION BOTTOM OF SCREEN: 300' /

DEPTH/ELEVATION BOTTOM OF SAND: 335' /

DEPTH/ELEVATION BOTTOM OF HOLE: 335' /

BACKFILL MATERIAL BELOW SAND: FILPRO #1 SAND

NOTE: L:\TT\GEOL\GBURD1.DWG

BORING LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NWIRP BETHPAGE
PROJECT NUMBER: N0565
DRILLING COMPANY: UNI-TECH
DRILLING RIG: FALCON 150

BORING NUMBER: GM-18D
DATE: 11/6-8/00
GEOLOGIST: S. NEIL
DRILLER: J. 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	Remarks	PID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	USCS *
							4" of asphalt and ≈4" of concrete						
	10					BRN	silty med-coarse sand, some pea-size gravel		0	0	0	0	SP
	20					BRN	large gravel; trace silty sand		0	0	0	0	GM
							continue drilling thru gravel						
	30					BRN	sandy gravel of varying sizes		0	0	0	0	GW GP
	40					BRN	sandy gravel, trace Fe nodules		0	0	0	0	GW GP
	50					BRN	sandy gravel		0	0	0	0	GW GP

* 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 0

Converted to Well: Yes X No Well I.D. #: GM-18D

BORING LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NWIRP BETHPAGE
PROJECT NUMBER: N0565
DRILLING COMPANY: UNI-TECH
DRILLING RIG: FALCON 150
BORING NUMBER: GM-18D
DATE: 11/6-8/00
GEOLOGIST: S. NOLL
DRILLER: J. 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	Remarks	PID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	USCS *
	60					BRN	gravelly med-coarse sand		0	0	0	0	SP
	70					BRN	same as above		0	0	0	0	SP
	80					BRN	med-coarse sand, trace		0	0	0	0	SP
							gravel						
	90					BRN	same as above		0	0	0	0	SP
	100					BRN	med-coarse sand, trace clay		0	0	0	0	SP

* 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): 0.0

Converted to Well: Yes X No Well I.D. #: GM-18D

BORING LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NWIRP BETHPAGE
PROJECT NUMBER: N0565
DRILLING COMPANY: UNI-TECH
DRILLING RIG: FALCON 1800
BORING NUMBER: GM - 18D
DATE: 11/6-8/00
GEOLOGIST: S. NIL
DRILLER: J. 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	Remarks	PID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	USCS*
S-1 C	110					BRN	med sand, trace gravel, trace		0	0	0	0	SW
1445	111	10 / TRIP	5"				clay						
	112	5	5										
S-2 C	120					BRN/GRY	fine grained sand, trace		0	0	0	0	SW
1509	121	20/20	17"				OR mottling						
11/6	122	15/15	24"										
11/7													
S-3 C	130					GRY/BRN	med sand		*	*	*	*	SW
0935	131	30/40	9"										
	132	55/50	24"										
S-4 C	140					GRY/BRN	med sand, some gravel at		*	*	*	*	SW
1006	141	20/20	22"				bottom 2 inches. Trace OR						
	142	20/20	24"				mottling						
	150												

* When rock coring, enter rock brokeness.

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

Remarks: * PID not functioning on 11/7/00, background ppm is from 11/6/00

Drilling Area Background (ppm): 0.

Converted to Well: Yes X No

Well I.D. #: GM - 18D

BORING LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NWIRP BETHPAGE
PROJECT NUMBER: N0565
DRILLING COMPANY: UNI-TECH
DRILLING RIG: FALCON 150
BORING NUMBER: GM-18D
DATE: 11/6-8/00
GEOLOGIST: S. NOLL
DRILLER: J. 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	Remarks	PID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	USCS*
S-5 @	151	24/60	9"			Gray Brn	Silty sand (med. grain)		*	*	*	*	SW
1045	152	41/50	24"										
S-6 @	160					Gray	V. dense clay; trace sandy		*	*	*	*	CL
1044	161	4/50	16"			Gray	V. dense clay.						
	162	35/40	24"										
S-7 @	170					Gry	Same as above w/o sandy clay		*	*	*	*	CL
1100	171	11/22	20"										
	172	40/53	24"										
S-8 @	180					Gray	Same as above.		*	*	*	*	CL
1117	181	46/50	18"										
	182	100/6	18"										
S-9 @	190					Gray	V. dense clay; bottom 3"		*	*	*	*	CL/
1144	191	18/55	18"				fine brown sand.						SW
	192	100/6	18"										
	200												

* When rock coring, enter rock brokeness.

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

Remarks: * PID not functioning properly.

Drilling Area Background (ppm): *

Converted to Well: Yes Y No _____ Well I.D. #: GM-18D

BORING LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NWIRP BETHPAGE
PROJECT NUMBER: NO565
DRILLING COMPANY: UNI-TECH
DRILLING RIG: FAILING 1500
BORING NUMBER: GM-18D
DATE: 11/6-8/00
GEOLOGIST: S. NYIL
DRILLER: J. 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	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	Remarks	PID Reading (ppm): Sample	PID Reading (ppm): Sampler BZ	PID Reading (ppm): Borehole**	PID Reading (ppm): Driller BZ**	USCS.
S-10 @	201	21/48	15"			brn gray	fine grained sand		*	*	*	*	SW
1203	202	28/36	24"										
		/											
		/											
S-11 @	210	/				gr	fine grained sand, trace		*	*	*	*	SW
1330	211	60/48					silt; clay in upper 3".						
	212	100/6	18"										
		/											
		/											
S-12 @	220	/				dk gray	upper 4" clay, bottom 3"		*	*	*	*	SW
1357	221	50/100	7"			gr	fine sand.						
	222	100/4	10"										
		/											
		/											
S-13 @	230	/				gry brn	med sand		*	*	*	*	SW
1412	231	57/100	7"										
	232	100/3	9"										
		/											
		/											
S-14 @	240	/				gry brn	same as above		*	*	*	*	SW
1433	241	56/100	5"										
	242	100/2	8"										
		/											
		/											
	250	/											

* When rock coring, enter rock brokeness.

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

Remarks: * PID not functioning properly

Drilling Area Background (ppm): *

Converted to Well: Yes x No

Well I.D. #: GM-18D

BORING LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NWIRP BETHPAGE
PROJECT NUMBER: N0565
DRILLING COMPANY: UNI-TECH
DRILLING RIG: FALCON 150

BORING NUMBER: GM-18D
DATE: 11/6-8/00
GEOLOGIST: S. NEIL
DRILLER: J. 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	Remarks	PID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	USCS*
S-15 @ 1450	251	100 / OVER	6"			GRY	fine sand		*	*	*	*	SW
	252	6	6"										
S-16 @ 1508	260					GRY	fine sand / little silt		*	*	*	*	SW
	261	100 / OVER	5"										
	262	5	5"										
S-17 @ 1540	270					BRN	same as above		*	*	*	*	SW
	271	100 / OVER	4"										
	272	5	5"										
S-18 @ 1600	280					BRN	fine sand		*	*	*	*	SW
	281	25 / 100	10"										
	282	OVER / 4	10"										
S-19 @ 1628	290					BRN	fine - med sand		*	*	*	*	SP
	291	60 / 100	7"										
	292	OVER / 6	12"										

* When rock coring, enter rock brokeness.

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

Remarks: * PID not functioning properly.

Drilling Area Background (ppm): *

Converted to Well: Yes X No

Well I.D. #: GM-18D

BORING LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NWIRP BETHPAGE
PROJECT NUMBER: N0565
DRILLING COMPANY: UNI-TECH
DRILLING RIG: FAILING 1500
BORING NUMBER: GM-18D
DATE: 11/6-8/00
GEOLOGIST: S. NEIL
DRILLER: J. 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	Remarks	PID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	USCS*
S-20 C	295					BRN	fine-med sand		*	*	*	*	SP
1710	296	100 / OVER	5"										
11/7	297	5	5"										
11R													
S-21 C	300					BRN	fine sand		*	*	*	*	SW
0935	301	100 / OVER	6"										
	302	6	6"										
S-22 C	305					BRN / GR	fine sand, some silt		*	*	*	*	SM
0950	306	35 / 35	19"										
	307	35 / 35	24"										
S-23 C	310					GRAY	fine sand, trace silt		*	*	*	*	SW
1008	311	40 / 100	6"										
	312	OVER / 5	11"										
S-24 C	315	15 / 19				BRN / GR	fine-med sand, trace silt		*	*	*	*	SP
1025	316	23 / 21	8"										
	317		24"										

* When rock coring, enter rock brokeness.

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

Remarks: *PID not functioning properly.

Drilling Area Background (ppm): *

Converted to Well: Yes X No ____ Well I.D. #: GM-18D

BORING LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NWIRP BETHPAGE
PROJECT NUMBER: N0565
DRILLING COMPANY: UNI-TECH
DRILLING RIG: FAILING 1500
BORING NUMBER: GM-18D
DATE: 11/6-8/00
GEOLOGIST: J. NEIL
DRILLER: J. 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	Remarks	PID Sample	PID Sampler BZ	PID Borehole**	PID Driller BZ**	USCS*
S-25 e	320					Gray	fine-med sand some silt		*	*	*	*	SP
1040	321	53/100	10"										
	322	[illegible]/5	11"										
	325						T.D. = 325'						

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

Remarks: * PID not functioning properly

Drilling Area Background (ppm): *

Converted to Well: Yes x No ___ Well I.D. #: GM-18D

GM-18D

10

MSI

COMPANY TETRA TECH NUS

WELL ID GM-18D

FIELD

COUNTRY STATE

CO
WELL
FLD
CTY
STE
FILING No

LOCATION

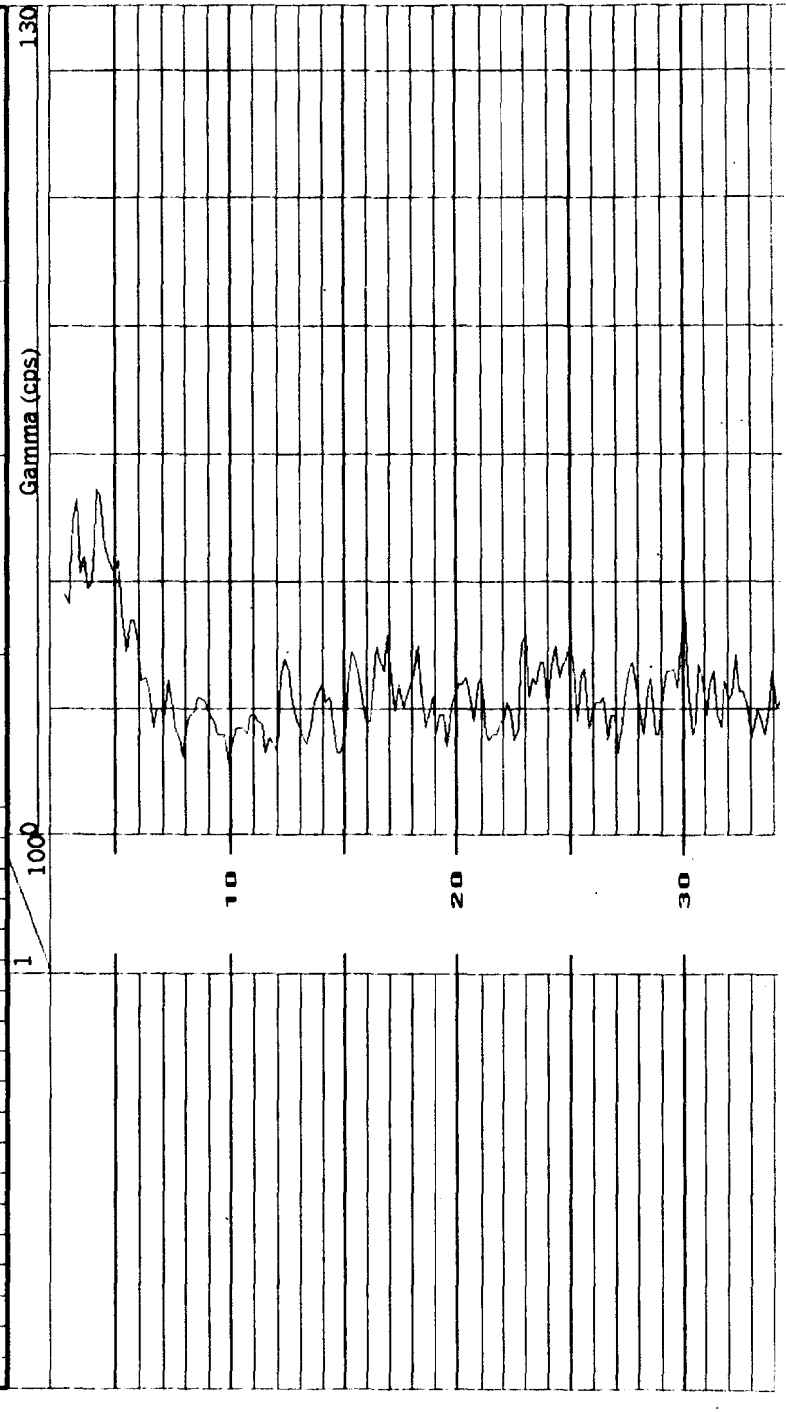
SEC TWP RGE

OTHER SERVICES

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

DATE		TYPE FLUID IN HOLE	
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			
WITNESSED BY			

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO



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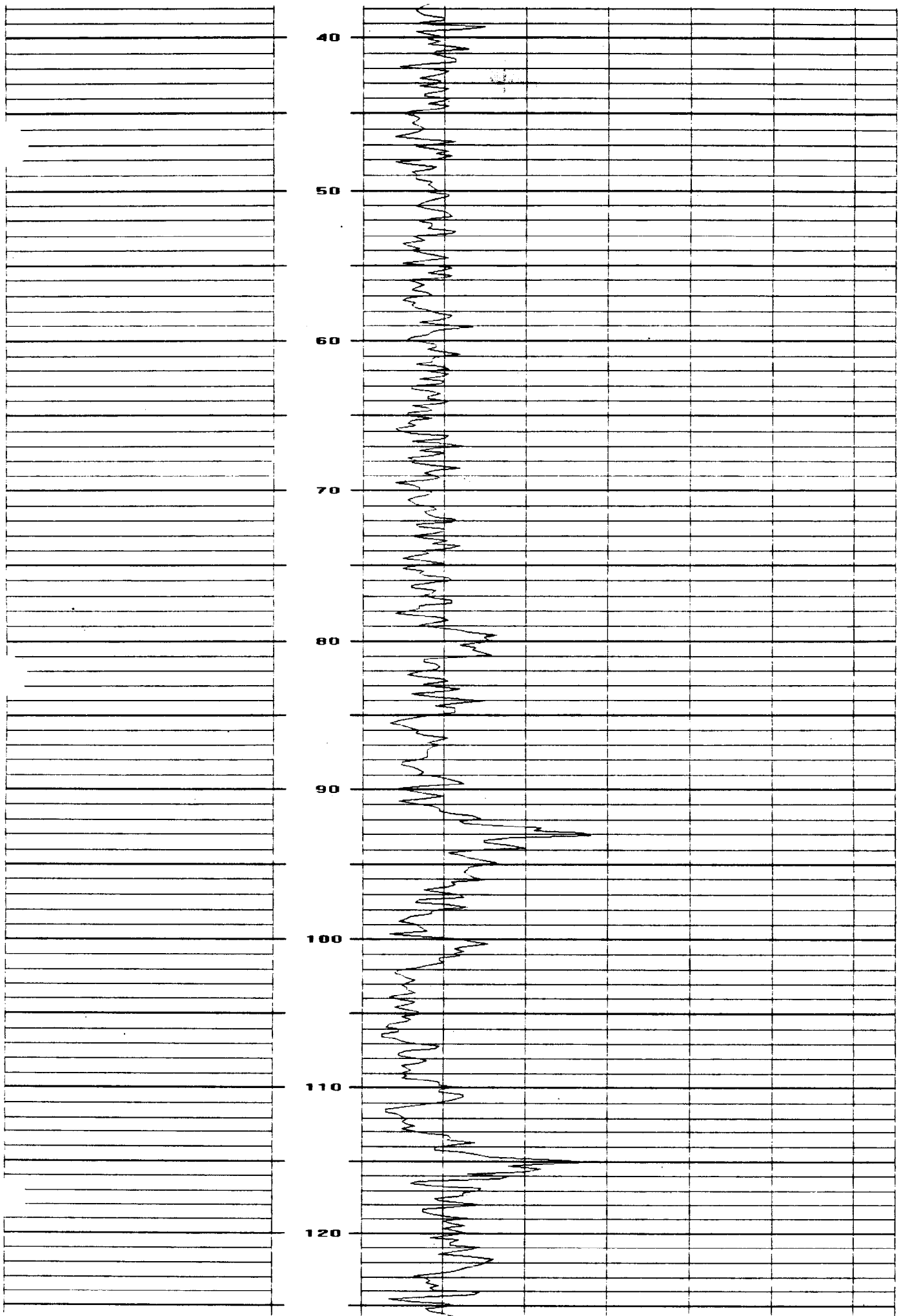
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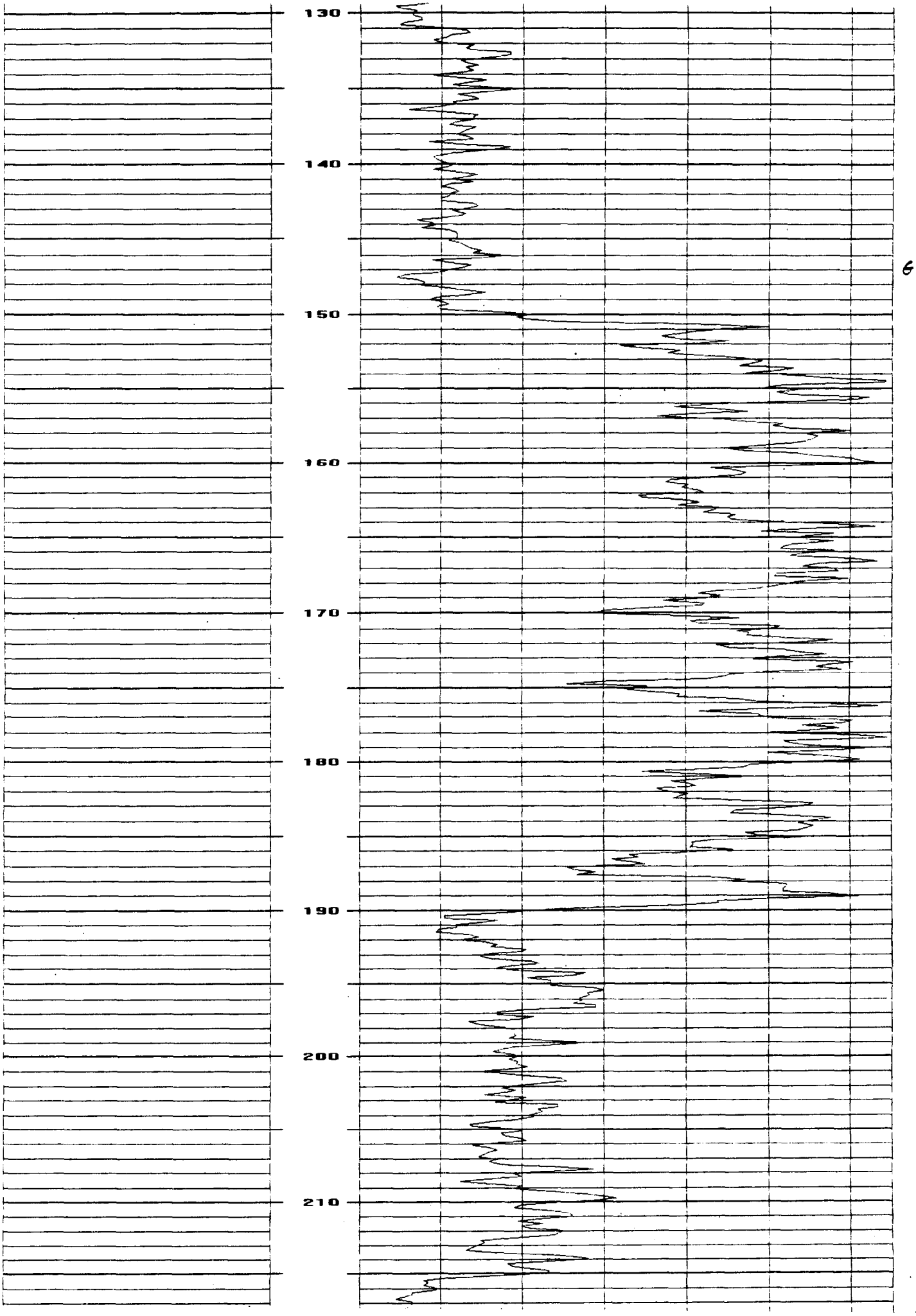
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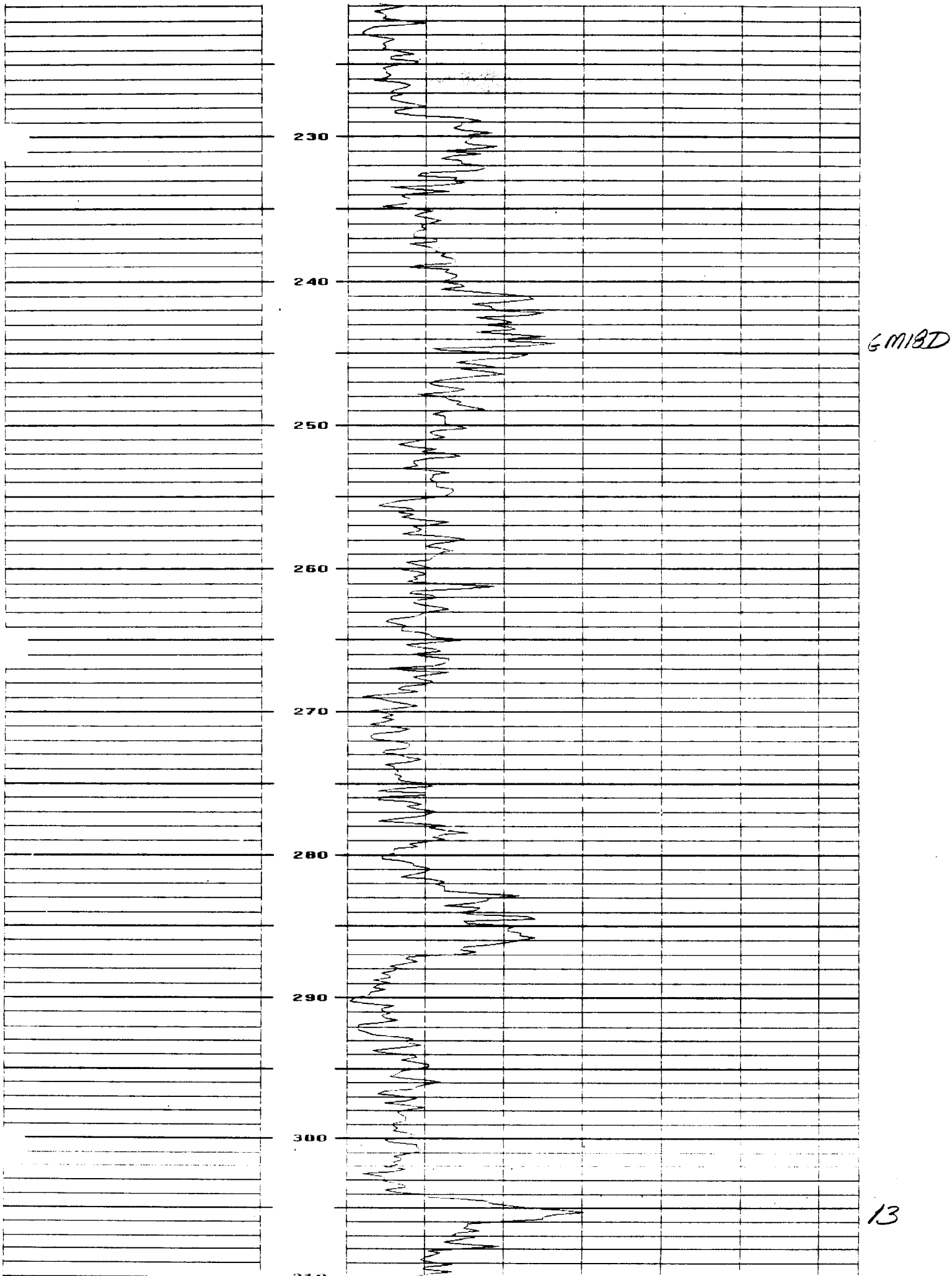
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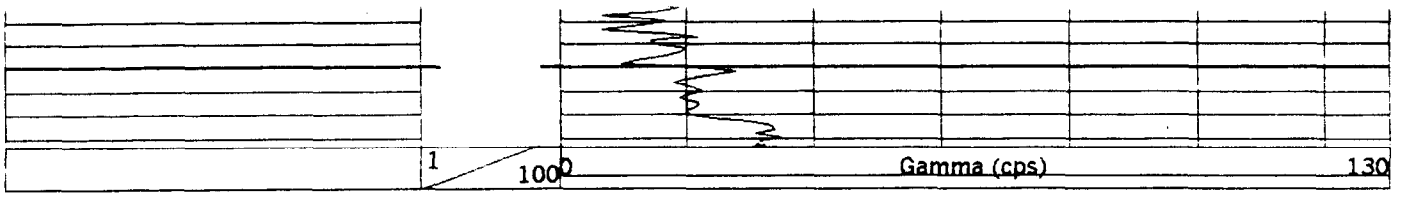
GM18D
13



Date: Wednesday, November 08, 2000 Time: 11:58 File: C:\My Documents\bethpgrumman18d gamma.rd

GM18D

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-18D
Site: NWIRP Bethpage
Date Installed: _____
Date Developed: 11/13/00
Dev. Method: Air lift
Pump Type: Compressor

Depth to Bottom (ft.): 300.00
Static Water Level Before (ft.): 43.15
Static Water Level After (ft.): 49.30
Screen Length (ft.): 10ft
Specific Capacity: _____
Casing ID (in.): 4"

Responsible Personnel: D. Stratsmith, J. Evans
Drilling Co.: Unitech Drilling Co
Project Name: CTO 0208
Project Number: N0565.0208

Time	Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Remarks (odor, color, etc.)
11/13 Start 1440 → Stop 1605									
1445 DS		0	56.5	15.5	7.01	0.216	7/1000	8.58	grey/cloudy/muddy
1500			55.5	15.3	5.82	0.100	7/1000	8.44	grey/cloudy
1515			54.8	15.5	5.41	0.091	7/1000	8.24	grey/cloudy
1530			54.5	15.4	5.49	0.086	966	7.05	grey/cloudy
1545			54.3	15.5	5.53	0.085	860	6.85	grey/cloudy
1600		2500	54.2	15.4	5.39	0.083	737	6.92	grey/cloudy
11/14 745			44.10	—	—	—	—	—	surge well from 300-298
750			53.2	15.2	7.05	0.104	7/1000	7.70	grey/cloudy
805			52.7	14.4	7.02	0.103	7/1000	9.17	grey/cloudy
~~DS 1520~~			52.7	15.3	6.63	0.087	667	6.72	grey/cloudy
835			52.7	15.4	5.99	0.082	558	6.78	grey/cloudy surge from 296-298
850			52.6	15.7	5.94	0.083	412	7.25	grey/cloudy
905			52.6	15.5	5.82	0.082	350	6.94	grey/cloudy surge from 294-296
920			52.6	15.6	5.89	0.081	550	7.23	grey/cloudy
935		5,000	52.6	15.5	5.86	0.081	274	7.02	grey/cloudy
1030			51.2	—	—	—	—	—	surge well from 292-294
1035			52.5	15.3	6.15	0.081	7/1000	7.39	grey/cloudy
1050			52.5	15.7	5.85	0.081	213	7.36	grey/slightly cloudy

