135925

GERAGHTY & MILLER, INC.
Ground-Water Consultants
Our 30th year

ORIGINAL
(Red)

February 11, 1988

Ms. Ruth Rzepski
Compliance Officer
U.S. Environmental Protection Agency
841 Chestnut Building
Philadelphia, PA 19107

RE: Administrative Order on Consent
Remedial Investigation/Feasibility Study
Field Investigation Summary Document
Avtex Fibers, Inc.
Front Royal, Virginia
EPA I.D. No. VAD 070358684

Dear Ms. Rzepski:

In keeping with the Remedial Investigation/Feasibility Study work plan for the CERCLA action at the Avtex Fibers, Inc. facility in Front Royal, Virginia, Geraghty & Miller, Inc. (G&M), has prepared this Field Investigation Summary Document. This document outlines the various field tasks accomplished under the Remedial Investigation (RI) between the months of May 1987 and January 1988.

This document has been developed as a summary of field activities accomplished and the preliminary results of each exercise. Due to the RI and FS submission schedule, this document also includes information concerning the treatability study. The raw data, equations, validation results, and critique of the study have been included and should be reviewed by the agency.

If you have any questions concerning the contents of this report, please let us know.

Sincerely,

GERAGHTY & MILLER, INC.

Mark E. Wagner
Senior Scientist

Jeffrey P. Sgambat
Vice President

AR302407

sar: Enclosure
cc: R.H. Hughes-Avtex
R. McManus-FMC

844 West Street • Annapolis, Maryland 21401 • (301) 268-7730

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FIELD INVESTIGATION
SUMMARY DOCUMENT

ADMINISTRATIVE ORDER ON CONSENT
REMEDIAL INVESTIGATION / FEASIBILITY STUDY
AVTEX FIBERS, INC.
FRONT ROYAL, VIRGINIA
EPA I.D. NO. VAD 070358684

FEBRUARY 1988

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL (Red)

TABLE OF CONTENTS

ORIGINAL
(Red)

LIST OF EXHIBITS

LIST OF EXHIBITS
(Continued)

ORIGINAL
(Red)

AR302411

ORIGINAL
(Red)

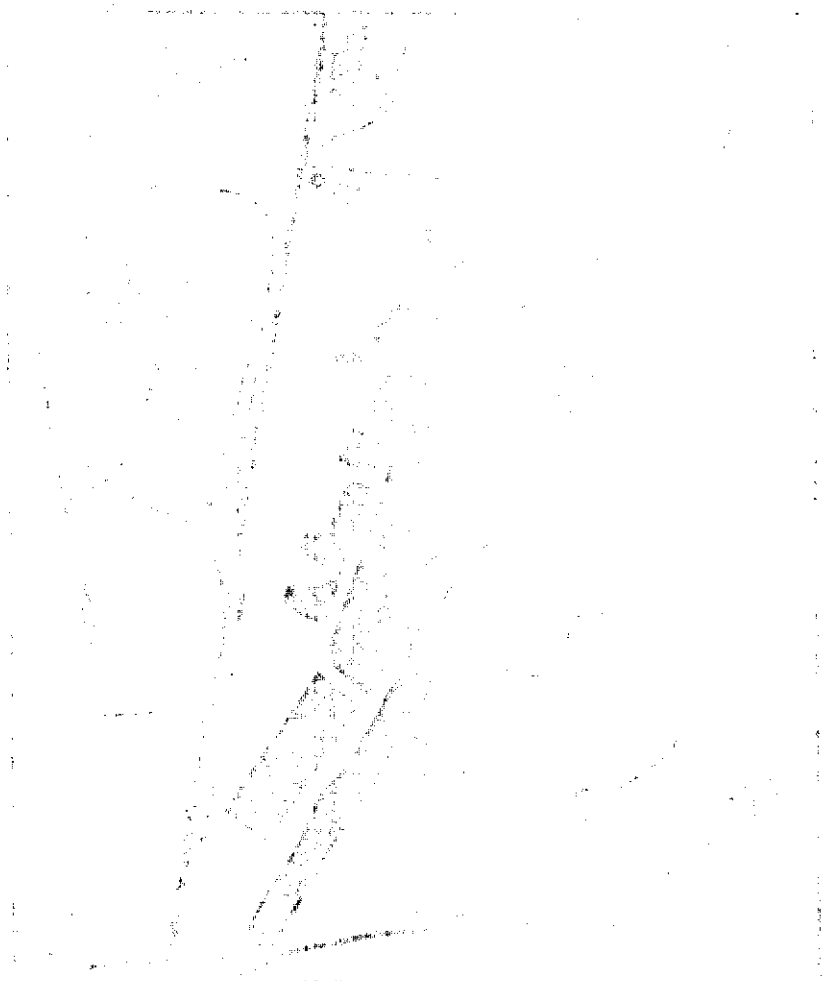
REMEDIAL INVESTIGATION
FIELD INVESTIGATION SUMMARY REPORT

In accordance with the Remedial Investigation (RI) work plans for the CERCLA activities at the Avtex Fibers, Inc. (Avtex), facility in Front Royal, Virginia, a summary document describing field tasks conducted between May 1987 and January 1988 has been developed. This document consists of exhibits detailing information for the following activities:

- Monthly Progress Reports
- Base map of RI installed wells
- Geologic Logs
- Well Construction Diagrams
- Monitor Well Survey Data
- Collected Water-Level Data
- Viscose Basin Sample Locations
- Viscose Basin Sample Descriptions
- Viscose Basin Piezometer Construction Details
- Summary of Air monitoring Results for Health and Safety
- Pump Test Observation Well Layout
- Pumping and Recovery Curves
- Ground-water Sampling Geochemistry Summary Tables
- Treatability Study Raw Data and Control Samples
- Field Audit Reports

The data presented herein represent the information developed during the RI field investigation for use in developing the draft RI and FS reports. Additional data sources representing collection tasks prior to the initiation of CERCLA activities at the Front Royal facility have been previously submitted by Geraghty & Miller, Inc. (G&M), to the agency within the work plans. Any interpreted conclusion regarding hydrogeology or geochemistry based on collected field data is to be considered preliminary and subject to change or revision prior to its incorporation into the draft Remedial Investigation Report.

AR302412



Final

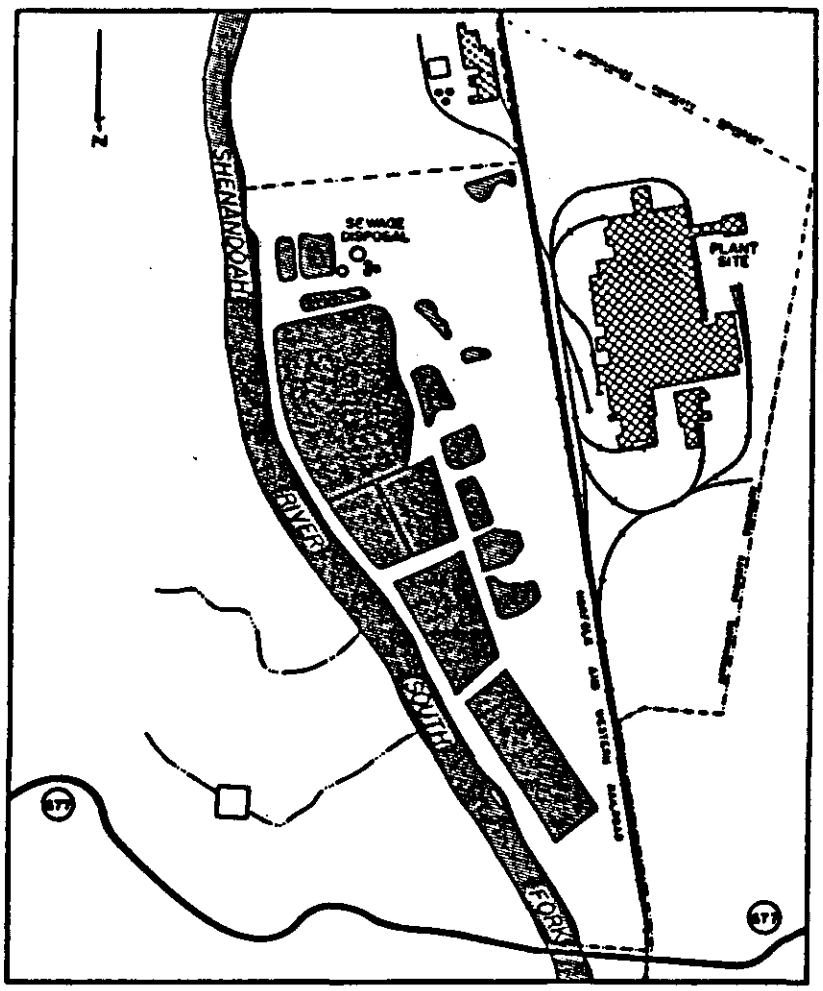
ORIGINAL
(Red)

SECTION 1.0

MONTHLY PROGRESS REPORTS

AVTEX FIBERS, INC.
FRONT ROYAL, VIRGINIA

MAY 1987 TO JANUARY 1988



AR302414

GERAGHTY & MILLER, INC.

ORIGINAL
(Red)

MONTHLY PROGRESS REPORT

AVTEX FIBERS, INC.

MAY 1987

DOC. CONTRL. #
M0679FR6-GM-6-1-87-1

AR302415

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL (Red)

1 June 1987
MO679FR6

Mr. James Miller (3HW16)
Compliance Officer
U.S. Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, PA 19107

Dear Mr. Miller:

This document constitutes the first monthly progress report since the commencement of Remedial Investigation field activities at the Avtex Fibers, Inc., Front Royal, Virginia facility. To date, Geraghty & Miller, Inc., has made progress with respect to the first two field tasks, the preliminary round of ground-water sampling and surface geophysical survey.

Ground-Water Sampling

To date, all but six wells have been sampled. Remaining wells are PW-1, PW-2, PW-3, GM-1B, GM-8, and GM-10. Presently, G&M plans to complete the sampling exercise Tuesday, June 2, 1987. Sampling could not be completed all at one time due to access problems associated with each of the remaining wells. For the PW-Well series, existing 3-inch steel eductor pipes used for recovery by air-lift method have to be removed. For GM-10 and GM-8, a smaller diameter pump is required to allow deeper pumping since well yields are extremely low. GM-1B has a top reducer assembly which is to be burned off.

Surface Geophysics

G&M has completed all but one 1000-foot traverses for the resistivity survey. All other resistivity line segments have been completed and data reduction and analysis for these lines is underway. G&M expects to complete the resistivity profiling and all of the electromagnetic traverses in two days, beginning Wednesday, June 3, 1987.

Work Plan Deficiencies

G&M still has remaining responses to comments from Diana Pickens dated May 7, 1987. As we discussed, G&M is still waiting for QC documentation for geotechnical laboratories. We expect to submit a response by June 12, 1987. believes that this time frame will not interfere progress since the first drilling task slated for Jur 1987, does not involve geotechnical testing. These a 10 riverbank wells.

AR302416

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Schedule

Presently, G&M is running one and one-half weeks behind the original schedule. Drilling was to have begun June 1. EPA will continue to be made aware of progress and changes or additions to the field activities.

Respectfully submitted,

GERAGHTY & MILLER, INC.

Mark E. Wagner
Project Manager

MEW:gph
cc: R. H. Hughes - Avtex, Valley Forge
M. Pisarcik - Avtex, Front Royal
J. Sgambat - G&M, Corporate Advisor
Project File

AR302417

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL (Red)

July 8, 1987

Ms. Ruth Rzepski (3HW16)
U.S. Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Re: Monthly Progress Report
Remedial Investigation Field Activities
Avtex Fibers, Inc., Front Royal, VA

Dear Ms. Rzepski:

During the course of the month of June 1987, Geraghty & Miller, Inc., (G&M), with the services of Pennsylvania Drilling, Inc., continued with the installation of shallow bedrock monitor wells along the east bank of the north fork of the Shenandoah River. Presently, G&M expects that this task will be completed by July 9, 1987. For your information, G&M has included a summary of the well depths and measurements for field conductivity and pH.

G&M is in the process of setting up the treatability study which we anticipate to begin by the third week of July. In addition, G&M has, as of July 6, received approximately three-fourths of the analytical results for the preliminary round of ground-water sampling from Cambridge Analytical Associates. We anticipate receiving the remaining analytical data within the week. Once all the data is received, the process of reviewing for quality control will begin. Once the data has been tabularized, information will be forwarded to the Agency.

The next scheduled field activity to begin on July 9 is the installation of the four perimeter wells penetrating the alluvial deposits surrounding viscose basins.

As you are aware, the remaining field tasks to be performed as part of the remedial investigations include the aforementioned perimeter wells, drilling and sampling within the viscose basins proper, aquifer testing, and the final round of ground-water sampling. G&M currently feels that the deadline for completion of these activities (July 20) cannot be met. Within the next week, we will be reviewing the possibilities of performing one or more of these tasks concurrently and would appreciate input from the Agency as to the effect on the total project schedule.

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(Red)

This is especially important in that G&M has just selected laboratories to be involved in the analyses of viscose basin materials and, according to the consent agreement between the Agency and Avtex, the EPA is afforded a two-week period for review of the submitted quality assurance documents supplied by the selected laboratories.

As to the issue of an interim report concerning the results from the surface geophysical surveys conducted in May, G&M will have a completed document by July 15 and will submit the report to the Agency at that time.

We would again like to stress that field conditions, specifically hot, humid weather, and the required use of protective suits and respirators, have drastically slowed the daily progress.

If you have any questions concerning progress to this point, or expected changes to the schedule, please let us know as soon as possible.

Sincerely yours,

GERAGHTY & MILLER, INC.

Mark E. Wagner

Mark E. Wagner
Project Manager
Senior Scientist

MEW:kmf

AR302419

ORIGINAL
(Red)

TABLE 1.
RIVERBANK PIEZOMETER
INSTALLATION CONDITIONS

Well Number	Well Depth, ft	Depth to Water, ft (top of casing)	pH (units)	Conductivity (umhos/cm)	
PZ-1	35	7.21	8.59	6950	STA. 1
PZ-2	16	8.44	9.04	6120	
PZ-3	18	5.18	7.84	6200	STA. 2
PZ-4	31.5	10.29	8.44	5430	STA. 3
PZ-5	25.5	6.92	9.10	6310	STA. 4
PZ-6	23.0	7.38	10.38	4340	STA. 5
PZ-7	23.0	7.12	8.08	2600	STA. 6
PZ-8	18.0	6.98	7.50	3870	STA.
PZ-9	28.0	5.98	7.61	4150	STA. 7

AR302420

AR302420

GERAGHTY & MILLER, INC.
Ground-Water Consultants

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(Red)

MONTHLY PROGRESS REPORT

AVTEX FIBERS, INC.
RI/FS

JULY 1987

DOC. CONTRL. #
M0679FR6-GM-_____

AR302421

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GERAGHTY & MILLER, INC.
Ground-Water Consultants

August 12, 1987

Ms. Ruth Rzepski (3HW16)
Compliance Officer
U.S. Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, PA 19107

Dear Ms. Rzepski:

During the course of the month of July, 1987, Geraghty & Miller, Inc., (G&M) completed the installation of the shallow bedrock monitor wells along the east bank of the Shenandoah River. Locations for all installed riverbank wells is presented as Attachment 1.

In addition, G&M has completed the installation of the four (4) overburden wells proximal to Viscose Basins 9, 10, 7, and 1. Preliminary well-construction sketches are presented as Attachments 2, 3, 4, and 5.

G&M has commenced the viscose basin boring program starting with Basin 3. G&M expects this program to continue for at least three weeks.

Final clarification to the Sampling and Analysis Plan have been finalized with the Agency, and the bench-scale treatability study is to commence the week of August 17, 1987. If there are any questions concerning work performed during the month of July, please let us know.

Sincerely,

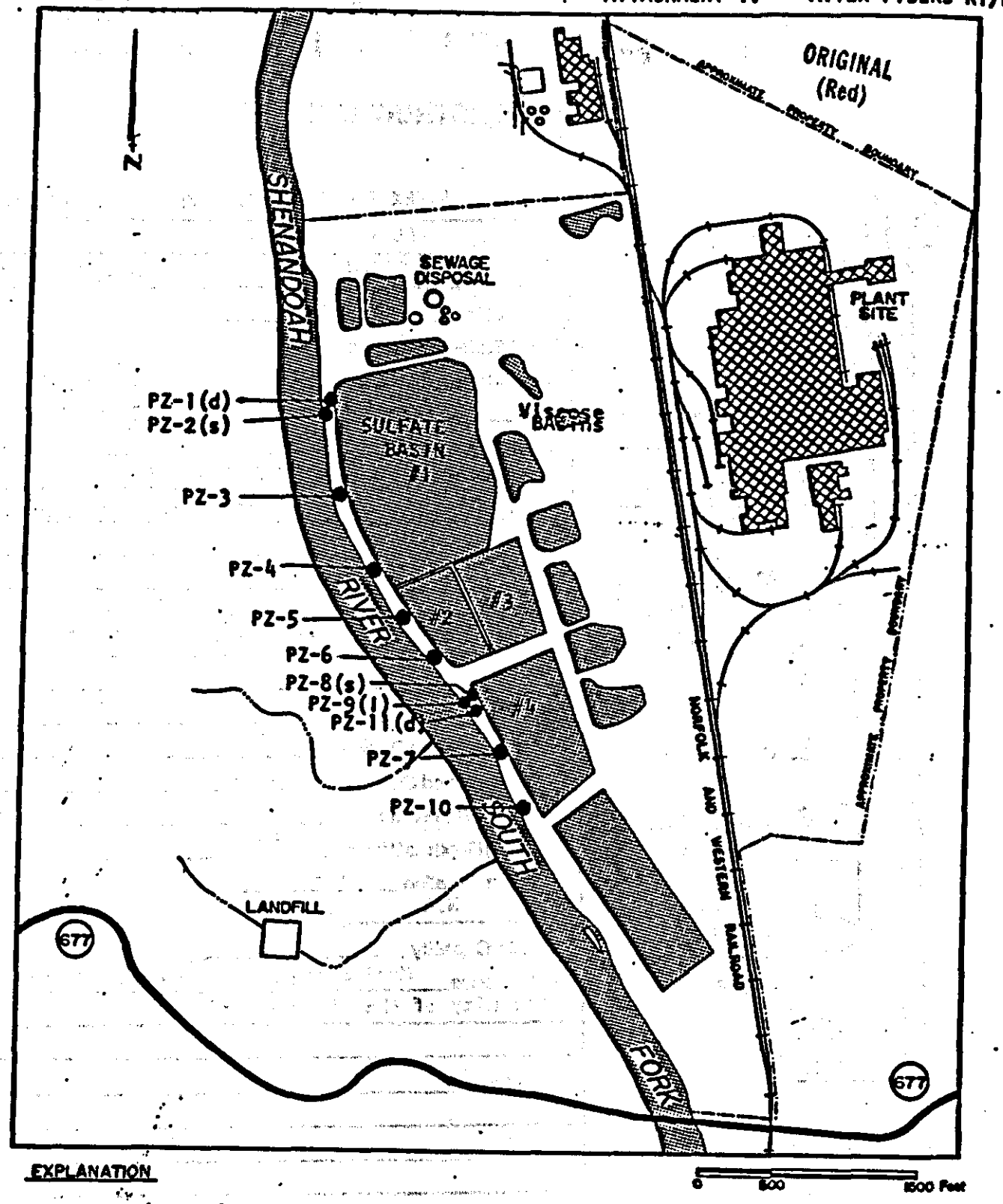
GERAGHTY & MILLER, INC.

Mark E. Wagner
Project Manager

Jeffrey P. Sgambat, C.P.G.
Project Consulting Coordinator

MEW/JPS:gh
cc: M. Pisarcik - Front Royal
R. H. Hughes - Valley Forge
File

AR302422



● Approximate Location of Shallow Bedrock Well Along East Bank of Shenandoah River

DOC. CONTROL # 302423
M0679FR6-GM-

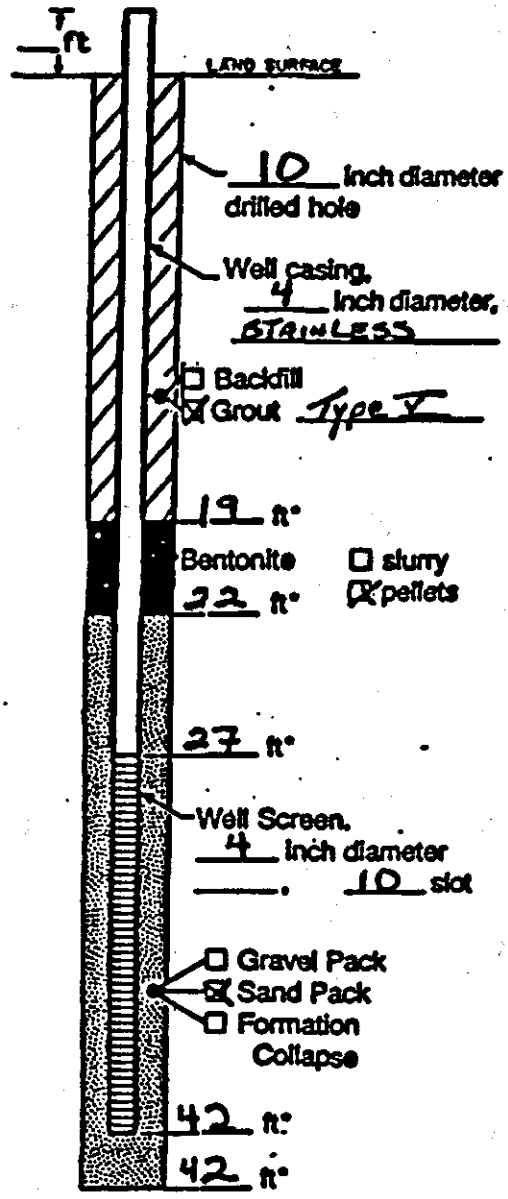
GERAGHTY & MILLER, INC.
Ground-Water Consultants

ATTACHMENT 2

ORIGINAL
(Red)

DOC. CONTRL. #
M0679FR6-GM-8-9-87-2

WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project AVTEX FIBERS, INC. RI/FS Well MW-9
Town/City FRONT ROYAL
County WARREN State VIRGINIA
Permit No. _____
Land-Surface Elevation
and Datum _____ feet ☐ surveyed ☐ estimated
Installation Dates(s) _____
Drilling Method HOLLOW STEM AUGER
Drilling Contractor PENNSYLVANIA DRILLING COMPANY
Drilling Fluid NONE

Development Techniques(s) and Date(s)
TO BE PERFORMED BY AIR-LIFT , WEEK OF AUGUST 10

Fluid Loss During Drilling N.A. gallons
Water Removed During Development N.A. gallons
Static Depth to Water _____ feet below M.P.
Pumping Depth to Water N.A. feet below M.P.
Pumping Duration N.A. hours
Yield N.A. gpm Date _____
Specific Capacity _____ gpm/ft
Well Purpose Monitoring of shallow groundwater in the vicinity of the viscose basins.

Remarks

Prepared by Jeff Moore AR302424

1/88

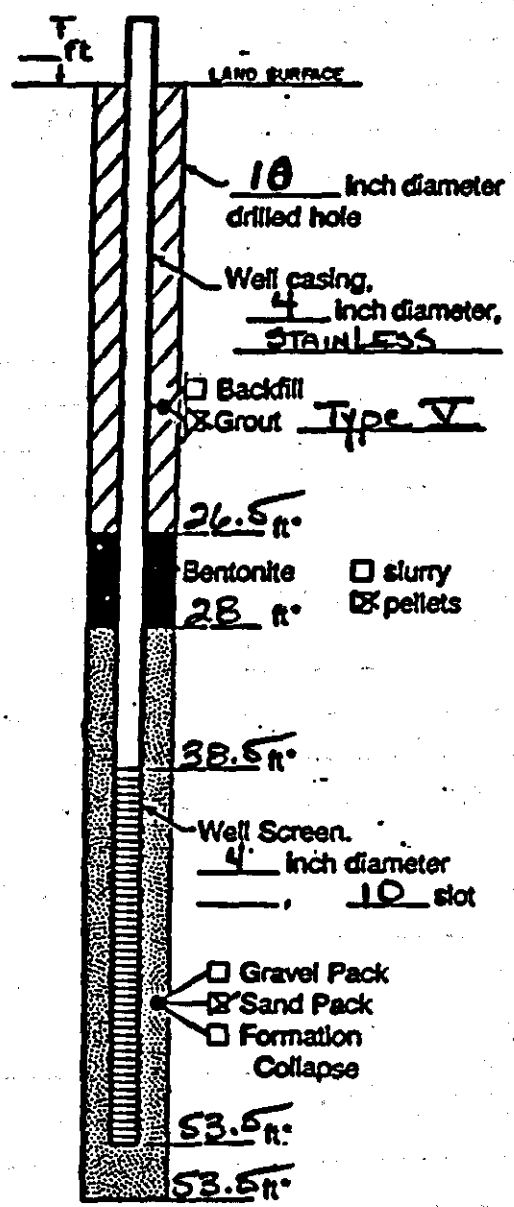
GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL (Red)

ATTACHMENT 3

DOC. CONTRL. # M0679FR6-GM-8-9-87-3

WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project AVTEX FIBERS, INC. RI/FS Well MW-10

Town/City FRONT ROYAL

County WARREN State VIRGINIA

Permit No. _____

Land-Surface Elevation and Datum _____ feet ☐ surveyed ☐ estimated

Installation Dates(s) _____

Drilling Method HOLLOW STEM AUGER

Drilling Contractor PENNSYLVANIA DRILLING COMPANY

Drilling Fluid NONE

Development Techniques(s) and Date(s)
TO BE PERFORMED BY AIR-LIFT , WEEK OF AUGUST 10

Fluid Loss During Drilling N.A. gallons

Water Removed During Development N.A. gallons

Static Depth to Water _____ feet below M.P.

Pumping Depth to Water N.A. feet below M.P.

Pumping Duration N.A. hours

Yield N.A. gpm Date _____

Specific Capacity _____ gpm/ft

Well Purpose Monitoring of shallow groundwater in the vicinity of the viscose basins.

Remarks _____

Prepared by Jeff Moore

AR302425

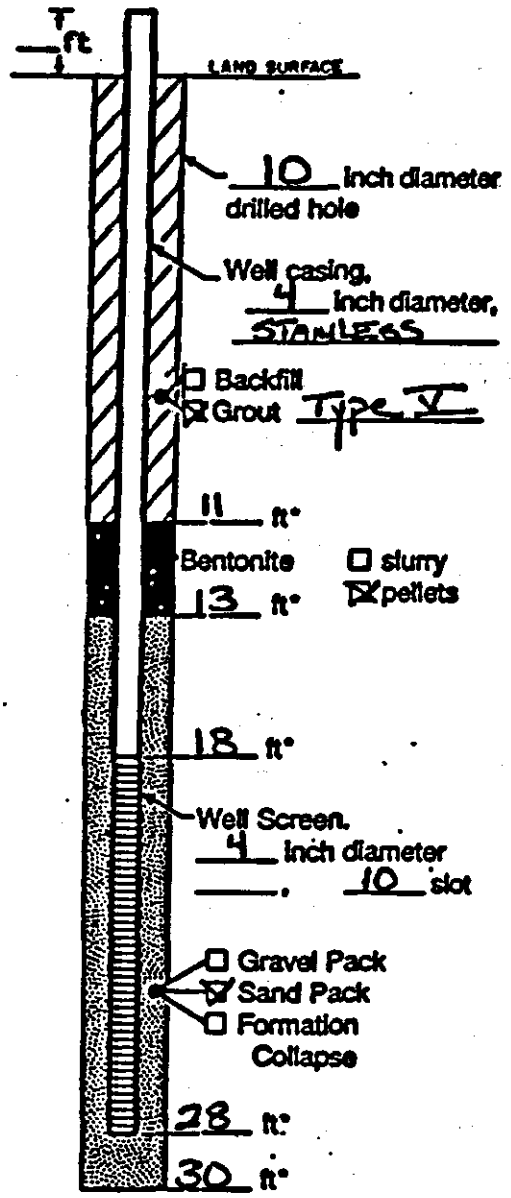
1-12

1/86

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ATTACHMENT 4 ORIGINAL (Red) DOC. CONTRL. # M0679FR6-GM-8-9-87

WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project AVTEX FIBERS, INC. RI/FS Well MW-11
Town/City FRONT ROYAL
County WARREN State VIRGINIA
Permit No. _____
Land-Surface Elevation and Datum _____ feet ☐ surveyed ☐ estimated
Installation Dates(s) _____
Drilling Method HOLLOW STEM AUGER
Drilling Contractor PENNSYLVANIA DRILLING COMPANY
Drilling Fluid NONE
Development Techniques(s) and Date(s) TO BE PERFORMED BY AIR-LIFT , WEEK OF AUGUST 10
Fluid Loss During Drilling N.A. gallons
Water Removed During Development N.A. gallons
Static Depth to Water _____ feet below M.P.
Pumping Depth to Water N.A. feet below M.P.
Pumping Duration N.A. hours
Yield N.A. gpm Date _____
Specific Capacity _____ gpm/ft
Well Purpose Monitoring of shallow groundwater in the vicinity of the viscose basins.
Remarks

Prepared by Jeff Moore

AR302426

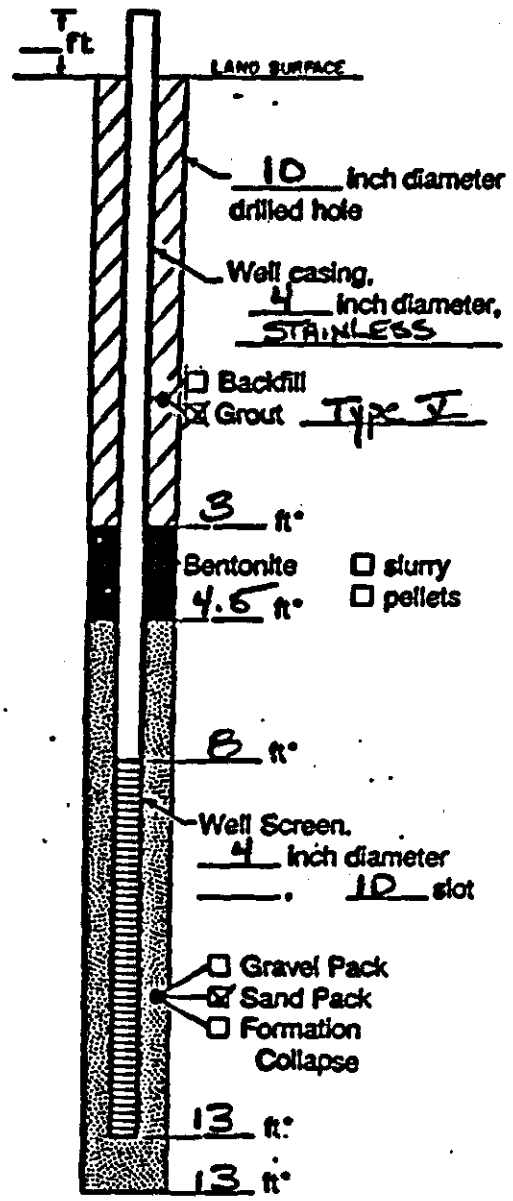
1/88

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ATTACHMENT 5

DOC. CONTRL. #
M0679FR6-GM-8-9-87-6

WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project AVTEX FIBERS, INC. RI/FS Well MW-12
Town/City FRONT ROYAL
County WARREN State VIRGINIA
Permit No. _____
Land-Surface Elevation and Datum _____ feet ☐ surveyed ☐ estimated
Installation Dates(s) _____
Drilling Method HOLLOW STEM AUGER
Drilling Contractor PENNSYLVANIA DRILLING COMPANY
Drilling Fluid NONE

Development Techniques(s) and Date(s)
TO BE PERFORMED BY AIR-LIFT , WEEK OF AUGUST 10

Fluid Loss During Drilling N.A. gallons
Water Removed During Development N.A. gallons
Static Depth to Water _____ feet below M.P.
Pumping Depth to Water N.A. feet below M.P.
Pumping Duration N.A. hours
Yield N.A. gpm Date _____
Specific Capacity _____ gpm/ft
Well Purpose Monitoring of shallow groundwater in the vicinity of the viscose basins.

Remarks

Prepared by Jeff Moore

AR302427

1/86

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL
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MONTHLY PROGRESS REPORT

AVTEX FIBERS, INC.
RI/FS

AUGUST 1987

AR302428

844 West Street • Annapolis, Maryland 21401 • (301) 268-7730

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL
(Red)

September 17, 1987

Ms. Ruth Rzepski (3HW16)
Compliance Officer
U.S. Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, PA 19107

Dear Ms. Rzepski:

During the month of August 1987, Geraghty & Miller, Inc., (G&M) completed the Viscose Basin Boring Program. The program consisted of the installation of a single-test hole in Viscose Basins 1, 2, 3, 7, 9, 10, and 11. At Basins 1, 2, 3, and 7, hollow-stem auger drilling with continuous split-spoon sampling was performed to the bedrock interface. Samples of viscose material were collected, packaged, and shipped to Cambridge Analytical, Froehling and Robertson, and Spotts, Stevens, and McCoy for analysis. Once bedrock was encountered, NX-coring was performed into the upper 10 feet of bedrock. Intact cores have been maintained for future use and documentation. Once NX-coring was completed, the core hole was grouted up to the ground surface. A second auger hole was then installed to the base of the viscose material and a stainless-steel monitor well was emplaced into the borehole. These small diameter wells are to be used for viscose liquid sample collection.

At Viscose Basins 9, 10, and 11, a skid rig was placed onto the basin by a crane and casing was hydraulically pushed with continuous split-spoon sampling. This procedure continued until natural clays were encountered at depth. Upon completion of the boring, a stainless-steel well was constructed at locations within Basins 9 and 11. Due to the loss of drilling tools, a well was not completed in Basin 10. Viscose liquid sampling from Basin 10 will be accomplished by collecting a sample from the seep located along the western berm. Well construction details as well as sample descriptions collected are presented as Exhibits 1 and 2, respectively.

In addition, G&M completed the final round of groundwater sampling with limited sample splits collected by EPA personnel. All existing and new well locations were sampled with the exception of the wells placed within the viscose basins. These wells will be sampled at a later date.

AR302429

AR302429

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(Red)

G&M will perform the final field task of aquifer testing within the next few weeks. G&M will advise EPA of the exact date once it is known.

Sincerely,

GERAGHTY & MILLER, INC.

Mark E. Wagner
Project Manager

Jeffrey P. Sgambat
Project Consulting Coordinator

MEW/gh
Enclosures: Exhibits

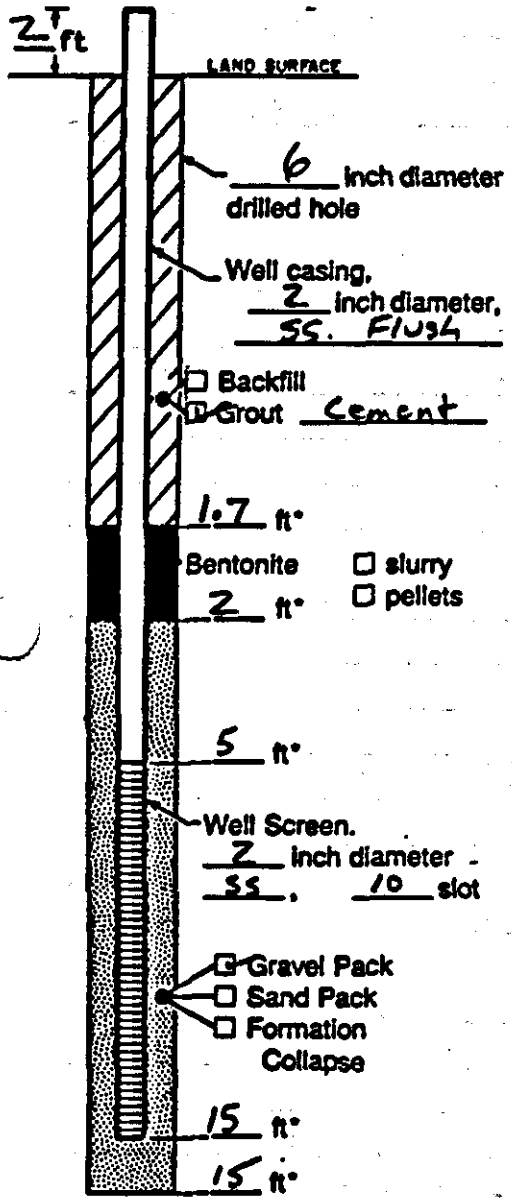
AR302430

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL

DOC. CONTRL. #
M0679FR6-GM-_____

WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project M0679FR6 Well VBI Piez
Town/City Front Royal
County _____ State Va
Permit No. _____
Land-Surface Elevation
and Datum _____ feet ☐ surveyed
_____ ☐ estimated
Installation Dates(s) 8-18-87
Drilling Method H.S. Auger
Drilling Contractor Penn Drill
Drilling Fluid N/A

Development Techniques(s) and Date(s)
N/A

Fluid Loss During Drilling N/A gallons
Water Removed During Development N/A gallons
Static Depth to Water _____ feet below M.P.
Pumping Depth to Water _____ feet below M.P.
Pumping Duration _____ hours
Yield _____ gpm Date _____
Specific Capacity _____ gpm/ft
Well Purpose _____

Remarks _____

AR302431

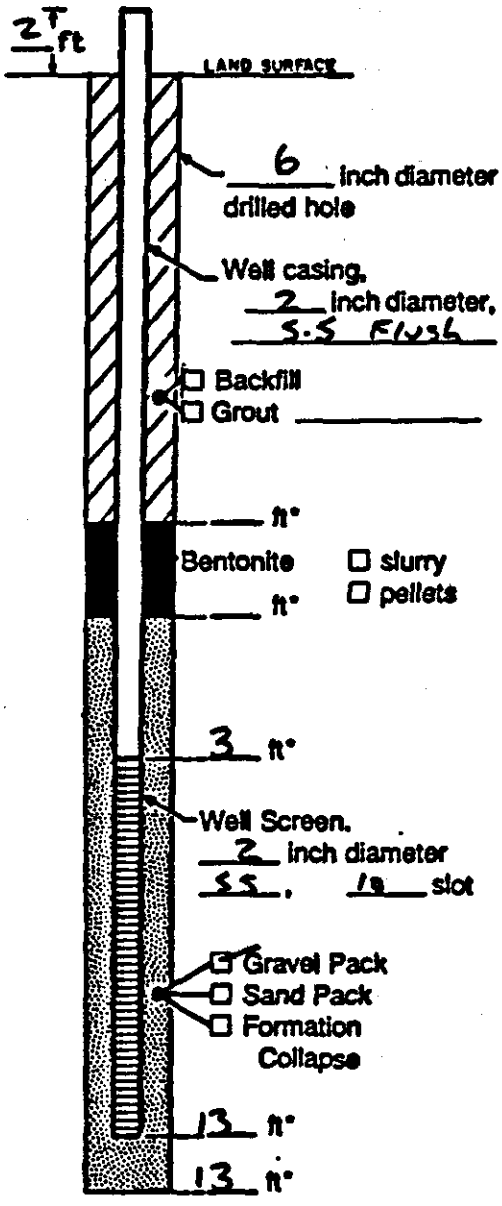
Prepared by Wesselman

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL

DOC. CONTRL. #
M0679FR6-GM-_____

WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project M0679FR6 Well VB2 Piez
Town/City Front Royal -
County _____ State VA
Permit No. _____
Land-Surface Elevation
and Datum _____ feet ☐ surveyed ☐ estimated
Installation Dates(s) 5-17-87
Drilling Method H.S Auger
Drilling Contractor Penn Drill
Drilling Fluid N/A

Development Techniques(s) and Date(s)
N/A

Fluid Loss During Drilling N/A gallons
Water Removed During Development N/A gallons
Static Depth to Water ≈ 4-5' feet below M.P.
Pumping Depth to Water _____ feet below M.P.
Pumping Duration _____ hours
Yield _____ gpm Date _____
Specific Capacity _____ gpm/ft
Well Purpose _____

Remarks Borehole open - sands lost through formations (15')
plugged on top w/ bags

AR302432

Prepared by Wesselman

1-19

AR302432

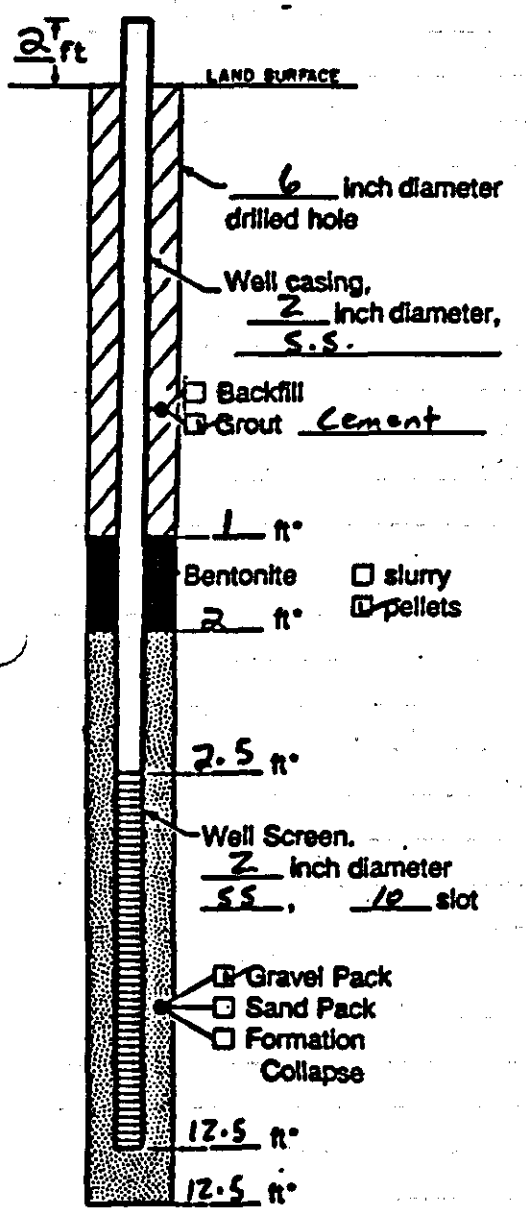
1/88

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL (Red)

DOC. CONTRL. #
M0679FR6-GM-_____

WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project M0679FR6 Well VBZ Piez.
Town/City Front Royal
County _____ State Va.
Permit No. _____
Land-Surface Elevation
and Datum _____ feet ☐ surveyed
_____ ☐ estimated
Installation Dates(s) 8-10-87
Drilling Method H.S. Augar
Drilling Contractor Penn drilling
Drilling Fluid N/A

Development Techniques(s) and Date(s)
N/A

Fluid Loss During Drilling N/A gallons
Water Removed During Development N/A gallons
Static Depth to Water ≈ 4-5' feet below M.P.
Pumping Depth to Water N/A feet below M.P.
Pumping Duration N/A hours
Yield _____ gpm Date _____
Specific Capacity _____ gpm/ft
Well Purpose _____

Remarks _____

AR302433

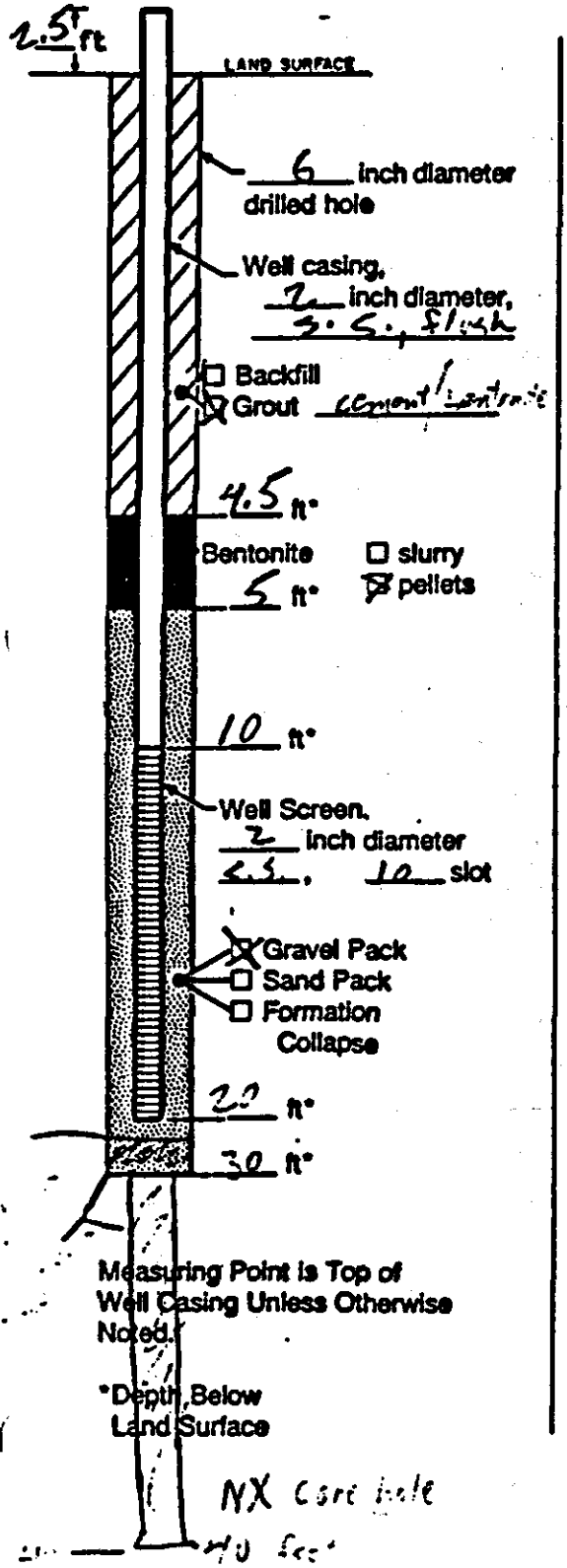
Prepared by Wesselman

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL
(Red)

DOC. CONTRL. #
M0679FR6-GM-_____

WELL CONSTRUCTION LOG



Project AVTEX Well VB-7
Town/City FRONT ROYAL
County _____ State VA
Permit No. _____
Land-Surface Elevation
and Datum _____ feet ☐ surveyed
_____ ☐ estimated
Installation Dates(s) 9-1 — 9-2-87
Drilling Method Auger
Drilling Contractor Pennsylvania Drilling Co.
Drilling Fluid Water used for coring

Development Techniques(s) and Date(s)
NA

Fluid Loss During Drilling Significant loss at 53' gallons
Water Removed During Development _____ gallons
Static Depth to Water _____ feet below M.P.
Pumping Depth to Water _____ feet below M.P.
Pumping Duration _____ hours
Yield _____ gpm Date _____
Specific Capacity _____ gpm/ft
Well Purpose _____

Remarks _____

AR302434

Prepared by _____

1-21

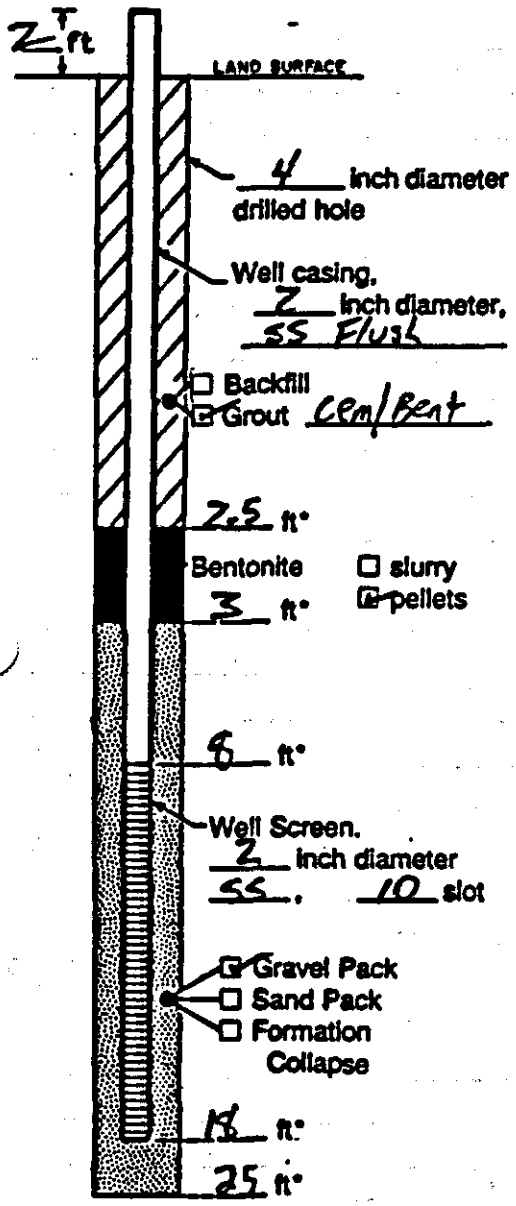
1/88

GERAGHTY & MILLER, INC.
Ground-Water Consultants

Universal (Key)

DOC. CONTRL. #
M0679FR6-GM-_____

WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project M1679FR6 Well VB-9
Town/City Front Royal
County _____ State Va
Permit No. _____
Land-Surface Elevation
and Datum _____ feet ☐ surveyed
_____ ☐ estimated
Installation Dates(s) 8-27-87
Drilling Method Driven 4" Casing
Drilling Contractor Penn Drill
Drilling Fluid N/A

Development Techniques(s) and Date(s)

Fluid Loss During Drilling _____ gallons
Water Removed During Development _____ gallons
Static Depth to Water _____ feet below M.P.
Pumping Depth to Water _____ feet below M.P.
Pumping Duration _____ hours
Yield _____ gpm Date _____
Specific Capacity _____ gpm/ft
Well Purpose _____

Remarks Not yet developed

AR302435

Prepared by Wesselman

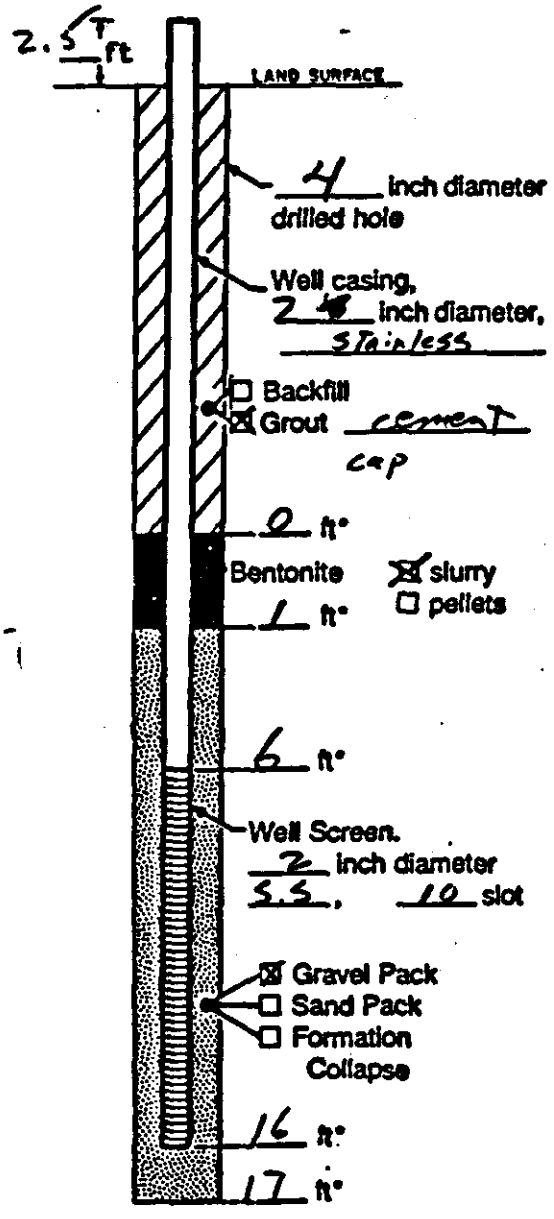
1/86

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL

DOC. CONTRL. #
M0679FR6-GM-_____

WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project AVTEX Well VB-11
Town/City FRONT ROYAL
County _____ State VA
Permit No. _____
Land-Surface Elevation
and Datum _____ feet ☐ surveyed
_____ ☐ estimated
Installation Dates(s) _____ 8-26
Drilling Method Driven casing
Drilling Contractor Pennsylvania Drilling
Drilling Fluid None

Development Techniques(s) and Date(s)

Fluid Loss During Drilling _____ gallons
Water Removed During Development _____ gallons
Static Depth to Water _____ feet below M.P.
Pumping Depth to Water _____ feet below M.P.
Pumping Duration _____ hours
Yield _____ gpm Date 8-26-87
Specific Capacity _____ gpm/ft
Well Purpose _____

Remarks Not yet developed

AR302436

Prepared by M. Pajerowski

1/86

GERAGHTY & MILLER, INC.
Ground-Water Consultants

DOC. CONTRL. #
M0679FR6-GM-_____

SAMPLE/CORE LOG

Boring/Well VB1 Project/No. M0679FR6 Page 1 of _____

Site Location Avtex Fibers Front Royal Drilling Started 8-13-87 Drilling Completed 8-14-87

Total Depth Drilled 22.5 feet Hole Diameter 6 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device _____ Sampling Interval Continuous feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method H.S. AUGER

Drilling Contractor Penn Drill Driller B.A. Helper B.K

Prepared By K. Wesselman Hammer Weight 140 Hammer Drop 24 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0	2.5	-	2-2-2-1	(Initial Boring) upper 1' clay cap.
				Lower 1' grey & black material, very soft
2.5	7.5	-	-	Black wastes, sludge mixed with fibrous
				material, saturated
7.5	10.0	2.0	1-1-5-6	Top 1' IBID
				Bottom 1' clay, brown w/ streaks of grey
				& black
10.0	12.5	2.0	3-5-7-7	clay, orange/brown with grey mottles,
				dry - slightly moist, dense yet slightly
				plastic.
12.5	15.0	1.0	1-7-15-20	clay; orange; stiff, less plastic
				than above.
15.0	17.5	2.0	7-14-17-31	IBID
17.5	20.0	2.0	17-16-21-21	clay, 25% sand, orange, moist.
20.0	22.5	1.0	8-24-39/5"	IBID plus small gravel
				END of Log for Boring
- Notes:				Hit cobble or trash layer at ± 22-5. A302437
				Rock (Bedrock at ± 29')
				Coring attempted
				ABANDONED Borehole

1/86

GERAGHTY & MILLER, INC.
Ground-Water Consultants

(Overburden)

SAMPLE/CORE LOG

DOC. CONTRL. #
M0679FR6-GM-

Boring/Well VB2 Project/No. M0679FR6 Page 1 of 1

Site Location Avtex Fibers Front Royal Drilling Started 8-11-87 Drilling Completed 8-11-87

Total Depth Drilled 25 feet Hole Diameter 6 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device — Sampling Interval Continuous feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method H.S Auger

Drilling Contractor Penn Drill Driller B.A Helper B.K.

Prepared By K Wendelmeal Hammer Weight 140 Hammer Drop 24" inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0	2.5	.5	—	Surface soil, clay/silt/sand, some natural organic material, Light Brown
2.5	4.5	1.75	—	SHELBY Tube Sample
5.0	7.5	1.0	1-4-3-3	Rubberlike black & grey material, some fiberous material, saturated
7.5	10.0	2.0	2-5-19-23	Upper 1.5' same as Above Lower 1.0' clay, grey/black.
10.0	12.5	2.0	5-6-10-14	clay, blue/grey (As in Basin 3), some brown colored soils.
12.5	15.0	2.0	6-8-10-13	Sandy clay, blue/grey w/ browns, firm
15.0	17.5	2.0	15-17-20-15	clay & sandy soils w/ much gravel content. Some browns & blue/grey colors, dense.
17.5	20.0	1.0	15-30-32-37	Black, very dense material, dry & brittle
20.0	22.5	0.5	12-$\frac{50}{5}$-x-x	clay w/ rock, brown/grey/black, hard
22.5	25.0	0.5	12-$\frac{50}{5}$-x-x	Appears to be weathered rock, grey & brown & layered, very dense yet breakable in layers
25.0	27.5	0	30/0	BEDROCK
				SEE Sample/Core Log For Bedrock Coring.

AR302438

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL (Red)

DOC. CONTRL. #
M0679FR6-GM-

(overburden)

SAMPLE/CORE LOG

Boring/Well VB3 Project/No. M0679FR6 Page 1 of 2

Site Location Autex Fibers Front Royal Drilling Started 8-6-87 Drilling Completed 8-7-87

Total Depth Drilled 29 feet Hole Diameter 6 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device — Sampling Interval Continuous feet

Land-Surface Elev. ____ feet ☐ Surveyed ☐ Estimated Datum ____

Drilling Fluid Used NONE Drilling Method H.S. Auger

Drilling Contractor Penn Drill Driller B.A Helper B.K

Prepared By K. Wesselman Hammer Weight 140 Hammer Drop 24 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
				Waste Material + Overburden
0	2.5	1.0	6-17-15-6	clay, brown; some shale pieces throughout. 1" thick layer of black glossy hard material at ≈ 2' (coal or black slag material)
2.5	5.0	0.5	1/24"	Void from ≈ 2.5-4.5', Black ooze material saturated. Tip had crusty, grey material, somewhat plastic.
5.0	7.5	1.5	—	Black/gray material, somewhat plastic, (clay)
7.5	10.0	2.0	—	Gray material, (clay), some orange colored mottles
10.0	12.5	2.0	14-20-35-X	Upper 0.5' green/black/grey material Lower 1.5' grey and orange/brown marbled material - (clays)
12.5	15.0	1.0	16-18-30-50	clay, brown/orange, hard
15.0	17.5	2.0	10-14-25-42	Grey material w/ orange/brown clay plastic yet very firm. (clay)
17.5	20.0	2.0	8-20-22-27	IBID, yet more orange/brown than grey.

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL
(red)

DOC. CONTRL.
M0679FR6-GM-

SAMPLE/CORE LOG (Cont.d)
(overburden)

Boring/Well VB3

Prepared By K Wesselman

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
20.0	22.5	1.5	12-36-41-50/3	Lower .5' orange/brown + grey material (clays), very dry, dense, brittle, has pieces of gravel in tip
				upper 1' same as previous interval
22.5	25.0	0.5	50/5"	Same as Lower portion Above
25.0	27.5	0.2	50/3"	IBID, some tan colors and ½" band of dark grey material.
27.5	30.0	0.1	50/2"	grey + brown material (clay), hard, brittle, dense, wet (possibly from upper water zone)
	Encountered Bedrock			at 29' - See sample/core
	Log for Bedrock			coring.

AR302440

1/88

GERAGHTY & MILLER, INC. Ground-Water Consultants ORIGINAL (Red)

DOC. CONTRL. # M0679FR6-GM-

(overburden)

SAMPLE/CORE LOG

Boring/Well VB7 Project/No. M0679FR6 Page 1 of 1

Site Location Avtex Fibers Front Royal Drilling Started 8-31-87 Drilling Completed 9-1-87

Total Depth Drilled 30 feet Hole Diameter 6 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device _____ Sampling Interval Continuous feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method H.S. Auger

Drilling Contractor Penn Drill Driller B.A Helper B.K

Prepared By K. Wesselman Hammer Weight 140 Hammer Drop 24 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 Inches	Sample/Core Description
0	7.5	7.5	—	(Original Boring) Fill CAP - clay, some gravel, brown + black (mixed colors)
7.5	10.0	2.0	5-5-6-6	clay, brown + med grey, plastic, exterior saturated, some sand.
10.0	12.5	1.0	5-4-6-5	IBID
12.5	15.0	2.0	9-3-6-5	TO 14.0' IBID
				14.0-14.5 - compressed crust material, some fibrous material, dry, fluffy, brownish black.
				14.5-15.0 - Hard rubberlike material, layered + platey, grey to black.
15.0	17.0	—	—	SHELBY TUBE
17.5	20.0	2.0	2-2-1-1	Rubberlike material (ground) in black liquid
20.0	22.5	4"	2-1-1-1	IBID
22.5	25.0	2.0	45-15-15-14	clay, w/ granular texture, black, dry interior, (top .5' same as above)
25.0	27.5	2.0	1/0"-1/3"-4-6	IBID, moist
27.5	30.0	2.0	—	clay, dense, brown/grey
SEE Sample/core Log For Bedrock coring				

AR302441

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL (Red)

DOC. CONTRL. # M0679FR6-GM-

(overburden)

SAMPLE/CORE LOG

Boring/Well VB8 Project/No. M0679FR6 Page 1 of 1

Site Location Avtex Fibers Front Royal Drilling Started 9-2-87 Drilling Completed 9-3-87

Total Depth Drilled — feet Hole Diameter — inches Type of Sample/ Coring Device

Length and Diameter of Coring Device Sampling Interval Continuous feet

Land-Surface Elev. feet ☐ Surveyed ☐ Estimated Datum

Drilling Fluid Used Drilling Method H.S. Auger

Drilling Contractor Penn Drill Driller BA Helper BK

Prepared By K. Wesselman Hammer Weight 140 Hammer Drop 24 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
				(7 Borings ATTEMPTED)
				6 wouldn't go >5'
				1 Not in Basin - Clay
				VB8 Abandoned because of
				concrete slabs near surface - unpenetrable

1R302442

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL (Red)

(waste overburden)

SAMPLE/CORE LOG

DOC. CONTRL. # 0679FR6-GM-

Boring/Well V69 Project/No. M0679FR6 Page 1 of 1

Site Location Avtex Fibers Front Royal Drilling Started 8-26-87 Drilling Completed 8-27-87

Total Depth Drilled 24 feet Hole Diameter 4 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device _____ Sampling Interval Continuous feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Driven Casing

Drilling Contractor Penn Drill Driller BA Helper BK

Prepared By K. Wesselman Hammer Weight 140 Hammer Drop 24 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0	0.5	—	—	Surface crust cellulose material, light tan
0.5	2.0	—	—	soft white material with grey streaks.
2.0	4.0	2.0	1-1-1-2	Rubberlike material, green & grey colors,
				hard, moist exterior
4.0	6.0	2.0	—	IBID
6.0	8.0	2.0	—	IBID plus layers of ground + softer rubberlike
				material. - saturated
8.0	10.0	2.0	—	Rubberlike material, green & grey, easy to
				break apart.
10.0	12.0	—	—	SHELBY TUBE
12.0	14.0	—	28/24"	Same as 8-10' (some layers very hard)
14.0	16.0	2.0	28/24"	Rubberlike material, dk green, crumbly to
				very hard
16.0	18.0	2.0	20/24"	IBID
18.0	20.0	2.0	11/24"	IBID
20.0	22.0	2.0	18/24"	IBID
22.0	24.0	—	—	upper 1' IBID
				23-24' Black, Dry, Hard Clay

AR302443

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL (Red)

DOC. CONTRL. # M0679FR6-GM-_____

(whole overburden)

SAMPLE/CORE LOG

Boring/Well V810 Project/No. M0679FR6 Page 1 of 2

Site Location Avtex Fibers Front Royal Drilling Started 8-19-87 Drilling Completed 8-21-87

Total Depth Drilled 23.5 feet Hole Diameter 4 inches Type of Sample/ Coring Device Split spoon

Length and Diameter of Coring Device _____ Sampling Interval Continuous feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used NONE Drilling Method Driven Casing

Drilling Contractor Penn Drill Driller B.A Helper B.K.

Prepared By K. Wesselman Hammer Weight 140 Hammer Drop 24 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0	2.0	—	—	SHELBY TUBE SAMPLE (crust, soft white material)
2.0	4.0	0.5	1-1-0-1	Rubberlike material, green, grey, and black
4.0	6.0	2.0	1-1-0-1	Rubberlike material, same colors and much more yellows + greens, soft (mushy) and saturated voids
6.0	8.0	2.0	1-1-2-1	Rubberlike material, yellow/green, set in green/black liquid + pieces of RL material
9.0	10.0	1.0	1-2	Upper .5' stiff green + yellow Rubberlike material
				Lower .5' same as above yet softer + more layered. Layers of brown and thin layers of green granular material present
10.0	12.0	2.0	1-2-2-3	Rubberlike material, layered greens, yellows, oranges, + black. From 10-11' orange/grey color Mostly very firm.
12.0	14.0	2.0	—	SHELBY TUBE SAMPLE
14.0	16.0	2.0	2-3-4-4	Rubberlike material, mostly green + other colors also
16.0	18.0	2.0	4-5-6-10	IBID, Less dense + whole and more broken than above.

AR302444

1/88

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL (Red)

DOC. CONTRL. #
M0679FR6-GM-_____

SAMPLE/CORE LOG (Cont.d)
(overburden)
WASTE

Boring/Well VBID

Prepared By K. Wenclawski

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
18.0	20.0	2.0	7-7-7-4	Rubberlike material, brown,
				easily broken - has slits throughout
20.0	22.0	2.0	2-2-3-4	TBID
22.0	24.0	1.5	3-3-50/5"	Upper 1', TBID
				Lower 1', clay, dk grey, dry,
				very hard. (23.0-23.5')

AR302445

GERAGHTY & MILLER, INC.
Ground-Water Consultants

Original (Red)

(Waste overburden)

SAMPLE/CORE LOG

DOC. CONTRL. # M0679FR6-GM-____

Boring/Well VB11 Project/No. M0679FR6 Page 1 of 1

Site Location Avtex Fibers Front Royal Drilling Started 8-24-87 Drilling Completed 8-26-87

Total Depth Drilled 16.8 feet Hole Diameter 4 inches Type of Sample/ Coring Device ____

Length and Diameter of Coring Device — Sampling Interval Continuous feet

Land-Surface Elev. ____ feet ☐ Surveyed ☐ Estimated Datum ____

Drilling Fluid Used NONE Drilling Method Driven Casing

Drilling Contractor Pena Drill Driller ____ Helper ____

Prepared By K. Wesselmann Hammer Weight 140 Hammer Drop 24 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0	0.5	—	—	Surface crust, grey & cream colored cellulose material.
0.5	2.0	—	2/24"	Soft white moist material (consistency & looks of mashed potatoes)
2.0	4.0	2.0	2-2-2-2	Rubberlike material, somewhat flakey, saturated void spaces
4.0	6.0	2.0	—	Rubberlike material, green & orange, wet
6.0	8.0	2.0	—	IBID
8.0	11.0	3.0	—	IBID, somewhat broken up
11.0	13.0	—	—	SHELBY TUBE
13.0	15.0	2.0	2-2-2-2	Rubberlike material, green/yellow, some darker colors
15.0	17.0	1.5	3-3-4-30/3"	IBID (upper 1.5')
				AT ± 16.5' very hard clay was encountered, grey, very dry, dense, some rock chips

AR302446

ORIGINAL
(Red)

MONTHLY PROGRESS REPORT

AVTEX FIBERS, INC.

REMEDIAL INVESTIGATION/FEASIBILITY STUDY

SEPTEMBER 1987

AR302447

GERAGHTY & MILLER, INC.

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL
(Red)

November 2, 1987

Ms. Ruth Rzepski
Compliance Officer
U.S. Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, PA 19107

Dear Ms. Rzepski:

During the month of September 1987, Geraghty & Miller, Inc., (G&M) completed sample collection in support of the Viscose Basin Boring Program. Liquid samples were collected from piezometers installed within Viscose Basins 1, 2, 3, 7, 9, and 11. In addition, a seep sample emanating from Viscose Basin 10 was collected, since it was infeasible to install a piezometer in the basin. These samples have been sent to Cambridge Analytical Associates for analysis.

During September, G&M continued with the bench-scale treatability study by adding ground water retrieved from well GM-8 to the reactors as the 2.5 and 5.0 percent contaminant feed. Once the data has been analyzed, results will be forwarded to the Agency.

G&M has also arranged for a land surveyor to measure vertical datum for all newly-constructed monitor wells. The last remaining field activity in support of the Remedial Investigation will be the aquifer testing program to be scheduled by Avtex Fibers, Inc.

If you have any questions concerning the project, please direct them to the attention of Mr. Michael Pisarcik at the Avtex Fibers, Inc.-Front Royal facility, or to Mr. R.H. Hughes at the corporate offices in Valley Forge, Pennsylvania.

Sincerely,

Mark E. Wagner
Senior Scientist
Project Manager

AR302448

844 West Street • Annapolis, Maryland 21401 • (301) 268-7730

AR302448

GERAGHTY & MILLER, INC.
Ground-Water Consultants
Our 30th year

ORIGINAL
(Red)

January 26, 1988

Ms. Ruth Rzepski
Compliance Officer
U.S. Environmental
Protection Agency
841 Chestnut Building
Philadelphia, PA

Dear Ms. Rzepski:

This letter constitutes the formal response as required by the consent agreement between the U.S. Environmental Protection Agency (EPA) and Avtex Fibers, Inc. (Avtex) concerning RI/FS project activities during the month of December 1987.

During December, 1987, RI/FS work had been suspended by Geraghty & Miller, Inc. (G&M), until the last week of the month. At that time, a new agreement had been reached by all parties, and G&M commenced the validation phase of the geochemical data collected during the summer drilling activities. The geochemical data includes ground-water samples, liquid and solid waste samples, and influent/effluent samples collected during the bench-scale treatability study. In addition to data validation, G&M made preparations for the pump tests that were performed during the week of January 11, 1988. G&M was involved in contract negotiations with the drilling subcontractor who would supply the necessary hardware for the job.

In addition to these tasks, Geraghty & Miller Consulting Engineers, Inc. (GMCE), proceeded with the identification and inscoping of potential remedial alternatives for the vicose basins and ground water. Work in support of the risk assessment was also started during the last week of December.

If you have any questions concerning what was accomplished during the month of December 1987, please contact Mr. Mark E. Wagner.

Sincerely,

Geraghty & Miller, Inc.

Mark E. Wagner
Senior Scientist

Jeffrey P. Sgambat, C.P.
Vice President

AR302449

844 West Street • Annapolis, Maryland 21401 • (301) 268-7730

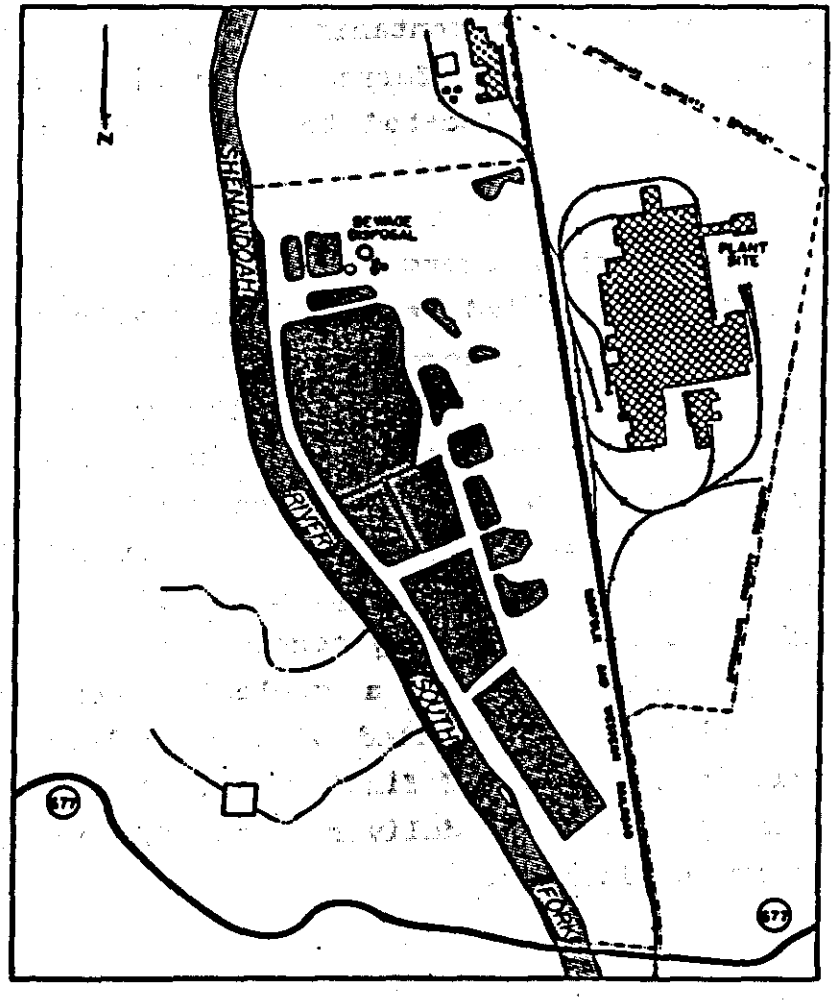
AR302449

Cardinal

ORIGINAL
(Red)

SECTION 2.0

SURFACE GEOPHYSICAL SURVEYS



AR302451

ORIGINAL
(Red)

SECTION 2.0

SURFACE GEOPHYSICAL SURVEYS

As a preliminary phase of the RI field activities at the Avtex facility, G&M performed a surface geophysical survey utilizing electrical resistivity technology. The purpose of the survey was to delineate any major bedrock fracture features which could have potentially transported highly mineralized ground water beneath the Avtex facility and to the west bank of the South Fork of the Shenandoah River. The results of the survey were intended to guide subsequent drilling activities on the plant side of the river, as well as aid in defining whether contaminated ground water had migrated past the floodplain referred to as Rivermont Acres and beneath the ridge line located to the southwest of the floodplain.

As a result of this exercise and interpretation of collected data, G&M identified several resistivity anomalies located along the perimeter berm on the plant side of the river, as well as several anomalies along the Rivermont Acres floodplain and up the ravine located proximal to well 193-177, commonly referred to as the Young well. Although anomalous values for resistivity have been detailed for the survey line extending up the ravine past the floodplain, the data is insufficient to support any conclusion as to whether the anomaly represents strictly a geologic phenomena, or mineralized ground water associated with a geologic phenomena. The preliminary report of findings from the electrical resistivity survey has been delivered to the agency and reviewed by their specialists.

ORIGINAL
(Red)

In addition to the dipole-dipole resistivity survey, G&M personnel conducted a shallow-penetrating, fixed frequency, electromagnetic survey in and around the viscose basins to 1) delineate the boundaries of the older covered basins and 2) delineate any areas of shallow ground water characterized by a high mineral content. The survey was conducted using a Geonics EM-31 unit with a EM-38 digital data logger. The locations of each transect line and identified anomalies for 3 and 6 meter penetration are presented as Exhibits 2.1 and 2.2, respectively. Raw data from the field data logger for survey lines EM-3 through EM-19 are presented as Exhibit 2.3.

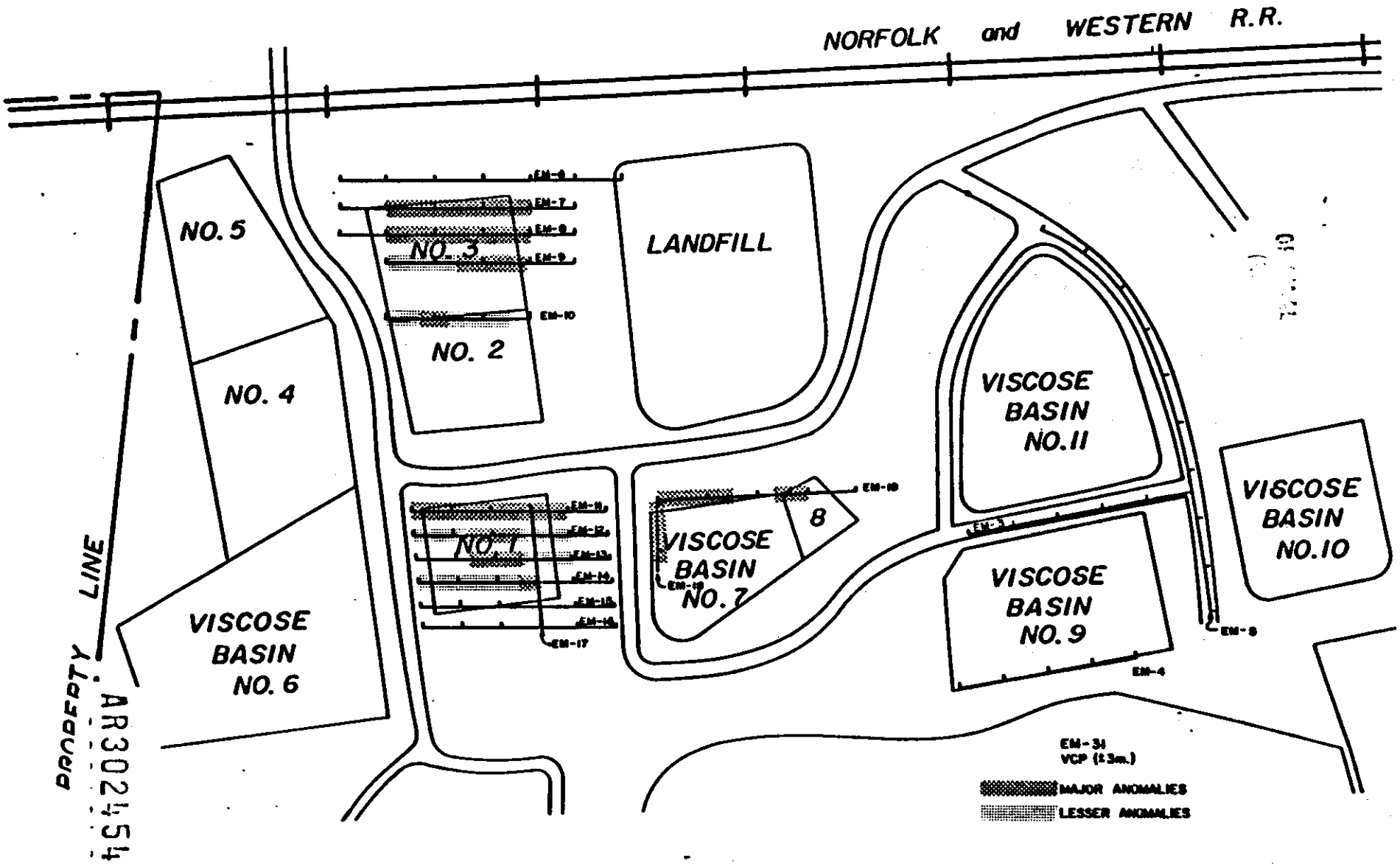


Exhibit 2.1 Preliminary EM-31 Survey Identified Anomalies - VCP.

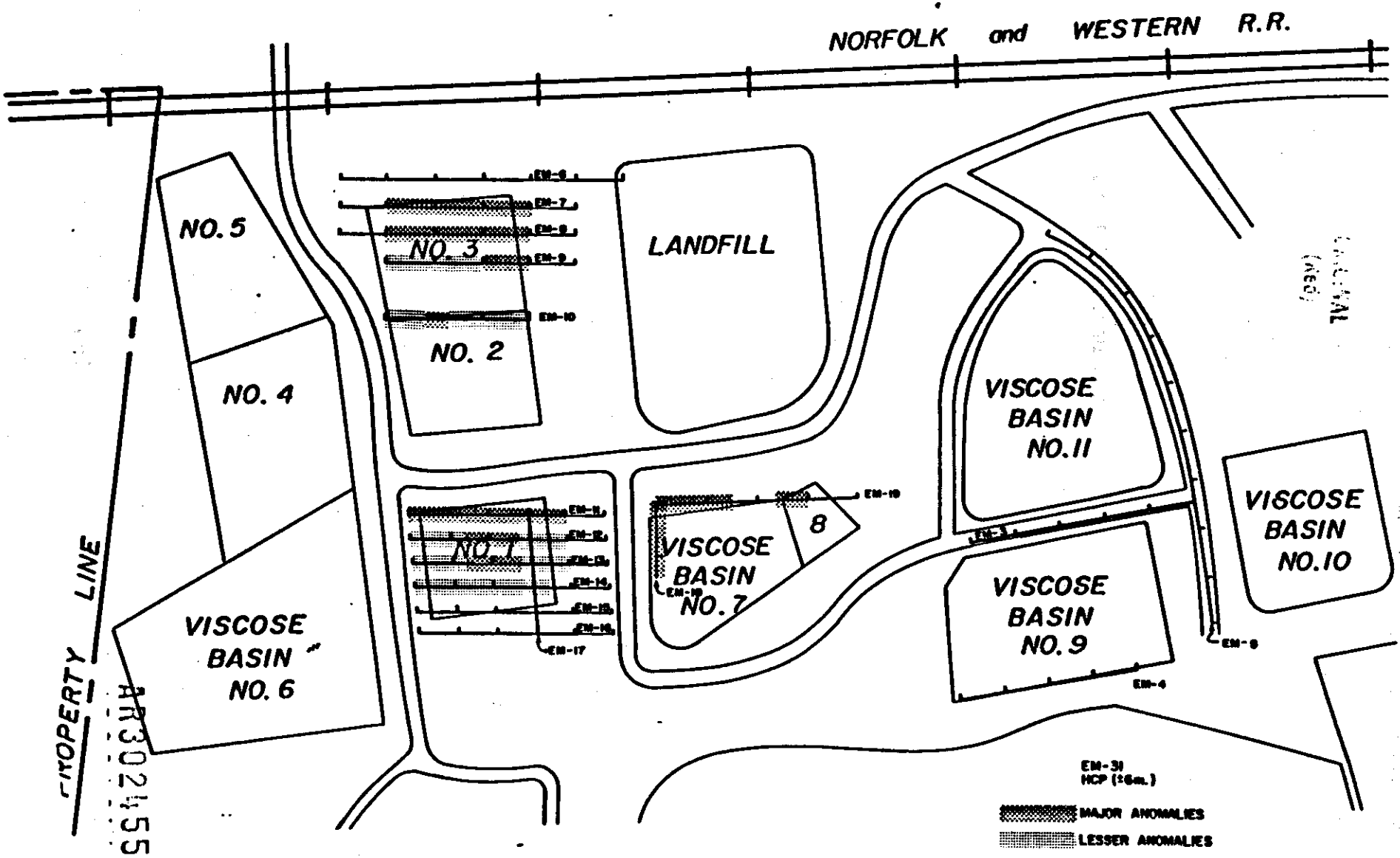
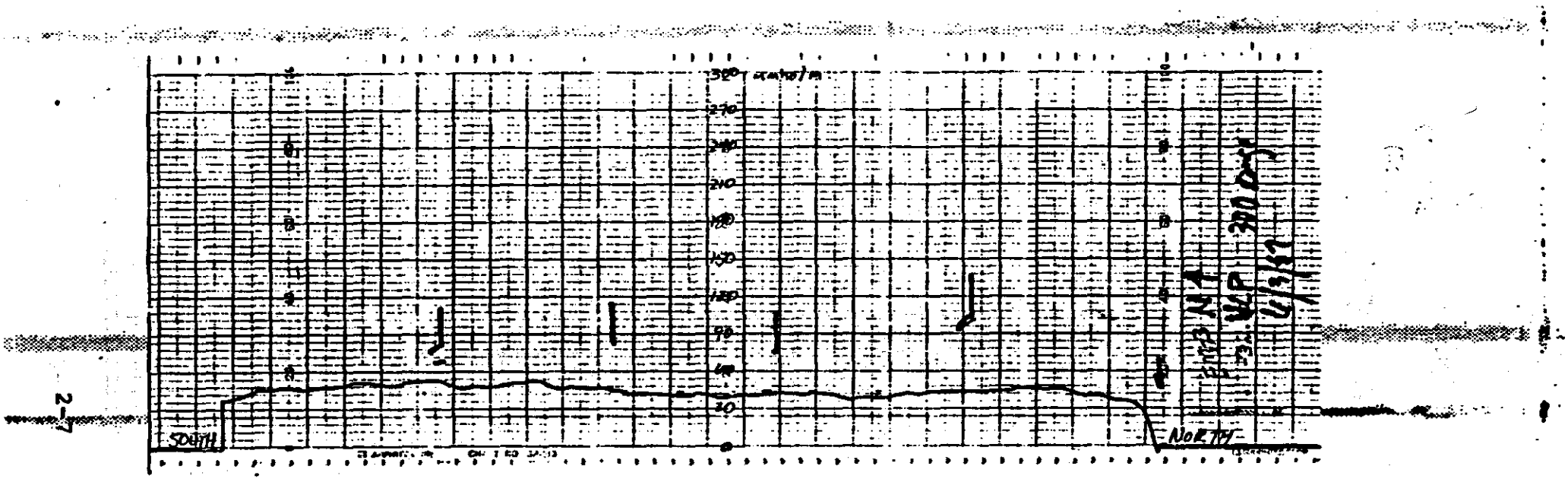


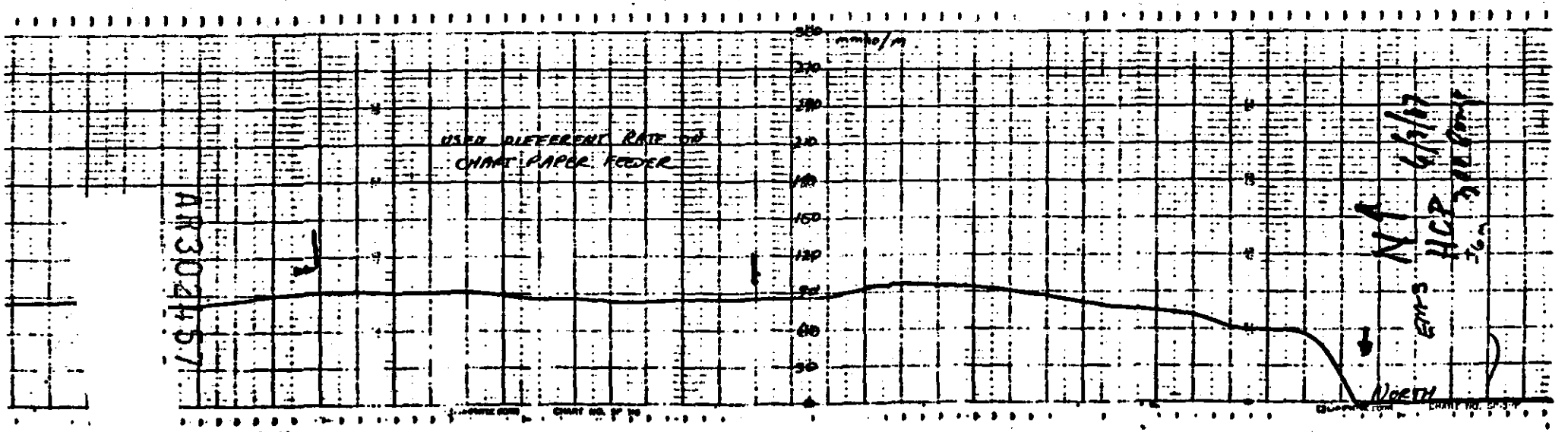
Exhibit 2.2 Preliminary EM-31 Survey Identified Anomalies - HCP.

ORIGINAL
(Red)

Exhibit 2.3

EM-31 Survey Raw Field Data


SOUTH
NORTH
AR3024457


USED DIFFERENT RATE OF
CHART PAPER FEEDER
AR3024457
NORTH

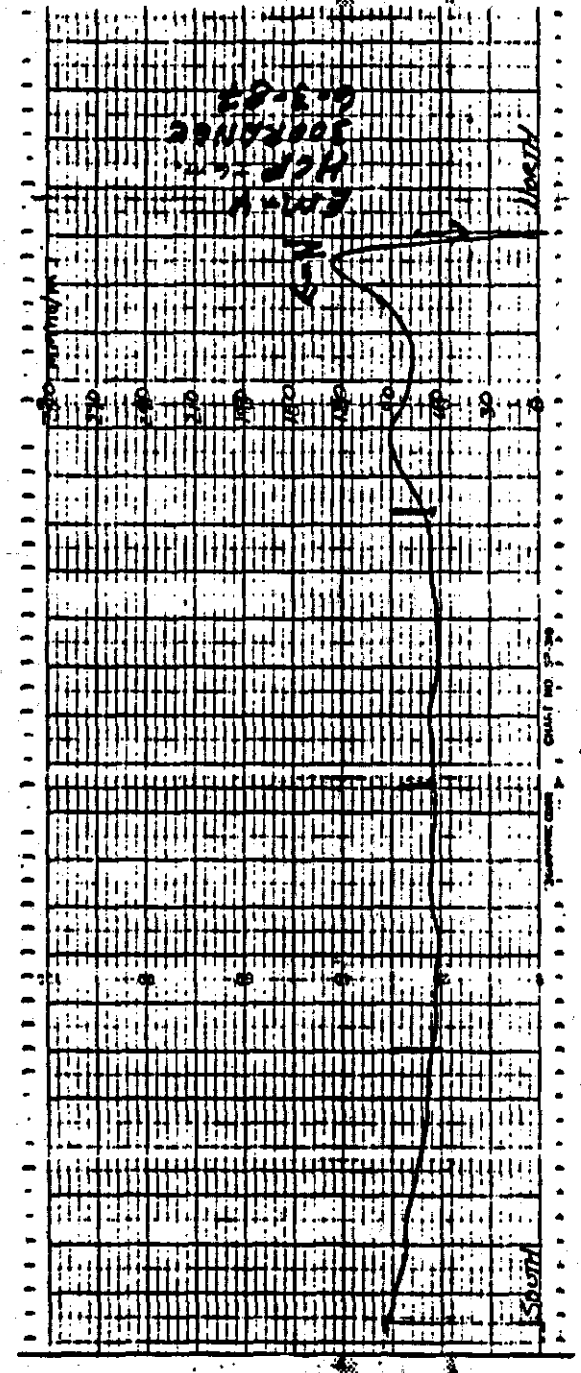
EM-3

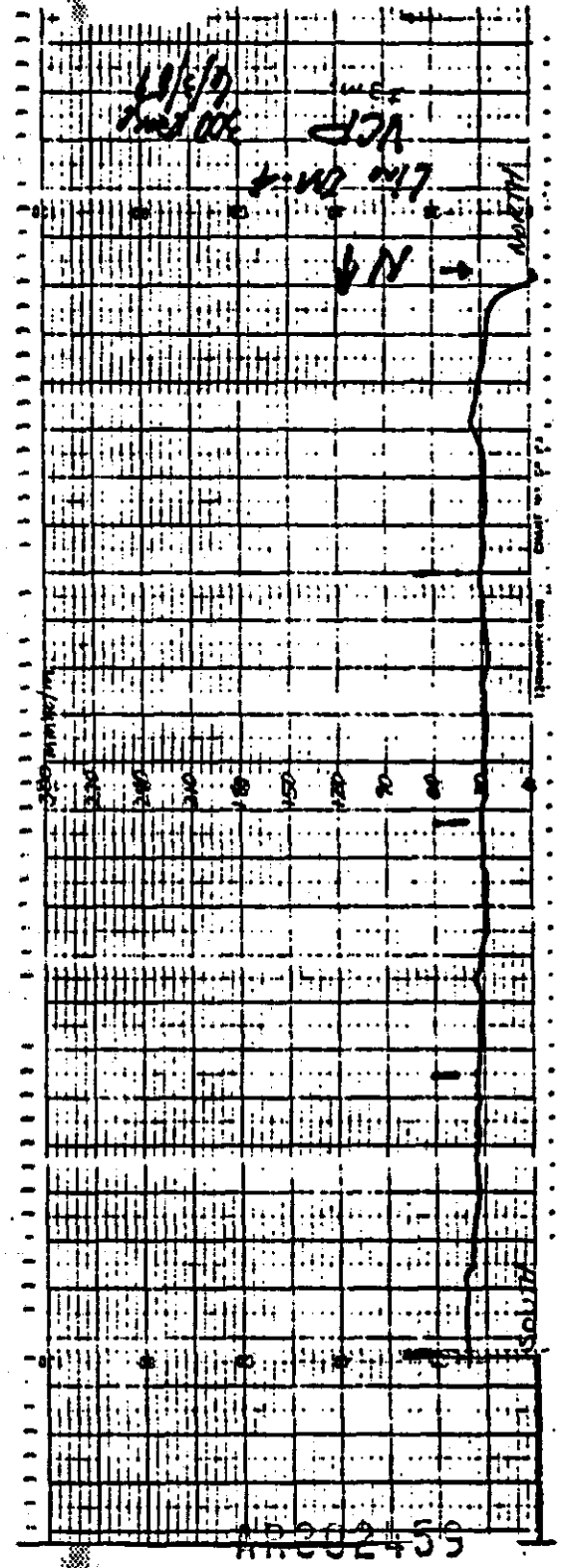
HCP 300 Axee
L-3-84

ORIGINAL
(Red)

AR302458

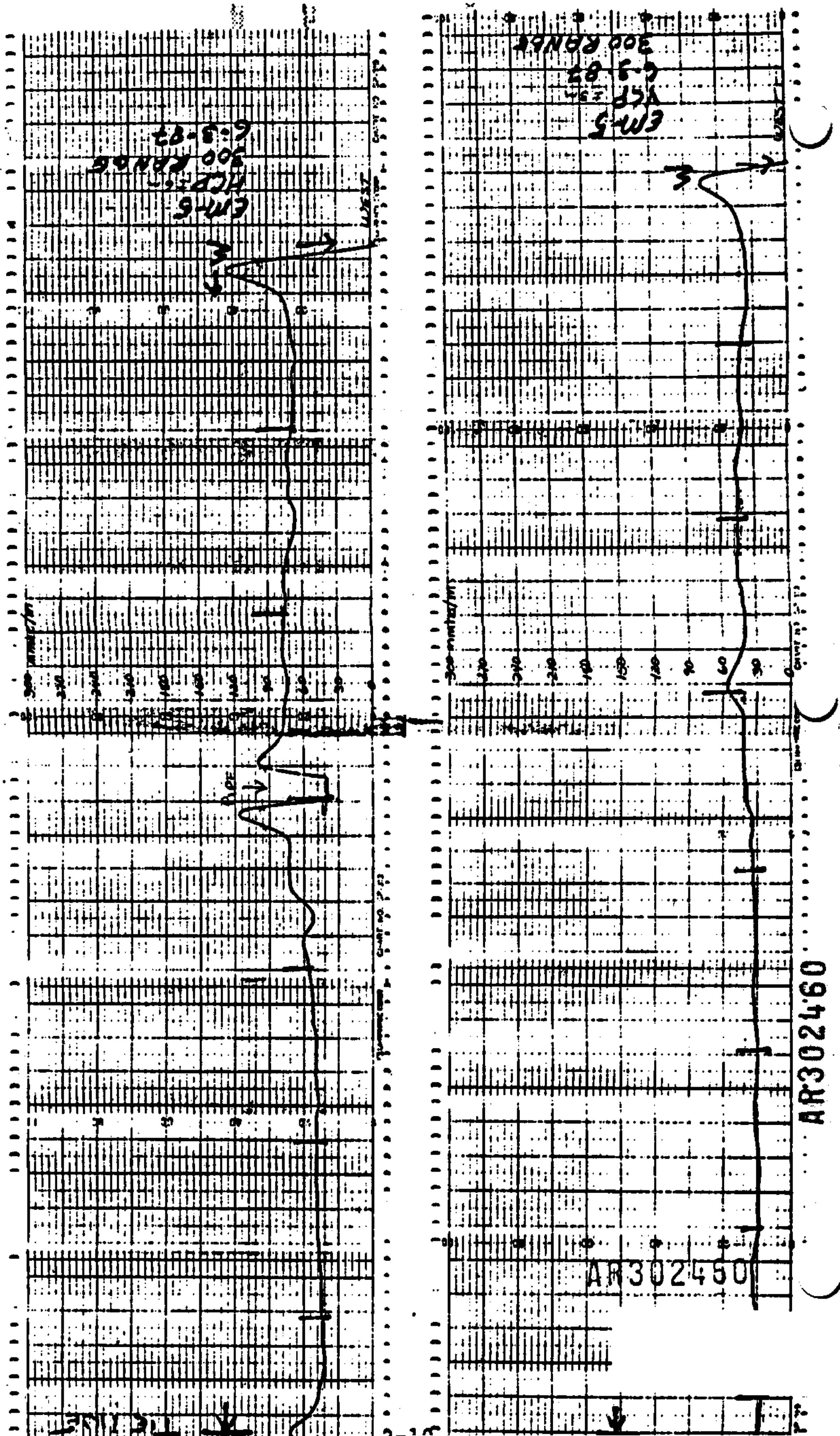
ORIGINAL
(Red)