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-18D
Site: NWIRP Bethpage
Date Installed: _____
Date Developed: 11/13-14/00
Dev. Method: Air Lift
Pump Type: Compressor

Depth to Bottom (ft.): 300.00
Static Water Level Before (ft.): 43.15
Static Water Level After (ft.): 49.30
Screen Length (ft.): 10'
Specific Capacity: _____
Casing ID (in.): 4"

Responsible Personnel: D. Streetsmith, J. Evans
Drilling Co.: UTD
Project Name: CTO 0208
Project Number: N0565

Time	Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Remarks (odor, color, etc.)
1105			52.5	15.6	5.80	0.080	140	6.29	clear/slightly cloudy — surge 290-292
1120			52.5	15.7	5.86	0.082	356	6.37	cloudy
1135			52.4	15.8	5.91	0.081	182	5.99	slightly cloudy drop pump to bottom
1150			52.4	15.9	5.92	0.081	272	6.65	slightly cloudy and surge entire screen
1205			52.4	15.9	5.89	0.081	193	6.40	slightly cloudy
1220			52.3	15.9	5.89	0.081	127	6.29	slightly cloudy/clear
1235		7,500	52.3	16.0	5.93	0.081	76	6.28	slightly cloudy/clear — surge entire screen
1335			53.1	15.7	6.02	0.080	146	7.08	slightly cloudy
1350			53.1	15.7	5.79	0.080	60	6.52	slightly cloudy/clear
1405			53.1	15.7	5.76	0.080	21	6.55	clear
1420			53.1	15.6	5.66	0.080	1	6.71	clear
1435			53.1	15.7	5.74	0.080	1	6.68	clear
1450		9,300	53.1	15.6	5.75	0.080	1	6.61	clear

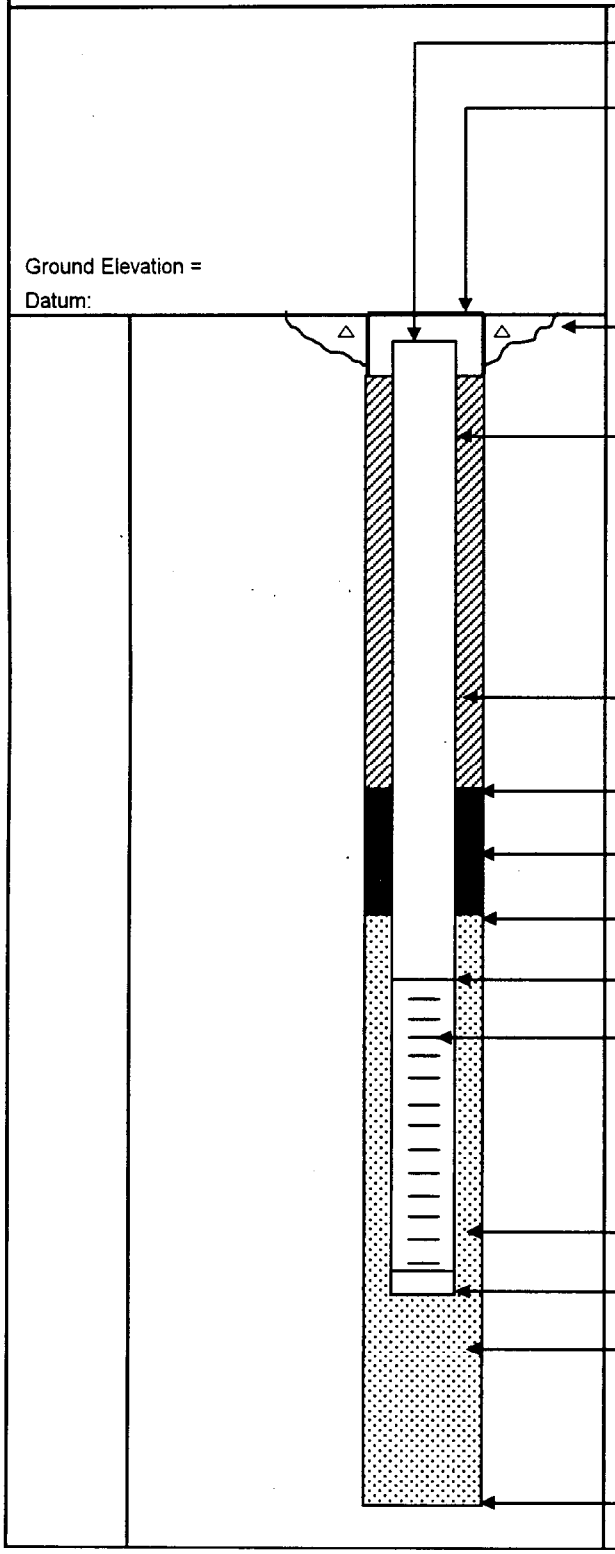
GM21D

Tetra Tech NUS, Inc.

WELL No.: GM-21D

MONITORING WELL SHEET

PROJECT:	NWIRP Bethpage	DRILLING Co.:	Uni-Tech	BORING No.:	GM-21D
PROJECT No.:	N4037	DRILLER:	B. Baer	DATE COMPLETED:	10/11/01
SITE:	Off Site Drilling	DRILLING METHOD:	Mud Rotary	NORTHING:	
GEOLOGIST:	S. Neil	DEV. METHOD:	Air Lift	EASTING:	



Elevation / Depth of Top of Riser: /

Elevation / Height of Top of Surface Casing: /

I.D. of Surface Casing: 9-inch

Type of Surface Casing: Steel

Type of Surface Seal: Concrete

I.D. of Riser: 4-inch

Type of Riser: Schedule 80 PVC

Borehole Diameter: 8-inch

Type of Backfill: Bentonite Slurry

Elevation / Depth of Seal: / 254 feet

Type of Seal: Bentonite

Elevation / Depth of Top of Filter Pack: / 260 feet*

Elevation / Depth of Top of Screen: / 278 feet

Type of Screen: Schedule 80 PVC

Slot Size x Length: 0.010 x 10 feet

I.D. of Screen: 4-inch

Type of Filter Pack: FilPro #1 Qtz Sand

Elevation / Depth of Bottom of Screen: / 288 feet

Elevation / Depth of Bottom of Filter Pack: / 298 feet

Type of Backfill Below Well: FilPro #1 Qtz Sand

Elevation / Total Depth of Borehole: / 298 feet

*Filter pack (FilPro #1 sand) to 266 feet; 6 feet of fine sand (FilPro #0 sand) above filter pack.

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-21D
DATE: 10/8-9/01
GEOLOGIST: S. Neil
DRILLER: B. Baer

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												
	10					WH/ TAN	V. COARSE SILTY SAND W/	SM		-	0	0	0
							FEW SIZE GRAVEL						
	20					WH/ TAN	V. COARSE SILTY SAND	SM		-	0	0	0
							SOME PEA SIZE GRAVEL						
	30					WH/ TAN	V. COARSE SILTY SAND	SM		-	0	0	0
							TR- SOME GRAVEL (PEA)		V2 INCH				
10/8	40					WH/ TAN	MED - V. COARSE SAND	SN		-	0	0	0
10/9							SOME GRAVEL (LARGER)		1/4 INCH				
	50					WH/ TAN	SANDY GRAVEL (LARGE)	SN		-	0	0	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: LOG CUTTINGS ONLY (TO 140')

Converted to Well: Yes X No _____ Well I.D. #: GM-21D

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-21D
DATE: 10/9/01
GEOLOGIST: S. Neil
DRILLER: R. Baker

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	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	60					BRN	FINE-MED SANDY SILT	ML		-	0	0	0
	70					LGHT BRN	FINE - MED SANDY SILT	ML		-	0	0	0
	80					WHITE/ BRN	COARSE - V. COARSE SAND	SM/SC		-	0	0	0
							SOME SILT/CLAY AND SIZE GRAVEL	(TAILINGS)					
	90					LIGHT BRN	V. COARSE SAND SOME	SM/SC		-	0	0	0
							SILT/CLAY						
	100						SAME AS ABOVE	SM/SC		-	0	0	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: LOG CUTTINGS ONLY (TO 140')

Converted to Well: Yes X No _____ Well I.D. #: GM-21D

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-21D
DATE: 10/9/01
GEOLOGIST: S. Neil
DRILLER: B. Beer

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**
	110					BRN	V. COARSE SILTY SAND WITH	SM		-	0	0	0
							TR CLAY						
	120					BRN	MED- COARSE SANDY SILT	ML		-	0	0	0
	130					BRN	MED- COARSE SANDY SILT	ML		-	0	0	0
							TR CLAY TR GRAVEL						
S-1 C	140	100	3'			WHT BRN	CLAYEY SAND w/	SC		0	0	0	0
1140	142	6	6"				GRAVEL						
	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: LOG CUTTINGS ONLY (TD 140')

Converted to Well: Yes X No _____ Well I.D. #: GM-21D

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-21D
DATE: 10/9/01
GEOLOGIST: S. Neil
DRILLER: B. Baker

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 @	150	100	6"			BRN	FINE SILTY SAND w/	SP		0	0	0	0
1155	152	6	6"				GRAVEL (LAG) (TOP 3")						
S-3 @	160	150	5"			BRN	FINE - MED SILTY SAND	SM		0	0	0	0
1247	162	5	5"										
S-4 @	170	150	3"			BRN	FINE - MED SILTY SAND	SM		0	0	0	0
1335	172	5	5"										
S-5 @	180	6 100	12"			BRN	SILT w/ TR FINE SAND TR	ML		0	0	0	0
1400	182	6 6	12"				CLAY LENSES						
S-6 @	190	100	6"			BRN	SILT w/ TR FINE SAND	ML		0	0	0	0
1423	192	6	6"				GRAY MOT.						
	200												

* 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 X No _____ Well I.D. #: GM-21D

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-21D
DATE: 10/9/01
GEOLOGIST: S. Neil
DRILLER: B. Boer

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-7 C	200	100	6"			RED	FINE - MED SILTY SAND	SM		0	0	0	0
1450	202	6	6"										
S-8 C	205	100	6"			BRN	FINE - MED SILTY SAND	SM		0	0	0	0
1507	207	6	6"				TR CLAY LENS						
S-9 C	210	100	6"			LT BRN	FINE SAND	SP		0	0	0	0
1523	212	6	6"										
S-10 C	215	22/100	9"			OR BRN	FINE SAND	SP		0	0	0	0
1545	217	ORM 6	12"										
S-11 C	220	36/100	5"			OR BRN	FINE SAND	SP		0	0	0	0
1610	222	6	12"										
S-12 C	225	100	6"			OR BRN	FINE SAND W/ INTERBED	SM		0	0	0	0
1625	227	6	6"				FINE - MED WH. SAND						

* 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 X No Well I.D. #: GM-21D

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-21D
DATE: 10/9-10/01
GEOLOGIST: S. Neil
DRILLER: B. Baer

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-13 @	230	57/100	8"			GY/BRN	FINE SAND TR SILT	SP		0	0	0	0
1650	232	ORM/6	12"										
10/9/01													
S-14 @	240	52/100	5"			BRN	SILTY/GRAVELLY SAND	SM/SP		0	0	0	0
0944	242	ORM/6	12"				TR CLAY						
S-15 @	250	34/34	24"		*	YELL BRN	FINE SAND	SP	WET	0	0	0	0
0405	252	28/21	24"										
							CLAY @ ≈ 258' BASED ON DRILLING						
S-16 @	260	11/100	12"			GRAY	CLAY (MED) W/	CL		0	0	0	0
0935	262	ORM/6	12"				PEAT?						
	265												
S-17 @	267	100/ORM	6"			DK GRAY	DENSE - V. DENSE CLAY	CL		0	0	0	0
0952		6	6"										
S-18 @	270	100/ORM	6"			GRAY	DENSE CLAY W/ SAND	CL		0	0	0	0
1010	272	6	6"				MOT. TR PYRITE						

* 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 x No _____ Well I.D. #: GM-21D

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-21D
DATE: 12/10/91
GEOLOGIST: S. Neil
DRILLER: B. Baer

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-19 C	275	100 OVER	6"			GRAY	V. DENSE CLAY	CL		0	0	0	0
1027	277	6	6"										
S-20 C	280	100 OVER	5"			GRAY	SOFT CLAY (UPPER 2")	CL		0	0	0	0
1050	282	5	5"			BRN	FINE SAND (BOTTOM 3")	SP					
S-21 C	285	100 OVER	6"			BRN	FINE SAND	SP	WET	0	0	0	0
1108	287	6	6"										
S-22 C	290	24 64	24"			BRN	FINE SAND	SP	WET	0	0	0	0
1128	292	70 24	24"										
S-23 C	295	62 27	5"			BRN	FINE SAND	SP	FORMATION TOOK ALL MUD WHEN RETRIEVING SPLIT SPOON	0	0	0	0
1145	297	4 12	24"										
S-24 C	300	45 100	8"			BRN	FINE SAND	SP	END OF BOREHOLE	0	0	0	0
1205	302	OVER 2	8"						@ 300'.				

* When rock coring, enter rock brokeness.

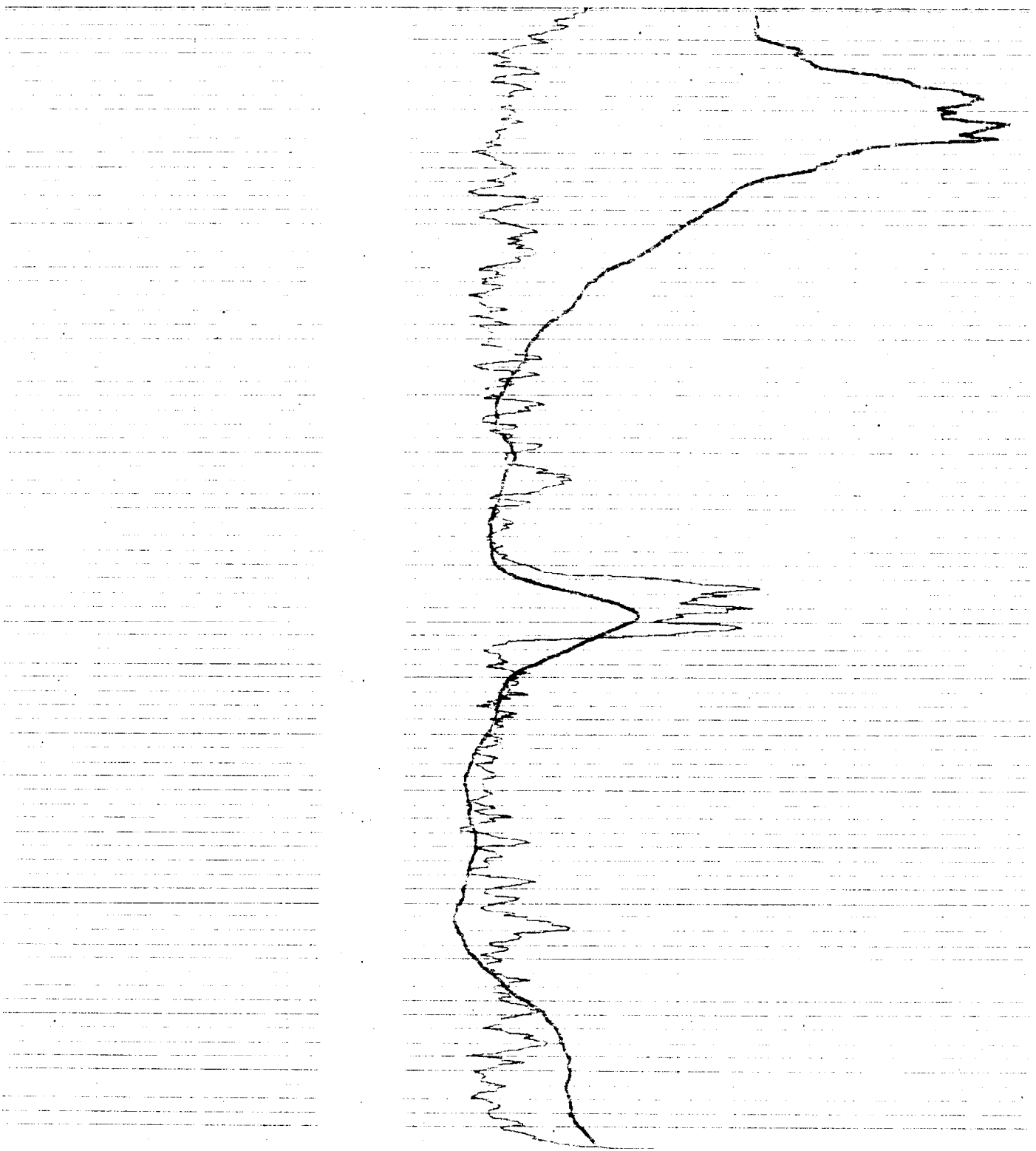
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

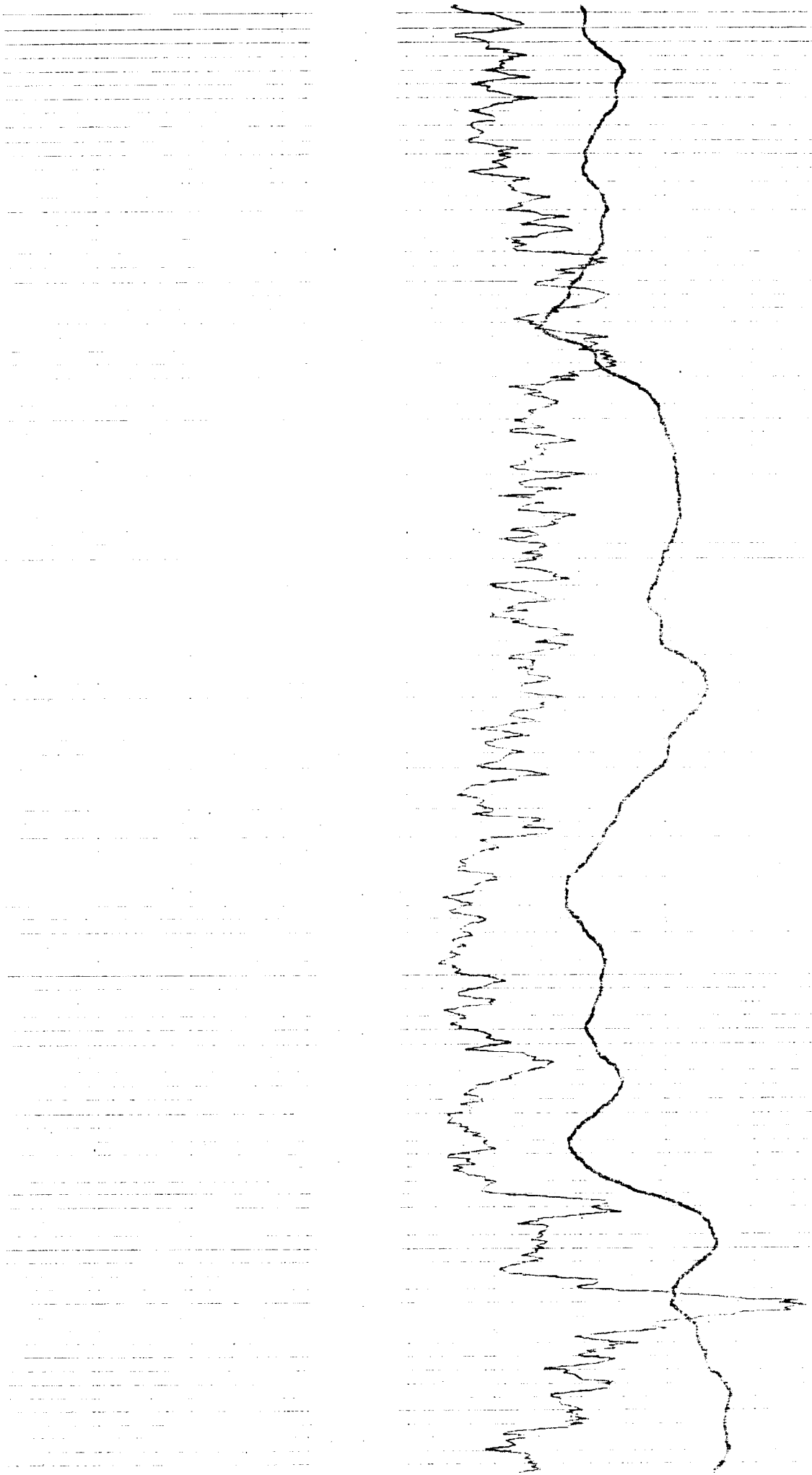
Drilling Area Background (ppm): 0

Remarks: TOTAL DEPTH OF BOREHOLE = 300'. WILL SET WELL SCREEN FROM 278-288'.

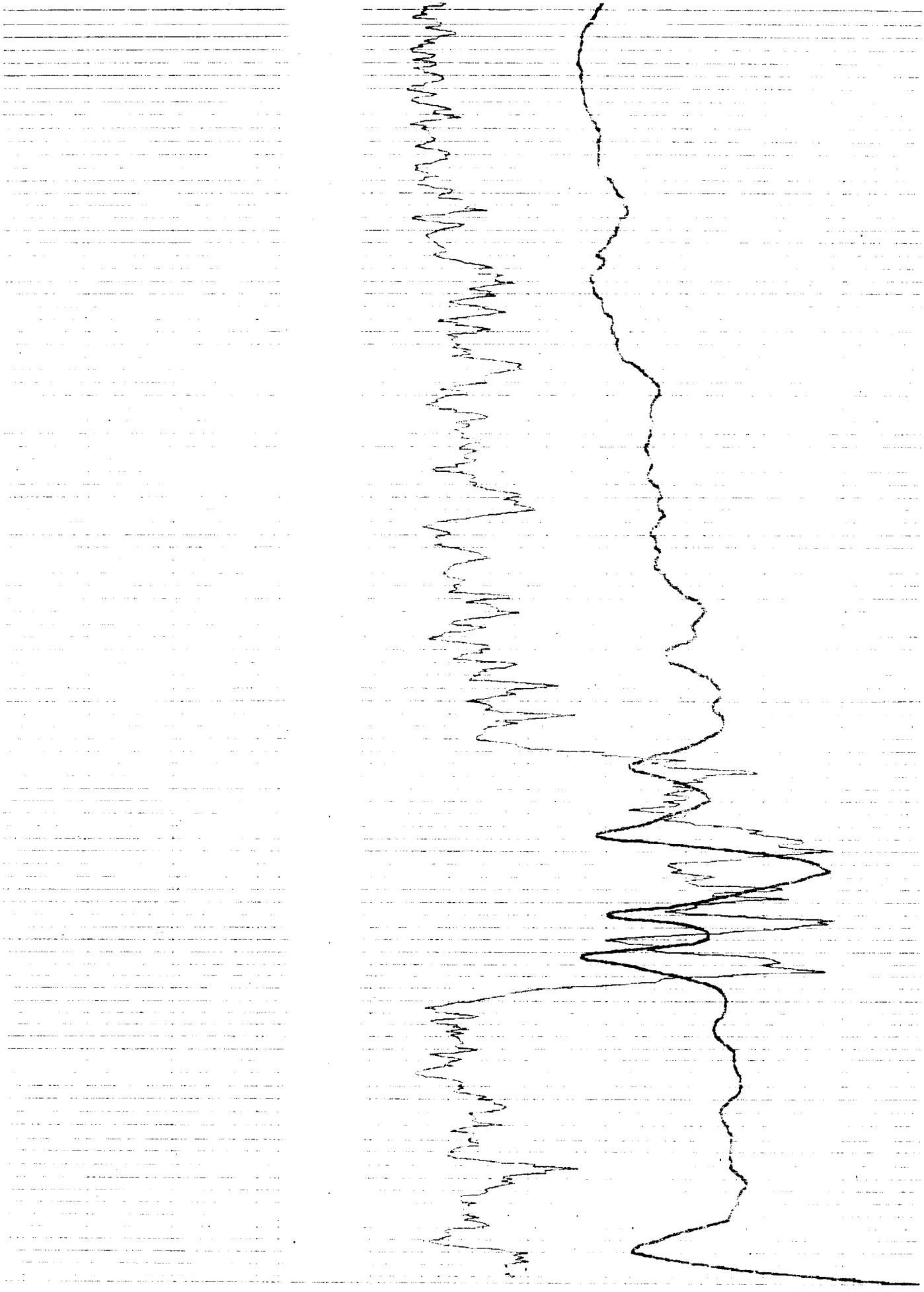
Converted to Well: Yes X No _____ Well I.D. #: GM-21D

	COMPANY: UNITECH DRILLING				Casing
	Location: BUTEHORN & HARRISON				
Well	GM - 21D		Depth Driller	300 '	NO
			Depth Logger	298' grade	
Date	10/10/01	BH Fluid BENT	Logged by: AQUA TERRA		
File Name			Witness: D STERN		





GM21D


GM21D

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-21D
Site: NWIRP Bethpage
Date Installed: 10/8-11/01
Date Developed: 10/17-19/01
Dev. Method: Air lift and
Pump Type: submersible

Depth to Bottom (ft.): 288
Static Water Level Before (ft.): 33
Static Water Level After (ft.): 46.2
Screen Length (ft.): 10
Specific Capacity:
Casing ID (in.): 4

Responsible Personnel: C. Lyon, B. Baer
Drilling Co.: Uni-Tech
Project Name: off-site well development
Project Number: ~~N0~~ N4037.0500 (CL)

GPM

Time	~~Estimated Sediment Thickness~~ (CL) ~~(Ft.)~~	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.) DO units - mg/L
1148	22			16.7	6.21	0.284	999	Starting air lift.
1150	(Pulsing)			16.7	6.28	0.291	999	Muddy. DO = 9.17
1155				15.0	6.27	0.163	999	Muddy, DO = 10.18
1158								Lifted blocks ~2 feet,
								then up and down 12 times
1207				14.9	6.20	0.114	999	Down 1 foot. DO = 9.52
1214				14.6	5.84	0.110	73	Clearing: DO = 10.54
1215					5.80 ~~0.110~~ (CL)			Up & down
1218				14.5	5.80	0.107	85	DO = 10.73
1223				14.3	5.68	0.105	49	DO = 11.15
1230	↓	1000			~~6.0~~ (CL)			Stopped to empty tank.
1307	28			15.2	6.04	0.109	999	Resumed air lift.
1319				15.0	5.39	0.105	999	Muddy DO = 10.87
1327				14.8	5.62	0.105	86	DO = 10.85
1336				15.0	5.78	0.102	78	Clearing
1342	↓	2000		14.2	7.02	0.096	45	DO = 11.29
1412	Water truck returned to site. Surging continued while truck was gone,							
14[illegible]5								resumed develop[illegible]

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Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-21D
Site: NWIRP Bethpage
Date Installed: 10/8-11/01
Date Developed: 10/17-18/01 (21)
Dev. Method: Air lift and
Pump Type: submersible

Depth to Bottom (ft.): 288
Static Water Level Before (ft.): 33
Static Water Level After (ft.): 46.2
Screen Length (ft.): 10
Specific Capacity:
Casing ID (in.): 4

Responsible Personnel: C. Lyon, B. Baer
Drilling Co.: Unitech
Project Name: off site well development
Project Number: N4037.0500

GPM

Time	~~Estimated Sediment Thickness~~ (21) (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.) DO units - mg/L
1415	25							Resume development.
1420	↓			15.8	6.37	0.105	60	Clearing. DO = 11.08
1428				15.8	6.37	0.105	192	Cloudy grey. DO = 10.38
1450				14.6	5.79	0.103	162	DO = 10.28
1455	↓	3000		14.6	5.64	0.102	105	DO = 10.10
	Continued surging while tank truck gone. Turbidity measurements below							
	made with LaMotte 2020. See logbook 1335.							
1520	23							Resume air lift.
1527	↓			15.3	5.65	0.098	85	Greyish. DO = 11.40
1540				14.8	5.66	0.100	130	DO = 10.46
1544				14.7	5.61	0.098	110	DO = 10.59
1552				14.8	5.63	0.099	95	
1557							90	Horiba battery dead.
1603	↓	4000	Surging while truck is				88	Stop to empty tank.
1630	30.3							Resume development.
1635	↓			14.5	5.71	0.100	95	DO = 10.30
1642				14.6	5.57	0.099	37	DO = 10.61
1648	↓			14.2	5.51	0.097	34	DO = 10.18

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-21D
Site: NWIRP Bethpage
Date Installed: 10/8-11/01
Date Developed: 10/17-19/01
Dev. Method: Air lift and
Pump Type: submersible

Depth to Bottom (ft.): 288
Static Water Level Before (ft.): 33
Static Water Level After (ft.): 46.2
Screen Length (ft.): 10
Specific Capacity:
Casing ID (in.): 4

Responsible Personnel: C. Lyon, B. Beer
Drilling Co.: Uni-Tech
Project Name: Off-site well
Project Number: N4037.0500

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.) DO units - mg/L
1658	30.3			14.4	5.51	0.098	29	DO = 10.23
1703	↓	5000		14.2	5.46	0.099	27	DO = 10.20
(1) 10/18/01								
0 1102								Begin surging - See log.
1108								Stop surge - begin pump.
1112				15.0	7.08	0.105	95	DO = 9.03
1117								Surging
1120								Water slightly brown.
1123				14.3	5.65	0.100	70	DO = 9.07
1128				14.3	5.51	0.100	36	Res. surge DO = 9.20
1135				14.2	5.48	0.100	270	DO = 9.43
1140		6000		14.4	5.48	0.097	29	Time to empty tank DO = 9.29
1211				13.9	5.67	0.100		Start surging 2nd
1223				13.9	5.68	0.101	650	interval from bottom
1232				14.2	5.52	0.100	22	DO = 8.73
1233								Start surge again.
1238								End surge
1 3				14.0	43	0.100	45	DO = ?

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: M-21D
Site: NWIRP Bethpage
Date Installed: 10/8-11/01
Date Developed: 10/17-19/01
Dev. Method: Air lift and
Pump Type: Submersible

Depth to Bottom (ft.): 288
Static Water Level Before (ft.): 33
Static Water Level After (ft.): 46.2
Screen Length (ft.): 10
Specific Capacity:
Casing ID (in.): 4

Responsible Personnel: C. Lyon, B. Beer
Drilling Co.: Uni-Tech
Project Name: Off-site well development
Project Number: N4037.0500

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.) DO units - mg/L
1246				14.3	5.44	0.101	17	DO = 9.12
1251		7000		14.4	5.33	0.099	15	Empty tank DO = 9.02
1318								Resume surge.
1324				14.5	5.49	1.00	370	End surge. DO = 8.64
1331				14.7	5.33	0.098	19	DO = 9.11
1336				14.6	5.33	0.098	18	DO = 8.75
1340					~~5.~~ (2)			End Surge
1343				14.4	5.37	0.099	50	DO = 8.81
(2) ~~1348~~ <1348				14.3	5.30	0.098	46	DO = 9.21
1353		8000		14.4	5.21	0.098	14	Tank full DO = 9.75
1440				14.2	5.39	0.099	21	End surge DO = 9.06
1445				14.2	5.37	0.098	17	DO = 8.84
1447				(2)	~~5.38~~	~~0.096~~		Start surge upper zone
1453								End surge upper zone
1456				14.2	5.38	0.096	45	DO = 8.64
1502				14.3	5.31	0.094	17	DO = 9.19
1506		9000		14.4	5.27	0.098	17	DO = 8.77
"		~~8000~~	(2)					End surge & air lift.

(W)

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: _____ Depth to Bottom (ft.): _____ Responsible Personnel: _____
Site: _____ Static Water Level Before (ft.): _____ Drilling Co.: _____
Date Installed: _____ Static Water Level After (ft.): _____ Project Name: _____
Date Developed: _____ Screen Length (ft.): _____ Project Number: _____
Dev. Method: _____ Specific Capacity: _____
Pump Type: _____ Casing ID (in.): _____

Time 10-19-01	~~Estimated Sediment Thickness~~ (CL) ~~(Ft.)~~ GPM	Cumulative Water Volume (Gal.)	Water Level Readings (CL) ~~(Ft. below TOC)~~ BGS	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.) DO units - mg/L
0741	20		46.17					Ready for submersible
0755	↓							Start pumping
0802	↓			15.1	5.28	0.198	129	light brown. DO= 7.31
0814	13			14.5	5.20	0.103	321	DO= 6.71
0820				14.3	5.09	0.099	62.3	Clearing DO= 6.92
0826				14.4	4.91	0.098	29.7	DO= 6.75
0832				14.3	4.87	0.098	24.6	DO= 7.20
0838				14.5	4.82	0.098	22.6	DO= 6.99
0845				14.4	4.78	0.097	22.9	DO= 5.14
0850				14.5	4.84	0.097	20.2	DO= 6.94
0855		9400		14.4	4.79	0.097	22.5	DO = 6.84
0900	↓	~~9400~~ (CL)	57.67	14.4	4.71	0.098	15.4	DO = 7.13
								End development

GM75D2

BORING NO.: GM-75D2

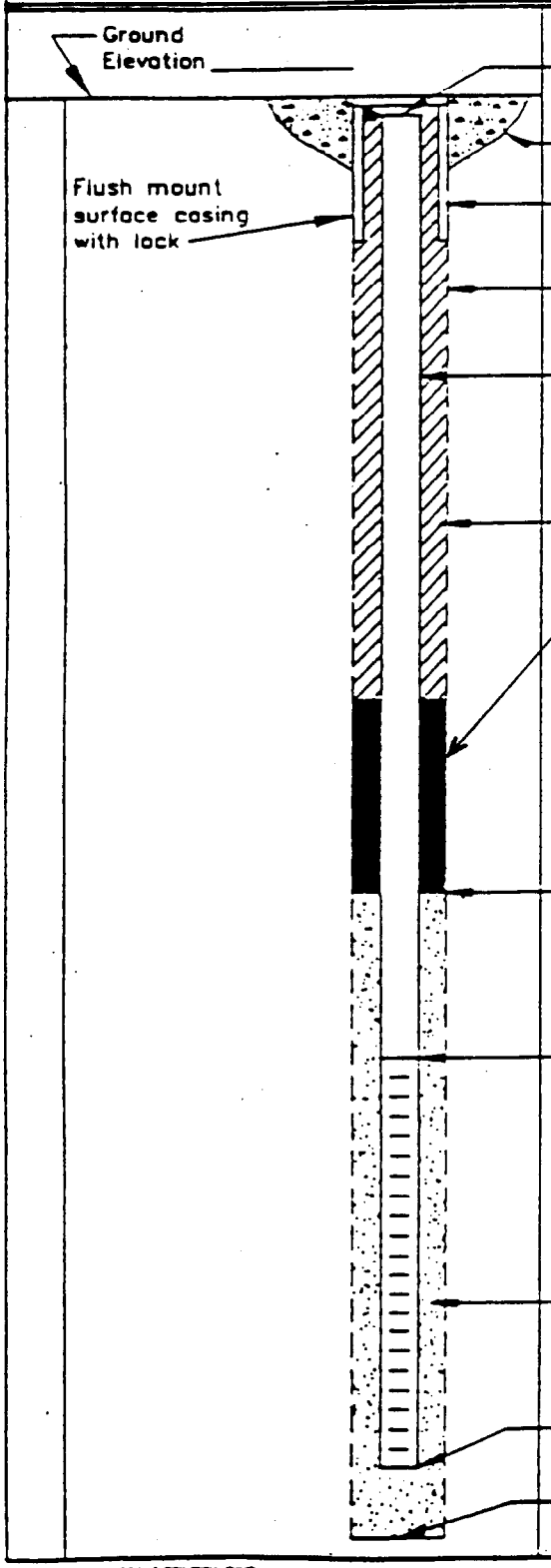
Tetra Tech NUS, Inc.

MONITORING WELL SHEET

PROJECT NWIRP BETHPAGE
PROJECT NO. NCSGS
ELEVATION
FIELD GEOLOGIST S. NEIL

LOCATION OFF-SITE
BORING GM-75D2
DATE 4/12/01

DRILLER JIM EVANS
DRILLING METHOD MUD ROTARY
DEVELOPMENT METHOD AIR LIFT



ELEVATION TOP OF RISER:

TYPE OF SURFACE SEAL: CONCRETE

TYPE OF PROTECTIVE CASING: FLUSH MOUNT COVER
I.D. OF PROTECTIVE CASING: 8-INCH

DIAMETER OF HOLE: 8-INCH

TYPE OF RISER PIPE: SCH. 80 PVC (4-INCH DIAM)
RISER PIPE I.D.: 3 7/8 - INCH

TYPE OF BACKFILL/SEAL: VOLCLAY BENTONITE GROUT
CETCO PURE GOLD BENTONITE SLURRY

DEPTH/ELEVATION TOP OF SAND: 475' /

DEPTH/ELEVATION TOP OF SCREEN: 505' /

TYPE OF SCREEN: SCH 80 PVC (4-INCH DIAMETER)

SLOT SIZE x LENGTH: 0.010-INCH X 20 FEET

TYPE OF SAND PACK: FILPRO #1 SAND TO 585 FEET / FILPRO #0 SAND TO 475 FEET

DIAMETER OF HOLE ~~IN BEDROCK~~ (SUM): 8-INCH

DEPTH/ELEVATION BOTTOM OF SCREEN: 525' /

DEPTH/ELEVATION BOTTOM OF SAND: 540' /

DEPTH/ELEVATION BOTTOM OF HOLE: 550' /

BACKFILL MATERIAL BELOW SAND: COLLAPSED FORMATIONAL MATERIAL

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-7502
DATE: 4/9 - 12/01
GEOLOGIST: S. Neil
DRILLER: J. 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**
1404	10					BRN	silt/sand w/ pea sized gravel	GM		*	*	*	*
1408	20					BRN	silty med sandy gravel pea size - med	GW		*	→		→
1418	30					BRN	med - coarse sandy gravel (medium)	GP		*	→		→
1426	40					BRN	Same as above w/ larger gravel	GP		*	→		→
1431	50					BRN	fine - coarse sand w/ some gravel	SW		*	→		→

* 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): *

Remarks: *Very erratic readings w/ PID - would not zero itself, therefore no readings taken

Converted to Well: Yes X No ____ Well I.D. #: GM-7502

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-75D2
DATE: 4/9-12/01
GEOLOGIST: S. Nfic
DRILLER: J. 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**
1437	60					BRN	silty fine-coarse	SM		*			→
							sand trace gravel						
1441	70					BRN	Same as above	SM		*			→
1450	80					BRN	Same as above	SM		*			→
1458	90					BRN	Silty fine-med	SM	Drillers mixing	*			→
							sand		another poly				
									tank of mud.				
1600	100					BRN	Same as above	SM		*			→

* 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): *

Remarks: * Erratic readings w/ PID - would not zero, therefore no readings taken.

Converted to Well: Yes X No _____ Well I.D. #: GM-75D2

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-75D2
DATE: 4/9-12/01
GEOLOGIST: S. Nail
DRILLER: J. 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**
1604	110					BLN	silty fine-med sand trace clay	SM		* →			
1611	120					BLN	same as above	SM		* →			
1615	130					GRN	same as above	SM		* →			
1621	140					GRN	silty fine sand	SM		* →			
1625	150					GRN	same as above	SM		* →			

* 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): *

Remarks: * Erratic readings on PID — would not zero, therefore no readings taken

Converted to Well: Yes X No ____ Well I.D. #: GM-75D2

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-75D2
DATE: 4/9 - 12/01
GEOLOGIST: S. NEIL
DRILLER: J. 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**
1634	160					Brn	silty fine sand	SM		*	—	—	—
1639	170					Brn	silty fine sand w/ some clay (white)	SM		*	—	—	—
1048	180					Brn	clayey silty sand	SC		0	0	0	0
1052	190					Brn	clay some sand + silt	CH/SC	(SN)	0	0	0	0
1056	192						silt		Lose circulation				
1057									Regain circulation - continue drilling				
1102	200					Brn	Clay some sand + silt	CH/SC		0	0	0	0

4/10/01

* 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: * Erratic PID readings - would not zero therefore no readings taken. (4/9/01) PID functioning properly on 4/10/01.

Converted to Well: Yes X No ____ Well I.D. #: GM-75D2

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-75D2
DATE: 4/9-12/01
GEOLOGIST: S. Neil
DRILLER: J. 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	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	U S C S *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
1107	210					BRN	Clay some sand/	CH/		0	0	0	0
							silt.	MH					
							Alternating clay/sand						
							drilling from 210-220'						
1115	220					BRN/BLK	sandy clay w/ ~~black~~ black (sand)	CH/		0	0	0	0
							fines/sand.	MH					
							Alternating clay/sand						
							drilling from 220-230'						
1121	230					BRN/BLK	sandy clay w/ black	CH/	Black fines appear	0	0	0	0
							fines/sand.	MH	to be lignite/				
									peat.				
1149	240					BRN/BLK	Same as above	CL		0	0	0	0
1154	250					BRN/BLK	Same as above	CL		0	0	0	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 x No ______ Well I.D. #: GM-75D2

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-75D2
DATE: 4/9-12/01
GEOLOGIST: S.NFIL
DRILLER: J. 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**
1202	260					BRN	silt and sand w/	SM		0	0	0	0
							black fines, tr clay						
1207	270					BRN	same as above	SM		0	0	0	0
1216	280					BRN	clay w/ sand/silt	CH/		0	0	0	0
							some black fines.	MH					
S-1 e	290					BRN	fine sand w/ interbedded	SW		0	0	0	0
1325	291	20/55	11"				clay lenses, or mottling &						
	292	61/59	24"				black seams.						
	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 X No Well I.D. #: GM-75D2

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-75D2
DATE: 4/9-12/01
GEOLOGIST: S. Nile
DRILLER: J. 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 C	300					Gray	fine sand w/ Cl	SW		0	0	0	0
1342	301	43/100	8"				mottling, black seams						
	302	over/6	12"										
S-3 C	310					Gray	V. dense clay	CL		0	0	0	0
1404	311	38/100	11"										
	312	over/5	11"										
S-4 C	320					Gray Brn	Dense clay (upper 8")	CL		0	0	0	0
1425	321	17/51	11"			Cl	fine sand w/ interbedded	SC					
	322	100/4	16"				clay						
S-5 C	330					Gray Brn	fine silty sand	SW		0	0	0	0
1447	331	53/100	8"				some sandy clay on top	CH					
	332	over/3	9"				2".						
S-6 C	340									0	0	0	0
1534	341	36/100	8"			Gray Brn	fine silty sand w/	SC					
	342	over/6	12"				interbedded clay						

* 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 x No

Well I.D. #: GM-75D2

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-75D2
DATE: 4/9-12/01
GEOLOGIST: S. Neil
DRILLER: J. 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-7 @	350					Gray Brn	silty fine sand trace	SW		0	0	0	0
1555	351	57/100	9"				interbedded clay OR mot.						
	352	over 5	11"										
S-8 @	360					Gray Brn	Same as above	SW		0	0	0	0
1617	361	50/100	8"										
	362	over 6	12"										
S-9 @	370					Gray Brn	Silty fine sand trace	SW		0	0	0	0
1643	371	25/56	9"				OR mottling						
	372	100/3	15"										
S-10 @	380					Brn	fine sand w/ interbedded	SW		0	0	0	0
0954	381	63/100	7"				clay lenses.						
	382	over 4	10"										
S-11 @	390					Brn/Gray	fine sand to silt	SW		0	0	0	0
1055	391	32/100	8"										
	392	over 6	12"										

4/11/01

* 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. #: GM-75D2

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N 4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: Failing 1500

BORING No.: GM-75D2
DATE: 4/9-12/01
GEOLOGIST: S. Nfil
DRILLER: J. 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-12 @	400					Gray	fine sand some silt	SM		0	0	0	0
1120	401	50/100	8"										
	402	over/6	12"										
S-13 @	410				SW	brown	fine sand trace silt	SM		0	0	0	0
1145	411	75/100	8"				≈2" of gray clay in top of split spoon						
	412	over/2	8"										
S-14 @	420					Gray Brown	fine silty sand	SM		0	0	0	0
1254	421	100/over	3"										
	422	5	5"										
S-15 @	430					Gray	fine silty sand trace	SM	intermittent	0	0	0	0
1318 1321	431	42/100					interbedded clay layers		orange/black (Mn) staining/staining				
	432	over/5	11"										

* 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 x No ____ Well I.D. #: GM-75D2

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-75D2
DATE: 4/9-12/01
GEOLOGIST: S. Neil
DRILLER: J. 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-16 @	440					Gray	fine sand w/ bands	SW		0	0	0	0
1350	441	52/100	9"				of "peat"; clay in						
	442	OVER/5	11"				upper portion of spoon						
S-17 @	450					DARK GRAY	MED - dense clay	CL		0	0	0	0
1420	451	44/60											
	452	—/—											
S-18 @	460					GRAY	Fine sand some	SM		0	0	0	0
1516	461	31/64	6"				silt						
	462	100/3	15"										
S-19 @	470					Gray	Same as above	SM		0	0	0	0
1543	471	39/100	3"										
	472	OVER/5	11"										

* 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 X No ____ Well I.D. #: GM-75D2

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-75D2
DATE: 4/9-12/01
GEOLOGIST: S. Neil
DRILLER: J. 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-20 @ 1405	490 / 491 / 492	50 / 100 over 2	7" / 8"			Gray	fine - med silty sand	SM		1.1	0	0	0
S-21 @ 1636	490 / 491 / 492	100 over 5	5" / 5"			Gray	Same as above w/ trace black peat bands	SM		6.2	0	0	0
S-22 @ 1705	500 / 501 / 502	69 / 100 over 2	4" / 8"			Gray	Same as above	SM		*	*	*	*
S-23 @ 1735	510 / 511 / 512	100 over 6	2" / 6"			Gray	fine - med sand trace silt.	SM		*	*	*	*

* When rock coring, enter rock brokeness

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

Remarks: * PID reacting erratically - stopped using.

Drilling Area Background (ppm): 0

Converted to Well: Yes x No Well I.D. #: GM-75D2

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-7502
DATE: 4/9 - 12/01
GEOLOGIST: S. NEIL
DRILLER: J. 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-24 C	515					Brown/ Black	Sandy clay w/	CL	very little recovery	*	*	*	*
0845	516	15/37	2"				crushed gravel (trace)		in split spoon.				
	517	100/6	18"										
S-25 C	520					Gray	fine - coarse sand trace	SM		*	*	*	*
0916	521	37/100	7"				interbedded clay at top.						
	522	over 2	8"				some silt.						
S-26 C	525					Gray	fine - med sand some	SM		*	*	*	*
0950	526	100/over	4"				silt to clay lens and						
	527	6	6"				trace peat						
S-27 C	530					Gray	same as above	SM		*	*	*	*
1015	531	57/100	10"										
	532	over 4	10"										

* When rock coring, enter rock brokeness

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

Remarks: * PID acting erratically due to weather - rain.

Drilling Area Background (ppm): *

Converted to Well: Yes x No Well I.D. #: GM-7502

Tetra Tech NUS, Inc.

BORING LOG

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

BORING No.: GM-7502
DATE: 4/9-10/01
GEOLOGIST: S. NEIL
DRILLER: J. 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-28 @	535					GRAY/BRN	fine silty sand w/	SM		*	*	*	*
1045	536	57/100	7"				trace OR mottling.						
	537	over 4	10"										
S-29 @	540					GRAY BRN	fine silty sand trace	SM		*	*	*	*
1115	541	100 over	4"				gravel (pea-size) trace						
	542	4	4"				clay (in gravel).						
S-30 @	545					BRN	clay in top 3" of	CL		*	*	*	*
1143	546	100 over	6"				spoon - bottom is	SM					
	547	6	6"				silty sand						
	550												
							END OF BOREHOLE @ 550 FEET						

* 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): *

Remarks: * PID reacting erratically possibly due to weather - rain / drizzle.

Converted to Well: Yes X No _____ Well I.D. #: GM-7502

AQUA TERRA GEOPHYSICS INC
16 STATION ROAD - SUITE # 8
BELLPORT, NEW YORK 11713
631.286.7699

BOREHOLE ID: GM-75D2

TYPE OF LOG: NATURAL GAMMA

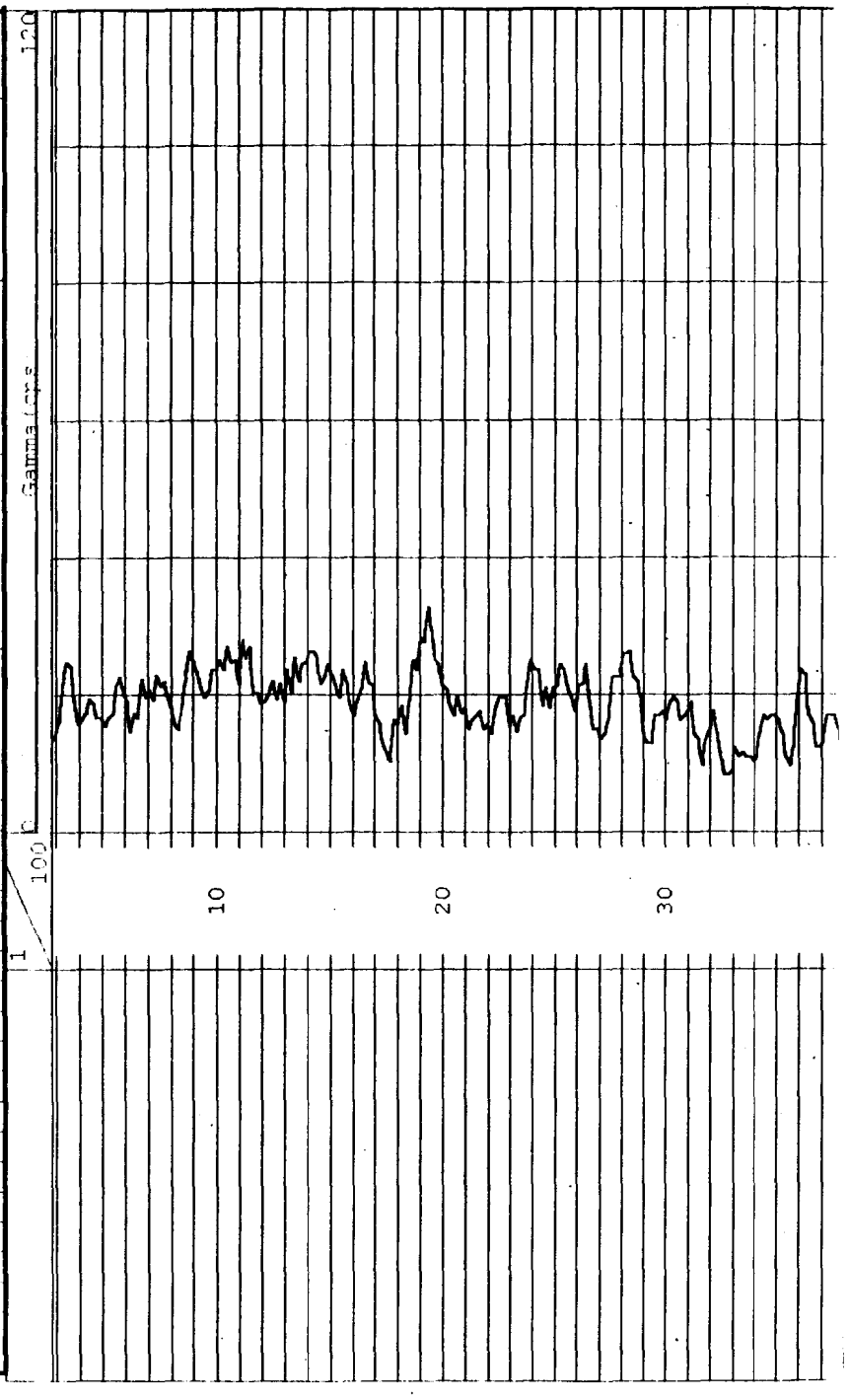
CUSTOMER UNITECH DRILLING
PROJECT NWIRP BETHPAGE
TOWN BETHPAGE
COUNTY NASSAU STATE NEW YORK

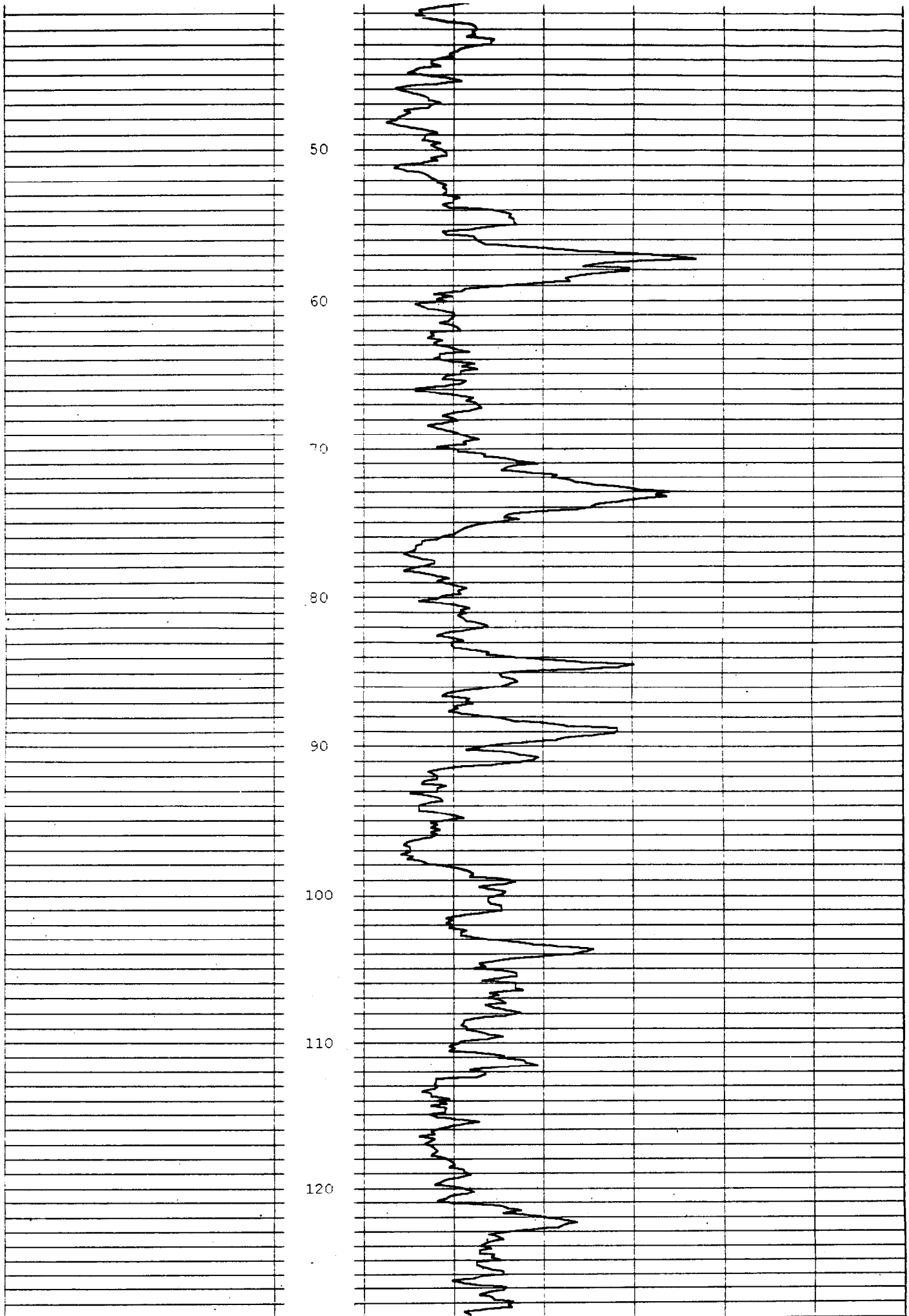
LOCATION	OTHER SERVICES
107 & N. WANTAGH AVE.	SPR-SP