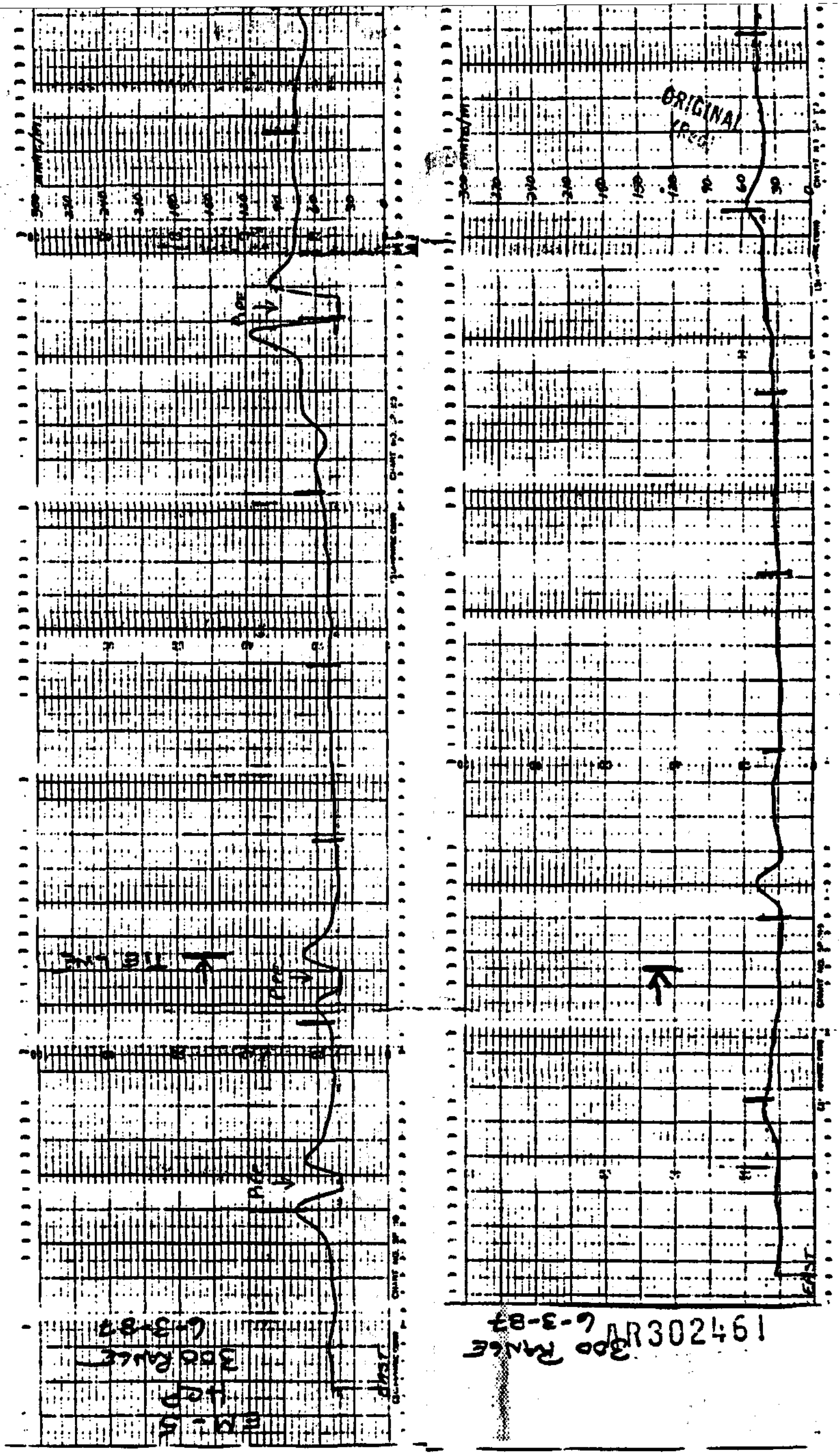




AR302459

AR302459





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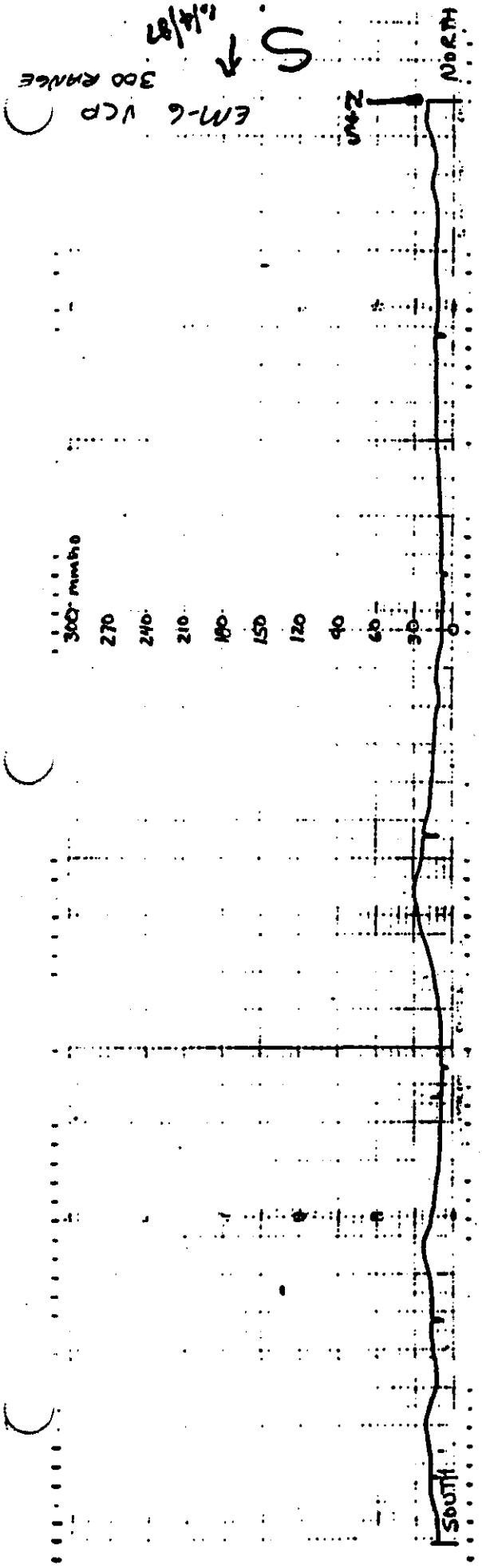
AR302462



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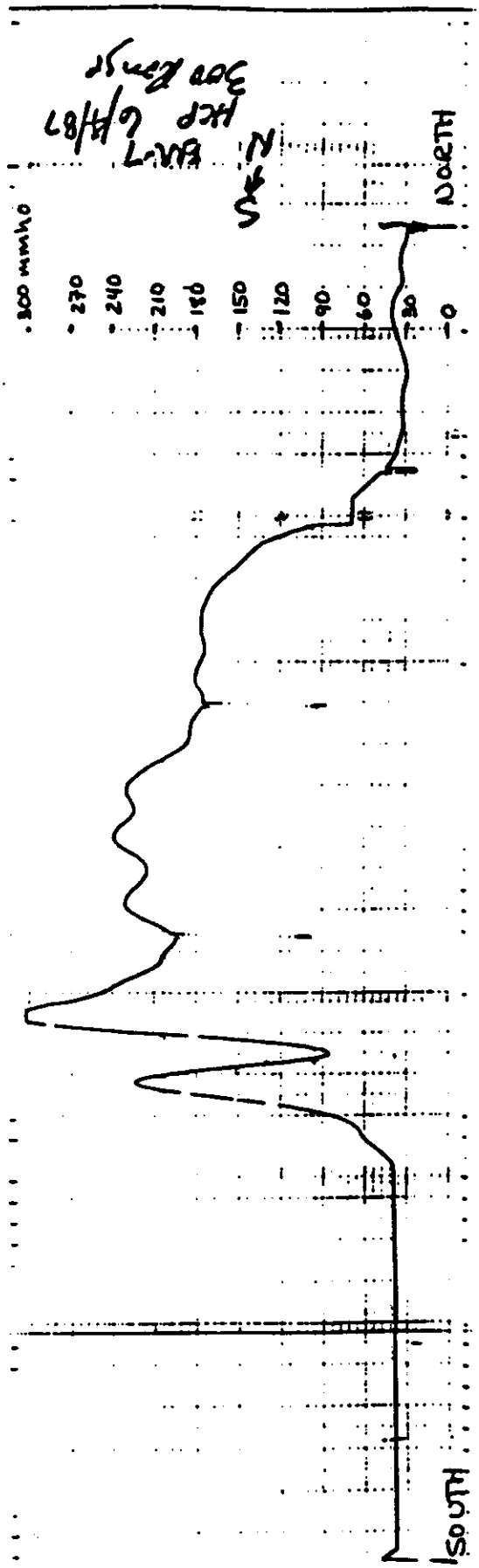
(Red)

AR302463



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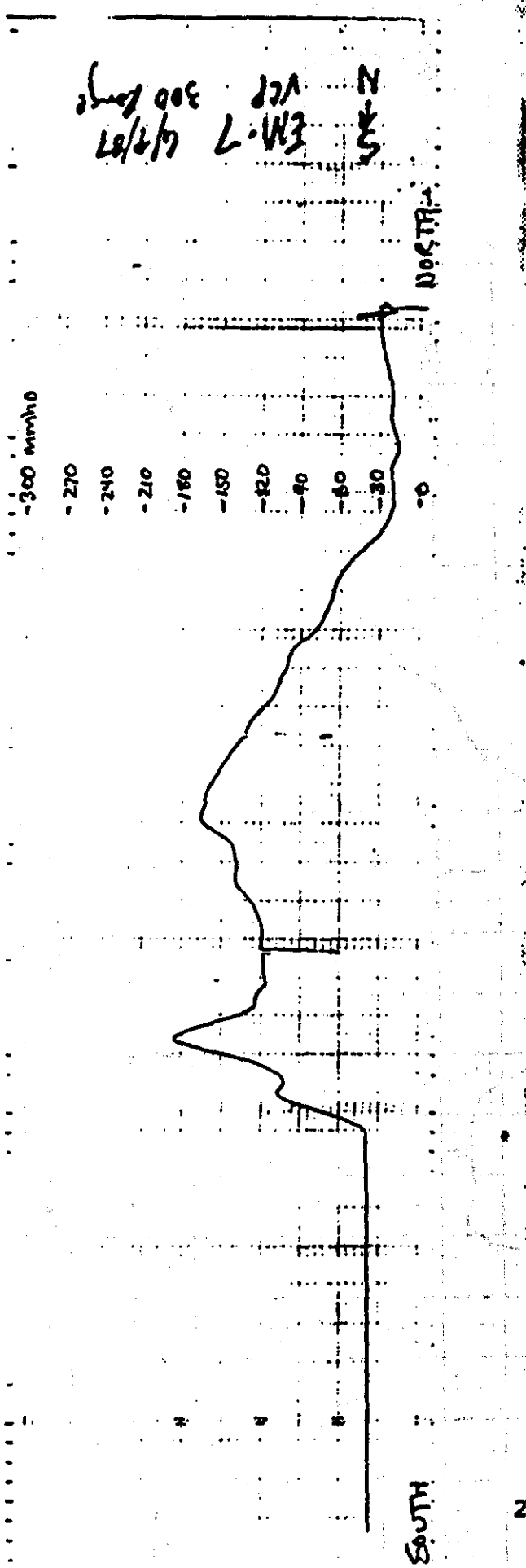

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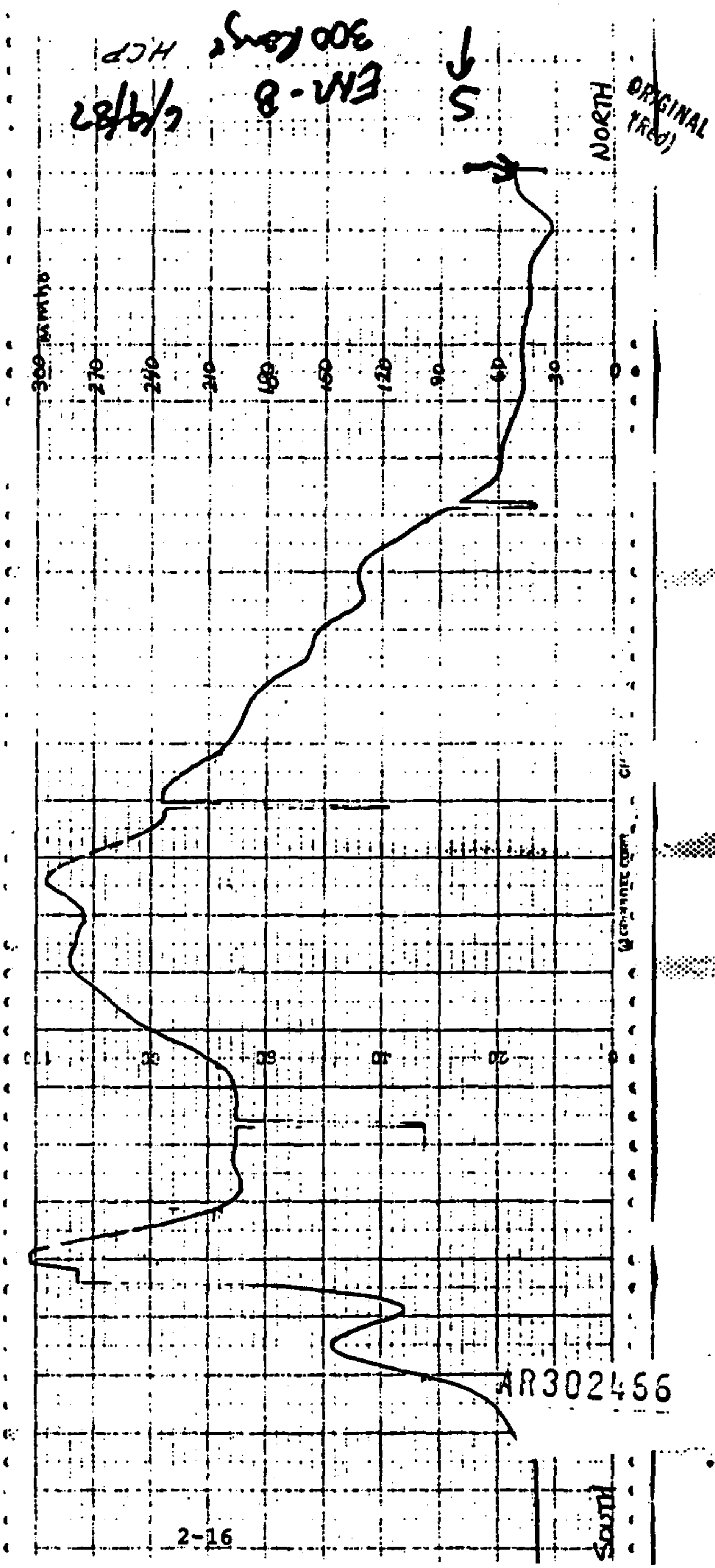
AR302465



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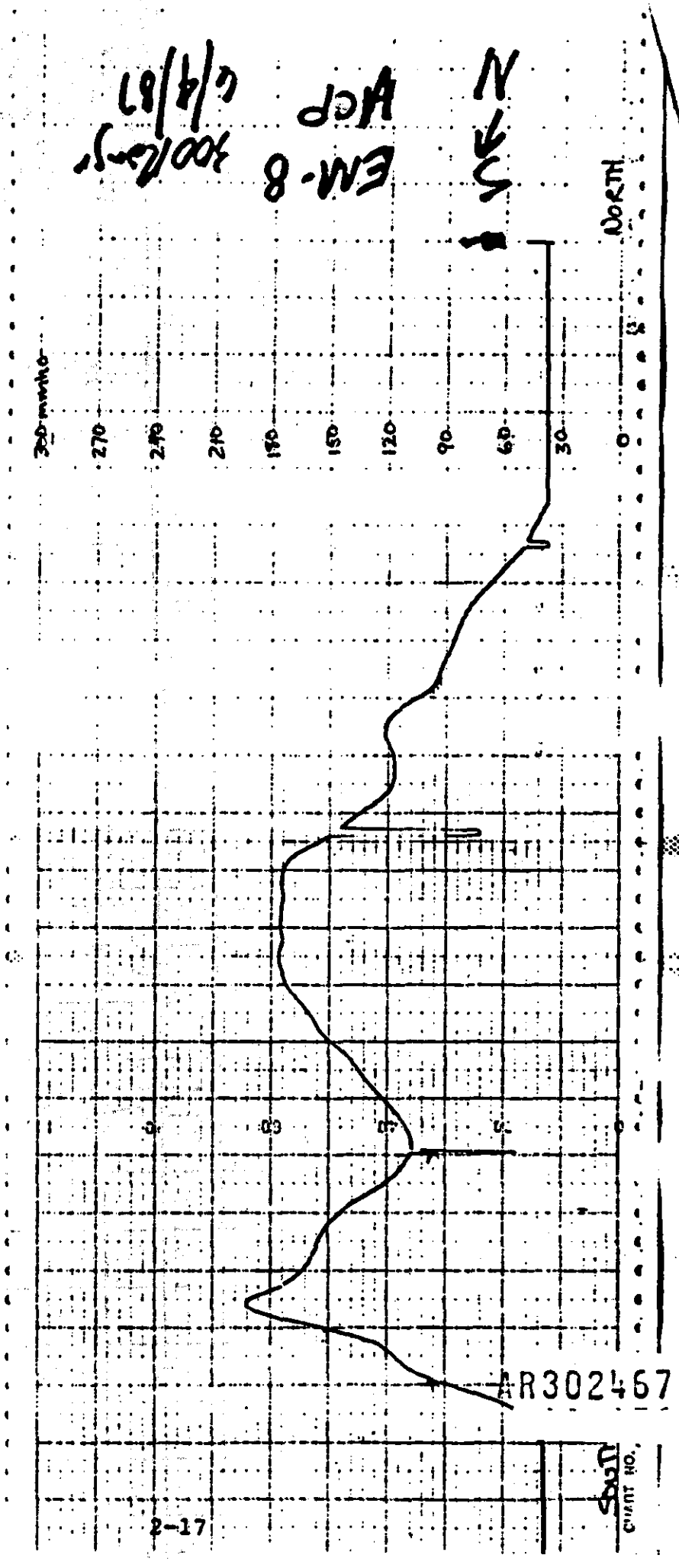
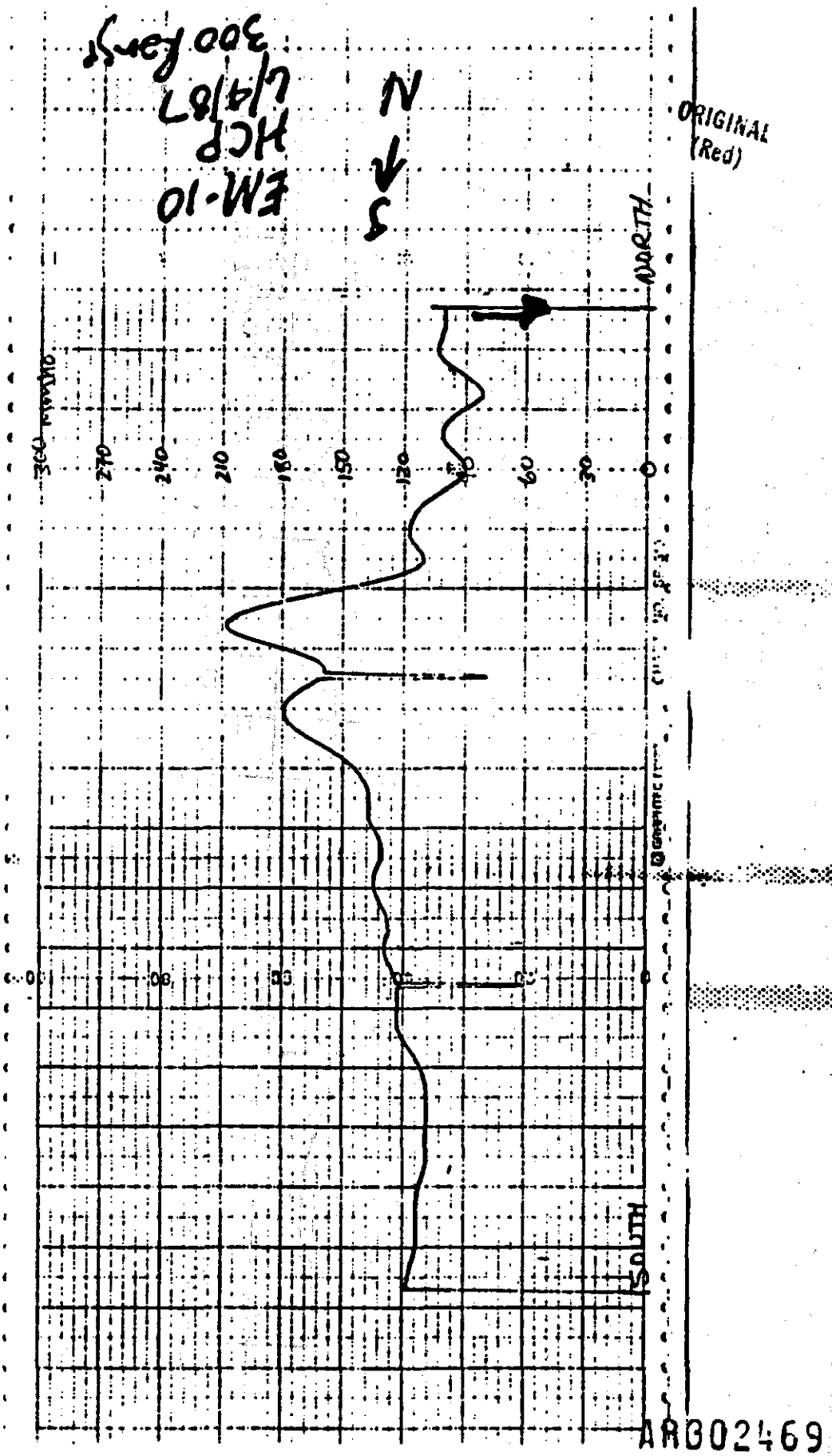


AR302468

AR302468



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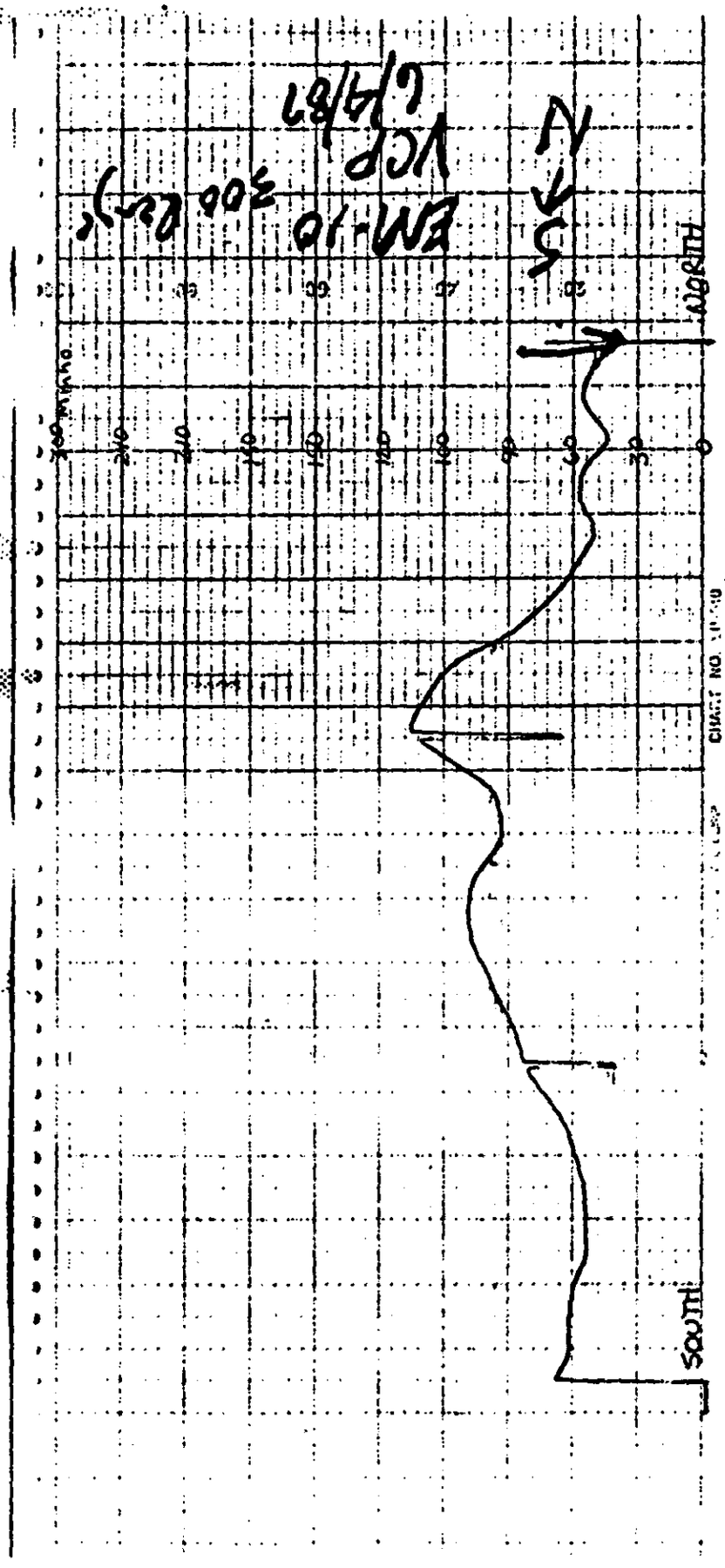

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(Red)

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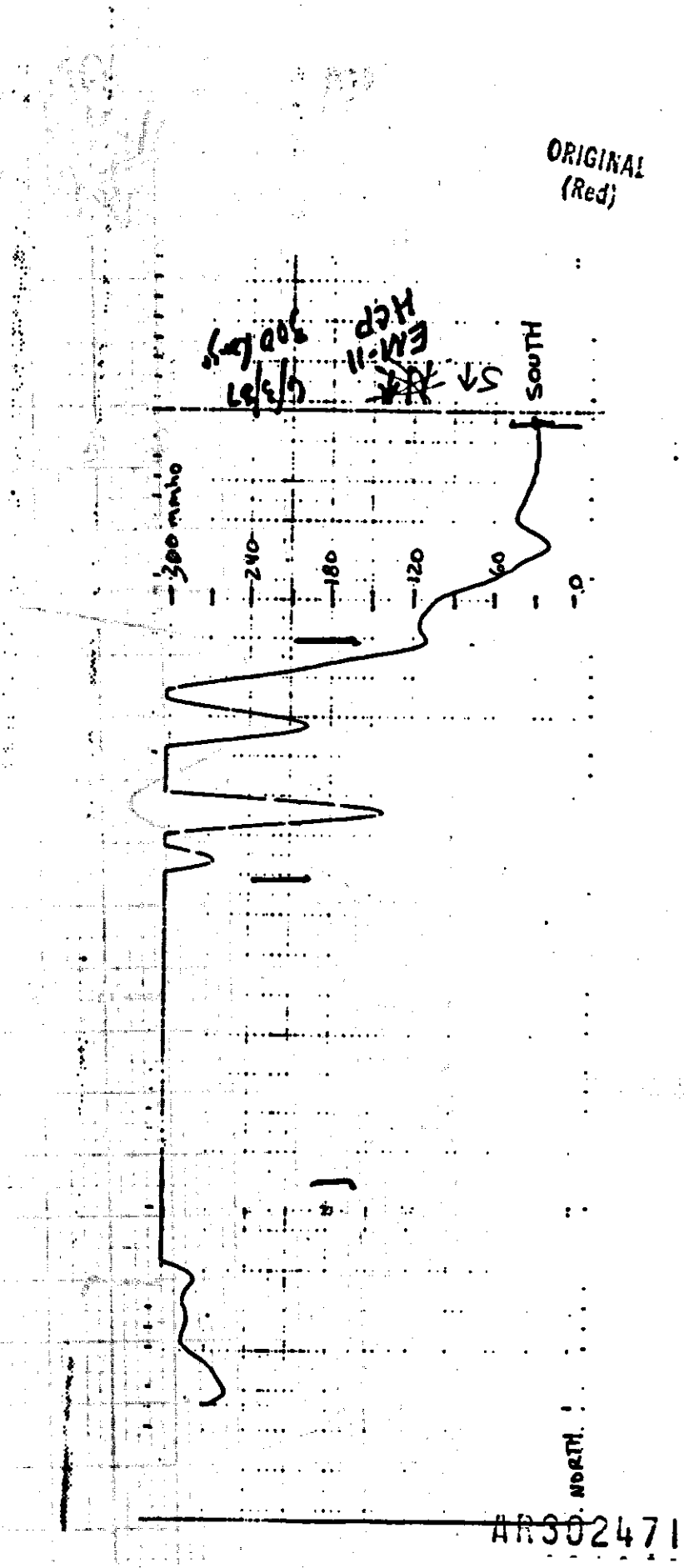

AR302471

ORIGINAL
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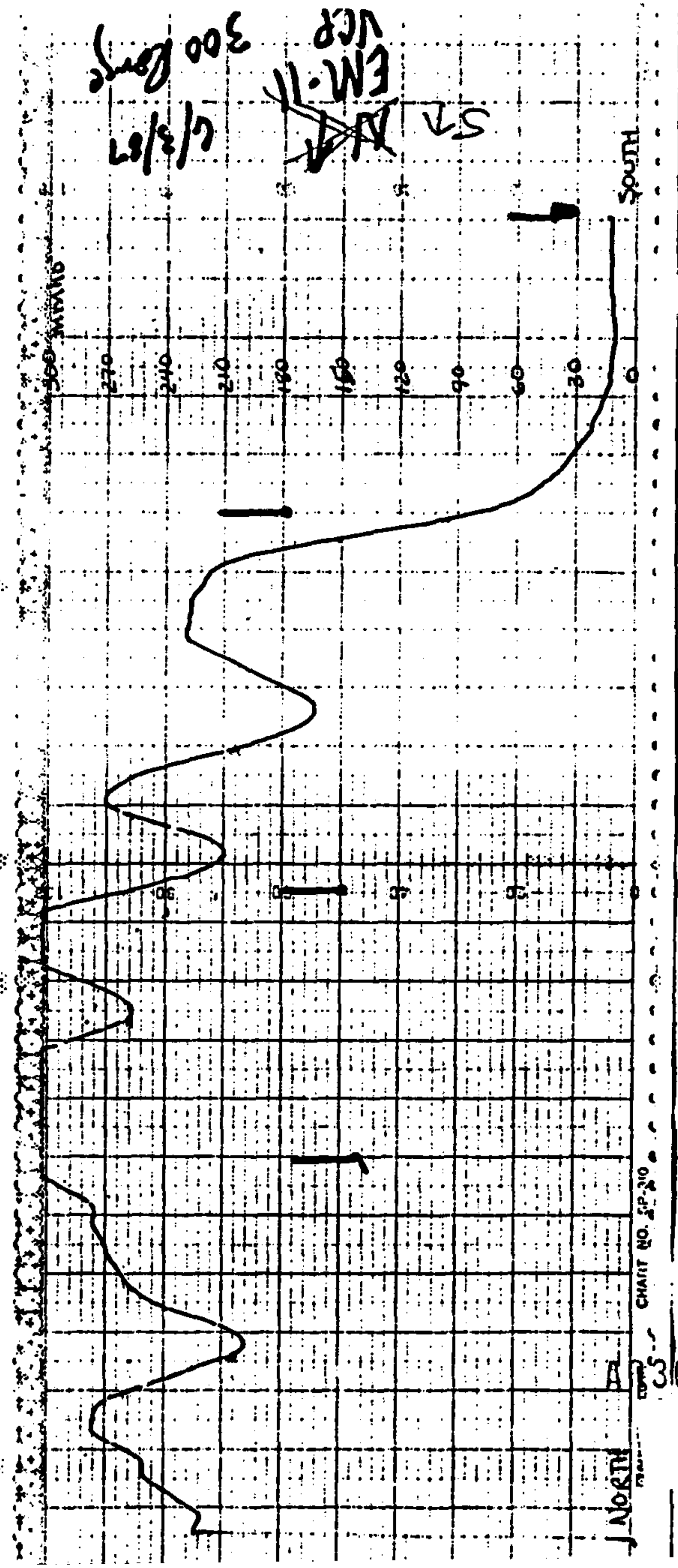
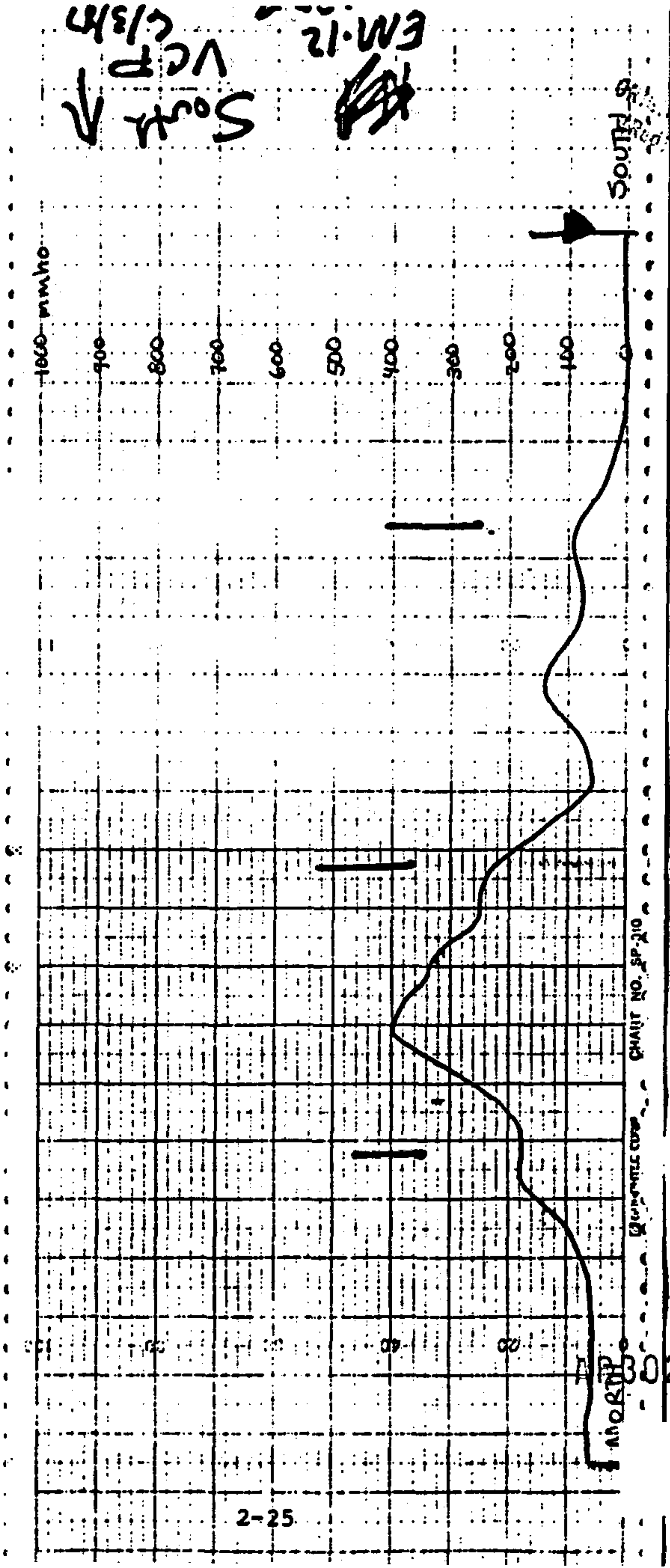


AR302472

ORIGINAL (Red)

AR302473


South
EM-12
VCP
1000 mmho
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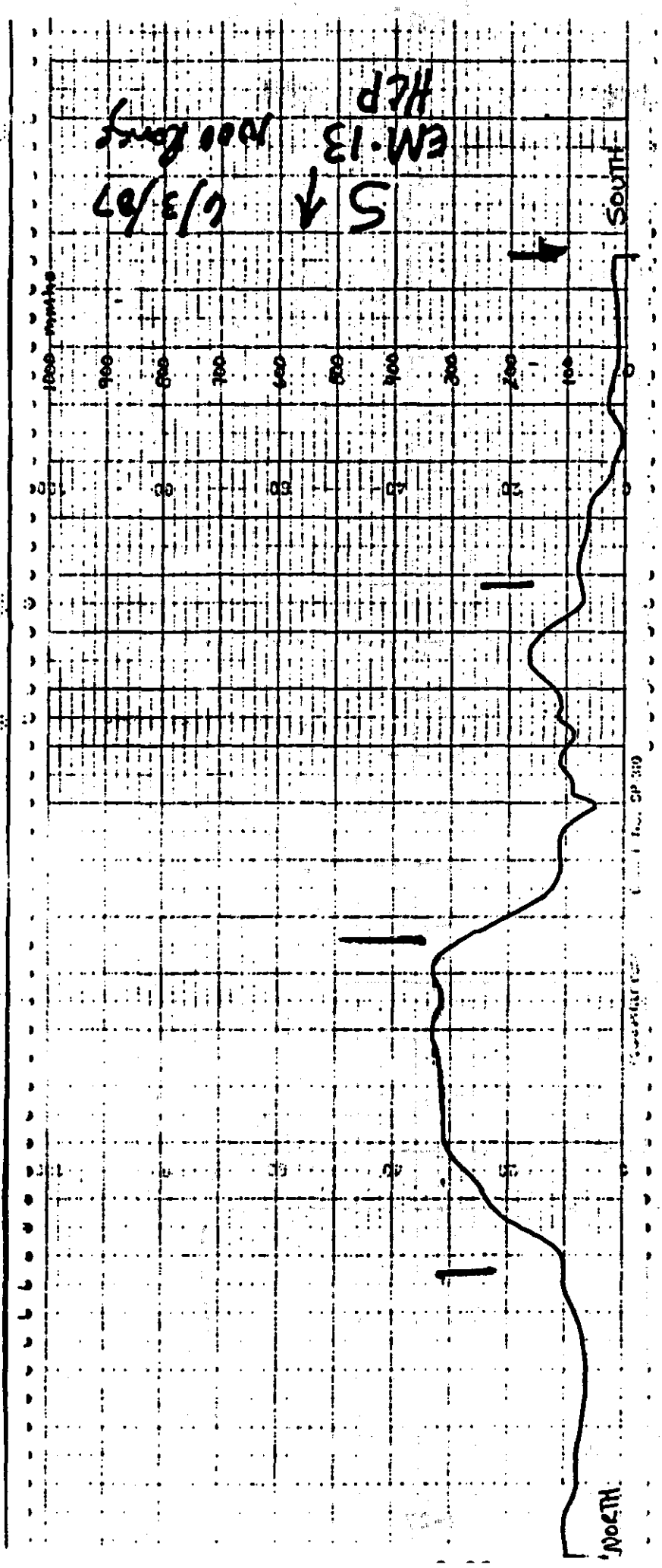
800
700
600
500
400
300
200
100
0
SOUTH
NORTH
CHART NO. SP-210

AR302474



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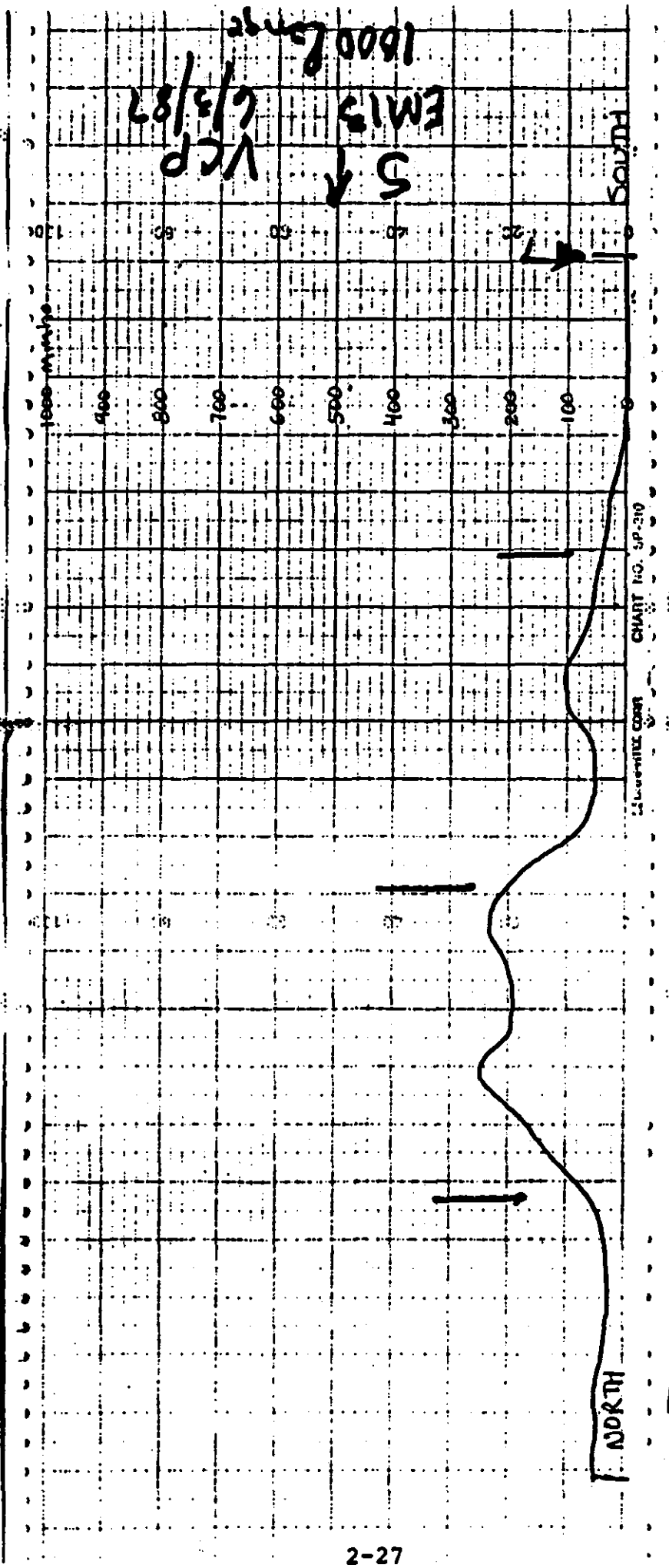
AR302475



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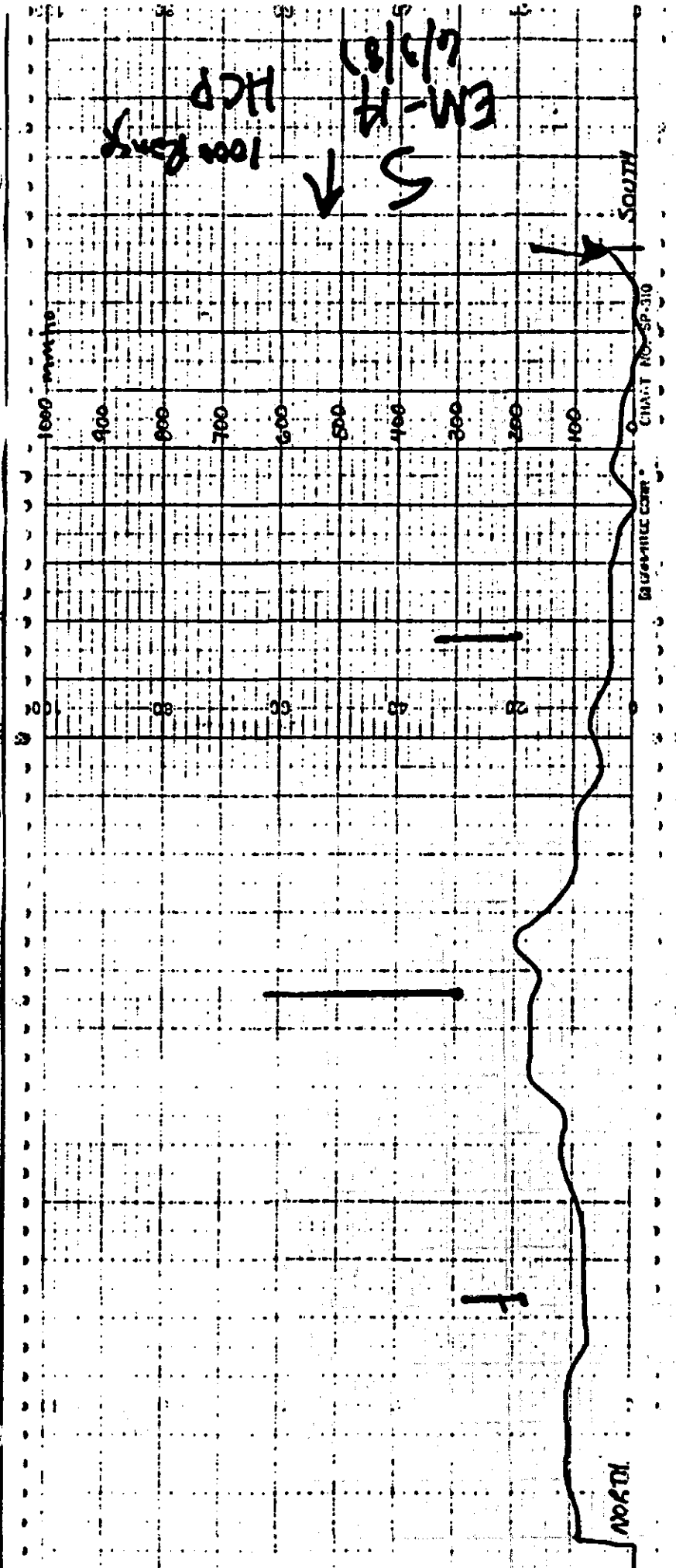
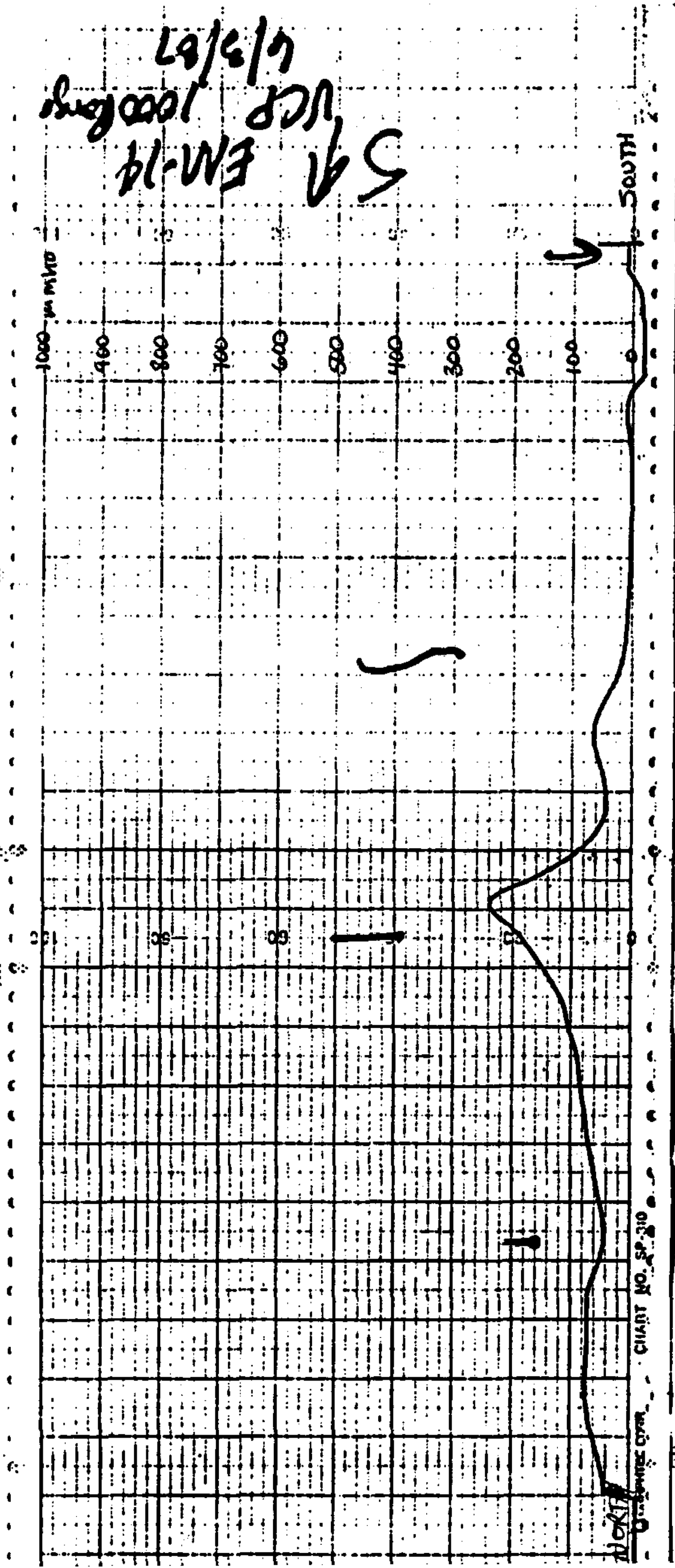


ORIGINAL

AR302477



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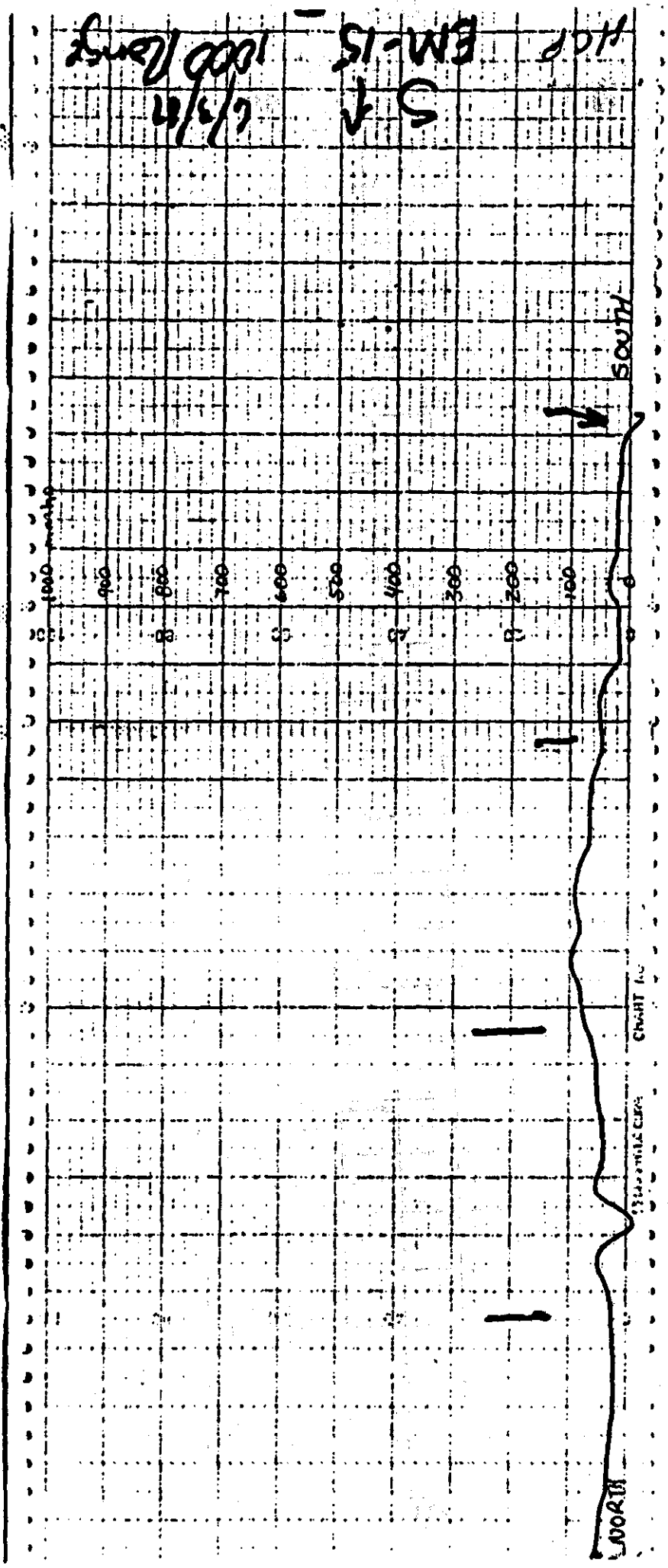