DEPTH REFERENCE	GRADE	ELEVATION	
LOGGING UNIT	MOUNT SOPRIS MGX II	TRUCK	1998 SUBURBAN
DRILLING MEAS FROM	GRADE		

DATE	APRIL 12, 2001	TYPE FLUID IN HOLE	BENTONITE
		SALINITY	
		DENSITY	
DEPTH-DRILLER	550 FEET	LEVEL	
DEPTH-LOGGER	540 FEET	MAX. REC. TEMP.	
BTM LOGGED INTERVAL			
TOP LOGGED INTERVAL			
OPERATING RIG TIME	1 HR.		
RECORDED BY	BENJAMIN A. RICE		
WITNESSED BY	SCOTT NEIL		

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

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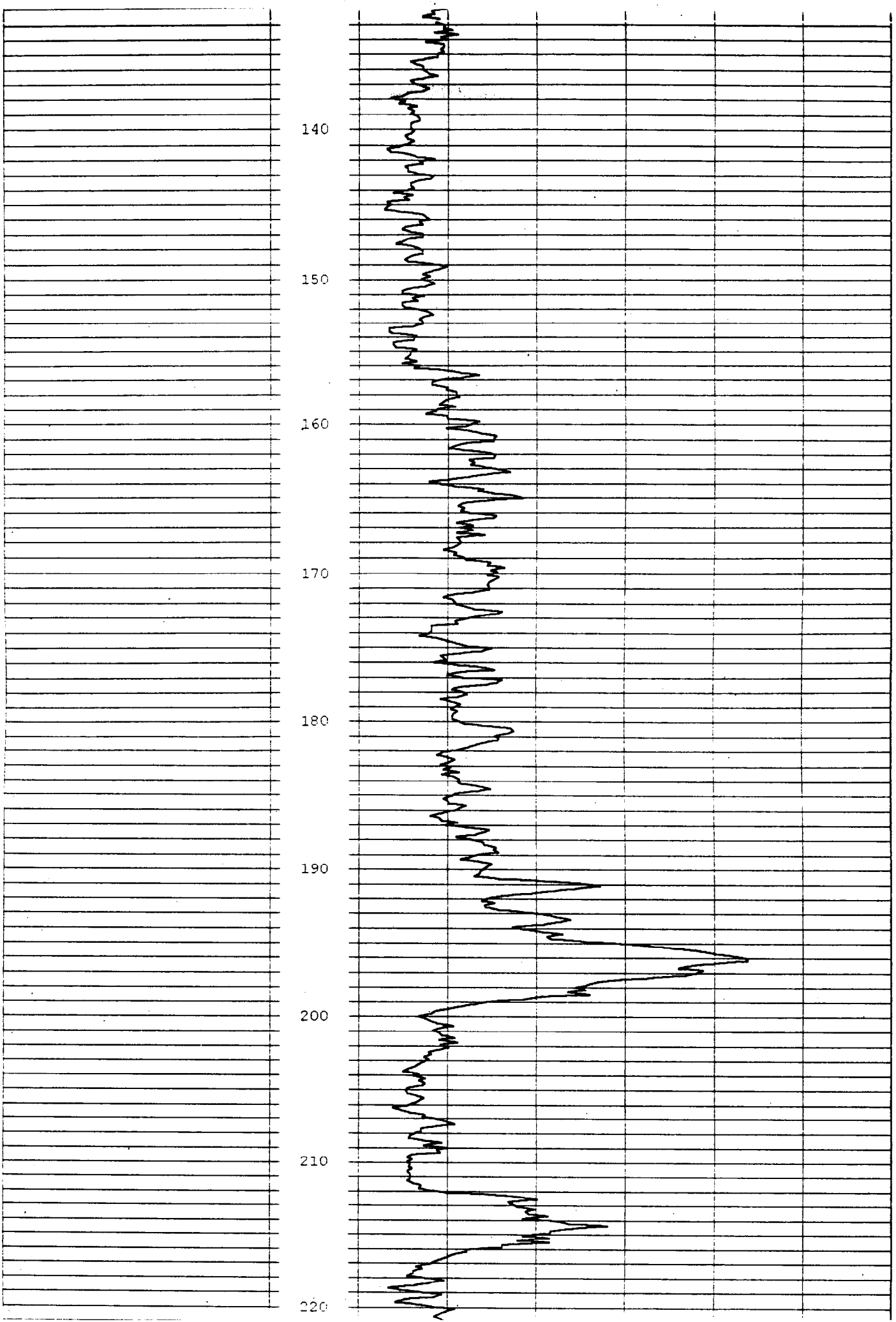
120
GM 75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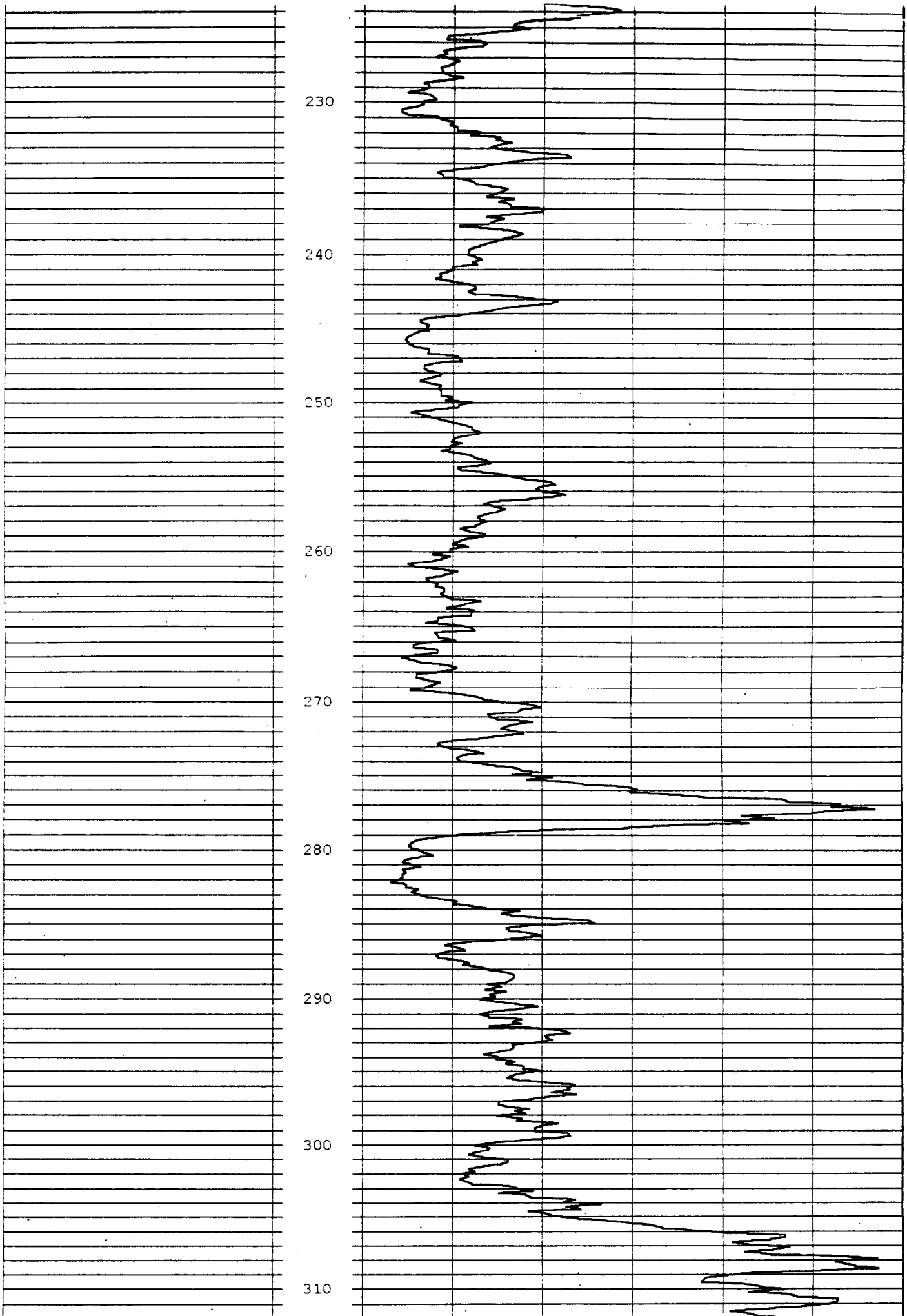
GN
75D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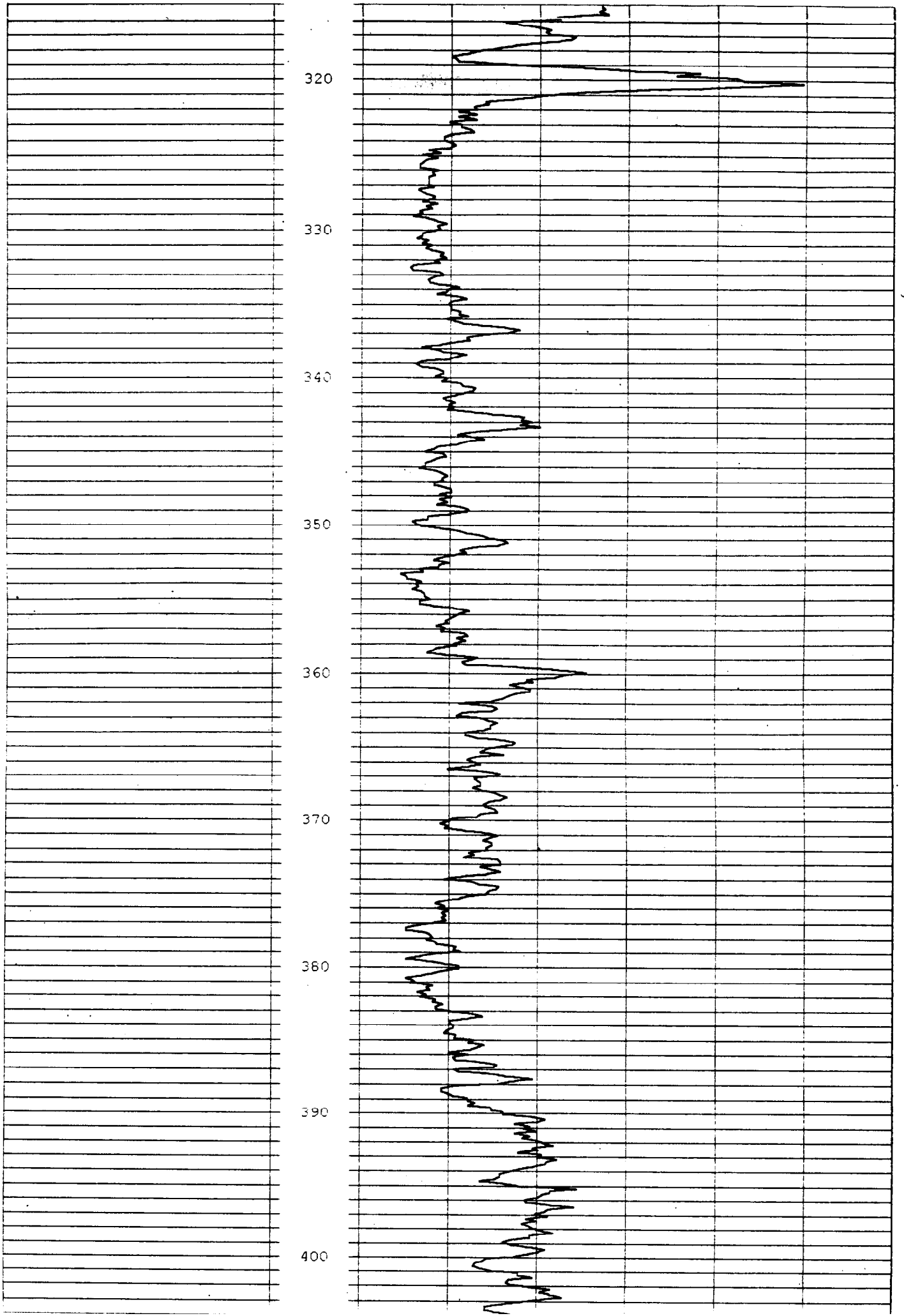
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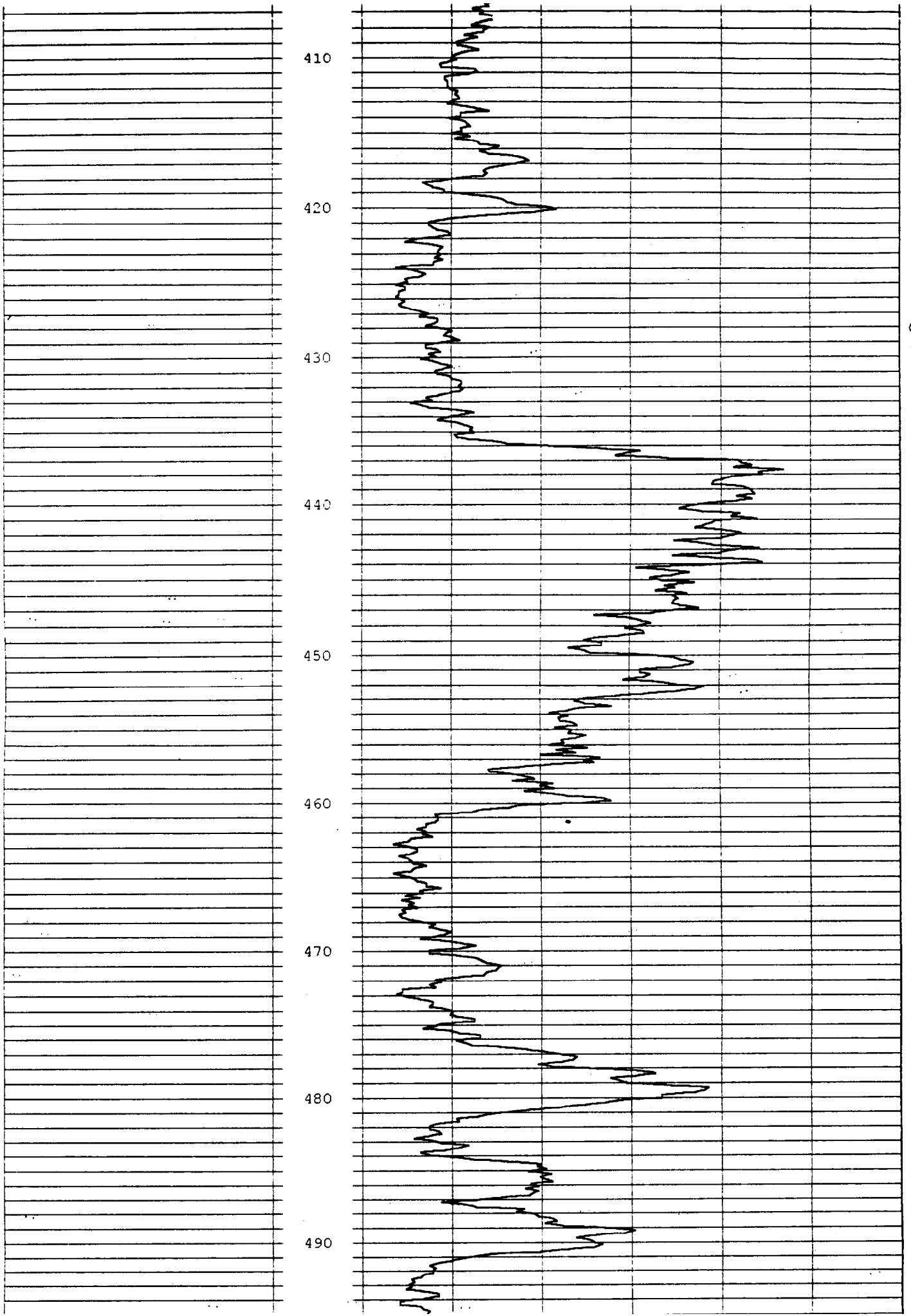
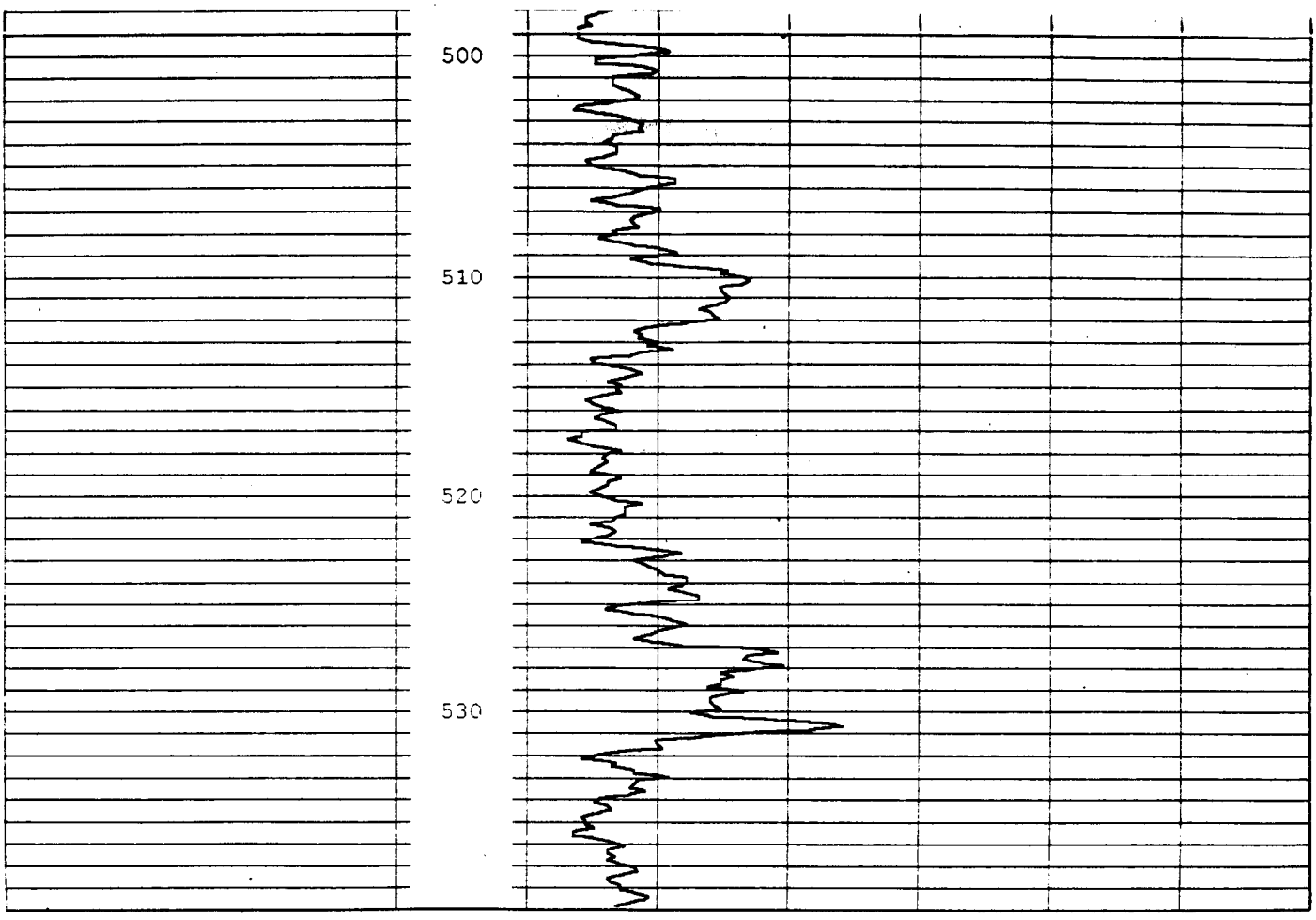

410
420
430
440
450
460
470
480
490


500
510
520
530

AQUA TERRA GEOPHYSICS INC
16 STATION ROAD - SUITE # 8
BELLPORT, NEW YORK 11713
631.286.7699

BOREHOLE ID: GM-75D2

TYPE OF LOG: SINGLE POINT RESISTANCE
SPONTANEOUS POTENTIAL

CUSTOMER UNITECH DRILLING
PROJECT NWIRP BETHPAGE
TOWN BETHPAGE
COUNTY NASSAU STATE NEW YORK

LOCATION	OTHER SERVICES
107 & N WANTAGH AVE.	GAMMA

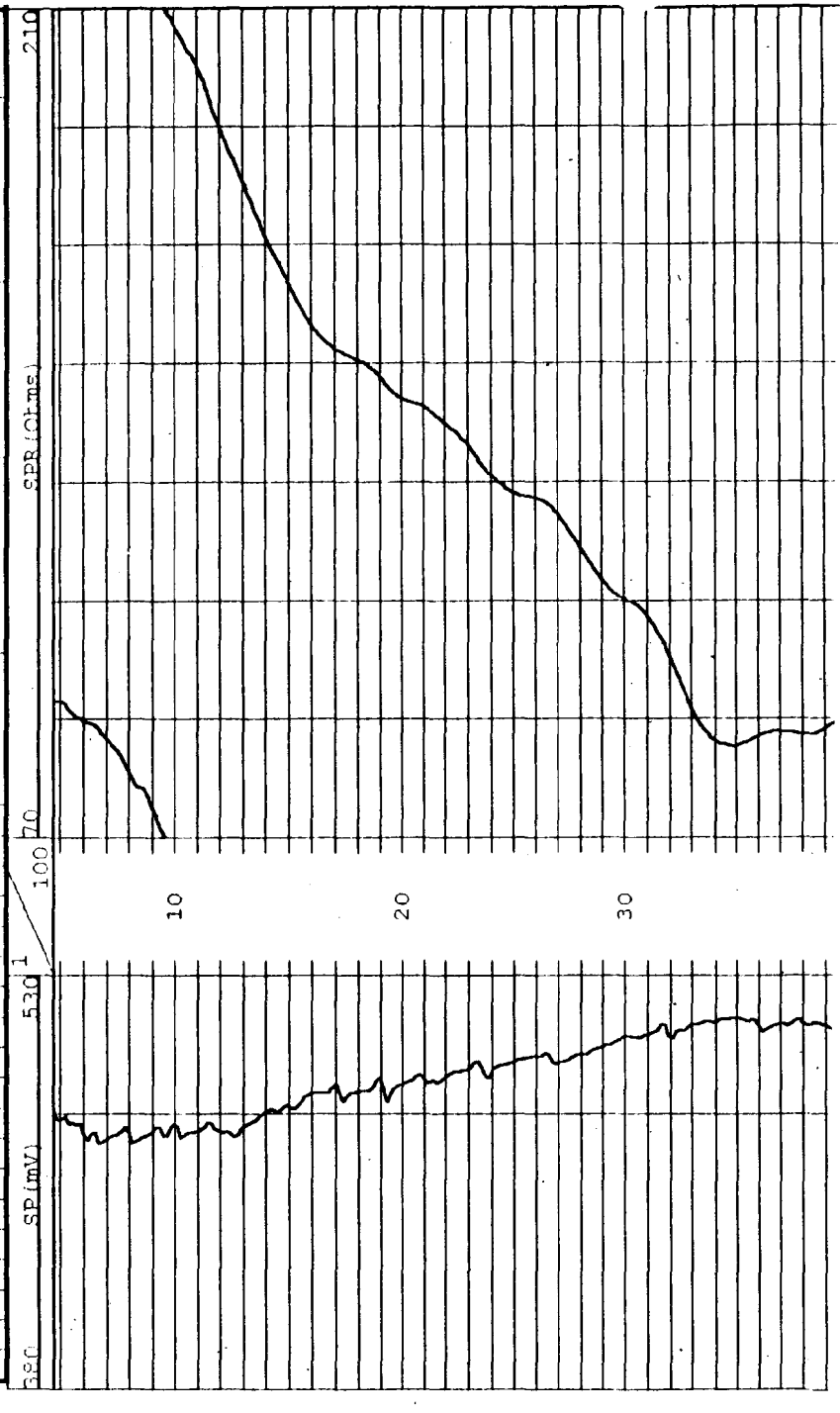
DEPTH REFERENCE GRADE ELEVATION

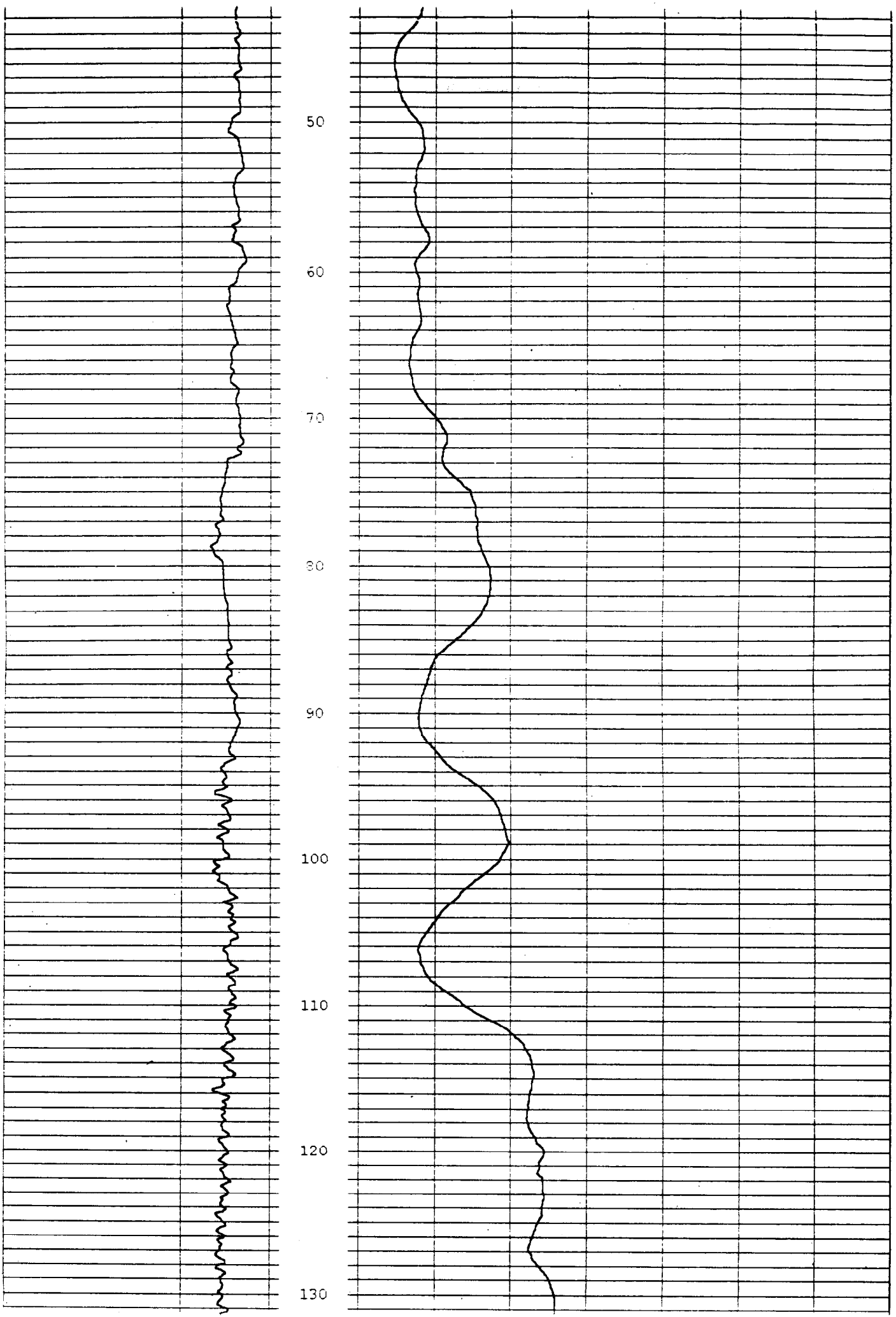
LOGGING UNIT MOUNT SOPRIS MGX II TRUCK 1998 SUBURBAN

DRILLING MEAS FROM

DATE	APRIL 12, 2001	TYPE FLUID IN HOLE	BENTONITE
		SALINITY	
		DENSITY	
DEPTH-DRILLER	550 FEET	LEVEL	
DEPTH-LOGGER	540 FEET	MAX. REC. TEMP.	
BTM LOGGED INTERVAL			
TOP LOGGED INTERVAL			
OPERATING RIG TIME	1 HR.		
RECORDED BY	BENJAMIN A. RICE		
WITNESSED BY	SCOTT NEIL		