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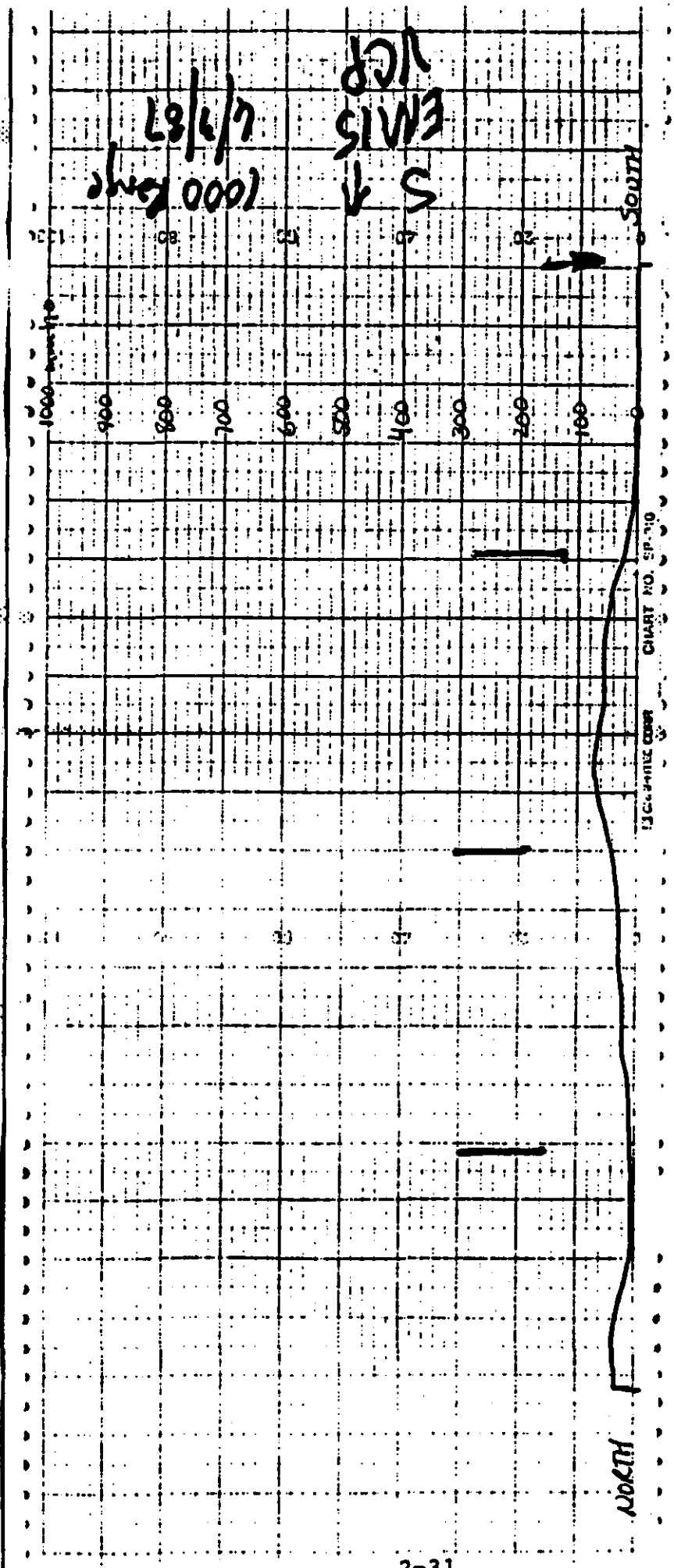

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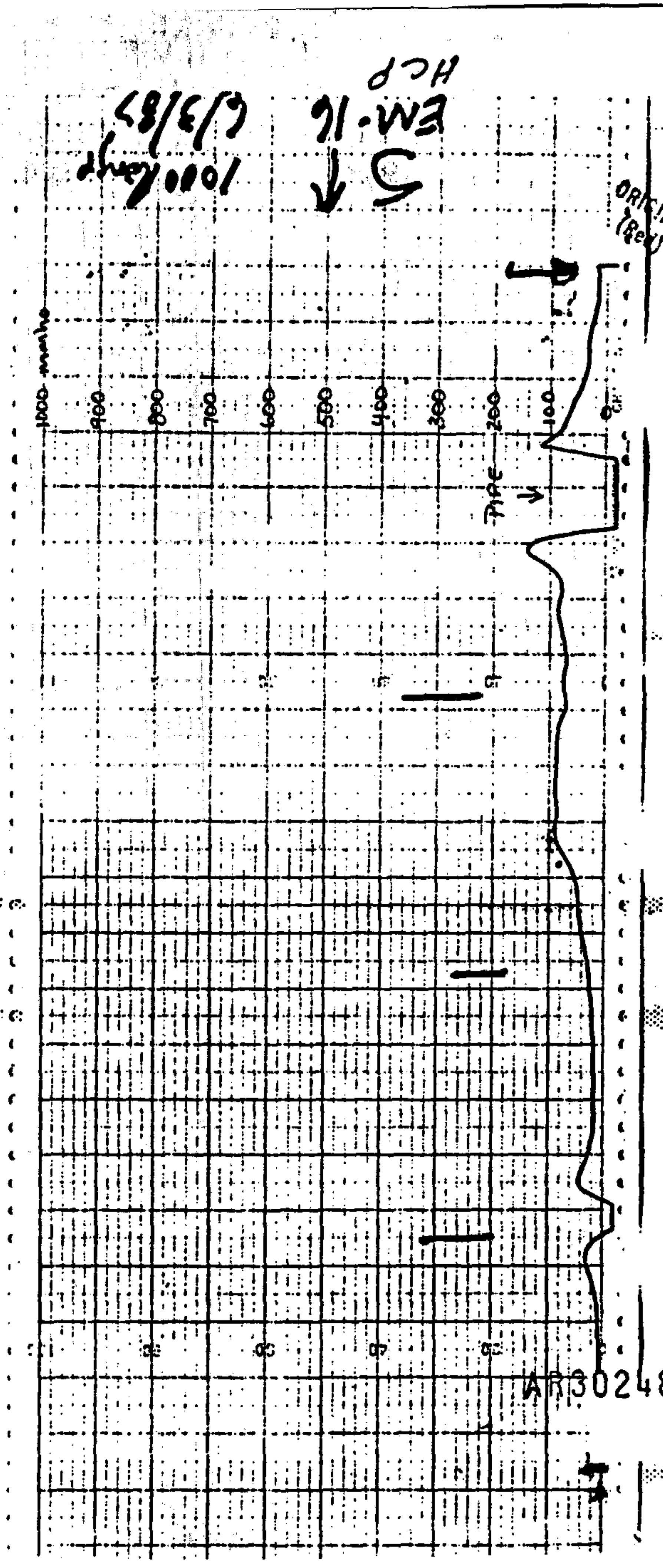
5
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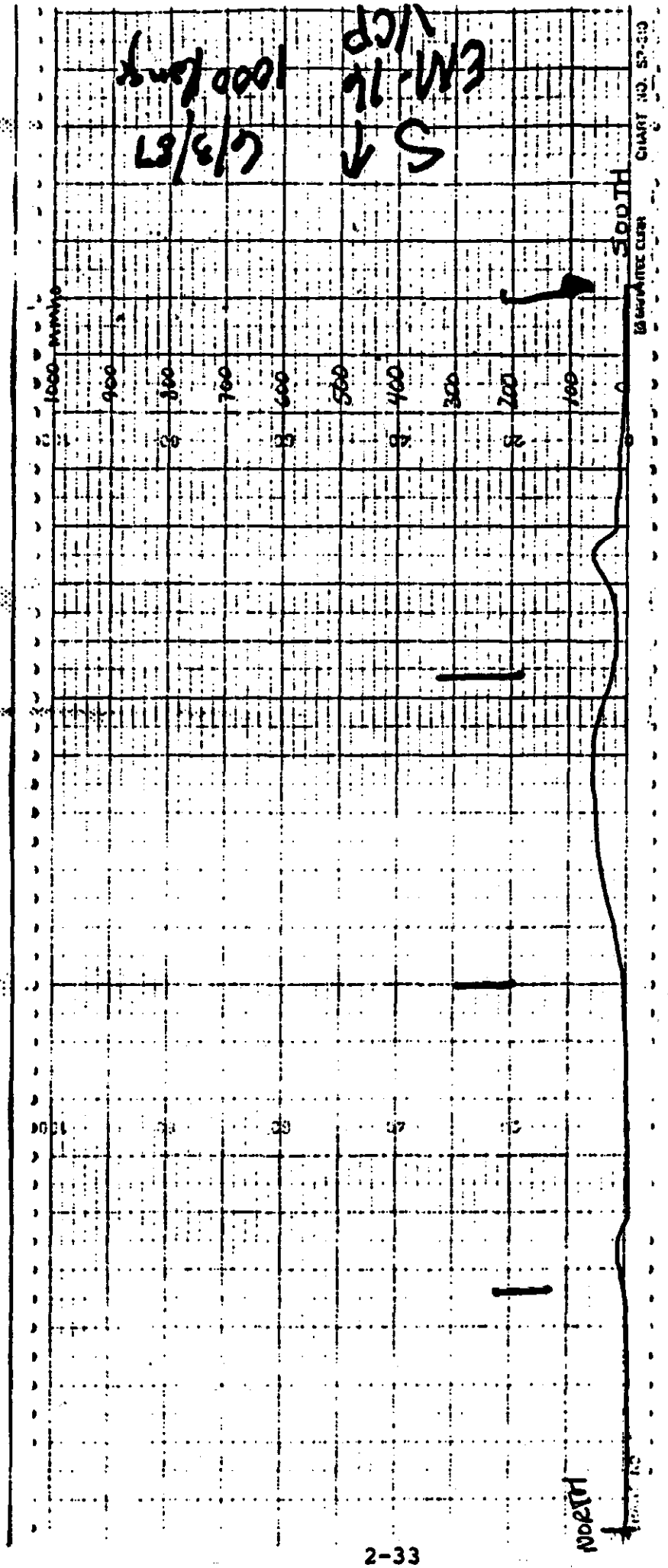
HCP
1000 amp
6/3/85
ORIGINAL (Red)
1000 mmho
900
800
700
600
500
400
300
200
100
0
PIPE



AR302482

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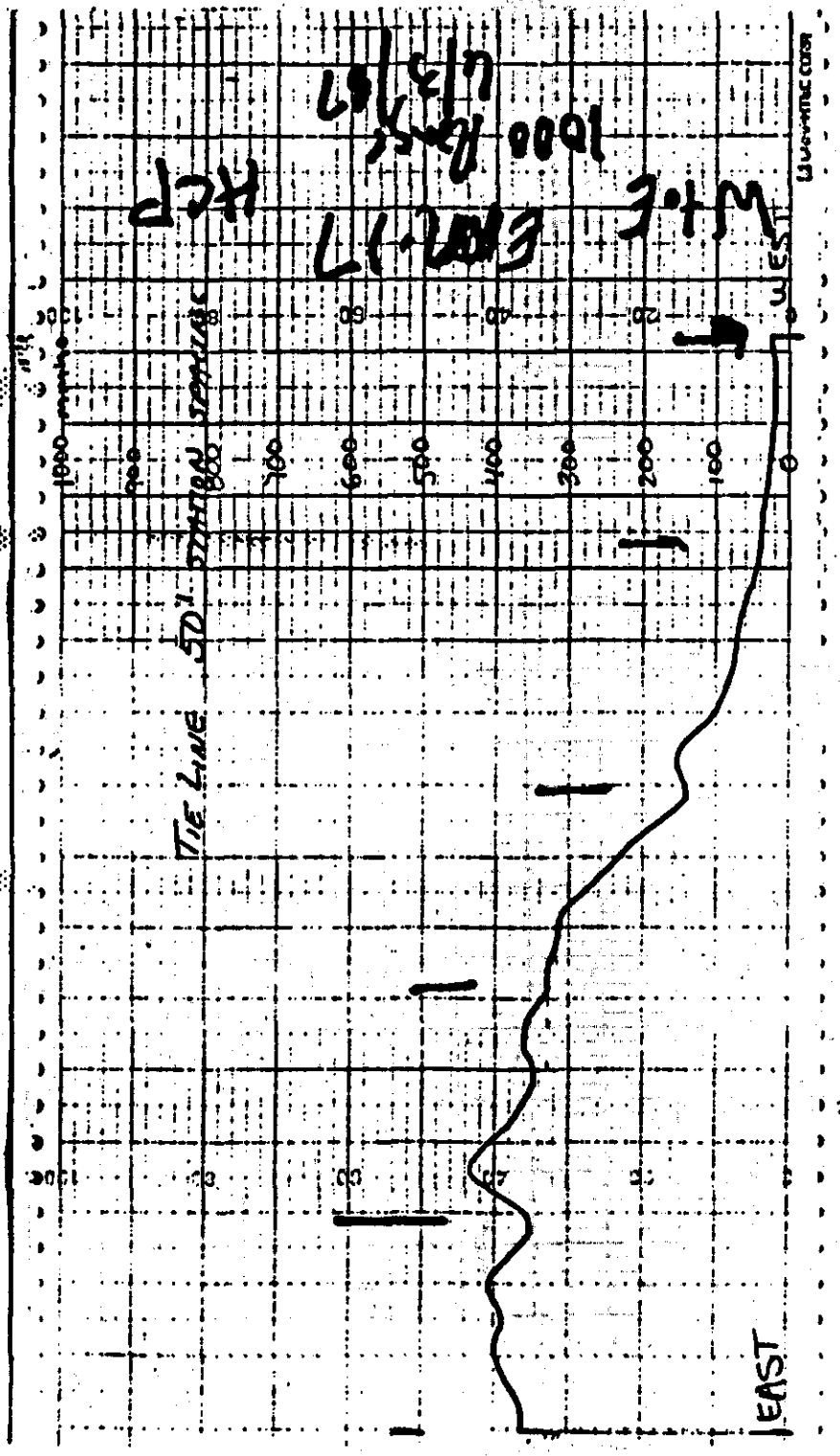
(Red)



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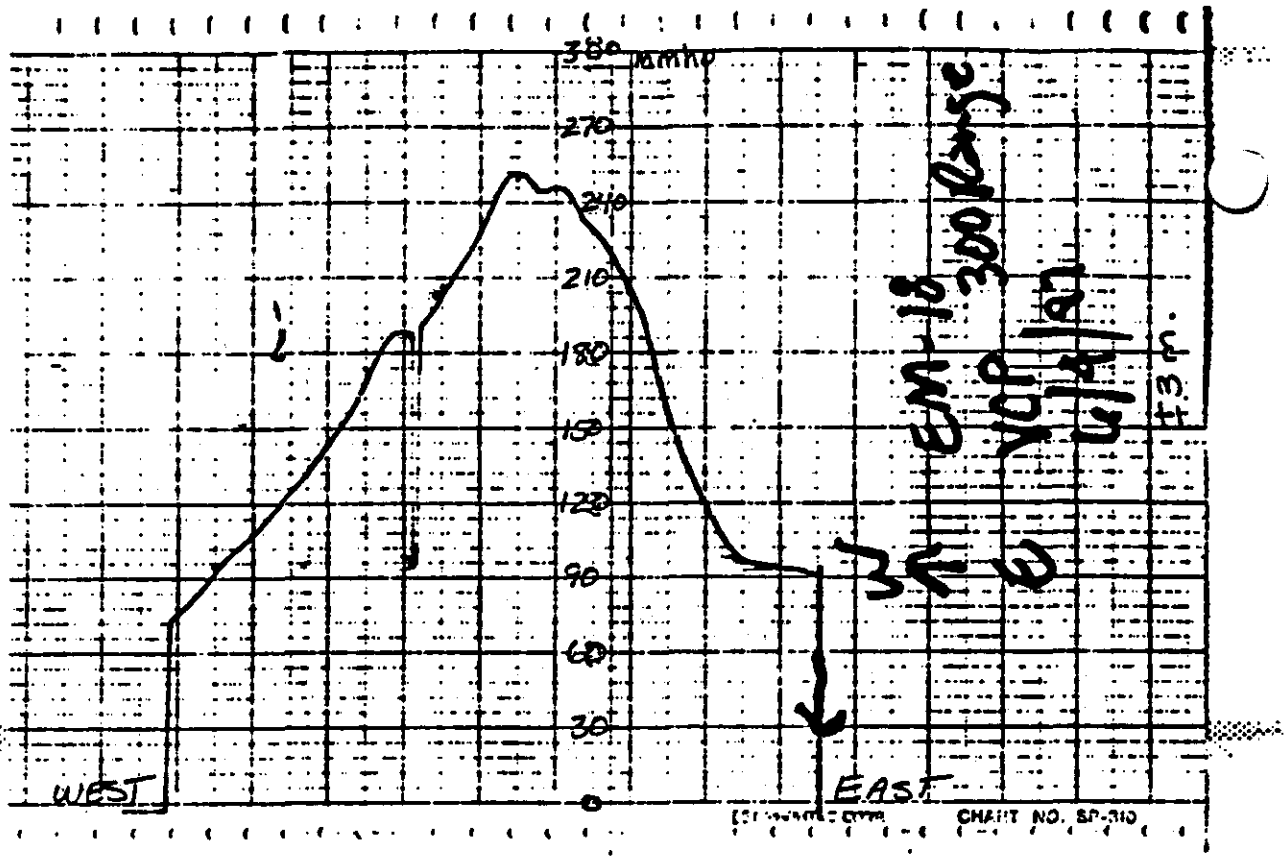
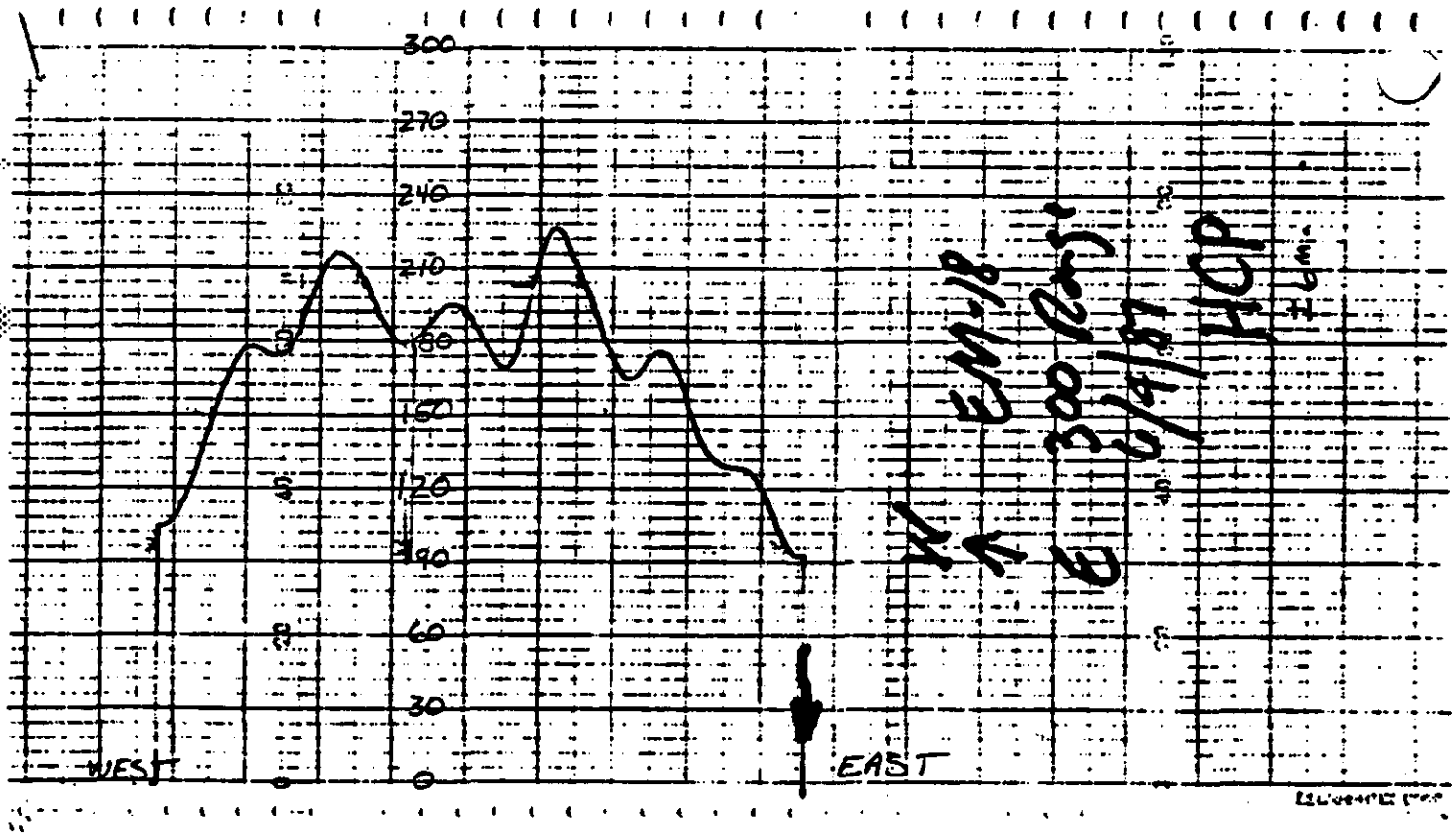
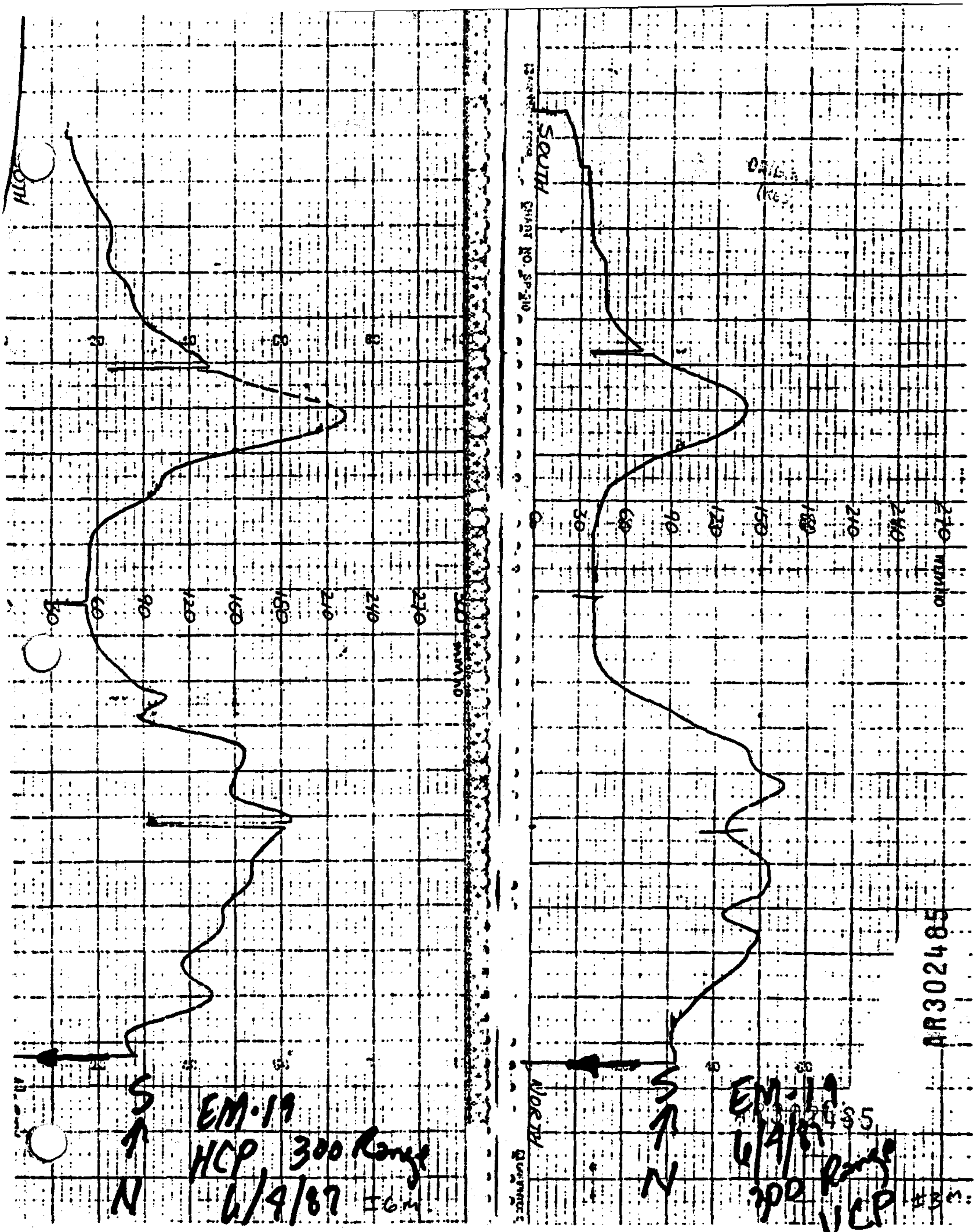




AR302484

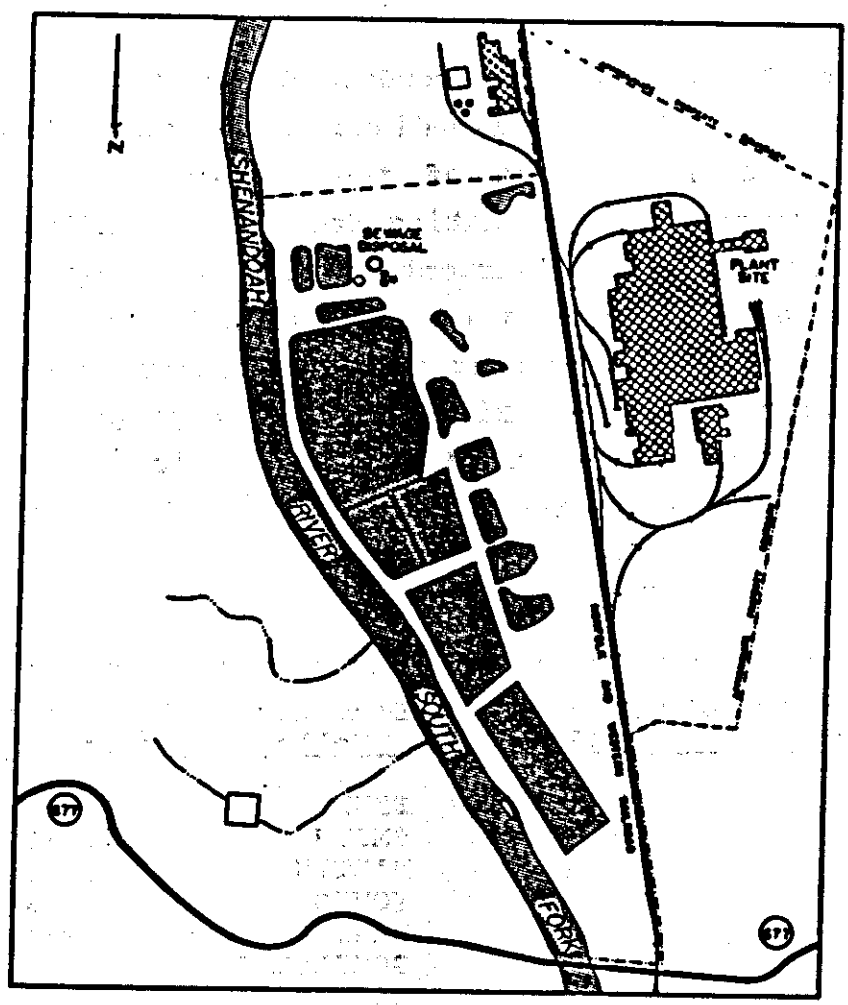
AR302484


S
N
EM-19
HCP 300 Range
6/4/87
SOUTH
NORTH
EM-19
6/4/8
300 Range
VCP
AR302485

ORIGINAL (Red)

SECTION 3.0

LOCATIONS OF REMEDIAL INVESTIGATION MONITOR WELLS



AR302487

ORIGINAL (Red)

SECTION 3.0

LOCATIONS OF REMEDIAL INVESTIGATION MONITOR WELLS

Prior to the initiation of CERCLA activities at the Front Royal facility, several hydrogeologic consultants had been involved in ground-water monitoring in response to requests made by the Virginia Water Control Board. The pre-CERCLA action wells consisted of installations completed in the unconsolidated deposits and shallow shale bedrock (MW-series) and wells completed within the shale bedrock at depths from 100 to 175 feet below land surface (GM-series).

As a result of the work conducted by G&M, Avtex initiated several tasks as immediate response actions to eliminate potential exposure of the public to the highly mineralized ground waters emanating from the facility. Avtex purchased properties at Rivermont Acres served by domestic wells and with the services of G&M installed the PW well series to commence back pumping for contaminant containment. Since the purchase of the Rivermont Acres properties, the domestic wells have been used for geochemical monitoring purposes. A summary of pre-CERCLA action wells is presented below:

Shallow Avtex Wells	G&M Bedrock Wells	Domestic Wells	Contaminant Recovery Wells
MW-1	GM-1A	FRUM	PW-0
MW-2	GM-1B	SMITH	PW-1
MW-3	GM-2A	MARTIN	PW-2
MW-4	GM-2B	YOUNG	PW-3
MW-5	GM-3	NAGI	PW-4
MW-6	GM-4	SCHILLING	
MW-7	GM-5	RITTER	

AR302488

ORIGINAL (Red)

Shallow Avtex Wells	G&M Bedrock Wells	Domestic Wells	Contaminant Recovery Wells
MW-8	GM-6	LONGERBEAM	
	GM-7	WEATHERHOLTZ	
	GM-8	BROWN	
	GM-9		
	GM-10*		
	GM-11**		

* GM-10 is no longer used as a monitor well due to the loss of a pump in the hole.
** GM-11 was abandoned with the capping of Viscose Basins 4,5, and 6.

As a result of the CERCLA field activities, several other well series have been installed at the Avtex facility. These wells constitute additional monitoring points for the shallow bedrock along the Shenandoah River (PZ-series), wells completed within the unconsolidated deposits hydraulically downgradient of viscose basins (classified with the MW-series), and piezometers installed within the viscose basins for the collection of basin fluids and head measurements (VB-series). The locations of all monitor wells used in the Remedial Investigation are presented as Exhibit 3.1. The nomenclature for the CERCLA activity-installed wells is presented below:

Riverbank Wells	Viscose Basin Perimeter Wells	Viscose Basin Piezometers
[illegible]	MW-9	VB-1
PZ-2	MW-10	VB-2
PZ-3	MW-11	VB-3
PZ-4	MW-12	VB-7
PZ-5		VB-9
PZ-6		VB-11
PZ-7		
PZ-8		
PZ-9		
PZ-10		
PZ-11		

AR302489

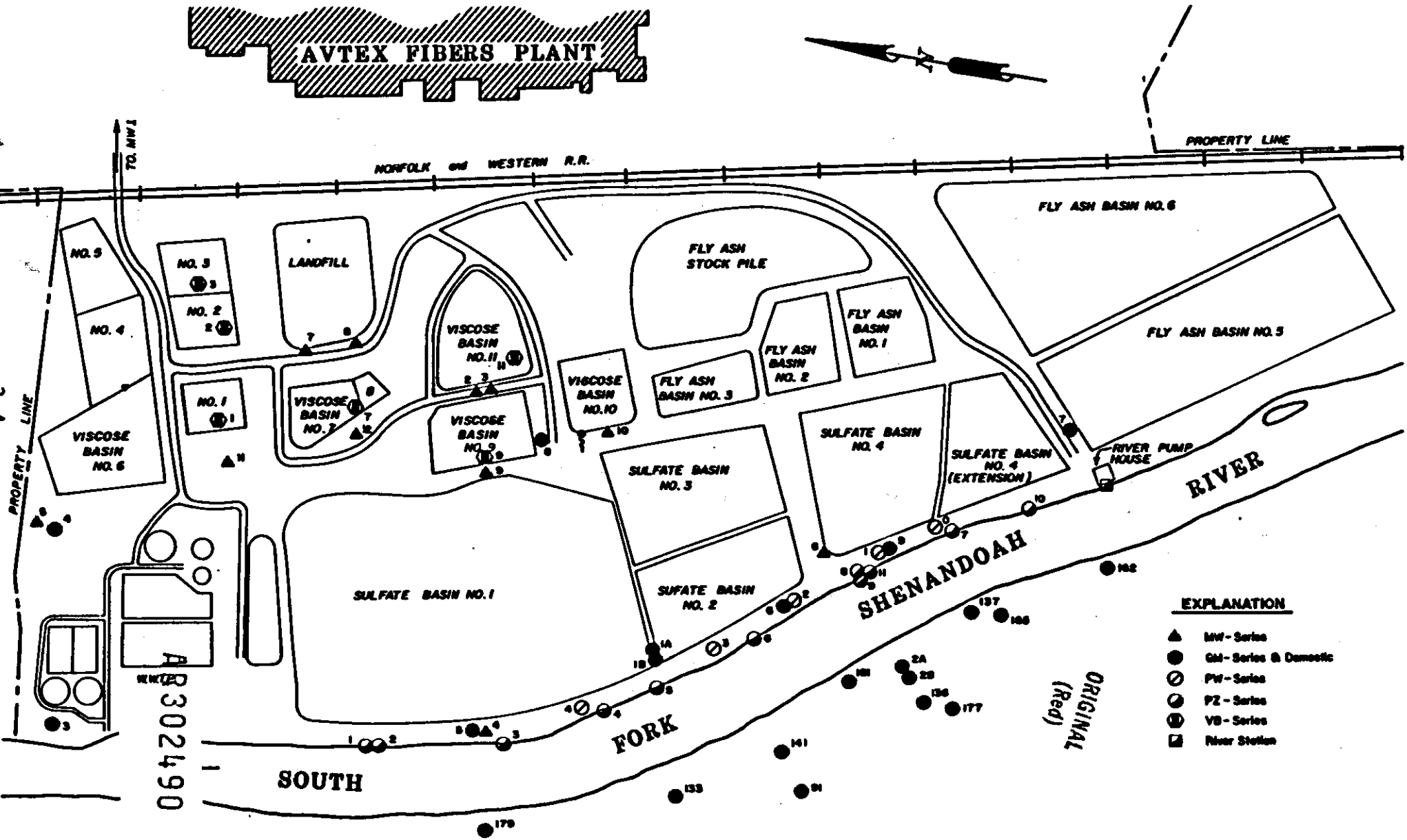
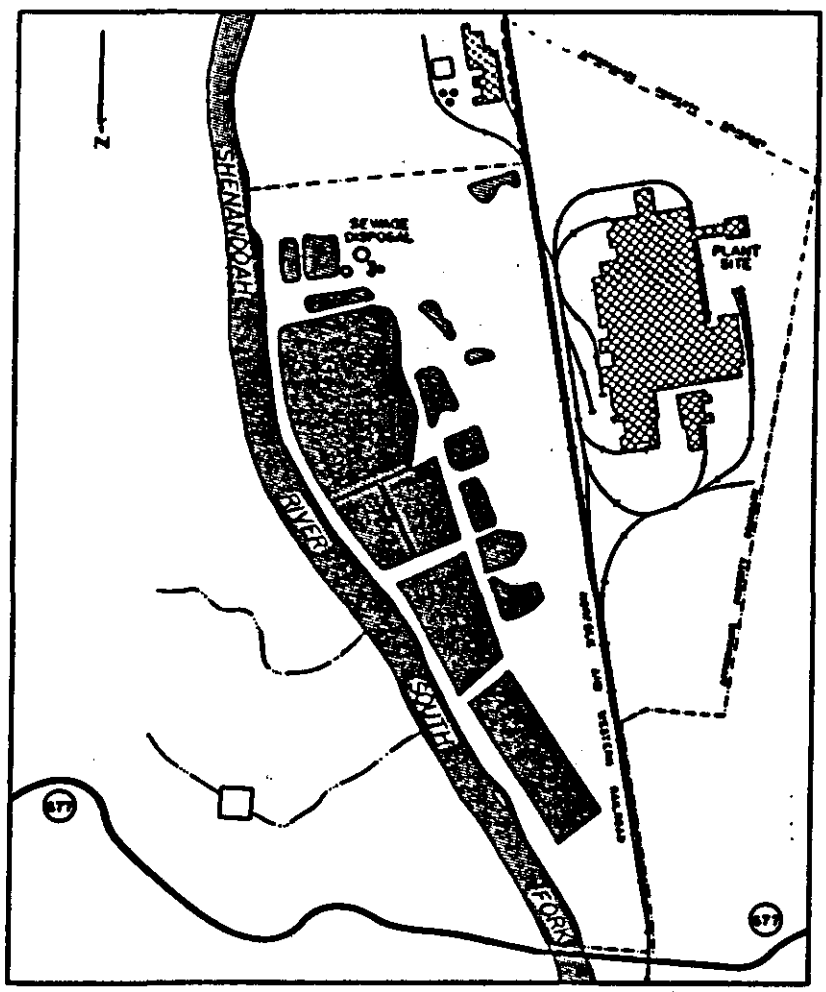


Exhibit 3.1 Locations of Avtex Monitoring Wells

ORIGINAL (Red)

SECTION 4.0

RIVERBANK WELL INSTALLATION



AR302492

ORIGINAL (Red)

SECTION 4.0

RIVERBANK WELL INSTALLATION

During the months of June and July, 1987, G&M installed 11 shallow wells along the eastern bank of the South Fork of the Shenandoah River. These wells serve as monitoring points to determine the quality of the shallow ground water and the dynamics of hydrology at the interface of the surface and subsurface regimes. Each well installation was drilled by air rotary method into the upper 3 to 10 feet of bedrock, and 4-inch stainless steel casing was grouted in place and allowed to cure prior to further drilling. Once the casing and grout setting had cured, a smaller diameter hammer bit was placed within the casing and the hole continued to final depth. Final depth was based upon the intersection of fractures yielding sufficient ground-water for development and sampling.

Two well clusters were installed to determine the hydraulic head for distinct saturated bedrock zones. One cluster comprised of PZ-1 and PZ-2 is located at the northwest corner of Sulfate Basin 1. The second cluster includes PZ-8, -9, and -11 located near the dividing line between Sulfate Basins 2 and 4. Geologic logs and well construction details for each installation are presented as Exhibits 4.1 and 4.2, respectively.

ORIGINAL
(Red)

Exhibit 4.1

Riverbank Well Geologic Logs

AR302494

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Ground-Water Consultants

ORIGINAL (Red)

SAMPLE/CORE LOG

Boring/Well PZ-1 Project/No. M0679FR6 Page 1 of 1

Site Location Avtex Fibers, Front Royal Drilling Started 6/17/87 Drilling Completed 6/22/87

Total Depth Drilled 35 feet Hole Diameter 4 inches Type of Sample/ Coring Device Air cuttings

Length and Diameter of Coring Device - Sampling Interval 2' to 5' feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Air rotary

Drilling Contractor Pennsylvania Drilling Co. Driller Bryan Adams Helper Bryan Krause

Prepared By J. Moore Hammer Weight _____ Hammer Drop _____ inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0	5'			Sand, fine to medium, silt, and organics, dark
				brown, damp.
5'	10'			Same
11'	16'			Shale, dark grey lime mudstone, wet
16'	18'			Shale, fractured lime mudstone, secondary
				minerals (calcite), filling fractures, dark
				grey, wet
18'	23'			Lime mudstone, massive, medium grey
23'	28'			Same
28'	33'			Same to friable, weathered shale
33'	35'			Same

AR302495

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GERAGHTY & MILLER, INC.
Ground-Water Consultants

SAMPLE/CORE LOG

Boring/Well PZ-2 Project/No. M0679FR6 Page 1 of 1

Site Location Avtex Fibers, Front Royal Drilling Started _____ Drilling Completed 6/23/87

Total Depth Drilled 16.0 feet Hole Diameter 4 inches Type of Sample/ Coring Device Air Cuttings

Length and Diameter of Coring Device _____ Sampling Interval 2' to 5' feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used _____ Drilling Method Air Rotary

Drilling Contractor Penn Drilling Driller Adams Helper Krause

Prepared By J. Moore Hammer Weight _____ Hammer Drop _____ Inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 Inches	Sample/Core Description
0	5'			Silt, some sand, fine to medium, and organics,
				dark brown, damp
5'	10'			Silt, little sand, fine, and organics, dark
				brown, very moist
10'	12'			Shale, lime mudstone, dark grey, wet
12'	16'			Shale, lime mudstone, friable, greenish grey,
				little calcite void filling, wet
				AR302496

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL
(Red)

SAMPLE/CORE LOG

Boring/Well PZ-3 Project/No. M0679FR6 Page 1 of 1

Site Location Avtex Fibers, Front Royal Drilling Started _____ Drilling Completed 6/23/87

Total Depth Drilled 18 feet Hole Diameter 4 inches Type of Sample/ Coring Device Air Rotary Cuttings

Length and Diameter of Coring Device - Sampling Interval Continuous feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Air Rotary

Drilling Contractor Penn Drilling Driller Adams Helper Krause

Prepared By J. Moore Hammer Weight _____ Hammer Drop _____ inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0'	5'			Sand, fine to course, some silt and organics,
				medium brown, moist
5'	6'			Same, dark brown to black, wet (weathered
				bedrock)
6'	8'			Shale, lime mudstone, fissil, dark grey
8'	13'			Same
13'	18'			Same
				AR302497

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Ground-Water Consultants

ORIGINAL
(Red)

SAMPLE/CORE LOG

Boring/Well PZ-4 Project/No. M0679FR6 Page 1 of 1

Site Location Avtex Fibers, Front Royal Drilling Started _____ Drilling Completed 6/25/87

Total Depth Drilled 31.5 feet Hole Diameter 4 inches Type of Sample/ Coring Device Air cuttings

Length and Diameter of Coring Device _____ Sampling Interval continuous feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Air Rotary

Drilling Contractor Penn Drilling Driller Adams Helper Krause

Prepared By J. Moore Hammer Weight _____ Hammer Drop _____ inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0	5'			Sane, medium to coarse, light brown
5'	10'			Same, with clay matrix, brown to light green
				Rock at 10.5'
10'	13.8'			Shale, weathered, black to grey, abundant
				calcite
13.8	17.2'			Shale, grey, some calcite filling
17.2'	31.5'			Same

AR302498

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Ground-Water Consultants

ORIGINAL
(Red)

SAMPLE/CORE LOG

Boring/Well PZ-5 Project/No. M0679FR6 Page 1 of 1

Site Location Avtex Fibers, Front Royal Drilling Started _____ Drilling Completed 6/30/87

Total Depth Drilled 25.5 feet Hole Diameter 4 inches Type of Sample/ Coring Device Air cuttings

Length and Diameter of Coring Device - _____ Sampling Interval continuous feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Air rotary

Drilling Contractor Penn Drilling Driller Adams Helper Krause

Prepared By J. Moore Hammer Weight _____ Hammer Drop _____ inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0	5'			Topsoil to silty clay, wet
5'	7.5'			Silty clay, wet
7.5'	10.6'			Bedrock - shale, weathered, black to grey, calcite veins
10.6'	25.5'			Shale, grey, some calcite filling

AR302499

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ORIGINAL
(Red)

SAMPLE/CORE LOG

Boring/Well PZ-6 Project/No. M0679FR6 Page 1 of 1

Site Location Avtex Fibers, Front Royal Drilling Started _____ Drilling Completed 6/30/87

Total Depth Drilled 23 feet Hole Diameter 4 inches Type of Sample/ Coring Device Air cuttings

Length and Diameter of Coring Device _____ Sampling Interval continuous feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Air rotary

Drilling Contractor Penn Drilling Driller Adams Helper Krause

Prepared By J. Moore Hammer Weight _____ Hammer Drop _____ inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0'	5'			Silt, some sand and gravel, medium to coarse,
				dark brown, organics, damp
5'	8'			Silt, some sand, medium, organics, some
				friable lime mudstone, moist
8'	12'			Lime mudstone, some weathering, light to
				dark grey
12'	17'			Lime mudstone, friable, fissil, dark grey,
				some weathering
17'	23'			Same

AR302500

AR302500

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Ground-Water Consultants

ORIGINAL (Red)

SAMPLE/CORE LOG

Boring/Well PZ-7 Project/No. M0679FR6 Page 1 of 1

Site Location Avtex Fibers - Front Royal Drilling Started _____ Drilling Completed 7/2/87

Total Depth Drilled 23 feet Hole Diameter _____ inches Type of Sample/ Coring Device Air cuttings

Length and Diameter of Coring Device - Sampling Interval continuous feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Air rotary

Drilling Contractor Penn Drilling Driller Adams Helper Krause

Prepared By J. Moore Hammer Weight _____ Hammer Drop _____ inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0	5'			Sand, fine to coarse, and silt, medium brown,
				damp
5'	10'			Same
10'	11'			Shale, dark grey, weathered
11'	13'			Shale, lime mudstone, dark grey, weathered
13'	18'			Shale, lime mudstone, grey, weathered, some
				calcite filling
18'	23'			Same

AR302501

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL

SAMPLE/CORE LOG

Boring/Well PZ-8 Project/No. M0679FR6 Page 1 of 1

Site Location Avtex Fibers - Front Royal Drilling Started _____ Drilling Completed 7/7/87

Total Depth Drilled 18 feet Hole Diameter 4 inches Type of Sample/ Coring Device Air cuttings

Length and Diameter of Coring Device - _____ Sampling Interval continuous feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Air rotary

Drilling Contractor Penn Drilling Driller Adams Helper Krause

Prepared By J. Moore Hammer Weight _____ Hammer Drop _____ inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0	5'			Silt, sand, medium to coarse, and organics,
				medium red brown, damp
5'	8'			Same to dark grey friable, lime mudstone,
				moist-wet
8'	13'			Lime mudstone, fissil, dark grey, wet
13'	18'			Lime mudstone fissil, dark grey, wet
				AR302502
				AR302502

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL
(Red)

SAMPLE/CORE LOG

Boring/Well PZ-9 Project/No. M0679FR6 Page 1 of 1

Site Location Avtex Fibers - Front Royal Drilling Started _____ Drilling Completed 7/7/87

Total Depth Drilled 28 feet Hole Diameter 4 inches Type of Sample/ Coring Device Air cuttings

Length and Diameter of Coring Device - Sampling Interval continuous feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Air rotary

Drilling Contractor Penn Drilling Driller Adams Helper Krause

Prepared By J. Moore Hammer Weight _____ Hammer Drop _____ inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0	5'			Silt, sand, medium to coarse, and organics,
				medium brown, damp
5'	8'			Same to dark grey friable lime mudstone,
				moist-wet
8'	13'			Lime mudstone, dark grey to medium grey, wet
13'	18'			Same, some weathering
18'	28'			Same

AR302503

AR302503

GERAGHTY & MILLER, INC.
Ground-Water Consultants

SAMPLE/CORE LOG

Boring/Well PZ-10 Project/No. M0679FR6 Page 1 of 1

Site Location Avtex Fibers - Front Royal Drilling Started _____ Drilling Completed 7/30/87

Total Depth Drilled 22.5 feet Hole Diameter 4 inches Type of Sample/ Coring Device Air cuttings

Length and Diameter of Coring Device - Sampling Interval continuous feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Air rotary

Drilling Contractor Penn Drilling Driller Adams Helper Krause

Prepared By J. Moore Hammer Weight _____ Hammer Drop _____ inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0	5'			Silt and sand, medium to coarse, organics, medium red brown, damp
5'	9'			Same to dark grey weathered limestone, damp
9'	13'			Lime mudstone, dark grey
13'	22.5'			Lime mudstone fissil, dark grey, wet

AR302504

GERAGHTY & MILLER, INC.
Ground-Water Consultants

SAMPLE/CORE LOG

Boring/Well PZ-11 Project/No. M0679FR6 Page 1 of 1

Site Location Avtex Fibers - Front Royal Drilling Started _____ Drilling Completed 7/30/87

Total Depth Drilled 80.5 feet Hole Diameter 4 inches Type of Sample/ Coring Device Air cuttings

Length and Diameter of Coring Device _____ Sampling Interval continuous feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Air Rotary

Drilling Contractor Penn Drilling Driller Adams Helper Krause

Prepared By Wesselman Hammer Weight _____ Hammer Drop _____ inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0	9			Silty sand with dobbles; light brown to grey,
				wet.
9'	13'			Lime mudstone, dark grey to medium grey, wet
13'	18'			Same, some weathering
18'	28'			Same
28'	33'			Same, little H_2O yield for section
33'	50'			Same, frequent zones of calcite filling
50'	77'			Limestone, light grey to dark grey, dense,
				no fractures, no ground water
77'	80.5'			Lime mudstone, dark grey, calcite veins,
				ground water ~5 gpm