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

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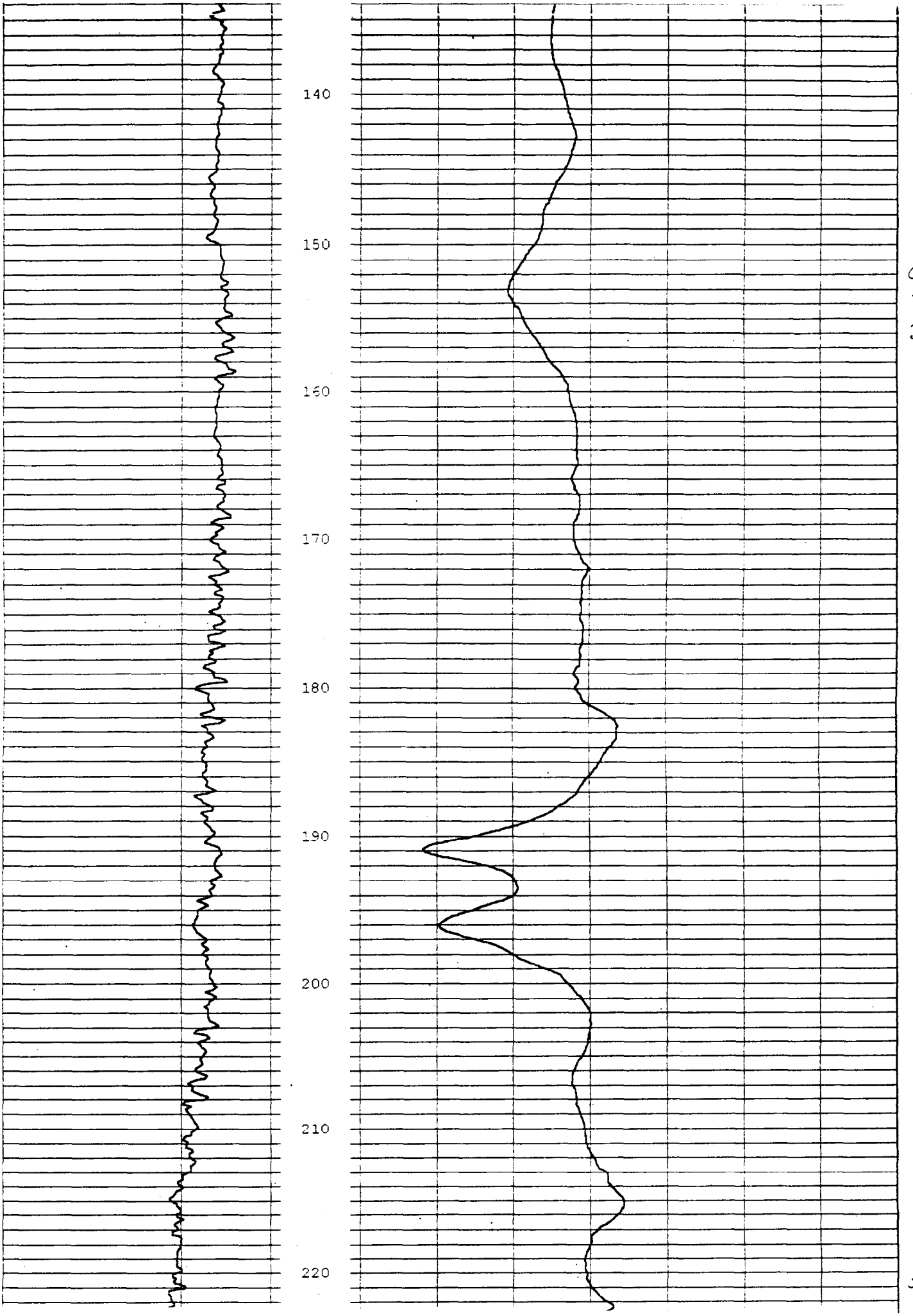
GM
7E
D2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D2
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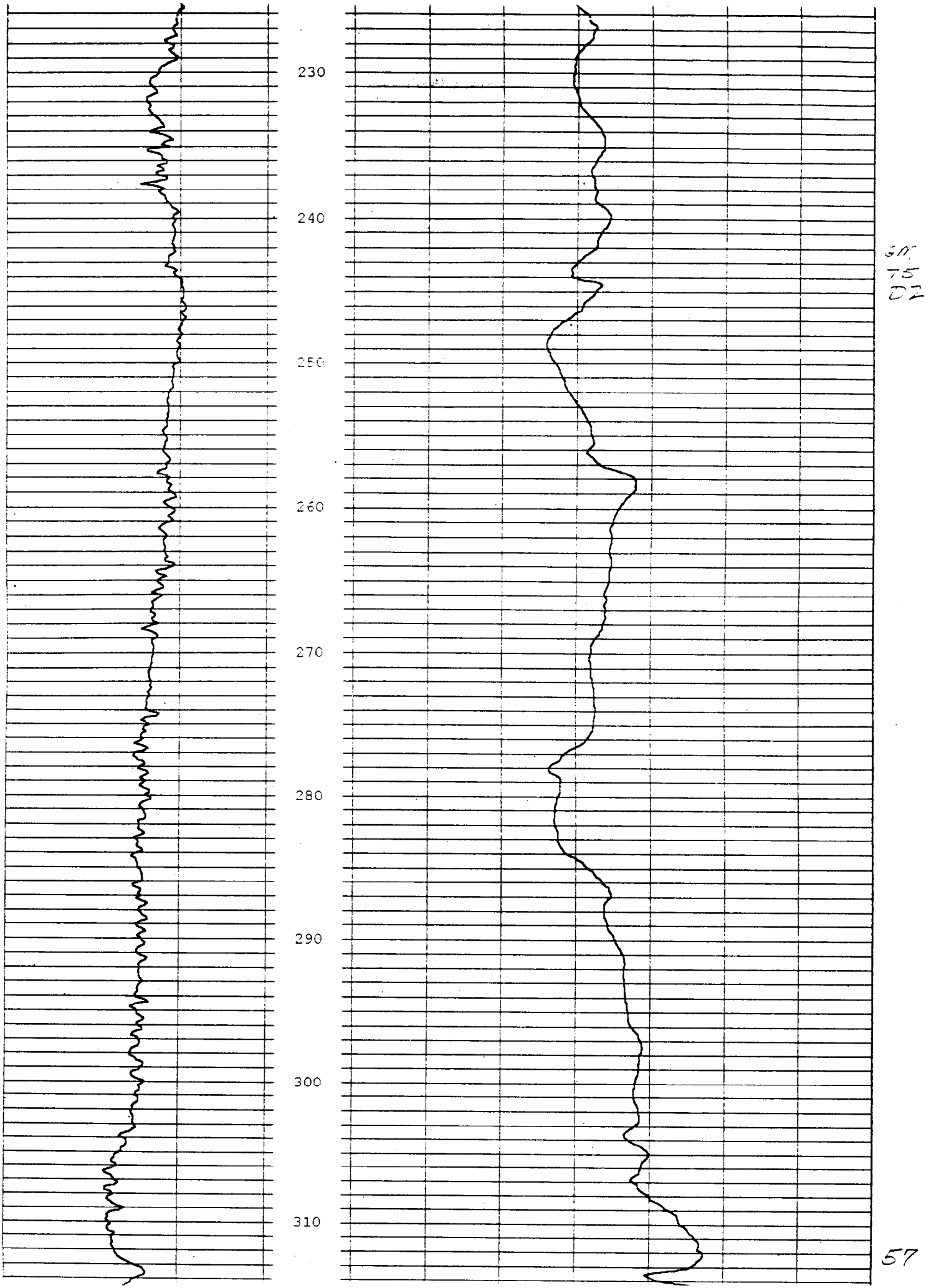
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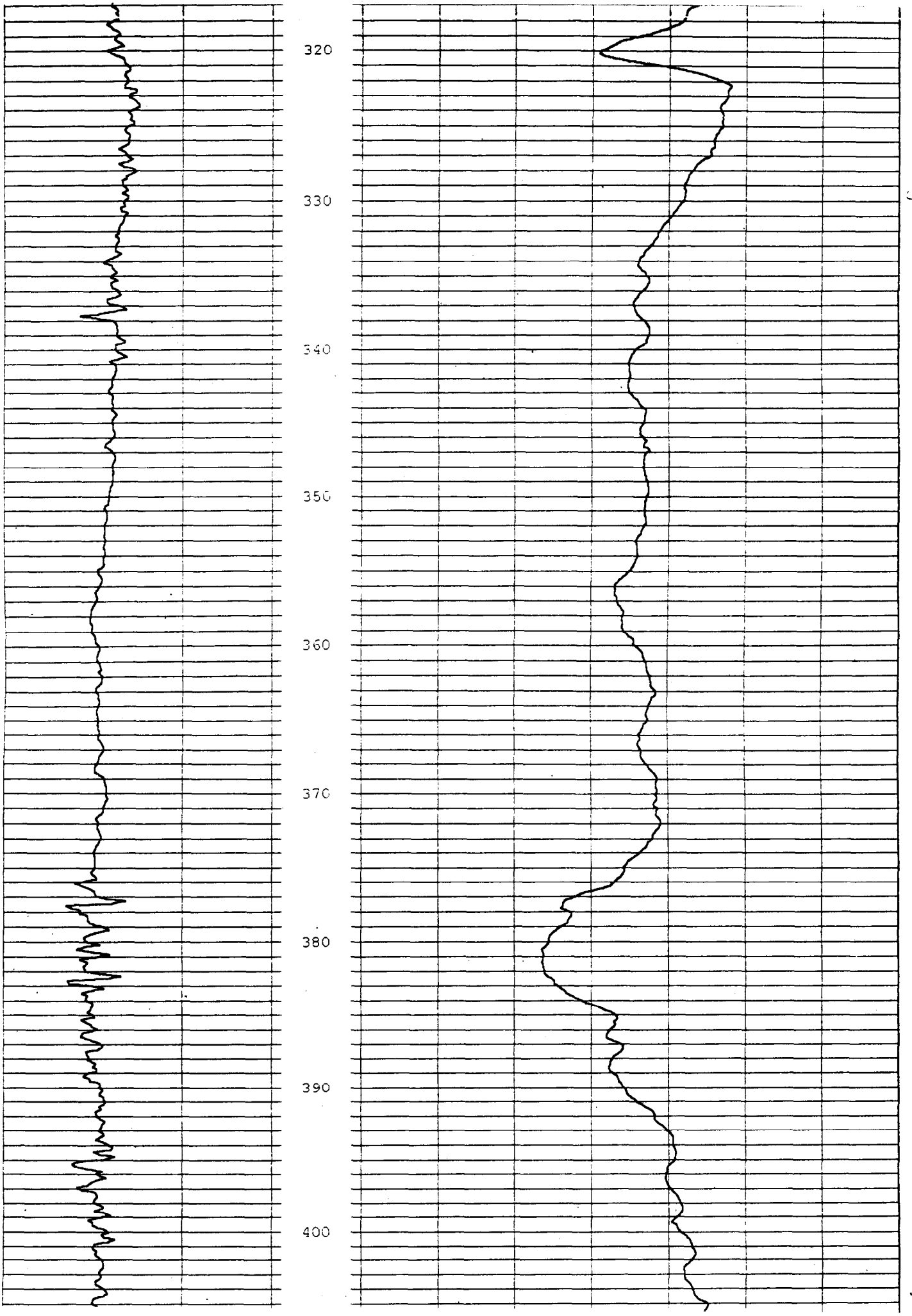
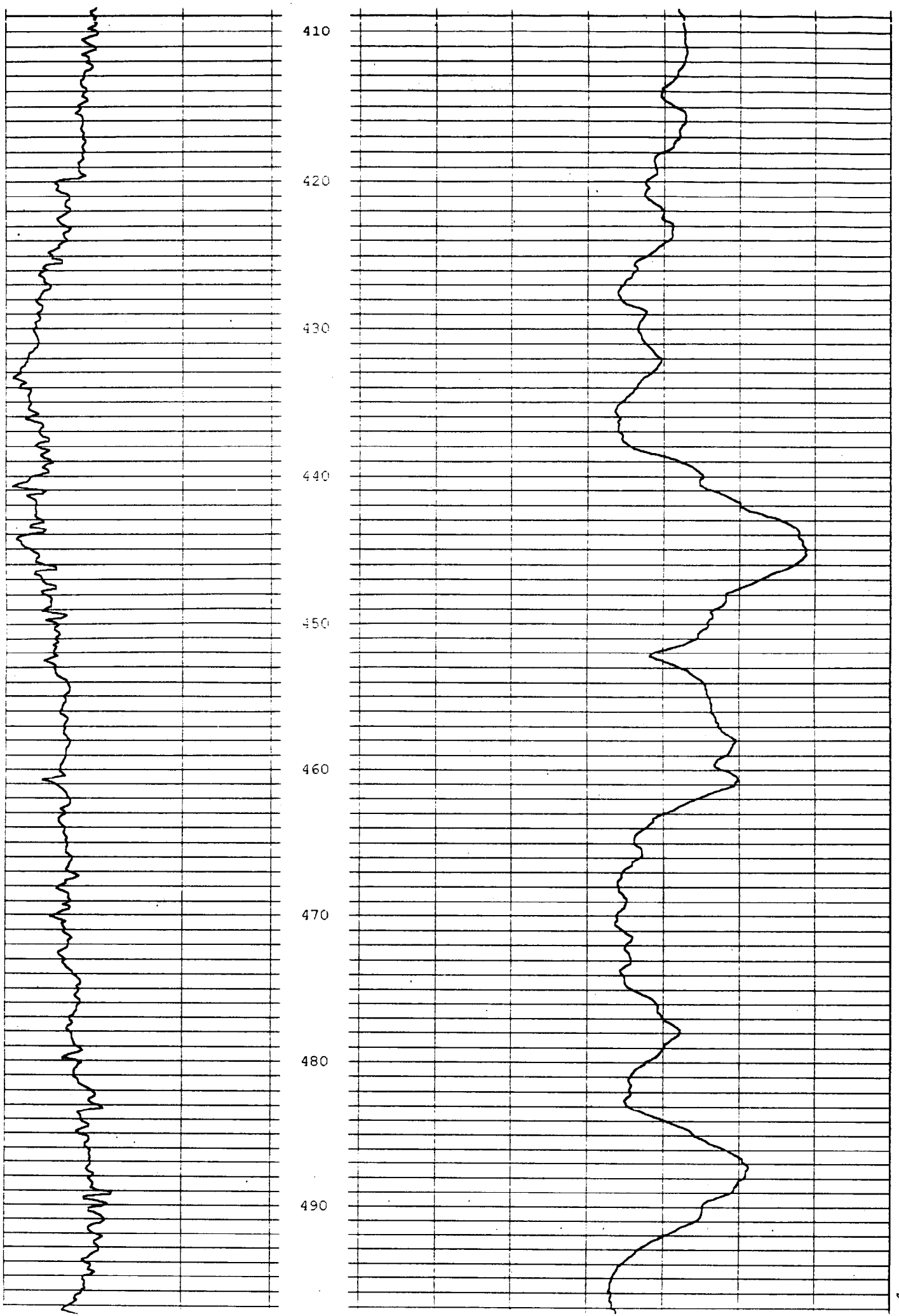


G11
75.
D2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D2
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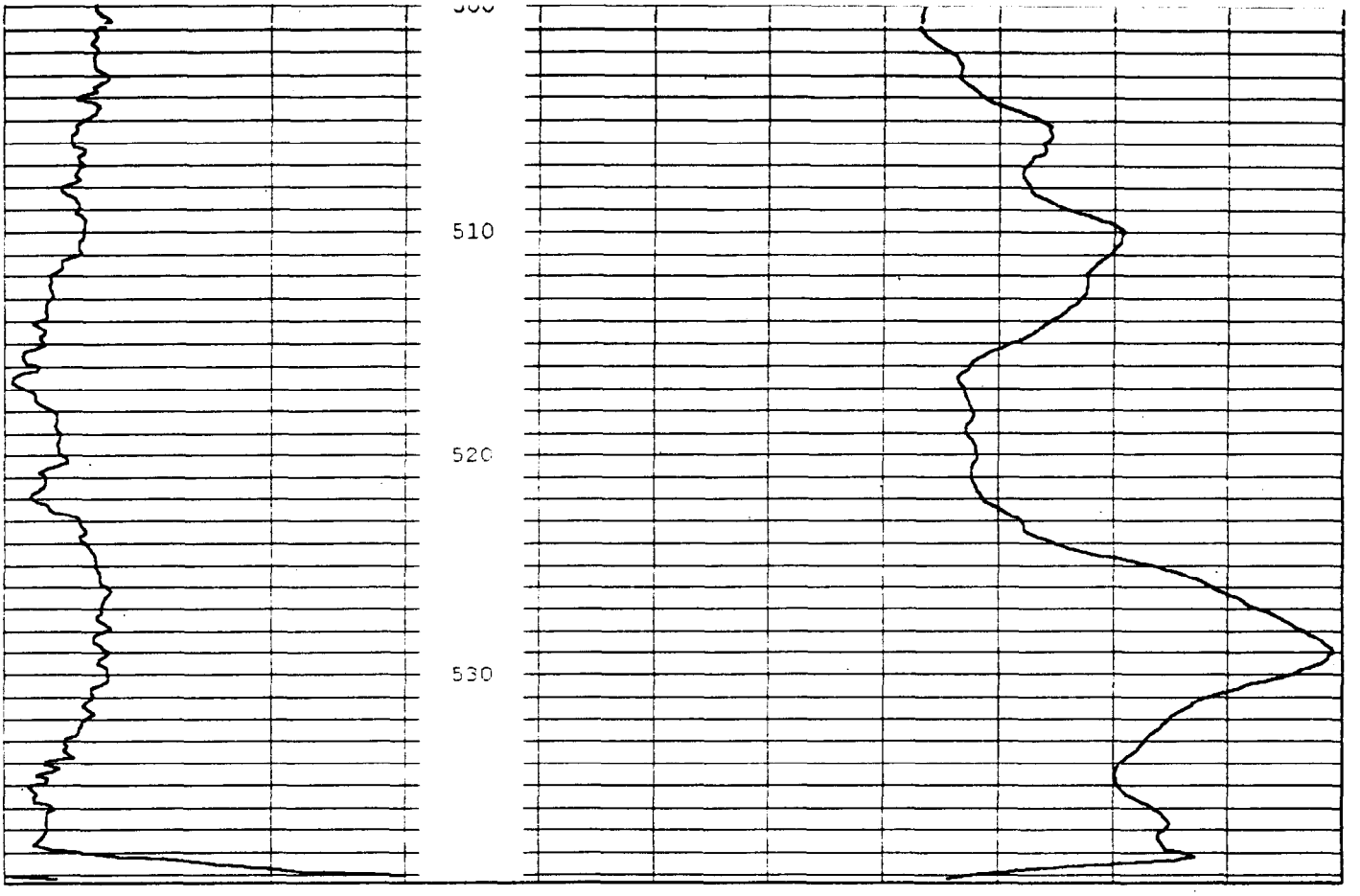

GM 757 — 60

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-75D2
Site: NWIRP Bethpage
Date Installed: _____
Date Developed: 4/17 → 4/20/01
Dev. Method: air lift / surge
Pump Type: _____

Depth to Bottom (ft.): _____
Static Water Level Before (ft.): 44.08
Static Water Level After (ft.): _____
Screen Length (ft.): 20
Specific Capacity: _____
Casing ID (in.): 4

Responsible Personnel: D. Whalen
Drilling Co.: UNITECH Drilling Co. Inc
Project Name: off-site drilling
Project Number: 4037

Time	~~Estimated Sediment Thickness~~ GPM ~~(Ft)~~	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.)
0926			44.08					start pumping
0929				15.0	8.34	.430	743	DO 9.01 Brown, turbid
0940				14.3	7.42	.213	>1000	DO 9.27 Brown gray
0950				14.4	7.21	.190	>1000	Brown gray
1000	13	500		14.5	7.20	.184	>1000	Milky brown
1010				14.5	7.18	.180	>1000	Light milky brown
1020	18	800		14.3	7.00	.171	>1000	Light brown
1030				14.5	7.06	.175	>1000	Milky brown
1040				14.8	7.05	.176	>1000	"
1050				15.1	7.12	.172	>1000	"
1100				15.3	7.21	.171	>1000	"
1112			44.09	15.2	7.14	.169	>1000	"
1122		1400		15.5	7.12	.166	944	"
1132		~~2400~~ gw		15.6	7.21	.167	896	"
1142	~~25~~ gw			15.6	7.23	.168	895	"
1152				15.3	7.19	.165	785	"
1201		~~2600~~ gw		15.1	7.16	.164	746	"
1211		2300		15.3	7.25	.163	680	Light gray/brown

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-75 D2
Site: NWIRP Bethpage
Date Installed: _____
Date Developed: 4/17 → 4/20/01
Dev. Method: air lift / mechanical / surge / submers. pump
Pump Type: _____
Depth to Bottom (ft.): _____
Static Water Level Before (ft.): 44.08
Static Water Level After (ft.): _____
Screen Length (ft.): 20
Specific Capacity: _____
Casing ID (in.): 4
Responsible Personnel: D. Whalen
Drilling Co.: Uni Tech Drilling Co. Inc.
Project Name: Off-site drilling
Project Number: 4037

Time	Pump Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (mS/cm)	D.O. (mg/L)	Turbidity (NTU)	Remarks (odor, color, etc.)
1211				15.1	7.36	.162		672	Lt. brown/gray
1224				—	—	—		—	Surge until 1230
1231				14.8	7.19	.170		>1000	gray color
1241				15.3	7.07	.159		>1000	gray
1251				14.8	7.13	.159		>1000	gray / lt. brown
1301				14.8	7.14	.159		>1000	lt. brown
1311				15.0	7.21	.158		909	lt. brown
1321				15.2	7.16	.157		753	"
1331	13	3000		15.[illegible]	7.04	.159		636	"
1341				15.9	7.07	.156		548	start surging, continue pumping
1351				16.3	7.24	.165		7000	stop surge gray
1401				16.2	7.17	.157		>1000	lt. gray
1411			44.12	16.3	7.27	.155		>1000	lt grey / brown
1421				16.1	6.92	.152		>1000	"
1431				17.2	6.92	.155		975	"
1441				15.5	7.28	.154		660	"
1451				15.2	7.26	.153		550	very "
1501				15.9	7.14	.156		530	very lt brown

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Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-75D2
Site: NWIRP Bethpage
Date Installed: _____
Date Developed: 4/17 → 4/20/01
Dev. Method: air lift/surge, submersible pump
Pump Type: _____

Depth to Bottom (ft.): _____
Static Water Level Before (ft.): 44.08
Static Water Level After (ft.): _____
Screen Length (ft.): 20
Specific Capacity: _____
Casing ID (in.): 4

Responsible Personnel: D. Whalen
Drilling Co.: Unitech Drilling Co. Inc.
Project Name: Off-site drilling
Project Number: 4037

Time	Estimated ~~Sediment Thickness~~ GPM ~~(Ft.)~~	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.)
1511	13	4000	44.10	15.1	7.27	.154	457	light brown
1521				14.9	7.27	.153	390	cloudy white start surge, continue pumping stop surge
1531				15.5	7.16	.153	>1000	lt. brown
1541				14.8	7.14	.153	>1000	lt gray/brown
1551				14.7	7.12	.153	>1000	lt. brown
1601				14.3	7.23	.152	>1000	lt. brown
1611				13.1	7.11	.157	608	cloudy gray
1621				14.7	7.37	.164	391	cloudy white
1631	13			14.8	7.17	.154	345	cloudy
1641				14.7	7.14	.154	272	"
1644		5000				~~.201~~	~~>1000~~	~~stop pumping~~
4/18 0740			43.89					start pumping
0747				14.2	6.65	.201	>1000	gray
0757				11.6	6.77	.160	797	lt. brown
0807				12.1	6.65	.155	401	cloudy
0817				13.1	6.53	.150	263	cloudy start surge
0827				11.6	6.55	.152	>1000	gray stop surge
0837				12.3	6.62	.152	>1000	lt. brown

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-75 D2
Site: NWIRP Bethpage
Date Installed: _____
Date Developed: 4/18
Dev. Method: air lift/surge, submersible pump
Pump Type: _____

Depth to Bottom (ft.): _____
Static Water Level Before (ft.): 44.08
Static Water Level After (ft.): _____
Screen Length (ft.): 20
Specific Capacity: _____
Casing ID (in.): 4

Responsible Personnel: D. Whalen
Drilling Co.: Uni Tech
Project Name: Off-site drilling
Project Number: 4037

Time	~~Estimated Sediment Thickness~~ GPM (ft.)	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.)
0847	15	6000		10.2	6.85	.149	580	cloudy gray
0857				12.7	6.43	.148	289	cloudy
0907				13.7	6.43	.147	210	cloudy
0917				11.7	6.51	.147	188	cloudy
0927				—	—	—	—	stop pumping tank full
0936				13.1	6.48	.146	157	resume pumping surge start
0940		7000		13.3	6.49	.158	>1000	lt. brown/gray surge stop
0950				13.5	6.57	.158	>1000	lt. brown/gray
1000				13.3	6.55	.147	437	cloudy lt brown
1010				14.4	6.56	.147	230	cloudy lt. brown
1020				14.4	6.63	.146	121	cloudy start surge
1030	17	8000		14.4	6.58	.147	>1000	lt. brown/gray stop surge
1040				14.7	6.58	.147	>1000	gray
1050			43.84	14.7	6.65	.148	378	cloudy
1100				14.6	6.90	.147	212	cloudy
1110				14.7	6.85	.147	185	cloudy start surge
1120				14.9	6.65	.147	>1000	lt. gray brown stop surge
1130		9000		14.8	6.92	.147	627	cloudy

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-75D2
Site: NWIRP Bethpage
Date Installed: _____
Date Developed: 4/17 → 4/20/01
Dev. Method: airlift/surge, submersible pump
Pump Type: _____

Depth to Bottom (ft.): _____
Static Water Level Before (ft.): 44.08
Static Water Level After (ft.): _____
Screen Length (ft.): 20
Specific Capacity: _____
Casing ID (in.): 4

Responsible Personnel: D. Whalen
Drilling Co.: Unitech
Project Name: off-site drilling
Project Number: 4037

Time	Estimated Sediment Thickness (Ft.)	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.)
1140	17			15.4	6.67	.147	310	
1150				15.0	6.75	.147	158	cloudy start surge
1200				15.1	6.84	.147	>1000	stop surge
1210				15.6	6.77	.148	415	
1213				—	—	—	—	stop pumping
1300				—	—	—	—	start pumping
1303				15.6	7.09	.153	173	start surge @ 1310
1320		10000	1	15.4	6.72	.147	>1000	stop surge
1330				15.1	6.70	.147	274	cloudy gray
1340				15.5	6.75	.145	160	slightly cloudy start surge
1350				15.0	6.88	.149	>1000	cloudy gray stop surge
1400	17	11000		15.7	6.75	.148	209	cloudy
1410			43.82	15.7	6.67	.147	85	sl. cloudy start surge
1420				15.7	6.68	.148	753	cloudy stop surge
1430				15.8	6.79	.146	122	clearing
1440				15.5	6.80	147	65	clearing full surge block up 2' 3'-5'
1450				15.5	6.91	.146	155	start surge
1500		12000		15.4	6.85	.148	>1000	stop surge