AR302505

1/86

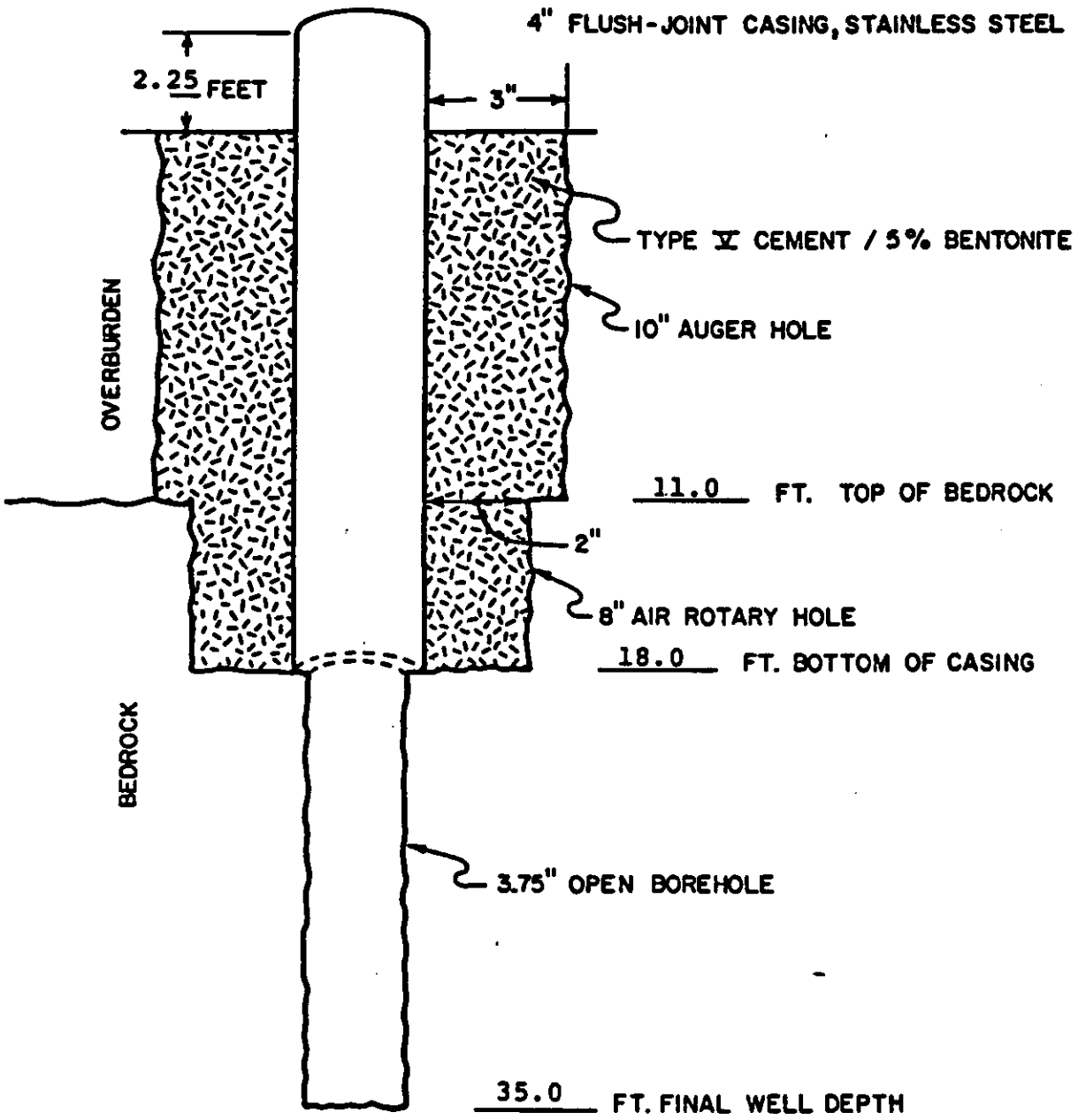
Exhibit 4.2

Riverbank Well Construction Details

AR302506

RIVERBANK WELL CONSTRUCTION DETAIL

WELL: PZ-1

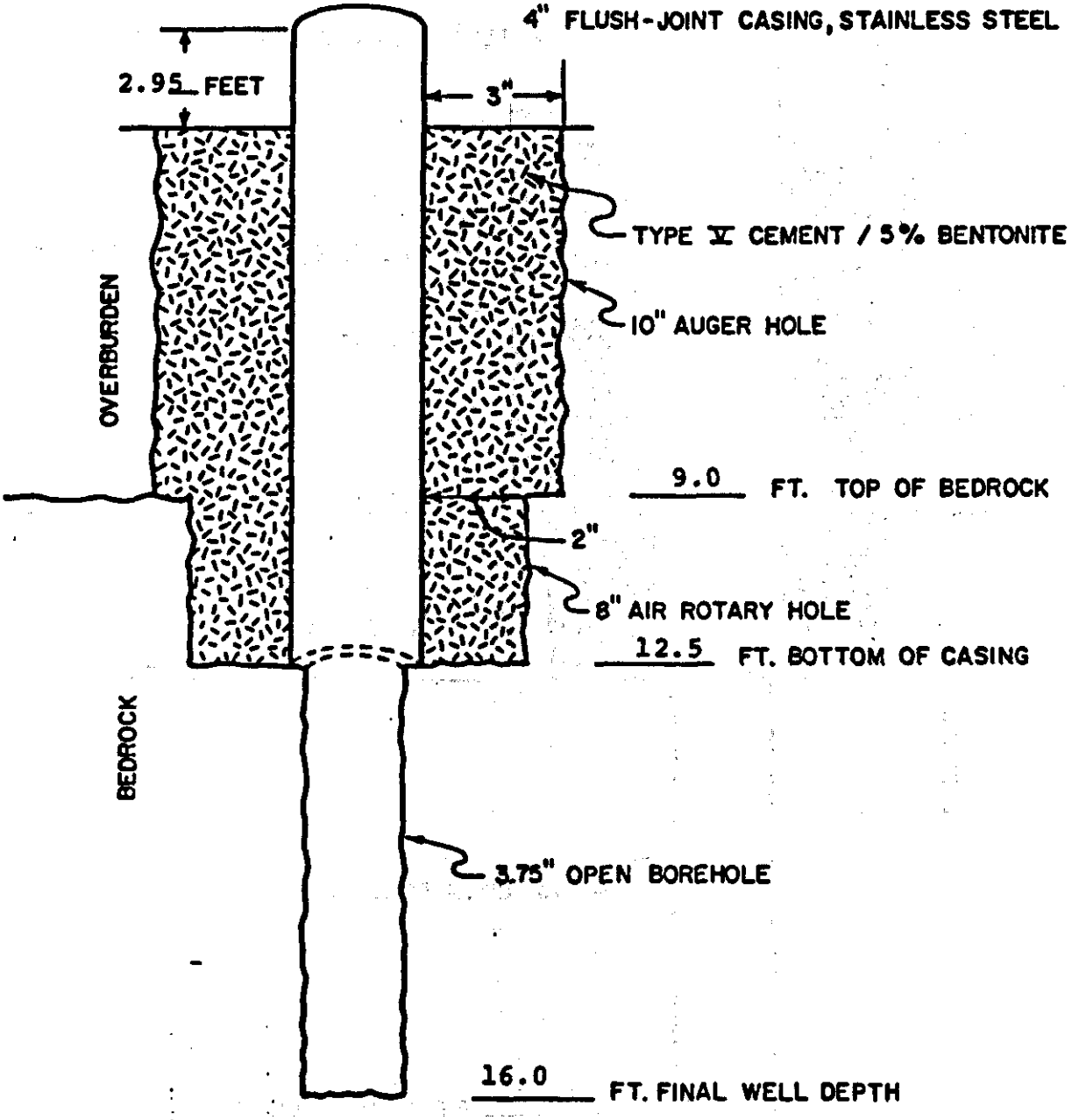


AR302507

AR302507

RIVERBANK WELL CONSTRUCTION DETAIL

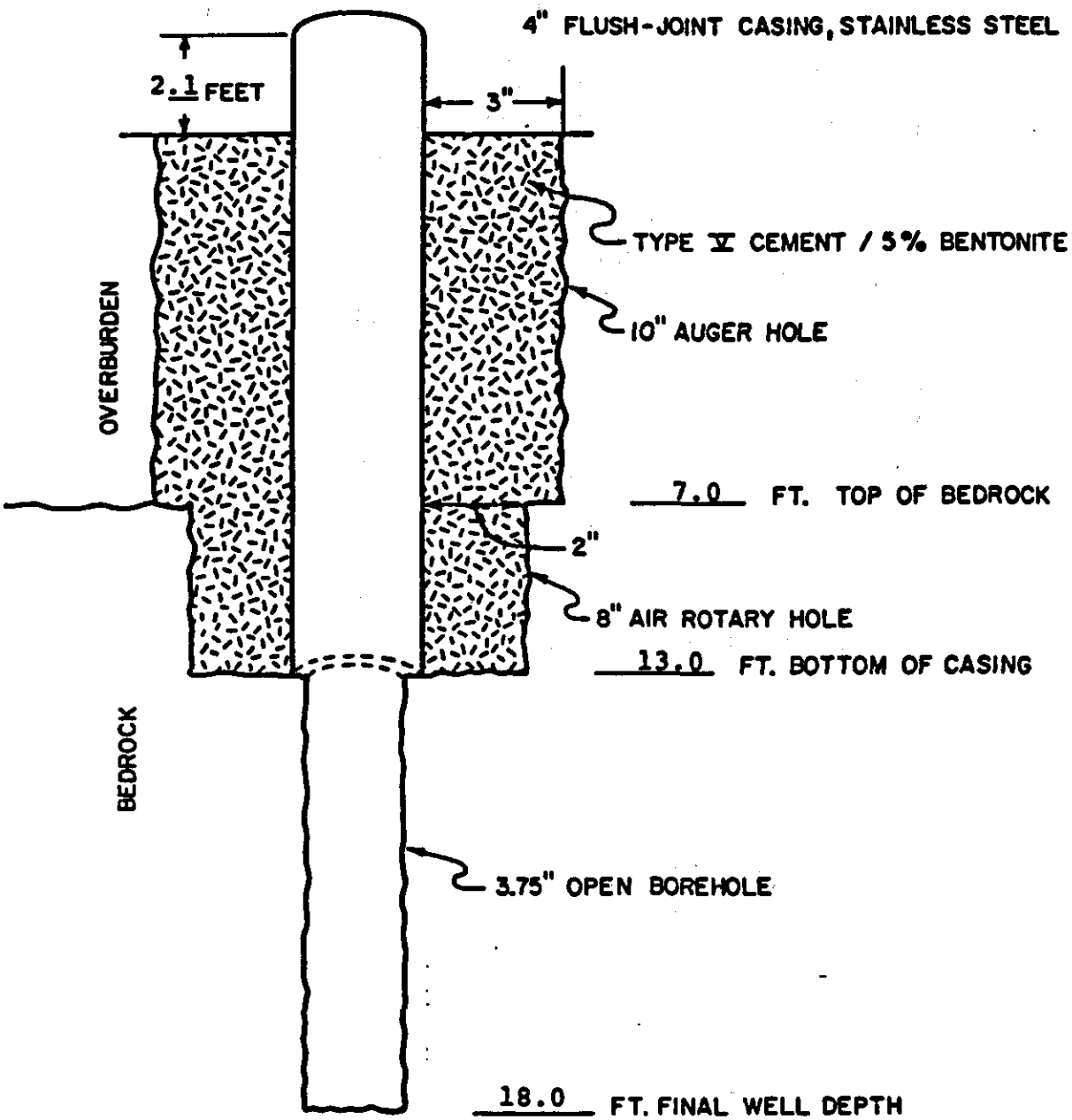
WELL: PZ-2



AR302508

RIVERBANK WELL CONSTRUCTION DETAIL

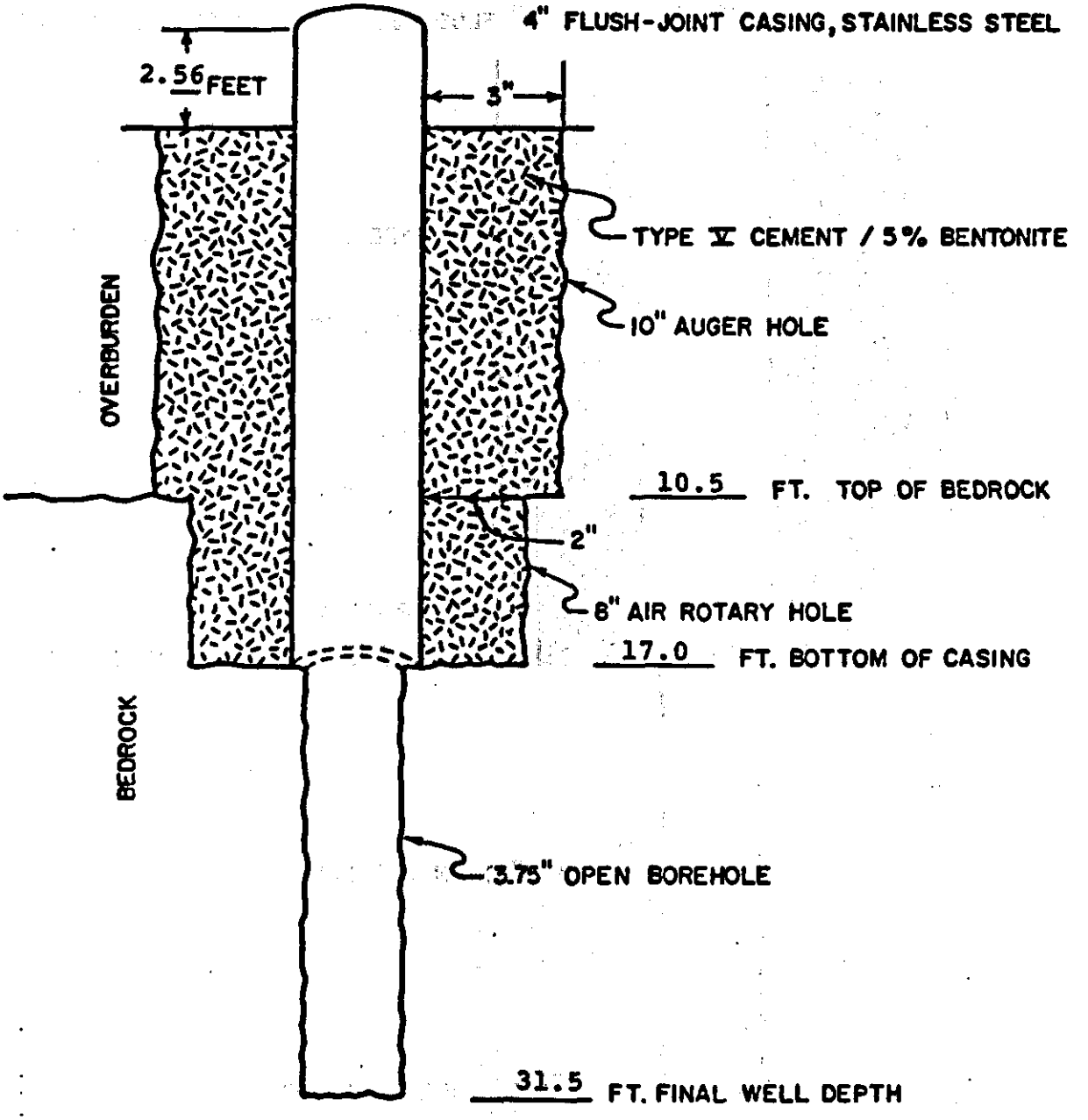
WELL: PZ-3



AR302509

RIVERBANK WELL CONSTRUCTION DETAIL

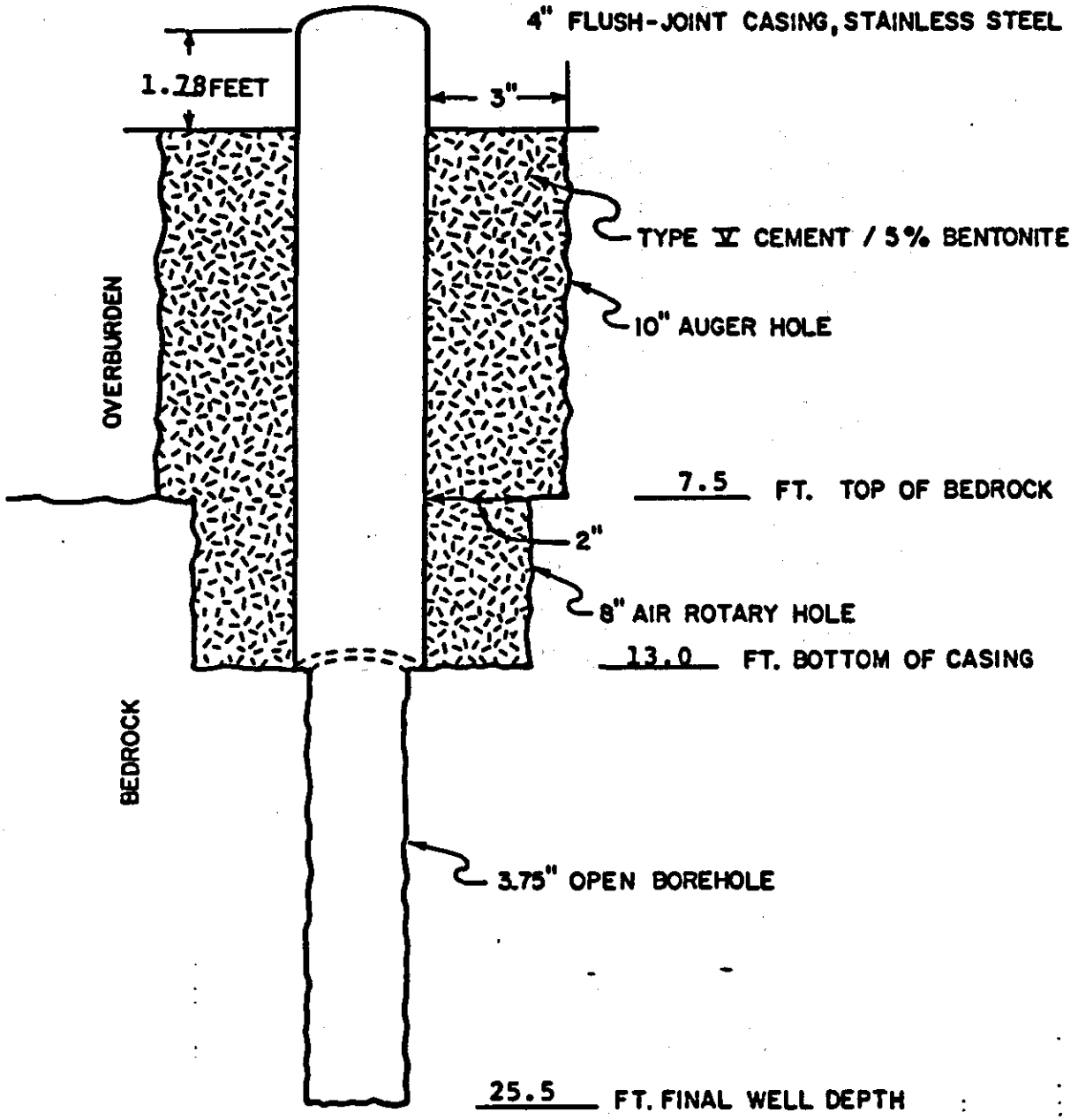
WELL: PZ-4



AR302510

RIVERBANK WELL CONSTRUCTION DETAIL

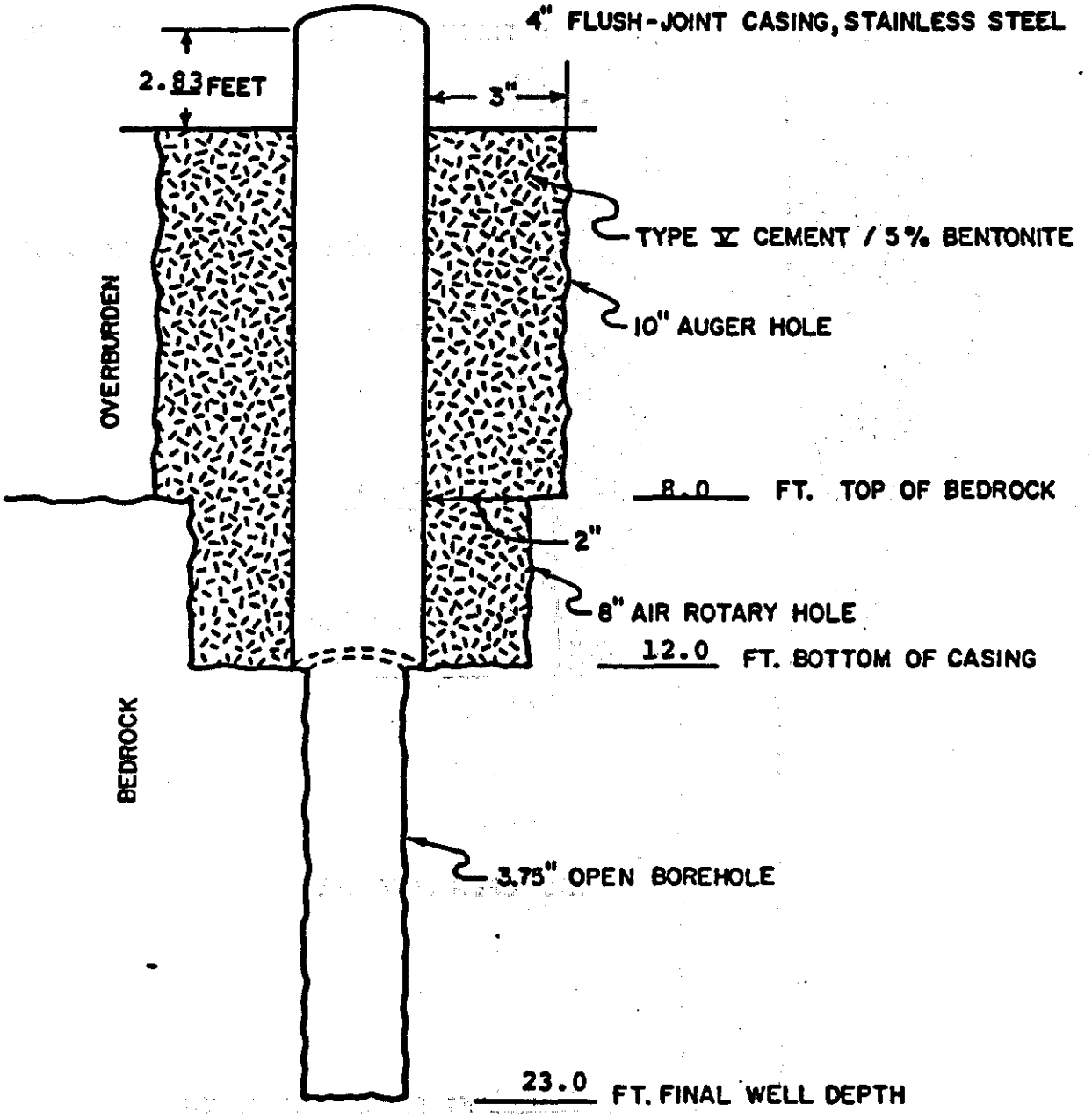
WELL: PZ-5



AR302511

RIVERBANK WELL CONSTRUCTION DETAIL

WELL: PZ-6



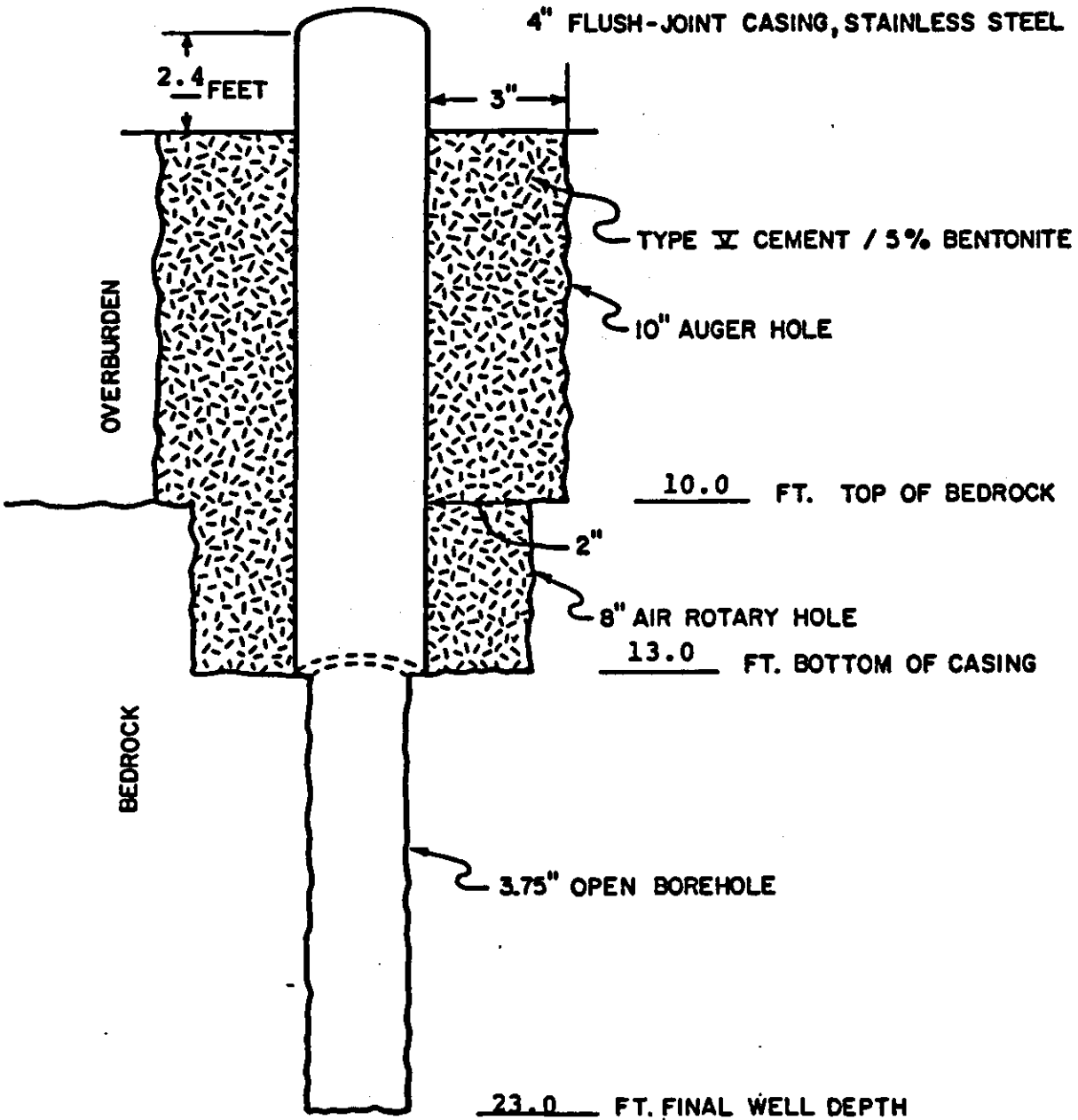
AR302512

AR302512

RIVERBANK WELL CONSTRUCTION DETAIL

ORIGINAL (Red)

WELL: PZ-7

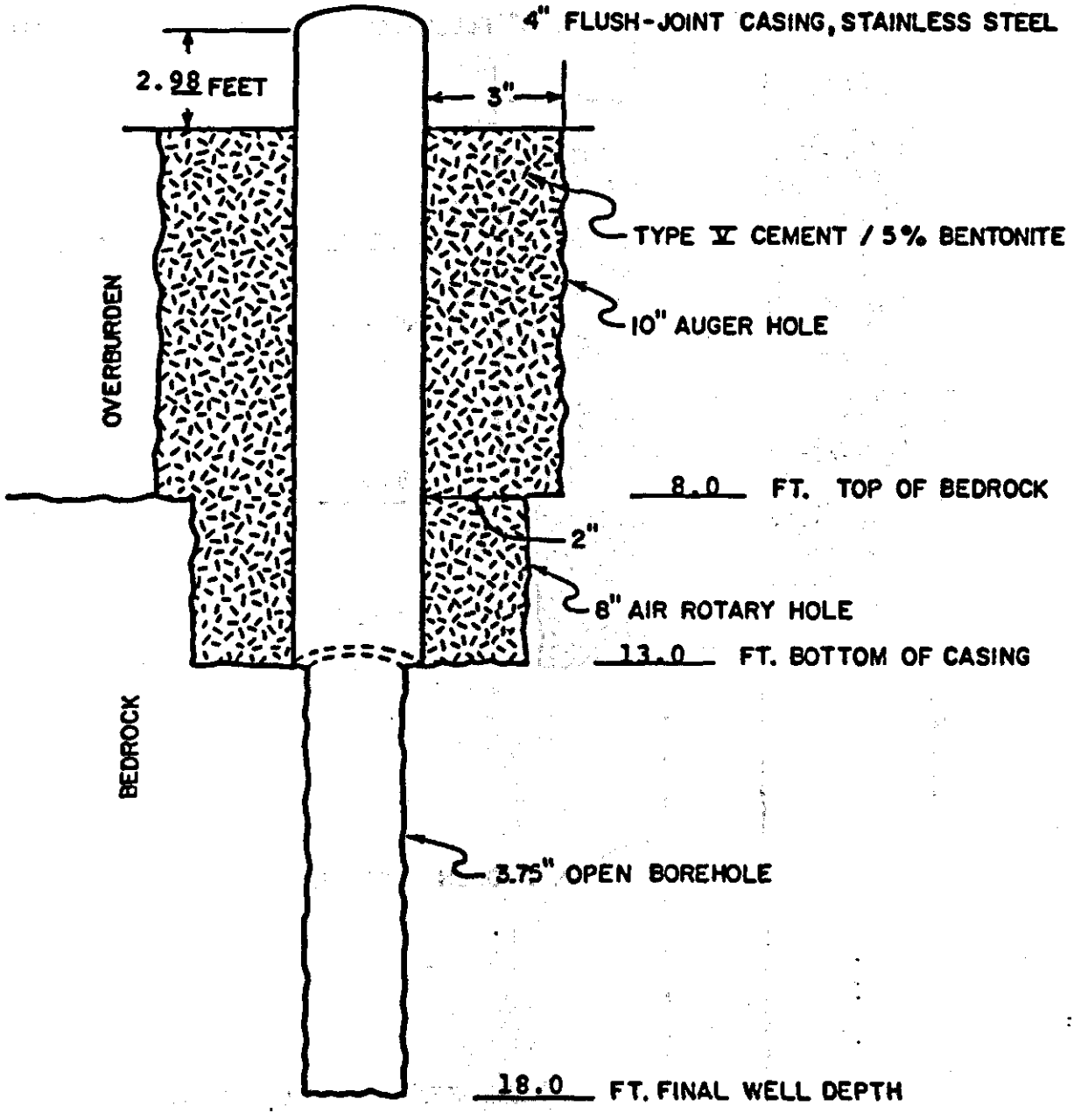


AR302513

AR302513

RIVERBANK WELL CONSTRUCTION DETAIL

WELL: PZ-8



AR302514

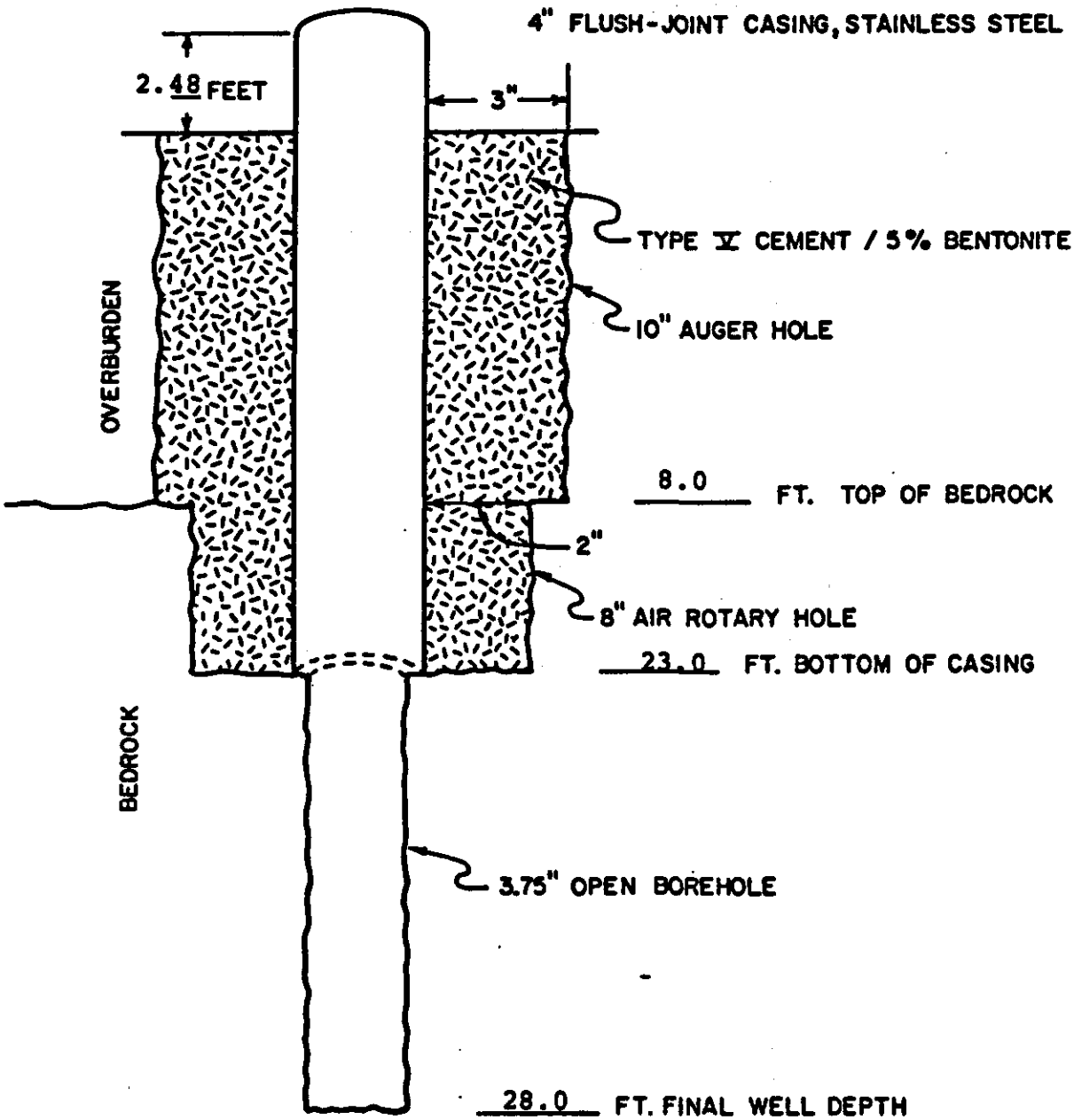
AR302514

GERAGHTY & MILLER, INC.

ORIGINAL
(Red)

RIVERBANK WELL CONSTRUCTION DETAIL

WELL: PZ-9



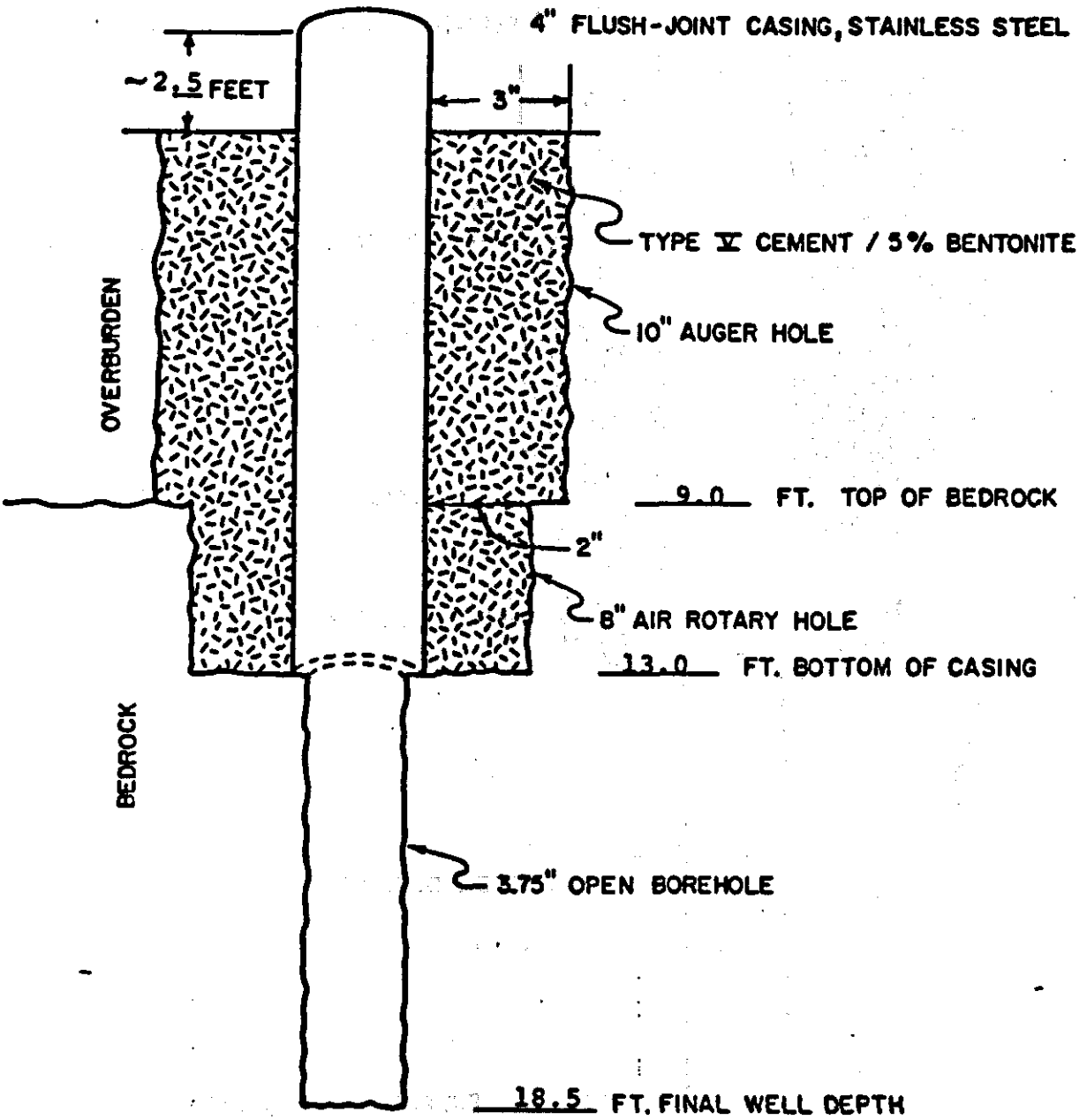
AR302515

GERAGHTY & MILLER, INC.

ORIGINAL (Red)

RIVERBANK WELL CONSTRUCTION DETAIL

WELL: PZ-10



AR302516

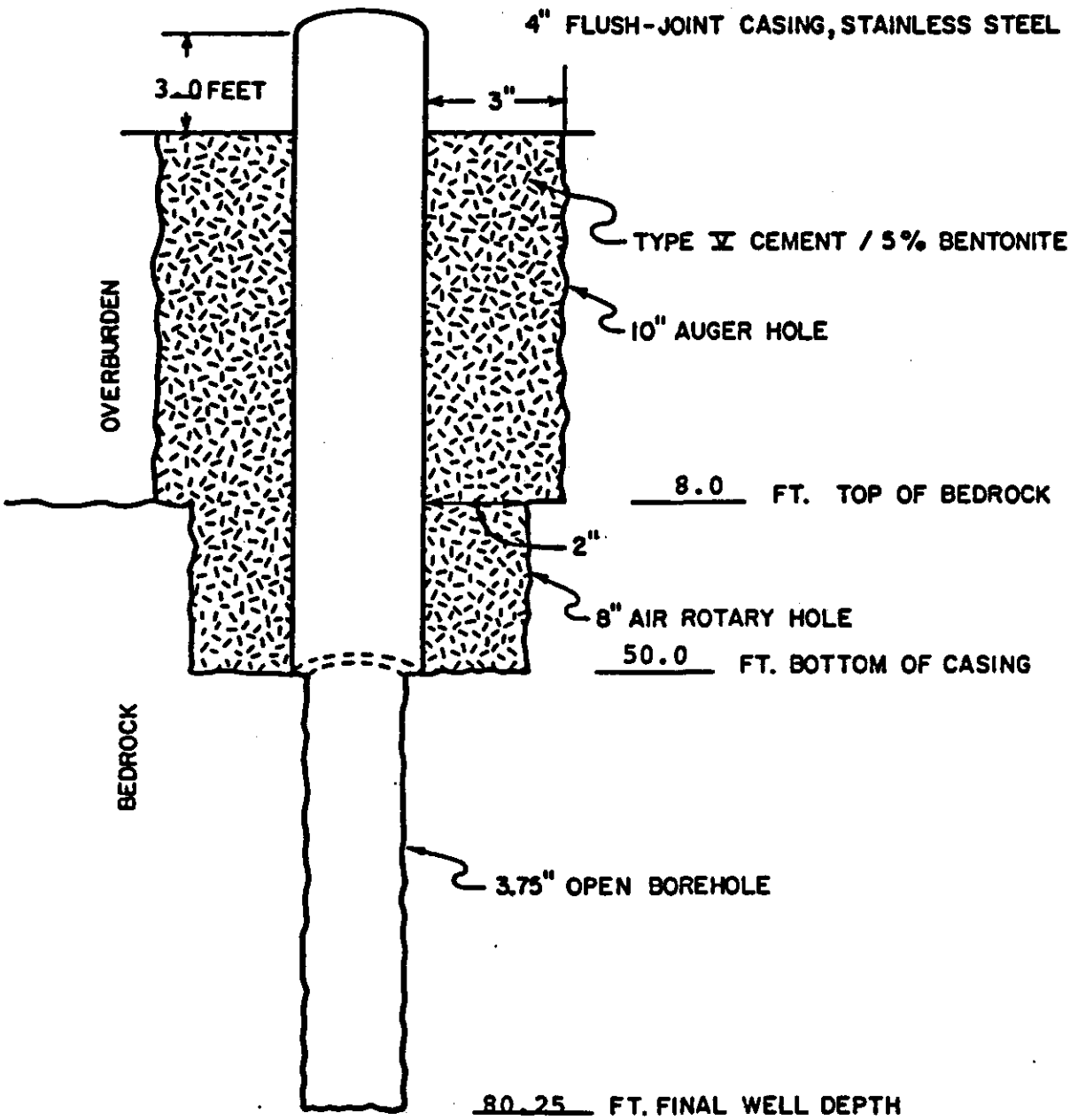
AR302516

GERAGHTY & MILLER, INC.

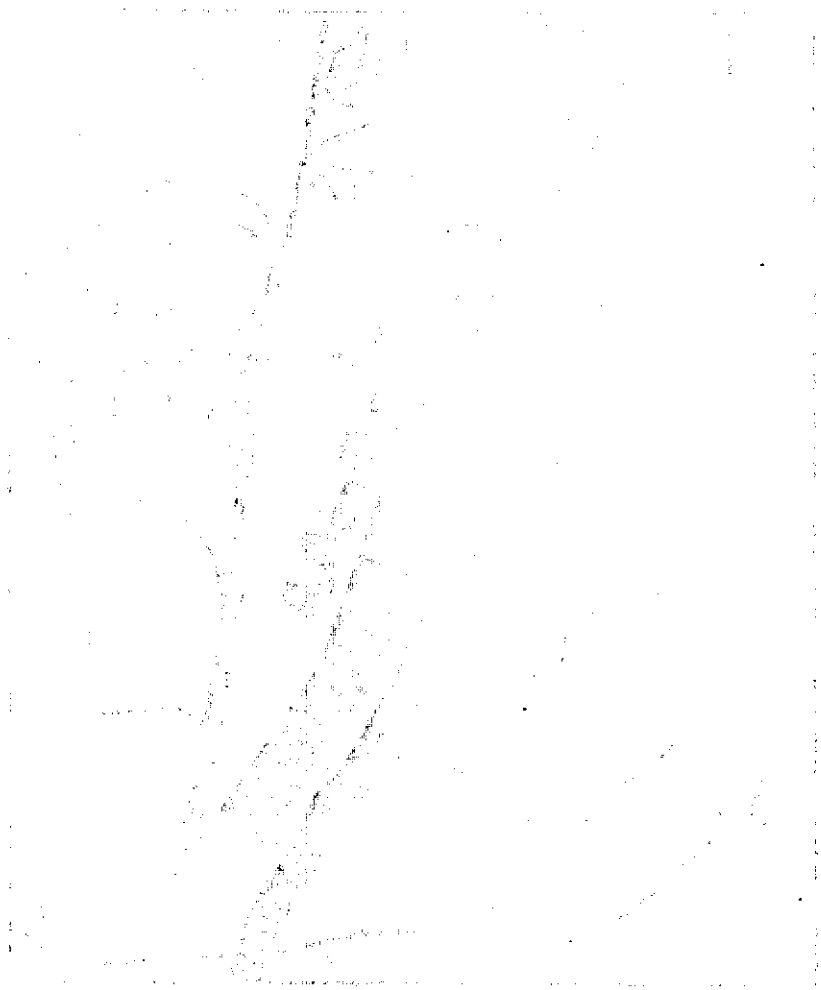
ORIGINAL (Red)

RIVERBANK WELL CONSTRUCTION DETAIL

WELL: PZ-11

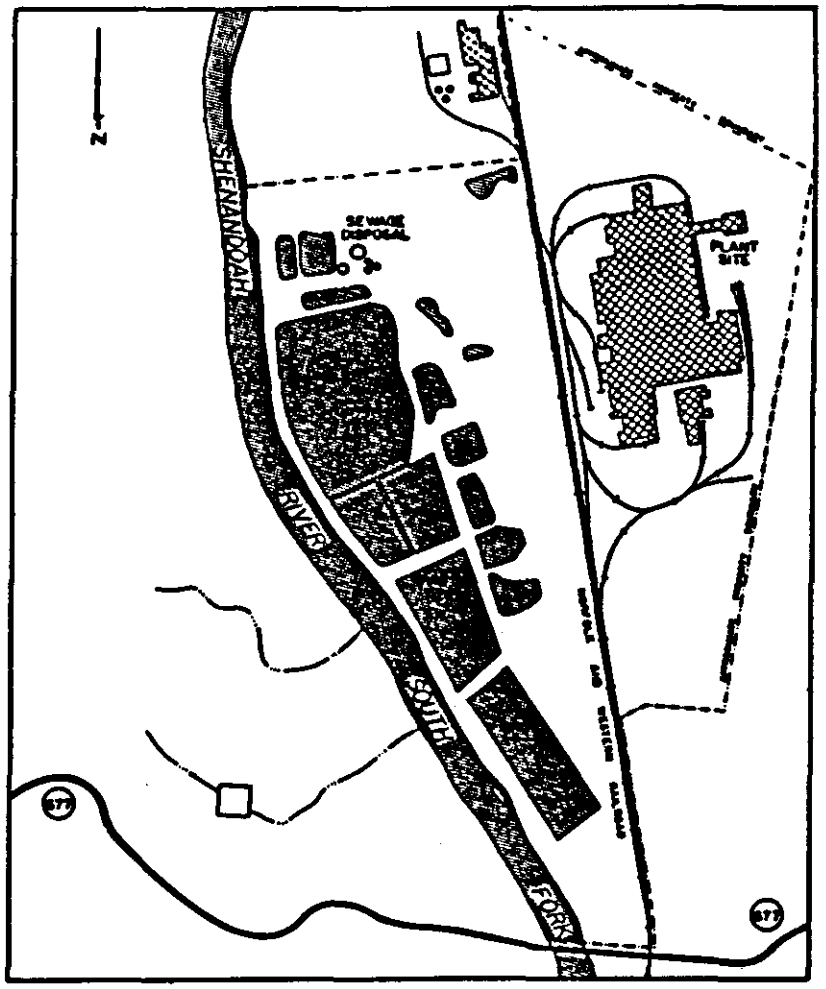


AR302517



SECTION 5.0

VISCOSE BASIN PERIMETER WELL INSTALLATION



AR302519

(Red)

SECTION 5.0

VISCOSE BASIN PERIMETER WELL INSTALLATION

After completing the installation of the riverbank wells, four screened wells within the unconsolidated horizons were installed in locations hydraulically downgradient of Viscose Basins 1, 7, 9, and 10. Each of these installations was drilled using oversized hollow-stem augers and construction materials included 4-inch stainless steel screen and riser pipe, with a sand backfill, bentonite seal and grout according to the work plan details. Upon completion, the grout was allowed to cure and then each well was developed using air-lift methods.

The geologic logs and well construction details for wells MW-9 through MW-12 are presented as Exhibits 5.1 and 5.2, respectively.

ORIGINAL
(Red)

Exhibit 5.1

Perimeter Well Geologic Logs

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL (Red)

SAMPLE/CORE LOG

Boring/Well MW-9 Project/No. M0679FR6 Page 1 of 3

Site Location Avtex Fibers - Front Royal Drilling Started _____ Drilling Completed 7/22/87

Total Depth Drilled 45 feet Hole Diameter 4 inches Type of Sample/ Coring Device Split spoon

Length and Diameter of Coring Device - 18" spoon Sampling Interval continuous feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Auger

Drilling Contractor Penn Drilling Driller Adams Helper Krause

Prepared By J. Moore Hammer Weight _____ Hammer Drop _____ inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
1.0	1.5'		5-3-4	Silt, clay, some sand, fine to medium, mottled
				light grey and medium brown, dry
1.5'	3.0'		6-10-9	Same, some coarse gravel, red brown, dry
3.0'	5.0'		3-3-5-5	Silt, some clay, some sand, medium, yellow
				brown to red brown, red and grey stringers,
				damp
5.0'	7.5'		2-4-3-3	Silt, some clay, sand medium to fine, mottled,
				medium brown to olive, odor, damp
7.5'	10.0'		6-6-8-4	Clay, silt and sand, fine to medium, some
				gravel, coarse, slightly cohesive, medium
				brown, damp
10.0'	12.5'		1-4-3-4	Clay and silty sand, fine to coarse, medium
				brown to black, damp, slightly cohesive

AR302522

AR302522

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Ground-Water Consultants

ORIGINAL (Red)

SAMPLE/CORE LOG (Cont.d)

Boring/Well MW-9 Page 2 of 3

Prepared By _____

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
12.5'	15.0'		1-2-2-1	Same, moist
15.0'	17.5'		1-1-3-3	Same, saturated
17.5'	20.0'		2-4-6-6	Same, mottled, light grey to red brown, saturated
20.0'	22.5'		1-3-4-4	Same
22.5'	25.0'		2-4-7-6	Silt, clay, and sand, fine to medium, redish brown, saturated
25.0'	27.5'			Silt, clay, sand and gravel, fine to coarse, medium brown to black, saturated
27.5'	30.0'		5-5-6-10	Silt and clay, some sand and gravel, fine to medium, dark greenish black, wet odor

AR302523

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL (Red)

SAMPLE/CORE LOG (Cont.d)

Boring/Well MW-9 Page 3 of 3

Prepared By _____

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
30.0'	32.5'		1-3-5-6	Same
32.5'	35.0'		2-3-6-10	Same to silt and clay, some sand
				and gravel, fine to coarse, cohesive,
				medium brown with olive mottle,
				moist
35.0'	37.5'		4-20-20-21	Silt and clay, some sand and
				gravel, fine to coarse, cohesive,
				medium brown with olive mottle,
				moist
37.5'	40.0'		11-21-12-12	Silt and Sand, fine to coarse,
				little gravel, dark red brown,
				moist, cohesive
40.0'	42.5'		5-15-21-15	Same
42.5'	45.0'		15-15-22-17	Silt and sand, medium, red brown
				and grey, wet

AR302524

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL (Red)

SAMPLE/CORE LOG

Boring/Well MW-10 Project/No. M0679FR6 Page 1 of 3

Site Location Avtex Fibers - Front Royal Drilling Started _____ Drilling Completed 7/23/87

Total Depth Drilled 53.5 feet Hole Diameter 4 inches Type of Sample/ Coring Device Split spoon

Length and Diameter of Coring Device 18" spoon Sampling Interval continuous feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method auger

Drilling Contractor Penn Drilling Driller Adams Helper Krause

Prepared By J. Moore Hammer Weight _____ Hammer Drop _____ inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0	2.5		10-12-16	Silt, sand, gravel and organics, fine to coarse,
				medium brown, dry
2.5	5.0		4-4-5-5	Silt, clay, mottled grey and red brown,
				soft, cohesive, damp
5.0	7.5		1-1-3-4	Silt and sand, fine to medium, little gravel,
				coarse, medium brown, damp
7.5	10.0		6-5-6-4	Silt and sand, some gravel, fine to medium,
				cohesive, dark red brown, damp
10.0	12.5		4-8-9-11	Same, some gravel to sand, fine to medium,
				some silt, olive, damp
12.5	15.0		5-6-4-6	Silt, some clay, some sand and gravel, fine
				to medium, dark red brown, damp cohesive
				AR302525
15.0	17.5		3-6-8-8	Same, more clay, darker brown

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Ground-Water Consultants

ORIGINAL

SAMPLE/CORE LOG (Cont.d)

Boring/Well MW-10 Page 2 of 3

Prepared By _____

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 Inches	Sample/Core Description
17.5'	20.0'		1-3-3-5	Same with black stringers
20.0'	22.5'		3-4-7-6	Same
22.5'	25.0'		5-5-9-7	Silt and clay, light grey to red brown, some fine sand, trace mica, damp
25.0'	27.5'		5-4-7-4	Same, light brown and grey to medium brown
27.5'	30.0'		6-10-8-7	Silt and clay, little sand, fine to medium, dark brown, damp, cohesive
30.0'	32.5'		3-5-6-7	Same
32.5'	35.0'			Same, mottled light grey to dark brown
				AR302526
35.0'	37.5'		6-5-5-9	Silty clay, olive, tra fine, some medium brow mottle, cohesive

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Ground-Water Consultants

ORIGINAL (Red)

SAMPLE/CORE LOG (Cont.d)

Boring/Well MW-10

Prepared By _____

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
37.5'	40.0'		4-7-10-11	Same
40.0'	42.5'		4-9-12-21	Clay and silt, medium to dark brown, damp, cohesive
42.5'	45.0'		7-12-27-25	Silt, some sand and gravel, fine to coarse, medium red brown, moist, cohesive
45.0'	47.5'		12-10-15-17	Same
47.5'	50.0'		2-6-10-12	Silt, sand and gravel, medium to coarse, medium grey to brown, wet

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL (Red)

SAMPLE/CORE LOG

Boring/Well MW-11 Project/No. M0679FR6 Page 1 of 2

Site Location Avtex Fibers - Front Royal Drilling Started _____ Drilling Completed 7/28/87

Total Depth Drilled 30 feet Hole Diameter 4 inches Type of Sample/ Coring Device Split spoon

Length and Diameter of Coring Device - 18" spoon Sampling Interval continuous feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Auger

Drilling Contractor Penn Drilling Driller Adams Helper Krause

Prepared By J. Moore Hammer Weight _____ Hammer Drop _____ inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0	2.5	1	1-12-12-10	Silt and sand, fine, some clay, medium brown, dry to damp
2.5	5.0		2-2-4-7	Clay, little silt, mottled red brown, light grey and yellow brown, damp, cohesive
5.0	7.5		5-9-11-12	Same, more silt
7.5	10.0		1-5-13-13	Clay, some silt, medium red brown, light grey stringers, damp, cohesive
10.0	12.5		1-4-11-13	Same, stiff clay
12.5	15.0	10	1-12-22-24	Very stiff clay, medium red brown, trace light grey stringers
15.0	17.5		4-12-23-26	Same with some silt, black organic inclusions
17.5	20.0	13	21-21-21	Sand and silt, fine to medium, variegated (red brown, buff, yellow brown, light grey and black), moist,odor
20.0	22.5	7	14-24-$\frac{50}{5"}$	Silt and sand, fine, buff to sand and gravel, coarse, organics, unknown sheet-like material, moist, wet

AR302528

AR302528

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL
(Red)

SAMPLE/CORE LOG (Cont.d)

Boring/Well MW-11

Page 2 of 2

Prepared By

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 Inches	Sample/Core Description
22.5'	25.0'		50/5"	Same
25.0'	27.5'		50/6"	Same with maroon colored flakes
				of shale
27.5'	30.0'		50/3"	Lime mudstone, fissil, broken,
				dark grey

AR302529

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ORIGINAL (Red)

SAMPLE/CORE LOG

Boring/Well MW-12 Project/No. M0679FR6 Page 1 of 1

Site Location Avtex Fibers - Front Royal Drilling Started _____ Drilling Completed 7/29/87

Total Depth Drilled 13 feet Hole Diameter 4 inches Type of Sample/ Coring Device Split spoon

Length and Diameter of Coring Device - 18" spoon Sampling Interval continuous feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None Drilling Method Auger

Drilling Contractor Penn Drilling Driller Adams Helper Krause

Prepared By J. Moore Hammer Weight _____ Hammer Drop _____ inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0	2.5		4-7-10-9	Silt, some sand, fine to medium, medium brown, organic, dry
2.5	5.0		7-40-50/5	Stiff, friable clay and silt, dark reddish brown, dry
5.0	7.5		2-18-27-50/5	Same
7.5	10.0		3-50/5	Silt, buff, some fine sand to shale at 9.0' (dark black)

AR302530

Exhibit 5.2

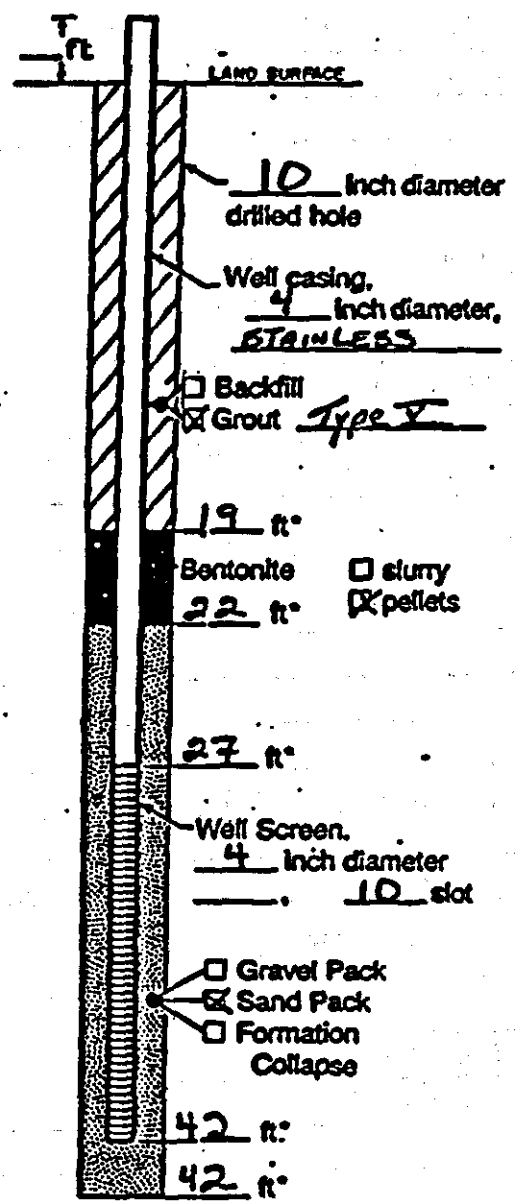
Perimeter Well Construction Details

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ATTACHMENT 2

DOC. CONTRL. # M0679FR6-GM-8-9-87-2

WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project AVTEX FIBERS, INC. RI/FS Well MW-9
Town/City FRONT ROYAL
County WARREN State VIRGINIA
Permit No. _____
Land-Surface Elevation
and Datum _____ feet ☐ surveyed
_____ ☐ estimated
Installation Dates(s) _____
Drilling Method HOLLOW STEM AUGER
Drilling Contractor PENNSYLVANIA DRILLING COMPANY
Drilling Fluid NONE

Development Techniques(s) and Date(s)
TO BE PERFORMED BY AIR-LIFT , WEEK OF AUGUST 10

Fluid Loss During Drilling N.A. gallons
Water Removed During Development N.A. gallons
Static Depth to Water _____ feet below M.P.
Pumping Depth to Water N.A. feet below M.P.
Pumping Duration N.A. hours
Yield N.A. gpm Date _____
Specific Capacity _____ gpm/ft
Well Purpose Monitoring of shallow groundwater in the vicinity of the viscose basins.

Remarks _____

Prepared by Jeff Koore AR302532

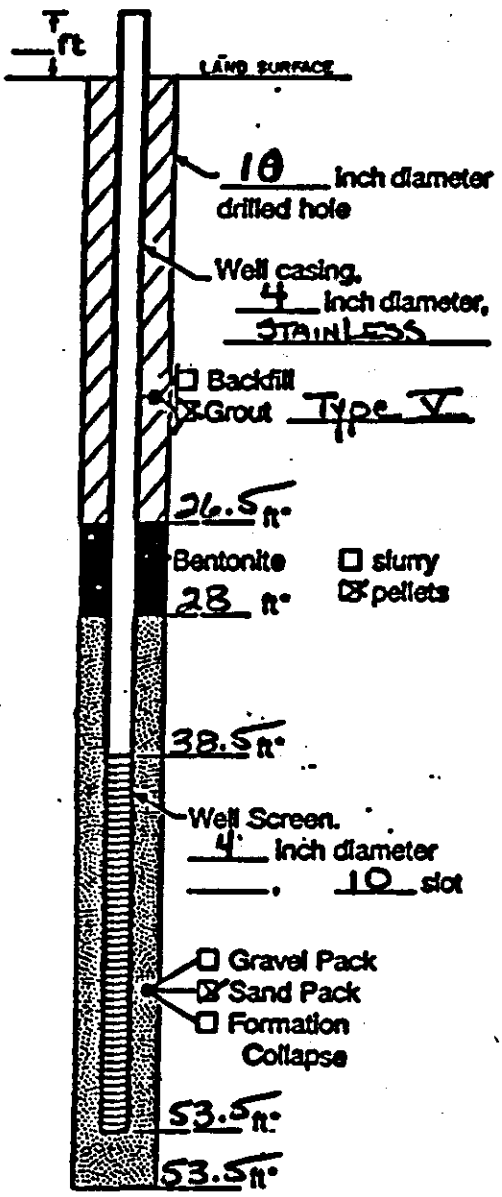
1/86

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ATTACHMENT 3

DOC. CONTRL. #
M0679FR6-GM-8-7-87-1

WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project AVTEX FIBERS, INC. RI/FS Well MW-10
Town/City FRONT ROYAL
County WARREN State VIRGINIA
Permit No. _____
Land-Surface Elevation and Datum _____ feet ☐ surveyed ☐ estimated
Installation Dates(s) _____
Drilling Method HOLLOW STEM AUGER
Drilling Contractor PENNSYLVANIA DRILLING COMPANY
Drilling Fluid NONE
Development Techniques(s) and Date(s)
TO BE PERFORMED BY AIR-LIFT, WEEK OF AUGUST 10
Fluid Loss During Drilling N.A. gallons
Water Removed During Development N.A. gallons
Static Depth to Water _____ feet below M.P.
Pumping Depth to Water N.A. feet below M.P.
Pumping Duration N.A. hours
Yield N.A. gpm Date _____
Specific Capacity _____ gpm/ft
Well Purpose Monitoring of shallow groundwater in the vicinity of the viscose basins.
Remarks

Prepared by Jeff Moore

AR302533

1/88

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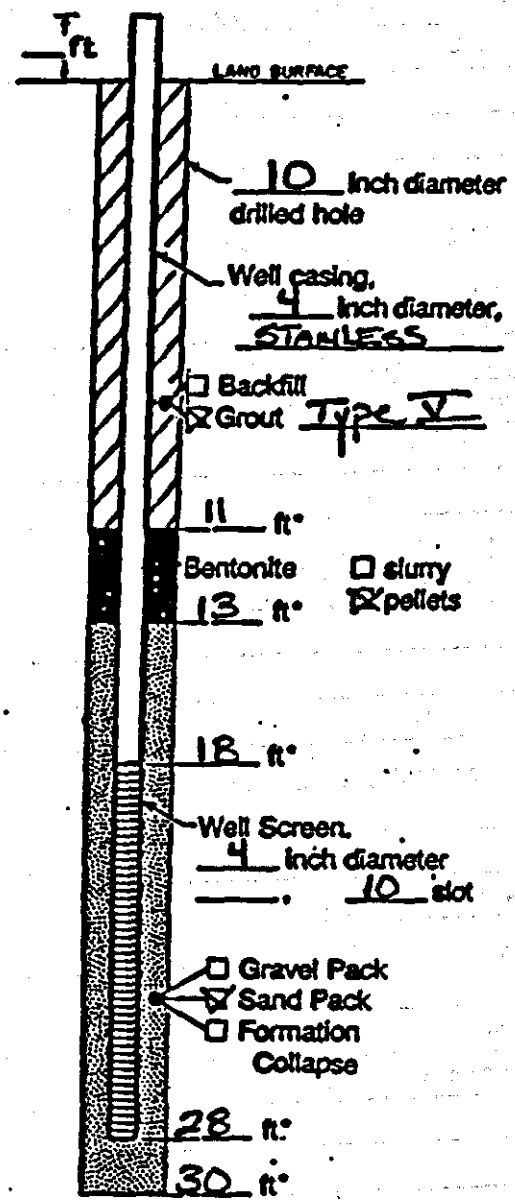
Ground-Water Consultants

ATTACHMENT 4

DOC. CONTRL. #
M0579FR6-GM-8-9-87-4

WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project AVTEX FIBERS, INC. RI/FS Well MW-11
Town/City FRONT ROYAL
County WARREN State VIRGINIA
Permit No. _____
Land-Surface Elevation and Datum _____ feet ☐ surveyed ☐ estimated
Installation Dates(s) _____
Drilling Method HOLLOW STEM AUGER
Drilling Contractor PENNSYLVANIA DRILLING COMPANY
Drilling Fluid NONE

Development Techniques(s) and Date(s)
TO BE PERFORMED BY AIR-LIFT, WEEK OF AUGUST 10

Fluid Loss During Drilling N.A. gallons
Water Removed During Development - N.A. gallons
Static Depth to Water _____ feet below M.P.
Pumping Depth to Water N.A. feet below M.P.
Pumping Duration N.A. hours
Yield N.A. gpm Date _____
Specific Capacity _____ gpm/ft
Well Purpose Monitoring of shallow groundwater in the vicinity of the viscose basins.

Remarks

Prepared by Jeff Moore

AR302534

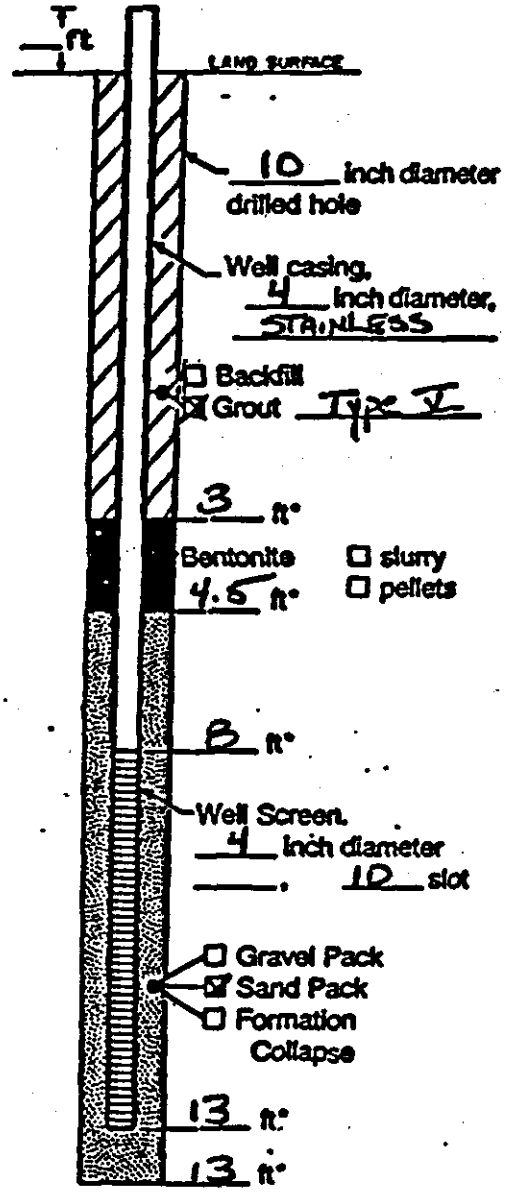
1/86

GERAGHTY & MILLER, INC.
Ground-Water Consultants

ATTACHMENT 5 (Rev.)

DOC. CONTRL. #
M0679FR6-GM-8-9-87-5

WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project AVTEX FIBERS, INC. RI/FS Well MW-12
Town/City FRONT ROYAL
County WARREN State VIRGINIA
Permit No.
Land-Surface Elevation and Datum ____ feet ☐ surveyed ☐ estimated
Installation Dates(s)
Drilling Method HOLLOW STEM AUGER
Drilling Contractor PENNSYLVANIA DRILLING COMPANY
Drilling Fluid NONE

Development Techniques(s) and Date(s)
TO BE PERFORMED BY AIR-LIFT, WEEK OF AUGUST 10

Fluid Loss During Drilling N.A. gallons
Water Removed During Development N.A. gallons
Static Depth to Water ____ feet below M.P.
Pumping Depth to Water N.A. feet below M.P.
Pumping Duration N.A. hours
Yield N.A. gpm Date
Specific Capacity ____ gpm/ft
Well Purpose Monitoring of shallow groundwater in the vicinity of the viscose basins.

Remarks

Prepared by Jeff Moore

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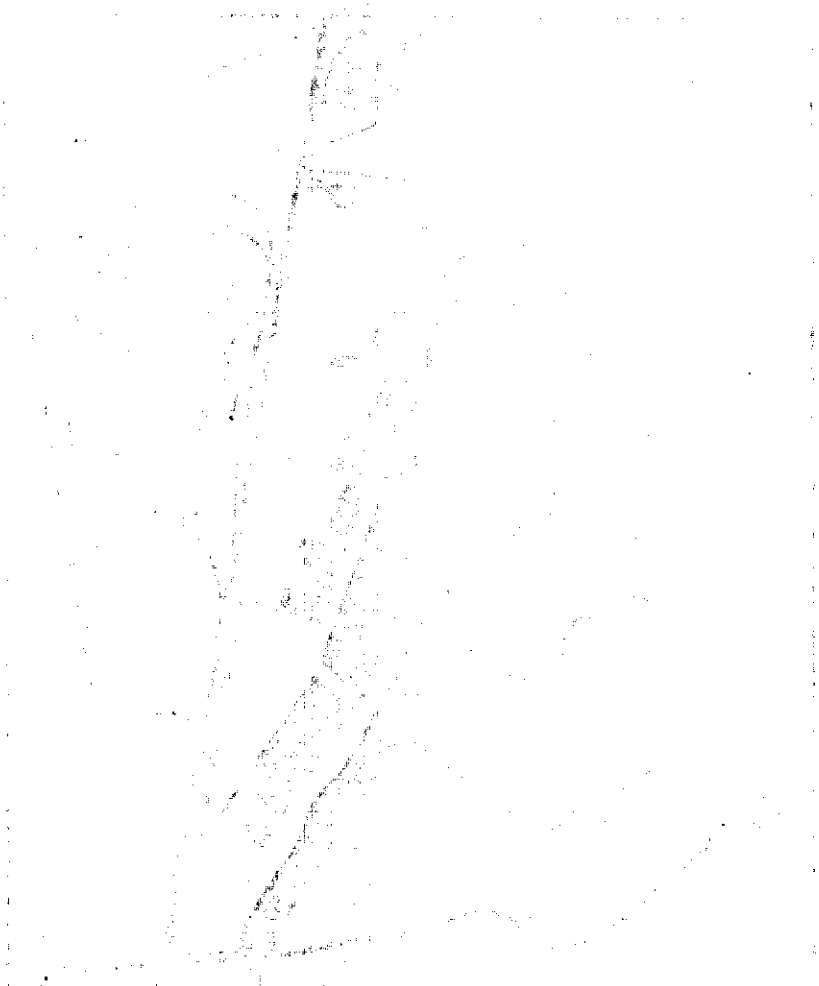
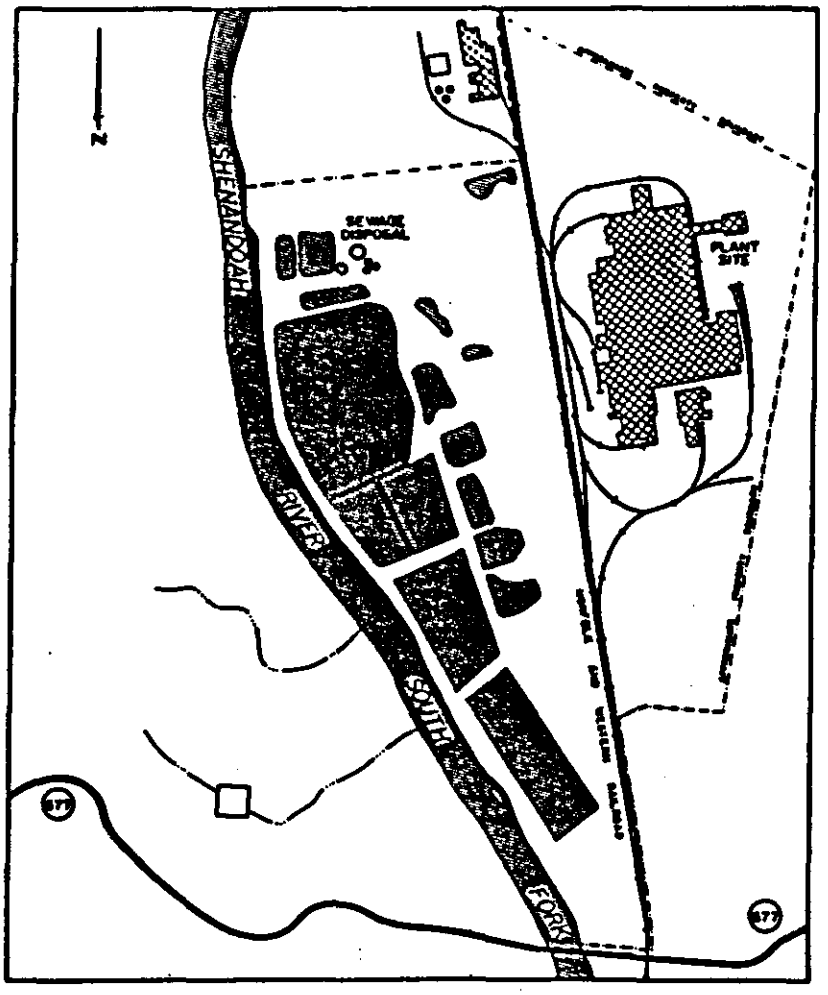


Cardinal

ORIGINAL
(Red)

SECTION 6.0

VISCOSE BASIN BORING PROGRAM



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SECTION 6.0

VISCOSE BASIN BORING PROGRAM

After the completion of the monitor well drilling program, G&M began the Viscose Basin Boring Program which involved the drilling of a single hole within Viscose Basins 1, 2, 3, 7, 9, 10, and 11 to collect waste samples for chemical and geotechnical testing. At each location, the field geologists and drilling crew operated in Level B with full-face respirators and supplied air. During the drilling, split-spoon samples and Shelby tubes were collected to identify the encountered material and selected samples were packaged for shipment to the three laboratories involved in chemical and geotechnical analyses.

Laboratories involved include:

Cambridge Analytical Associates, Inc. - Solid and Liquid Chemistry

Spotts, Stevens & McCoy - Solid Chemistry

Froehling & Robertson, Inc. - Geotechnical Testing

At locations in Viscose Basin 1, 2, 3, and 7, each boring was extended through the waste material and into the underlying natural soils until bedrock was encountered. Once bedrock was encountered, drilling was continued from within the hollow-stem augers into the bedrock formation by NX coring method to collect intact rock samples to identify lithology and important structural features within the rock matrix.

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Once the NX coring had recovered 10 feet of rock, the hole was abandoned by tremmie method using a thick slurry of bentonite and sulfate-resistant cement to land surface. The augers were then pulled from the hole and the displaced volume was filled with the bentonite/grout mixture to land surface. At Viscose Basin 7, a piezometer was installed in the borehole after the borehole section within the bedrock and lower 5 feet of native clay material had been grouted by tremmie method and allowed to cure. A 10-foot section of 2-inch stainless steel screen and a length of stainless steel riser pipe was then installed in the hole with a sand pack, bentonite seal and surface grout plug. At Viscose Basin 1, 2, and 3, a second hole was drilled near the original sampling borehole, and a piezometer was constructed using the same construction materials as used at Viscose Basin 7.

Within the open viscose basin (9, 10, and 11), a skid rig mounted to a platform was moved out onto the crust material using a crane and a plywood walkway was constructed from the berm to the drilling platform. Drilling consisted of driving a 4-inch diameter casing into the materials with a 318-pound hammer and collecting samples from within the casing. This procedure continued until natural earth materials were encountered. Once the drilling was completed, a section of 2-inch stainless steel screen and casing was placed into the open borehole and constructed using a clean silica sand pack, bentonite seal and grout plug to land surface.

At Viscose Basin 10, the drilling pipe could not be retrieved from the borehole and was grouted in place. No piezometer was constructed in this basin. Liquid samples representative of Basin 10 were collected from the seep located near Well MW-10.

Logs describing the material encountered and piezometer construction details for each location are presented as Exhibit 6.1. The physical characteristics for each basin are presented as Exhibit 6.2. A summary of the collected solid waste samples and the laboratories involved in the analyses is presented as Exhibit 6.3. In addition to the collection of solid samples for analysis, G&M collected liquid samples from the installed piezometers to characterize types and concentrations of leachable constituents. Summary tables of the chemical analyses for the solid and liquid samples are presented as Exhibit 6.4. Additional analyses were performed on the solid waste samples for geotechnical and chemical properties for use in defining potential remediation/treatment alternatives for the waste. The chemical and geotechnical testing results are presented as Exhibits 6.5 and 6.6, respectively. Based on the boring and geochemical data, preliminary cross-sections through the viscose basins have been developed and are presented as Exhibit 6.7.

ORIGINAL (Red)

Exhibit 6.1

Viscose Basin Boring Logs and Piezometer Construction Details

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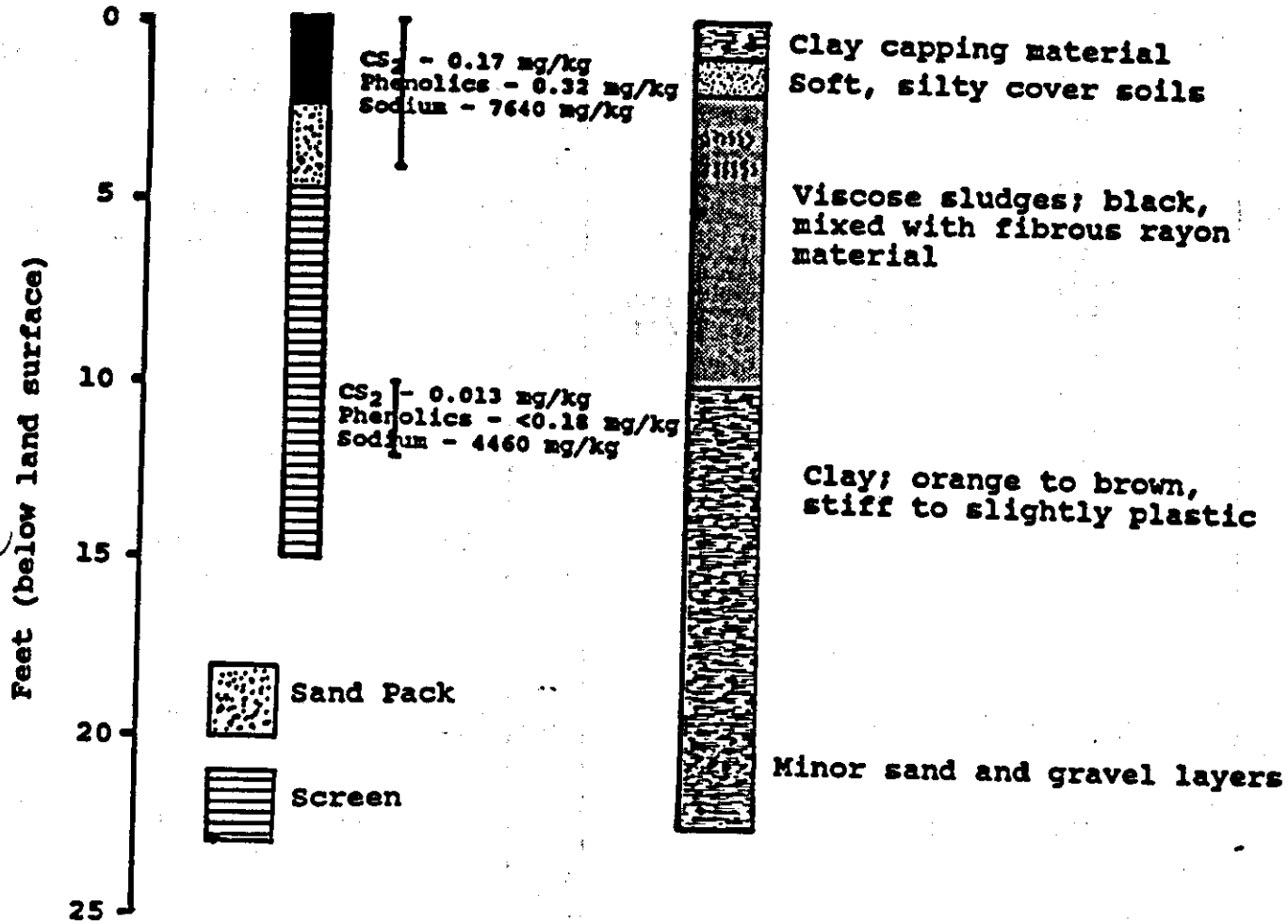
VISCOSE BASIN NO. 1
VB-1



Basin Liquid Sample: CS_2 - <0.05 mg/l
Phenolics - 0.2 mg/l
Sodium - 10,000 mg/l

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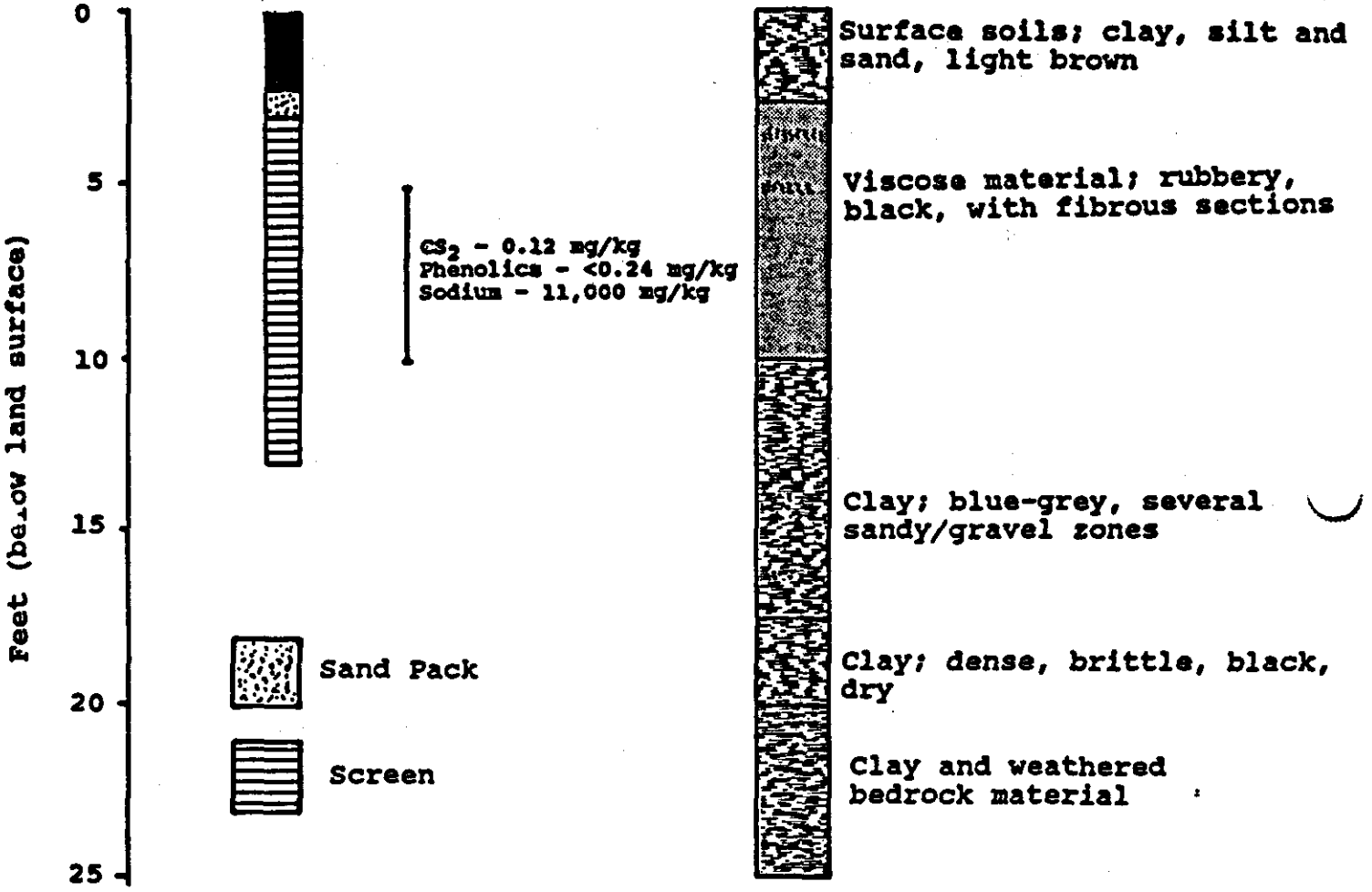
VISCOSE BASIN NO. 2
VB-2



Basin Liquid Sample: CS_2 - <0.05 mg/l
Phenolics - 0.02 mg/l
Sodium - 2400 mg/l

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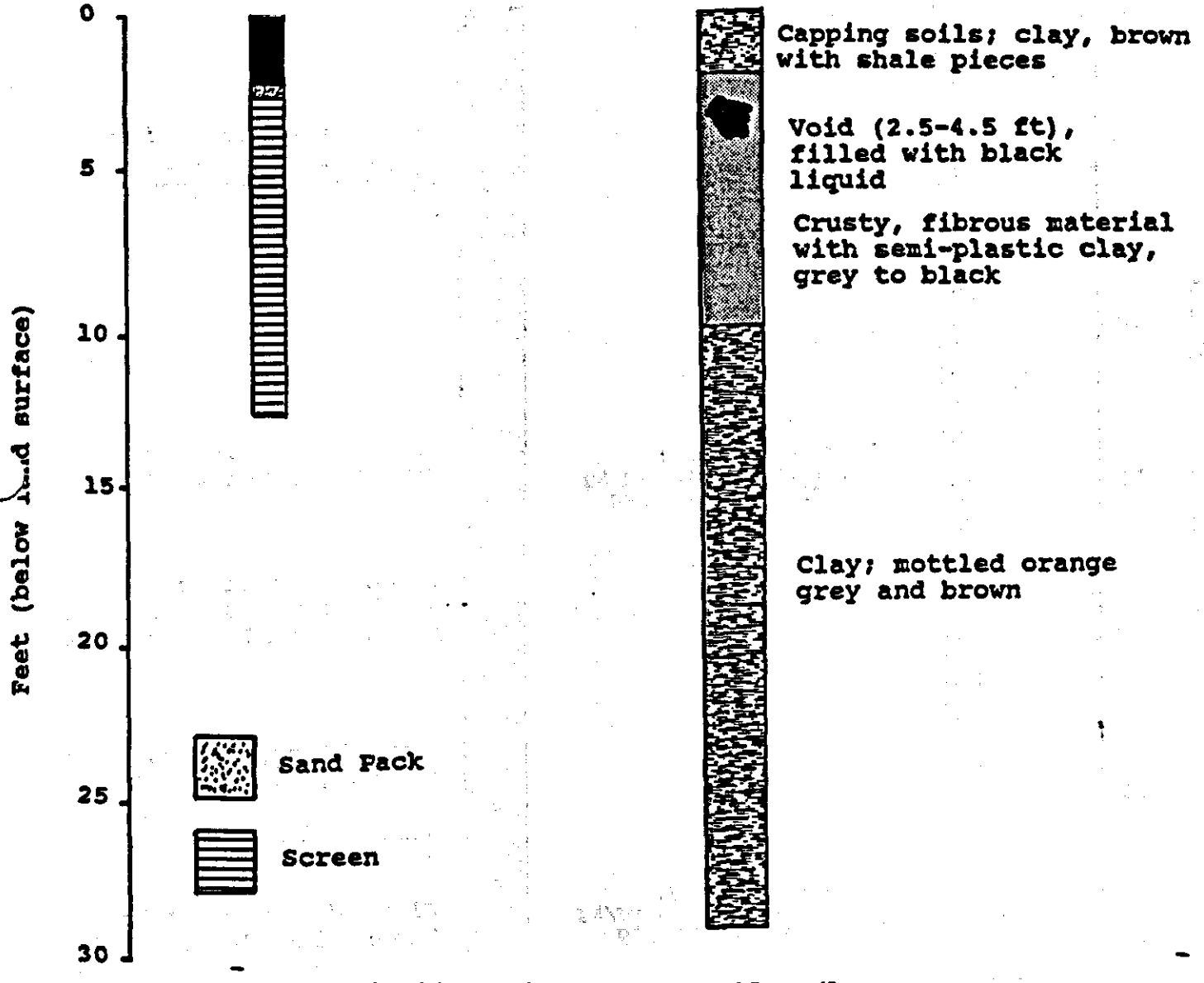
VISCOSE BASIN NO. 3
VB-3



Basin Liquid Sample: CS_2 - <0.05 mg/l
Phenolics - 7.1 mg/l
Sodium - 5600 mg/l

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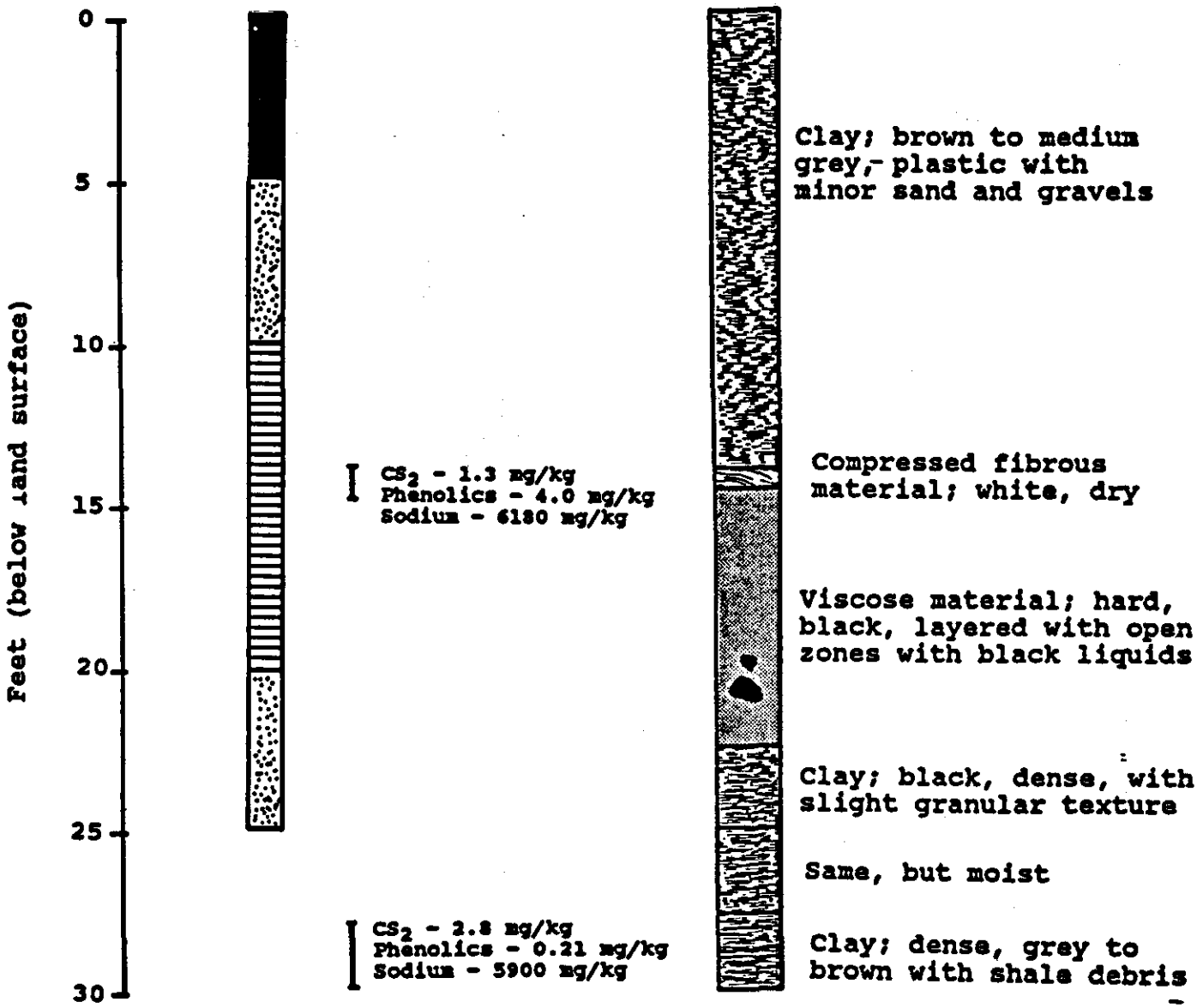
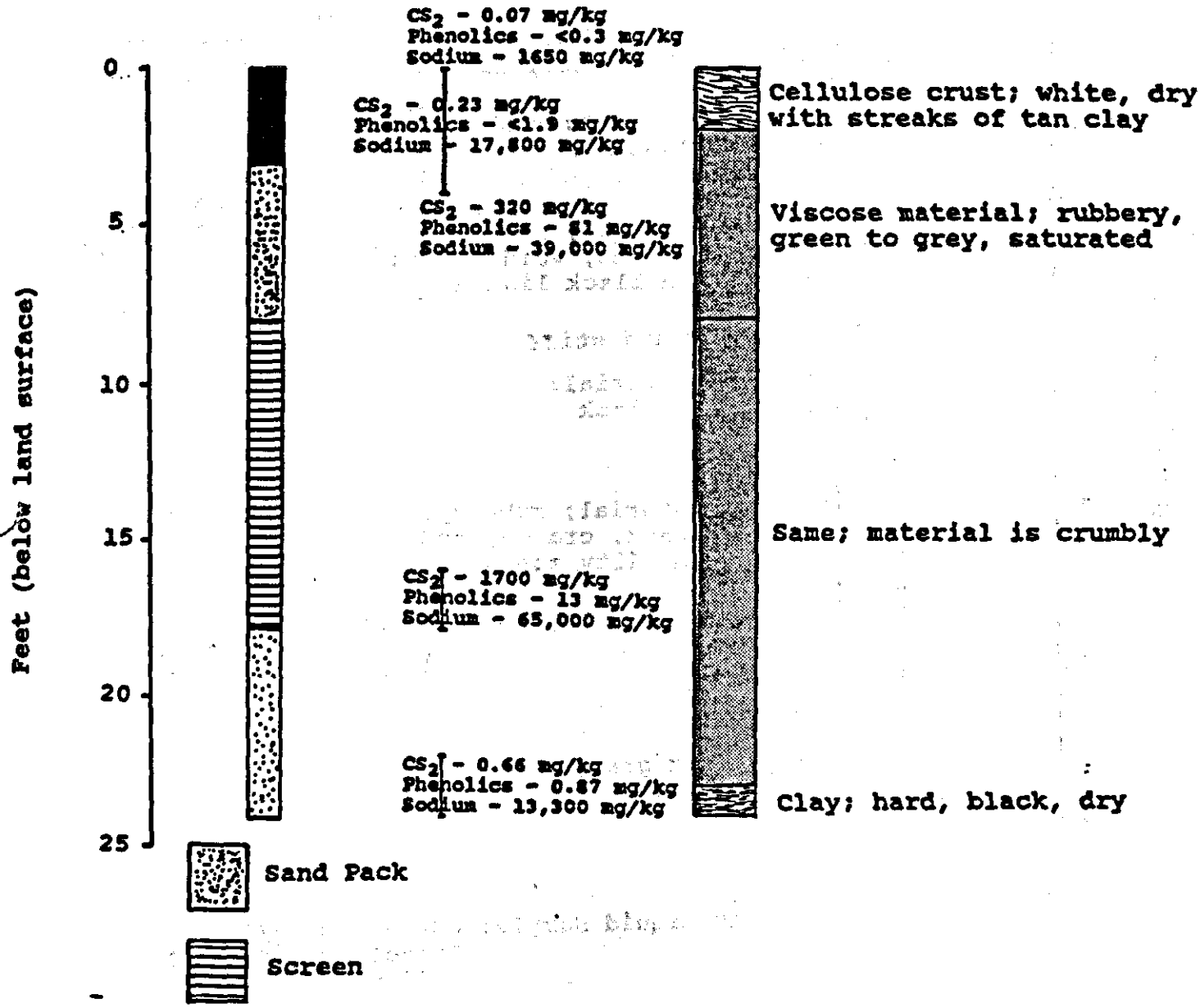
VISCOSE BASIN NO. 7
VB-7



Basin Liquid Sample: CS_2 - 1.5 mg/l
Phenolics - 0.56 mg/l
Sodium - 2700 mg/l

VISCOSE BASIN NO. 9
VB-9



Basin Liquid Sample: CS_2 - 710 mg/l
Phenolics - 12 mg/l
Sodium - 10,000 mg/l

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(Red)