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-75D2
Site: NWIRP Bethpage
Date Installed:
Date Developed:
Dev. Method: air lift/surge, submersible pump
Pump Type:

Depth to Bottom (ft.):
Static Water Level Before (ft.): 44.08
Static Water Level After (ft.):
Screen Length (ft.): 20
Specific Capacity:
Casing ID (in.): 4

Responsible Personnel: D. Whalen
Drilling Co.: Uni Tech
Project Name: off-site drilling
Project Number: 4037

Time	~~Estimated Sediment Thickness~~ GPM (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1510	17		43.79	15.3	6.79	.149	277	cloudy
1520				15.3	6.86	.148	75	cloudy start surge
1530				15.4	6.55	.148	>1000	cloudy, lt. brown stop surge
1540				15.8	6.55	.148	300	cloudy
1550		13,000		15.4	6.73	.148	52	clearing start surge
1600				15.3	6.63	.148	>1000	v. cloudy End surge
1610				15.5	6.56	.148	192	cloudy
1620				15.0	6.63	.146	20	clear start surge
1630			43.79	15.0	6.47	.148	626	cloudy End surge
1640		14,000		14.8	6.53	.147	27	clear ~~start surge~~ pull up 2' 5-7
1650				14.8	6.58	.148	>1000	cloudy gray brown End surge
1700				14.7	6.61	.148	286	cloudy
1710				14.6	6.60	.150	56	start surge
1720	17			14.5	6.61	.148	>1000	lt. gray brown
1730				14.8	6.55	.149	131	cloudy
0736			43.00	14.6	6.34	.146	38	start pumping slightly cloudy lift 4' 7-1
0740				14.8	6.90	.154	856	v. cloudy
0750				15.2	6.67	.150	169	cloudy start surge continuous pumping

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Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-75 D2
Site: NWIRP Bethpage
Date Installed: _____
Date Developed: 4/17/01 → 4/20/01
Dev. Method: air lift/surge, ~~pump~~ submersible
Pump Type: _____

Depth to Bottom (ft.): _____
Static Water Level Before (ft.): 44.08
Static Water Level After (ft.): _____
Screen Length (ft.): 20
Specific Capacity: _____
Casing ID (in.): 4

Responsible Personnel: D. Whalen
Drilling Co.: Unitech Drilling Co. Inc
Project Name: off-site drilling
Project Number: 4037

Time	~~Estimated Sediment Thickness~~ 6PM (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
0810				15.3	6.54	.145	>1000	Stop surge BRN-Gray
0820				14.9	6.67	.142	826	cloudy
0830				14.7	6.58	.140	130	14. Brn cloudy
0840	17	16,000	~~16000 gal~~	14.6	6.79	.140	17	clear start surge
0850				14.9	6.60	.142	>1000	light Brn-Gray stop surge
0900				14.3	6.65	.143	192	
0910				15.0	6.40	.145	47	Slightly cloudy 1 ft 4"
0920				14.7	6.55	.148	150	start surge
0930				15.2	6.36	.146	>1000	light Brn-Gray stop surge
0940				14.6	6.62	.142	>1000	
0950				15.2	6.45	.142	262	
1000		17,000	~~17000 gal~~	15.1	6.47	.141	76	start surge
1010				15.3	6.35	.144	>1000	stop surge
1020				15.2	6.44	.139	>1000	
1030				15.2	6.47	.140	125	
1040				15.1	6.45	.141	8	clear start surge
1050				15.4	6.44	.144	>1000	stop surge
1100	17	18,000	~~18000 gal~~	15.1	6.43	.141	467	

11-15

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-75 D2
Site: NWIRP Bethpage
Date Installed: _____
Date Developed: 4/17 → 4/20/01
Dev. Method: air lift/surge, submersible pump
Pump Type: _____

Depth to Bottom (ft.): _____
Static Water Level Before (ft.): 44.08
Static Water Level After (ft.): _____
Screen Length (ft.): 20
Specific Capacity: _____
Casing ID (in.): 4

Responsible Personnel: D. Whalen
Drilling Co.: Uni-Tech
Project Name: off-site drilling
Project Number: 4037

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1110				15.3	6.41	.141	26	clear lift surge Block
1120				15.2	6.45	.141	15	clear start surge
1130				15.4	6.44	.146	936	light gray brown stop surge
1135				—	—	—	—	stop pumping - tank full
1305			43.15	16.1	6.67	.152	441	resume pumping start surge
1310	17	19,000		15.9	6.67	.146	>1000	light gray Brn stop surge
1320				15.7	6.58	.144	461	cloudy
1330				15.2	6.54	.144	72	
1340				15.5	6.52	.143	10	clear
1350				15.6	6.57	.141	976	surge entire screen
1400				15.7	6.37	.141	310	stop pumping Tank full
1420				15.6	6.51	.143	172	resume pumping
1430		20,000	43.41	15.8	6.50	.141	67	slightly cloudy
1435				15.8	6.36	.140	8	surge entire screen once clear
1445				15.7	6.38	.141	>1000	surge entire screen for 5 minutes
1455				15.2	6.32	.141	154	
1505	17	21,000		15.3	6.33	.140	9	clear END air lift development
0844								Start pumping with submers. pump @ 140'

4/20

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-75D2
Site: NWIRP Bethpage
Date Installed: _____
Date Developed: 4/17 → 4/20/01
Dev. Method: air lift/surge, submersible pump
Pump Type: _____

Depth to Bottom (ft.): _____
Static Water Level Before (ft.): 44.08
Static Water Level After (ft.): _____
Screen Length (ft.): 20
Specific Capacity: _____
Casing ID (in.): 4

Responsible Personnel: P. Whalen
Drilling Co.: Uni-Tech
Project Name: off-site drilling
Project Number: 4037

Time	~~Estimated Sediment Thickness~~ GPM (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
0845	12.5	20	40.81	15.7	7.15	.350	>1000	gray-brown
0855		150		16.0	7.31	.279	>1000	gray-brn 12.5 gpm
0905		300	39.45	16.0	5.37	.151	449	
0910		400	39.42	16.0	5.37	.148	184	lt. brown cloudy turn pump off for 30 sec
0925		550	39.40	16.2	5.55	.150	406	
0935		650	39.40	16.1	5.42	.147	159	lt. brown cloudy 12.5 gpm
0945		770	39.39	16.2	5.30	.145	77	cloudy
0950				16.2	5.34	.145	83	↓
0955				16.3	5.40	.145	148	
1000			39.38	16.0	5.46	.145	142	↓
1005								
1010		980	39.36	15.8	5.36	.145	151	pump off, tank full
1016			38.87	—	—	—	—	pump ON
1020			39.33	16.1	5.40	.144	104	cloudy
1025			39.33	16.0	5.38	.143	88	
1030				16.0	5.43	.145	145	
1035			39.31	16.0	5.39	.144	135	
1040	↓			15.8	5.40	.144	111	↓

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Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-75D2
Site: NWIRP Bethpage
Date Installed: _____
Date Developed: 4/17 → 4/20/01
Dev. Method: air lift/surge, submersible pump
Pump Type: _____

Depth to Bottom (ft.): _____
Static Water Level Before (ft.): 44.08
Static Water Level After (ft.): _____
Screen Length (ft.): 20
Specific Capacity: _____
Casing ID (in.): 4

Responsible Personnel: D. Whalen
Drilling Co.: Uni-Tech Drilling Co. Inc.
Project Name: Off-site drilling
Project Number: _____

Time	Estimated ~~Sediment Thickness~~ GPM ~~(Ft.)~~	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1045	12.5			16.1	5.39	.144	139	cloudy
1050	↓		39.29	16.1	5.40	.146	161	cloudy
1055				16.1	5.37	.144	143	raise pump up to 10' below static w
1100				16.3	7.90	.291	>1000	[redacted] brown-gray
1105			38.80	16.3	5.32	.147	62	slightly cloudy
1110				16.2	5.31	.143	7	clear
1115			38.79	16.3	5.25	.143	5	↓
1120				16.3	5.25	.143	4	
1125			38.78	16.4	5.26	.144	4	
1130				16.2	5.23	.143	5	pump off Development complete
1135	↓	2050	38.41	—	—	—	—	

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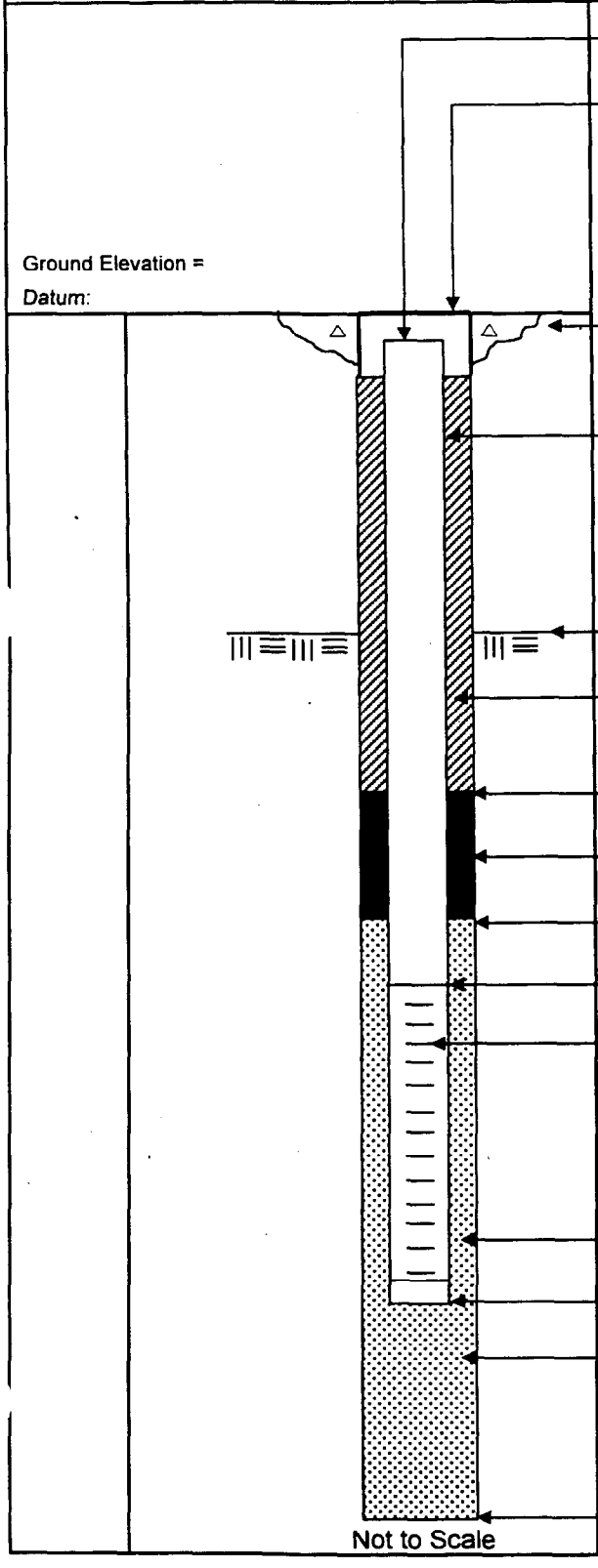
GM-78S

Tetra Tech NUS, Inc.

WELL No.: GM-78S

MONITORING WELL SHEET

PROJECT:	NWIRP Bethpage	DRILLING Co.:	Uni-Tech	BORING No.:	GM-78S
PROJECT No.:	4037	DRILLER:	R. Eastjack	DATE COMPLETED:	4/27/01
SITE:		DRILLING METHOD:		NORTHING:	
GEOLOGIST:	D. Whalen	DEV. METHOD:	submers. pump/surge	EASTING:	



Elevation / Depth of Top of Riser: 1

Elevation / Height of Top of Surface Casing: 1

I.D. of Surface Casing: 8"

Type of Surface Casing: Flush Mount

Type of Surface Seal: Concrete

I.D. of Riser: 4"

Type of Riser: Schedule 40 PVC

Borehole Diameter: 10"

Elevation / Depth Top of Rock: 1 NA

Type of Backfill: Bentonite (Volclay Bentonite Slurry)

Elevation / Depth of Seal: 1 3'

Type of Seal: Bentonite

Elevation / Depth of Top of Filter Pack: 1 52'

Elevation / Depth of Top of Screen: 1 60'

Type of Screen: Schedule 40 PVC

Slot Size x Length: 0.01" x 10'

I.D. of Screen: 4"

(No. 0 sand 52'-53')

Type of Filter Pack: No. 1 Sand

Elevation / Depth of Bottom of Screen: 1 70'

Elevation / Depth of Bottom of Filter Pack: 1 73'

Type of Backfill Below Well: NA

Elevation / Total Depth of Borehole: 1 73'

Tetra Tech NUS, Inc.

BORING LOG

Page 1 of 1

PROJECT NAME: NWFRP Beachpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: CME 85
BORING NUMBER: GM-78S
DATE: 4-26-01
GEOLOGIST: D. Whalen
DRILLER: R. Eastlack

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**
	0.0						Auger from 0' to 55' No split spoons collected						
S-1	55.0												
@ 1430		50 / 3"	6/12			light BRN	FGR to CGR sand and Gravel, tr. silt	GW	wet	0	0	0	0
	57.0												
S-2	60.0					light BRN	as above	GW	wet	0	0	0	0
@ 1500		30 / 44	9/16										
	62.0	50/4											
	65.0					light BRN	FGR to MGR sand tr. silt, some gravel (rounded quartz)	SP	wet	0	0	0	0
S-3 @ 1524		10 / 13	19/24										
	67.0	16 / 14											
	70.0												
S-4 @ 1541		10 / 14	24/24			light BRN	FGR to CGR sand some gravel, tr. silt	SW	WET	0	0	0	0
	72.0	13 / 15											

* 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): 0.0

Remarks: 8 1/4" HSA, 3"x24" split spoons

Converted to Well: Yes ✓ No _____ Well I.D. #: GM-78S

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-78S
Site: NWIRP Bethpage
Date Installed: 4/27/01
Date Developed: 5/2
Dev. Method: submers. pump /surge
Pump Type:

Depth to Bottom (ft.): 70
Static Water Level Before (ft.): 42.13
Static Water Level After (ft.): 42.20
Screen Length (ft.): 10
Specific Capacity:
Casing ID (in.): 4

Responsible Personnel: D. Whalen
Drilling Co.: Uni-Tech
Project Name:
Project Number: 4037

Time	Pump Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (mS/cm)	D.O. (mg/L)	Turbidity (NTU)	Remarks (odor, color, etc.)
1219			42.13						start pumping pump at bottom
1220	15			18.1	5.76	0.220	7.70	>1000	lt. Brown, silty
1230			49.40	17.4	5.99	0.230	6.86	>1000	lt. Brown
1240			49.35	17.2	5.97	0.235	6.84	638	
1242				17.0	5.83	0.227	7.14	>1000	surge lt. Brown
1250	↓		51.45	17.3	5.83	0.231	6.68	675	lt. Brown surge
1255	15	600	51.23	16.9	5.79	0.229	7.15	>1000	
1258									Pump off (tank full)
1332			42.16	17.6	5.87	0.226	7.26	>1000	pump on surge
1340			51.26	17.4	5.88	0.228	6.73	299	lt. Brown
1345			51.31	16.8	5.80	0.227	6.85	>1000	SURGE
1355			51.36	17.4	5.83	0.228	6.55	58	
1400				16.7	5.75	0.229	6.85	>1000	lt. BRN SURGE
1405			51.15	16.7	5.76	0.230	6.60	50	
1410				16.6	5.71	0.227	6.76	>1000	surge
1415			51.15	16.9	5.72	0.231	6.53	38	cloudy lift pump 3' surge
1420			50.80	16.7	5.69	0.228	6.64	>1000	
1425	↓		51.02	16.7	5.74	0.228	6.78	39	

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-78S
Site: NWIRP Bethpage
Date Installed: 4/27/01
Date Developed: 5/2
Dev. Method: submersible pump/surge
Pump Type: _____

Depth to Bottom (ft.): 70
Static Water Level Before (ft.): 42.13
Static Water Level After (ft.): 42.20
Screen Length (ft.): 10
Specific Capacity: _____
Casing ID (in.): 4

Responsible Personnel: D. Whalen
Drilling Co.: Uni-Tech
Project Name: _____
Project Number: 4037

Time	Pump Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (mS/cm)	D.O. (mg/L)	Turbidity (NTU)	Remarks (odor, color, etc.)
1428	15			16.5	5.65	0.228	7.50	>1000	lt. BRN SURGE
1435	↓		51.05	16.9	5.74	0.229	7.11	28	
1439	15	1600		17.1	5.69	0.231	6.36	16	clear pump off tank Full
1512			42.18	—	—	—	—	—	start pump lift 3' surge
1514	13.7			17.7	5.77	0.228	7.39	>1000	lt. Brn
1520			52.05	17.5	5.82	0.233	6.77	48	
1523				17.4	5.77	0.237	6.63	>1000	surge lt. BRN
1528			52.50	17.5	5.84	0.237	6.81	56	
1530				16.8	5.75	0.236	6.70	>1000	surge lt. BRN
1535			52.63	17.2	5.78	0.237	6.71	59	
1540			52.63	17.1	5.77	0.237	6.54	24	clear
1545				17.4	5.75	0.237	6.67	17	clear lower pump to bottom and surge
1549				16.7	5.76	0.241	6.58	>1000	lt. BRN
1554			51.2	17.1	5.80	0.239	6.80	32	
1559			51.20	16.8	5.74	0.240	6.83	19	clear
1604			51.21	17.0	5.78	0.239	6.83	14	
1609				17.1	5.75	0.240	6.83	12	clear lift pump to ~2' above screen
1615	↓			17.0	5.75	0.228	6.29	>1000	

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Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-78S
Site: NWIRP Bethpage
Date Installed: 4/27/01
Date Developed: 5/2
Dev. Method: submers. pump / surge
Pump Type:

Depth to Bottom (ft.): 70
Static Water Level Before (ft.): 42.13
Static Water Level After (ft.): 42.20
Screen Length (ft.): 10
Specific Capacity:
Casing ID (in.): 4

Responsible Personnel: D. Whalen
Drilling Co.: UniTech
Project Name:
Project Number: 4037

Time	Pump Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (mS/cm)	D.O. (mg/L)	Turbidity (NTU)	Remarks (odor, color, etc.)
1620				17.0	5.80	.239	6.48	18	clear
1625	13.7	2600		17.1	5.78	0.241	6.37	11	clear stop pumping tank full
~~162~~									

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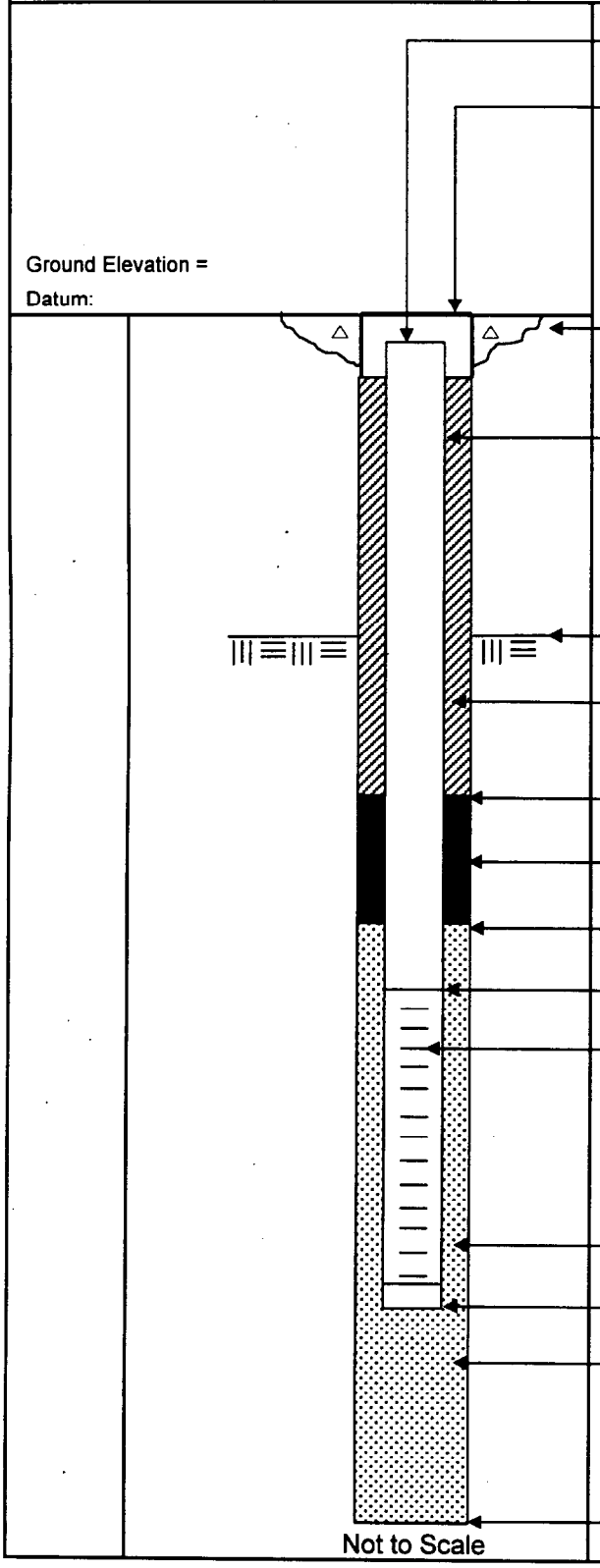
GM-78I

Tetra Tech NUS, Inc.

WELL No.: GM-78I

MONITORING WELL SHEET

PROJECT:	NWIRP Bethpage	DRILLING Co.:	Uni-Tech	BORING No.:	GM-78I
PROJECT No.:	4037	DRILLER:	R. Eastlack	DATE COMPLETED:	4/26/01
SITE:		DRILLING METHOD:		NORTHING:	
GEOLOGIST:	D. Whalen	DEV. METHOD:	submers. pump/surge	EASTING:	



- Elevation / Depth of Top of Riser: 1
- Elevation / Height of Top of Surface Casing: 1
- I.D. of Surface Casing: 8"
- Type of Surface Casing: Flush Mount
- Type of Surface Seal: Concrete
- I.D. of Riser: 4"
- Type of Riser: Schedule 40 PVC
- Borehole Diameter: 10"
- Elevation / Depth Top of Rock: 1 NA
- Type of Backfill: Bentonite (Volclay Bentonite slurry)
- Elevation / Depth of Seal: 1 3'
- Type of Seal: Bentonite
- Elevation / Depth of Top of Filter Pack: 1 82'
- Elevation / Depth of Top of Screen: 1 89.5'
- Type of Screen: Schedule 40 PVC
- Slot Size x Length: 0.01" x 20'
- I.D. of Screen: 4" (No. 0 sand 82'-83')
- Type of Filter Pack: No. 1 sand
- Elevation / Depth of Bottom of Screen: 1 109.5'
- Elevation / Depth of Bottom of Filter Pack: 1 112'
- Type of Backfill Below Well: NA
- Elevation / Total Depth of Borehole: 1 112'

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Uni-Tech
DRILLING RIG: CME 85
BORING NUMBER: GM-78I
DATE: 4/23 →
GEOLOGIST: Don Whalen
DRILLER: Rich Eastlack

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**
1350	0.0	/				BRN	silty sand, some gravel grass roots		damp	0			
		/											
		/											
		10 / 17	6"										
S-1 @ 1605	10.0	19 / 10	/24"			M. BRN	FGR to CGR sand and gravel, tr. silt	SW/GW	damp	0	0	0	0
		/											
		/											
		/											
S-2 @ 1630	20.0	75 / 50/2	4" / 8"			M. BRN	FGR to CGR sand and rounded qtz gravel Tr. silt	SW/GW	damp	0	0	0	0
		/											
		/											
		/											
S-3 @ 1655	30.0	4" / 50/3	4" / 9"			Light BRN	aa	SW/GW	moist	0	0	0	0
4/24		/											
		/											
		/											
S-4 @ 0840	40.0	18 / 50/2	6" / 8"			Light BRN	as above	SW/GW	moist	0	0	0	0
		/											
		/											
		/											
S-5 @ 0905	50.0	26 / 50/4	8" / 10"			Light BRN	as above	SW/GW	wet	0	0	0	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): 0.0

Remarks: CME 85 rig; 8¼ HSA; 2" x 24" split spoons

Converted to Well: Yes ✓ No _____ Well I.D. #: GM-78I

Tetra Tech NUS, Inc.

BORING LOG

Page 2 of 3

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N4037
DRILLING COMPANY: Unitech
DRILLING RIG: CME 85
BORING NUMBER: GM-78I
DATE: 4/23 →
GEOLOGIST: D. Whalen
DRILLER: Rich Eastlack

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-6		9 / 9	11/24			Light Orange BRN							
@ 0928	60.0	14 / 6					FGR sand, trace silt some pebbles	SP	v. pt	0	0	0	0
S-7		20 / 15				Light							
@	70.0	5#1" / —				Orange BRN	FGR to MGR sand, tr. silt some gravel (rounded quartz)	SP	WET	0	0	0	0
S-8		3 / 5	14/24			Light							
@ 1210	80.0	7 / 6				Orange BRN	FGR to MGR sand, some silt, some gravel	SP	WET	0	0	0	0
S-9	85	2 / 3	9/24			Light Brown	FGR to CGR sand	SW	WET	0	0	0	0
@ 1244	87	5 / 7				TAN	tr. silt, some gravel						
	90.0												
S-10		3 / 2	8/24			light BRN	FGR sand, tr. silt	SP	WET	0	0	0	0
@ 1308	92	5 / 6											
S-11	95	3 / 5	10/24			light BRN	FGR to CGR sand tr. to some silt, some gravel	SW	wet	0	0	0	0
@ 1325	97	7 / 11											

* 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): 0.0

Converted to Well: Yes ✓ No ____ Well I.D. #: GM-78I

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER:
DRILLING COMPANY:
DRILLING RIG:

BORING NUMBER: GM-78I
DATE: 4-24-01
GEOLOGIST:
DRILLER:

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-12 @ 1502	100 / 102	3 / 7 / 9 / 14	16 / 24			light Brn	FGR sand, some gravel tr. silt	SP	wet	0	0	0	0
S-13 @ 1518	105 / 107 / 110.0	2 / 4 / 5 / 7	8 / 24			light BRN	FGR to MGR sand tr. silt, some pebbles	SP	wet	0	0	0	0
S-14 @ 1545	112	4 / 5 / 7 / 17	11 / 24			light BRN	FGR to MGR Sand some silt, some gravel	SP	wet	0	0	0	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): 0.0

Remarks:

Converted to Well: Yes ✓ No ____ Well I.D. #: GM-78I

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-78I
Site: NWIRP Bethpage
Date Installed: 4/26/01
Date Developed: 4/30-
Dev. Method: submers. pump/surge
Pump Type: _____

Depth to Bottom (ft.): _____
Static Water Level Before (ft.): 42.28
Static Water Level After (ft.): _____
Screen Length (ft.): 20
Specific Capacity: _____
Casing ID (in.): 4

Responsible Personnel: D. Whalen
Drilling Co.: Uni-Tech
Project Name: _____
Project Number: 4037

Time	Pump Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (mS/cm)	D.O. (mg/L)	Turbidity (NTU)	Remarks (odor, color, etc.)
1330			42.28						START Pumping; pump ~1' off bottom
1335	13	~~3~~	43.18	18.4	5.90	.383	8.02	>1000	Light Brown
1345	↓		43.17	17.1	5.83	.371	7.06	668	Light Brown
1355			43.17	16.9	5.80	.367	7.07	109	cloudy surge for 2min.
1400				16.5	5.78	.362	7.62	>1000	Light Brown
1410			43.10	16.6	5.67	.367	6.67	>1000	Light Brown
1420			43.11	16.7	5.74	.367	6.18	518	Light Brown
1430	↓		43.11	16.2	5.70	.367	6.42	193	cloudy surge for 2min.
1435		950							pump off
1527									start pump surge for 2min
1530	16		43.07	16.6	5.69	.364	7.36	>1000	Light Brown
1540			43.08	16.4	5.71	.368	6.78	>1000	Light Brown
1550			43.08	16.3	5.66	.368	6.40	229	cloudy surge for 2min
1555			43.06	16.3	5.59	.364	7.10	>1000	lt. Brown
1600			43.06	16.2	5.59	.367	6.27	745	lt. Brown
1605			43.06	16.1	5.61	.367	6.33	132	cloudy
1615			43.06	16.1	5.58	.370	6.28	42	slightly cloudy
1620	↓			16.2	5.60	.368	7.19	>1000	Lt. Brn

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-78I
Site: NWIRP Bethpage
Date Installed: 4/26/01
Date Developed: 4/30-
Dev. Method: submersible pump/surge
Pump Type: _____

Depth to Bottom (ft.): _____
Static Water Level Before (ft.): 42.28
Static Water Level After (ft.): _____
Screen Length (ft.): 20
Specific Capacity: _____
Casing ID (in.): 4

Responsible Personnel: D. Whalen
Drilling Co.: Vni-Tech
Project Name: _____
Project Number: 4037

Time	Pump Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (mS/cm)	D.O. (mg/L)	Turbidity (NTU)	Remarks (odor, color, etc.)
1625	16		43.06	15.9	5.59	.367	6.47	791	Light Brown
1630		1950	42.32						pump off Tank Full
5/1/01 0827	14		42.33						start pumping SURGE for
0830			43.16	16.8	5.98	.394	7.40	>1000	light Brown
0840			43.13	16.5	5.77	.381	6.52	484	light Brn.
0850			43.13	17.0	5.82	.377	6.61	141	cloudy lift pump 4' surge for 2min
0855			43.13	16.7	5.80	.372	6.94	>1000	lt. Brown
0905			43.11	16.8	5.82	.375	6.82	104	cloudy
0915			43.11	17.1	5.89	.377	6.94	22	clear surge for 2min
0920	↓		43.11	17.4	5.82	.367	6.97	>1000	H. Brn
0935	14		43.12	16.7	5.88	.378	6.29	97	cloudy
0937		2950		~~or 17.9~~	~~5.87~~	~~.373~~	~~7.13~~	~~449~~	pump off tank full
1020	13		43.09	17.9	5.87	.373	7.13	449	pump on
1030			43.09	17.0	5.88	.376	7.15	44	lift 4', surge
1040				17.0	5.82	.363	7.51	>1000	
1050				16.5	5.88	.376	6.71	168	
1100			43.23	16.7	5.79	.379	6.41	27	
1105	↓		43.25	16.7	5.74	.376	7.56	>1000	light Brown surge

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-78I
Site: NWIRP Bethpage
Date Installed: 4/26/01
Date Developed: 4/30 -
Dev. Method: Eckmers. pump/surge
Pump Type: _____

Depth to Bottom (ft.): _____
Static Water Level Before (ft.): 42.28
Static Water Level After (ft.): _____
Screen Length (ft.): 20
Specific Capacity: _____
Casing ID (in.): 4

Responsible Personnel: D. Whalen
Drilling Co.: Uni-Tech
Project Name: _____
Project Number: _____

Time	Pump Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (mS/cm)	D.O. (mg/L)	Turbidity (NTU)	Remarks (odor, color, etc.)
1110			43.25	16.6	5.86	.381	6.59	459	light Brn
1170		3750		17.0	5.80	.381	5.83	57	cloudy pump off
1245			42.34						pump on
1250	15		43.21	18.1	5.79	.390	7.32	89	sl. cloudy
1300			43.21	17.4	5.92	.382	6.92	22	clear lift pump 4' and surge
1305			43.40	17.1	5.81	.368	7.43	>1000	lt. Brn.
1315			43.40	16.9	5.84	.378	6.75	280	lt. Brn
1320			43.40	16.9	5.77	.380	7.50	>1000	lt. Brn surge
1330			43.42	17.1	5.84	.380	6.78	63	cloudy lift 4' and surge
1335				17.0	5.74	.367	7.75	>1000	lt. Brn
1345	↓		44.49	16.9	5.87	.380	6.47	88	
1352	15	4750		17.4	5.87	.378	6.50	32	pump off
1433			42.37						Start pump lift 4' and surge
1435	15		43.52	17.7	5.87	.379	7.45	>1000	lt. BRN
1445			43.49	17.9	5.90	.380	6.85	52	cloudy
1450			43.48	17.1	5.82	.376	7.09	>1000	lt. BRN surge
1500			43.48	17.4	5.85	.375	6.68	36	clear
1505	↓			17.6	5.80	.375	6.73	12	clear

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Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-78I
Site: NWIRP Bethpage
Date Installed: 4/26/01
Date Developed: 4/30-
Dev. Method: submers. pump/surge
Pump Type: _____

Depth to Bottom (ft.): _____
Static Water Level Before (ft.): 42.28
Static Water Level After (ft.): _____
Screen Length (ft.): 20
Specific Capacity: _____
Casing ID (in.): 4

Responsible Personnel: D whalen
Drilling Co.: Uni-Tech
Project Name: _____
Project Number: 4037

Time	Pump Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (mS/cm)	D.O. (mg/L)	Turbidity (NTU)	Remarks (odor, color, etc.)
1510	15		43.55	16.9	5.75	.370	7.72	>1000	surge lt. BRN
1520				17.5	5.84	.379	7.12	35	
1525			43.51	16.9	5.81	.372	7.82	>1000	surge H. BRN
1535			43.50	17.7	5.87	.379	7.24	62	slightly cloudy
1540	15	5750		17.7	5.80	.379	7.02	17	clear pump off Tank Full
1618			43.50	17.7	5.85	.370	7.45	>1000	Start pump ~~lower~~ lower pump 4', surge
1630			43.46	17.9	5.88	.376	6.60	62	slightly cloudy
1635				17.7	5.86	.379	6.81	37	clear
1640				17.7	5.81	.379	6.56	15	clear lower pump 4'
1645				16.9	5.73	.378	7.43	>1000	and surge H. Brn
1655			43.49	17.0	5.83	.378	6.63	74	sl. cloudy ~~clear~~
1700				17.1	5.77	.378	6.75	31	clear lower pump 4' and
1705			43.37	16.8	5.67	.380	7.54	>1000	surge H. BRN
1715			43.35	16.9	5.88	.380	6.51	≈5	clear
1725	15	6750		17.2	5.75	.378	6.50	8	clear stop pumping Tank Full
5/2 0840			42.40						Start pumping ~1' above bottom
0841				16.6	5.71	.384	7.30	>1000	surge
0850			43.34	16.5	5.70	.377	7.10	99	

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-78I
Site: NWIRP Bethpage
Date Installed: 4-26-01
Date Developed: 4/30 – 5/2/01
Dev. Method: submersible pump/surge
Pump Type:

Depth to Bottom (ft.):
Static Water Level Before (ft.): 42.28
Static Water Level After (ft.):
Screen Length (ft.): 10
Specific Capacity:
Casing ID (in.): 4

Responsible Personnel: K. Whalen
Drilling Co.: Uni-Tech
Project Name:
Project Number: 4037

Time	Pump Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (mS/cm)	D.O. (mg/L)	Turbidity (NTU)	Remarks (odor, color, etc.)
0900	15		43.35	16.5	5.68	.376	6.91	23	clear
0910	↓		43.35	16.9	5.77	.377	7.06	14	clear
0920			43.35	17.2	5.75	.379	7.09	11	clear
0925			43.36	17.1	5.74	.376	6.32	5	clear
0932				17.1	5.75	.372	7.78	>1000	lift pump up 35'
0937			43.60	16.9	5.78	.375	7.15	975	lt. BRN
0942	↓			17.0	5.76	.376	6.81	52	
0947	15	7750		—					stop pump tank full
~~1035~~ 10 35			42.48	20.4	5.92	.369	7.61	664	start pumping
1040				17.7	5.91	.379	8.15	35	clear
1045				17.6	5.85	.379	7.27	14	clear
1053			43.53	17.0	5.86	.378	7.36	>1000	lift pump up to 25' below static
1058				17.1	5.84	.380	6.84	40	
1103		8150	43.54	17.2	5.80	.379	6.24	14	stop pumping
									Development complete

GM-78I

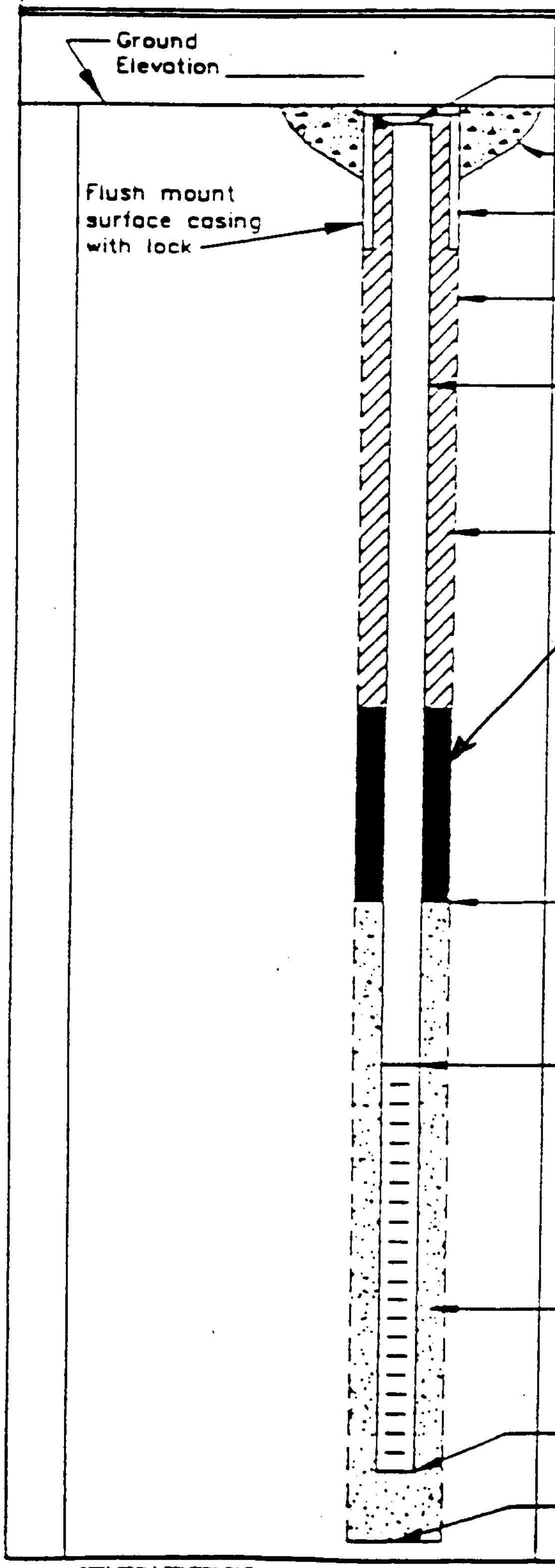
GM-79I

BORING NO.: GM-79I

Tetra Tech NUS, Inc.

MONITORING WELL SHEET

PROJECT: NWIRP Bethpage	LOCATION: Off-Site	DRILLER: J. Evans
PROJECT NO.: 0565	BORING: GM-79I	DRILLING METHOD: Mud Rotary
ELEVATION:	DATE: 11/1/00	DEVELOPMENT METHOD: Air Lift
FIELD GEOLOGIST: S. Ngil		



ELEVATION TOP OF RISER:

TYPE OF SURFACE SEAL: Concrete

TYPE OF PROTECTIVE CASING: Flush mount cover

I.D. OF PROTECTIVE CASING: 8"

DIAMETER OF HOLE: 8"

TYPE OF RISER PIPE: Sch 80 PVC (4" Diameter)

RISER PIPE I.D.: 3 7/8"

TYPE OF BACKFILL/SEAL: Volclay Bentonite Grout / Cetco Pure Gold Bentonite Slurry (164' – 159')

DEPTH/ELEVATION TOP OF SAND: 164' /

DEPTH/ELEVATION TOP OF SCREEN: 170' /

TYPE OF SCREEN: Sch 80 PVC (4" Diameter)

SLOT SIZE x LENGTH: 0.010" x 10'

TYPE OF SAND PACK: Filpro #1 Sand to 165' / Filpro #0 sand to 164'

DIAMETER OF HOLE ~~IN BEDROCK~~ (Sand): 8"

DEPTH/ELEVATION BOTTOM OF SCREEN: 180' /

DEPTH/ELEVATION BOTTOM OF SAND: 185' /

DEPTH/ELEVATION BOTTOM OF HOLE: 185' /

BACKFILL MATERIAL BELOW SAND: Filpro #1 Sand

ACFILE: L670\GEOL\OBWELL.DWG

BORING LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NWIRP BETHPAGE
PROJECT NUMBER: N0565
DRILLING COMPANY: UNI-TECH
DRILLING RIG: FAILING 150
BORING NUMBER: GM-79I
DATE: 10/31/00
GEOLOGIST: S. NEIL
DRILLER: J. 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	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	Remarks	PID Reading (ppm): Sample	PID Reading (ppm): Sampler BZ	PID Reading (ppm): Borehole**	PID Reading (ppm): Driller BZ**	USCS *
0955	4					BRN/ OR	Silty sand w/ some pea-size gravel.		0	0	0	0	SM/ GW
0958	10					BRN/ OR	pea-size gravelly sand, some silt.		0	0	0	0	GW
1003	20					BRN/ OR	pea-size gravelly sand, trace silt, trace 1/4"-1/2" gravel.		0	0	0	0	GP
1007	30					BRN/ OR	Sandy gravel (gravel approaches 1").		0	0	0	0	GP
1014	40					BRN	Silty course sand, trace large (1") gravel.		0	0	0	0	SM
1020	50					BRN	med sand, trace gravel (1/4")		0	0	0	0	SW

* 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. #: GM-79I

BORING LOG

Tetra Tech NUS, Inc.

OJECT NAME: NWIRP BETHPAGE
PROJECT NUMBER: N0565
DRILLING COMPANY: UNI-TECH
DRILLING RIG: FAILING 150

BORING NUMBER: GM-79I
DATE: 10/31/00
GEOLOGIST: S. NEIL
DRILLER: J. 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	Remarks	PID Reading (ppm): Sample	Sampler BZ	Borehole*	Driller BZ**	USCS*
1045	60					BRN	silty med-coarse sand,		0	0	0	0	SM
							trace pea-size gravel.						
17	70					BRN	med-coarse sand, trace silt.		0	0	0	0	SM
1100	80					BRN	silty orange sand (fine-med),		0	0	0	0	SM
							trace small angular gravel.						
1104	90					BRN	same as above without		0	0	0	0	SM
							gravel.						
1120	100					BRN	silty fine sand,		0	0	0	0	SM

* 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): 0.0

Converted to Well: Yes x No

Well I.D. #: GM-79I

BORING LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NWIRP BETHPAGE
PROJECT NUMBER: N0565
DRILLING COMPANY: UNI-TECH
DRILLING RIG: FALING 180
BORING NUMBER: GM-79I
DATE: 10/31/00
GEOLOGIST: S. NAIL
DRILLER: J. 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	Remarks	PID Reading (ppm): Sample	Sampler BZ	Borehole*	Driller BZ**	USCS*
1124	110					BRN	silty fine sand, trace		0	0	0	0	SM
							pea-size gravel.						
1256	120					BRN	silty fine-med sand, trace		0	0	0	0	SM
							white clay						
1259	130					BRN	same as above		0	0	0	0	SM
1311	140					BRN	clayey (white) gravel, some		0	0	0	0	GC
							silty sand.						
1314	150					BRN	gravelly med-coarse sand		0	0	0	0	SP

* 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): 0.0

Converted to Well: Yes X No

Well I.D. #: GM-79I

BORING LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NWIRP BETHPAGE
PROJECT NUMBER: N0565
DRILLING COMPANY: UNI-TECH
DRILLING RIG: FAILING 1500
BORING NUMBER: GM-79I
DATE: 10/31/00
GEOLOGIST: S. NEIL
DRILLER: J. 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	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	Remarks	PID Reading (ppm): Sample	PID Reading (ppm): Sampler BZ	PID Reading (ppm): Borehole**	PID Reading (ppm): Driller BZ**	USCS*
S-1 C	160					BRN/ TAN	Silty fine sand, some silty		0	0	0	0	SM/
1355	161	17/10	20			TAN/ Gray	sandy clay.						CL
	162	10/12	24										
S-2 C	165					TAN/ BRN	Silty clay w/ OR mottling		0	0	0	0	CL
1440	166	12/18	18			TAN							
	167	25/31	24										
							"clay-like" drilling to 167'						
S-3 C	170	54/100	4			LT. BRN	fine-med sand		0	0	0	0	SP
1507	171	over 2	8										
	172												
S-4 C	175												
1526	176	51/100	4			LT. BRN	same as above		0	0	0	0	SP
	177	over 4	10										
S-5 C	180					LT. BRN	fine-med sand trace OR mottling		0	0	0	0	SP
1546	181	54/100	5										
	182	over 6	12				End of borehole @ 180'.						

* When rock coring, enter rock brokeness.

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

marks:

Drilling Area Background (ppm): 0.0

Converted to Well: Yes X No

Well I.D. #: GM-79I

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-79 I
Site: NWIRP
Date Installed: _____
Date Developed: 11/15-16/00
Dev. Method: Submersible
Pump Type: Grunfos 3"

Depth to Bottom (ft.): 190
Static Water Level Before (ft.): 43.5
Static Water Level After (ft.): 43.4
Screen Length (ft.): 10
Specific Capacity: _____
Casing ID (in.): 4

Responsible Personnel: D. Streetsmith (TTEMI) J. Evans (UTD)
Drilling Co.: Uni-Tech Drilling
Project Name: CTO 0208
Project Number: N0578 5-0260

Time	Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Remarks (odor, color, etc.)
1500	12gpm	10	50.8	14.9	7.10	0.282	>1000	7.56	brn, v cloudy, muddy pump at top of screen
1515			48.6	15.0	5.28	0.148	>1000	4.55	brn, v. cloudy
1530			48.0	15.2	5.03	0.133	371	3.56	brn, cloudy + lower pump to bottom
1545			46.7	15.3	4.90	0.127	19	3.44	clear - surge lower 4'
1600			46.1	15.3	4.95	0.126	93	3.99	clear - move to 188'
1615			45.8	15.1	4.89	0.125	13	3.28	clear - surge mid 4'
1625			45.6	15.2	4.95	0.124	12	5.01	clear - move to 186'
1635			45.5	15.2	4.93	0.126	67	3.09	slightly cloudy
1645			45.5	15.3	4.84	0.125	41	3.56	slightly cloudy surge - move to 184
11/15 1655		1500	45.4	15.2	4.92	0.126	181	4.47	cloudy
11/16 0730	—	—	43.3	—	—	—	—	—	—
0745	10gpm		45.2	15.2	5.61	0.167	>1000	4.44	v. cloudy, brn - pump at bottom
0800			45.2	15.3	4.92	0.130	16	3.49	clear - surge well move to 182'
0815			45.2	15.3	4.76	0.128	10	3.31	clear
0830			45.2	15.4	4.78	0.126	6	3.29	clear - surge well, move to 180'
0845			45.1	15.5	4.74	0.126	8	3.25	clear
0900			45.1	15.5	4.74	0.126	1	3.51	clear - surge well move to 190'
0910			45.1	15.6	4.70	0.126	5	3.29	clear surge well

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-79I
Site: NWIRP
Date Installed: _____
Date Developed: 11/15-16/00
Dev. Method: Submersible
Pump Type: grundfos

Depth to Bottom (ft.): 190
Static Water Level Before (ft.): 43.5
Static Water Level After (ft.): 43.4
Screen Length (ft.): 10
Specific Capacity: _____
Casing ID (in.): 4

Responsible Personnel: D Streetsmith, J Evans
Drilling Co.: UTD
Project Name: CTO-0208
Project Number: N0565

Time	Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Remarks (odor, color, etc.)
0920	10gpm	↓	45.0	15.6	4.76	0.126	2	3.97	clear - surge well
0930	↓	↓	45.0	15.5	4.75	0.126	1	4.02	clear - surge well
0940	↓	2600	45.0	15.5	4.72	0.126	1	4.11	clear

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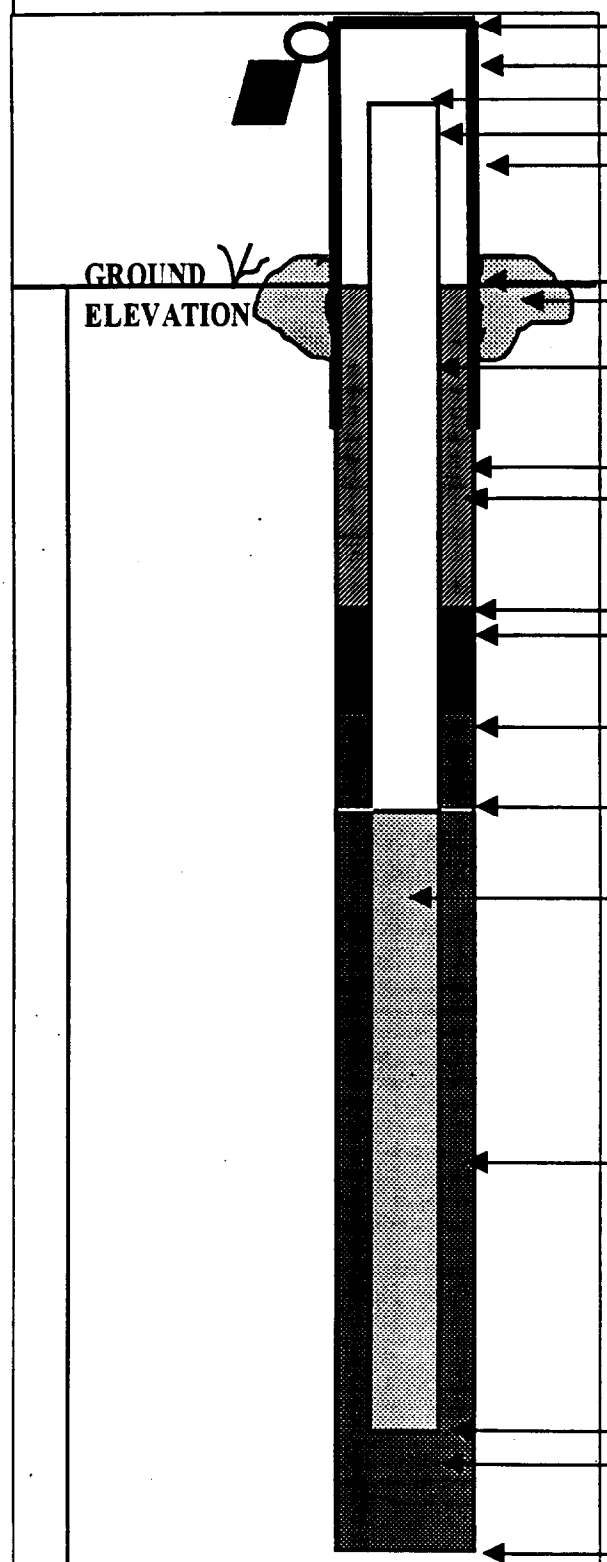
GM-79D

BORING NO.: GM-79D

Tetra Tech NUS, Inc.

OVERBURDEN MONITORING WELL SHEET

PROJECT:	NWIRP Bethpage	DRILLING Co.:	Unitech	BORING No.:	GM-79D
PROJECT No.:	NCS65-0200	DRILLER:	Jim Evans	DATE COMPLETED:	10-27-00
SITE:	Bethpage	DRILLING METHOD:	Mud Rotary	NORTHING:	
GEOLOGIST:	Vince Shuckett	DEV. METHOD:		EASTING:	



ELEVATION OF TOP OF SURFACE CASING:

STICK-UP TOP OF SURFACE CASING:

ELEVATION OF TOP OF RISER PIPE:

RISER STICK-UP ABOVE GROUND SURFACE:

I.D. OF SURFACE CASING:

TYPE OF SURFACE CASING:

GROUND ELEVATION:

TYPE OF SURFACE SEAL: Concrete

RISER PIPE I.D.: 4 inch

TYPE OF RISER PIPE: 4 inch PVC x 10ft

BOREHOLE DIAMETER:

TYPE OF BACKFILL: Volclay High Solids Bentonite clay grout

ELEVATION / DEPTH OF SEAL: 260 Ft.

TYPE OF SEAL: CETCO Pure Gold Bentonite Slurry

ELEVATION / DEPTH TOP OF FILTER PACK: 265 Ft.

ELEVATION / DEPTH TOP OF SCREEN: 280 Ft.

TYPE OF SCREEN: Schedule 80 PVC

SLOT SIZE X LENGTH: 0.010 x 10 Ft.

I.D. OF SCREEN: 4 inch

TYPE OF FILTER PACK: Filpro Quartz No 1 Sand to 270' / Filpro quartz No. 0 Sand to 265 Ft.

ELEVATION / DEPTH BOTTOM OF SCREEN: 290 Ft.

ELEVATION / DEPTH BOTTOM OF FILTER PACK: 330 Ft.

TYPE OF BACKFILL BELOW WELL: Filpro quartz No. 1 Sand

ELEVATION / DEPTH OF BOREHOLE: 330 Ft.

BORING LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N0565 - 0200
DRILLING COMPANY: Unitech Drilling
DRILLING RIG: Failing 150C
BORING NUMBER: GM-79D
DATE: 10-25-00
GEOLOGIST: Vince Shickora
DRILLER: Jim 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	Remarks	PID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	USCS *
	3					DK BRN	Silty Sand and gravel	Hand Auger to 4 feet BGS	0	0	0	0	
0806	5												
0811	10					BRN	Silty Sand with well rounded pebbles (Trace gravel)		0	0	0	0	
0812													
	15												
0814	20					BRN	Same as above		0	0	0	0	
0816													
	25												
0824	30					TAN BRN	medium-coarse silty Sand with well rounded pebbles + gravel		0	0	0	0	
0825							(40% pebbles + gravel)						
	35												
0910	40						Same as above		0	0	0	0	
	45												
0918	50						Medium-Coarse Sand with well rounded pebbles / gravel		0	0	0	0	

* When rock coring, enter rock brokeness.

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

Remarks: 8" x 1 Ft drag bit and 8" x 10 Ft reamer bits used

Drilling Area Background (ppm): 0

Converted to Well: Yes X No ____ Well I.D. #: GM-79D

BORING LOG

Tetra Tech NUS, Inc.