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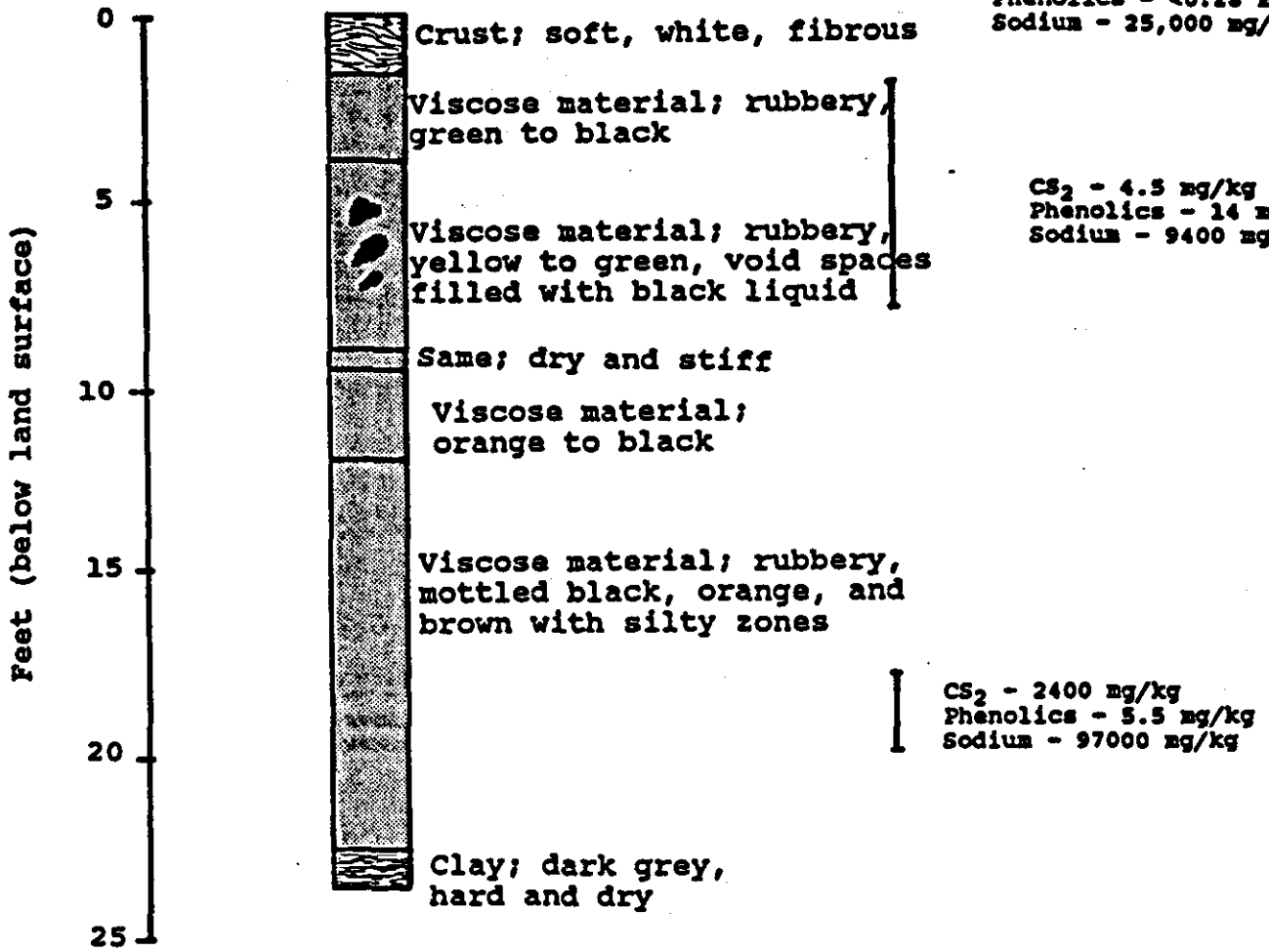
VISCOSE BASIN NO. 10
VB-10



Basin Liquid Sample: CS_2 - 320 mg/l
Phenolics - 20 mg/l
Sodium - 9800 mg/l

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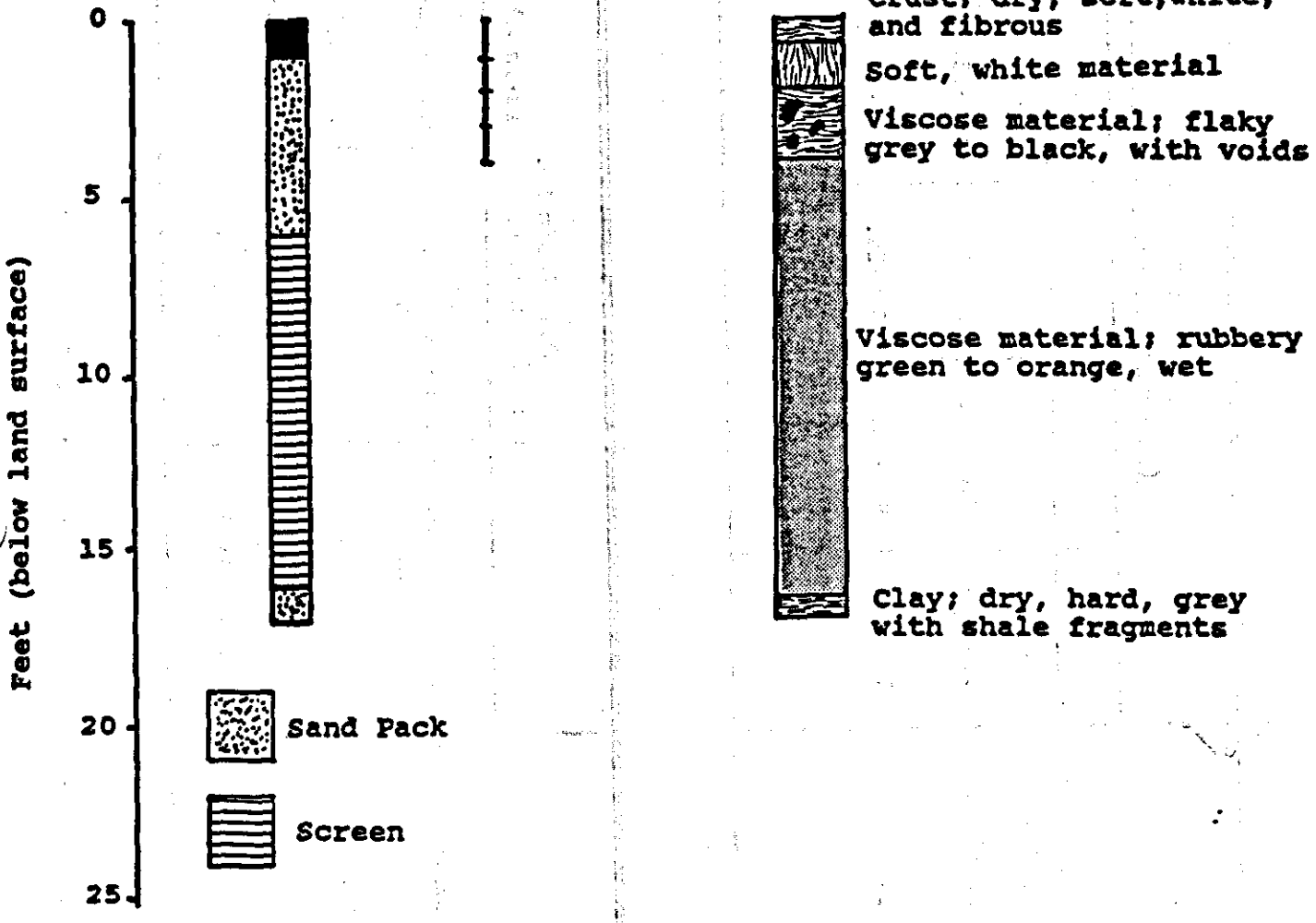
VISCOSE BASIN NO. 11
VB-11



Sample Depth (feet)	CS_2 (mg/kg)	Phenolics (mg/kg)	Sodium (mg/kg)
Surface	0.016	<0.28	46
0 - 1	12.	<2.6	56,700
1 - 2	6.	<2.1	40,000
2 - 3	8300.	15.	92,300
3 - 4	20000.	14.	113,000
Liquid Sample:	3431. mg/l	0.07 mg/l	15,000 mg/l

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Material Type (General)	Closed Basin No. (intervals in feet, from surface)				
	1	2	3	7	8*
Fill or Cap (predominantly clay)	0-1.0	0-2.0	0-2.5	0-14.0	>5.0
Black Fiberous and/or Rubberlike Materials	1.0-9.0	2.0- 9.0	2.5-5.0	14.0-23.0	N/A
Natural Deposits (predominantly clay)	9.0-29.0	9.0-25.0	5.0-29.0	23.0-30.0	N/A
Bedrock	29.0+	25.0+	29.0+	30.0+	N/A

Material Type (General)	Open Basin No. (intervals in feet, from surface)		
	9	10	11
Cellulose Crust Material	0-0.5	0-0.5	0-0.5
Moist, White, Soft Material	0.5-2.0	0.5-2.0	0.5-2.0
Rubberlike Material	2.0-23.0	2.0-23.0	2.0-16.5
Natural Deposits(predominantly clay)	23.0-24.0+	23.0-24.0+	16.5+

*Viscose Basin 8 unpenetrable with auger rig - fill contains concrete slabs

Exhibit 6.2 Summary of Physical Composition of Viscose Basins

Sample I.D.	Spotls, Stevens, & McCoy	Cambridge Analytical Associates	Froehling & Robertson	Replicate I.D.	Major Type Material	Depth Interval Sampled (ft)	Viscose Basin	Date Sampled
VB3-4-7	X				Subsurface Solid	4-7	3	8-10
VB2-5-7	X				Subsurface Solid	5-7	2	8-11
VB2-17-22	X				Subsurface Solid	17-22	2	8-11
VB2-5-10		X			Subsurface Solid	5-10	2	8-11
VB1-2-6	X	X			Subsurface Solid	2-6	1	8-13
VB10-2-8	X	X			Subsurface Solid	2-8	10	8-19
VB10-Surface	X	X (No ABN)			Surface Crust	Surface	10	8-19
VB10-18-20	X	X			Subsurface Solid	18-20	10	8-20
VB2-2-4			X		Subsyrface Solid	2-4	2	8-11
VB3-2-4			X		Subsurface Solid	2-4	3	8-10
VB10-0-2			X		Surface Crust & Subsurface Solid	0-2	10	8-19
VB10-12-14			X		Subsurface Solid	12-14	10	8-20
VB-11-Surface	X	X (No ABN)		VB11-0-0	Surface Crust	Surface	11	8-24
VB11-0-1	X	X		VB11-1-2	Surface Crust & Subsurface Solid	0-2	11	8-24
VB11-2-3	X	X		VB11-3-4	Subsurface Solid	2-4	11	8-24
VB-9-Surface	X	X (No ABN)			Surface Crust	Surface	9	8-26
VB-9-0-2	X	X			Subsurface Solid	0-2	9	8-26
VB-9-2-4	X	X			Subsurface Solid	2-4	9	8-26
2VB-1-1-4		X	X		Subsurface Solid	1-4	1	8-27
VB-9-23-24		X			Subsurface Solid	23-24	9	8-27
2VB-1-10-12		X	X		Clay	10-12	1	8-27
VB-9-16-18	X	X			Subsurface Solid	16-18	9	8-27
VB-9-Surface		X (ABN)			Surface Crust	Surface	9	8-27
VB-9-0-2			X		Subsurface Solid	0-2	9	8-26
VB-9-10-12			X		Subsurface Solid	10-12	9	8-26
VB-11-11-13			X		Subsurface Solid	11-13	11	8-25
VB-11-1-2			X		Subsurface Solid	1-2	11	8-25
VB-7-1	X	X			Subsurface Solid	14-15	7	9-1
VB7-2[illegible]		X			Subsurface Solid	28-30	7	9-1
VB-10-		X (ABN)			Surface Crust	Surface	10	9-2
VB-11-		X (ABN)			Surface Crust	Surface	11	9-2
VB-7-1			X		Subsurface Solid	15-17	7	9-1

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Exhibit 6.3 Viscose Solid Sample Identification and Routing Summary

Exhibit 6.4

Viscose Solid Waste and Liquid Chemistry Summary Tables

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VISCOSE BASIN SOLID & LIQUID CHEMISTRY

AWTEX - VISCOSE BASIN SOLID SAMPLES

	VB-1 (1-4)	VB-1 (10-12)	VB-2 (5-10)	VB-7 (14-15)	VB-7 (20-30)	VB-9 (Surface)	VB-9 (0-2)	VB-9 (2-4)	VB-9 (15-18)	VB-9 (23-24)	VB-10 (Surface)	VB-10 (2-3)	VB-10 (19-20)	VB-11 (Surface)	VB-11 (Surface) Replicate	VB-11 (0-1)	VB-11 (0-1) Replicate	VB-11 (2-3)
Arsenic	<10	<11	3.5	13.1	6.9	0.85	1	0.51	<32	<11	12	0.25	(0.96	0.42	0.41	<2.0	<2.4	<1.04
Cadmium	11	(0.28	<4.1	7	<0.28	<0.38	<2.8	<1.2	<0.95	<0.29	8	<3.64	<1.2	<0.24	<9.26	<2.57	<3.08	<1.24
Iron	13000	52000	15000	5000	41700	1.92	183	470	157	17092	9700	759	1299	227	663	208	419	734
Potassium	230	354	320	309	655	105	<278	<124	1570	595	739	<22	115	<28	72	<258	<379	180
Magnesium	1900	354	1200	1799	946	720	467	59	27	739	2290	140	24	71	43	185	274	47
Manganese	183	75	280	144	991	52.5	<5.6	<2.5	4.2	999	160	7.7	6.6	8.4	2.2	<5.1	21	9.1
Sodium	7640	4460	11000	6180	5900	1650	17000	29000	65000	13300	25000	9400	97000	65	46	56700	40000	113000
Lead	3700	17	410	2300	130	32	470	260	51	<11	<37	9.1	<24	42	<10	<100	<120	<49
Phenols	0.32	<0.18	<0.24	4	0.21	<0.39	<1.9	81	13	0.87	<0.28	14	5.5	<0.22	<0.28	<2.6	<2.1	14
Zinc	774	75	2900	12.3	78	4999	423	226	293	55	7900	91	510	274	36	170	245	153

Avtex - Viscose Basin Liquid Samples

	VB-1	VB-2	VB-3	VB-7	VB-9	VB-9 (Replicate)	VB-11	SP-10	Field Blank
Alkalinity	9000	4000	12000	3500	18000	17000	32000	14000	
Arsenic	0.16	0.04	0.2	<0.040	<0.040	<0.040	<0.040	<0.040	
Cadmium	<0.020	<0.020	<0.20	<0.020	<0.020	<0.020	<0.020	<0.020	
Chloride	360	200	520	170	150	310	130	360	
COD	1200	690	1500	1000	4000	4500	12000	3900	<3.0
Conductivity	32100	6930	15440	12210	36800	36500	71000	39300	
Iron	2.9	2.1	2.4	0.77	9.5	8.29	0.19	0.35	
Potassium	5.5	10	6.5	3	14	14	22	230	
Magnesium	150	84	86	450	4.4	4.5	<0.4	6.4	
Manganese	0.66	0.18	0.67	4.5	9.02	8.92	<0.020	<0.020	
Sodium	10000	2400	5500	2700	15000	10000	15000	9000	
Lead	<0.20	<0.20	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	
Phenolics	0.2	0.02	7.1	0.36	14	12	0.07	20	<0.01
pH	7.48	7.49	7.63	6.77	10.20	10.27	12.05	10.11	
Sulfate	5400	750	170	4500	3200	2400	2600	4200	
TDS	29100	5190	14200	12900	24200	27700	45500	25900	
Zinc	0.1	0.27	0.06	0.11	0.06	0.74	1.0	1.6	

6-15

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AMTEX - VISCOSE BASIN SOLID SAMPLES

	VB-1 (1-4)	VB-1 (10-12)	VB-2 (5-10)	VB-7 (14-15)	VB-7 (28-30)	VB-9 (Surface)	VB-9 (0-2)	VB-9 (2-4)	VB-9 (2-4) Perm	VB-9 (15-18)	VB-9 (16-18) Perm	VB-9 (23-24)	VB-9 (23-24) Perm	VB-9 (23-24) Perm 2	VB-10 (Surface)	VB-10 (2-8)	VB-10 (18-20)
DATE SAMPLE REC.	8/28/87	8/28/87	8/13/87	9/3/87	9/3/87	8/27/87	8/27/87	8/27/87	8/27/87	8/28/87	8/28/87	8/28/87	8/28/87	8/28/87	8/28/87	8/29/87	8/21/87
DATE EXTR./PREP	9/8/87	9/9/87	9/25/87	9/10/87	9/10/87	9/4/87	9/4/87	9/4/87	9/16/87	9/10/87	9/14/87	9/8/87	9/14/87	9/21/87	9/7/87	8/29/87	8/26/87
DATE ANALYZED	9/8/87	9/9/87	8/25/87	9/10/87	9/10/87	9/4/87	9/4/87	9/4/87	9/16/87	9/10/87	9/14/87	9/8/87	9/14/87	9/21/87	9/7/87	8/29/87	8/26/87
CHLOROETHANE	92 u	62 u	300 u	UR	UR	55 u	450 u	7100 u	71000 u	30000 u	300000 u	64 u	1300 u	64 u	UR	9100 u	220 u
BROMOETHANE	92 u	62 u	300 u	UR	UR	55 u	450 u	7100 u	71000 u	30000 u	300000 u	64 u	1300 u	64 u	UR	9100 u	220 u
VINYL CHLORIDE	92 u	62 u	300 u	UR	UR	55 u	450 u	7100 u	71000 u	30000 u	300000 u	64 u	1300 u	64 u	UR	9100 u	220 u
CHLOROETHANE	92 u	62 u	300 u	UR	UR	55 u	450 u	7100 u	71000 u	30000 u	300000 u	64 u	1300 u	64 u	UR	9100 u	220 u
METHYLENE CHLORIDE	21 J	69	250	58	58	25	140 J	2300 J	24000 J	12000 J	170000	12 J	250 J	46	58	5900	210 u
ACETONE	820	320	1500	UR	UR	99	400	7100 u	71000 u	30000 u	300000 u	1300	1300 u	64 u	UR	15000	220 u
CARBON DISULFIDE	170	13 J	120 J	1300	2900	70	8 220	460000	220000	2500000	1700000	44 00	190 J	660	170 u	4500 u	200000
1,1-DICHLOROETHENE	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	210 u
1,1-DICHLOROETHANE	46 u	31 u	150 u	UR	UR	28 u	230 u	3500 u	35000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	210 u
TRANS-1,2-DICHLOROETHENE	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	210 u
CHLOROFORM	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	210 u
1,2-DICHLOROETHANE	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	210 u
2-BUTANONE	92 u	62 u	300 u	UR	UR	55 u	450 u	7100 u	71000 u	30000 u	300000 u	64 u	1300 u	64 u	UR	9100 u	220 u
1,1,1-TRICHLOROETHANE	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	110 u
CARBON TETRACHLORIDE	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	110 u
VINYL ACETATE	92 u	62 u	300 u	UR	UR	55 u	450 u	7100 u	71000 u	30000 u	300000 u	64 u	1300 u	64 u	UR	9100 u	220 u
BROMODICHLOROMETHANE	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	110 u
1,2-DICHLOROPROPANE	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	110 u
TRANS-1,3-DICHLOROPROPENE	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	110 u
TRICHLOROETHENE	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	110 u
DIBROMOCHLOROMETHANE	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	110 u
1,1,2-TRICHLOROETHANE	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	110 u
BENZENE	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	110 u
CIS-1,3 DICHLOROPROPENE	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	110 u
2-CHLOROETHYLVINYLETHER	92 u	62 u	300 u	UR	UR	55 u	450 u	7100 u	71000 u	30000 u	300000 u	64 u	1300 u	64 u	UR	9100 u	220 u
BROMOFORM	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	110 u
4-METHYL-2-PENTANONE	92 u	62 u	300 u	UR	UR	55 u	450 u	7100 u	71000 u	30000 u	300000 u	64 u	1300 u	64 u	UR	9100 u	220 u
2-HEXANONE	92 u	62 u	300 u	UR	UR	55 u	450 u	7100 u	71000 u	30000 u	300000 u	64 u	1300 u	64 u	UR	9100 u	220 u
TETRACHLOROETHENE	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	73000	15000 u	150000 u	32 u	640 u	25 J	UR	4500 u	110 u
1,1,2,2-TETRACHLOROETHANE	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	110 u
TOLUENE	46 u	31 u	35 J	UR	UR	14 J	230 u	3600 u	25000 u	15000 u	150000 u	32 u	640 u	8 J	UR	4500 u	110 u
CHLOROBENZENE	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	110 u
ETHYLBENZENE	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	110 u
STYRENE	46 u	31 u	150 u	UR	UR	28 u	230 u	3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	110 u
TOTAL XYLENES	46 u	31 u	46 J	UR	UR	19 J	230 u	pR 3600 u	36000 u	15000 u	150000 u	32 u	640 u	32 u	UR	4500 u	110 u

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ORIGINAL (Red)

AVTEX - VISCOSE BASIN SOLID SAMPLES

	VB-11 (10-20) Perun	VB-11 (Surface)	VB-11 (Surface) Replicate	VB-11 (0-1)	VB-11 (0-1) Replicate	VB-11 (2-3) Replicate	VB-11 (2-3) Perun	VB-11 (2-3)	VB-11 (2-3) Perun
DATE SAMPLE REC.	9/21/87	9/25/87	9/25/87	9/25/87	9/25/87	9/25/87	9/25/87	9/25/87	9/25/87
DATE EXTR./PREP	9/16/87	9/3/87	9/3/87	9/3/87	9/3/87	9/4/87	10/11/87	9/4/87	10/11/87
DATE ANALYZED	9/16/87	9/3/87	9/3/87	9/3/87	9/3/87	9/4/87	10/11/87	9/4/87	10/11/87
CHLOROMETHANE	870000 u	50 u	50 u	420 u	420 u	7700 u	1500000 u	3300 u	330000 u
BROMOMETHANE	870000 u	50 u	50 u	420 u	420 u	7700 u	1500000 u	3300 u	330000 u
VINYL CHLORIDE	870000 u	50 u	50 u	420 u	420 u	7700 u	1500000 u	3300 u	330000 u
CHLOROETHANE	870000 u	50 u	50 u	420 u	420 u	7700 u	1500000 u	3300 u	330000 u
METHYLENE CHLORIDE	450000 u	25	25	210 j	190 j	5700	700000 u	1600 j	36000 j
ACETONE	870000 u	230	210	1400	2200	22000	2000000	5400	130000
CARBON DISULFIDE	2490000	15 j	16 j	12000	6000	880000	20000000	920000	8200000
1,1-DICHLOROETHENE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
1,1-DICHLOROETHANE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
TRANS-1,2-DICHLOROETHENE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
CHLOROFORM	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
1,2-DICHLOROETHANE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
2-BUTANONE	870000 u	50 u	50 u	420 u	420 u	7700 u	1500000 u	3300 u	330000 u
1,1,1-TRICHLOROETHANE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
CARBON TETRACHLORIDE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
VINYL ACETATE	870000 u	50 u	50 u	420 u	420 u	7700 u	1500000 u	3300 u	330000 u
BROMODICHLOROMETHANE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
1,2-DICHLOROPROPANE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
TRANS-1,3-DICHLOROPROPENE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
TRICHLOROETHENE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
DIBROMOCHLOROMETHANE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
1,1,2-TRICHLOROETHANE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
BENZENE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
CIS-1,3 DICHLOROPROPENE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
2-CHLOROETHYLVINYLETHER	870000 u	50 u	50 u	420 u	420 u	7700 u	1500000 u	3300 u	330000 u
BROMOFORM	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
4-METHYL-2-PENTANONE	870000 u	50 u	50 u	420 u	420 u	7700 u	1500000 u	3300 u	330000 u
2-HEXANONE	870000 u	50 u	50 u	420 u	420 u	7700 u	1500000 u	3300 u	330000 u
TETRACHLOROETHENE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
1,1,2,2-TETRACHLOROETHANE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
TOLUENE	450000 u	18 J	19 J	210 u	210 u	3800 u	700000 u	1700 u	170000 u
CHLOROBENZENE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
ETHYLBENZENE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
STYRENE	450000 u	25 u	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u
TOTAL XYLENES	450000 u	11 J	25 u	210 u	210 u	3800 u	700000 u	1700 u	170000 u

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ORIGINAL (Red)

AVTEX - VISCOSE BASIN SOLID SAMPLES

	VB-1 (1-4)	VB-1 (10-12)	VB-2 (5-10)	VB-7 (14-15)	VB-7 (28-29)	VB-9 (Surface)	VB-9 (0-2)	VB-9 (2-4)	VB-9 (16-18)	VB-9 (22-24)	VB-10 (Surface)	VB-10 (2-8)	VB-10 (18-20) Pre-extract	VB-11 (Surface)	VB-11 (0-1)	VB-11 (0-1) Perm	VB-11 (0-1) Replicate
DATE EXTR./PREP	9/5/87	9/8/87	8/21/87	9/8/87	9/8/87	9/8/87	9/3/87	9/3/87	9/8/87	9/8/87	9/8/87	8/31/87	9/8/87	9/8/87	9/4/87	9/4/87	9/4/87
DATE ANALYZED	10/4/87	10/5/87	9/08/87	10/7/87	10/5/87	10/4/87	10/5/87	10/8/87	10/5/87	10/4/87	10/5/87	9/20/87	10/01/87	10/5/87	10/1/87	10/2/87	10/2/87
PHENOL	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	30000	330 u	330 u	330 u	15000	3300 u	330 u	330 u	330 u	330 u
BIS-(2,-CHLOROETHYL)ETHER	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
2-CHLOROPHENOL	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
1,3-DICHLOROBENZENE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
1,4-DICHLOROBENZENE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
BENZYL ALCOHOL	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
1,2-DICHLOROBENZENE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
2-METHYLPHENOL	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
BIS(2-CHLOROISOPROPYL)ETHER	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
4-METHYLPHENOL	2000	330 u	330 u	6700	330 u	330 u	330 u	400	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
N-NITROSO-DI-N-PROPYLAMINE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
HEXACHLOROETHANE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
NITROBENZENE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
ISOPHORONE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
2-NITROPHENOL	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
2,4-DIMETHYLPHENOL	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
BENZOIC ACID	1600 u	1600 u	1600 u	16000 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	16000 u	1600 u	1600 u	190 j	190 j
BIS(2-CHLOROETHOXY)METHANE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
2,4-DICHLOROPHENOL	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
1,2,4-TRICHLOROBENZENE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
NAPHTHALENE	400	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
4-CHLOROANILINE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
HEXACHLOROBUTADIENE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
4-CHLORO-3-METHYLPHENOL	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
2-METHYLNAPHTHALENE	200 j	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
HEXACHLOROCYCLOPENTADIENE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
2,4,6-TRICHLOROPHENOL	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
2,4,5-TRICHLOROPHENOL	1600 u	1600 u	1600 u	16000 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	16000 u	1600 u	1600 u	1600 u	1600 u
2-CHLORONAPHTHALENE	200 j	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
2-NITROANILINE	1600 u	1600 u	1600 u	16000 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	16000 u	1600 u	1600 u	1600 u	1600 u
DIMETHYL PHTHALATE	330 u	330 u	330 u	56000	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
ACENAPHTHYLENE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
3-NITROANILINE	1600 u	1600 u	1600 u	16000 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	16000 u	1600 u	1600 u	1600 u	1600 u
ACENAPHTHENE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
2,4-DINITROPHENOL	1600 u	1600 u	1600 u	16000 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	16000 u	1600 u	1600 u	1600 u	1600 u
4-NITROPHENOL	1600 u	1600 u	1600 u	16000 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	16000 u	1600 u	1600 u	1600 u	1600 u
DIBENZOFURAN	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
2,4-DINITROTOLUENE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
2,6-DINITROTOLUENE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
DIETHYLPHTHALATE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
4-CHLOROPHENYL-PHENYLETHER	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
FLUORENE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
4-NITROANILINE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
4,6-DINITRO-2-METHYLPHENOL	1600 u	1600 u	1600 u	16000 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	16000 u	1600 u	1600 u	1600 u	1600 u
N-NITROSODIPHENYLAMINE(1)	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
4-BROMOPHENYL-PHENYLETHER	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
HEXACHLOROBENZENE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
PENTACHLOROPHENOL	1600 u	1600 u	1600 u	16000 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	1600 u	16000 u	1600 u	1600 u	1600 u	1600 u
PHENANTHRENE	400	330 u	330 u	1100	330 u	330 u	330 u	330 u	300	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
ANTHRACENE	330 u	330 u	330 u	3300	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u

ORIGINAL (Red)

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AVTEX - VISCOSE BASIN SOLID SAMPLES

DI-N-BUTYLPHTHALATE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
FLUORANTHENE	330 u	330 u	330 u	9100	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
PYRENE	400	330 u	330 u	5900	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
BUTYLBENZYLPHTHALATE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
3,3-DICHLOROBENZIDINE	660 u	660 u	660 u	6600 u	660 u	660 u	660 u	660 u	660 u	660 u	660 u	660 u	6600 u	660 u	660 u	660 u	660 u
BENZO(A)ANTHRACENE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
BIS(2-ETHYLHEXYL)PHTHALATE	330 u	330 u	330 u	15000	330 u	570	330 u	330 u	1000	330 u	330 u	330 u	3300 u	330 u	100 j	62 j	200 j
CHRYSENE	330 u	330 u	330 u	5100	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
DI-N-OCTYL PHTHALATE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
BENZO(B)FLUORANTHENE	330 u	330 u	330 u	7800	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
BENZO(K)FLUORANTHENE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
BENZO(A)PYRENE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
INDENO(1,2,3-CD)PYRENE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
DIBENZ(A,H)ANTHRACENE	330 u	330 u	330 u	3300 u	330 u	330 u	[illegible]	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u
BENZO(G,H,I)PERYLENE	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	330 u	3300 u	330 u	330 u	330 u	330 u

ORIGINAL (Red)

AR302557

AR302557

AVTEX - VISCOSE BASIN SOLID SAMPLES

	VB-11 (2-3)	VB-11 (2-3) Replicate
DATE EXTR./PREP	9/4/87	9/4/87
DATE ANALYZED	10/2/87	10/2/87
PHENOL	2300	1100
BIS-(2,-CHLOROETHYL)ETHER	330 u	330 u
2-CHLOROPHENOL	330 u	330 u
1,3-DICHLOROBENZENE	330 u	330 u
1,4-DICHLOROBENZENE	330 u	330 u
BENZYL ALCOHOL	330 u	330 u
1,2-DICHLOROBENZENE	330 u	330 u
2-METHYLPHENOL	330 u	330 u
BIS(2-CHLOROISOPROPYL)ETHER	330 u	330 u
4-METHYLPHENOL	330 u	330 u
N-NITROSO-DI-N-PROPYLAMINE	330 u	330 u
HEXACHLOROETHANE	330 u	330 u
NITROBENZENE	330 u	330 u
ISOPHORONE	330 u	330 u
2-NITROPHENOL	330 u	330 u
2,4-DIMETHYLPHENOL	330 u	330 u
BENZOIC ACID	1600 u	1600 u
BIS(2-CHLOROETHOXY)METHANE	330 u	330 u
2,4-DICHLOROPHENOL	330 u	330 u
1,2,4-TRICHLOROBENZENE	330 u	330 u
NAPHTHALENE	330 u	330 u
4-CHLOROANILINE	330 u	330 u
HEXACHLOROBUTADIENE	330 u	330 u
4-CHLORO-3-METHYLPHENOL	330 u	330 u
2-METHYLNAPHTHALENE	330 u	330 u
HEXACHLOROCYCLOPENTADIENE	330 u	330 u
2,4,6-TRICHLOROPHENOL	330 u	330 u
2,4,5-TRICHLOROPHENOL	1600 u	1600 u
2-CHLORONAPHTHALENE	330 u	330 u
2-NITROANILINE	1600 u	1600 u
DIMETHYL PHTHALATE	330 u	330 u
ACENAPHTHYLENE	330 u	330 u
3-NITROANILINE	1600 u	1600 u
ACENAPHTHENE	330 u	330 u
2,4-DINITROPHENOL	1600 u	1600 u
4-NITROPHENOL	1600 u	1600 u
DIBENZOFURAN	330 u	330 u
2,4-DINITROTOLUENE	330 u	330 u
2,6-DINITROTOLUENE	330 u	330 u
DIETHYLPHTHALATE	330 u	330 u
4-CHLOROPHENYL-PHENYLETHER	330 u	330 u
FLUORENE	330 u	330 u
4-NITROANILINE	330 u	330 u
4,6-DINITRO-2-METHYLPHENOL	1600 u	1600 u
N-NITROSODIPHENYLAMINE (1)	330 u	330 u
4-BROMOPHENYL-PHENYLETHER	330 u	330 u
HEXACHLOROBENZENE	330 u	330 u
PENTACHLOROPHENOL	1600 u	1600 u
PHENANTHRENE	330 u	330 u
ANTHRACENE	330 u	330 u

6-21

AR302558

AR302558

AMTEX - VISCOSE BASIN SOLID SAMPLES

DI-N-BUTYLPHTHALATE	330	330
FLUORANTHENE	330	330
PYRENE	330	330
BUTYLBENZYLPHTHALATE	330	330
3,3-DICHLOROBENZIDINE	660	660
BENZO(A)ANTHRACENE	330	330
BIS(2-ETHYLHEXYL)PHTHALATE	330	330
CHRYSENE	330	330
DI-N-OCTYL PHTHALATE	330	330
BENZO(B)FLUORANTHENE	330	330
BENZO(K)FLUORANTHENE	330	330
BENZO(A)PYRENE	330	330
INDENO(1,2,3-CD)PYRENE	330	330
DIBENZ(A,H)ANTHRACENE	330	330
BENZO(G,H,I)PERYLENE	330	330

AVTEX - VISCOSE BASIN LIQUID SAMPLES

	VB-1	VB-1 Perun	VB-2	VB-2 Perun	VB-3	VB-3 Perun	VB-7	VB-7 Perun	VB-9	VB-9 Perun	VB-9 Replicate	VB-9 Replicate Perun	VB-11	SP-10	SP-10 Perun
DATE SAMPLE REC.	9/11/87	9/11/87	9/11/87	9/11/87	9/11/87	9/25/87	9/11/87	9/11/87	9/11/87	9/11/87	9/11/87	9/11/87	9/11/87	9/11/87	9/11/87
DATE EXTR./PREP	9/18/87	9/29/87	9/18/87	9/29/87	9/18/87	9/3/87	9/18/87	9/29/87	9/18/87	10/20/87	9/18/87	10/20/87	9/18/87	9/18/87	10/20/87
DATE ANALYZED	9/18/87	9/29/87	9/18/87	9/29/87	9/18/87	9/3/87	9/18/87	9/29/87	9/18/87	10/20/87	9/18/87	10/20/87	9/18/87	9/18/87	10/20/87
CHLOROMETHANE	1000000 u	100 u	1000000 u	100 u	1000000 u	50 u	1000000 u	100 u	1000000 u	100000 u	1000000 u	100000 u	1000000 u	1000000 u	100000 u
BROMOMETHANE	1000000 u	100 u	1000000 u	100 u	1000000 u	50 u	1000000 u	100 u	1000000 u	100000 u	1000000 u	100000 u	1000000 u	1000000 u	100000 u
VINYL CHLORIDE	1000000 u	100 u	1000000 u	100 u	1000000 u	50 u	1000000 u	100 u	1000000 u	100000 u	1000000 u	100000 u	1000000 u	1000000 u	100000 u
CHLOROETHANE	1000000 u	100 u	1000000 u	100 u	1000000 u	50 u	1000000 u	100 u	1000000 u	100000 u	1000000 u	100000 u	1000000 u	1000000 u	100000 u
METHYLENE CHLORIDE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	38000 J	500000 u	500000 u	500000 u	500000 u	29000 J
ACETONE	1000000 u	100 u	1000000 u	100 u	1000000 u	50 u	1000000 u	100 u	1000000 u	340000	1000000 u	250000	1000000 u	1000000 u	240000
CARBON DISULFIDE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	1500	500000 u	710000	500000 u	690000	340000	500000 u	320000
1,1-DICHLOROETHENE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
1,1-DICHLOROETHANE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
TRANS-1,2-DICHLOROETHENE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
CHLOROFORM	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
1,2-DICHLOROETHANE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
2-BUTANONE	1000000 u	100 u	1000000 u	990	1000000 u	50 u	1000000 u	100 u	1000000 u	100000 u	1000000 u	38000 J	1000000 J	1000000 u	100000 u
1,1,1-TRICHLOROETHANE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
CARBON TETRACHLORIDE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
VINYL ACETATE	1000000 u	100 u	1000000 u	100 u	1000000 u	50 u	1000000 u	100 u	1000000 u	100000 u	1000000 u	100000 u	1000000 u	1000000 u	100000 u
BROMODICHLOROMETHANE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
1,2-DICHLOROPROPANE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
TRANS-1,3-DICHLOROPROPENE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
TRICHLOROETHENE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
DIBROMOCHLOROMETHANE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
1,1,2-TRICHLOROETHANE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
BENZENE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
CIS-1,3 DICHLOROPROPENE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
2-CHLOROETHYLVINYLETHER	1000000 u	100 u	1000000 u	100 u	1000000 u	50 u	1000000 u	100 u	1000000 u	100000 u	1000000 u	100000 u	1000000 u	1000000 u	100000 u
BROMOFORM	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
4-METHYL-2-PENTANONE	1000000 u	100 u	1000000 u	100 u	1000000 u	50 u	1000000 u	100 u	1000000 u	100000 u	1000000 u	100000 u	1000000 u	1000000 u	100000 u
2-HEXANONE	1000000 u	100 u	1000000 u	100 u	1000000 u	50 u	1000000 u	100 u	1000000 u	100000 u	1000000 u	100000 u	1000000 u	1000000 u	100000 u
TETRACHLOROETHENE	500000 u	50 u	760000	50 u	500000 u	25 u	1900000	50 u	920000	50000 u	500000 u	50000 u	500000 J	500000 u	50000 u
1,1,2,2-TETRACHLOROETHANE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
TOLUENE	590000 u	20 J	500000 u	18 J	500000 u	25 u	500000 u	50 J	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	19000 J
CHLOROBENZENE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
ETHYLBENZENE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
STYRENE	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u
TOTAL XYLENES	500000 u	50 u	500000 u	50 u	500000 u	25 u	500000 u	50 u	500000 u	50000 u	500000 u	50000 u	500000 u	500000 u	50000 u

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ORIGINAL (Red)

AR302560

AR302560

AVTEX - VISCOSE BASIN LIQUID SAMPLES

	VB-1	VB-2	VB-3	VB-7	VB-9	VB-9 Replicate	VB-11	SP-10
DATE EXTR./PREP	9/17/87	9/17/87	9/17/87	9/17/87	9/17/87	9/17/87	9/17/87	9/17/87
DATE ANALYZED	10/9/87	10/9/87	10/9/87	10/9/87	10/9/87	10/10/87	10/10/87	10/15/87
PHENOL	70 J	100 U	170 U	400	6000	5200	2200	7700
BIS-(2,-CHLOROETHYL)ETHER	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
2-CHLOROPHENOL	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
1,3-DICHLOROBENZENE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
1,4-DICHLOROBENZENE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
BENZYL ALCOHOL	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
1,2-DICHLOROBENZENE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
2-METHYLPHENOL	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
BIS(2-CHLOROISOPROPYL)ETHER	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
4-METHYLPHENOL	1000	100 U	100	500	100	70 J	470	1000 U
N-NITROSO-DI-N-PROPYLAMINE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
HEXACHLOROETHANE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
NITROBENZENE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
ISOPHORONE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
2-NITROPHENOL	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
2,4-DIMETHYLPHENOL	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
BENZOIC ACID	500 U	500 U	500 U	500 U	500 U	500 U	500 U	300 J
BIS(2-CHLOROETHOXY)METHANE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
2,4-DICHLOROPHENOL	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
1,2,4-TRICHLOROBENZENE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
NAPHTHALENE	100 U	100 U	20 J	100 U	100 U	100 U	100 U	1000 U
4-CHLOROANILINE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
HEXACHLOROBUTADIENE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
4-CHLORO-3-METHYLPHENOL	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
2-METHYLNAPHTHALENE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
HEXACHLOROCYCLOPENTADIENE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
2,4,6-TRICHLOROPHENOL	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
2,4,5-TRICHLOROPHENOL	500 U	500 U	500 U	500 U	500 U	500 U	500 U	5000 U
2-CHLORONAPHTHALENE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
2-NITROANILINE	500 U	500 U	500 U	500 U	500 U	500 U	500 U	5000 U
DIMETHYL PHTHALATE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
ACENAPHTHALENE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
3-NITROANILINE	500 U	500 U	500 U	500 U	500 U	500 U	500 U	5000 U
ACENAPHTHENE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
2,4-DINITROPHENOL	500 U	500 U	500 U	500 U	500 U	500 U	500 U	5000 U
4-NITROPHENOL	500 U	500 U	500 U	500 U	500 U	500 U	500 U	5000 U
DIBENZOFURAN	100 U	100 U	100 U	100 U	100	100 U	100 U	1000 U
2,6-DINITROTOLUENE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
2,4-DINITROTOLUENE	100 U	100 U	100 U	100 U	100	100 U	100 U	1000 U
DIETHYLPHTHALATE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	220 J
4-CHLOROPHENYL-PHENYLETHER	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
FLUORENE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
4-NITROANILINE	500 U	500 U	500 U	500 U	500 U	500 U	500 U	5000 U
4,6-DINITRO-2-METHYLPHENOL	500 U	500 U	500 U	500 U	500	500 U	500 U	5000 U
N-NITROSODIPHENYLAMINE(1)	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
4-BROMOPHENYL-PHENYLETHER	100 U	100 U	100 U	100 U	100 U	100 U	100	1000 U
HEXACHLOROBENZENE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U
PENTACHLOROPHENOL	500 U	500 U	500 U	500 U	500 U	500 U	500 U	5000 U
PHENANTHRENE	100 U	100 U	100 U	100 U	100 U	100 U	100	1000 U
ANTHRACENE	100 U	100 U	100 U	100 U	100 U	100 U	100	1000 U

6-24

AR302561

ORIGINAL (red)

ORIGINAL
(Red)

AWTEL - VISCOSE BASIS LIMITS SAMPLES

	WB-1	WB-2	WB-3	WB-7	WB-9	WB-9 Replicate	WB-11	SP-10
BIS-2-BUTYL PHTHALATE								
CYCLOHEXANONE								
PYRENE								
BUTYLBENZYLPHTHALATE								
3,3-DICHLOROBENZIDINE								
BENZO(A)ANTHRACENE								
BIS(2-ETHYLHEXYL)PHTHALATE								
CHRYSENE								
DI-N-OCTYL PHTHALATE								
BENZO(B)FLUORANTHENE								
BENZO(K)FLUORANTHENE								
BENZO(A)PYRENE								
INDENO(1,2,3-CD)PYRENE								
DIBENZ(A,H)ANTHRACENE								
BENZO(G,H,I)PERYLENE								

AR302562

AR302562

ORIGINAL (Red)

Exhibit 6.5

Spotts, Stevens & McCoy
Chemical Testing Results

AR302563

SSM
SPOTTS, STEVENS and McCOY, INC
ENGINEERS • PLANNERS • SCIENTISTS

ORIGINAL (Red)

CERTIFICATE OF ANALYSIS

CLIENT: Geraghty & Miller, Inc.
844 West Street
Annapolis MD 21401

DATE REPORTED: 10/09/87
REPORT NO: 8710479-001
DATE SAMPLED: 08/24/87
DATE RECEIVED: 08/25/87
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Soil

SAMPLED BY: Wesselman

SAMPLE IDENTIFICATION: Soil-Viscose Basin Material
Front Royal Project - M0679FR6
VB-11 Surface

- - - - - - - - - - - - - - - -

II. CHEMICAL ANALYSIS

		AS RECEIVED	DRY BASIS
Total Moisture	%	7.21	
Volatile Matter	%	85.4	92.0
Fixed Carbon	%	5.67	6.15
Ash	%	1.72	1.85
Heating Value	Btu/lb	6720	7240
Sulfur	%	0.18	0.19
Carbon	%	39.1	42.1
Hydrogen (Excluding H in moisture)	%	5.04	5.44
Hydrogen (Including H in moisture)	%	5.85	
Nitrogen	%	0.02	0.02
Chlorine	%	0.01	0.01

AR302564

Form No. L11a Rev. 1/87

REPLY TO:

☐ HOME OFFICE
345 N. Wyomissing Blvd.,
P.O. Box 6307
Reading PA 19610-0307
(215) 376-6581

☐ INDUSTRIAL HYGIENE LABORATORY
345 N. Wyomissing Blvd.,
P.O. Box 6307
Reading PA 19610-0307

☐ CHEMISTRY LABORATORY
30 Noble Street,
P.O. Box 6527,
Reading PA 19611-0527

☐ LEHIGH VALLEY OFFICE
MacArthur Office Plaza Suite 401
3722 Lehigh Street
Whitehall PA 18052-3438

☐ BALTIMORE OFFICE
606 Fairmount Avenue
Suite 105
Towson MD 21204-2819

ORIGINAL (Red)

II. REACTIVITY

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were generated when mixed with water.

E. No Sulfide (<29.0 mg/Kg) or Cyanide (<0.29 mg/Kg) was detected when exposed to pH conditions between 2 and 12.

F. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

III. IGNITABILITY

The sample ignited at Ambient temperature. The sample burned slowly, but was entirely consumed by the flame. The same observations were made when the temperature was increased to 60 Degrees Celsius.

Respectfully submitted,

R. M. LARGE
Program Supervisor
Chemistry Laboratory

PRN

cc: Michele Ruth
Richard Smith

AR302565

SSM
SPOTTS, STEVENS and McCOY, INC
ENGINEERS • PLANNERS • SCIENTISTS

CERTIFICATE OF ANALYSIS

ORIGINAL (Red)

CLIENT: Geraghty & Miller, Inc.
844 West Street
Annapolis MD 21401

DATE REPORTED: 10/09/87
REPORT NO: 8710479-002
DATE SAMPLED: 08/24/87
DATE RECEIVED: 08/25/87
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Soil

SAMPLED BY: Wesselman

SAMPLE IDENTIFICATION: Soil-Viscose Basin Material
Front Royal Project - M0679FR6
VB-11-0-0

- - - - - - - - - - - - - - - -

II. CHEMICAL ANALYSIS

		AS RECEIVED	DRY BASIS
Total Moisture	%	8.00	
Volatile Matter	%	84.0	91.3
Fixed Carbon	%	4.79	5.21
Ash	%	3.21	3.49
Heating Value	Btu/lb	6580	7150
Sulfur	%	0.13	0.14
Carbon	%	39.1	42.5
Hydrogen (Excluding H in moisture)	%	5.28	5.74
Hydrogen (Including H in moisture)	%	6.17	
Nitrogen	%	< 0.01	< 0.01
Chlorine	%	0.01	0.01

AR302566

AR302566

Form No. L11a Rev. 1/87

6-29

REPLY TO:

☐ HOME OFFICE
345 N. Wyomissing Blvd.
P.O. Box 6307
Reading PA 19610-0307
(215) 376-6591

☐ INDUSTRIAL HYGIENE LABORATORY
345 N. Wyomissing Blvd.
P.O. Box 6307
Reading PA 19610-0307
(215) 376-6591

☐ CHEMISTRY LABORATORY
30 Noble Street
P.O. Box 6527,
Reading PA 19611-0527

☐ LEHIGH VALLEY OFFICE
MacArthur Office Plaza Suite 401
3722 Lehigh Street
Whitehall PA 18052-3439
(215) 433-4188

☐ BALTIMORE OFFICE
606 Fairmount Avenue
Suite 105
Towson MD 21204-2619
(301) 494-0500

ORIGINAL (Red)

II. REACTIVITY

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were generated when mixed with water.

E. No Sulfide (<27.8 mg/Kg) or Cyanide (<0.28 mg/Kg) was detected when exposed to pH conditions between 2 and 12.

F. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

III. IGNITABILITY

The sample ignited at Ambient temperature. The sample burned slowly, but was entirely consumed by the flame. The same observations were made when the temperatures was increased to 60 Degrees Celsius.

Respectfully submitted,

R.M. LARGE
Program Supervisor

PRN

cc: Michele Ruth
Richard Smith

AR302567

SSM
SPOTTS, STEVENS and McCOY, INC
ENGINEERS • PLANNERS • SCIENTISTS

ORIGINAL (Red)

CERTIFICATE OF ANALYSIS

CLIENT: Geraghty & Miller, Inc.
844 West Street
Annapolis MD 21401

DATE REPORTED: 10/09/87
REPORT NO: 8710479-003
DATE SAMPLED: 08/24/87
DATE RECEIVED: 08/25/87
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Soil

SAMPLED BY: Wesselman

SAMPLE IDENTIFICATION: Soil-Viscose Basin Material
Front Royal Project - M0679FR6
VB-11-0-1

- - - - - - - - - - - - - - - -

II. CHEMICAL ANALYSIS

		AS RECEIVED	DRY BASIS
Total Moisture	%	88.6	
Volatile Matter	%	9.21	80.6
Fixed Carbon	%	1.35	11.8
Ash	%	0.84	7.36
Heating Value	Btu/lb	770	6740
Sulfur	%	0.09	0.79
Carbon	%	4.64	40.6
Hydrogen (Excluding H in moisture)	%	0.58	5.12
Hydrogen (Including H in moisture)	%	10.5	
Nitrogen	%	< 0.01	< 0.01
Chlorine	%	< 0.01	0.02

AR302568

Form No. L11a Rev. 1/87

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(301) 494-0500

II. REACTIVITY

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were generated when mixed with water.