OJECT NAME: NEIRP Bethpage
PROJECT NUMBER: N0565-C200
DRILLING COMPANY: Yitech
DRILLING RIG: Failing 1500
BORING NUMBER: GM-79.0
DATE: 10-25-00
GEOLOGIST: Vince Shickora
DRILLER: Jim Evan

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	Remarks	PID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	USCS *
0925	51					Brn	Med-coarse silty sand with		0	0	0	0	
							some amount of clay						
	55												
0940	60						Same as above		0	0	0	0	
	65												
							Same as above		0	0	0	0	
50	70												
1001	71	60/100	5"			Lt. Brn Tan	Med to Coarse Sand with several 1/8 to 1/4 inch gravel Frags (quartz)	wet	0	0	0	0	
1016	72	5	11"										
							(Driller indicates mostly Sand drilling From 70' to 90' Bgs)						
1030	80												
S-2 CW	81	37/48	10"			orange Brown	Med grain Silty Sand with Trace of clay	wet	0	0	0	0	
1038	82	100/6	18"										
							(Driller indicates mostly Sand drilling From 90' to 90' Bgs)						
1047	90												
S-3 CW	91	75/100	3"/7"			Brn	Fine to Med grain Silty Sand with Trace of clay	wet	0	0	0	0	
1101	92												
							(Sand drilling to 100')						
1106	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. #: _____

BORING LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N0565-0206
DRILLING COMPANY: Unitech
DRILLING RIG: Failing 1500
BORING NUMBER: GM-79D
DATE: 10-25-00
GEOLOGIST: Vince Shickora
DRILLER: Jim 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	Remarks	PID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	USCS *
S-4 CW	101	36/100	6"			Orange Brown	Fine to Med Silty Sand with Trace of clay	wet	0	0	0	0	
1119	102	6/	12"										
		/											
		/											
1230	110	/											
S-5 CW	111	31/76	17"			Orange Brown Tan	Fine to Med gr. Silty Sand	wet	0	0	0	0	
1247	112	66/40	24"										
		/											
		/											
1253	120	/											
S-6 CW	121	40/50	8"			Tan Orange	Fine to Medium grain	wet	0	0	0	0	
1304	122	100/5	17"			Black Gray	Sand (Trace silt)						
		/											
		/											
1311	130	/											
S-7 CW	131	31/100	5"			Lt. Gry White	Fine to med grain Sand with	wet	0	0	0	0	
1326	132	5/	11"				Trace silt and clay						
		/											
		/											
1331	140	/											
S-8 CW	141	10/15	9"			Black Orange	Fine grain Silt - Sand with	wet	0	0	0	0	
1342	142	15/15	24"			Gray	Trace of clay						
		/					(softer Drilling to 150')	color change in Drilling mud to darke - Gray					
		/											
1352	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. #: ____

BORING LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NWIRP Beth Page
PROJECT NUMBER: N0565-02020
DRILLING COMPANY: Unitech
DRILLING RIG: Failing 1500
BORING NUMBER: GM-79D
DATE: 10-25-00
GEOLOGIST: Vince Shickora
DRILLER: Jim 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	Remarks	PID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	USCS *
S-9 @	151	10/33	14"			Lt Grey Orange	Fine to med grain Silty Sand	wet	0	0	0	0	
1402	152	21/18	24"			Black							
							(Softer drilling to 160')						
1407	160												
S-10 @	161	12/20	19"			Black Grey	Sandy silt with Trace of clay	wet	0	0	0	0	
1422	162	38/31	24"										
							(driller indicates mostly sand drilling from 160' to 170')						
32	170												
@	171	50/83	9"			Brown Grey	Fine to Med. grain Sand with	wet	0	0	0	0	
1453	172	48/35	24"				some silt						
1459	180												
S-12 @	181	15/33	11"			Orange Brown	Fine to Med. grain Silty Sand	wet	0	0	0	0	
1516	182	70/70	24"			Black							
							(driller indicates likely clay drilling 182' to 188')						
1523	190												
S-13 @	191	21/100	8"			Black	Slightly silty clay	damp	0	0	0	0	
1540	192	6	12"				(very dense/ hard)						
1552	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. #: _____

BORING LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N0565-0206
DRILLING COMPANY: Layne
DRILLING RIG: Failing 1500
BORING NUMBER: GM-79D
DATE: 10-25-00 / 10-26-00
GEOLOGIST: Vince Shickora
DRILLER: Jim 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	Remarks	PID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	USCS*
S-14 @	201	25/100	12"			Black	Slightly Silty Clay	damp	0	0	0	0	
1609	202	6	12"				(very Hard / dense)						
							(Driller indicates likely Sand drilling from 205' to 210')						
1615	210												
S-15 @	211	53/100				Tan orange Gray	Fine to Med grain Sand (Trace of Silt)	wet	0	0	0	0	
1633	212	3											
							(Sand drilling to 220')						
1637	220												
S-16 @	221	23/30	10"			Brown orange Tan	Fine to Med grain Sand (Trace of Silt)	wet	0	0	0	0	
1659	222	21/18	24"										
							(likely Sand Drilling to 230')						
0905	230												
S-17 @	231	25/25	12"			Black Gray	Slightly Sandy Silt with Trace of clay	(moist)	0	0	0	0	
0930	232	40/60	24"										
0935	240												
S-18 @	241	23/25	15"			Black Tan Lt. Gray	Slightly Sandy Silt with Trace of clay	wet	0	0	0	0	
0949	242	18/15	24"										
							(Likely Sand / Silt drilling to 250'						
0955	250												

10-25-00

10-26-00

* 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. #: _____

BORING LOG

Tetra Tech NUS, Inc.

OJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N0565-0200
DRILLING COMPANY: Layne
DRILLING RIG: Failing 1500
BORING NUMBER: GM-79D
DATE: 10-26-00
GEOLOGIST: Vince Shickora
DRILLER: Jim Evans

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	Remarks	PID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	USCS *
S-19 @	251	13/30	16"			Black Orange	Fine grain Silty Sand	wet	0	0	0	0	
1010	252	45/48	24"			Grey							
1016	260												
S-20 @	261	23/29	11"			Brown Black	Fine grain Silty Sand	wet	0	0	0	0	
1034	262	100/6	18"			Grey	(Thin clay layer (2 inch) at roughly 261.5 feet						
							(Likely Sand drilling from 266' to 270'						
TD	270												
@ 21	271	20/36	9"			Orange Brown	Fine to Med grain Sand with	wet	0	0	0	0	
1055	272	100/6	18"				Trace of Silt						
1059	280												
S-22 @	281	36/100/4	5"			Orange Black	Fine to Medium grain Sand	wet	0	0	0	0	
1116	282		10"			Tan	with Trace of Silt						
							(Driller indicates likely Sand						
							drilling to 290'						
11.21	290												
S-23 @	291	100/5	5"			Grey Brown	Fine grain Sand with	wet	0	0	0	0	
1139	292		5"				Trace of Silt.						
1143	295												
TD	~~300~~												

* 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. #: _____

BORING LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NWIRP Bethpage
PROJECT NUMBER: N0565-02DC
DRILLING COMPANY: Unitech
DRILLING RIG: Failing 1500

BORING NUMBER: GM-79D
DATE: 10-26-00
GEOLOGIST: Vince Shickora
DRILLER: Jim 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	Remarks	PID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	USCS*
S-24 @	296	53/100/5	8"			Brown Gray	Fine to Med. grain Sand with	wet	0	0	0	0	
1156	297	/	11"				Trace of silt						
		/											
		/											
1200	300	/											
S-25 @	301	26/100/5	2"			Brown Tan	Clayey Silt	wet	0	0	0	0	
1214	302	/	11"										
		/											
		/											
1219	305	/											
S-26 @	306	12/31	16"			Orange Brown Gray	very fine grain Silty Sand	wet	0	0	0	0	
1237	307	18/40	24"										
		/											
		/											
1243	310	/											
S-27 @	311	12/41	13"				Same as above with	wet	0	0	0	0	
1301	312	53/58	24"				Trace of clay						
		/											
		/											
	315	/											
S-28 @	316	17/51	14"			Gray Black	interbedded layers of clayey Silt and Silty clay with	Wet	0	0	0	0	
1328	317	100/5	18"				Some lignite Frags						
		/											
		/					(will overdrill and Stop Boring to Gamma log hole at 330' BGS)						
1535	320	/											

* 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. #: _____

GM-79D Gamma Log

100

Date: Thursday, October 26, 2000 Time: 13:52 File: C:\My Documents\bethpage grumman.rd

MSI

COMPANY Tetra Tech NUS
WELL ID GM-79D
FIELD
COUNTRY STATE

CO WELL FLD CTY STE FILING No

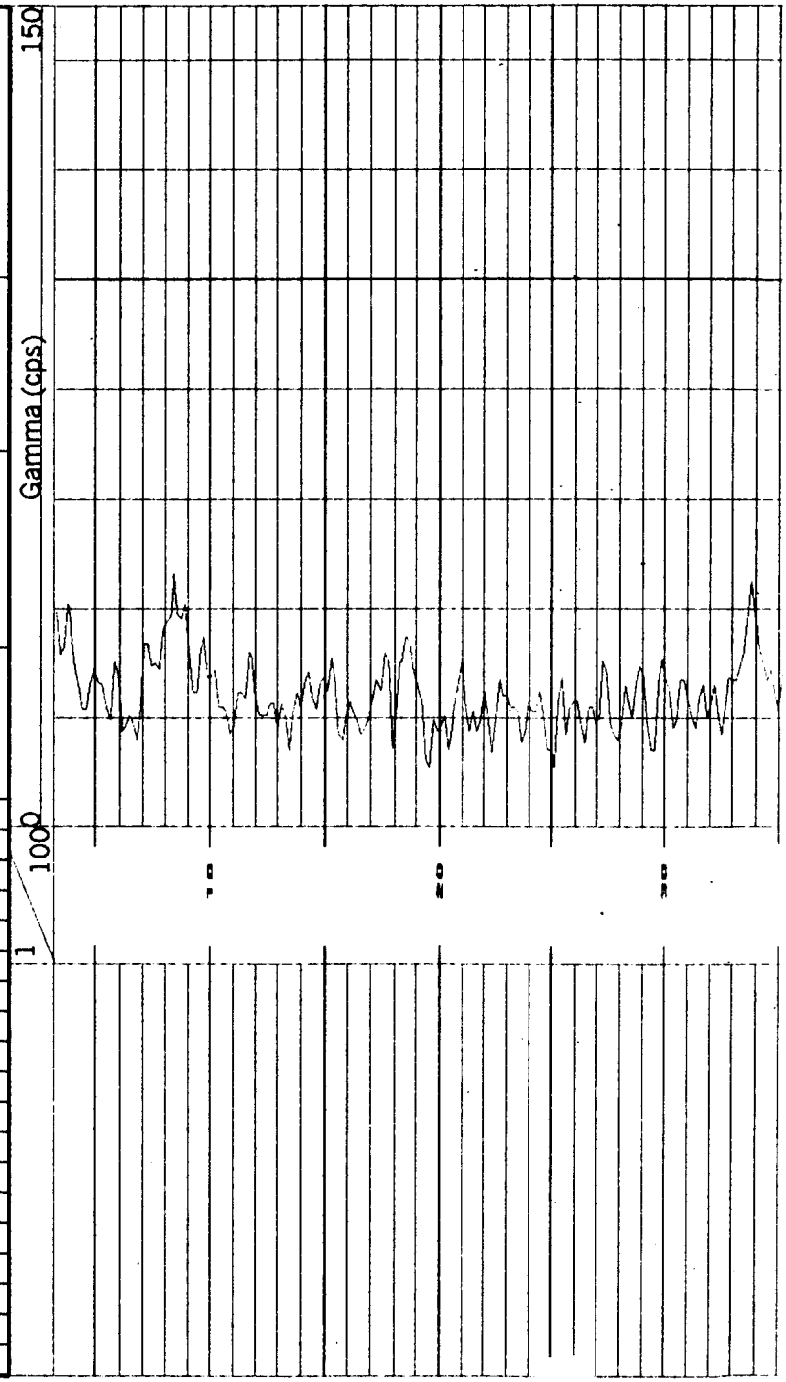
LOCATION Central Avenue

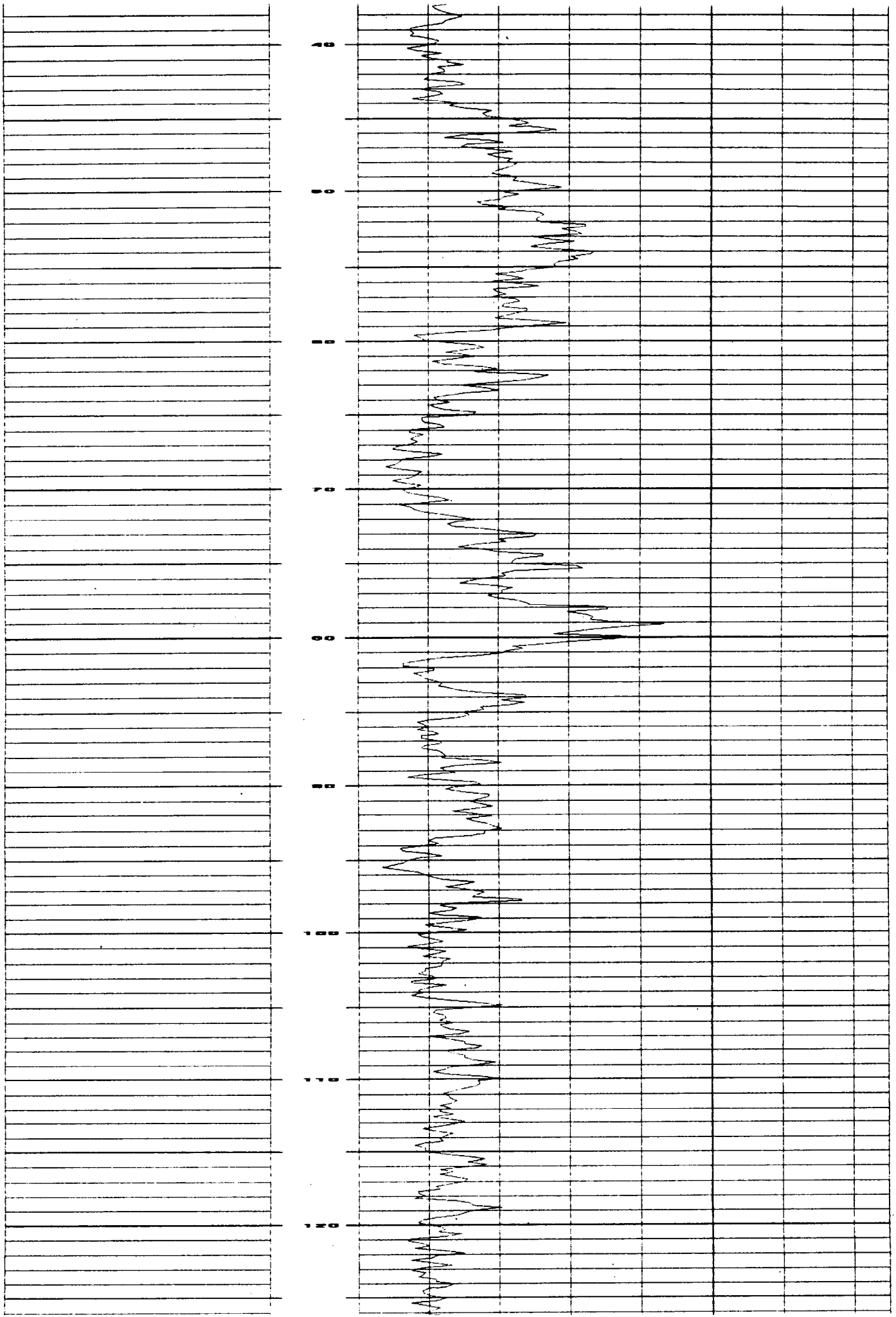
OTHER SERVICES

SEC TWP RGE

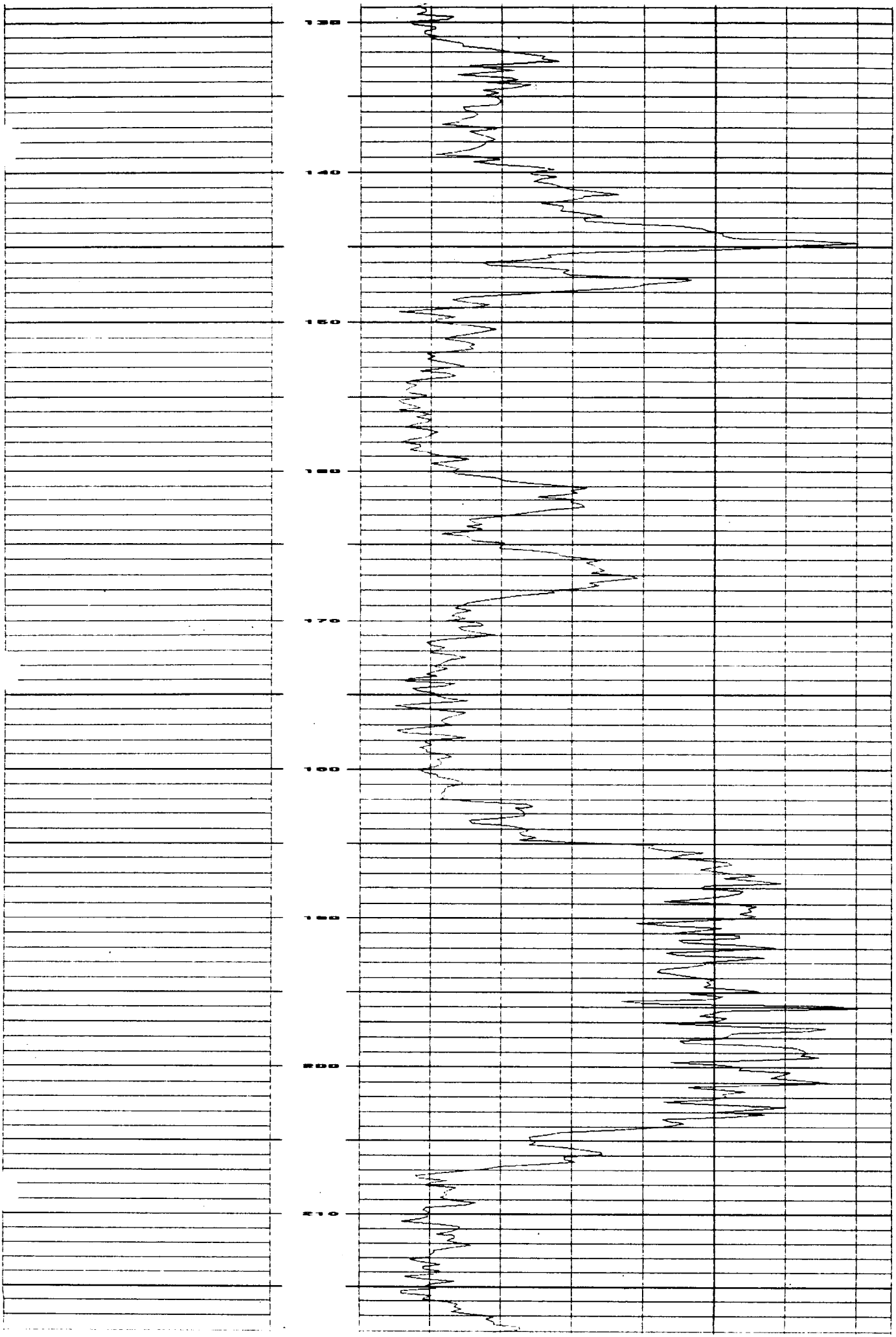
PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM		ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM			G.L.
DATE 10-26-00		TYPE FLUID IN HOLE	
RUN No		SALINITY	
TYPE LOG		DENSITY	
DEPTH-DRILLER		LEVEL	
DEPTH-LOGGER		MAX. REC. TEMP.	
BTM LOGGED INTERVAL			
TOP LOGGED INTERVAL			
OPERATING RIG TIME			
RECORDED BY			
WITNESSED BY			

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO

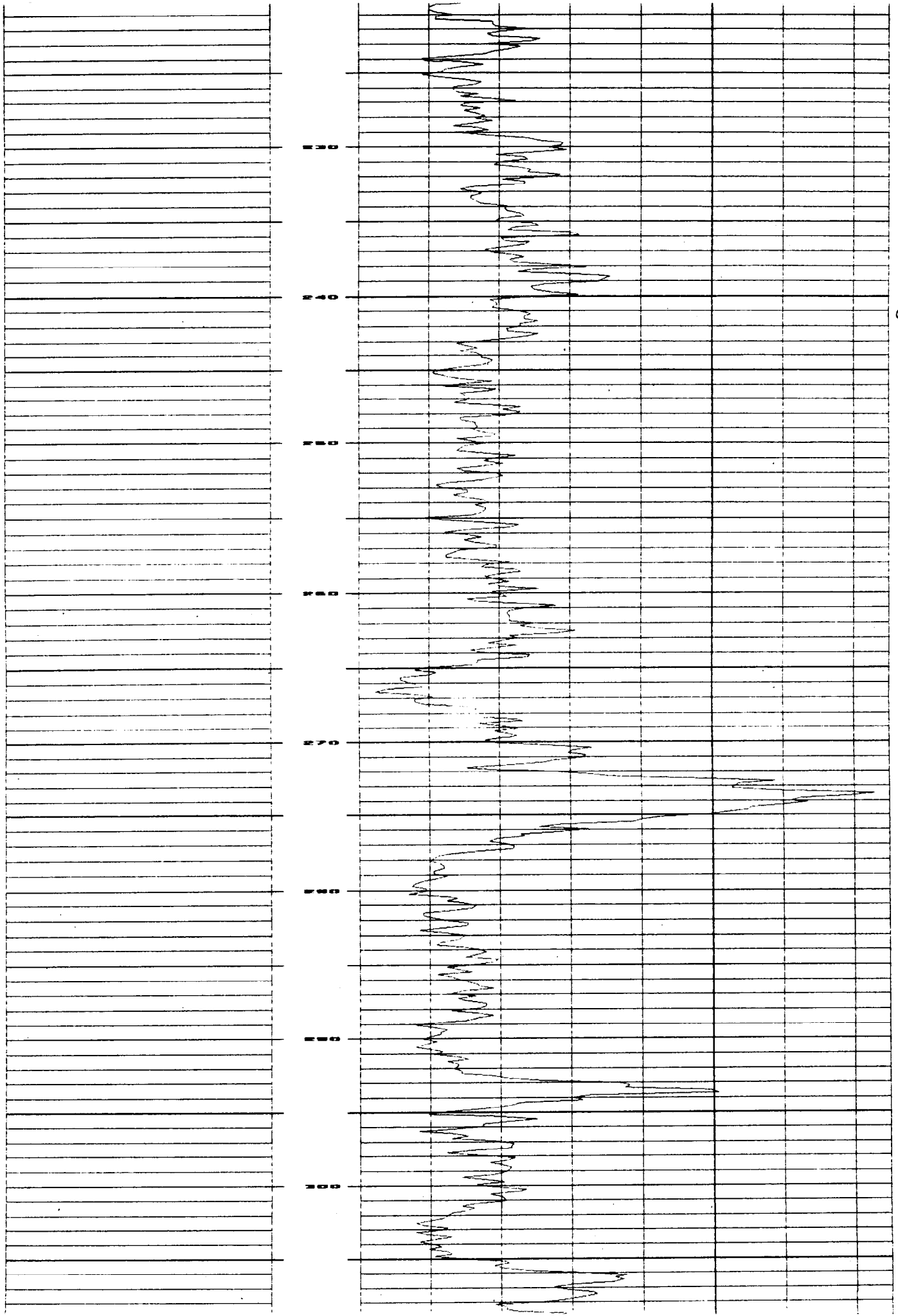




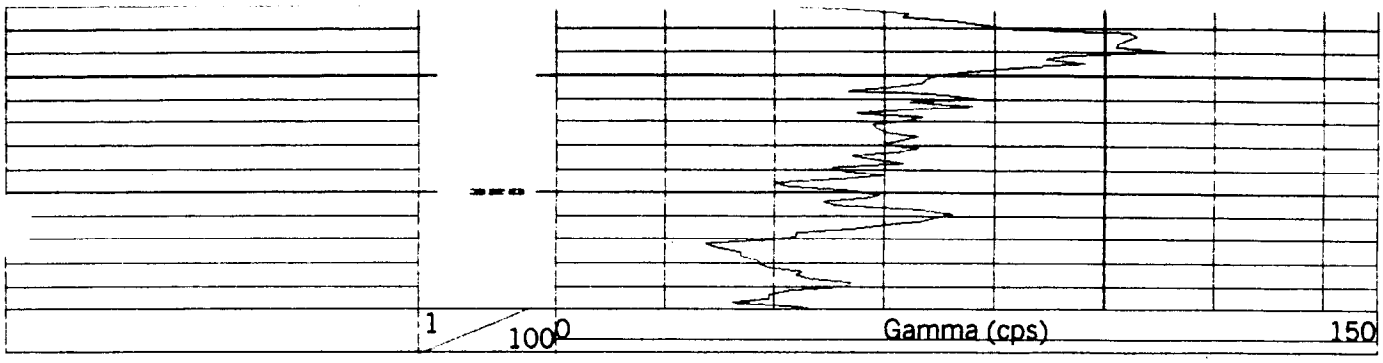
GM
79
D



GM
79D



GM
79D



Date: Thursday, October 26, 2000 Time: 13:52 File: C:\My Documents\bethpage grumman.rd

104 GM79D

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-79D
Site: NWIRP
Date Installed: 10/27/00
Date Developed: 11/16-17/00
Dev. Method: air lift
Pump Type: Compressor
Depth to Bottom (ft.): 290
Static Water Level Before (ft.): 46.8
Static Water Level After (ft.): 46.8
Screen Length (ft.): 10
Specific Capacity:
Casing ID (in.): 4
Responsible Personnel: D. Streetsmith, J. Evans
Drilling Co.: UTD
Project Name:
Project Number: N0565

Time	Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Remarks (odor, color, etc.)
1440	~20	80	68.6	13.4	6.50	0.232	7/000	10.77	brn/grey, muddy
1455			61.9	13.5	6.18	0.118	7/000	9.94	" "
1510			59.6	13.4	6.49	0.111	7/000	10.05	"
1525			59.1	13.4	6.40	0.111	720	10.80	" surge well
1540			50.8	13.8	6.57	0.108	7/000	9.98	"
1555			50.9	13.8	6.42	0.108	386	10.08	grey v. cloudy
1610			50.8	13.5	6.58	0.107	178	9.68	grey, cloudy surge well - move to 288
1625			50.8	13.5	6.55	0.107	570	10.16	grey/cloudy
1640		2500	50.7	13.4	6.52	0.107	203	9.89	grey, cloudy
0730	—	—	45.6	—	—	—	—	—	surge well set pump on bottom
0800			49.7	14.5	5.82	0.144	591	8.58	grey cloudy
0815			49.5	14.4	6.05	0.105	101	8.06	slightly cloudy - move pump to 286
0830			49.5	14.5	6.25	0.104	21	8.37	clear
0845			49.5	14.4	6.40	0.104	1	8.19	clear - move pump to 284
0900			49.3	14.5	6.42	0.104	49	8.06	clear
0915			49.1	15.0	6.42	0.104	1	8.35	clear - move to 282
0930			49.0	15.4	6.38	0.104	95	8.44	slightly cloudy
0945			49.1	15.5	6.42	0.104	6	7.90	clear move to 280

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: GM-79D
Site: Nwirp
Date Installed: 10/27/00
Date Developed: 11/16 - 17/02
Dev. Method: air lift
Pump Type: Compressor

Depth to Bottom (ft.): 290
Static Water Level Before (ft.): 46.8
Static Water Level After (ft.): 45.2
Screen Length (ft.): 10
Specific Capacity:
Casing ID (in.): 4

Responsible Personnel: D. Streetsmith, J Evans
Drilling Co.: UTD
Project Name:
Project Number: 10565

Time	Flow Rate (GPM)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Remarks (odor, color, etc.)
1000		~~5,000~~ 2,500	49.1	15.6	6.46	0.104	1	8.06	clear
1040	—	—	45.7	—	—	—	—	—	— surge well
1100			48.7	15.9	6.47	0.106	103	7.92	slightly cloudy
1115			48.7	15.5	6.50	0.104	1	8.53	clear - surge well put pump at bottom
1130			48.6	15.6	6.45	0.104	248	8.55	cloudy
1145			48.7	15.3	6.52	0.104	49	8.01	slightly cloudy
1200			48.7	15.1	6.55	0.104	2	8.12	clear surge well put pump at top of screen
1210			48.7	15.4	6.52	0.104	131	8.18	slightly cloudy
1220			48.6	15.3	6.52	0.104	49	7.97	clear, slightly cloudy
1230			48.6	15.5	6.54	0.104	248	7.99	clear
1240		7,100	48.6	15.6	6.55	0.104	1	7.89	clear

start 1045
stop 1245
90'