E. No Sulfide (<26.8 mg/Kg) or Cyanide (<0.27 mg/Kg) was detected when exposed to pH conditions between 2 and 12.

F. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

III. IGNITABILITY

The sample does not exhibit the characteristic of ignitability as described in Section 2.1.1 of EPA SW-846.

Respectfully submitted,

R. M. LARGE
Program Supervisor
Chemistry Laboratory

PRN

cc: Michele Ruth
Richard Smith

AR302569

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CERTIFICATE OF ANALYSIS

ORIGINAL (Red)

CLIENT: Geraghty & Miller, Inc.
844 West Street
Annapolis MD 21401

DATE REPORTED: 10/09/87
REPORT NO: 8710479-004
DATE SAMPLED: 08/24/87
DATE RECEIVED: 08/25/87
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Soil

SAMPLED BY: Wesselman

SAMPLE IDENTIFICATION: Soil-Viscose Basin Material
Front Royal Project - M0679FR6
VB-11-1-2

- - - - - - - - - - - - - - - -

II. CHEMICAL ANALYSIS

		AS RECEIVED	DRY BASIS
Total Moisture	%	83.3	
Volatile Matter	%	13.7	81.8
Fixed Carbon	%	2.38	14.2
Ash	%	0.62	3.70
Heating Value	Btu/lb	1160	6930
Sulfur	%	0.05	0.30
Carbon	%	7.00	41.8
Hydrogen (Excluding H in moisture)	%	0.86	5.14
Hydrogen (Including H in moisture)	%	10.2	
Nitrogen	%	< 0.01	0.01
Chlorine	%	< 0.01	< 0.01

AR302570

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Suite 105
Towson MD 21204-2819
(301) 494-0600

ORIGINAL
(Red)

II. REACTIVITY

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were generated when mixed with water.

E. No Sulfide (<21.9 mg/Kg) or Cyanide (<0.22 mg/Kg) was detected when exposed to pH conditions between 2 and 12.

F. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

III. IGNITABILITY

The sample does not exhibit the characteristic of ignitability as described in Section 2.1.1 of EPA SW-846.

Respectfully submitted,

R. M. LARGE
Program Supervisor
Chemistry Laboratory

PRN

cc: Michele Ruth
Richard Smith

AR302571

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CERTIFICATE OF ANALYSIS

ORIGINAL (Red)

CLIENT: Geraghty & Miller, Inc.
844 West Street
Annapolis MD 21401

DATE REPORTED: 10/09/87
REPORT NO: 8710479-005
DATE SAMPLED: 08/24/87
DATE RECEIVED: 08/25/87
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Soil

SAMPLED BY: Wesselman

SAMPLE IDENTIFICATION: Soil-Viscose Basin Material
Front Royal Project - M0679FR6
VB-11-2-3

- - - - - - - - - - - - - - - -

II. CHEMICAL ANALYSIS

		AS RECEIVED	DRY BASIS
Total Moisture	%	83.4	
Volatile Matter	%	11.4	6.86
Fixed Carbon	%	1.67	10.1
Ash	%	3.53	21.2
Heating Value	Btu/lb	870	5240
Sulfur	%	0.51	3.07
Carbon	%	5.20	31.3
Hydrogen (Excluding H in moisture)	%	0.56	3.37
Hydrogen (Including H in moisture)	%	9.89	
Nitrogen	%	< 0.01	< 0.01
Chlorine	%	0.01	0.06

AR302572

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(301) 494-0500

ORIGINAL (red)

II. REACTIVITY

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were generated when mixed with water.

E. No Sulfide (<22.9 mg/Kg) or Cyanide (<0.23 mg/Kg) was detected when exposed to pH conditions between 2 and 12.

F. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

III. IGNITABILITY

The sample does not exhibit the characteristic of ignitability as described in Section 2.1.1 of EPA SW-846.

Respectfully submitted,

R. M. LARGE
Program Supervisor
Chemistry Laboratory

PRN

cc: Michele Ruth
Richard Smith

AR302573

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ORIGINAL (Red)

CERTIFICATE OF ANALYSIS

CLIENT: Geraghty & Miller, Inc.
844 West Street
Annapolis MD 21401

DATE REPORTED: 10/09/87
REPORT NO: 8710479-006
DATE SAMPLED: 08/24/87
DATE RECEIVED: 08/25/87
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Soil

SAMPLED BY: Wesselman

SAMPLE IDENTIFICATION: Soil-Viscose Basin Material
Front Royal Project - M0679FR6
VB-11-3-4

- - - - - - - - - - - - - - - -

II. CHEMICAL ANALYSIS

		AS RECEIVED	DRY BASIS
Total Moisture	%	83.8	
Volatile Matter	%	11.5	70.9
Fixed Carbon	%	1.12	6.91
Ash	%	3.58	22.1
Heating Value	Btu/lb	860	5310
Sulfur	%	0.50	3.08
Carbon	%	5.38	33.2
Hydrogen (Excluding H in moisture)	%	0.43	2.64
Hydrogen (Including H in moisture)	%	9.80	
Nitrogen	%	< 0.01	< 0.01
Chlorine	%	0.01	0.06

AR302574

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ORIGINAL
(Red)

II. REACTIVITY

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were generated when mixed with water.

E. No Sulfide (<24.8 mg/Kg) or Cyanide (<0.25 mg/Kg) was detected when exposed to pH conditions between 2 and 12.

F. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

III. IGNITABILITY

The sample does not exhibit the characteristic of ignitability as described in Section 2.1.1 of EPA SW-846.

Respectfully submitted,

R. M. LARGE
Program Supervisor
Chemistry Laboratory

PRN

cc: Michele Ruth
Richard Smith

AR302575

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(Red)
SEP 28 1987

CERTIFICATE OF ANALYSIS

CLIENT: Geraghty & Miller, Inc.
844 West Street
Annapolis MD 21401

DATE REPORTED: 9/23/87
REPORT NO: 8710429-001
DATE SAMPLED: 8/21/87
DATE RECEIVED:
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Soil

SAMPLED BY: Client

SAMPLE IDENTIFICATION: Soil Sample -
Viscose Basin Sub Surface Waste
VB 10 - 18 - 20

		AS RECEIVED	DRY BASIS
Total Moisture	%	71.8	
Volatile Moisture	%	17.6	62.3
Ash	%	8.20	29.0
Heating Value	Btu/lb	1260	4460
Sulfur	%	0.95	3.36
Carbon	%	7.54	26.7
Hydrogen (Excluding H in moisture)	%	0.89	3.16
Hydrogen (Including H in moisture)	%	8.92	
Nitrogen	%	0.02	0.09
Chlorine	%	0.03	0.03
Oxygen (Excluding O in moisture)	%	10.6	37.6
Oxygen (Including O in moisture)	%	74.3	

Respectfully submitted,

JOHN M. MEHOLICK, Chemist
Chemistry Laboratory

PRN
cc: Michele Ruth
Richard Smith

6-39

AR302576

Form No. L11a Rev. 1/87

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CERTIFICATE OF ANALYSIS

CLIENT: Geraghty & Miller, Inc.
844 West Street
Annapolis MD 21401

DATE REPORTED: 9/23/87
REPORT NO: 8710429-001
DATE SAMPLED: 8/21/87
DATE RECEIVED:
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Soil

SAMPLED BY: Client

SAMPLE IDENTIFICATION: Soil Sample -
Viscose Basin Sub Surface Waste
VB 10 - 18 - 20

REACTIVITY

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were forced when mixed with water.

D. No toxic gases, vapors or fumes were generated when mixed with water.

E. No Sulfide (<24.0 mg/Kg) or Cyanide (<0.25 mg/Kg) was detected when exposed to pH conditions between 2 and 12.

F. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

The sample does not exhibit the characteristic of reactivity as described in Section 2.1.3 of EPA SW-846.

IGNITABILITY

The sample did not exhibit any signs of combustibility at Ambient or 60°C.

Respectfully submitted,

JOHN M. MEHOLICK, Chemist
Chemistry Laboratory

AR302577

PRN

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SEP 28 1987

CERTIFICATE OF ANALYSIS

ORIGINAL (Red)

CLIENT: Geraghty & Miller, Inc.
844 West Street
Annapolis MD 21401

DATE REPORTED: 9/24/87
REPORT NO: 8710394-001
DATE SAMPLED: 8/19/87
DATE RECEIVED: 8/20/87
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Soils

SAMPLED BY: Wesselman

SAMPLE IDENTIFICATION: Soil - Project M0679FR6
Front Royal-Viscose Basin
Samples
VB-10 - Surface

I. CHEMICAL ANALYSIS

		AS RECEIVED	DRY BASIS
Total Moisture	%	18.0	
Volatile Matter	%	67.3	82.0
Fixed Carbon	%	7.09	8.72
Ash	%	7.61	9.28
Heating Value	Btu/lb	5720	6970
Sulfur	%	0.23	0.28
Carbon	%	32.4	39.5
Hydrogen (Excluding H in moisture)	%	4.35	5.30
Hydrogen (Including H in moisture)	%	6.36	
Nitrogen	%	0.07	0.08
Chlorine	%	0.01	0.01

II. IGNITABILITY

The sample does not exhibit the characteristic of ignitability as described in Section 2.1.1 of EPA SW-846.

AR302578

AR302578

Form No. L11a Rev. 1/87

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3722 Lehigh Street
Whitehall PA 18052-3439

☐ BALTIMORE OFFICE
606 Fairmount Avenue
Suite 105
Towson MD 21204-2619

III. REACTIVITY

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were generated when mixed with water.

E. No Sulfide (<23.6 mg/Kg) or Cyanide (<0.25 mg/Kg) was detected when exposed to pH conditions between 2 and 12.

F. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

The sample does not exhibit the characteristic of reactivity as described in Section 2.1.3 of EPA SW-846.

Respectfully submitted,

R. M. LARGE, Program Supervisor
Chemistry Laboratory

PRN

cc: Michele Ruth
Richard Smith

AR302579

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ORIGINAL (Red)

CERTIFICATE OF ANALYSIS

CLIENT: Geraghty & Miller, Inc.
844 West Street
Annapolis MD 21401

DATE REPORTED: 9/24/87
REPORT NO: 8710394-002
DATE SAMPLED: 8/19/87
DATE RECEIVED: 8/20/87
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Soils

SAMPLED BY: Wesselman

SAMPLE IDENTIFICATION: Soil - Project M0679FR6
Front Royal-Viscose Basin
Samples
VB-10 - 2-0'- 8-0'

- - - - - - - - - - - - - - -

I. CHEMICAL ANALYSIS

		AS RECEIVED	DRY BASIS
Total Moisture	%	87.7	
Volatile Matter	%	8.55	69.4
Fixed Carbon	%	0.39	3.30
Ash	%	3.36	27.3
Heating Value	Btu/lb	660	5360
Sulfur	%	0.38	3.09
Carbon	%	3.70	30.1
Hydrogen (Excluding H in moisture)	%	0.44	3.56
Hydrogen (Including H in moisture)	%	10.2	
Nitrogen	%	0.01	0.10
Chlorine	%	0.01	0.04

II. IGNITABILITY

The sample does not exhibit the characteristic of ignitability as described in Section 2.1.1 of EPA SW-846.

AR302580

AR302580

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(215) 433-4188

☐ BALTIMORE OFFICE
606 Fairmount Avenue
Suite 105
Towson MD 21204-2619
(301) 494-0500

ORIGINAL (Red)

III. REACTIVITY

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were generated when mixed with water.

E. No Sulfide (< 24.3 mg/Kg) or Cyanide (<0.25 mg/Kg) was detected when exposed to pH conditions between 2 and 12.

F. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

The sample does not exhibit the characteristic of reactivity as described in Section 2.1.3 of EPA SW-846.

Respectfully submitted,

R. M. LARGE, Program Supervisor
Chemistry Laboratory

PRN

cc: Michele Ruth
Richard Smith

AR302581

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CERTIFICATE OF ANALYSIS

ORIGINAL

CLIENT: Geraghty & Miller, Inc.
844 West Street
Annapolis, MD 21401

DATE REPORTED: 9/17/87
REPORT NO: 8710265-001
DATE SAMPLED: 8/13/87
DATE RECEIVED: 8/17/87
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Soil

SAMPLED BY: K. Wesselman

SAMPLE IDENTIFICATION: VBI-2-6
Front Royal Project MO679FR6

- - - - - - - - - - -

I. CHEMICAL ANALYSIS OF MILLABLE FRACTION*

		AS RECEIVED	DRY BASIS
Total Moisture	%	41.4	
Volatile Matter	%	14.9	25.4
Fixed Carbon	%	2.20	3.80
Ash	%	41.5	70.8
Heating Value	Btu/lb	1240	2120
Sulfur	% S	2.00	3.41
Carbon	% C	6.67	11.4
Hydrogen (Excluding H in moisture)	% H	0.65	1.10
Hydrogen (Including H in moisture)	% H	5.28	
Nitrogen	% N	0.10	0.17
Chlorine	% Cl	<0.01	<0.01

II. IGNITABILITY

The sample does not exhibit the characteristic of ignitability as described in Section 2.1.1 of EPA SW-846.

* NOTE:
Analysis performed on millable portion only. Approximately 38% of the sample consisted of dense hard plastic-like circular plugs which could not be blended into the analysis sample. This material was removed before analysis as per instructions from Richard Smith 8/25/87.

AR302582

REPLY TO:

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Whitehall PA 18052-3439

☐ BALTIMORE OFFICE
606 Fairmount Avenue
Suite 105
Towson MD 21204-2819

ORIGINAL
(Red)

III. REACTIVITY

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were generated when mixed with water.

E. No Sulfide (<44.3 mg/kg) or Cuanide (<0.50 mg/kg) was detected when exposed to pH conditions between 2 and 12.

F. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

The sample does not exhibit the characteristic of reactivity as described in Section 2.1.3 of EPA SW-846.

Respectfully submitted,

R. M. Large - Program Supervisor
Chemistry Laboratory

OMD
cc: Michele Ruth
Richard Smith

AR302583

AR302583

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CERTIFICATE OF ANALYSIS

ORIGINAL
(Red)

CLIENT: Geraghty & Miller, Inc.
844 West Street
Annapolis, MD 21401

DATE REPORTED: 9/17/87
REPORT NO: 8710221-003
DATE SAMPLED: Unknown
DATE RECEIVED: 8/13/87
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Solid Waste

SAMPLED BY: Wesselman/Barrientes

SAMPLE IDENTIFICATION: VB2-17-22
Porject MO679FR6

- - - - - - - - - - -

I. CHEMICAL ANALYSIS OF MILLABLE FRACTION*

		AS RECEIVED	DRY BASIS
Total Moisture	%	64.0	
Volatile Matter	%	14.6	40.6
Fixed Carbon	%	<0.01	<0.01
Ash	%	27.2	75.7
Heating Value	Btu/lb	610	1700
Sulfur	% S	0.15	0.42
Carbon	% C	2.06	5.72
Hydrogen (Excluding H in moisture)	% H	0.22	0.60
Hydrogen (Including H in moisture)	% H	7.38	
Nitrogen	% N	0.04	0.10
Chlorine	% Cl	<0.01	<0.01

II. IGNITABILITY

The sample does not exhibit the characteristic of ignitability as described in Section 2.1.1 of EPA SW-846.

* NOTE:

Analysis performed on millable portion only. Approximately 15.6% of the sample consisted of dense hard plastic-like circular plugs which could not be blended into the analysis sample. This material was removed before analysis as per instructions from Richard Smith 8/25/87.

AR302584

REPLY TO:

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Whitehall PA 18052-3439

☐ BALTIMORE OFFICE
606 Fairmount Avenue
Suite 105
Towson MD 21204-2619

ORIGINAL
(Red)

III. REACTIVITY

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were generated when mixed with water.

E. No Sulfide (<24.4 mg/kg) or Cyanide (<0.25 mg/kg) was detected when exposed to pH conditions between 2 and 12.

F. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

The sample does not exhibit the characteristic of reactivity as described in Section 2.1.3 of EPA SW-846.

Respectfully submitted,

R. M. Large - Program Supervisor
Chemistry Laboratory

OMD
cc: Michele Ruth
Richard Smith

AR302585

AR302585

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CERTIFICATE OF ANALYSIS

ORIGINAL

CLIENT: Geraghty & Miller, Inc.
844 West Street
Annapolis, MD 21401

DATE REPORTED: 9/17/87
REPORT NO: 8710221-001
DATE SAMPLED: Unknown
DATE RECEIVED: 8/13/87
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Solid Waste

SAMPLED BY: Wesselman/Barrientes

SAMPLE IDENTIFICATION: VB3-4-7
Project M0679FR6

- - - - - - - - - - -

I. CHEMICAL ANALYSIS

		AS RECEIVED	DRY BASIS
Total Moisture	%	41.3	
Volatile Matter	%	5.49	9.36
Fixed Carbon	%	<0.01	<0.01
Ash	%	54.9	93.6
Heating Value	Btu/lb	140	240
Sulfur	% S	0.22	0.37
Carbon	% C	0.69	1.18
Hydrogen (Excluding H in moisture)	% H	<0.01	<0.01
Hydrogen (Including H in moisture)	% H	4.62	
Nitrogen	% N	0.02	0.04
Chlorine	% Cl	0.02	0.03

II. IGNITABILITY

The sample does not exhibit the characteristic of ignitability as described in Section 2.1.1 of EPA SW-846.

AR302586

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(301) 494-0500

ORIGINAL
(Red)

III. REACTIVITY

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were generated when mixed with water.

E. No Sulfide (<24.2 mg/kg) or Cuanide (<0.25 mg/kg) was detected when exposed to pH conditions between 2 and 12.

F. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

The sample does not exhibit the characteristic of reactivity as described in Section 2.1.3 of EPA SW-846.

Respectfully submitted,

R. M. Large - Program Supervisor
Chemistry Laboratory

OMD
cc: Michele Ruth
Richard Smith

AR302587

AR302587

SSM
SPOTTS, STEVENS and McCOY, INC
ENGINEERS • PLANNERS • SCIENTISTS

CERTIFICATE OF ANALYSIS

ORIGINAL (Red)

CLIENT: Geraghty & Miller, Inc.
844 West Street
Annapolis, MD 21401

DATE REPORTED: 9/17/87
REPORT NO: 8710221-002
DATE SAMPLED: Unknown
DATE RECEIVED: 8/13/87
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Solid Waste

SAMPLED BY: Wesselman/Barrientes

SAMPLE IDENTIFICATION: VB2-5-7
Project MO679FR6

- - - - - - - - - - -

I. CHEMICAL ANALYSIS

		AS RECEIVED	DRY BASIS
Total Moisture	%	13.2	
Volatile Matter	%	2.37	2.73
Fixed Carbon	%	<0.01	<0.01
Ash	%	85.2	98.1
Heating Value	Btu/lb	<50	<50
Sulfur	% S	0.26	0.30
Carbon	% C	<0.01	<0.01
Hydrogen (Excluding H in moisture)	% H	0.01	0.01
Hydrogen (Including H in moisture	% H	1.48	
Nitrogen	% N	0.02	0.02
Chlorine	% Cl	<0.01	<0.01

II. IGNITABILITY

The sample does not exhibit the characteristic of ignitability as described in Section 2.2.1 of EPA SW-846.

AR302588

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(215) 433-4186

☐ BALTIMORE OFFICE
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Suite 105
Towson MD 21204-3819
(301) 494-0500

ORIGINAL (Red)

III. REACTIVITY

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were generated when mixed with water.

E. No Sulfide (<24.2 mg/kg) or Cyanide (<0.25 mg/kg) was detected when exposed to pH conditions between 2 and 12.

F. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

The sample does not exhibit the characteristic of reactivity as described in Section 2.1.3 of EPA SW-846.

Respectfully submitted,

R. M. Large - Program Supervisor
Chemistry Laboratory

OMD
cc: Michele Ruth ✓
Richard Smith

AR302589

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CERTIFICATE OF ANALYSIS

ORIGINAL (Red)

CLIENT: Geraghty & Miller
844 West Street
Annapolis MD 21401

DATE REPORTED: 10/13/87
REPORT NO: 8710541-001
DATE SAMPLED: 08/26/87
DATE RECEIVED: 08/27/87
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Solid Waste

SAMPLED BY: Wesselman

SAMPLE IDENTIFICATION: Solid Waste - Front Royal Project
Project M0679FR6
Sample VB - 9 Surface

- - - - - - - - - - - - - - - -

I. CHEMICAL ANALYSIS

		AS RECEIVED	DRY BASIS
Total Moisture	%	27.9	
Volatile Matter*	%	58.6	81.3
Fixed Carbon	%	9.15	12.7
Ash	%	4.35	6.04
Heating Value	Btu/lb	5000	6940
Sulfur	%	0.16	0.22
Carbon	%	29.4	40.8
Hydrogen (Excluding H in moisture)	%	3.90	5.41
Hydrogen (Including H in moisture)	%	7.03	
Nitrogen	%	< 0.01	< 0.01
Chlorine	%	0.02	0.02

* 12 Minute Volatile

AR302590

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Towson MD 21204-3819

ORIGINAL
(Red)

II. REACTIVITY

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were generated when mixed with water.

E. No Sulfide (<24.3 mg/Kg) or Cyanide (<0.25 mg/Kg) was detected when exposed to pH conditions between 2 and 12.

F. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

III. IGNITABILITY

The sample does not exhibit the characteristic of reactivity as described in Section 2.1.3 of EPA SW-846.

Respectfully submitted,

R. M. Large/jkk

R. M. LARGE
Program Supervisor
Chemistry Laboratory

PRN

cc: Michele Ruth
Richard Smith

AR302591

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SPOTTS, STEVENS and McCOY, INC
ENGINEERS • PLANNERS • SCIENTISTS

ORIGINAL (Red)

CERTIFICATE OF ANALYSIS

CLIENT: Geraghty & Miller
844 West Street
Annapolis MD 21401

DATE REPORTED: 10/13/87
REPORT NO: 8710541-002
DATE SAMPLED: 08/26/87
DATE RECEIVED: 08/27/87
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Solid Waste

SAMPLED BY: Wesselman

SAMPLE IDENTIFICATION: Solid Waste - Front Royal Project
Project M0679FR6
Sample VB - 9 - 0 - 2

- - - - - - - - - - - - - - - -

I. CHEMICAL ANALYSIS

		AS RECEIVED	DRY BASIS
Total Moisture	%	90.2	
Volatile Matter	%	8.05	81.7
Fixed Carbon	%	1.03	13.2
Ash	%	0.45	4.57
Heating Value	Btu/lb	680	6900
Sulfur	%	0.05	0.51
Carbon	%	4.06	41.2
Hydrogen (Excluding H in moisture)	%	0.55	5.27
Hydrogen (Including H in moisture)	%	10.6	
Nitrogen	%	< 0.01	0.01
Chlorine	%	< 0.01	0.03

AR302592

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MacArthur Office Plaza Suite 401
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Whitehall PA 18052-3438

☐ BALTIMORE OFFICE
606 Fairmount Avenue
Suite 105

II. REACTIVITY

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were generated when mixed with water.

E. No Sulfide (<20.1 mg/Kg) or Cyanide (<0.20 mg/Kg) was detected when exposed to pH conditions between 2 and 12.

F. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

III. IGNITABILITY

The sample does not exhibit the characteristic of reactivity as described in Section 2.1.3 of EPA SW-846.

Respectfully submitted,

R. M. LARGE
Program Supervisor
Chemistry Laboratory

PRN

cc: Michele Ruth
Richard Smith

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ORIGINAL

CERTIFICATE OF ANALYSIS

CLIENT: Geraghty & Miller
844 West Street
Annapolis MD 21401

DATE REPORTED: 10/13/87
REPORT NO: 8710541-003
DATE SAMPLED: 08/26/87
DATE RECEIVED: 08/27/87
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Solid Waste

SAMPLED BY: Wesselman

SAMPLE IDENTIFICATION: Solid Waste - Front Royal Project
Project M0679FR6
Sample VB - 9 - 2 - 4

- - - - - - - - - - - - - - - -

I. CHEMICAL ANALYSIS

		AS RECEIVED	DRY BASIS
Total Moisture	%	84.8	
Volatile Matter	%	11.7	77.1
Fixed Carbon	%	1.51	9.95
Ash	%	1.99	13.1
Heating Value	Btu/lb	1060	6980
Sulfur	%	0.29	1.91
Carbon	%	6.97	45.9
Hydrogen (Excluding H in moisture)	%	0.50	3.28
Hydrogen (Including H in moisture)	%	9.99	
Nitrogen	%	0.01	0.04
Chlorine	%	0.01	0.06

AR302594

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Towson MD 21204-2619
(301) 494-0500

ORIGINAL (Red)

II. REACTIVITY

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were generated when mixed with water.

E. No Sulfide (<24.0 mg/Kg) or Cyanide (<0.25 mg/Kg) was detected when exposed to pH conditions between 2 and 12.

F. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

III. IGNITABILITY

The sample does not exhibit the characteristic of reactivity as described in Section 2.1.3 of EPA SW-846.

Respectfully submitted,

R. M. Large

R. M. LARGE
Program Supervisor
Chemistry Laboratory

PRN

cc: Michele Ruth
Richard Smith

AR302595

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SPOTTS, STEVENS and McCOY, INC
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CERTIFICATE OF ANALYSIS

ORIGINAL

CLIENT: Geraghty & Miller
844 West Street
Annapolis MD 21401

DATE REPORTED: 10/13/87
REPORT NO: 8710566-001
DATE SAMPLED: 08/27/87
DATE RECEIVED: 08/28/87
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Solid Waste

SAMPLED BY: Wesselman

SAMPLE IDENTIFICATION: Solid Waste - Front Royal Project
Project M0679FR6
Sample VB - 9 - 16 - 18

- - - - - - - - - - - - - - - -

I. CHEMICAL ANALYSIS

		AS RECEIVED	DRY BASIS
Total Moisture	%	79.0	
Volatile Matter	%	15.0	71.4
Fixed Carbon	%	1.02	4.85
Ash	%	4.98	23.7
Heating Value	Btu/lb	1170	5570
Sulfur	%	0.78	3.71
Carbon	%	8.22	39.1
Hydrogen (Excluding H in moisture)	%	0.25	1.18
Hydrogen (Including H in moisture)	%	9.09	
Nitrogen	%	0.05	0.21
Chlorine	%	< 0.01	< 0.01

AR302596

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(301) 494-0500

II. REACTIVITY

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were generated when mixed with water.

E. No Sulfide (147 mg/Kg) or Cyanide (<0.25 mg/Kg) was detected when exposed to pH conditions between 2 and 12.

F. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

III. IGNITABILITY

The sample does not exhibit the characteristic of reactivity as described in Section 2.1.3 of EPA SW-846.

Respectfully submitted,

R. M. LARGE
Program Supervisor
Chemistry Laboratory

PRN

cc: Michele Ruth
Richard Smith

AR302597

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CERTIFICATE OF ANALYSIS

ORIGINAL (Red)

CLIENT: Geraghty & Miller
844 West Street
Annapolis MD 21401

DATE REPORTED: 10/13/87
REPORT NO: 8710747-001
DATE SAMPLED: 09/01/87
DATE RECEIVED: 09/03/87
PURCHASE NO.:
ORDER NO.:

SAMPLE TYPE: Solid Waste

SAMPLED BY: Wesselman

SAMPLE IDENTIFICATION: Solid Waste - Front Royal Project
Project M0679FR6
Sample VB - 7 - 14 - 15

- - - - - - - - - - - - - - -

I. CHEMICAL ANALYSIS

		AS RECEIVED	DRY BASIS
Total Moisture	%	71.8	
Volatile Matter*	%	16.0	56.7
Fixed Carbon	%	1.80	6.38
Ash	%	10.4	36.9
Heating Value	Btu/lb	1660	5880
Sulfur	%	1.20	4.25
Carbon	%	8.61	30.5
Hydrogen (Excluding H in moisture)	%	0.99	3.50
Hydrogen (Including H in moisture)	%	9.02	
Nitrogen	%	0.04	0.13
Chlorine	%	0.02	0.08

* 12 Minute Volatile

AR302598

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ORIGINAL
(Red)

II. REACTIVITY

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were generated when mixed with water.

E. Sulfide (65.7 mg/Kg $S^{=}$) was detected when exposed to pH conditions between 2 and 12.

F. No Cyanide (<0.25 mg/Kg CN) was detected when exposed to pH conditions between 2 and 12.

G. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

III. IGNITABILITY

The sample does not exhibit the characteristic of reactivity as described in Section 2.1.3 of EPA SW-846.

Respectfully submitted,

E. M. Large/JKK

R. M. LARGE
Program Supervisor
Chemistry Laboratory

PRN

cc: Michele Ruth
Richard Smith

AR302599

ORIGINAL (Red)

Exhibit 6.6

Geotechnical Testing Results

GERAGHTY & MILLER, INC

ORIGINAL (Red)

AVTEX FIBERS, INC. - LABORATORY TESTS

	SPECIFIC GRAVITY	WET UNIT WEIGHT (PCF)	NATURAL MOISTURE CONTENT (%)	GRAIN-SIZE DISTRIBUTION	ATTERBERG LIMITS LIQUID LIMIT	PLASTICITY INDEX	SHRINKAGE (R)	SHRINKAGE (S)	UNCONFINED COMPRESSIVE STRENGTH (PSF)	ONE DIMENSIONAL CONSOLIDATION TEST
2VB-1-1-4 SILT, SOME FIBEROUS MATERIAL AND FINE TO MEDIUM SAND	2.32	82.1	67.6	NT(1)	54	17	1.86	15.51	1178	SEE GRAPH
2VB-1-10-12 LIGHT GRAY AND YELLOW BROWN CLAY WITH TRACE SAND AND FIBERS	2.69	121.5	27.8	C.SAND=0.0% M.SAND=0.5% F.SAND=4.6% %P#200=94.9%	46	25	1.87	14.99	1842	SEE GRAPH
VB-7-15-17 BLACK RUBBERY MATERIAL	1.80	79.1	455.4	NT(3)	NT(3)	NT(3)	NT(3)	NT(3)	372	NT(2)
VB2-2-4 SANDY CLAY WITH BLACK RUBBER MATERIAL	NT	63.5	508.4	NT(1)	NT(1)	NT(1)	NT(3)	NT(3)	557	SEE GRAPH
VB3-2-4 S-1 SILTY CLAY, LITTLE FINE TO MEDIUM SAND	2.70	118.1	25.7	F.GRAVEL=0.7% C.SAND=1.0% M.SAND=3.0% F.SAND=11.7% %P#200=83.6%	22	5	1.82	14.34	125	SEE GRAPH
VB3-2-4 S-2 BLACK RUBBER MATERIAL MIXED WITH GRAY BROWN SILTY CLAY	2.70	113.3	29.8	C.SAND=2.7% M.SAND=3.1% F.SAND=10.9% %P#200=83.3%	NT(1)	NT(1)	NT(3)	NT(3)	NT(2)	SEE GRAPH

1. Test was attempted but failed because of the material (material was rubbery and would not mix with water).

2. Proper test sample could not be obtained (rubbery of fibrous material could not be cut or would not hold its shape).

3. Test was not performed because material was evaluated to be similar to material that failed because of reason 1.

AR302601

ORIGINAL
(Red)

GERAGHTY & MILLER, INC

AVTEX FIBERS, INC. - LABORATORY TESTS

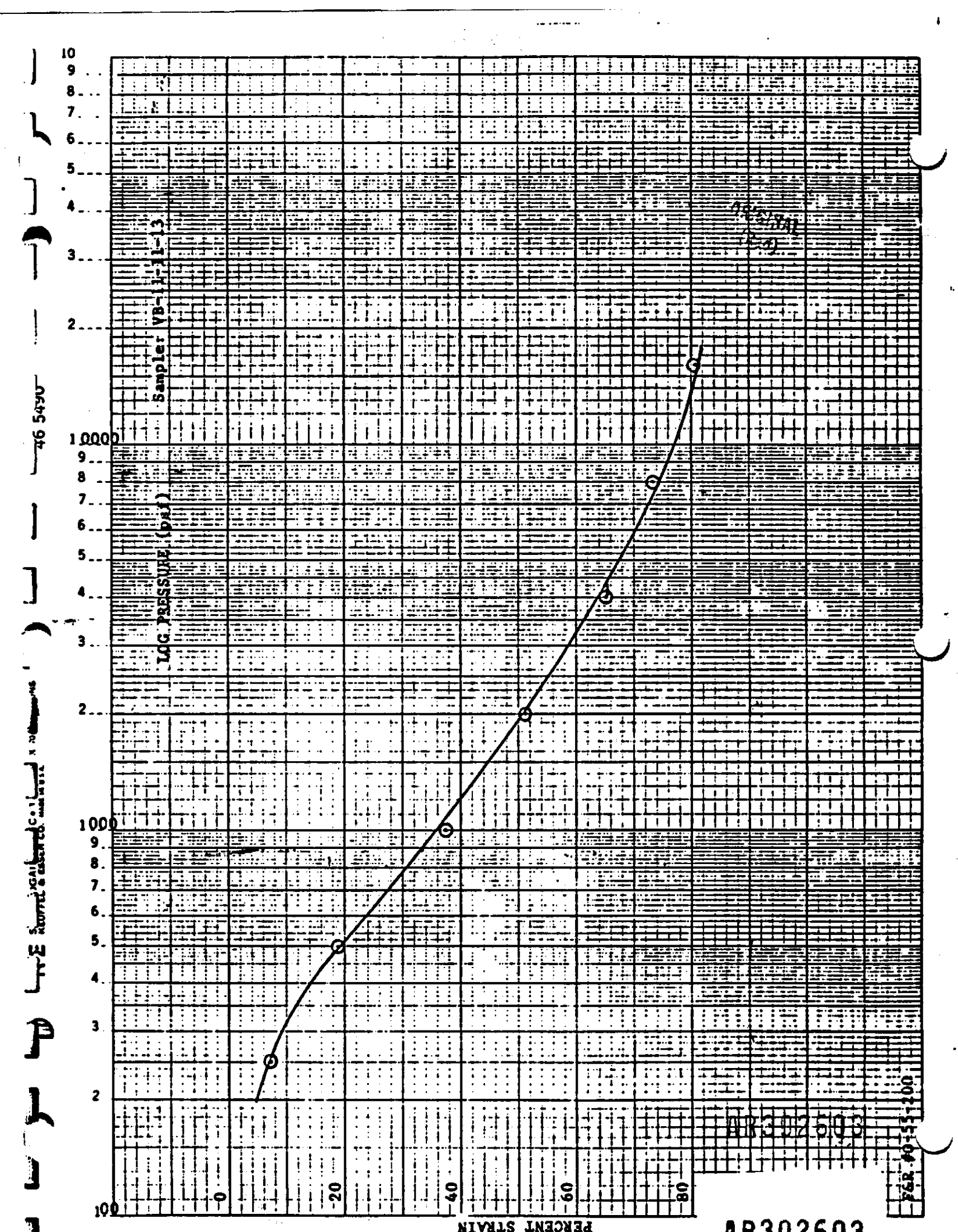
	SPECIFIC GRAVITY	WET UNIT WEIGHT (PCF)	NATURAL MOISTURE CONTENT (%)	GRAIN-SIZE DISTRIBUTION	ATTERBERG LIMITS LIQUID LIMIT	PLASTICITY INDEX	SHRINKAGE (R)	SHRINKAGE (S)	UNCONFINED COMPRESSIVE STRENGTH (PSF)	ONE DIMENSIONAL CONSOLIDATION TEST
VB10-0-2 BLACK AND GRAY RUBBERY MATERIAL	1.53	63.0	971.3	NT(3)	NT(3)	NT(3)	NT(3)	NT(3)	69	SEE GRAPH
VB10-12-14 GRAY AND WHITE RUBBERY MATERIAL, GREEN RUBBERY MATERIAL	1.62	59.9	351.4	NT(3)	NT(3)	NT(3)	NT(3)	NT(3)	8051	SEE GRAPH
VB-9-0-2 GRAY AND WHITE RUBBERY MATERIAL	1.61	60.4	928.9	NT(1)	NT(1)	NT(1)	NT(3)	NT(3)	1113	SEE GRAPH
VB-9-10-12 GREEN,BLACK AND WHITE RUBBERY MATERIAL	1.91	98.6	300.0	NT(3)	NT(3)	NT(3)	NT(3)	NT(3)	NT(2)	NT(2)
VB-11-11-13 GRAY AND WHITE RUBBERY MATERIAL	2.35	57.2	412.8	NT(3)	NT(3)	NT(3)	NT(3)	NT(3)	NT(2)	SEE GRAPH
VB-11-1-2 WHITE AND GRAY RUBBERY MATERIAL	1.61	61.2	482.6	NT(3)	NT(3)	NT(3)	NT(3)	NT(3)	NT(2)	SEE GRAPH

1. Test was attempted but failed because of the material (material was rubbery and would not mix with water).

2. Proper test sample could not be obtained (rubbery or fibrous material could not be cut or would not hold its shape).

3. Test was not performed because material was evaluated to be similar to material that failed because of reason 1.

AR302602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LOG PRESSURE (psf)
PERCENT STRAIN
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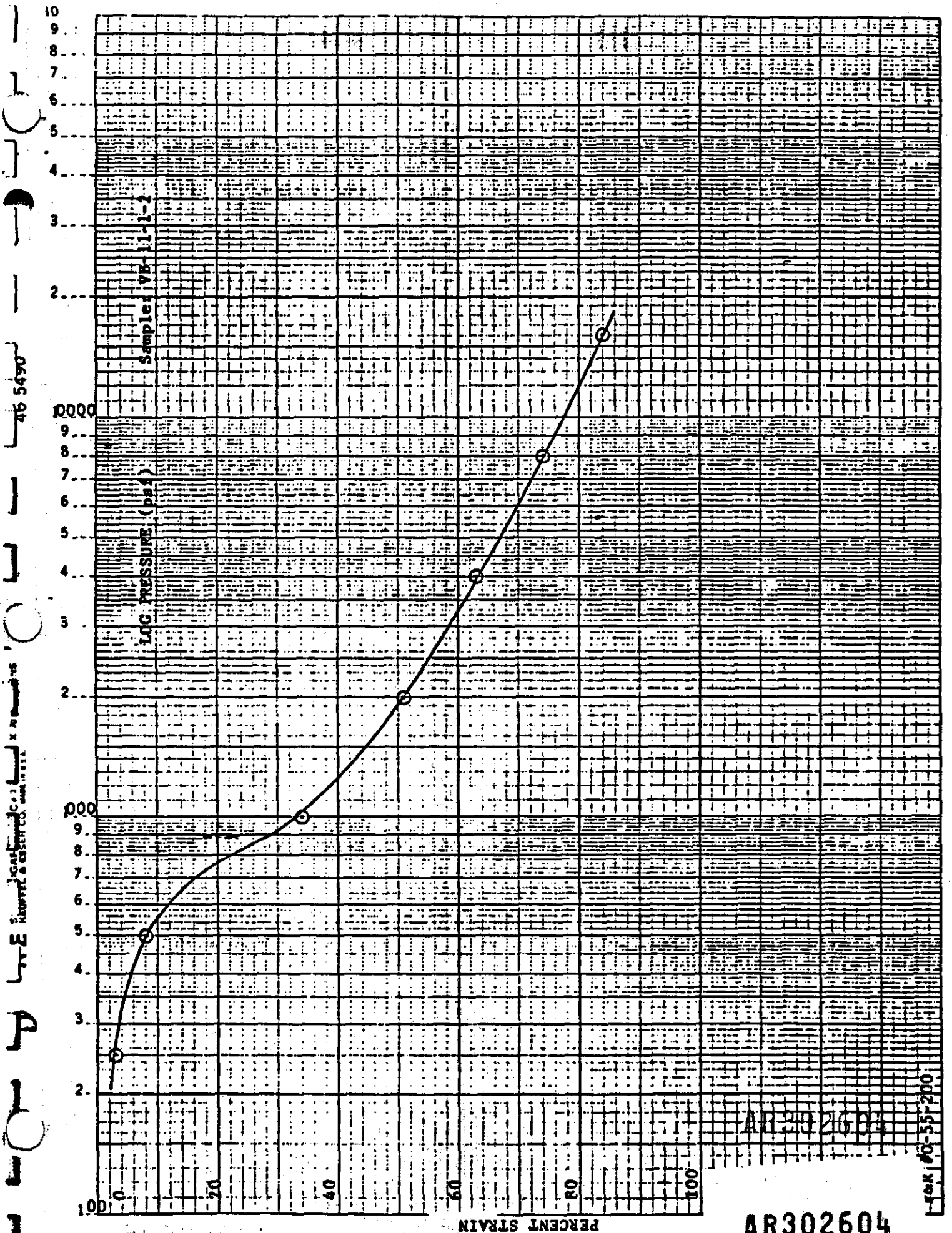
9
8
7
6
5
4
3
2
1000
100
0
20
40
60
80
AR302603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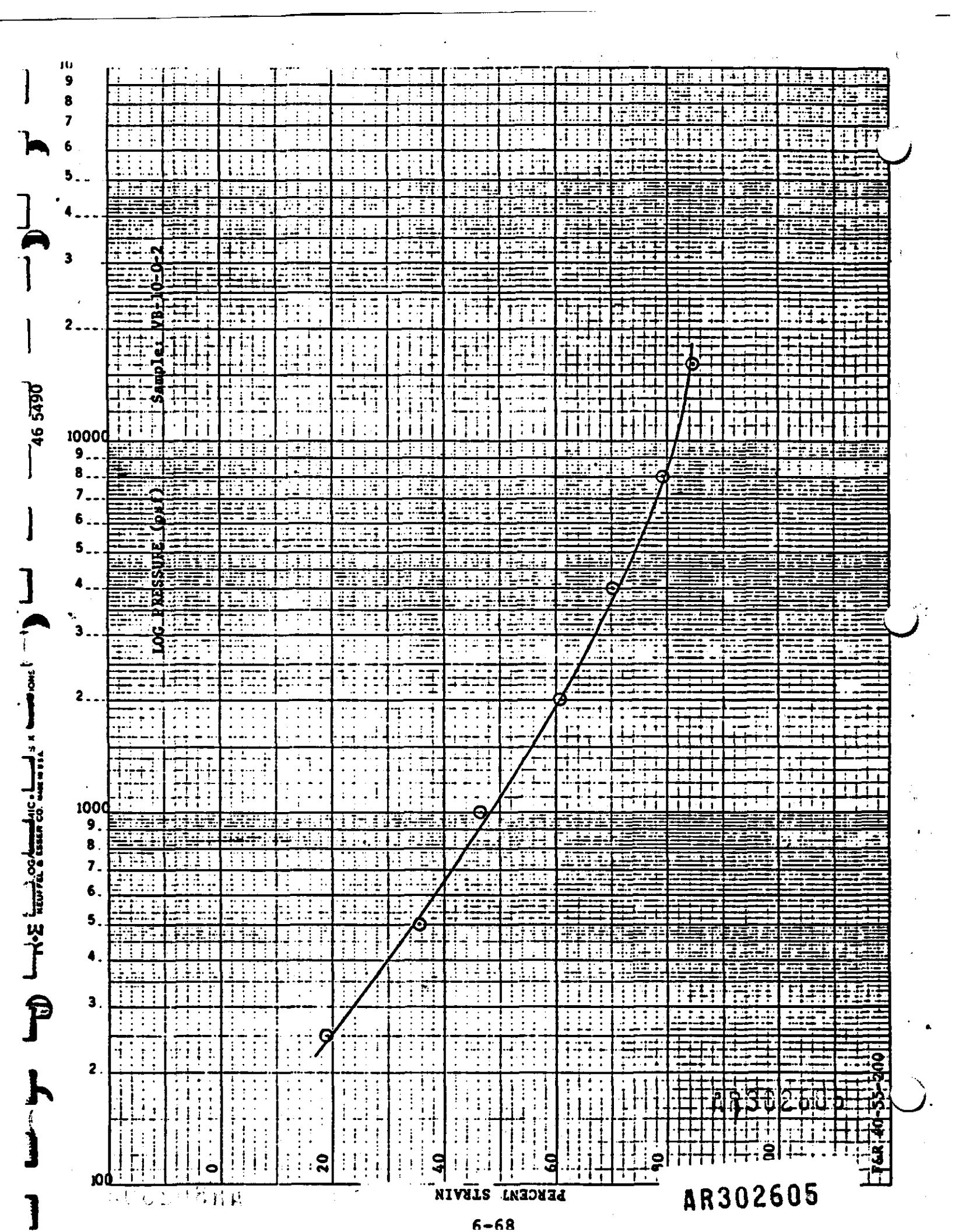
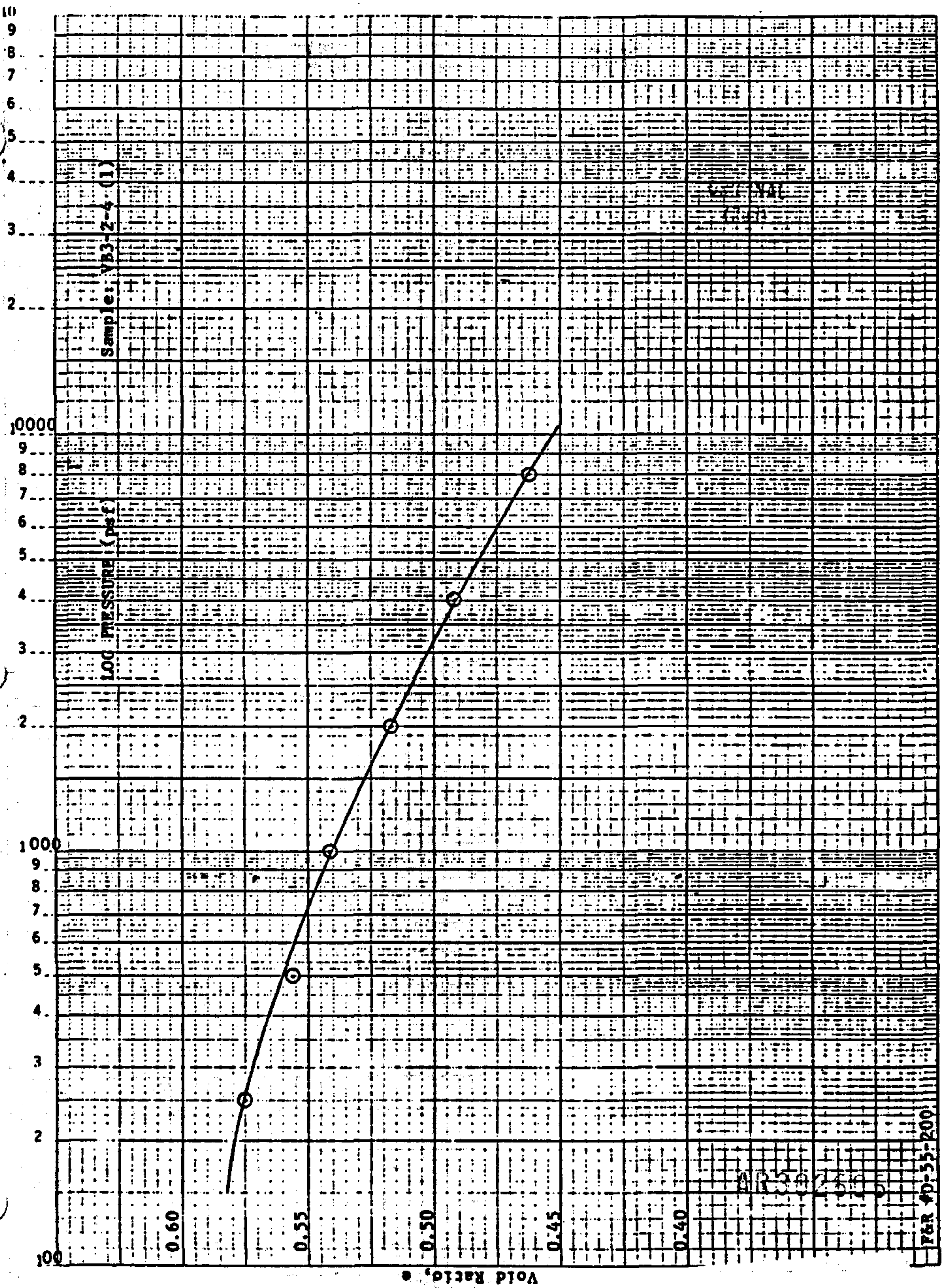
LOG PRESSURE (psf)
PERCENT STRAIN
0
20
40
60
80
100
AR302604


Sample: VB-10-0-2
LOG PRESSURE (psf)
PERCENT STRAIN
10000
1000
100
0
20
40
60
90
AR302605


Sample: VB3-2-4 (1)
LOG PRESSURE (psf)
100
1000
10000
0.60
0.55
0.50
0.45
0.40
Void Ratio, e
P&R #D-55-200

AR302606